

INVESTING SPECIALISTS

# Experts Forecast Long-Term Stock and Bond Returns: 2018 Edition

Christine Benz ▾

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In Focus  
↑ WARAX

As 2017 dawned, few market experts had high hopes for stocks' returns over the next seven to 10 years; after all, the market had already staged a strong run stretching back to March 2009.

With stocks posting another stellar year last year--and with valuations that could hardly be described as cheap--most serious experts are even more circumspect in their long-range return expectations today.

True, economic fundamentals are fine: The economy is solid, unemployment remains low, and corporate earnings growth has been robust. But much of that good news is arguably already priced into stocks' valuations today.

At first blush, forecasting the market's returns, even on a long-term basis, might seem like folly. It's impossible to predict the future, right? But like it or not, market-return assumptions are an essential input for your financial plan. Without some reasonable expectation of what your portfolio will return, you can't know how much you'll need to save and for how long. You can't know whether saving for retirement should be your sole financial preoccupation or whether you can hit other goals, such as college funding, along the way.

To help you arrive at an educated guess of how much the market will contribute to the success of your plans, I've gathered return expectations from market experts both inside and outside of Morningstar. Note that the specifics of these return estimates vary a bit; some of these return expectations are inflation-adjusted while others are not. In addition, some of the experts cited below forecast returns for the next decade, while others employ slightly shorter time horizons. In any case, these return estimates are more intermediate-term than they are long. As such, they're the most relevant to investors whose time horizons are in that ballpark, or to new retirees who face sequence-of-return risk in the next decade. Investors with very long time horizons of 20 to 30 years or longer can reasonably assume that market returns will run in line with their very long-term historic norms: 8%-10% for stocks and half that amount for bonds.

**John C. Bogle, founder of Vanguard Group**

*Highlights:* 4% returns for stocks, 3% returns for bonds over the next decade (October 2017)

In an interview this past October, the Vanguard founder continued to assert that future returns from the major asset classes will be muted. As always, Bogle backs into his return forecast by looking at the equity market's current dividend yield, then factors in expected earnings growth and P/E multiple expansion or contraction. The S&P 500 currently yields less than 2%, and Bogle expects that earnings growth will run in the range of 4%, down a bit from its current torrid pace. He then gives that 6% expected return (the 2% dividend yield plus 4% earnings growth) a haircut to account for expected P/E contraction, bringing his self-described "reasonable expectation" for stocks down to 4%. To arrive at his 3% return

expectations for bonds over the next decade, Bogle uses a blend of the starting yields for Treasuries and high-quality corporates.

## **GMO**

*Highlights:* -4.4% real (inflation-adjusted) returns for U.S. large caps over the next seven years; 2% real returns for emerging markets equities (October 2017).

You didn't expect a sunny return forecast from GMO, did you? True to pessimistic form, especially in the late innings of a bull market, the firm's real-return expectations for most equity categories are negative, with a handful of exceptions. GMO's outlook for U.S. large-cap growth stocks and what the firm classifies as "low-quality" U.S. large-cap equities is especially dour; the firm expects real losses in the neighborhood of 5% -7% over the next seven years. For GMO, emerging markets equities are the sole bright spot on the horizon for stocks: The firm expects emerging markets equities to return an inflation-adjusted 2% over the next seven years, while its real-return expectation for value-oriented emerging-markets equities is a sunny 7%. Indeed, the firm notes that the expected return advantage of value-priced emerging markets equities relative to the next-best asset class is the largest it has observed in more than two decades. It's worth noting that the firm's pessimism U.S. equities has cost it on the return front over the past several years: ➔ Wells Fargo Absolute Return (WARAX), which GMO manages, has recently struggled and earns a Neutral rating from Morningstar's analyst team.

## **Morningstar Investment Management**

*Highlights:* 1.8% 10-year nominal returns for U.S. stocks; 2.5% 10-year nominal returns for U.S. bonds (Sept. 30, 2017).

Like GMO and Research Affiliates (below), Morningstar Investment Management's return expectations for U.S. stocks and bonds are low, if not downright discouraging, especially when you factor in inflation. But the outlook is more optimistic for foreign equities: MIM expects U.S. holders of international developed equities to earn nearly 5% on a nominal (noninflation-adjusted) basis, and U.S. holders of emerging-markets equities to earn more than 5% nominally. (Note that those forecasts are down substantially from a year ago, owing to very strong performance from foreign stocks over the past year.) Morningstar Investment Management provides its latest return expectations in Morningstar Markets Observer; the latest issue will be out this month.

## **Research Affiliates**

*Highlights:* 0.3% real returns for U.S. large caps during the next 10 years; 0.8% real returns for the Barclays U.S. Aggregate Bond Index (Dec. 31, 2017).

I love Research Affiliates' intuitive and user-friendly scatter plot depicting the firm's expectations for 10-year returns and volatility from the major asset classes as well as portfolios. Users can use the tool to see the firm's return/volatility expectations for numerous asset classes, as well as backward-looking data. The firm's recent 10-year risk/return expectations, based on its "valuation-dependent model," suggest that investors who are inclined to stick with a plain-vanilla U.S. stock/bond portfolio should curb their enthusiasm: A 60% U.S. equity/40% bond portfolio will only barely break into the black



on an inflation-adjusted basis over the next decade. Like GMO and Morningstar, the firm has higher return expectations from foreign stocks and especially emerging markets, however. It's expecting a 4.5% return over the next decade from the MSCI EAFE index (developed markets foreign stocks) and a nearly 6% return from emerging markets equities.

### **Charles Schwab Investment Advisory**

*Highlights:* 6.7% expected nominal return from U.S. large-cap stocks from 2017-2026; 3.1% nominal returns from U.S. investment-grade bonds (August 2017)

Charles Schwab Investment Advisory (a separately registered investment advisor and affiliate of Charles Schwab & Co. Inc.) was forecasting higher equity returns than many of the other firms in our survey--roughly 7% on a noninflation-adjusted basis for U.S. and foreign large caps as of August 2017. (Given stocks continued run in the second half of 2017, it's possible the firm has ratcheted its expectations downward since then.) Moreover, the firm's return expectations for foreign equities wasn't appreciably better than for U.S. stocks. But like most of the other firms, Charles Schwab Investment Advisory expects returns over the next decade to be lower than in the past 45 years, owing to high stock valuations, among other factors.

### **Vanguard**

*Highlights:* Nominal U.S. equity-market returns in the 3% to 5% range during the next decade; 5.5% to 7.5% returns for non-U.S. equities; 2% to 3% expected returns for global fixed-income markets (December 2017).

In its 2018 Economic and Market Outlook, Vanguard's Investment Strategy Group projects higher risks and lower returns for 2018 and beyond. "Elevated valuations, low

volatility, and secularly low bond yields are unlikely to be allies for robust financial markets over the next five years," the firm's researchers wrote. In line with many of the other firms' return projections, Vanguard believes that the prospects for foreign equities are better than for U.S. stocks, accentuating the value of maintaining a globally diversified equity portfolio. Vanguard describes its outlook for global fixed-income assets as "positive but muted," noting that tightened credit spreads point to less variation in the returns of fixed-income subasset classes over the next decade than in previous periods.

Christine Benz does not own shares in any of the securities mentioned above. Find out about Morningstar's editorial policies.



# Survey of Capital Market Assumptions

## 2018 Edition



Horizon Actuarial Services, LLC is proud to serve as the actuary to over 100 multiemployer defined benefit pension plans across the United States and across various industries. As actuary to these plans, we must develop assumptions regarding future investment returns on plan assets. We then use those assumptions as we determine the actuarial values of the benefits promised by these plans to their participants and beneficiaries, as well as to project plan funding and solvency levels years into the future.

At Horizon Actuarial, we are actuaries, not investment professionals. Therefore, when developing assumptions as to what returns a pension plan's assets might be expected to earn in the future, we look to our colleagues in the investment advisory community. Each year, as part of this survey, we ask different investment firms to provide their "capital market assumptions" – their expectations for future risk and returns for different asset classes in which pension plans commonly invest. The information gathered from this survey can help answer the common question: "Are my plan's investment return assumptions reasonable?"

There are many factors to consider when evaluating a plan's investment return assumptions, such as its asset allocation and the maturity of its participant population. Any of these factors can make the expected return for one plan very different from others. Therefore, this report does not opine on the reasonableness of any one plan's investment return assumptions. Nevertheless, we hope this report will be a useful resource for trustees, actuaries, and investment professionals alike.

*Horizon Actuarial sincerely thanks the 34 investment advisors who participated in this survey.*

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# Survey of Capital Market Assumptions: 2018 Edition

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## Summary

Horizon Actuarial first conducted this survey in 2010, and it included 8 investment advisors. In 2012, we first published a report on the survey results, which included 17 advisors. The survey has expanded considerably over the past few years; this 2018 edition of the survey includes assumptions from 34 different investment firms.

In general, expected returns have declined in recent years. When we focus on the 22 advisors who participated in each of the last five surveys, we see that expected returns for equity and alternative investments generally decreased from 2014 to 2018. During the same period, expected returns for core fixed income and U.S. Treasuries have remained relatively flat. Expected volatilities for alternative investments have decreased in recent years, but have not changed significantly for other asset classes.

As we have seen in prior surveys, expected returns are noticeably lower over the short term than over the long term. This trend is apparent when we focus on the 13 advisors who provided assumptions for both the short term (up to 10 years) and long term (20 years or more). In fact, the difference between short-term and long-term expectations is more pronounced in this 2018 survey than it has been in any year since the survey began developing separate 10-year and 20-year expected returns in 2013.

For ongoing pension plans without solvency issues, we believe a horizon of 20 years or more is appropriate for evaluating the reasonableness of the long-term investment return assumption. A shorter horizon, such as 10 years, may be more appropriate for evaluating the return assumption for a plan that is more mature or has solvency issues. Even for plans with long-term investment horizons, it is important to understand the potential impact of lower expected returns over the short term. Therefore, this survey shows return expectations over horizons of both 10 years and 20 years.

For illustration, this report also constructs an asset allocation for a hypothetical multiemployer pension plan and uses the results from the survey to develop a range of reasonably expected returns for the plan. When compared to the 2017 edition of the survey, the expected returns for this 2018 edition were lower over 10-year and 20-year horizons by 23 and 16 basis points, respectively. These decreases were primarily driven by lower expected returns across most asset classes for many of the advisors who participated in both the 2017 survey and the 2018 survey.

If you have questions about how the results of this survey relate to your multiemployer plan, please contact your consultant at Horizon Actuarial or visit the "contact us" page on our website, [www.horizonactuarial.com](http://www.horizonactuarial.com). For questions about the survey itself, please contact Ben Ablin at [ben.ablin@horizonactuarial.com](mailto:ben.ablin@horizonactuarial.com).

*Horizon Actuarial Services, LLC is an independent consulting firm specializing in providing actuarial and consulting services to multiemployer benefit plans. Horizon Actuarial does not provide investment, legal, or tax advice. Please consult with your investment advisor, legal counsel, or tax advisor for information specific to your plan's investment, legal, or tax implications.*



## Survey of Capital Market Assumptions: 2018 Edition

### Survey Participants

Exhibit 1 below lists the 34 investment advisors whose capital market assumptions are included in the 2018 survey. This report does not attribute specific assumptions to individual firms, which is a precondition of the survey.

Originally, this survey was exclusive to the multiemployer plan community; it included only assumptions from investment advisors to multiemployer pension plans. The survey has expanded over the years, and it now includes assumptions from investment advisors outside of the multiemployer plan community.

Of the 34 sets of capital market assumptions included in the 2018 edition of the survey, 27 were provided by investment advisors to multiemployer plans, 4 were obtained from published white papers, and 3 were provided by investment advisors who do not consult with multiemployer plans. A complete listing of the firms participating in the survey is provided below.

#### Exhibit 1

| 2018 Survey Participants                          |  |
|---|--|
| <i>AJ Gallagher</i>                               | <i>Marquette Associates</i>                          |
| <i>Alan Biller</i>                                | <i>Meketa Investment Group</i>                       |
| <i>AndCo Consulting</i>                           | <i>Merrill Lynch Global Institutional Consulting</i> |
| <i>Aon Hewitt</i>                                 | <i>Morgan Stanley Wealth Management</i>              |
| <i>The Atlanta Consulting Group</i>               | <i>New England Pension Consultants (NEPC)</i>        |
| <i>Bank of New York Mellon*</i>                   | <i>Pavilion Advisory Group</i>                       |
| <i>BlackRock*</i>                                 | <i>Pension Consulting Alliance</i>                   |
| <i>Callan Associates</i>                          | <i>PFM Asset Management, LLC</i>                     |
| <i>Cambridge Associates</i>                       | <i>RVK</i>   |
| <i>CapTrust</i>                                   | <i>Segal Marco Advisors</i>                          |
| <i>Ellwood Associates</i>                         | <i>SEI</i>   |
| <i>Investnet**</i>                                | <i>Sellwood Consulting</i>                           |
| <i>Goldman Sachs Asset Management</i>             | <i>Summit Strategies Group</i>                       |
| <i>Graystone Consulting</i>                       | <i>UBS</i>   |
| <i>Investment Performance Services, LLC (IPS)</i> | <i>Verus</i>   |
| <i>Janney Montgomery Scott, LLC</i>               | <i>Voya Investment Management*</i>                   |
| <i>J.P. Morgan Asset Management*</i>              | <i>Willis Towers Watson**</i>                        |

\* Assumptions obtained from published white paper  
\*\* Advisor from outside multiemployer community

### Investment Horizons

When evaluating the expected return assumption for an active, ongoing multiemployer pension plan, actuaries usually consider investment returns over a long-term investment horizon of 20 years or more. A shorter time horizon, say over the next 10 years, may be more appropriate when evaluating the return assumption for a mature plan, a plan that has high negative cash flows, or a plan that is projected to become insolvent.

It is also important to understand the sensitivity of plan funding to changes in future investment returns. For example, the actuary for an active, ongoing pension plan will typically set the plan's investment return assumption based on expectations over a long-term horizon. However, evaluating the sensitivity of funding results to short-term investment returns that are expected to be higher or lower than the long-term assumption also plays an integral role in the decision making process.

Survey participants were requested to provide their most recent capital market assumptions: expected returns for different asset classes, standard deviations (i.e., volatilities) for those expected returns, and a correlation matrix. The survey participants were also requested to indicate the investment horizon(s) to which their assumptions apply. If the participant develops separate assumptions for different time horizons, they were requested to provide each set of assumptions.

In the 2018 edition of the survey, 21 advisors provided one set of assumptions: of those, 19 specified a time horizon of 10 years and 2 specified a time horizon of 10 to 15 years. The remaining 13 advisors provided assumptions over both shorter-term (5 to 10 years) and longer-term (20 years or more) horizons.

Exhibit 2 below summarizes the time horizons specified by each advisor, grouped by type.

#### Exhibit 2

| Investment Time Horizons         |           |          |          |           |
|----------------------------------|-----------|----------|----------|-----------|
| Advisor Type                     | (A)       | (B)      | (C)      | Total     |
| 10 Years                         | 14        | 3        | 2        | 19        |
| 10 to 15 Years                   | 1         | 1        | -        | 2         |
| <u>Both Short- and Long-Term</u> | <u>12</u> | <u>-</u> | <u>1</u> | <u>13</u> |
| Total                            | 27        | 4        | 3        | 34        |

(A) Multiemployer plan investment advisor  
(B) Published white paper  
(C) Advisor from outside multiemployer community



## Survey of Capital Market Assumptions: 2018 Edition

### Short-Term vs. Long-Term

As noted in the previous section, survey participants provided expected returns over different time horizons. Given current market conditions, many investment advisors may expect returns for certain asset classes to be different in the short term versus over the long term.

For comparability, this survey groups expected returns into two time horizons: 10 years and 20 years. As pension plan actuaries, we often refer to the 10-year expected returns as “short-term” and the 20-year expected returns as “long-term.” Note, however, that many investment firms consider 10-year expectations to be “long-term.”

When comparing the expected returns for the 13 advisors who provided both short-term and long-term assumptions,<sup>1</sup> we see some interesting differences. See Exhibit 3 below. Expected returns are geometric and are generally considered to be indexed and net of fees.

#### Exhibit 3

| Average Expected Returns: Short-Term vs. Long-Term |                 |                 |            |
|--|-----------------|-----------------|------------|
| Subset of 13 Survey Respondents                    |                 |                 |            |
| Asset Class  | 10-Year Horizon | 20-Year Horizon | Difference |
| US Equity - Large Cap                              | 6.24%           | 7.42%           | 1.18%      |
| US Equity - Small/Mid Cap                          | 6.97%           | 8.18%           | 1.21%      |
| Non-US Equity - Developed                          | 7.05%           | 7.71%           | 0.66%      |
| Non-US Equity - Emerging                           | 7.85%           | 8.82%           | 0.97%      |
| US Corporate Bonds - Core                          | 3.59%           | 4.46%           | 0.87%      |
| US Corporate Bonds - Long Dur.                     | 3.36%           | 4.44%           | 1.08%      |
| US Corporate Bonds - High Yield                    | 4.81%           | 5.82%           | 1.01%      |
| Non-US Debt - Developed                            | 2.19%           | 3.22%           | 1.03%      |
| Non-US Debt - Emerging                             | 5.24%           | 6.13%           | 0.89%      |
| US Treasuries (Cash Equivalents)                   | 2.51%           | 3.05%           | 0.54%      |
| TIPS (Inflation-Protected)                         | 3.23%           | 4.04%           | 0.81%      |
| Real Estate  | 5.87%           | 6.66%           | 0.79%      |
| Hedge Funds  | 5.46%           | 6.19%           | 0.73%      |
| Commodities  | 4.73%           | 4.92%           | 0.19%      |
| Infrastructure                                     | 6.77%           | 7.14%           | 0.37%      |
| Private Equity                                     | 8.59%           | 9.52%           | 0.93%      |
| Inflation  | 2.41%           | 2.47%           | 0.06%      |

*The 10-year and 20-year returns shown above are the averages for the 13 advisors who provided both short-term and long-term assumptions. Expected returns are annualized (geometric).*

The consensus among these 13 advisors was that returns are expected to be lower in the short term compared to the long term. In general, the difference between long-term and short-term returns is more pronounced for US equity and fixed income investments.

As noted earlier, the results shown in Exhibit 3 are based on a subset of 13 advisors. If we include all 34 survey advisors, the short-term and long-term expected returns do not change dramatically. See Exhibit 4 below.

#### Exhibit 4

| Average Expected Returns: Short-Term vs. Long-Term |                 |                 |            |
|--|-----------------|-----------------|------------|
| All Survey Respondents                             |                 |                 |            |
| Asset Class  | 10-Year Horizon | 20-Year Horizon | Difference |
| US Equity - Large Cap                              | 6.07%           | 7.42%           | 1.35%      |
| US Equity - Small/Mid Cap                          | 6.57%           | 8.18%           | 1.61%      |
| Non-US Equity - Developed                          | 6.71%           | 7.71%           | 1.00%      |
| Non-US Equity - Emerging                           | 7.64%           | 8.82%           | 1.18%      |
| US Corporate Bonds - Core                          | 3.37%           | 4.46%           | 1.09%      |
| US Corporate Bonds - Long Dur.                     | 3.32%           | 4.44%           | 1.12%      |
| US Corporate Bonds - High Yield                    | 4.78%           | 5.82%           | 1.04%      |
| Non-US Debt - Developed                            | 2.18%           | 3.22%           | 1.04%      |
| Non-US Debt - Emerging                             | 5.00%           | 6.13%           | 1.13%      |
| US Treasuries (Cash Equivalents)                   | 2.48%           | 3.05%           | 0.57%      |
| TIPS (Inflation-Protected)                         | 2.88%           | 4.04%           | 1.16%      |
| Real Estate  | 5.90%           | 6.66%           | 0.76%      |
| Hedge Funds  | 4.96%           | 6.19%           | 1.23%      |
| Commodities  | 3.97%           | 4.92%           | 0.95%      |
| Infrastructure                                     | 6.56%           | 7.14%           | 0.58%      |
| Private Equity                                     | 8.33%           | 9.52%           | 1.19%      |
| Inflation  | 2.24%           | 2.47%           | 0.23%      |

*10-year horizon results include all 34 survey respondents.  
20-year horizon results include a subset of 13 survey respondents.  
Expected returns are annualized (geometric).*

The 10-year expected returns shown above include assumptions from all 34 advisors, while the 20-year expected returns include assumptions from only the 13 advisors who provided longer-term assumptions.

While past editions of this survey have indicated lower expected returns over the short term than over the long term, the difference has increased in recent years for most asset classes. For example, the difference between short term expected returns and long term expected returns for large cap US equity based on the average assumptions from the 2018 survey is 135 basis points. For comparison, the difference was 88 basis points based on the average assumptions from the 2014 survey.

For this reason, it may be more important than ever for the actuary to evaluate the sensitivity of funding results to short-term investment returns that are expected to be lower than the long-term assumption.

<sup>1</sup> In cases where an advisor indicated a time horizon shorter than 10 years, the shorter-term expected returns were combined with the longer-term expected returns to achieve a 10-year horizon. Similarly, if an advisor indicated a time horizon longer than 20 years, the longer-term expected returns were combined with the shorter-term expected returns to achieve a 20-year horizon.



## Survey of Capital Market Assumptions: 2018 Edition

### Differing Opinions

Exhibit 5 below shows the distribution of expected returns and standard deviations (i.e., volatilities) for each asset class in the survey, as provided by the 34 individual advisors in the survey. Expected returns are geometric and apply to a 10-year investment horizon. Average assumptions from the 2018 survey are listed in brackets for each asset class. As noted earlier, returns are assumed to be indexed and net of fees.

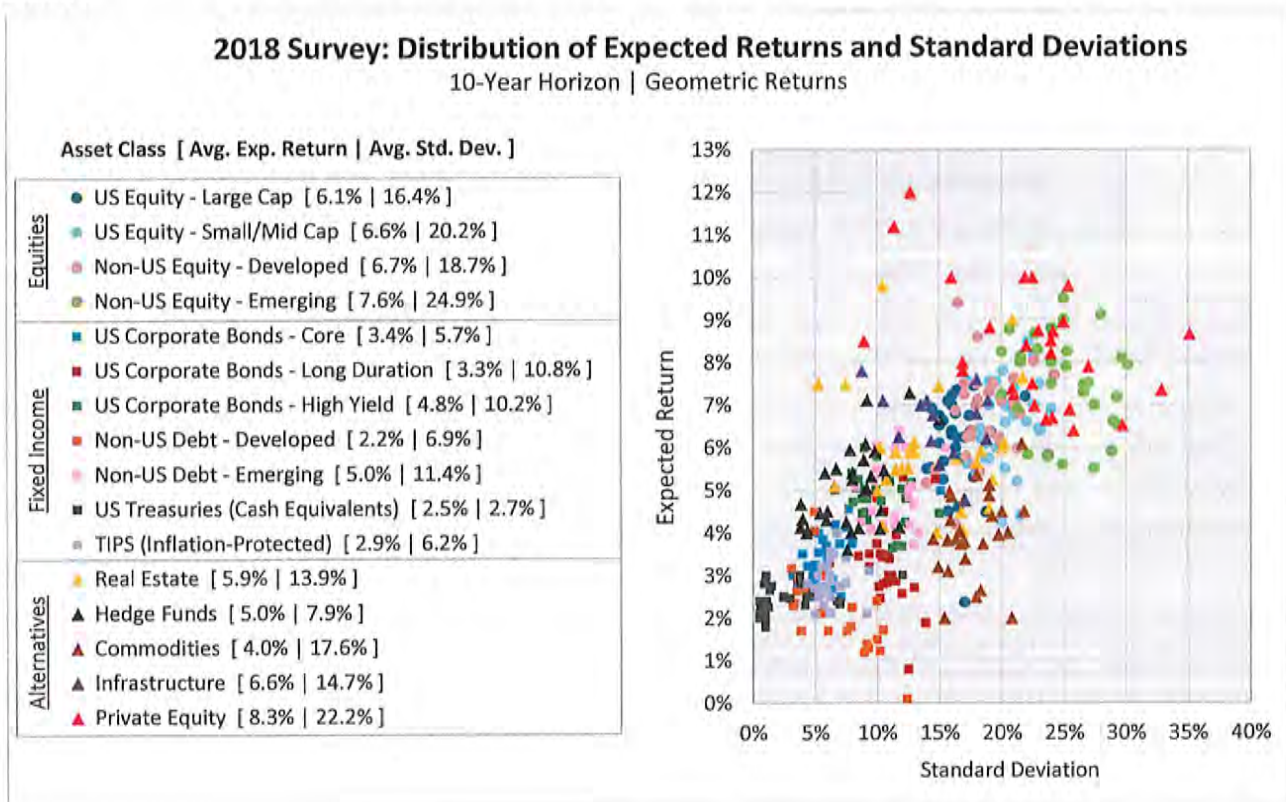
Note that the exhibit below focuses on a 10-year horizon in order to include assumptions from all 34 advisors. See Exhibit 16 in the appendix to this report for the assumptions over a 20-year horizon, based on the 13 advisors who provided longer-term assumptions. Also note that the exhibit considers both expected returns and standard deviations. The ranges of expected returns by asset class can be found in the appendix as Exhibits 17 and 18.

The exhibit below shows that there are significant differences in expected returns and standard deviations among investment advisors. As the saying goes, "reasonable people may differ."

The differences in assumptions are more pronounced for alternative investments such as real estate, hedge funds, and private equity. A contributing factor may be differences in the underlying strategies different advisors apply to these alternative investments (for example, opportunistic versus defensive). To contrast, the differences in expected returns and volatilities are smaller for more traditional investments, such as US equity and US fixed income.

A summary of the average survey assumptions can be found in the appendix to this report as Exhibit 15. This summary includes expected returns, standard deviations, and a correlation matrix.

### Exhibit 5





## Survey of Capital Market Assumptions: 2018 Edition

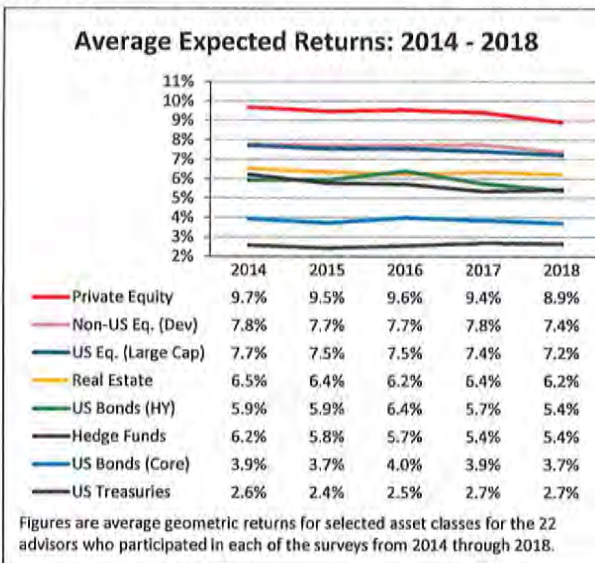
### Changing Outlooks: 2014 to 2018

In recent years, there has been much discussion about whether it is reasonable to expect that future investment returns will be as high as they have been historically. Citing various reasons such as increased equity prices, tightening credit spreads, and continuing low interest rates, many advisors have lowered their expectations over the last five years, especially from 2017 to 2018.

Exhibit 6 below shows average expected returns for selected asset classes each year from 2014 to 2018. For consistency, this exhibit includes only the 22 advisors who participated in the survey in each of these years.

Note that the expected returns shown below are based on a 20-year horizon for advisors who provided longer-term assumptions and a 10-year horizon for others.<sup>2</sup> For that reason (as well as the fact that we include only a subset of advisors), the expected returns shown below are not directly comparable with those in other sections or previous surveys.

**Exhibit 6**



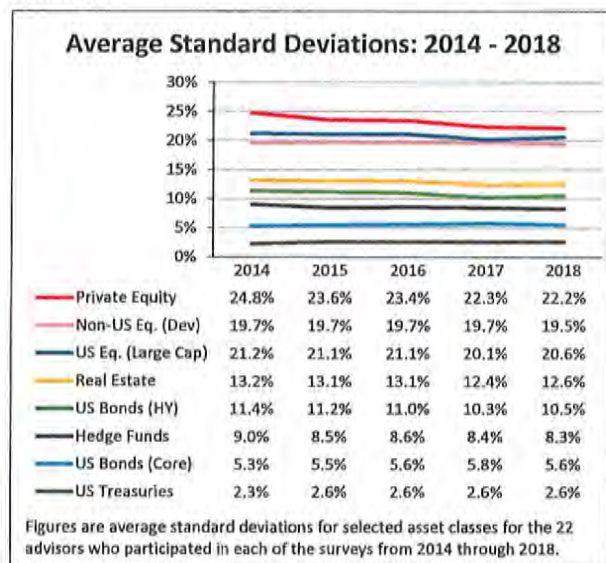
For this subset of advisors, average expected returns have decreased for every asset class except US Treasuries over the last five years. The sharpest declines from 2017 to 2018 were for the asset classes with the highest expected returns – private equity and non-US developed equity.

Other asset classes, such as large cap US equity, real estate, high-yield bonds, and hedge funds have seen more gradual declines over the course of the last five years.

Average expected returns asset classes with lower expected returns such as core fixed income and US Treasuries remained relatively flat from 2014 to 2018.

In addition to expected returns, it is also important to consider expected volatility of the returns, measured by standard deviations. Average standard deviations over the last five years are shown in Exhibit 7 below.

**Exhibit 7**



In general, average standard deviations have decreased from 2014 to 2018. This decrease may be related to the decrease in average expected returns over the same period as investments with lower expected returns are often less volatile than investments with higher expected returns. This trend of decreasing standard deviations is most apparent for private equity, but noticeable shifts have occurred for large cap US equities, real estate, and high-yield bonds as well.

On the contrary, average standard deviations have increased for investments whose returns are more closely tied to interest rates such as core US bonds and US Treasuries. This increase may indicate greater uncertainty about the timing of future changes in interest rates or the rate at which those rates are expected to change.

<sup>2</sup> Of the 13 survey advisors who provided both shorter-term and longer-term assumptions, 11 of them indicated no difference in the standard deviations of the expected returns over the short term versus the long term. For the other 2 advisors, the differences between short-term and long-term standard deviations were very minor.



## Survey of Capital Market Assumptions: 2018 Edition

### Evaluating the Return Assumption

Multiemployer pension plans are usually invested in a well-diversified mix of stocks, bonds, real estate, and alternative investments structured to meet the goals of the Trustees. This typically involves maximizing returns over the long term while minimizing return volatility.

The actuary of a multiemployer pension plan must evaluate the plan's asset allocation and, based on expectations of future returns, develop an assumption for what plan assets are projected to earn over the long term. This assumption is then used (along with others) to determine the actuarial present value of the benefits promised by the plan to its participants and beneficiaries.

The actuary will often rely on the future return expectations of the plan's investment advisor in developing the plan's investment return assumption. However, as noted earlier, different investment advisors often have widely differing opinions on what future returns will be. Therefore, it can be beneficial to keep in mind other advisors' expectations when setting the investment return assumption.

In the following exhibits, we will evaluate the investment return assumption for a hypothetical multiemployer pension plan. Exhibit 8 below shows the asset allocation for this hypothetical plan. The asset allocations are arbitrary, except for the fact that we made sure to include at least a small allocation to every asset class in the survey.

**Exhibit 8**

| Hypothetical Multiemployer Plan    |               |
|------------------------------------|---------------|
| Asset Class                        | Weight        |
| US Equity - Large Cap              | 20.0%         |
| US Equity - Small/Mid Cap          | 10.0%         |
| Non-US Equity - Developed          | 7.5%          |
| Non-US Equity - Emerging           | 5.0%          |
| US Corporate Bonds - Core          | 7.5%          |
| US Corporate Bonds - Long Duration | 2.5%          |
| US Corporate Bonds - High Yield    | 5.0%          |
| Non-US Debt - Developed            | 5.0%          |
| Non-US Debt - Emerging             | 2.5%          |
| US Treasuries (Cash Equivalents)   | 5.0%          |
| TIPS (Inflation-Protected)         | 5.0%          |
| Real Estate                        | 10.0%         |
| Hedge Funds                        | 5.0%          |
| Commodities                        | 2.5%          |
| Infrastructure                     | 2.5%          |
| Private Equity                     | 5.0%          |
| <b>TOTAL PORTFOLIO</b>             | <b>100.0%</b> |

Exhibit 9 shows expected annualized (geometric) returns for the hypothetical plan over a 10-year horizon. These results may be appropriate for modeling sensitivities of future funding results to short-term investment returns, or for evaluating the return assumption for a plan with severely negative cash flows or solvency issues.

**Exhibit 9**

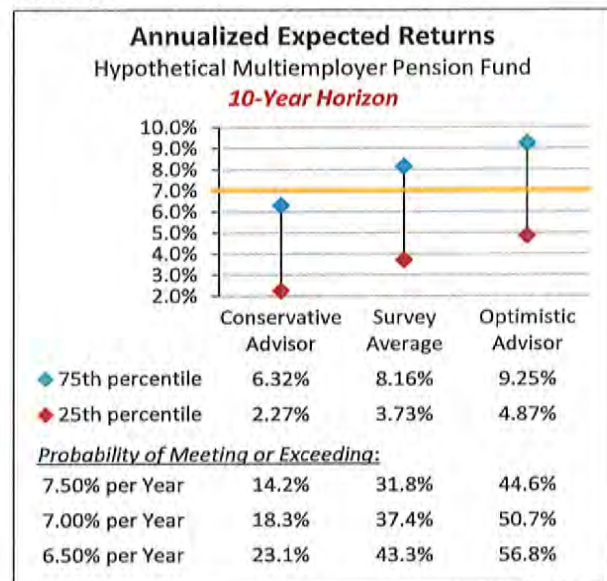


Exhibit 10 shows expected annualized (geometric) returns for the hypothetical plan over a 20-year horizon based on assumptions from the 13 advisors who provided longer-term assumptions. These results may be more appropriate for evaluating the return assumption for an ongoing plan with no projected solvency issues.

**Exhibit 10**





## Survey of Capital Market Assumptions: 2018 Edition

### **Evaluating the Return Assumption (cont)**

It is important to keep in mind that the expected returns shown in Exhibits 9 and 10 apply only to the hypothetical asset allocation shown in Exhibit 8. The expected returns will be different – perhaps significantly – for different asset allocations.

Exhibit 13 in the appendix to this report shows more detail regarding the derivation of the expected returns for this hypothetical pension plan.

The following are points to consider when reviewing the results in Exhibits 9 and 10:

**Range of Reasonable Assumptions:** When setting the investment return assumption for pension valuations, actuaries traditionally constructed a range of reasonable assumptions and then selected a best-estimate point within that range. Actuaries would often consider the reasonable range to be the middle 50 percent of possible results, bounded by the 25<sup>th</sup> and 75<sup>th</sup> percentiles.

The applicable actuarial standards of practice were updated in 2013, and the new standards de-emphasize use of the reasonable range when setting the investment return assumption. Nevertheless, considering this range remains instructive; it may be difficult for an actuary to justify an assumption outside of this range.

Based on the average assumptions in this 2018 survey, the middle 50 percent range for this hypothetical pension plan is very wide: 5.50% to 8.73% over the next 20 years. Note that the range is even wider for a 10-year horizon: 3.73% to 8.16%. This is due to the fact that, while returns may be volatile from one year to the next, deviations will be lower when returns are annualized (in other words, smoothed out) over longer horizons.

**Probability of Meeting/Exceeding the Benchmark:** For example, say that the actuary for this hypothetical pension plan expects its investment returns to be 7.00% per year, represented by the gold lines in Exhibits 9 and 10. Based on the average assumptions in this 2018 survey, there is a 52.0% probability the plan will meet or beat its 7.00% benchmark on an annualized basis over a 20-year period. The probability is lower, 37.4%, that the plan will meet or beat its benchmark over the next 10 years.

Also note that over a 20-year period, the probability that the annualized investment return will exceed 7.50% (arbitrarily, 50 basis points above the benchmark return) is 43.7%. The probability that the annualized return will exceed 6.50% (50 basis points below the benchmark) is 60.2%. These probabilities are a bit lower when focusing on a 10-year horizon rather than a 20-year horizon.

**Optimistic and Conservative Assumptions:** As previously noted, different investment advisors may have widely varying future capital market expectations. Therefore, it may also be interesting to consider the range of expected returns based on the assumptions provided by the most conservative and most optimistic advisors in the survey.

For this hypothetical asset allocation, the assumptions from the most conservative advisor indicate that the probability of beating the 7.00% benchmark assumption over the next 20 years is 28.3%. Using assumptions from the most optimistic advisor results in a probability of 71.0%. Again, reasonable people may differ.

**Limitations:** The following are some important limiting factors to keep in mind when reviewing these results. In most cases, adjustments made to account for these limitations tended to slightly lower the expected returns in the survey, for the sake of conservatism.

- The asset classes in this survey do not always align perfectly with the asset classes provided by the investment advisors. Adjustments were made to standardize the different asset classes provided.
- Many of the advisors develop their future assumptions based on investment horizons of no more than 10 years, and returns are generally expected to be lower in the short term. The typical multiemployer pension plan will have an investment horizon that is much longer than 10 years.
- The return expectations are based on indexed returns. In other words, they do not reflect any additional returns that may be earned due to active asset managers outperforming the market (“alpha”), net of investment expenses.
- The return expectations do not adjust for plan size. Specifically, they do not take into account the fact that certain investment opportunities are more readily available to larger plans, as well as the fact that larger plans may often receive more favorable investment fee arrangements than smaller plans.
- The ranges of expected annualized returns were constructed using basic, often simplified, formulas and methodologies. More sophisticated investment models – which may consider various economic scenarios, non-normal distributions, etc. – could produce significantly different results.

**Use of the Survey:** This survey is not intended to be a substitute for the expectations of individual portfolio managers, advisors, or actuaries performing their own independent analyses. The actuarial standards of practice provide for various methods of selecting the investment return assumption. This survey is intended to be used in conjunction with these methods, with appropriate weighting of various resources based on the plan actuary’s professional judgment.



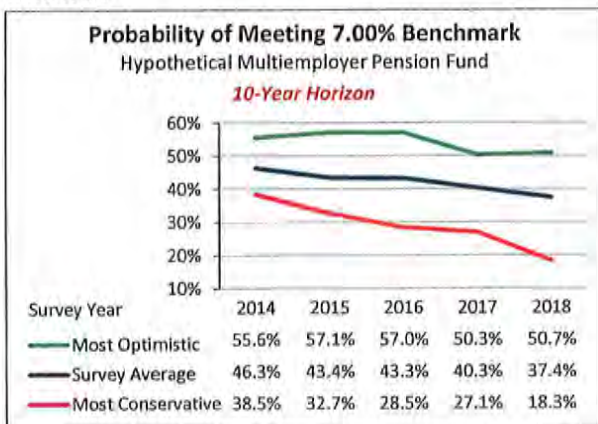
## Survey of Capital Market Assumptions: 2018 Edition

### Comparison with Prior Surveys

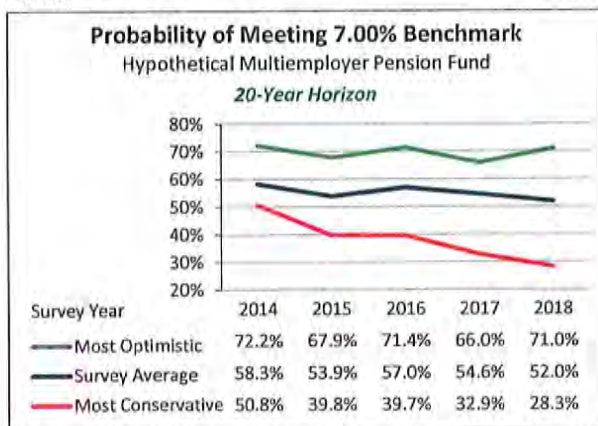
Exhibits 6 and 7 showed how expected returns and standard deviations for certain asset classes have changed over the past few years. Similarly, Exhibits 11 and 12 below show how return expectations for the hypothetical multiemployer pension plan whose asset allocation is shown in Exhibit 8 have changed from 2014 to 2018.

Both exhibits show the probabilities that the hypothetical pension plan will meet or exceed its 7.00% benchmark return on an annualized basis over the given time horizon. Exhibit 11 focuses on expected returns over a 10-year period, and Exhibit 12 focuses on expected returns over a 20-year period. Probabilities are shown for the survey average for each year from 2014 through 2018. For comparison, probabilities are also shown for the most conservative and optimistic advisors in each survey.

**Exhibit 11**



**Exhibit 12**



As shown in Exhibits 11 and 12, the probabilities that this hypothetical pension plan would meet or beat a benchmark return of 7.00% have generally decreased from 2014 to 2018. The decrease is more pronounced when considering a 10-year horizon versus a 20-year horizon.

For example:

- Based on the average assumptions from the 2018 survey, the probability of this hypothetical plan meeting or exceeding an annualized return of 7.00% over the next 10 years is 37.4%. For comparison, the probability was considerably higher (46.3%) five years ago when the 2014 survey was conducted.
- Based on the average assumptions from the 2018 survey, the probability of this hypothetical plan meeting or exceeding an annualized return of 7.00% over the next 20 years is 52.0%. While the probability was higher (58.3%) based on the average assumptions from 2014, the decrease over time for longer-term expectations is less pronounced than it has been for shorter-term expectations.

Other points of note when comparing the results from the 2018 survey to those from prior years:

- The results for the most conservative advisor in each survey from 2014 through 2018 have changed more dramatically than the results for the survey average and the most optimistic advisors. Based on the assumptions of the most conservative advisor in the 2014 survey, the probability of this hypothetical plan meeting or exceeding its 7.00% benchmark over the next 20 years was 38.5%. This can be compared to a probability of only 18.3% for the most conservative advisor in the 2018 survey.
- The results for the most optimistic advisor in each survey have generally remained more stable over the past five years, though there was a significant decrease in the probability of meeting the 7.00% benchmark over a 10-year horizon from 2016 to 2017. Nevertheless, the probability of meeting the 7.00% benchmark over a 10-year horizon based on the most optimistic advisor in the 2017 and 2018 surveys is still greater than 50%.
- Note that the most conservative and most optimistic advisors are not necessarily the same from year to year.



## Survey of Capital Market Assumptions: 2018 Edition

### Glossary

The following are basic definitions of some of the investment terminology used in this report.

#### Expected Return

The *expected return* is the amount, as a percentage of assets, that an investment is expected to earn over a period of time. Expected returns presented in this survey are generally assumed to be indexed and net of fees.

#### Arithmetic vs. Geometric Returns

The *arithmetic return* is the average return in any one year; in other words, it has a one-year investment horizon. A *geometric return* is the annualized return over a multi-year period. In general, when evaluating expected returns over multi-year horizons, it is more appropriate to focus on geometric returns. However, arithmetic returns are also important. For example, the expected return of a portfolio is calculated as the weighted average of arithmetic returns, not geometric returns.

This survey focuses on geometric returns. Many advisors provide both arithmetic and geometric expected returns. For advisors who provided expected returns only on an arithmetic basis, we converted them to geometric returns for consistency. The following formula was used in making this conversion.

$$E[R_G] = ((1 + E[R_A])^2 - \text{VAR}[R])^{1/2} - 1$$

In this formula,  $E[R_G]$  is the expected geometric return,  $E[R_A]$  is the expected arithmetic return, and  $\text{VAR}[R]$  is the variance of the expected annual return.

#### Standard Deviation

The *standard deviation* is a measure of the expected volatility in the returns. Generally, the standard deviation expresses how much returns may vary in any one year. Assuming that returns are “normally distributed,” there is about a 68% probability that the actual return for a given year will fall within one standard deviation (higher or lower) of the expected return. There is about a 95% probability that the actual return will fall within two standard deviations of the expected return.

#### Correlation

An important aspect of capital market assumptions is the degree to which the returns for two different asset classes move in tandem with one another: this is their *correlation*. For example, if two asset classes are perfectly correlated, their correlation coefficient will be 1.00; in other words, if one asset class has a return of X% in a given market environment, then the other asset class is expected to also have a return of X%. A portfolio becomes better diversified as its asset classes have lower (or even negative) correlations with each other.

### Methodology

The following is a high-level description of the methodology used in compiling the survey results.

#### Standardized Asset Classes

Not all investment advisors use the same asset classes when developing their capital market assumptions. Some are very specific (more asset classes), while others keep things relatively simple (fewer asset classes).

We exercised judgment in classifying each advisor's capital market assumptions into a standard set of asset classes. In the event that an advisor did not provide assumptions for a given asset class, the average assumptions from the other advisors was used when developing expected returns for that advisor.

#### Investment Horizons

This survey considers “short-term” expected returns to apply to a 10-year investment horizon, and “long-term” expected returns to apply to a 20-year horizon.

In this 2018 edition of the survey, 23 of the 34 advisors provided only short-term assumptions, indicating a horizon of no more than 10 years. Included in this group are 2 advisors who provided assumptions over a horizon of 10 to 15 years.

All 13 advisors who provided long-term assumptions over horizons of 20 years or more also provided short-term assumptions. In cases where such an advisor indicated a horizon shorter than 10 years, the shorter-term expected returns were combined with the longer-term expected returns to achieve a 10-year horizon. If an advisor indicated a time horizon longer than 20 years, the longer-term expected returns were combined with the shorter-term expected returns to achieve a 20-year horizon.

#### No Adjustment for Alpha

No adjustment was made to reflect the possible value added by an active investment manager outperforming market returns (earning “alpha”).

#### Normally-Distributed Returns

This survey assumes that investment returns will be normally distributed according to the capital market assumptions provided. The survey also assumes that the investment return in one year does not affect the investment return in the following year.

#### Equal Weighting

Each advisor was given equal weight in developing the average assumptions for the survey, regardless of factors such as total assets under advisement, number of clients in common with Horizon Actuarial, etc.



APPENDIX

Survey of Capital Market Assumptions: 2018 Edition

Exhibit 13

The following exhibit evaluates the investment return assumption for a hypothetical multiemployer pension plan. It reflects the same hypothetical asset allocation as shown in Exhibit 8, and it provides more detail than Exhibits 9 and 10. Note that the most conservative and optimistic advisors for the 10-year horizon are not necessarily the same as the most conservative and optimistic advisors for the 20-year horizon. This hypothetical pension plan has a benchmark return of 7.00% per year, which is indicated by the gold line in the exhibit below.

Hypothetical Multiemployer Plan  
2018 Survey of Capital Market Assumptions

| Asset Class                        | Average Survey Assumptions |                 |                 | Standard Deviation |
|------------------------------------|----------------------------|-----------------|-----------------|--------------------|
|                                    | Portfolio Weight           | 10-Year Horizon | 20-Year Horizon |                    |
| US Equity - Large Cap              | 20.0%                      | 6.07%           | 7.42%           | 16.39%             |
| US Equity - Small/Mid Cap          | 10.0%                      | 6.57%           | 8.18%           | 20.20%             |
| Non-US Equity - Developed          | 7.5%                       | 6.71%           | 7.71%           | 18.67%             |
| Non-US Equity - Emerging           | 5.0%                       | 7.64%           | 8.82%           | 24.89%             |
| US Corporate Bonds - Core          | 7.5%                       | 3.37%           | 4.46%           | 5.71%              |
| US Corporate Bonds - Long Duration | 2.5%                       | 3.32%           | 4.44%           | 10.83%             |
| US Corporate Bonds - High Yield    | 5.0%                       | 4.78%           | 5.82%           | 10.24%             |
| Non-US Debt - Developed            | 5.0%                       | 2.18%           | 3.22%           | 6.86%              |
| Non-US Debt - Emerging             | 2.5%                       | 5.00%           | 6.13%           | 11.43%             |
| US Treasuries (Cash Equivalents)   | 5.0%                       | 2.48%           | 3.05%           | 2.74%              |
| TIPS (Inflation-Protected)         | 5.0%                       | 2.88%           | 4.04%           | 6.25%              |
| Real Estate                        | 10.0%                      | 5.90%           | 6.66%           | 13.86%             |
| Hedge Funds                        | 5.0%                       | 4.96%           | 6.19%           | 7.87%              |
| Commodities                        | 2.5%                       | 3.97%           | 4.92%           | 17.60%             |
| Infrastructure                     | 2.5%                       | 6.56%           | 7.14%           | 14.74%             |
| Private Equity                     | 5.0%                       | 8.33%           | 9.52%           | 22.16%             |
| <b>TOTAL PORTFOLIO</b>             | <b>100.0%</b>              | <b>2.24%</b>    | <b>2.47%</b>    | <b>1.76%</b>       |

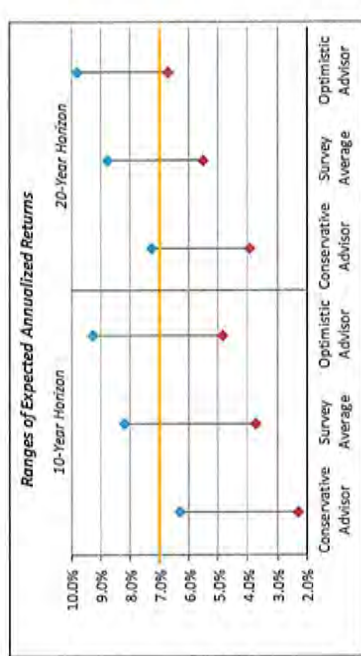
Expected returns are geometric.

Considerations and Limitations

- Allocations may be approximated if certain asset classes are not included in the survey.
- Many investment advisors provided only shorter-term assumptions (10 years or less).
- Assumptions are based on indexed returns and do not reflect anticipated alpha.
- Assumptions do not reflect investment opportunities or fee considerations available to larger funds.

SOURCE: Horizon Actuarial 2018 Survey of Capital Market Assumptions  
Expected returns over a 10-year horizon include all 34 survey participants.  
Expected returns over a 20-year horizon are based on a subset of 13 survey participants who provided longer-term assumptions.

| Expected Returns                                  | 10-Year Horizon      |                    | 20-Year Horizon      |                    |
|---|----------------------|--------------------|----------------------|--------------------|
|   | Conservative Advisor | Optimistic Advisor | Conservative Advisor | Optimistic Advisor |
| Average Annual Return (Arithmetic)                | 4.72%                | 7.55%              | 6.16%                | 8.74%              |
| Annualized Return (Geometric)                     | 4.29%                | 7.06%              | 5.59%                | 8.26%              |
| Annual Volatility (Standard Deviation)            | 9.48%                | 10.38%             | 11.03%               | 10.19%             |
| <b>Range of Expected Annualized Returns</b>       |                      |                    |                      |                    |
| 75th Percentile                                   | 6.32%                | 9.25%              | 7.25%                | 9.80%              |
| 25th Percentile                                   | 2.27%                | 3.73%              | 3.92%                | 5.50%              |
| <b>Probabilities of Exceeding Certain Returns</b> |                      |                    |                      |                    |
| 7.50% per Year, Annualized                        | 14.2%                | 31.8%              | 21.9%                | 43.7%              |
| 7.00% per Year, Annualized                        | 18.3%                | 37.4%              | 28.3%                | 52.0%              |
| 6.50% per Year, Annualized                        | 23.1%                | 43.3%              | 35.6%                | 60.2%              |

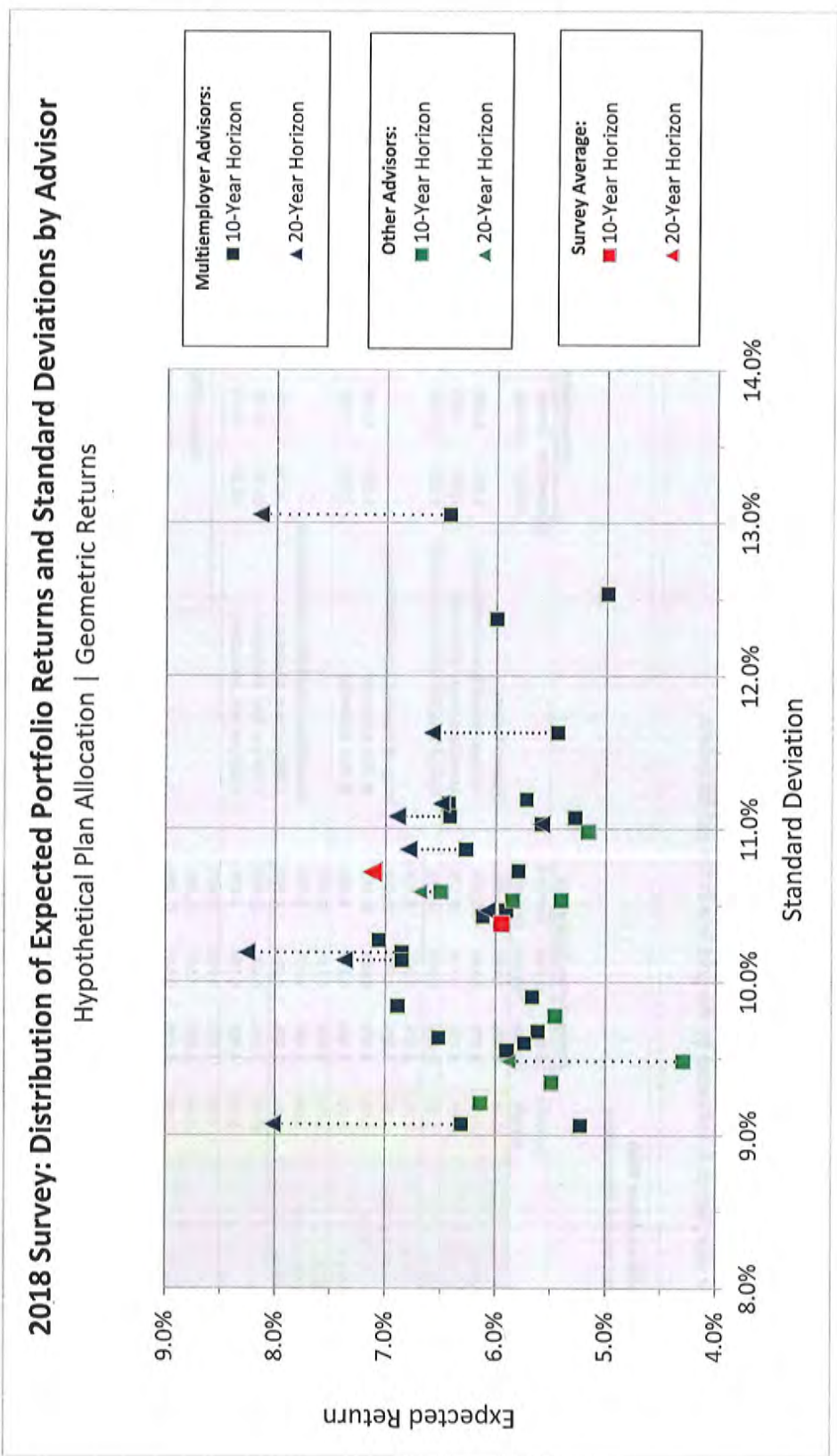


**APPENDIX**

**Survey of Capital Market Assumptions: 2018 Edition**

**Exhibit 14**

The following exhibit shows the distribution of expected annualized returns and annual standard deviations for the same hypothetical asset allocation that is shown in Exhibit 13. The expected annualized return and annual standard deviation of the hypothetical asset allocation are shown separately for each advisor who participated in the survey. Individual advisors are grouped by type and investment horizon, and the survey average assumptions are shown in red. The exhibit shows that there are a wide variety of investment return assumptions that could be considered to be reasonable for any given asset allocation.





## Exhibit 15

The following exhibit provides the average capital market assumptions for all 34 investment advisors in the 2018 survey. Each of the 34 advisors was given equal weight in determining the average assumptions. For reference, expected returns are shown over 10-year and 20-year horizons. Expected returns are also provided on both an arithmetic basis (one-year average) and geometric basis (multi-year annualized). The standard deviations (volatilities) and correlations apply to both arithmetic and geometric expected returns.

| Asset Class                          | Expected Returns |       |                 |       |                    |       |                    |        |        |        |      |      |        |      |      |        |      |      |      |      |      |      |  |  |
|--------------------------------------|------------------|-------|-----------------|-------|--------------------|-------|--------------------|--------|--------|--------|------|------|--------|------|------|--------|------|------|------|------|------|------|--|--|
|                                      | 10-Year Horizon  |       | 20-Year Horizon |       | Standard Deviation |       | Correlation Matrix |        |        |        |      |      |        |      |      |        |      |      |      |      |      |      |  |  |
|                                      | Arith.           | Geom. | Arith.          | Geom. | Arith.             | Geom. | 1                  | 2      | 3      | 4      | 5    | 6    | 7      | 8    | 9    | 10     | 11   | 12   | 13   | 14   | 15   | 16   |  |  |
| 1 US Equity - Large Cap              | 7.34%            | 6.07% | 8.73%           | 7.42% | 16.39%             |       | 1.00               |        |        |        |      |      |        |      |      |        |      |      |      |      |      |      |  |  |
| 2 US Equity - Small/Mid Cap          | 8.49%            | 6.57% | 10.13%          | 8.18% | 20.20%             |       | 0.89               | 1.00   |        |        |      |      |        |      |      |        |      |      |      |      |      |      |  |  |
| 3 Non-US Equity - Developed          | 8.36%            | 6.71% | 9.46%           | 7.71% | 18.67%             |       | 0.84               | 0.76   | 1.00   |        |      |      |        |      |      |        |      |      |      |      |      |      |  |  |
| 4 Non-US Equity - Emerging           | 10.52%           | 7.64% | 11.94%          | 8.82% | 24.89%             |       | 0.72               | 0.67   | 0.79   | 1.00   |      |      |        |      |      |        |      |      |      |      |      |      |  |  |
| 5 US Corporate Bonds - Core          | 3.54%            | 3.37% | 4.63%           | 4.46% | 5.71%              |       | 0.12               | 0.07   | 0.14   | 0.14   | 1.00 |      |        |      |      |        |      |      |      |      |      |      |  |  |
| 6 US Corporate Bonds - Long Duration | 3.90%            | 3.32% | 5.14%           | 4.44% | 10.83%             |       | 0.11               | 0.05   | 0.13   | 0.10   | 0.83 | 1.00 |        |      |      |        |      |      |      |      |      |      |  |  |
| 7 US Corporate Bonds - High Yield    | 5.29%            | 4.78% | 6.44%           | 5.82% | 10.24%             |       | 0.61               | 0.60   | 0.60   | 0.62   | 0.36 | 0.26 | 1.00   |      |      |        |      |      |      |      |      |      |  |  |
| 8 Non-US Debt - Developed            | 2.37%            | 2.18% | 3.56%           | 3.22% | 6.86%              |       | 0.17               | 0.11   | 0.30   | 0.24   | 0.55 | 0.55 | 0.24   | 1.00 |      |        |      |      |      |      |      |      |  |  |
| 9 Non-US Debt - Emerging             | 5.63%            | 5.00% | 6.85%           | 6.13% | 11.43%             |       | 0.54               | 0.49   | 0.58   | 0.66   | 0.44 | 0.37 | 0.59   | 0.41 | 1.00 |        |      |      |      |      |      |      |  |  |
| 10 US Treasuries (Cash Equivalents)  | 2.55%            | 2.48% | 3.10%           | 3.05% | 2.74%              |       | (0.10)             | (0.12) | (0.09) | (0.07) | 0.33 | 0.28 | (0.03) | 0.26 | 0.06 | 1.00   |      |      |      |      |      |      |  |  |
| 11 TIPS (Inflation-Protected)        | 3.08%            | 2.88% | 4.26%           | 4.04% | 6.25%              |       | 0.05               | 0.01   | 0.10   | 0.16   | 0.68 | 0.57 | 0.31   | 0.52 | 0.40 | 0.33   | 1.00 |      |      |      |      |      |  |  |
| 12 Real Estate                       | 6.89%            | 5.90% | 7.67%           | 6.66% | 13.86%             |       | 0.44               | 0.41   | 0.40   | 0.33   | 0.10 | 0.11 | 0.30   | 0.09 | 0.24 | 0.03   | 0.10 | 1.00 |      |      |      |      |  |  |
| 13 Hedge Funds                       | 5.29%            | 4.96% | 6.61%           | 6.19% | 7.87%              |       | 0.66               | 0.64   | 0.68   | 0.67   | 0.14 | 0.06 | 0.58   | 0.15 | 0.48 | (0.07) | 0.13 | 0.35 | 1.00 |      |      |      |  |  |
| 14 Commodities                       | 5.46%            | 3.97% | 6.47%           | 4.92% | 17.60%             |       | 0.31               | 0.29   | 0.39   | 0.43   | 0.10 | 0.03 | 0.35   | 0.22 | 0.34 | 0.02   | 0.26 | 0.24 | 0.42 | 1.00 |      |      |  |  |
| 15 Infrastructure                    | 7.61%            | 6.56% | 8.24%           | 7.14% | 14.74%             |       | 0.54               | 0.49   | 0.53   | 0.47   | 0.20 | 0.21 | 0.41   | 0.33 | 0.43 | (0.08) | 0.18 | 0.31 | 0.41 | 0.29 | 1.00 |      |  |  |
| 16 Private Equity                    | 10.72%           | 8.33% | 12.17%          | 9.52% | 22.16%             |       | 0.73               | 0.69   | 0.70   | 0.61   | 0.03 | 0.03 | 0.48   | 0.10 | 0.40 | (0.08) | 0.04 | 0.39 | 0.60 | 0.30 | 0.39 | 1.00 |  |  |
| Inflation                            | 2.24%            | 2.24% | 2.48%           | 2.47% | 1.76%              |       |                    |        |        |        |      |      |        |      |      |        |      |      |      |      |      |      |  |  |

Expected returns over a 10-year horizon include all 34 survey participants.

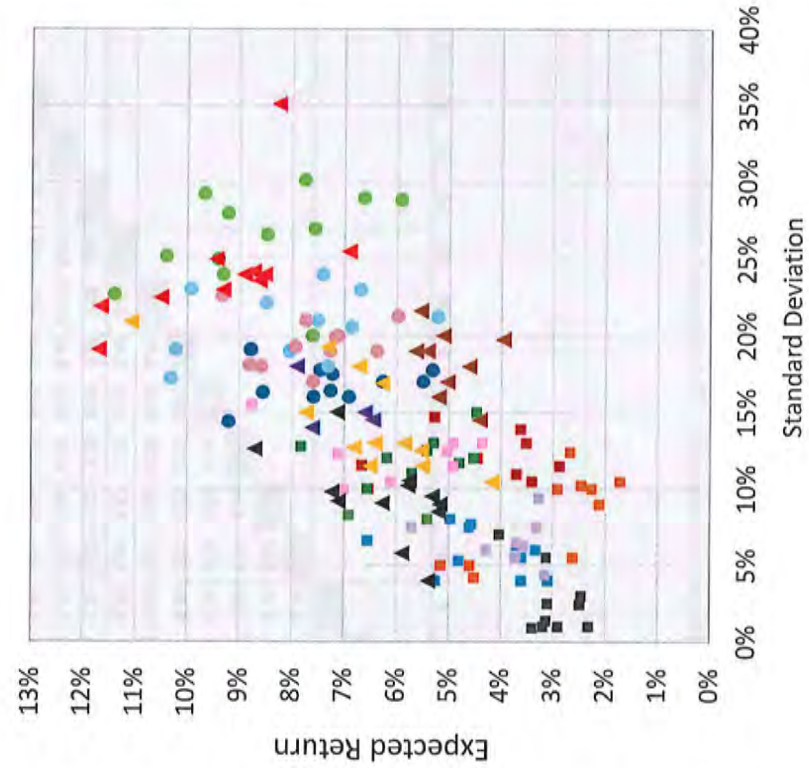
Expected returns over a 20-year horizon are based on a subset of 13 survey participants who provided long-term assumptions.



Exhibit 16

Earlier in this report, Exhibit 5 showed the distribution of expected returns and standard deviations over an investment horizon of 10 years. The exhibit below shows the same distribution, but for a horizon of 20 years. Note that while Exhibit 5 included assumptions for all 34 advisors in the survey, the exhibit below includes only assumptions for the 13 advisors who provided longer-term assumptions (horizons of 20 years or more).

2018 Survey: Distribution of Expected Returns and Standard Deviations  
20-Year Horizon | Geometric Returns



Asset Class [ Avg. Exp. Return | Avg. Std. Dev. ]

| Asset Class                        | Avg. Exp. Return | Avg. Std. Dev. |
|------------------------------------|------------------|----------------|
| US Equity - Large Cap              | 7.4%             | 16.7%          |
| US Equity - Small/Mid Cap          | 8.2%             | 20.5%          |
| Non-US Equity - Developed          | 7.7%             | 19.5%          |
| Non-US Equity - Emerging           | 8.8%             | 26.0%          |
| US Corporate Bonds - Core          | 4.5%             | 5.8%           |
| US Corporate Bonds - Long Duration | 4.4%             | 12.0%          |
| US Corporate Bonds - High Yield    | 5.8%             | 11.2%          |
| Non-US Debt - Developed            | 3.2%             | 7.8%           |
| Non-US Debt - Emerging             | 6.1%             | 12.3%          |
| US Treasuries (Cash Equivalents)   | 3.0%             | 2.4%           |
| TIPS (Inflation-Protected)         | 4.0%             | 6.7%           |
| Real Estate                        | 6.7%             | 14.4%          |
| Hedge Funds                        | 6.2%             | 9.0%           |
| Commodities                        | 4.9%             | 17.9%          |
| Infrastructure                     | 7.1%             | 15.4%          |
| Private Equity                     | 9.5%             | 23.9%          |





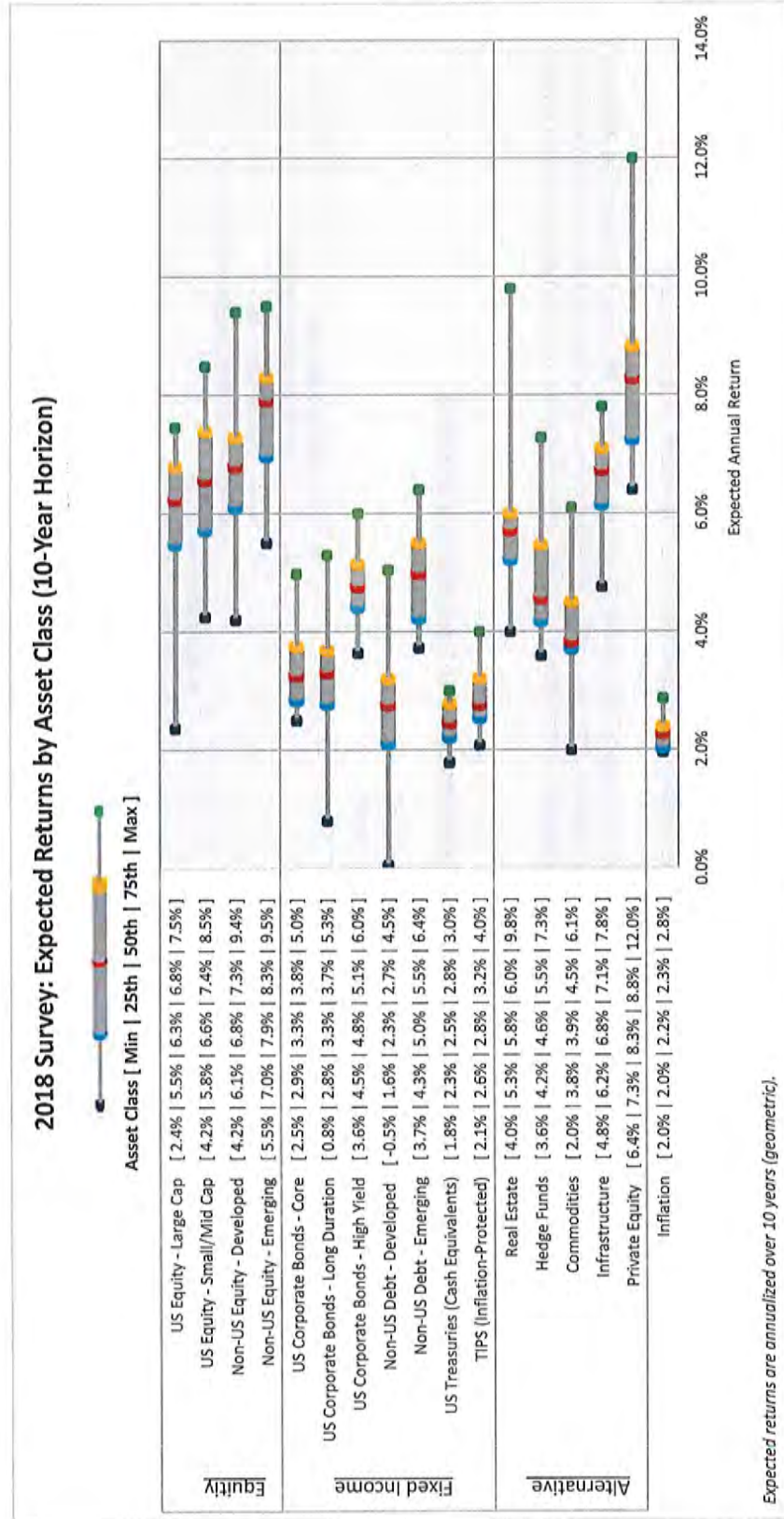
APPENDIX

Survey of Capital Market Assumptions: 2018 Edition

Exhibit 17

The exhibit below shows the ranges of expected annual returns for different asset classes over a 10-year investment horizon. The ranges shown below include assumptions for all the 34 advisors in the 2018 survey. Expected returns shown below are annualized (geometric).

To illustrate the distribution of expected returns, the exhibit shows the range of the middle 50 percent of results: the range between the 25th and 75th percentiles. It also shows the median expected return for each asset class: the 50th percentile. Note that the expected returns for the median advisor shown below are not the same as the average expected returns shown elsewhere in the report. In most cases, however, the differences between median and average expected returns are relatively small.



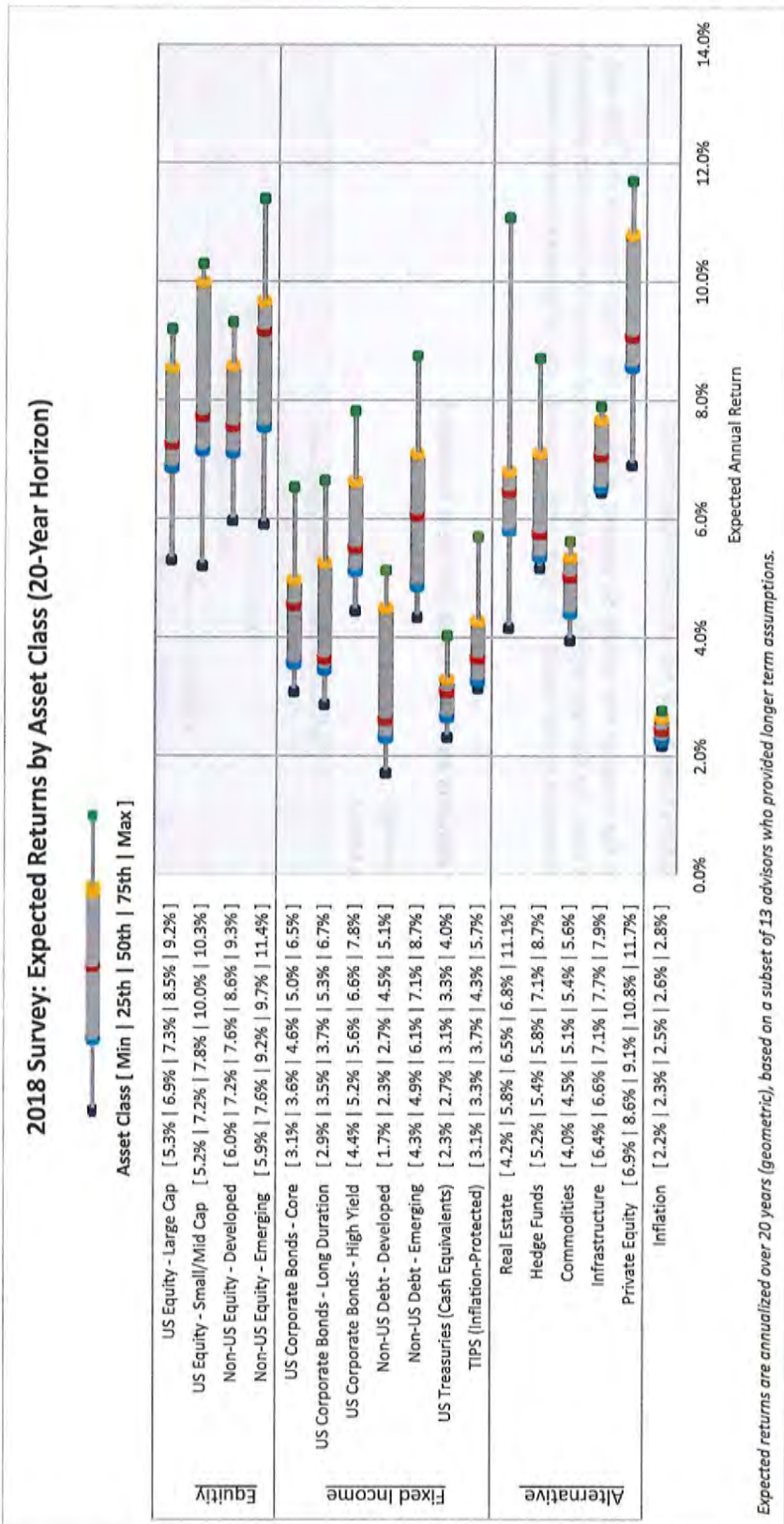
**APPENDIX**

**Survey of Capital Market Assumptions: 2018 Edition**

**Exhibit 18**

The exhibit below shows the ranges of expected annual returns for different asset classes over a 20-year investment horizon. The ranges shown below are based on the assumptions for 13 advisors who provided longer-term assumptions (horizons of 20 years or more). Expected returns shown below are annualized (geometric). Note that the ranges of expected returns are somewhat narrower when the investment horizon is longer.

To illustrate the distribution of expected returns, the exhibit shows the range of the middle 50 percent of results: the range between the 25th and 75th percentiles. It also shows the median expected return for each asset class: the 50th percentile. Note that the expected returns for the *median* advisor shown below are not the same as the *average* expected returns shown elsewhere in the report. In most cases, however, the differences between median and average expected returns are relatively small.



Expected returns are annualized over 20 years (geometric), based on a subset of 13 advisors who provided longer term assumptions.



OUCC Q-1-13

**DATA INFORMATION REQUEST**  
**Indiana-American Water Company**  
**Cause No. 45142**

**Information Requested:**

For the portion of Petitioner's pension fund(s) that are invested in equities, what rate of return does Indiana American assume the pension fund(s) will earn? Please explain why that rate of return was used.

**Information Provided:**

Indiana-American is part of the total American Water Pension Plan and does not have a separate and distinct pension plan. The expected/assumed returns for equities for the Actuarial Valuation Report for Fiscal Year Ending December 31, 2018 are listed below. The asset classes invested in equities are the S&P 500, Small Cap, and International. These projected returns are based on capital market assumptions provided by the Plan's Investment Consultant (Callan Associates) to American Water Company in 2017, are not necessarily indicative of current investor return requirements for these indices, nor for any particular company within any of the indices. Please refer to OUCC Q-1-13\_Attachment for the Capital Market Expectations for Callan's Long-Term Capital Market Projections (2017-2026).

| <b>Equity Returns for 2018 Calendar Year</b> |                |
|--|----------------|
|  | <b>Pension</b> |
| S&P 500 Index                                | 8.05%          |
| Small Caps                                   | 9.30%          |
| International Equities                       | 8.45%          |

**Attachment:**

OUCC Q-1-13\_Attachment.pdf

**OUCG Q-1-14**

**DATA INFORMATION REQUEST**  
**Indiana-American Water Company**  
**Cause No. 45142**

**Information Requested:**

For the portion of Petitioner's OPEB fund(s) that are invested in equities, what rate of return does Indiana American assume the OPEB fund(s) will earn? Please explain why that rate of return was used.

**Information Provided:**

Indiana-American is part of the total American Water Retiree Welfare Plan and does not have a separate and distinct Retiree Welfare Plan. The expected/assumed returns for equities for the Actuarial Valuation Report Postretirement Welfare Cost for Fiscal Year Ending December 31, 2018 are listed below. The asset classes invested in equities are the S&P 500, Small Cap, International, and Emerging Market. The projected returns are based on capital market assumptions provided by the Plan's Investment Consultant (Callan Associates) to American Water Company in 2017, are not necessarily indicative of current investor return requirements for these indices, nor for any particular company within any of the indices. Please refer to OUCG Q-1-13\_Attachment for Callan's Long-Term Capital Market Projections (2017-2026).

| <b>Equity Returns for 2018 Calendar Year</b> |                        |
|--|------------------------|
|  | <b>Post-Retirement</b> |
| S&P 500 Index                                | 8.05%                  |
| Small Caps                                   | 9.30%                  |
| International Equities                       | 8.45%                  |

# 2017 Capital Market Expectations—Return and Risk

## Summary of Callan’s Long-Term Capital Market Projections (2017 – 2026)

| Asset Class             | Index                           | PROJECTED RETURN  |                    | PROJECTED RISK     |        | Sharpe Ratio | Projected Yield |
|-------------------------|---------------------------------|-------------------|--------------------|--------------------|--------|--------------|-----------------|
|                         |                                 | 1-Year Arithmetic | 10-Year Geometric* | Standard Deviation | Real   |              |                 |
| <b>Equities</b>         |                                 |                   |                    |                    |        |              |                 |
| Broad Domestic Equity   | Russell 3000                    | 8.30%             | 6.85%              | 4.60%              | 18.25% | 0.332        | 2.00%           |
| Large Cap               | S&P 500                         | 8.05%             | 6.75%              | 4.50%              | 17.40% | 0.333        | 2.10%           |
| Small/Mid Cap           | Russell 2500                    | 9.30%             | 7.00%              | 4.75%              | 22.60% | 0.312        | 1.55%           |
| Global ex-U.S. Equity   | MSCI ACWI ex USA                | 8.95%             | 7.00%              | 4.75%              | 21.00% | 0.319        | 3.10%           |
| International Equity    | MSCI World ex USA               | 8.45%             | 6.75%              | 4.50%              | 19.70% | 0.315        | 3.25%           |
| Emerging Markets Equity | MSCI Emerging Markets           | 10.50%            | 7.00%              | 4.75%              | 27.45% | 0.301        | 2.65%           |
| <b>Fixed Income</b>     |                                 |                   |                    |                    |        |              |                 |
| Short Duration          | Barclays G/C 1-3                | 2.60%             | 2.60%              | 0.35%              | 2.10%  | 0.167        | 2.85%           |
| Domestic Fixed          | Barclays Aggregate              | 3.05%             | 3.00%              | 0.75%              | 3.75%  | 0.213        | 3.50%           |
| Long Duration           | Barclays Long G/C               | 3.75%             | 3.20%              | 0.95%              | 10.90% | 0.138        | 4.50%           |
| TIPS                    | Barclays TIPS                   | 3.10%             | 3.00%              | 0.75%              | 5.25%  | 0.162        | 3.35%           |
| High Yield              | Barclays High Yield             | 5.20%             | 4.75%              | 2.50%              | 10.35% | 0.285        | 7.75%           |
| Non-U.S. Fixed          | Barclays Global Aggregate ex US | 1.80%             | 1.40%              | -0.85%             | 9.20%  | -0.049       | 2.50%           |
| Emerging Market Debt    | EMBI Global Diversified         | 4.85%             | 4.50%              | 2.25%              | 9.60%  | 0.271        | 5.75%           |
| <b>Other</b>            |                                 |                   |                    |                    |        |              |                 |
| Real Estate             | Callan Real Estate              | 6.90%             | 5.75%              | 3.50%              | 16.35% | 0.284        | 4.75%           |
| Private Equity          | TR Post Venture Cap             | 12.45%            | 7.35%              | 5.10%              | 32.90% | 0.310        | 0.00%           |
| Hedge Funds             | Callan Hedge FOF Database       | 5.35%             | 5.25%              | 2.80%              | 9.15%  | 0.339        | 2.25%           |
| Commodities             | Bloomberg Commodity             | 4.25%             | 2.65%              | 0.40%              | 18.30% | 0.109        | 2.25%           |
| Cash Equivalents        | 90-Day T-Bill                   | 2.25%             | 2.25%              | 0.00%              | 0.90%  | 0.000        | 2.25%           |
| Inflation               | CPI-U                           |                   | 2.25%              |                    | 1.50%  |              | -               |

\* Geometric returns are derived from arithmetic returns and the associated risk (standard deviation).

Source: Callan Associates

**Callan** | Knowledge. Experience. Integrity.

2017 Capital Market Projections



# 2018-2027 Capital Market Projections



Each year, Callan develops long-term capital market projections, detailing expected return, standard deviation, and correlations for major asset classes. These projections are the cornerstone for strategic planning. This chartlet summarizes key figures from Callan's 2018-2027 capital market projections.



### Callan's 10-Year Return Expectations

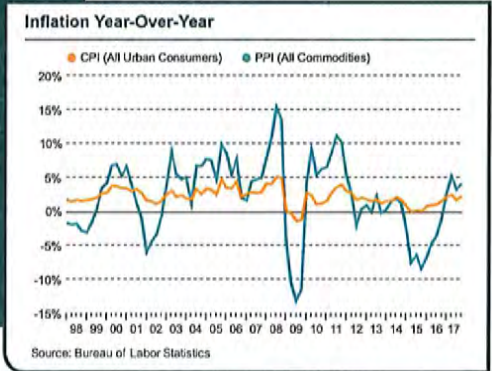
**U.S. Equity 6.85%** Compound earnings growth is expected to be modestly above GDP growth. P/E ratios are still within historical norms. Expansive fiscal policies could provide an additional tailwind. Dividend yields are expected to hold steady.

**Global ex-U.S. Equity 7.00%** Earnings growth for non-U.S. developed and emerging market equities should be higher due to improving economies. Income payouts should continue to be a driver of overall returns. Valuations are within historical ranges.

**U.S. Fixed Income 3.00%** Interest rates should rise modestly over the next 10 years, with most of the increase front-loaded to the first three years. The yield curve should continue to flatten. Future higher yields offset capital losses expected up front.

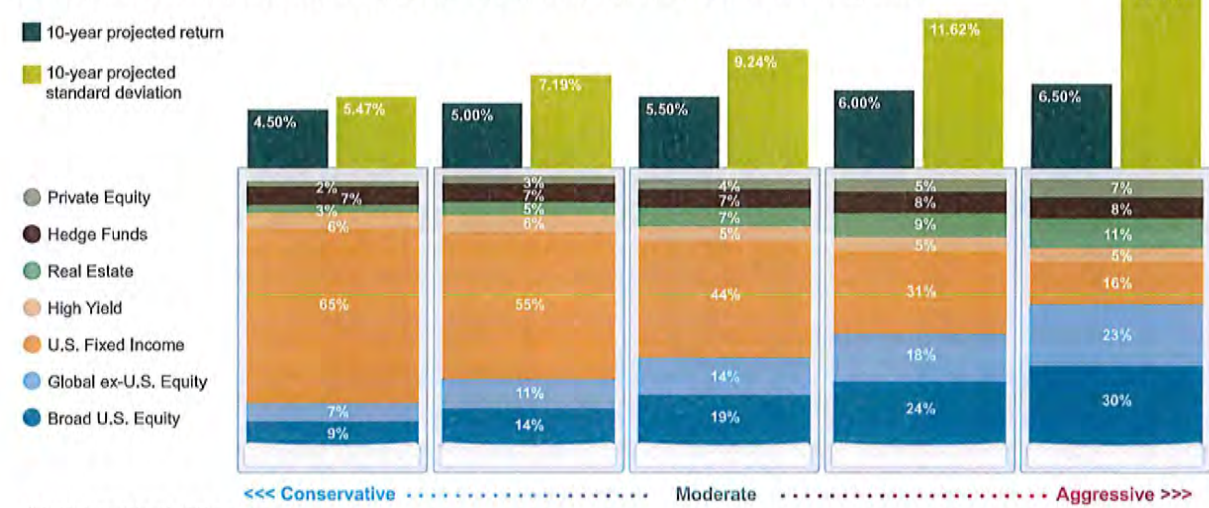
**Real Estate 5.75%** Even though capitalization rates reached a record low in 2017, capital flows were healthy as investors rebalanced their overall portfolios by moving equity market gains into real estate.

**Hedge Funds 5.05%** Returns reflect the cross currents of modest equity expectations, higher cash rates, and the prospect of varied return opportunities in uncertain markets.



### Projected Risk and Return of Different Asset Mixes

This exhibit uses Callan's projections to create a range of efficient portfolios on a spectrum from conservative to aggressive.



Note: Charts may not sum to 100% due to rounding.  
Source: Callan

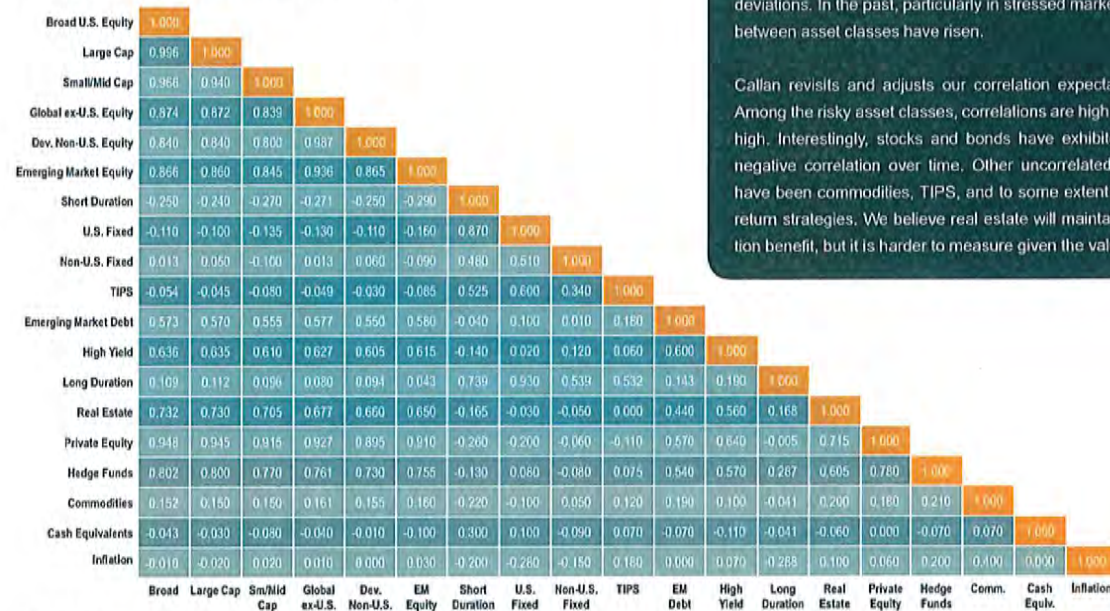


## About These Projections

Callan's projections consist of three primary figures for each asset class: a mean rate of return, a corresponding range defined by standard deviation, and the correlations to other asset classes. These figures represent our best thinking for long-term expectations and establish a mid-point within a wider range of potential outcomes. We use the projections to model portfolios for our clients.

Multiple elements of the capital markets influence the projections: returns relative to inflation, equity valuations, risk premiums, GDP growth, and many other factors. These projections incorporate advanced quantitative modeling as well as qualitative feedback and the economic expertise of Callan's consulting professionals. Our 2018 numbers reflect our optimism for the economy, for inflation, and for the capital markets.

## Correlation Expectations (10 Years)



Relationships between asset classes are as important as standard deviations. In the past, particularly in stressed markets, correlations between asset classes have risen.

Callan revisits and adjusts our correlation expectations annually. Among the risky asset classes, correlations are high and will remain high. Interestingly, stocks and bonds have exhibited tremendous negative correlation over time. Other uncorrelated asset classes have been commodities, TIPS, and to some extent many absolute return strategies. We believe real estate will maintain a diversification benefit, but it is harder to measure given the valuation process.

Source: Callan

## Then and Now: Comparing Historical Returns to Historical Projections

|                                  | Annualized Returns<br>for periods ended 12/31/2017 |          |          |
|----------------------------------|--|----------|----------|
|                                  | 10 Years   | 15 Years | 25 Years |
| <b>Broad U.S. Stock Market</b>   |  |          |          |
| Russell 3000                     | 8.60%  | 10.25%   | 9.72%    |
| <b>Large Cap U.S. Stocks</b>     |  |          |          |
| S&P 500                          | 8.50%  | 9.92%    | 9.69%    |
| <b>Small/Mid Cap U.S. Stocks</b> |  |          |          |
| Russell 2500                     | 9.22%  | 11.75%   | 10.76%   |
| <b>Non-U.S. Stock Markets</b>    |  |          |          |
| MSCI World ex USA                | 1.87%  | 8.22%    | 6.58%    |
| MSCI Emerging Markets            | 1.68%  | 12.31%   | 7.76%    |
| <b>Fixed Income</b>              |  |          |          |
| Bloomberg Barclays Aggregate     | 4.01%  | 4.15%    | 5.48%    |
| Bloomberg Barclays Gbl Agg ex-US | 2.40%  | 4.25%    | 5.02%    |
| Bloomberg Barclays Long G/C      | 7.26%  | 6.77%    | 7.67%    |
| <b>Real Estate</b>               |  |          |          |
| NCREIF*                          | 6.93%*   | 9.00%*   | 8.63%*   |
| <b>Hedge Funds</b>               |  |          |          |
| Callan Hedge FOF Database*       | 3.11%*   | 5.16%*   | 7.51%*   |
| <b>Private Equity</b>            |  |          |          |
| Cambridge Private Equity*        | 9.40%*   | 11.61%*  | 15.39%*  |
| <b>Commodities</b>               |  |          |          |
| Bloomberg Commodity              | -5.57%   | 1.16%    | 2.55%    |
| <b>Cash Market</b>               |  |          |          |
| 90-Day T-Bill                    | 0.80%  | 1.34%    | 2.71%    |
| <b>Inflation</b>                 |  |          |          |
| CPI-U**                          | 1.81%  | 2.10%    | 2.26%    |

\* Data for periods ended 9/30/2017 rather than 12/31/2017 due to a reporting lag. Private equity data is time-weighted return series for periods ended 06/30/2017.  
\*\* CPI-U data are measured as year-over-year change through 09/30/2017 due to a reporting lag.  
Sources: Bloomberg Barclays, Bureau of Labor Statistics, Callan, Cambridge, Credit Suisse, MSCI, NCREIF, Russell, and Standard & Poor's.

## How Callan's 10-Year Return Projections Have Changed Since 1998



Source: Callan

## About Callan

Founded in 1973, Callan is one of the largest independently owned investment consulting firms in the country. Headquartered in San Francisco, CA, the firm provides research, education, decision support, and advice to a broad array of institutional investors.

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# RRA Water Advisory

## Major Rate Case Decisions

### January – June 2018

The return on equity authorized in water utility rate cases averaged 9.41%, for the six months ended June 30, 2018, below the 9.56% average ROE authorized water utilities nationwide in rate cases decided in calendar-2017, as monitored by Regulatory Research Associates, an offering of S&P Global Market Intelligence.

During the second quarter, just two water utility rate cases were finalized. In a litigated proceeding in South Carolina, Utilities Inc. subsidiary Carolina Water Service, Inc. was authorized a 10.5% ROE, which marks the highest authorized ROE of the year. In a black box settlement for Missouri American Water Co., which was silent regarding cost of capital parameters, the order noted that the parties had recommended returns on equity in the range of 9.5% to 10%. This case is not included the rate case in the year-to date average, as no ROE determination was made by the commission. If the midpoint of the range in the Missouri case were included, the average for rate cases completed during the first two quarters would have been 9.46%.

In water utility rate cases decided during 2017 the ROE average for decisions that included cost of capital parameters was 9.56%, falling within a range of 9 % to 10.4%.

#### Water utility rate case decisions — January to June 2018

| Date                      | Company                        | State | ROR (%)     | ROE (%)     | Common equity as % of capital | Rate base (\$M) | Test year |
|---------------------------|--------------------------------|-------|-------------|-------------|-------------------------------|-----------------|-----------|
| 03/07/18                  | Aqua Illinois                  | IL    | 7.52        | 9.60        | 53.22                         | 268             | 12/2018   |
| 03/22/18                  | California American Water Co.* | CA    | 7.61        | 9.20        | 55.39                         | NA              | NA        |
| 03/22/18                  | California Water Service Co.*  | CA    | 7.48        | 9.20        | 53.40                         | NA              | NA        |
| 03/22/18                  | Golden State Water Co.*        | CA    | 7.91        | 8.90        | 57.00                         | NA              | NA        |
| 03/22/18                  | San Jose Water Co.*            | CA    | 7.64        | 8.90        | 53.28                         | NA              | NA        |
| 03/24/18                  | Middlesex Water Co.            | NJ    | 6.5         | 9.60        | 52.75                         | 245             | 12/2017   |
| 05/02/18                  | Missouri American Water Co.**  | MO    | NA          | NA          | NA                            | NA              | 05/2019   |
| 05/02/18                  | Carolina Water Service, Inc.   | NC    | 8.4         | 10.50       | 51.89                         | 55.5            | 08/2017   |
| <b>Average rate award</b> |                                |       | <b>7.58</b> | <b>9.41</b> | <b>53.85</b>                  |                 |           |

As of July 24, 2018.

\* This was a cost-of-capital proceeding and no other ratemaking issues were addressed.

\*\* Case was resolved by a black box settlement with no traditional rate case parameters specified in the order. However the parties recommended ROEs ranging from 9.5% to 10%.

NA = Not applicable

Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence

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The 2018 average was driven lower by the ROEs authorized in a California Public Utilities Commission decision impacting the state's four largest water utilities, representing half of the ROEs observed during the period. On March 22, the California Public Utilities Commission approved a revised proposed decision in a cost-of-capital proceeding for California American Water Co., California Water Service Co., Golden State Water Co. and San Jose Water Co. authorizing ROEs ranging from 8.9% to 9.2%. California Water is a subsidiary of California Water Service Group. California American is a subsidiary of American Water Works Co. Inc. Golden State Water is a subsidiary of American States Water Co., and San Jose Water is a subsidiary of SJW Group.

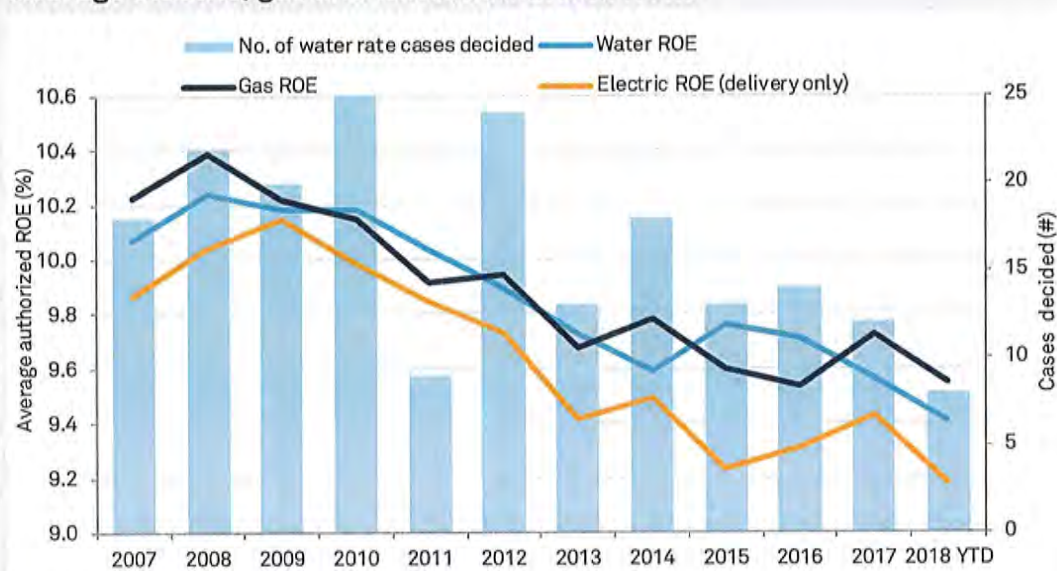
Water rate case activity has been a bit more robust in 2018 as compared to 2017. There have been eight water utility rate proceedings decided in 2018 through June 30, compared to six in the comparable 2017 period. Additionally, a final decision was recently issued in New York and two Virginia proceedings are awaiting a final decision. An additional 23 rate cases are pending, and RRA expects an additional final decisions to be issued during 2018 in seven to ten of those proceedings. During 2017, 12 rate cases were completed with an ROE disclosed in nine of those proceedings.

### Utility sector comparison

ROE trends for electric distribution and natural gas utilities similarly declined in 2018. For electric distribution-only utilities, the average ROE authorized in the first half of 2018 was 9.18% versus 9.43% in 2017. The average ROE authorized gas utilities was 9.55% in cases decided during the first two quarters of 2018 versus 9.72% in full year 2017.

As shown in the graph below, the annual average ROE, for all three utility subsectors, has been below 10% since 2012, as the persistently low interest rate environment has put a downward pressure on authorized ROEs.

**Average electric, gas and water authorized ROEs**



As of July 24, 2018.  
Note: Electric ROE includes rate cases from distribution utilities only  
Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence

For additional details on rate case trends for electric and gas utilities, refer to the July 17, 2018 report titled [Major Rate Case Decisions – January – June 2018](#).



## Rate case trends

Since 2012, the number of water rate cases has moderated somewhat. Many water utilities have consolidated their smaller operating companies, decreasing the frequency of rate filings. California Water Service Group had previously requested rate changes for its 24 systems on a cycle of eight systems per year, but starting with its 2009 general rate case, now files for all its jurisdictions in a single filing every three years. The two other large, multi-system water utilities in California similarly transitioned to consolidated rate proceedings.

By consolidating its small subsidiaries in each of the sixteen states in which Utilities Inc. operates, the company has also decreased the frequency of base rate case filings. These actions streamline the rate case process and result in lower rate case expenses that are passed on to customers.

During the 2010-to-2012 time frame, American Water Works Company, Inc. and Aqua America, Inc. swapped assets in four states, leaving each company's customer count largely unchanged, while allowing for a more targeted approach to managing regulated operations and optimizing cost structures. Aqua America gained customers in Texas and Ohio in exchange for its New York and Missouri customers. As these systems were consolidated, rate case frequency declined in these jurisdictions.

Lastly, the expansion of infrastructure surcharge mechanisms, has slowed the frequency of base rates case in some jurisdictions. Commonly referred to as a distribution system improvement charge, or DSIC, the mechanism allows water utilities to earn a return on incremental qualifying, non-revenue producing infrastructure replacement in between general rate cases. DSIC mechanisms for water utilities are utilized in sixteen states, with varying parameters regarding: qualifying investments; surcharge caps and frequencies; and, program oversight. Not all infrastructure surcharge programs are created equal.

The water utility sector faces increasing capital investment needs, driven by increasing environmental standards and aging infrastructure, namely distribution pipes. Widely-cited estimates of the spending needed to upgrade, replace, and expand water & wastewater infrastructure over the next 20 years range from \$600 billion to \$1.3 trillion. It stands to reason that this accelerated spending would warrant the continuation of an active rate case agenda over the next few years.

## Historical rate case details

RRA currently evaluates water utility regulation in 25 state jurisdictions and monitors rate proceedings involving rate change requests of \$0.5 million or greater for the thirteen largest investor-owned and privately-held water utilities. As RRA broadens its water utility coverage to encompass all 44 states that currently regulate water utilities, this data set will continue to expand, which will likely result in some adjustments to the historical water industry averages, as historical data is backfilled.

The individual water utility rate cases for 2014 through 2017 are listed on pages 5 through 6, with the decision date shown first, followed by the company name, the abbreviation for the state issuing the decision, the authorized rate of return, or ROR, ROE, and percentage of common equity in the adopted capital structure. The following columns show the month and year in which the adopted test year ended, and the rate base. Additional details regarding rate requests and rate rewards pertaining to 2018 proceedings are detailed on page 7.

The simple mean is utilized for the return averages. In addition, the average equity returns indicated in this report reflect the cases decided in the specified time periods and are not necessarily representative of the returns actually earned by utilities industry wide.



**Average ROEs authorized 2007 - H1 2018**

| Year | Period      | Water utilities |            | Electric utilities ** |            | Gas utilities |            |
|------|-------------|-----------------|------------|-----------------------|------------|---------------|------------|
|      |             | ROE %           | (# Cases)* | ROE %                 | (# Cases)* | ROE %         | (# Cases)* |
| 2007 | Full year   | 10.07           | (15)       | 9.91                  | (11)       | 10.22         | (35)       |
| 2008 | Full year   | 10.24           | (15)       | 9.86                  | (9)        | 10.39         | (32)       |
| 2009 | Full year   | 10.18           | (17)       | 10.04                 | (10)       | 10.22         | (30)       |
| 2010 | Full year   | 10.18           | (25)       | 10.15                 | (17)       | 10.15         | (39)       |
| 2011 | Full year   | 10.04           | (8)        | 9.98                  | (12)       | 9.92          | (16)       |
| 2012 | Full year   | 9.90            | (21)       | 9.85                  | (13)       | 9.94          | (35)       |
| 2013 | Full year   | 9.73            | (11)       | 9.73                  | (11)       | 9.68          | (21)       |
|      | 1st quarter | 9.60            | (4)        | 9.38                  | (3)        | 9.54          | (6)        |
|      | 2nd quarter | 9.56            | (5)        | 9.65                  | (3)        | 9.84          | (8)        |
|      | 3rd quarter | 9.77            | (3)        | 9.64                  | (4)        | 9.45          | (6)        |
|      | 4th quarter | 9.20            | (1)        | 9.22                  | (3)        | 10.28         | (6)        |
| 2014 | Full year   | 9.59            | (13)       | 9.49                  | (13)       | 9.78          | (26)       |
|      | 1st quarter | 9.74            | (4)        | 9.75                  | (1)        | 9.47          | (3)        |
|      | 2nd quarter | 10.05           | (2)        | 9.00                  | (2)        | 9.43          | (3)        |
|      | 3rd quarter | 9.75            | (3)        | NA                    | 0          | 9.75          | (1)        |
|      | 4th quarter | 9.55            | (2)        | 9.09                  | (3)        | 9.68          | (9)        |
| 2015 | Full year   | 9.76            | (11)       | 9.17                  | (6)        | 9.60          | (16)       |
|      | 1st quarter | 9.60            | (5)        | NA                    | 0          | 9.48          | (6)        |
|      | 2nd quarter | 9.75            | (1)        | 9.39                  | (4)        | 9.42          | (6)        |
|      | 3rd quarter | 9.93            | (2)        | 9.83                  | (2)        | 9.47          | (4)        |
|      | 4th quarter | 9.79            | (1)        | 9.09                  | (6)        | 9.68          | (10)       |
| 2016 | Full year   | 9.71            | (9)        | 9.31                  | (12)       | 9.54          | (26)       |
|      | 1st quarter | 9.56            | (4)        | 9.40                  | (3)        | 9.60          | (3)        |
|      | 2nd quarter | 9.18            | (2)        | 9.53                  | (3)        | 9.47          | (7)        |
|      | 3rd quarter | 10.40           | (1)        | 9.63                  | (3)        | 10.14         | (6)        |
|      | 4th quarter | 9.55            | (2)        | 9.26                  | (5)        | 9.65          | (8)        |
| 2017 | Full year   | 9.56            | (9)        | 9.43                  | (14)       | 9.72          | (24)       |
|      | 1st quarter | 9.23            | (6)        | 9.00                  | (1)        | 9.68          | (6)        |
|      | 2nd quarter | 10.50           | (1)        | 9.23                  | (4)        | 9.43          | (7)        |
| 2018 | 1st half    | 9.41            | (7)        | 9.18                  | (5)        | 9.55          | (13)       |

As of June 30, 2018.

\* (# cases) identifies the amount of ROE datapoints available, not the amount of rate cases completed during the period.

\*\* Electric ROE includes distribution-only rate proceedings

Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence

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**Water utility decisions (2014-2015)**

| Date        | Company                                  | State | Return on rate base (%) | Return on equity (%) | Common equity as % of capital | Rate base (\$M) | Test year |
|-------------|--|-------|-------------------------|----------------------|-------------------------------|-----------------|-----------|
| 01/09/14    | The York Water Co.                       | PA    | NA                      | NA                   | NA                            | NA              | 02/15     |
| 02/21/14    | Aqua Virginia Utilities, Inc.            | VA    | 7.24                    | 9.75                 | NA                            | NA              | 12/12     |
| 02/28/14    | Iowa American Water Co.                  | IA    | 8.47                    | 9.41                 | 52.57                         | 101             | 12/12     |
| 03/10/14    | Carolina Water Service of North Carolina | NC    | 8.18                    | 9.75                 | 50.27                         | 36              | 12/12     |
| 03/04/14    | Carolina Water Services, Inc.            | SC    | 7.97                    | 9.50                 | NA                            | 27              | 12/12     |
| 04/15/14    | Golden States Water                      | CA    | NA                      | NA                   | NA                            | 695             | 12/10     |
| 05/02/14    | Aqua North Carolina                      | NC    | 7.52                    | 9.75                 | 50.00                         | 126             | 03/13     |
| 05/23/14    | Waikoloa Utilities                       | HI    | 7.75                    | 9.90                 | 50.00                         | 17              | 06/13     |
| 06/18/14    | Middlesex Water Co.                      | NJ    | 6.72                    | 9.75                 | 50.71                         | 209             | 03/14     |
| 06/24/14    | SUEZ Water New York Inc.                 | NY    | 6.88                    | 9.20                 | 44.00                         | 273             | 05/16     |
| 06/24/14    | SUEZ Water Westchester                   | NY    | 7.52                    | 9.20                 | 47.00                         | 38              | 05/16     |
| 08/14/14    | San Jose Water                           | CA    | NA                      | NA                   | NA                            | 517             | 12/13     |
| 08/18/14    | California Water                         | CA    | NA                      | NA                   | NA                            | 861             | 12/14     |
| 08/19/14    | Tidewater Utilities, Inc.                | DE    | 7.92                    | 9.75                 | 50.96                         | NA              | 09/13     |
| 08/20/14    | Aqua New Jersey                          | NJ    | 7.70                    | 9.75                 | 52.47                         | 115             | 04/14     |
| 09/10/14    | Aqua Ohio Water Co.                      | OH    | 7.47                    | 9.80                 | 51.60                         | 152             | 03/14     |
| 11/14/14    | SUEZ Water New Rochelle, Inc.            | NY    | 7.52                    | 9.20                 | 47.00                         | 207             | 10/15     |
| 12/18/14    | Suburban Water                           | CA    | NA                      | NA                   | NA                            | 120             | 12/15     |
| <b>2014</b> | <b>Averages/total</b>                    |       | <b>7.60</b>             | <b>9.59</b>          | <b>49.69</b>                  |                 |           |
|             | <b>Observations</b>                      |       | <b>13</b>               | <b>13</b>            | <b>11</b>                     |                 |           |
| 01/28/15    | Indiana American Water Co.               | IN    | 6.60                    | 9.75                 | 41.55                         | 842             | 11/16     |
| 02/19/15    | Waikoloa Water                           | HI    | 7.75                    | 9.89                 | 50.00                         | NA              | 06/13     |
| 03/11/15    | Maine Water                              | ME    | 7.20                    | 9.50                 | 48.50                         | 18              | 12/13     |
| 03/25/15    | Aqua Illinois                            | IL    | 8.09                    | 9.81                 | 53.26                         | 87              | 12/15     |
| 04/09/15    | California American Water Co.            | CA    | NA                      | NA                   | NA                            | 443             | 12/15     |
| 05/26/15    | Maryland American Water                  | MD    | NA                      | 10.00                | NA                            | NA              | 09/14     |
| 06/29/15    | Kona Water Service                       | HI    | 7.75                    | 10.10                | 53.00                         | 11              | 06/15     |
| 08/19/15    | SUEZ Toms River                          | NJ    | 7.65                    | 9.75                 | 53.00                         | 99              | 12/15     |
| 08/19/15    | Middlesex Water Co.                      | NJ    | 6.73                    | 9.75                 | 51.36                         | 219             | 06/15     |
| 09/11/15    | New Jersey American Water Co. Inc        | NJ    | 7.55                    | 9.75                 | 52.00                         | 2,390           | 07/15     |
| 10/29/15    | SUEZ Water Pennsylvania                  | PA    | NA                      | NA                   | NA                            | NA              | 10/16     |
| 12/07/15    | Carolina Water Service of North Carolina | NC    | 8.20                    | 9.75                 | 51.00                         | 59              | 12/14     |
| 12/22/15    | Carolina Water Services, Inc.            | SC    | 7.99                    | 9.34                 | NA                            | 51              | 10/16     |
| <b>2015</b> | <b>Averages/total</b>                    |       | <b>7.55</b>             | <b>9.76</b>          | <b>50.41</b>                  |                 |           |
|             | <b>YTD Observations</b>                  |       | <b>10</b>               | <b>11</b>            | <b>9</b>                      |                 |           |

As of June 30, 2018.

NA: Data unavailable

Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence



**Water utility decisions (2016-2017)**

| Date        | Company  | State | Return on rate base (%) | Return on equity (%) | Common equity as % of capital | Rate base (\$M) | Test year |
|-------------|--|-------|-------------------------|----------------------|-------------------------------|-----------------|-----------|
| 01/07/16    | Aqua Virginia, Inc.                            | VA    | 6.94                    | 9.25                 | 49.20                         | 60              | 12/14     |
| 01/19/16    | Artesian Water                                 | DE    | 7.82                    | 9.75                 | 50.54                         | 217             | 12/17     |
| 01/25/16    | Utilities, Inc. of Central Nevada (UICN)       | NV    | 6.94                    | 9.50                 | 49.45                         | 60              | NA        |
| 02/24/16    | West Virginia American Water Co.               | WV    | 7.31                    | 9.75                 | 45.84                         | 529             | 02/16     |
| 02/24/16    | CWS Systems, Inc.                              | NC    | 8.20                    | 9.75                 | 51.00                         | 14              | 12/14     |
| 04/27/16    | SUEZ New Jersey Inc.                           | NJ    | 7.60                    | 9.75                 | 53.00                         | 735             | 06/16     |
| 05/26/16    | Missouri American Water Co.                    | MO    | NA                      | NA                   | NA                            | NA              | 12/14     |
| 06/16/16    | San Jose Water Co.                             | CA    | NA                      | NA                   | NA                            | 659             | 12/16     |
| 08/09/16    | Aqua New Jersey                                | NJ    | 7.48                    | 9.75                 | 52.86                         | 133             | 04/16     |
| 08/23/16    | Kentucky American Water Co.                    | KY    | NA                      | NA                   | NA                            | NA              | 08/17     |
| 09/12/16    | Hawaii Water Service K'Anapali Division        | HI    | 7.75                    | 10.10                | 53.00                         | 12              | 12/16     |
| 12/13/16    | Illinois American Water Co.                    | IL    | 7.47                    | 9.79                 | 49.80                         | 883             | 12/17     |
| 12/15/16    | Golden States Water                            | CA    | NA                      | NA                   | NA                            | 700             | 12/16     |
| 12/15/16    | California Water Co.                           | CA    | NA                      | NA                   | NA                            | 996             | 12/17     |
| <b>2016</b> | <b>Averages/total</b>                          |       | <b>7.50</b>             | <b>9.71</b>          | <b>50.52</b>                  |                 |           |
|             | <b>Observations</b>                            |       | <b>9</b>                | <b>9</b>             | <b>9</b>                      |                 |           |
| 01/27/17    | SUEZ Water New York                            | NY    | 6.92                    | 9.00 <sup>1</sup>    | 46.00                         | 332             | 01/18     |
| 02/24/17    | SUEZ Water Delaware                            | DE    | NA                      | 9.75                 | NA                            | NA              | 06/16     |
| 02/27/17    | Iowa American Water                            | IA    | 8.28                    | 9.60                 | 52.04                         | 108             | 12/15     |
| 03/22/17    | Aqua Ohio, Inc.                                | OH    | 7.47                    | 9.87                 | NA                            | 169             | 12/16     |
| 05/18/17    | New York American Water Co.                    | NY    | 6.56                    | 9.10                 | 46.00                         | 276             | 03/18     |
| 05/24/17    | Virginia-American Water                        | VA    | 7.13                    | 9.25                 | 46.09                         | 148             | 06/15     |
| 08/21/17    | Monarch Utilities                              | TX    | NA                      | NA                   | NA                            | 82              | 06/15     |
| 09/21/17    | Great Basin Water Co.                          | NV    | NA                      | NA                   | NA                            | NA              | 10/16     |
| 09/25/17    | Utilites Inc. of Florida                       | FL    | 7.09                    | 10.40 <sup>2</sup>   | 41.92                         | 82              | 12/15     |
| 11/08/17    | Carolina Water Service, Inc. of North Carolina | NC    | 7.84                    | 9.60                 | 52.00                         | 98              | 12/16     |
| 12/18/17    | Pennsylvania American Water Co.                | PA    | NA                      | NA                   | NA                            | NA              | 12/18     |
| 12/18/17    | The Maine Water Co.                            | ME    | NA                      | 9.50                 | NA                            | NA              | 12/16     |
| <b>2017</b> | <b>Averages/total</b>                          |       | <b>7.33</b>             | <b>9.56</b>          | <b>47.34</b>                  |                 |           |
|             | <b>YTD Observations</b>                        |       | <b>7</b>                | <b>9</b>             | <b>6</b>                      |                 |           |

As of June 30, 2018.

NA: Data unavailable

<sup>1</sup> An ROE of 7.8% was authorized for investment in the Haverstraw project, making the effective equity return nominally lower.

<sup>2</sup> Effective equity return is lower, due to punitive returns in 3 systems for for unsatisfactory service quality

Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence

## 2018 Water utility decisions

| State          | Company                        | Initial filing date | Increase requested          |                           |                         |                             | Increase authorized          |                            |                         |                             |                   |       |      |       |         |               |
|----------------|--------------------------------|---------------------|-----------------------------|---------------------------|-------------------------|-----------------------------|------------------------------|----------------------------|-------------------------|-----------------------------|-------------------|-------|------|-------|---------|---------------|
|                |                                |                     | Rate change requested (\$M) | Rate change requested (%) | Return on base rate (%) | Common equity total cap (%) | Rate change authorized (\$M) | Rate change authorized (%) | Return on base rate (%) | Common equity total cap (%) |                   |       |      |       |         |               |
| Illinois       | Aqua Illinois Water Co.*       | 05/01/17            | 10.5 W<br>1.5 WW            | NA                        | 8.18                    | 10.85                       | 238 W<br>31 WW               | 3/7/18                     | Litigated               | 6.5 W<br>0.8 WW             | 19.1 W<br>9.81 WW | 7.52  | 9.6  | 53.22 | 12/2018 | 237 W<br>31WW |
| California     | California American Water Co.* | 04/03/17            | 4.9                         | NA                        | 8.41                    | 10.80                       | 55.39 NA                     | 3/22/18                    | Litigated               | NA                          | NA                | 7.61  | 9.2  | 55.39 | NA      | NA            |
| California     | California Water Service Co.*  | 04/03/17            | 9.2                         | 1.4                       | 8.31                    | 10.75                       | 53.40 NA                     | 3/22/18                    | Litigated               | NA                          | NA                | 7.48  | 9.2  | 53.40 | NA      | NA            |
| California     | Golden State Water Co.*        | 04/03/17            | 12.1                        | 4.0                       | 9.11                    | 11.00                       | 57.00 NA                     | 3/22/18                    | Litigated               | NA                          | NA                | 7.91  | 8.9  | 57.00 | NA      | NA            |
| California     | San Jose Water Co.*            | 04/03/17            | 7.6                         | 2.1                       | 8.63                    | 10.75                       | 53.28 NA                     | 3/22/18                    | Litigated               | NA                          | NA                | 7.64  | 8.9  | 53.28 | NA      | NA            |
| New Jersey     | Middlesex Water Co.            | 09/11/17            | 15.3                        | 19.8                      | 7.07                    | 10.70                       | 52.75 263                    | 3/24/18                    | Settled                 | 5.486                       | 7.2               | 6.496 | 9.6  | 52.75 | 12/2017 | 245           |
| Missouri       | Missouri American Water Co.**  | 06/30/17            | 89.0 W<br>0.4 WW            | NA                        | 8.07                    | 10.80                       | 1,341 W<br>30 WW             | 5/2/18                     | Settled                 | 24                          | 8.16              | NA    | NA   | NA    | 05/2019 | NA            |
| South Carolina | Carolina Water Service, Inc.   | 11/14/17            | 2.3 W<br>2.3 WW             | 23.0                      | 8.62                    | NA                          | 51.89 30 WW                  | 5/2/18                     | Litigated               | 2.9                         | NA                | 8.42  | 10.5 | 51.89 | 08/2017 | 56            |

As of July 24, 2018.

\* This was a cost-of-capital proceeding and no other ratemaking issues were addressed.

\*\* Case was resolved by a black box settlement with no traditional rate case parameters specified in the order. However the parties recommended ROEs ranging from 9.5% to 10%.

NA = Not applicable

Source: Regulatory Research Associates, an offering of S&P Global Market Intelligence







# We recommend a MRP of 5.5% as per 30 September 2018

If you are reading this, it is likely that you are in regular contact with KPMG on the topic of valuations. The goal of this document is to provide a summary to our business partners about our recent observations and conclusions regarding one of the key valuation parameters, the equity market risk premium.

**We recommend the use of an equity market risk premium of 5.5% as of 30 September 2018, in line with last quarter. However, with a negative outlook. For Europe we observe lower equity returns, as well as an increase in risk-free rates. The USA market's increase in expected equity returns seems to be short-lived and does decrease after an increase in the previous period. Moreover, we observe a sharp decrease in growth expectations for all markets. However, given the recent developments in the stock markets we will monitor the MRP on a more frequent basis and provide updates if deemed necessary.**

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# Introduction - valuation and discount rates



The discount rate is an important input parameter to any valuation based on the discounted cash flow methodology ("DCF"). All else equal, a higher discount rate will lead to a lower asset value and vice versa.

In this document, we will specifically focus on the derivation of the cost of equity for company valuations. This discount rate can either be directly applied to equity cash flow forecasts of a company or it can be used in conjunction with the cost of debt and a certain financing structure to derive the weighted average cost of capital ("WACC").

A general DCF model can be expressed by the following formula:

$$\text{Present value} = \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \frac{CF_3}{(1+k)^3} + \dots = \sum_{t=1}^{\infty} \frac{CF_t}{(1+k)^t}$$

Present value = value of the analysed asset (e.g. a company)  
CF<sub>t</sub> = cash flow that the asset will generate in period t  
k = asset-specific discount rate



## Discount rate derivation

While there are several ways to derive discount rates, the most commonly applied methodology is the 'build-up methodology' based on the Capital Asset Pricing Model ("CAPM"). This methodology builds up the discount rate by summation of several asset-related risk components in order to derive a return at which investors are willing to invest in this asset (e.g. a company).

The build-up of the cost of equity ("k") of a company can be expressed as:

$$k = rfr + \beta \times MRP + \alpha$$

k = required return on equity  
rfr = risk-free rate  
β = a company's systematic risk  
MRP = market or equity risk premium  
α = asset-specific risk factors

The function and derivation of the individual discount rate parameters are briefly discussed on the following slide.

# Introduction - discount rate parameters



## Risk-free rate

The risk-free rate forms the basis for any discount rate estimation using the build-up methodology. As the name implies, this rate should not take into account any risk factors and should only include two general components:

- The time value of money; and
- Inflation.

Since there are no investments that are truly risk-free, the risk-free rate is commonly approximated by reference to the yield on long-term debt instruments issued by presumably financially healthy governments (e.g. AAA-rated government bonds with a maturity of 30 years).



## Beta

Beta measures how the returns of a certain company behave in relation to the returns of the relevant market benchmark.

A beta greater/smaller than 1.0 means that the share price of a company is more/less volatile than the general market and therefore investors will require a higher/lower return to compensate for this volatility.



## Alpha

Alpha is an asset-specific adjustment factor that may need to be applied for a number of different reasons. If a financial forecast does not account for certain operational risks, it may be appropriate to include a forecast risk premium. Other examples of alpha adjustments are size premia and illiquidity premia.



## Equity market risk premium (MRP)

The equity market risk premium ("MRP") is the average return that investors require over the risk-free rate for accepting the higher variability in returns that are common for equity investments (i.e. the MRP reflects a minimum threshold for investors in order to be willing to invest).

Since alpha only relates to company-specific adjustments, it can be omitted if considering the overall market (alpha = 0). Furthermore it is important to note that for the overall market, beta will by definition always be 1.0, since the sum of all returns of individual stocks equals the overall return of the market, and therefore, the two are perfectly correlated.

As the figure below shows, the required return for the overall market is defined entirely by the risk-free rate and the equity market risk premium.





# Measurement of the equity market risk premium - methodologies

## Implied equity market risk premium

The general DCF formula discussed earlier can be used to solve for the implied discount rate that reconciles these parameters.

Deducting the risk-free rate from this implied discount rate will yield an implied equity market risk premium.

The implied equity market risk premium methodology is to some extent sensitive to input assumptions and careful consideration must be given to:

- The selection of income proxies (e.g. dividends, buy-backs, cash flow);
- The basis of expected growth rates (e.g. macroeconomic considerations, analyst forecasts); and
- The trade-off between outcome stability and current relevance with regards to certain historical inputs (e.g. dividend yield normalisations, pay-out ratios).

We deem the implied equity market risk premium methodology the most appropriate methodology in order to derive changes in the equity market risk premium as a result of the financial crisis, because it incorporates recent market developments, expectations, and it can be logically deduced from observable market data.

## Historical observation methodology

This methodology assumes that the expected equity market risk premium can be derived by studying historical equity returns.

While this methodology is well established and theoretically sound, it does not allow for the incorporation of the most recent market developments.

## Other methodologies

There are a number of other prominent methodologies which may lead to additional insights, the most common being:

- The multi-factor model;
- The yield spread build-up; and
- The survey approach.

While each of these methodologies offers some unique advantages, the application of these methodologies involves similar trade-offs as the ones between the historical and the implied equity market risk premium methodology.

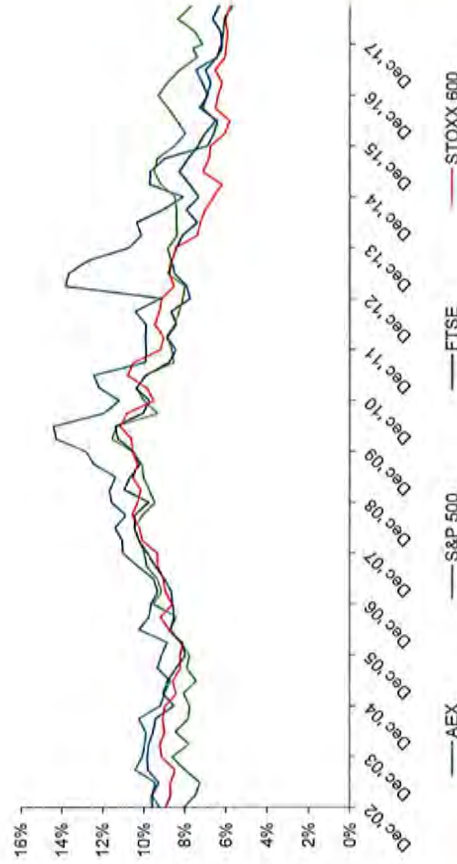


# Development of discount rates

## Implied equity return

The graph below illustrates the movement in the implied equity returns for a number of major equity markets over time. The increase / recovery from last quarter has been mitigated by a sharp decrease in the USA market (S&P 500) and a more minor decrease in the European markets (i.e. AEX, FTSE and the Stoxx 600).

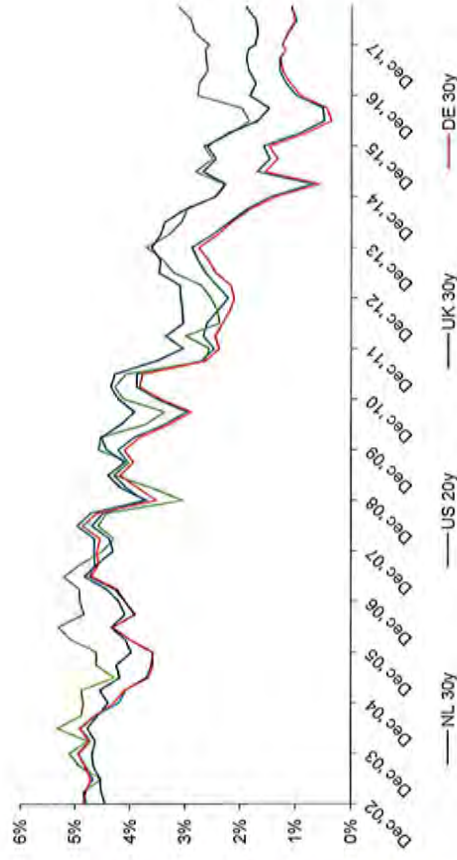
Noteworthy are the developments in growth expectations. For the S&P, growth expectations seem to have gone back to average 2014 – 2018 levels. However, for the European markets we observe growth expectations which are noticeable below average 2014 – 2018 levels. Ongoing macro-economic developments in Europe do seem to weight heavily on the growth forecasts, however a direct cause is not clear.



## Yield on long-term bonds

In the graph below, the interest rate movements for a number of highly developed markets (Netherlands, UK, Germany and US) are displayed.

As can be observed, the interest rates as per 30 September 2018 in Europe showed minor increases compared to prior quarter after a decline since the beginning of 2018. The increasing trend for the USA interest rate keeps momentum, in line with government policies regarding risk-free rate hikes as well as, to a lesser extent, ongoing political uncertainty.





# Equity market risk premium as per 30 September 2018: 5.5%

## Findings

Since markets fluctuate on a daily basis and there are some differences between market risk premia in different regions, it is difficult to mathematically derive one single point estimate for an universal equity market risk premium for all developed markets.

In our current update we observe signs of a decreasing equity risk premium. Given the current developments in the stock market one can question a decreasing equity risk premium as analysts, and therefore indirectly the equity risk premium, may be lagging behind for a short period of time.

Due to this observed decrease in the equity market risk premium while the markets increase in volatility, we have decided to keep the current equity market risk premium equal to 5.5% and monitor the movements on a monthly basis. Moreover, we deem the outlook to be negative for the equity risk premium (i.e. no further decrease).

## Equity market risk premium KPMG NL

Based on the analyses set out in this report, we conclude that the markets show signs of halting their momentum. Therefore KPMG Netherlands recommends the use of an **equity market risk premium of 5.5%** as per 30 September 2018, constant compared to prior quarters.

We note that our estimation is based on information available as at 30 September 2018. Developments in the market after 30 September 2018 may have an impact on the perceived market risk which is not reflected in the equity market risk premium estimate as at 30 September 2018.

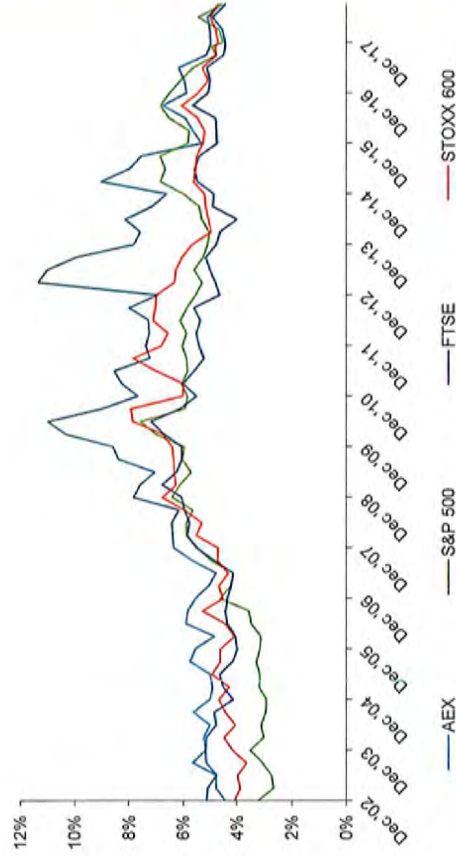
## Considerations

In order to assess the reasonableness of the outcomes of our implied equity market risk premium study, we have considered various other methodologies as previously described. To the extent that these methodologies are valid to derive insights about the current level of the equity market risk premium, these methodologies have confirmed our findings.

Based on our research and professional judgement we propose a global equity market risk premium. However, when calculating a discount rate consideration must be given to (amongst others):

- The basis for the applied risk-free rate;
- The applicable country risk premia; and
- Expected differences in inflationary outlook.

We highlight that individual input parameters should never be viewed in isolation.

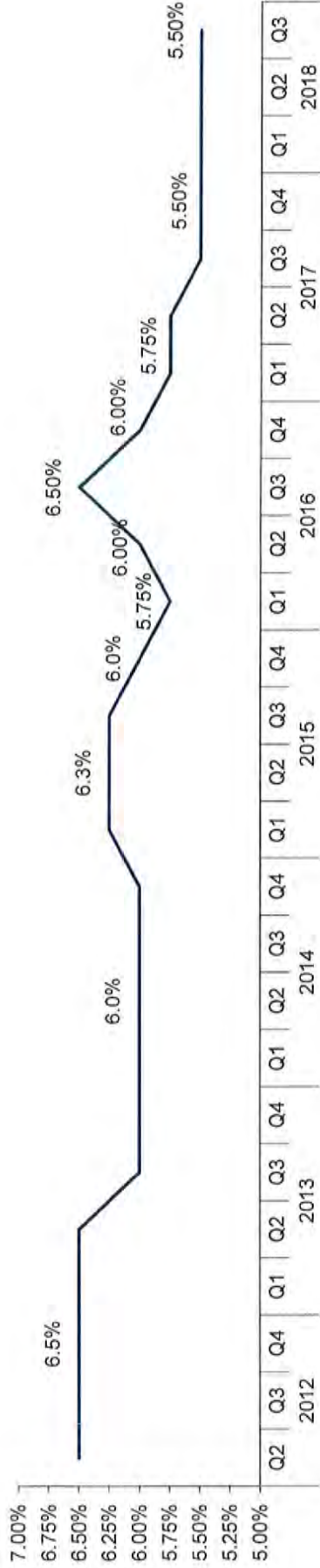


# Appendix



## Historic MRP estimates

Please find an overview of the historic MRP estimates by KPMG in the graph below.







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## Market Risk Premium and Risk-Free Rate used for 59 countries in 2018: a survey

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### ABSTRACT

This paper contains the statistics of a survey about the Risk-Free Rate (**R<sub>F</sub>**) and the Market Risk Premium (**MRP**) used in 2018 for **59 countries**. We got answers for 73 countries, but we only report the results for 59 countries with more than 5 answers.

The change between 2015 and 2018 of the average **K<sub>m</sub>** (**R<sub>F</sub>** + **MRP**) used was higher than 1% for 22 countries (see table 5).

Most of the respondents use for European countries a **R<sub>F</sub>** higher than the yield of the 10-year Government bonds. Due to “Quantitative Easing”, the **R<sub>F</sub>** and the **MRP** reported for some countries are negatively correlated (Spain, Germany, Netherlands, Norway). The coefficient of variation (standard deviation / average) of **K<sub>m</sub>** is lower than the one of **MRP** and **R<sub>F</sub>** for 35 countries.

For the first time of this survey, 11 respondents provided -without being asked for- a different **MRP** for Spain and Catalonia (on average, 6,7% for Spain and 11,3% for Catalonia).

1. Market Risk Premium (**MRP**), Risk Free Rate (**R<sub>F</sub>**) and **K<sub>m</sub>** [**R<sub>F</sub>** + **MRP**] used in 2018 in 59 countries
  2. Distribution of the answers for the US
  3. Changes from 2015 to 2017, and to 2018
  4. Previous surveys
  5. Expected and Required Equity Premium: different concepts
  6. Conclusion
- Exhibit 1. Mail sent on March 2018  
Exhibit 2. Some comments and webs recommended by respondents  
Exhibit 3. Coefficient of variation (standard deviation / average) of **K<sub>m</sub>**, **MRP** and **R<sub>F</sub>**

**JEL Classification:** G12, G31, M21

**Keywords:** equity premium; required equity premium; expected equity premium; risk-free rate; heterogeneous expectations

April 4, 2018

<https://ssrn.com/abstract=3155709>

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xPpLhMom



### 1. Market Risk Premium (MRP), Risk Free Rate (RF) and Km [RF + MRP] used in 2018 in 59 countries

We sent a short email (see exhibit 1) on March, 2018 to more 20,000 email addresses of finance and economic professors, analysts and managers of companies obtained from previous correspondence, papers and webs of companies and universities. We asked about the Risk Free Rate and the Market Risk Premium (MRP) used *“to calculate the required return to equity in different countries”*.

By April 4, 2018, we had received 2,238 emails. 251 persons answered that they do not use MRP for different reasons (see table 1). The remaining emails had specific Risk Free Rates and MRPs used in 2018 for one or more countries.<sup>1</sup> We would like to sincerely thank everyone who took the time to answer us.

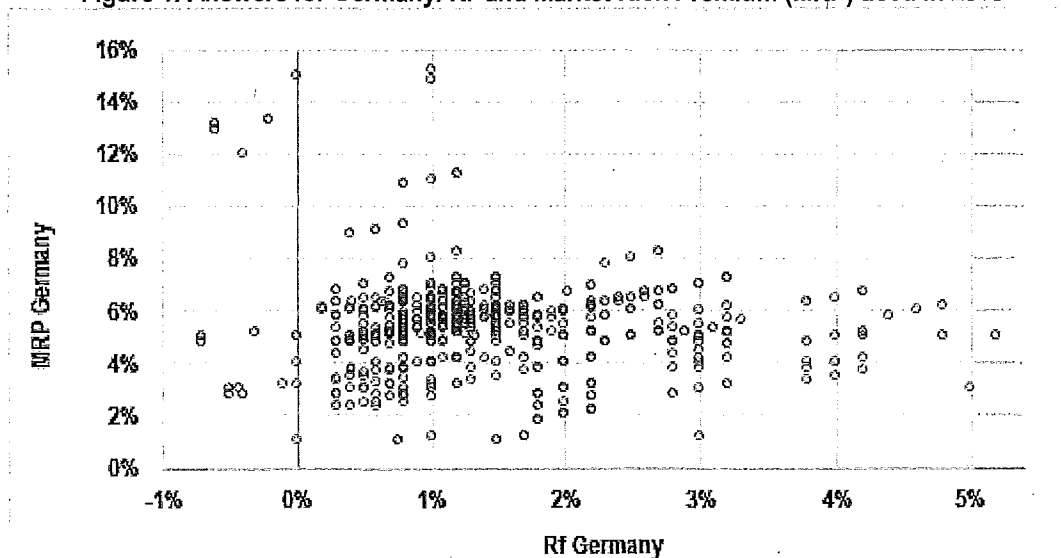
**Table 1. MRP and RF used in 2018: 2,238 emails**

|   | Total |
|---|-------|
| Answers reported (MRP figures)                    | 4,368 |
| Outliers  | 18    |
| Answers for 14 countries with less than 6 answers | 34    |
| Only MRP or RF (not both)                         | 37    |
| Answers that do not provide figures               | 251   |

**Table 2** contains the statistics of the **MRP** used in 2018 for **59 countries**. We got answers for 73 countries, but we only report the results for 59 countries with more than 5 answers. **Table 3** contains the statistics of the Risk-Free Rate (**RF**) used in 2018 in the 59 countries and **Table 4** contains the statistics of **Km** (required return to equity:  $Km = Risk\text{-Free Rate} + MRP$ ).

**Figure 1** is a graphic representation of the answers (MRP and RF) we got for Germany.

**Figure 1. Answers for Germany, RF and Market Risk Premium (MRP) used in 2018**



<sup>1</sup> We considered 18 of them as outliers because they provided a very small MRP (for example, below 0%) or a very high MRP (for example, 32% for the USA).

Table 2. Market Risk Premium (MRP) used for 59 countries in 2018

| MRP            | Number of Answers | Average | St. Dev. | Median | MAX   | min  | St.Dev. / Average |
|----------------|-------------------|---------|----------|--------|-------|------|-------------------|
| USA            | 1348              | 5,4%    | 1,7%     | 5,2%   | 17,8% | 1,3% | 32,1%             |
| Spain          | 675               | 6,7%    | 2,4%     | 6,2%   | 20,0% | 0,8% | 36,2%             |
| Germany        | 528               | 5,3%    | 1,7%     | 5,2%   | 15,2% | 1,0% | 32,5%             |
| Argentina      | 73                | 13,9%   | 4,7%     | 16,3%  | 20,2% | 1,9% | 34,3%             |
| Australia      | 74                | 6,6%    | 1,4%     | 7,1%   | 10,2% | 3,3% | 20,8%             |
| Austria        | 56                | 6,2%    | 0,7%     | 6,4%   | 7,2%  | 4,2% | 10,5%             |
| Belgium        | 53                | 6,2%    | 0,8%     | 6,4%   | 7,2%  | 3,3% | 12,5%             |
| Bolivia        | 6                 | 6,6%    | 2,9%     | 6,6%   | 9,4%  | 3,8% | 43,3%             |
| Brazil         | 100               | 8,4%    | 2,3%     | 8,6%   | 15,2% | 2,3% | 26,9%             |
| Bulgaria       | 8                 | 7,5%    | 1,3%     | 7,7%   | 9,5%  | 5,0% | 16,8%             |
| Canada         | 77                | 5,8%    | 0,7%     | 6,0%   | 7,2%  | 4,1% | 12,7%             |
| Chile          | 72                | 6,1%    | 1,1%     | 6,2%   | 8,2%  | 3,1% | 17,7%             |
| China          | 95                | 6,3%    | 2,8%     | 7,0%   | 13,2% | 0,6% | 43,4%             |
| Colombia       | 72                | 8,7%    | 3,7%     | 7,9%   | 25,2% | 3,8% | 42,6%             |
| Czech Republic | 63                | 5,9%    | 0,7%     | 6,0%   | 8,2%  | 4,8% | 12,3%             |
| Denmark        | 53                | 6,0%    | 0,8%     | 6,2%   | 7,2%  | 3,8% | 12,9%             |
| Ecuador        | 7                 | 9,0%    | 3,5%     | 8,0%   | 12,8% | 5,5% | 38,7%             |
| Egypt          | 9                 | 10,9%   | 4,5%     | 12,6%  | 15,2% | 4,8% | 41,6%             |
| Estonia        | 7                 | 5,1%    | 1,0%     | 5,2%   | 6,1%  | 3,0% | 20,4%             |
| Finland        | 53                | 5,9%    | 0,8%     | 6,0%   | 7,2%  | 3,8% | 13,0%             |
| France         | 83                | 5,9%    | 1,6%     | 6,4%   | 8,8%  | 1,3% | 27,3%             |
| Greece         | 42                | 15,8%   | 3,1%     | 16,9%  | 18,2% | 6,8% | 19,7%             |
| Hong Kong      | 21                | 5,8%    | 1,0%     | 6,0%   | 7,2%  | 3,8% | 16,8%             |
| Hungary        | 42                | 7,9%    | 1,2%     | 8,4%   | 9,0%  | 4,8% | 15,5%             |
| India          | 64                | 7,9%    | 2,1%     | 8,3%   | 13,7% | 2,3% | 26,7%             |
| Indonesia      | 39                | 8,8%    | 1,0%     | 9,0%   | 11,9% | 5,0% | 11,8%             |
| Iran           | 15                | 22,1%   | 25,4%    | 8,0%   | 70,2% | 4,8% | 115,1%            |
| Ireland        | 49                | 6,5%    | 0,6%     | 6,7%   | 7,2%  | 4,2% | 9,7%              |
| Israel         | 51                | 5,8%    | 1,3%     | 6,4%   | 7,0%  | 2,8% | 21,6%             |
| Italy          | 108               | 6,1%    | 1,2%     | 6,4%   | 10,0% | 2,1% | 20,0%             |
| Japan          | 57                | 5,7%    | 2,6%     | 5,9%   | 12,0% | 0,3% | 45,4%             |
| Korea (South)  | 48                | 6,4%    | 1,0%     | 6,6%   | 8,2%  | 3,2% | 15,8%             |
| Malaysia       | 10                | 7,1%    | 1,5%     | 6,6%   | 10,0% | 5,0% | 20,8%             |
| Mexico         | 123               | 8,5%    | 3,5%     | 8,0%   | 20,2% | 2,8% | 40,5%             |
| Netherlands    | 81                | 5,8%    | 0,7%     | 6,0%   | 6,8%  | 3,5% | 11,6%             |
| New Zealand    | 42                | 5,8%    | 0,9%     | 5,8%   | 9,5%  | 4,6% | 15,0%             |
| Norway         | 52                | 5,7%    | 0,9%     | 6,1%   | 6,8%  | 3,8% | 15,0%             |
| Pakistan       | 9                 | 11,5%   | 3,9%     | 12,6%  | 15,5% | 6,3% | 34,1%             |
| Panama         | 14                | 8,4%    | 2,5%     | 7,4%   | 12,2% | 5,6% | 29,4%             |
| Peru           | 91                | 7,3%    | 2,8%     | 7,6%   | 20,2% | 2,8% | 38,9%             |
| Phillipines    | 6                 | 5,1%    | 2,4%     | 5,6%   | 7,5%  | 2,0% | 47,4%             |
| Poland         | 64                | 6,0%    | 1,3%     | 6,3%   | 9,2%  | 1,3% | 21,2%             |
| Portugal       | 58                | 7,2%    | 1,2%     | 7,7%   | 8,4%  | 3,4% | 17,3%             |
| Qatar          | 10                | 6,9%    | 1,2%     | 6,9%   | 9,0%  | 5,0% | 17,6%             |
| Romania        | 31                | 7,0%    | 1,8%     | 6,9%   | 10,2% | 3,8% | 26,4%             |
| Russia         | 61                | 8,7%    | 3,2%     | 8,0%   | 20,2% | 3,8% | 37,4%             |
| Singapore      | 10                | 5,2%    | 1,5%     | 5,2%   | 7,2%  | 3,2% | 28,6%             |
| Slovakia       | 9                 | 6,6%    | 1,1%     | 6,1%   | 8,2%  | 5,4% | 17,0%             |
| Slovenia       | 16                | 7,2%    | 0,8%     | 7,1%   | 8,7%  | 5,8% | 11,7%             |
| South Africa   | 40                | 6,9%    | 1,7%     | 7,6%   | 8,2%  | 2,8% | 24,0%             |
| Sri Lanka      | 6                 | 8,0%    | 2,5%     | 8,1%   | 10,5% | 5,6% | 30,7%             |
| Sweden         | 58                | 7,1%    | 1,6%     | 6,9%   | 11,2% | 2,9% | 22,8%             |
| Switzerland    | 43                | 6,9%    | 1,0%     | 7,2%   | 7,9%  | 4,0% | 14,3%             |
| Taiwan         | 30                | 4,9%    | 1,5%     | 5,6%   | 6,8%  | 1,8% | 31,3%             |



|                |    |       |      |       |       |      |       |
|----------------|----|-------|------|-------|-------|------|-------|
| Thailand       | 46 | 8,9%  | 3,0% | 8,3%  | 20,2% | 6,3% | 34,2% |
| Turkey         | 54 | 7,7%  | 2,4% | 8,1%  | 15,2% | 3,8% | 31,0% |
| United Kingdom | 89 | 5,5%  | 1,1% | 5,9%  | 7,2%  | 2,3% | 20,5% |
| Uruguay        | 39 | 8,3%  | 1,1% | 8,2%  | 11,0% | 5,0% | 13,4% |
| Venezuela      | 33 | 16,9% | 3,0% | 17,9% | 21,0% | 7,0% | 17,9% |

Table 3. Risk Free Rate (RF) used for 59 countries in 2018

| RF             | Number of Answers | Average | St. Dev. | Median | MAX   | min   | St. Dev. / Average |
|----------------|-------------------|---------|----------|--------|-------|-------|--------------------|
| USA            | 1348              | 2,8%    | 0,8%     | 2,8%   | 7,0%  | -0,3% | 30,0%              |
| Spain          | 675               | 2,1%    | 1,1%     | 1,8%   | 6,2%  | -0,1% | 52,3%              |
| Germany        | 528               | 1,4%    | 1,0%     | 1,2%   | 5,2%  | -0,7% | 67,6%              |
| Argentina      | 73                | 9,3%    | 4,9%     | 10,4%  | 25,9% | 2,0%  | 52,8%              |
| Australia      | 74                | 3,1%    | 0,5%     | 3,0%   | 5,0%  | 2,4%  | 14,7%              |
| Austria        | 56                | 2,0%    | 1,1%     | 1,8%   | 6,2%  | 0,7%  | 54,1%              |
| Belgium        | 53                | 1,6%    | 0,4%     | 1,7%   | 2,4%  | 0,8%  | 26,6%              |
| Bolivia        | 6                 | 3,0%    | 1,1%     | 3,0%   | 4,2%  | 1,8%  | 37,0%              |
| Brazil         | 100               | 7,3%    | 2,3%     | 7,2%   | 10,7% | 2,0%  | 31,9%              |
| Bulgaria       | 8                 | 2,8%    | 1,2%     | 2,9%   | 5,0%  | 1,3%  | 44,9%              |
| Canada         | 77                | 2,9%    | 0,5%     | 2,9%   | 4,2%  | 1,8%  | 17,7%              |
| Chile          | 72                | 4,1%    | 0,7%     | 4,3%   | 5,0%  | 1,8%  | 15,9%              |
| China          | 95                | 3,8%    | 0,4%     | 3,8%   | 4,7%  | 2,3%  | 11,7%              |
| Colombia       | 72                | 6,7%    | 1,4%     | 6,7%   | 10,2% | 3,9%  | 20,6%              |
| Czech Republic | 63                | 2,6%    | 0,6%     | 2,8%   | 3,3%  | 0,8%  | 21,4%              |
| Denmark        | 53                | 1,6%    | 0,5%     | 1,7%   | 2,7%  | 0,5%  | 30,4%              |
| Ecuador        | 7                 | 3,6%    | 1,4%     | 3,8%   | 6,0%  | 2,1%  | 38,8%              |
| Egypt          | 9                 | 10,0%   | 3,5%     | 10,0%  | 14,2% | 5,8%  | 34,7%              |
| Estonia        | 7                 | 2,1%    | 0,9%     | 1,8%   | 4,0%  | 1,3%  | 43,5%              |
| Finland        | 53                | 1,7%    | 0,6%     | 1,8%   | 2,7%  | 0,6%  | 33,4%              |
| France         | 83                | 1,6%    | 0,7%     | 1,6%   | 3,2%  | 0,3%  | 41,7%              |
| Greece         | 42                | 4,8%    | 1,6%     | 5,0%   | 6,4%  | 0,4%  | 33,2%              |
| Hong Kong      | 21                | 2,2%    | 0,6%     | 2,0%   | 3,7%  | 1,7%  | 25,9%              |
| Hungary        | 42                | 3,6%    | 0,9%     | 3,8%   | 4,9%  | 1,3%  | 25,7%              |
| India          | 64                | 6,8%    | 0,7%     | 6,7%   | 8,2%  | 4,8%  | 9,6%               |
| Indonesia      | 39                | 6,8%    | 0,9%     | 7,2%   | 7,8%  | 4,0%  | 13,7%              |
| Iran           | 15                | 12,6%   | 4,9%     | 13,0%  | 20,2% | 6,8%  | 39,1%              |
| Ireland        | 49                | 1,6%    | 0,4%     | 1,7%   | 2,4%  | 0,7%  | 25,0%              |
| Israel         | 51                | 1,9%    | 0,7%     | 2,0%   | 4,0%  | 0,0%  | 39,6%              |
| Italy          | 108               | 2,3%    | 0,5%     | 2,2%   | 3,4%  | 1,3%  | 21,0%              |
| Japan          | 57                | 0,3%    | 0,8%     | 0,4%   | 1,7%  | -2,6% | 231,1%             |
| Korea (South)  | 48                | 2,4%    | 0,3%     | 2,5%   | 3,2%  | 1,3%  | 14,2%              |
| Malaysia       | 10                | 4,2%    | 1,0%     | 4,1%   | 6,0%  | 3,0%  | 24,8%              |
| Mexico         | 123               | 6,8%    | 1,3%     | 7,0%   | 8,7%  | 1,5%  | 19,3%              |
| Netherlands    | 81                | 1,7%    | 0,9%     | 1,7%   | 4,0%  | -0,7% | 56,3%              |
| New Zealand    | 42                | 3,1%    | 0,4%     | 3,1%   | 3,7%  | 2,0%  | 11,7%              |
| Norway         | 52                | 2,4%    | 0,7%     | 2,4%   | 4,7%  | 1,0%  | 28,9%              |
| Pakistan       | 9                 | 6,7%    | 1,2%     | 6,2%   | 9,5%  | 5,8%  | 18,4%              |
| Panama         | 14                | 4,0%    | 0,7%     | 4,0%   | 5,0%  | 2,0%  | 16,7%              |
| Peru           | 91                | 5,3%    | 1,4%     | 5,5%   | 8,2%  | 2,6%  | 25,6%              |
| Philippines    | 6                 | 5,3%    | 1,4%     | 5,3%   | 6,7%  | 3,8%  | 26,3%              |
| Poland         | 64                | 3,4%    | 0,7%     | 3,5%   | 5,2%  | 1,0%  | 20,2%              |
| Portugal       | 58                | 3,2%    | 0,9%     | 3,6%   | 4,4%  | 1,0%  | 29,4%              |
| Qatar          | 10                | 3,4%    | 0,6%     | 3,3%   | 5,0%  | 2,8%  | 18,1%              |

|                |    |       |      |       |       |       |       |
|----------------|----|-------|------|-------|-------|-------|-------|
| Romania        | 31 | 5,2%  | 1,7% | 4,7%  | 7,7%  | 2,0%  | 32,2% |
| Russia         | 61 | 7,8%  | 1,5% | 8,2%  | 9,6%  | 3,8%  | 19,6% |
| Singapore      | 10 | 2,3%  | 0,3% | 2,3%  | 2,7%  | 1,8%  | 11,9% |
| Slovakia       | 9  | 2,5%  | 0,8% | 2,8%  | 3,2%  | 1,3%  | 30,8% |
| Slovenia       | 16 | 4,1%  | 2,6% | 3,9%  | 8,5%  | 0,8%  | 64,3% |
| South Africa   | 40 | 7,6%  | 1,8% | 8,1%  | 9,3%  | 2,3%  | 23,3% |
| Sri Lanka      | 6  | 9,2%  | 1,3% | 9,2%  | 10,6% | 7,8%  | 14,4% |
| Sweden         | 58 | 1,8%  | 0,8% | 1,9%  | 3,8%  | 0,2%  | 41,9% |
| Switzerland    | 43 | 1,1%  | 0,5% | 1,2%  | 1,8%  | 0,0%  | 46,4% |
| Taiwan         | 30 | 1,7%  | 0,8% | 1,8%  | 3,2%  | 0,5%  | 48,0% |
| Thailand       | 46 | 3,5%  | 1,6% | 3,0%  | 8,2%  | 2,1%  | 46,3% |
| Turkey         | 54 | 10,3% | 2,8% | 10,8% | 13,2% | -0,2% | 26,9% |
| United Kingdom | 89 | 2,0%  | 0,5% | 2,0%  | 3,2%  | 0,8%  | 25,5% |
| Uruguay        | 39 | 5,3%  | 1,8% | 4,7%  | 12,0% | 4,2%  | 33,5% |
| Venezuela      | 33 | 11,7% | 1,4% | 11,9% | 14,0% | 6,0%  | 11,9% |

**Table 4. Km [Required return to equity (market): RF + MRP]] used for 59 countries in 2018**

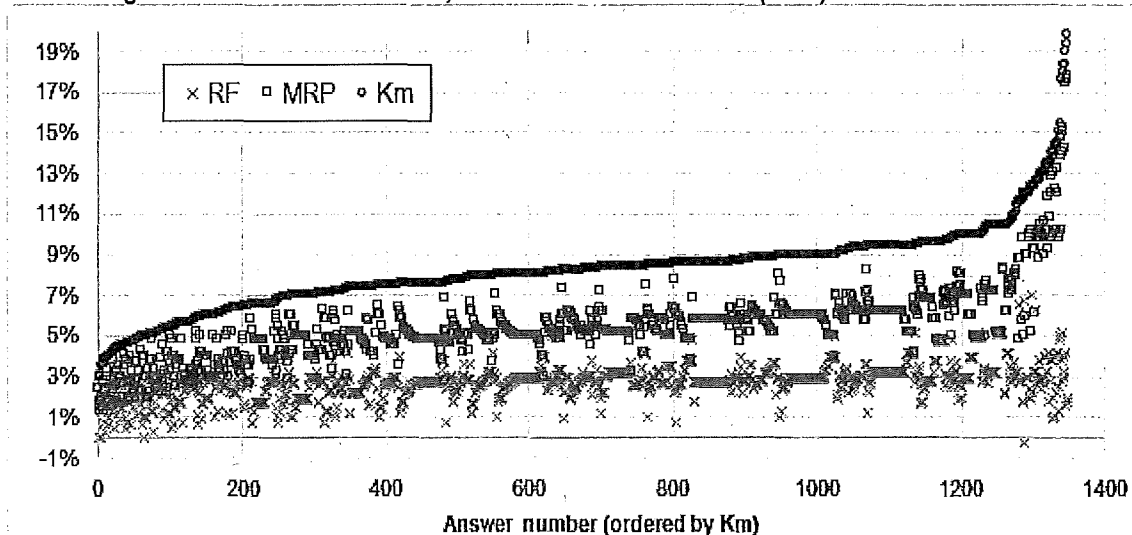
| Km             | Number of Answers | Average | St. Dev. | Median | MAX   | min   | St.Dev. / Average |
|----------------|-------------------|---------|----------|--------|-------|-------|-------------------|
| USA            | 1348              | 8,2%    | 2,0%     | 8,3%   | 19,8% | 2,4%  | 23,9%             |
| Spain          | 675               | 8,8%    | 2,5%     | 8,5%   | 21,2% | 1,9%  | 27,8%             |
| Germany        | 528               | 6,7%    | 1,9%     | 6,8%   | 16,2% | 1,0%  | 28,3%             |
| Argentina      | 73                | 23,1%   | 6,8%     | 26,2%  | 43,5% | 8,6%  | 29,4%             |
| Australia      | 74                | 9,7%    | 1,5%     | 10,0%  | 14,4% | 7,1%  | 15,2%             |
| Austria        | 56                | 8,2%    | 1,3%     | 8,2%   | 12,4% | 4,9%  | 15,6%             |
| Belgium        | 53                | 7,8%    | 1,1%     | 8,1%   | 9,2%  | 4,1%  | 14,2%             |
| Bolivia        | 6                 | 9,6%    | 1,8%     | 9,6%   | 11,6% | 7,6%  | 18,7%             |
| Brazil         | 100               | 15,7%   | 3,0%     | 15,2%  | 21,4% | 10,5% | 19,2%             |
| Bulgaria       | 8                 | 10,3%   | 1,2%     | 10,0%  | 13,0% | 9,1%  | 11,6%             |
| Canada         | 77                | 8,7%    | 1,1%     | 9,0%   | 10,4% | 6,1%  | 12,4%             |
| Chile          | 72                | 10,2%   | 1,2%     | 10,5%  | 12,4% | 7,1%  | 12,0%             |
| China          | 95                | 10,1%   | 2,7%     | 10,6%  | 17,4% | 4,3%  | 27,2%             |
| Colombia       | 72                | 15,4%   | 4,4%     | 14,6%  | 35,4% | 10,1% | 28,7%             |
| Czech Republic | 63                | 8,5%    | 1,0%     | 8,5%   | 11,4% | 6,1%  | 11,9%             |
| Denmark        | 53                | 7,6%    | 1,0%     | 7,8%   | 9,0%  | 4,9%  | 13,3%             |
| Ecuador        | 7                 | 12,5%   | 4,4%     | 14,0%  | 17,0% | 7,6%  | 34,7%             |
| Egypt          | 9                 | 20,9%   | 3,1%     | 19,0%  | 25,4% | 18,2% | 15,0%             |
| Estonia        | 7                 | 7,2%    | 0,8%     | 7,0%   | 8,3%  | 6,1%  | 10,8%             |
| Finland        | 53                | 7,6%    | 1,0%     | 7,8%   | 9,0%  | 4,5%  | 12,9%             |
| France         | 83                | 7,4%    | 1,9%     | 7,9%   | 10,4% | 2,6%  | 24,9%             |
| Greece         | 42                | 20,6%   | 4,2%     | 21,3%  | 24,2% | 10,6% | 20,2%             |
| Hong Kong      | 21                | 8,0%    | 0,7%     | 8,0%   | 9,4%  | 6,6%  | 8,9%              |
| Hungary        | 42                | 11,4%   | 1,5%     | 12,1%  | 13,1% | 7,7%  | 13,6%             |
| India          | 64                | 14,7%   | 2,2%     | 15,1%  | 20,6% | 8,6%  | 14,6%             |
| Indonesia      | 39                | 15,6%   | 1,2%     | 16,1%  | 16,9% | 12,1% | 7,9%              |
| Iran           | 15                | 34,7%   | 26,5%    | 25,0%  | 85,4% | 14,6% | 76,3%             |
| Ireland        | 49                | 8,2%    | 1,0%     | 8,4%   | 9,4%  | 4,9%  | 11,8%             |
| Israel         | 51                | 7,7%    | 1,7%     | 8,4%   | 9,4%  | 3,0%  | 21,8%             |
| Italy          | 108               | 8,4%    | 1,5%     | 8,6%   | 13,0% | 3,8%  | 17,6%             |
| Japan          | 57                | 6,0%    | 2,0%     | 6,1%   | 11,3% | 1,6%  | 34,1%             |



|                |     |       |      |       |       |       |       |
|----------------|-----|-------|------|-------|-------|-------|-------|
| Korea (South)  | 48  | 8,8%  | 1,2% | 9,0%  | 11,4% | 5,4%  | 13,1% |
| Malaysia       | 10  | 11,3% | 0,8% | 11,1% | 13,0% | 10,1% | 7,4%  |
| Mexico         | 123 | 15,3% | 3,7% | 15,0% | 28,4% | 7,9%  | 24,4% |
| Netherlands    | 81  | 7,4%  | 1,1% | 7,7%  | 9,9%  | 4,2%  | 15,0% |
| New Zealand    | 42  | 8,9%  | 0,8% | 8,8%  | 11,6% | 7,3%  | 9,1%  |
| Norway         | 52  | 8,1%  | 1,1% | 8,4%  | 9,9%  | 6,1%  | 13,2% |
| Pakistan       | 9   | 18,2% | 3,0% | 18,6% | 21,7% | 13,6% | 16,3% |
| Panama         | 14  | 12,4% | 2,3% | 11,7% | 16,2% | 9,4%  | 18,3% |
| Peru           | 91  | 12,6% | 3,5% | 12,7% | 28,4% | 6,6%  | 27,4% |
| Phillipines    | 6   | 10,4% | 1,1% | 10,6% | 11,7% | 8,7%  | 10,9% |
| Poland         | 64  | 9,4%  | 1,6% | 9,6%  | 14,4% | 4,1%  | 17,2% |
| Portugal       | 58  | 10,4% | 1,8% | 10,9% | 12,6% | 4,9%  | 17,4% |
| Qatar          | 10  | 10,3% | 1,1% | 10,4% | 12,2% | 8,8%  | 10,9% |
| Romania        | 31  | 12,2% | 2,7% | 11,6% | 17,9% | 7,2%  | 22,1% |
| Russia         | 61  | 16,4% | 3,7% | 16,6% | 28,4% | 10,4% | 22,5% |
| Singapore      | 10  | 7,5%  | 1,4% | 7,8%  | 9,4%  | 5,3%  | 18,7% |
| Slovakia       | 9   | 9,1%  | 1,7% | 9,1%  | 11,4% | 6,7%  | 19,0% |
| Slovenia       | 16  | 11,2% | 3,2% | 10,7% | 17,2% | 8,1%  | 28,2% |
| South Africa   | 40  | 14,5% | 3,0% | 15,7% | 17,1% | 6,0%  | 20,6% |
| Sri Lanka      | 6   | 17,2% | 1,2% | 17,3% | 18,7% | 15,8% | 7,0%  |
| Sweden         | 58  | 8,9%  | 2,2% | 8,7%  | 14,6% | 5,1%  | 24,2% |
| Switzerland    | 43  | 8,0%  | 1,4% | 8,5%  | 9,5%  | 4,0%  | 17,7% |
| Taiwan         | 30  | 6,6%  | 1,3% | 6,7%  | 9,4%  | 3,6%  | 19,7% |
| Thailand       | 46  | 12,3% | 4,4% | 11,3% | 28,4% | 8,4%  | 35,5% |
| Turkey         | 54  | 18,0% | 4,3% | 18,8% | 28,4% | 3,6%  | 24,1% |
| United Kingdom | 89  | 7,5%  | 1,4% | 7,9%  | 9,4%  | 3,1%  | 18,9% |
| Uruguay        | 39  | 13,7% | 1,8% | 13,0% | 18,8% | 9,5%  | 13,4% |
| Venezuela      | 33  | 28,5% | 3,2% | 29,7% | 32,3% | 18,5% | 11,2% |

## 2. Distribution of the answers for the USA

Figure 2. Answers for USA. RF, and Market Risk Premium (MRP) and Km used in 2018



### 3. Changes from 2015 to 2017, and to 2018

In this section, we compare the results of 2018 with the results of similar surveys published in 2015 (see <https://ssrn.com/abstract=2598104>) and 2017 (<https://ssrn.com/abstract=2954142>).

**Table 5. Market Risk Premium (MRP), Risk Free Rate (RF) and Km  
 Averages of the surveys of 2018, 2017 and 2015**

|                | Average 2018 |       |       | Average 2017 |       |       | Average 2015 |       |       |
|----------------|--------------|-------|-------|--------------|-------|-------|--------------|-------|-------|
|                | Km           | RF    | MRP   | Km           | RF    | MRP   | Km           | RF    | MRP   |
| USA            | 8,2%         | 2,8%  | 5,4%  | 8,2%         | 2,5%  | 5,7%  | 7,9%         | 2,4%  | 5,5%  |
| Spain          | 8,8%         | 2,1%  | 6,7%  | 8,8%         | 2,2%  | 6,6%  | 8,1%         | 2,2%  | 5,9%  |
| Germany        | 6,7%         | 1,4%  | 5,3%  | 7,2%         | 1,4%  | 5,7%  | 6,6%         | 1,3%  | 5,3%  |
| France         | 7,4%         | 1,6%  | 5,9%  | 8,3%         | 1,8%  | 6,5%  | 7,2%         | 1,5%  | 5,6%  |
| United Kingdom | 7,5%         | 2,0%  | 5,5%  | 8,1%         | 2,2%  | 5,9%  | 7,2%         | 2,1%  | 5,2%  |
| Italy          | 8,4%         | 2,3%  | 6,1%  | 9,0%         | 2,6%  | 6,4%  | 7,0%         | 1,5%  | 5,4%  |
| Canada         | 8,7%         | 2,9%  | 5,8%  | 9,0%         | 3,0%  | 6,0%  | 8,3%         | 2,3%  | 5,9%  |
| Portugal       | 10,4%        | 3,2%  | 7,2%  | 11,1%        | 3,5%  | 7,6%  | 7,3%         | 1,6%  | 5,7%  |
| Switzerland    | 8,0%         | 1,1%  | 6,9%  | 8,4%         | 1,3%  | 7,1%  | 6,5%         | 1,1%  | 5,4%  |
| Belgium        | 7,8%         | 1,6%  | 6,2%  | 8,1%         | 1,7%  | 6,4%  | 6,7%         | 1,3%  | 5,5%  |
| Sweden         | 8,9%         | 1,8%  | 7,1%  | 8,5%         | 1,7%  | 6,8%  | 6,5%         | 1,1%  | 5,4%  |
| Denmark        | 7,6%         | 1,6%  | 6,0%  | 7,6%         | 1,6%  | 6,1%  | 6,8%         | 1,3%  | 5,5%  |
| Finland        | 7,6%         | 1,7%  | 5,9%  | 7,6%         | 1,7%  | 5,9%  | 6,9%         | 1,2%  | 5,7%  |
| Japan          | 6,0%         | 0,3%  | 5,7%  | 6,3%         | 0,3%  | 6,0%  | 6,6%         | 0,7%  | 5,8%  |
| Norway         | 8,1%         | 2,4%  | 5,7%  | 8,4%         | 2,3%  | 6,1%  | 6,8%         | 1,4%  | 5,5%  |
| Brazil         | 15,7%        | 7,3%  | 8,4%  | 18,0%        | 9,0%  | 9,0%  | 16,5%        | 9,0%  | 7,5%  |
| Ireland        | 8,2%         | 1,6%  | 6,5%  | 8,4%         | 1,7%  | 6,7%  | 6,7%         | 1,3%  | 5,5%  |
| China          | 10,1%        | 3,8%  | 6,3%  | 10,8%        | 3,3%  | 7,5%  | 12,6%        | 4,5%  | 8,1%  |
| Mexico         | 15,3%        | 6,8%  | 8,5%  | 16,0%        | 6,7%  | 9,3%  | 12,2%        | 4,3%  | 8,0%  |
| Russia         | 16,4%        | 7,8%  | 8,7%  | 16,5%        | 8,7%  | 7,7%  | 17,1%        | 7,4%  | 9,7%  |
| India          | 14,7%        | 6,8%  | 7,9%  | 15,0%        | 6,5%  | 8,5%  | 15,8%        | 7,4%  | 8,4%  |
| South Africa   | 14,5%        | 7,6%  | 6,9%  | 15,0%        | 7,5%  | 7,5%  | 15,9%        | 8,2%  | 7,7%  |
| Australia      | 9,7%         | 3,1%  | 6,6%  | 10,3%        | 3,0%  | 7,3%  | 9,2%         | 3,1%  | 6,0%  |
| Chile          | 10,2%        | 4,1%  | 6,1%  | 10,8%        | 4,5%  | 6,2%  | 10,4%        | 3,9%  | 6,5%  |
| Uruguay        | 13,7%        | 5,3%  | 8,3%  | 12,5%        | 4,5%  | 8,0%  | 10,6%        | 3,6%  | 7,1%  |
| Poland         | 9,4%         | 3,4%  | 6,0%  | 9,8%         | 3,4%  | 6,4%  | 7,9%         | 2,7%  | 5,2%  |
| Peru           | 12,6%        | 5,3%  | 7,3%  | 13,0%        | 5,5%  | 7,6%  | 11,2%        | 4,0%  | 7,2%  |
| Czech Republic | 8,5%         | 2,6%  | 5,9%  | 8,7%         | 2,5%  | 6,2%  | 7,4%         | 1,8%  | 5,6%  |
| Indonesia      | 15,6%        | 6,8%  | 8,8%  | 16,1%        | 7,2%  | 8,9%  | 16,4%        | 7,5%  | 8,9%  |
| Israel         | 7,7%         | 1,9%  | 5,8%  | 8,4%         | 1,9%  | 6,5%  | 6,1%         | 0,9%  | 5,2%  |
| Korea (South)  | 8,8%         | 2,4%  | 6,4%  | 9,0%         | 2,4%  | 6,6%  | 8,5%         | 2,3%  | 6,2%  |
| Netherlands    | 7,4%         | 1,7%  | 5,8%  | 7,7%         | 1,7%  | 6,0%  | 7,6%         | 1,8%  | 5,9%  |
| New Zealand    | 8,9%         | 3,1%  | 5,8%  | 8,5%         | 2,9%  | 5,6%  | 9,5%         | 2,9%  | 6,6%  |
| Thailand       | 12,3%        | 3,5%  | 8,9%  | 11,2%        | 3,0%  | 8,2%  | 16,0%        | 8,7%  | 7,3%  |
| Turkey         | 18,0%        | 10,3% | 7,7%  | 18,5%        | 10,5% | 8,0%  | 17,2%        | 7,8%  | 9,3%  |
| Austria        | 8,2%         | 2,0%  | 6,2%  | 8,0%         | 1,6%  | 6,4%  | 8,4%         | 2,8%  | 5,7%  |
| Greece         | 20,6%        | 4,8%  | 15,8% | 20,9%        | 4,8%  | 16,2% | 29,3%        | 15,0% | 14,3% |
| Colombia       | 15,4%        | 6,7%  | 8,7%  | 14,1%        | 6,6%  | 7,6%  | 12,1%        | 3,8%  | 8,3%  |
| Hungary        | 11,4%        | 3,6%  | 7,9%  | 12,0%        | 3,6%  | 8,4%  | 9,5%         | 0,6%  | 8,8%  |
| Venezuela      | 28,5%        | 11,7% | 16,9% | 28,9%        | 11,5% | 17,4% | 23,1%        | 3,5%  | 19,6% |
| Argentina      | 23,1%        | 9,3%  | 13,9% | 26,7%        | 10,5% | 16,3% | 35,5%        | 12,6% | 22,9% |



#### 4. Previous surveys

**Previous surveys. Market risk premium used**

|      |   |
|------|---|
| 2008 | <a href="http://ssrn.com/abstract=1344209">http://ssrn.com/abstract=1344209</a>   |
| 2010 | <a href="http://ssrn.com/abstract=1606563">http://ssrn.com/abstract=1606563</a> ; <a href="http://ssrn.com/abstract=1609563">http://ssrn.com/abstract=1609563</a> |
| 2011 | <a href="http://ssrn.com/abstract=1822182">http://ssrn.com/abstract=1822182</a> ; <a href="http://ssrn.com/abstract=1805852">http://ssrn.com/abstract=1805852</a> |
| 2012 | <a href="http://ssrn.com/abstract=2084213">http://ssrn.com/abstract=2084213</a>   |
| 2013 | <a href="http://ssrn.com/abstract=914160">http://ssrn.com/abstract=914160</a>   |
| 2014 | <a href="http://ssrn.com/abstract=1609563">http://ssrn.com/abstract=1609563</a>   |
| 2015 | <a href="https://ssrn.com/abstract=2598104">https://ssrn.com/abstract=2598104</a>   |
| 2016 | <a href="https://ssrn.com/abstract=2776636">https://ssrn.com/abstract=2776636</a>   |
| 2017 | <a href="https://ssrn.com/abstract=2954142">https://ssrn.com/abstract=2954142</a>   |

Welch (2000) performed two surveys with finance professors in 1997 and 1998, asking them what they thought the Expected MRP would be over the next 30 years. He obtained 226 replies, ranging from 1% to 15%, with an average arithmetic EEP of 7% above T-Bonds.<sup>2</sup> Welch (2001) presented the results of a survey of 510 finance and economics professors performed in August 2001 and the consensus for the 30-year arithmetic EEP was 5.5%, much lower than just 3 years earlier. In an update published in 2008 Welch reports that the MRP “used in class” in December 2007 by about 400 finance professors was on average 5.89%, and 90% of the professors used equity premiums between 4% and 8.5%.

Johnson et al (2007) report the results of a survey of 116 finance professors in North America done in March 2007: 90% of the professors believed the Expected MRP during the next 30 years to range from 3% to 7%.

Graham and Harvey (2007) indicate that U.S. CFOs reduced their average EEP from 4.65% in September 2000 to 2.93% by September 2006 (st. dev. of the 465 responses = 2.47%). In the 2008 survey, they report an average EEP of 3.80%, ranging from 3.1% to 11.5% at the tenth percentile at each end of the spectrum. They show that average EEP changes through time. Goldman Sachs (O'Neill, Wilson and Masih 2002) conducted a survey of its global clients in July 2002 and the average long-run EEP was 3.9%, with most responses between 3.5% and 4.5%.

Ilmanen (2003) argues that surveys tend to be optimistic: “*survey-based expected returns may tell us more about hoped-for returns than about required returns*”. Damodaran (2008) points out that “*the risk premiums in academic surveys indicate how far removed most academics are from the real world of valuation and corporate finance and how much of their own thinking is framed by the historical risk premiums... The risk premiums that are presented in classroom settings are not only much higher than the risk premiums in practice but also contradict other academic research*”.

Table 4 of Fernandez et al (2011a) shows the evolution of the Market Risk Premium used for the USA in 2011, 2010, 2009 and 2008 according to previous surveys (Fernandez et al, 2009, 2010a and 2010b).

**Table 6. Comparison of previous surveys**

|                       | Surveys of Ivo Welch |                |               |               |                   | Fernandez et al (2009, 2010) |                |            |                |
|-----------------------|----------------------|----------------|---------------|---------------|-------------------|------------------------------|----------------|------------|----------------|
|                       | Oct 97–<br>Feb 98*   | Jan-May<br>99* | Sep<br>2001** | Dec.<br>2007# | January<br>2009** | US<br>2008                   | Europe<br>2008 | US<br>2009 | Europe<br>2009 |
| Number of answers     | 226                  | 112            | 510           | 360           | 143               | 487                          | 224            | 462        | 194            |
| <b>Average</b>        | <b>7.2</b>           | <b>6.8</b>     | <b>4.7</b>    | <b>5.96</b>   | <b>6.2</b>        | <b>6.3</b>                   | <b>5.3</b>     | <b>6.0</b> | <b>5.3</b>     |
| <b>Std. Deviation</b> | <b>2.0</b>           | <b>2.0</b>     | <b>2.2</b>    | <b>1.7</b>    | <b>1.7</b>        | <b>2.2</b>                   | <b>1.5</b>     | <b>1.7</b> | <b>1.7</b>     |
| Max                   | 15                   | 15             | 20            | 20            |                   | 19.0                         | 10.0           | 12.0       | 12.0           |
| Q3                    | 8.4                  | 8              | 6             | 7.0           | 7                 | 7.2                          | 6.0            | 7.0        | 6.0            |
| Median                | 7                    | 7              | 4.5           | 6.0           | 6                 | 6.0                          | 5.0            | 6.0        | 5.0            |
| Q1                    | 6                    | 5              | 3             | 5.0           | 5                 | 5.0                          | 4.1            | 5.0        | 5.3            |
| Min                   | 1.5                  | 1.5            | 0             | 2             |                   | 0.8                          | 1.0            | 2.0        | 2.0            |

\* 30-Year Forecast. Welch (2000) First survey

+ 30-Year Forecast. Welch (2000) Second survey

<sup>2</sup> At that time, the most recent Ibbotson Associates Yearbook reported an arithmetic HEP versus T-bills of 8.9% (1926–1997).

- \*\* 30 year Equity Premium Forecast (Geometric). "The Equity Premium Consensus Forecast Revisited" (2001)  
 # 30-Year Geo Eq Prem Used in class. Welch, I. (2008), "The Consensus Estimate for the Equity Premium by Academic Financial Economists in December 2007". <http://ssrn.com/abstract=1084918>  
 ++ In your classes, what is the main number you are recommending for long-term CAPM purposes? "Short Academic Equity Premium Survey for January 2009". <http://welch.econ.brown.edu/academics/equpdate-results2009.html>

**Table 7. Estimates of the EEP (Expected Equity Premium) according to other surveys**

| Authors                                | Conclusion about EEP                        | Respondents             |
|--|---|-------------------------|
| <i>Pensions and Investments</i> (1998) | 3%  | Institutional investors |
| Graham and Harvey (2007)               | Sep. 2000. Mean: 4.65%. Std. Dev. = 2.7%    | CFOs                    |
| Graham and Harvey (2007)               | Sep. 2006. Mean: 2.93%. Std. Dev. = 2.47%   | CFOs                    |
| Welch update                           | December 2007. Mean: 5.69%. Range 2% to 12% | Finance professors      |
| O'Neill, Wilson and Masih (2002)       | 3.9%  | Global clients Goldman  |

The magazine *Pensions and Investments* (12/1/1998) carried out a survey among professionals working for institutional investors: the average EEP was 3%. Shiller<sup>3</sup> publishes and updates an index of investor sentiment since the crash of 1987. While neither survey provides a direct measure of the equity risk premium, they yield a broad measure of where investors or professors expect stock prices to go in the near future. The 2004 survey of the Securities Industry Association (SIA) found that the median EEP of 1500 U.S. investors was about 8.3%. Merrill Lynch surveys more than 300 institutional investors globally in July 2008: the average EEP was 3.5%.

A main difference of this survey with previous ones is that this survey asks about the **Required MRP**, while most surveys are interested in the **Expected MRP**.

## 5. Expected and Required Equity Premium: different concepts

Fernandez and F. Acín (2015) claim and show that Expected Return and Required Return are two very different concepts. Fernandez (2007, 2009b) claims that the term "equity premium" is used to designate four different concepts:

1. **Historical** equity premium (HEP): historical differential return of the stock market over treasuries.
2. **Expected** equity premium (EEP): expected differential return of the stock market over treasuries.
3. **Required** equity premium (REP): incremental return of a diversified portfolio (the market) over the risk-free rate required by an investor. It is used for calculating the required return to equity.
4. **Implied** equity premium (IEP): the required equity premium that arises from assuming that the market price is correct.

The four concepts (HEP, REP, EEP and IEP) designate different realities. The **HEP** is easy to calculate and is equal for all investors, provided they use the same time frame, the same market index, the same risk-free instrument and the same average (arithmetic or geometric). But the **EEP**, the **REP** and the **IEP** may be different for different investors and are not observable.

The **HEP** is the historical average differential return of the market portfolio over the risk-free debt. The most widely cited sources are Ibbotson Associates and Dimson *et al.* (2007).

Numerous papers and books assert or imply that there is a "market" EEP. However, it is obvious that investors and professors do not share "homogeneous expectations" and have different assessments of the **EEP**. As Brealey *et al.* (2005, page 154) affirm, "Do not trust anyone who claims to know what returns investors expect".

The **REP** is the answer to the following question: What incremental return do I require for investing in a diversified portfolio of shares over the risk-free rate? It is a crucial parameter because the **REP** is the key to determining the company's required return to equity and the WACC. Different companies may use, and in fact do use, different **REPs**.

<sup>3</sup> See <http://icf.som.yale.edu/Confidence.Index>



The IEP is the implicit REP used in the valuation of a stock (or market index) that matches the current market price. The most widely used model to calculate the IEP is the dividend discount model: the current price per share ( $P_0$ ) is the present value of expected dividends discounted at the required rate of return ( $K_e$ ). If  $d_1$  is the dividend per share expected to be received in year 1, and  $g$  the expected long term growth rate in dividends per share,

$$P_0 = d_1 / (K_e - g), \text{ which implies: } IEP = d_1 / P_0 + g - R_f \quad (1)$$

The estimates of the IEP depend on the particular assumption made for the expected growth ( $g$ ). Even if market prices are correct for all investors, there is not an IEP common for all investors: there are many pairs (IEP,  $g$ ) that accomplish equation (1). Even if equation (1) holds for every investor, there are many *required* returns (as many as expected growths,  $g$ ) in the market. Many papers in the financial literature report different estimates of the IEP with great dispersion, as for example, Claus and Thomas (2001, IEP = 3%), Harris and Marston (2001, IEP = 7.14%) and Ritter and Warr (2002, IEP = 12% in 1980 and -2% in 1999). There is no a common IEP for all investors.

For a particular investor, the EEP is not necessary equal to the REP (unless he considers that the market price is equal to the value of the shares). Obviously, an investor will hold a diversified portfolio of shares if his EEP is higher (or equal) than his REP and will not hold it otherwise.

We can find out the REP and the EEP of an investor by asking him, although for many investors the REP is not an explicit parameter but, rather, it is implicit in the price they are prepared to pay for the shares. However, it is not possible to determine the REP for the market as a whole, because it does not exist: even if we knew the REPs of all the investors in the market, it would be meaningless to talk of a REP for the market as a whole. There is a distribution of REPs and we can only say that some percentage of investors have REPs contained in a range. The average of that distribution cannot be interpreted as the REP of the market nor as the REP of a representative investor.

Much confusion arises from not distinguishing among the four concepts that the phrase *equity premium* designates: Historical equity premium, Expected equity premium, Required equity premium and Implied equity premium. 129 of the books reviewed by Fernandez (2009b) identify Expected and Required equity premium and 82 books identify Expected and Historical equity premium.

Finance textbooks should clarify the MRP by incorporating distinguishing definitions of the four different concepts and conveying a clearer message about their sensible magnitudes.

## 6. Conclusion

Most previous surveys have been interested in the Expected MRP, but this survey asks about the Required MRP.

This paper contains the statistics of a survey about the Risk-Free Rate ( $R_f$ ) and of the Market Risk Premium (MRP) used in 2018 for **59 countries**. We got answers for 73 countries, but we only report the results for 59 countries with more than 5 answers.

The average ( $R_f$ ) used in 2018 was smaller than the one used in 2015 in 14 countries.

The change between 2015 and 2018 of the average Market risk premium used was higher than 1% for 12 countries. The change between 2015 and 2018 of the average  $K_m$  used was higher than 1% for 22 countries (see table 5).

Most of the respondents use for European countries a Risk-Free Rate ( $R_f$ ) higher than the yield of the 10-year Government bonds.

This survey links with the *Equity Premium Puzzle*: Fernandez et al (2009), argue that the equity premium puzzle may be explained by the fact that many market participants (equity investors, investment banks, analysts, companies...) do not use standard theory (such as a standard representative consumer asset pricing model...) for determining their Required Equity Premium, but rather, they use historical data and advice from textbooks and finance professors. Consequently, ex-ante equity premia have been high, market prices have been consistently undervalued, and the ex-post risk premia has been also high. Many investors use historical data and textbook prescriptions to estimate the required and the expected equity premium, the undervaluation and the high ex-post risk premium are self fulfilling prophecies.

## EXHIBIT 1. Mail sent on March 2018

### Survey Market Risk Premium and Risk-Free Rate 2018

We are doing a survey about the **Market Risk Premium** (MRP or Equity Premium) and **Risk-Free Rate** that companies, analysts, regulators and professors use to calculate the **required return on equity** in different countries.

I would be grateful if you would kindly answer the following 2 questions. No companies, individuals or universities will be identified, and only aggregate data will be made public. I will send you the results in a month.

Best regards and thanks,

*Pablo Fernandez. Professor of Finance. IESE Business School. Spain.*

#### 2 questions:

1. The Market Risk Premium that I am using in 2018

for USA is: \_\_\_\_\_ %

for Germany is: \_\_\_\_\_ %

for \_\_\_\_\_ is: \_\_\_\_\_ %

for \_\_\_\_\_ is: \_\_\_\_\_ %

2. The Risk-Free rate that I am using in 2018

for USA is: \_\_\_\_\_ %

for Germany is: \_\_\_\_\_ %

for \_\_\_\_\_ is: \_\_\_\_\_ %

for \_\_\_\_\_ is: \_\_\_\_\_ %

## EXHIBIT 2. Some comments and webs recommended by respondents

**Equity premium:** [http://pages.stern.nyu.edu/~adamodar/New\\_Home\\_Page/datafile/ctryprem.html](http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html)

<http://www.market-risk-premia.com/market-risk-premia.html>

<http://www.marktrisikoprämie.de/marktrisikopraemien.html>

**US risk free rate:** <http://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yieldYear&year=2015>

**risk free rate:** <http://www.basiszinskurve.de/basiszinssatz-gemaess-idw.html>

<http://www.econ.yale.edu/~shiller/>

<http://www.cfosurvey.org/pastresults.htm>

<http://alephblog.com/>

The risk free rate are determined on the historical present value-equivalent base interest rates on the basis of a series of payments increasing with the selected growth rate over a period of 1,000 years. For the calculations, the spot rate from year 30 to year 1,000 is updated constantly based upon the valuation date.

#### Germany

Risk free rate  
 Adjustment

0.9% 20 y Bund  
 1.8% Credit Suisse

[Investing.com/rates-bonds/germany-20-year-bond-yield](http://Investing.com/rates-bonds/germany-20-year-bond-yield) (1-1-2018)  
 Credit Suisse Global Investment Source book and Yield book 2016 – Range of estimated long term real rate government bonds 1900-2015 - globally diversified

Risk free rate Adjusted

2.7%

I don't use the market risk premium. I use a hurdle rate of return and won't invest in investments that don't achieve that hurdle. I aspire to a 25% rate of return on my investments but will generally settle for 15%.

I use the relevant rate from each country/currency "risk-free" yield curve to discount the respective expected future cash flow:  $V_0 = CF_1 / (1 + Rf_1 + risk\ prem)^1 + CF_2 / (1 + Rf_2 + risk\ prem)^2 + \dots + CF_t / (1 + Rf_t + risk\ prem)^t$

The Risk-Free rate that I am using in 2018 for USA is: 10 year historical average from date of valuation, US Treasuries 20-year notes.

I use the US Equity premium of Damodaran to avoid explanations or justifications to clients.

We only use ROS (Return on Sales).

Rf: 3%, of which 2% is a premium for the risk of manipulation of the interest rate market operated by the ECB with the Quantitative Easing.



Al tener limitación nacional al hacer inversiones, debemos emplear un tipo de interés sin riesgo alto. Al operar en mercados muy consolidados, con pocos operadores y con fuertes barreras de entrada, la prima de riesgo de mercado es muy alta.

Utilizamos la tasa de las LEBAC como tasa de descuento para proyectos locales

Cuando analizamos el mercado de capitales, por ejemplo el Merval en 2017 fue record mundial con una rentabilidad del 78% en pesos (con máximos de algunas acciones de 446 %), con una inflación del 25% y el dólar el 17%, ¿qué referencia tomar? Los agentes de bolsa y grandes inversores pueden tomar esta tasa, pero la mayoría de los inversores toma como referencia las LEBAC. Se estima para el 2018 una expansión del Merval del 14 % en dólares y un 32 % en pesos, siguiendo la tendencia del 2017.

Como la economía argentina está dolarizada, el pequeño inversor va derecho al dólar, por lo que nosotros cuando proponemos una Prima tenemos la opción de dolarizar, para no intervenir con la Tasa de Inflación y generar más ruido (en la industria toman el dólar como parámetro, si suben los costos, mantienen sus márgenes de ganancia, y se traslada a toda la cadena), en ese caso tomamos la tasa en dólares + riesgo país (CAPM), se va 1 o 2 puntos más que las LEBAC, aunque coincido con ustedes q no es lo ideal, por lo menos en nuestra economía.

En función de todo esto:

LEBACS (Títulos de cuenta a corto plazo licitadas x el Bco. Central): 26.75 % (son las tasas más altas del mercado, con riesgo cero jiji), con todo lo que esto significa para la Argentina)

Plazo Fijo Banco Nacion: 19.00 % (son las tasas más bajas del mercado, con riesgo cero)

Plazo Fijo Banco Nacion En Dolares: 19.75 % (en Sucursal) y 23.76 % (electrónico)

PRIMA DE RIESGO PAIS: 4.18 % (Puntos Básicos)

Negociación De Cheques Pago Diferido (CNV): 26,00 % (Tasa Promedio Según El Mercado Argentino De Valores S.A.)

En anteriores encuestas intenté ofrecer un tipo orientativo pero estos últimos años, después de la "experimentación" de tipos, de diferentes QE con tipos negativos... sólo tengo una certeza, que ya hemos comentado en muchas ocasiones: es muy difícil, o de dudosa utilidad, establecer un tipo de interés sin riesgo. Porque ¿Es normal que la Deuda Griega pague menos que la Deuda de USA? ¿Emisiones de Deuda del gobierno argentino a periodos larguísimo? ¿Deuda alemana o suiza en tipos negativos?...

Respecto a establecer una tasa que sirva como referencia, mantendría dos premisas: 1) El horizonte de inversión (una Tasa de referencia con el mismo plazo); 2) La seguridad en las estimaciones de los flujos de caja futuros del proyecto o inversión: en caso de menor confianza o duda en las estimaciones, mayor tasa de Descuento

Como norma, siempre tenemos en cuenta que la Renta variable ha sido en periodos muy largos el activo más rentable y, por tanto, a muy largo plazo es el Activo de "Menor riesgo"

Fascinating results. It is always interesting how investors and fund managers interpret the risk free rate of countries who have a negative prevailing long-term bond rate.

I am sure you that you are analysing the data and asking more questions that data can answer. It's time to improve theory! I hope you will advance on it.

In my DCF valuation I use a global perspective of the marginal investor hence a global MRP.

I match rf with currency/inflation of cash flows being discounted and do not rely too much on current interest rates due to imperfections in the market. The MRP is made consistent with the level of interest rate I use in my model  $(E(R_m) - R_f)$  end end up with 6%

For equities we use a 10% as a cost of opportunity independently of the level of interest.

Rf: average last 5-year 10 year Treasury

I would like to help you with these two questions, but the problem is that in no any literature sources or analytical reports I met the calculation of Market Risk Premium and Risk Free rate for Uzbekistan.

The risk free rate that I use depends upon the timing of the future cash flows. I refer to the interest rate swap market and the US treasury market for starters. These days, one has to bear in mind currency volatility as that has a bigger effect on PV than market cost-of-capital.

We use the same Market Risk Premium for any country: 5,75% (source: Damodaran). Only Rf changes.

I am happy that you are asking the second question, because it accounts for what I consider to be a historical anomaly in the reply to the first question. I've concluded that the ERP was recently 3-4 percent. But I think US monetary policy (the various "QE" programs) have in the past couple of years distorted the traditional relationship between expected total market returns and the risk free rate. QE has been driving the US Treasury rate down, while the expected total market return has held steady, leading to a larger than usual market risk premium. This higher market risk premium is not a sign of higher market equity risk, but of the perverse impact of aggressive monetary policy.

For the US in 2015: MRP: 14% (as US equities are even more highly priced than last year).

Interest rates are artificially well below historic levels. Thus, bonds and equities values are artificially inflated.

I do not use "canned" rates applicable for a whole year. The rates I use are time-specific and case-specific, depending on conditions prevailing as of the valuation date.

I must confess I am still surprised with the rates suggested that are at the upper bound of respondent answers.

One hint: It might make sense to ask more precisely about the premium before/after personal income tax. For Germany the premium would differ and I am not sure how people would interpret the question.

The Risk-Free Rate we use is based on rates published by the Federal Reserve. We use the 20 year rate, currently 2.73%. The Equity Risk Premium we use is based on Duff & Phelps Annual Valuation Handbook.

For foreign countries, I generally look at it in dollar terms and assume that purchasing power parity held; hence, I'd use US rates. If I had to do it in a foreign currency, I would use the local 10-year treasury for the risk-free rate. I would use the US equity risk premium, adjust for inflation to real terms, and then adjust for foreign inflation to put it in local nominal terms.

USA. MRP 6.4% - essentially bloomberg/ibbotson number. RF 10 year U.S. treasury yield.

Exijo un mínimo de un 15% de retorno neto de impuestos a cualquier acción, independientemente de su nacionalidad.

No creo que exista un activo libre de riesgo en absoluto. Y menos en estos distorsionados entornos debido a la intervención de los bancos centrales. En mi modesta opinión, creo que nunca sido tan riesgosa la renta fija como lo es ahora.

No creo especialmente en el modelo de CAPM y prefiero usar una cifra basada en el sentido común.

En Uruguay la práctica más aceptada es descontar flujos convertidos a USD dada la debilidad de la moneda local y dolarización de la economía.

Exigimos una rentabilidad de fondos propios del 8% (que puede variar según la posibilidad percibida de adjudicación o las ganas de ser competitivos). Pero cuál el tipo libre de riesgo que los financieros consideran, no lo sé.

### Exhibit 3. Coefficient of variation (standard deviation / average) of Km, MRP and Rf

|                | Km      |          | MRP     |          | RF      |          | CV = St. Dev. / Average |     |      |
|----------------|---------|----------|---------|----------|---------|----------|-------------------------|-----|------|
|                | Average | St. Dev. | Average | St. Dev. | Average | St. Dev. | Km                      | MRP | RF   |
| USA            | 8,2%    | 2,0%     | 5,4%    | 1,7%     | 2,8%    | 0,8%     | 24%                     | 32% | 30%  |
| Spain          | 8,8%    | 2,5%     | 6,7%    | 2,4%     | 2,1%    | 1,1%     | 28%                     | 36% | 52%  |
| Germany        | 6,7%    | 1,9%     | 5,3%    | 1,7%     | 1,4%    | 1,0%     | 28%                     | 32% | 68%  |
| Japan          | 6,0%    | 2,0%     | 5,7%    | 2,6%     | 0,3%    | 0,8%     | 34%                     | 45% | 231% |
| Taiwan         | 6,6%    | 1,3%     | 4,9%    | 1,5%     | 1,7%    | 0,8%     | 20%                     | 31% | 48%  |
| Estonia        | 7,2%    | 0,8%     | 5,1%    | 1,0%     | 2,1%    | 0,9%     | 11%                     | 20% | 44%  |
| France         | 7,4%    | 1,9%     | 5,9%    | 1,6%     | 1,6%    | 0,7%     | 25%                     | 27% | 42%  |
| Netherlands    | 7,4%    | 1,1%     | 5,8%    | 0,7%     | 1,7%    | 0,9%     | 15%                     | 12% | 56%  |
| Singapore      | 7,5%    | 1,4%     | 5,2%    | 1,5%     | 2,3%    | 0,3%     | 19%                     | 29% | 12%  |
| United Kingdom | 7,5%    | 1,4%     | 5,5%    | 1,1%     | 2,0%    | 0,5%     | 19%                     | 21% | 25%  |
| Denmark        | 7,6%    | 1,0%     | 6,0%    | 0,8%     | 1,6%    | 0,5%     | 13%                     | 13% | 30%  |
| Finland        | 7,6%    | 1,0%     | 5,9%    | 0,8%     | 1,7%    | 0,6%     | 13%                     | 13% | 33%  |
| Israel         | 7,7%    | 1,7%     | 5,8%    | 1,3%     | 1,9%    | 0,7%     | 22%                     | 22% | 40%  |
| Belgium        | 7,8%    | 1,1%     | 6,2%    | 0,8%     | 1,6%    | 0,4%     | 14%                     | 13% | 27%  |
| Hong Kong      | 8,0%    | 0,7%     | 5,8%    | 1,0%     | 2,2%    | 0,6%     | 9%                      | 17% | 26%  |
| Switzerland    | 8,0%    | 1,4%     | 6,9%    | 1,0%     | 1,1%    | 0,5%     | 18%                     | 14% | 46%  |
| Norway         | 8,1%    | 1,1%     | 5,7%    | 0,9%     | 2,4%    | 0,7%     | 13%                     | 15% | 29%  |
| Ireland        | 8,2%    | 1,0%     | 6,5%    | 0,6%     | 1,6%    | 0,4%     | 12%                     | 10% | 25%  |
| Austria        | 8,2%    | 1,3%     | 6,2%    | 0,7%     | 2,0%    | 1,1%     | 16%                     | 10% | 54%  |
| Italy          | 8,4%    | 1,5%     | 6,1%    | 1,2%     | 2,3%    | 0,5%     | 18%                     | 20% | 21%  |
| Czech Republic | 8,5%    | 1,0%     | 5,9%    | 0,7%     | 2,6%    | 0,6%     | 12%                     | 12% | 21%  |
| Canada         | 8,7%    | 1,1%     | 5,8%    | 0,7%     | 2,9%    | 0,5%     | 12%                     | 13% | 18%  |
| Korea (South)  | 8,8%    | 1,2%     | 6,4%    | 1,0%     | 2,4%    | 0,3%     | 13%                     | 16% | 14%  |
| New Zealand    | 8,9%    | 0,8%     | 5,8%    | 0,9%     | 3,1%    | 0,4%     | 9%                      | 15% | 12%  |



|              |       |       |       |       |       |      |     |      |     |
|--------------|-------|-------|-------|-------|-------|------|-----|------|-----|
| Sweden       | 8,9%  | 2,2%  | 7,1%  | 1,6%  | 1,8%  | 0,8% | 24% | 23%  | 42% |
| Slovakia     | 9,1%  | 1,7%  | 6,6%  | 1,1%  | 2,5%  | 0,8% | 19% | 17%  | 31% |
| Poland       | 9,4%  | 1,6%  | 6,0%  | 1,3%  | 3,4%  | 0,7% | 17% | 21%  | 20% |
| Bolivia      | 9,6%  | 1,8%  | 6,6%  | 2,9%  | 3,0%  | 1,1% | 19% | 43%  | 37% |
| Australia    | 9,7%  | 1,5%  | 6,6%  | 1,4%  | 3,1%  | 0,5% | 15% | 21%  | 15% |
| China        | 10,1% | 2,7%  | 6,3%  | 2,8%  | 3,8%  | 0,4% | 27% | 43%  | 12% |
| Chile        | 10,2% | 1,2%  | 6,1%  | 1,1%  | 4,1%  | 0,7% | 12% | 18%  | 16% |
| Bulgaria     | 10,3% | 1,2%  | 7,5%  | 1,3%  | 2,8%  | 1,2% | 12% | 17%  | 45% |
| Qatar        | 10,3% | 1,1%  | 6,9%  | 1,2%  | 3,4%  | 0,6% | 11% | 18%  | 18% |
| Portugal     | 10,4% | 1,8%  | 7,2%  | 1,2%  | 3,2%  | 0,9% | 17% | 17%  | 29% |
| Phillipines  | 10,4% | 1,1%  | 5,1%  | 2,4%  | 5,3%  | 1,4% | 11% | 47%  | 26% |
| Slovenia     | 11,2% | 3,2%  | 7,2%  | 0,8%  | 4,1%  | 2,6% | 28% | 12%  | 64% |
| Malaysia     | 11,3% | 0,8%  | 7,1%  | 1,5%  | 4,2%  | 1,0% | 7%  | 21%  | 25% |
| Hungary      | 11,4% | 1,5%  | 7,9%  | 1,2%  | 3,6%  | 0,9% | 14% | 16%  | 26% |
| Romania      | 12,2% | 2,7%  | 7,0%  | 1,8%  | 5,2%  | 1,7% | 22% | 26%  | 32% |
| Thailand     | 12,3% | 4,4%  | 8,9%  | 3,0%  | 3,5%  | 1,6% | 36% | 34%  | 46% |
| Panama       | 12,4% | 2,3%  | 8,4%  | 2,5%  | 4,0%  | 0,7% | 18% | 29%  | 17% |
| Ecuador      | 12,5% | 4,4%  | 9,0%  | 3,5%  | 3,6%  | 1,4% | 35% | 39%  | 39% |
| Peru         | 12,6% | 3,5%  | 7,3%  | 2,8%  | 5,3%  | 1,4% | 27% | 39%  | 26% |
| Uruguay      | 13,7% | 1,8%  | 8,3%  | 1,1%  | 5,3%  | 1,8% | 13% | 13%  | 33% |
| South Africa | 14,5% | 3,0%  | 6,9%  | 1,7%  | 7,6%  | 1,8% | 21% | 24%  | 23% |
| India        | 14,7% | 2,2%  | 7,9%  | 2,1%  | 6,8%  | 0,7% | 15% | 27%  | 10% |
| Mexico       | 15,3% | 3,7%  | 8,5%  | 3,5%  | 6,8%  | 1,3% | 24% | 40%  | 19% |
| Colombia     | 15,4% | 4,4%  | 8,7%  | 3,7%  | 6,7%  | 1,4% | 29% | 43%  | 21% |
| Indonesia    | 15,6% | 1,2%  | 8,8%  | 1,0%  | 6,8%  | 0,9% | 8%  | 12%  | 14% |
| Brazil       | 15,7% | 3,0%  | 8,4%  | 2,3%  | 7,3%  | 2,3% | 19% | 27%  | 32% |
| Russia       | 16,4% | 3,7%  | 8,7%  | 3,2%  | 7,8%  | 1,5% | 22% | 37%  | 20% |
| Sri Lanka    | 17,2% | 1,2%  | 8,0%  | 2,5%  | 9,2%  | 1,3% | 7%  | 31%  | 14% |
| Turkey       | 18,0% | 4,3%  | 7,7%  | 2,4%  | 10,3% | 2,8% | 24% | 31%  | 27% |
| Pakistan     | 18,2% | 3,0%  | 11,5% | 3,9%  | 6,7%  | 1,2% | 16% | 34%  | 18% |
| Greece       | 20,6% | 4,2%  | 15,8% | 3,1%  | 4,8%  | 1,6% | 20% | 20%  | 33% |
| Egypt        | 20,9% | 3,1%  | 10,9% | 4,5%  | 10,0% | 3,5% | 15% | 42%  | 35% |
| Argentina    | 23,1% | 6,8%  | 13,9% | 4,7%  | 9,3%  | 4,9% | 29% | 34%  | 53% |
| Venezuela    | 28,5% | 3,2%  | 16,9% | 3,0%  | 11,7% | 1,4% | 11% | 18%  | 12% |
| Iran         | 34,7% | 26,5% | 22,1% | 25,4% | 12,6% | 4,9% | 76% | 115% | 39% |

The coefficient of variation (CV = standard deviation / average) of RF is higher than the CV of MRP for 36 countries.

The coefficient of variation (CV = standard deviation / average) of Km is lower than the CV of MRP and the CV of RF for 35 countries.

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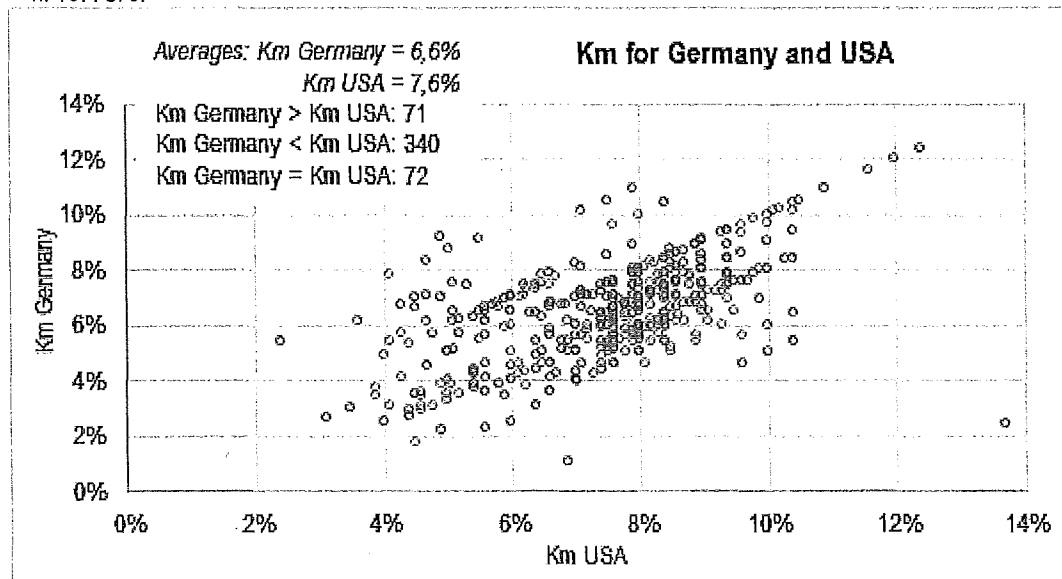
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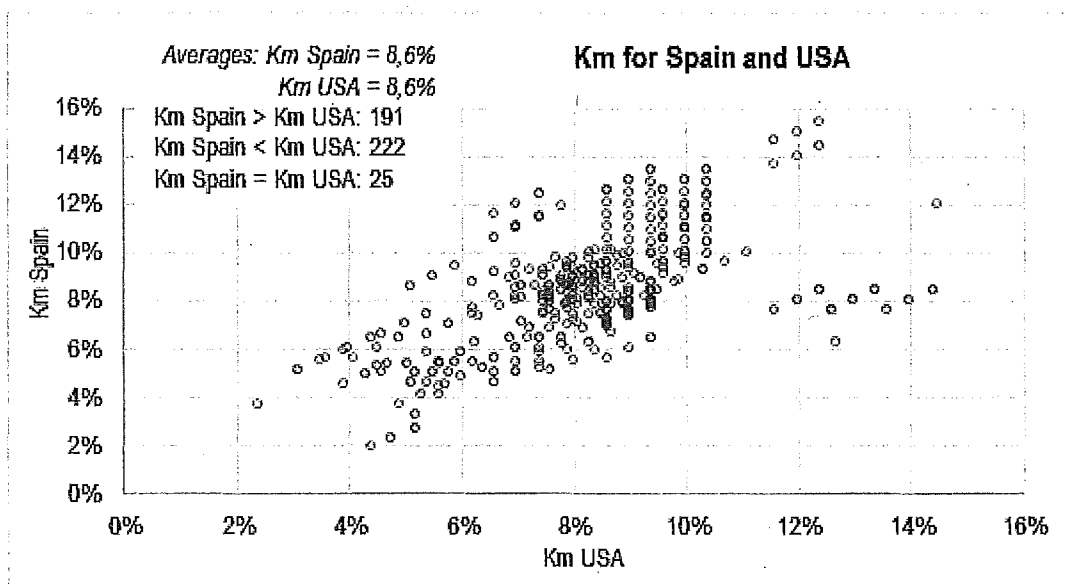
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**Duke CFO magazine Global Business Outlook survey - U.S. - Third Quarter, 2018**

**On August 20th, 2018 the annual yield on 10-yr treasury bonds was 2.83%. Please complete the following:**  
**(Winsorized)**

|  | Mean  | SD   | 95% CI        | Median | Minimum | Maximum | Total |
|--|-------|------|---------------|--------|---------|---------|-------|
| Over the next 10 years, I expect the average annual S&P 500 return will be: There is a 1-in-10 chance it will be less than:    | 1.23  | 4.89 | 0.60 - 1.87   | 2      | -11     | 12.32   | 227   |
| Over the next 10 years, I expect the average annual S&P 500 return will be: Expected return:                                   | 6.34  | 3.00 | 5.95 - 6.73   | 6      | -1.45   | 14.71   | 229   |
| Over the next 10 years, I expect the average annual S&P 500 return will be: There is a 1-in-10 chance it will be greater than: | 9.68  | 4.27 | 9.13 - 10.24  | 10     | 0       | 21.03   | 227   |
| Over the next year, I expect the average annual S&P 500 return will be: There is a 1-in-10 chance it will be less than:        | -1.76 | 7.61 | -2.75 - -0.77 | 0      | -18.10  | 13.43   | 227   |
| Over the next year, I expect the average annual S&P 500 return will be: Expected return:                                       | 6.15  | 3.66 | 5.68 - 6.62   | 6      | -2.10   | 14.56   | 229   |
| Over the next year, I expect the average annual S&P 500 return will be: There is a 1-in-10 chance it will be greater than:     | 10.86 | 5.47 | 10.15 - 11.57 | 10     | 0       | 23.27   | 227   |



CLIENT ALERT OCTOBER 30, 2017

# Duff & Phelps' U.S. Equity Risk Premium Recommendation Decreased from 5.5% to 5.0%, Effective September 5, 2017

## Executive Summary

The Equity Risk Premium ("ERP") changes over time. Fluctuations in global economic and financial conditions warrant periodic reassessments of the selected ERP and accompanying risk-free rate.

Based upon current market conditions, Duff & Phelps is decreasing its U.S. Equity Risk Premium recommendation from 5.5% to 5.0%. The 5.0% ERP guidance is to be used in conjunction with a normalized risk-free rate of 3.5% when developing discount rates as of September 5, 2017 and thereafter, until further guidance is issued. In summary:

- Equity Risk Premium: Decreased from 5.5% to 5.0%
- Risk-Free Rate: Reaffirmed at 3.5% (normalized)
- Base U.S. Cost of Equity Capital: 8.5% (5.0% + 3.5%)


## Background

The ERP is a key input used to calculate the cost of capital within the context of the Capital Asset Pricing Model ("CAPM") and other models. Duff & Phelps regularly reviews fluctuations in global economic and financial market conditions that warrant a periodic reassessment of the ERP.<sup>1</sup>

Based on current market conditions, we are decreasing the recommended U.S. ERP from 5.5% to 5.0% when developing discount rates as of September 5, 2017 and thereafter, until there is evidence indicating equity risk in financial markets has materially changed and new guidance is issued.

Duff & Phelps last changed its U.S. ERP recommendation on January 31, 2016.<sup>2</sup> On that date, our recommendation was increased to 5.5% (from 5.0%) in response to evidence in late 2015 and early 2016 that suggested an increased level of risk in financial markets. Later in the year, on November 15, 2016, Duff & Phelps reaffirmed its U.S. ERP recommendation of 5.5%, but lowered the accompanying normalized risk-free rate from 4.0% to 3.5%, supported by academic evidence of declining real interest rates and long-term growth potential for the U.S. economy.<sup>3</sup>



 Client Alert - Duff & Phelps' U.S. Equity Risk Premium Recommendation Decreased from 5.5% to 5.0%, Effective September 5, 2017

Towards the end of 2016 – particularly after the surprising win of the U.S. presidential elections by Mr. Trump – and the beginning of 2017, we saw some indications that equity risk in financial markets was declining. However, at that time, several economists and market analysts were questioning the record highs in stock markets and the extremely low levels of volatility, given the potential global turmoil that could be generated in 2017 by a variety of events and risk factors. Notably, uncertainty surrounding the new U.S. Administration's policies and global geopolitical risks associated with a rising populism and anti-globalization sentiment were reasons for concern, which could be exacerbated by the scheduled presidential and parliamentary elections in major countries in Europe (e.g., Netherlands, France, Germany) and other parts of the world, as well as the predicted official triggering of Brexit by the United Kingdom.<sup>4</sup> From a qualitative perspective, we deemed it prudent to adopt a "wait-and-see" approach to better assess the impact of the U.S. presidential election results and other geopolitical events in our estimate of the forward-looking ERP. As such, on December 31, 2016 we reaffirmed the Duff & Phelps U.S. ERP recommendation of 5.5%.<sup>5</sup> We are now revisiting our recommendation based on recent trends in economic indicators and financial market conditions.

## Overview of the Duff & Phelps' ERP Methodology

### A Two-Dimensional Process

There is no single universally accepted methodology for estimating the ERP; consequently, there is wide diversity in practice among academics and financial advisors regarding ERP estimates. For this reason, Duff & Phelps employs a two-dimensional process that considers a broad range of economic information and multiple ERP estimation methodologies to arrive at its recommendation.

First, a reasonable range of normal or unconditional ERP is established. Second, based on current economic conditions, we estimate where in the range the true ERP likely lies (top, bottom, or middle).

Long-term research indicates that the ERP is cyclical.<sup>6</sup> We use the term normal, or unconditional ERP to mean the long-term average ERP without regard to current market conditions. This concept differs from the conditional ERP, which reflects current economic conditions.<sup>7</sup> The "unconditional" ERP range versus a "conditional" ERP is further distinguished as follows:

#### "What is the range?"

- **Unconditional ERP Range** – The objective is to establish a reasonable range for a normal or unconditional ERP that can be expected over an entire business cycle. Based on an analysis of academic and financial literature and various empirical studies, we have concluded that a reasonable long-term estimate of the normal or unconditional ERP for the U.S. is in the range of 3.5% to 6.0%.<sup>8</sup>

#### "Where are we in the range?"

- **Conditional ERP** – The objective is to determine where within the unconditional ERP range the conditional ERP should be, based on current economic conditions. Research has shown that ERP fluctuates during the business cycle. When the economy is near (or in) a recession, the conditional ERP is at the higher end of the normal, or unconditional ERP range. As the economy improves, the conditional ERP moves back toward the middle of the range and at the peak of an economic expansion, the conditional ERP approaches the lower end of the range.

## Basis for Estimating the U.S. Equity Risk Premium as of September 5, 2017

### Conditional Equity Risk Premium

In estimating the conditional ERP, valuation analysts cannot simply use the long-term historical ERP without further analysis. There is ample academic evidence that equity risk premia are not constant over time. Professor John Cochrane (senior fellow at the Hoover Institution at Stanford University) has summarized the changes in our knowledge of estimating rates of return for equity over the last 40 years, while emphasizing the need to adjust our valuation procedures and methodologies accordingly:<sup>9</sup>

*"Discount rates vary a lot more than we thought. Most of the puzzles and anomalies that we face amount to discount-rate variation we do not understand. Our theoretical controversies are about how discount rates are formed. We need to recognize and incorporate discount-rate variation in applied procedures."*

Duff & Phelps goes beyond historical measures of ERP by examining approaches that are sensitive to the current economic and financial market conditions. In Exhibit 1, we list the primary factors considered when arriving at the Duff & Phelps recommended U.S. ERP: we document the evolution of these factors from January 31, 2016 – the last time we changed our recommendation – through July 31, 2017, along with the corresponding relative impact on ERP indications.<sup>10</sup>

**Exhibit 1: Factors Considered in the U.S. ERP Recommendation:  
Relative Change from January 2016 to July 2017**

| Factor   | Change | Effect on ERP |
|--|--------|---------------|
| U.S. Equity Markets  | ↑      | ↓             |
| Implied Equity Volatility  | ↓      | ↓             |
| Corporate Spreads  | ↓      | ↓             |
| Economic Policy Uncertainty (EPU) and Equity Uncertainty Indices | ↓      | ↓             |
| Historical Real GDP Growth and Forecasts                         | ↓      | ↑             |
| Unemployment Environment   | ↓      | ↓             |
| Consumer and Business Sentiment                                  | ↑      | ↓             |
| Sovereign Credit Ratings   | ↔      | ↔             |
| Damodaran Implied ERP Model                                      | ↓      | ↓             |
| Default Spread Model   | ↓      | ↓             |

A high-level review of the same factors in August 2017 does not change materially the picture depicted above, other than an improvement in U.S. real gross domestic product ("GDP") growth (with a significant upward revision in second quarter's real growth), corroborating the view that system-wide risks have declined since January 2016.

### Current Economic Conditions

Macroeconomic conditions provide the foundation for financial market performance, with economic growth influencing the level of interest rates, inflation, corporate earnings, and other factors that impact financial asset returns.

More than eight years have elapsed since the U.S. economy began its recovery from the global financial crisis of 2008 (the "Financial Crisis"). The 2008–2009 U.S. recession was declared officially over in June 2009, and was of greater duration than those of 1973–1975 and 1981–1982. The current business cycle expansion is now the third longest in U.S. history.<sup>11</sup> However, the recent recovery has fallen short of the rebound observed in other



post-World War II recessions. Real GDP growth in the year following the recessions of 1957–1958, 1973–1975, and 1981–1982 was on average 5.6%.<sup>12</sup> In contrast, real GDP expanded by 2.5% during 2010 and by an average of 2.1% over the 2010–2016 period (see Exhibit 2).

**Exhibit 2: U.S. Real Gross Domestic Product (GDP) Growth: 2007–2017**



Source of underlying data: Historical data: U.S. Bureau of Economic Analysis. Forecast data based on average from the following: The Livingston Survey, June 16, 2017; Survey of Professional Forecasters, Second Quarter 2017, May 12, 2017; Blue Chip Financial Forecasts, August 1, 2017; Blue Chip Economic Indicators, July 10, 2017; Consensus Forecasts USA, July 2017; Bloomberg's Contributor Composite estimates, dated August 11, 2017.

For the last several years, the U.S. and the broader global economy have been oscillating between periods of strong and accelerating growth and periods when growth is either stagnating or weakening to positive but lackluster pace. At the beginning of 2016, less than two years ago, the world economy faced faltering growth and financial market turbulence. Fast forward to mid-2017, and the picture that emerges is very different: the world economy is finally experiencing some growth momentum, with real GDP accelerating in U.S., Europe (except for the U.K.), Japan, and China.

After a disappointing first quarter, the U.S. economy expanded in the second quarter of 2017 at its most robust pace since early 2015, supported by solid consumer spending and a pickup in business investment.<sup>13</sup> Consumer confidence and business sentiment have improved markedly, with the former well above its long-term average.<sup>14</sup> The employment situation has also improved, with the unemployment rate gradually declining since the beginning of 2016 and the U.S. economy moving close to full employment.

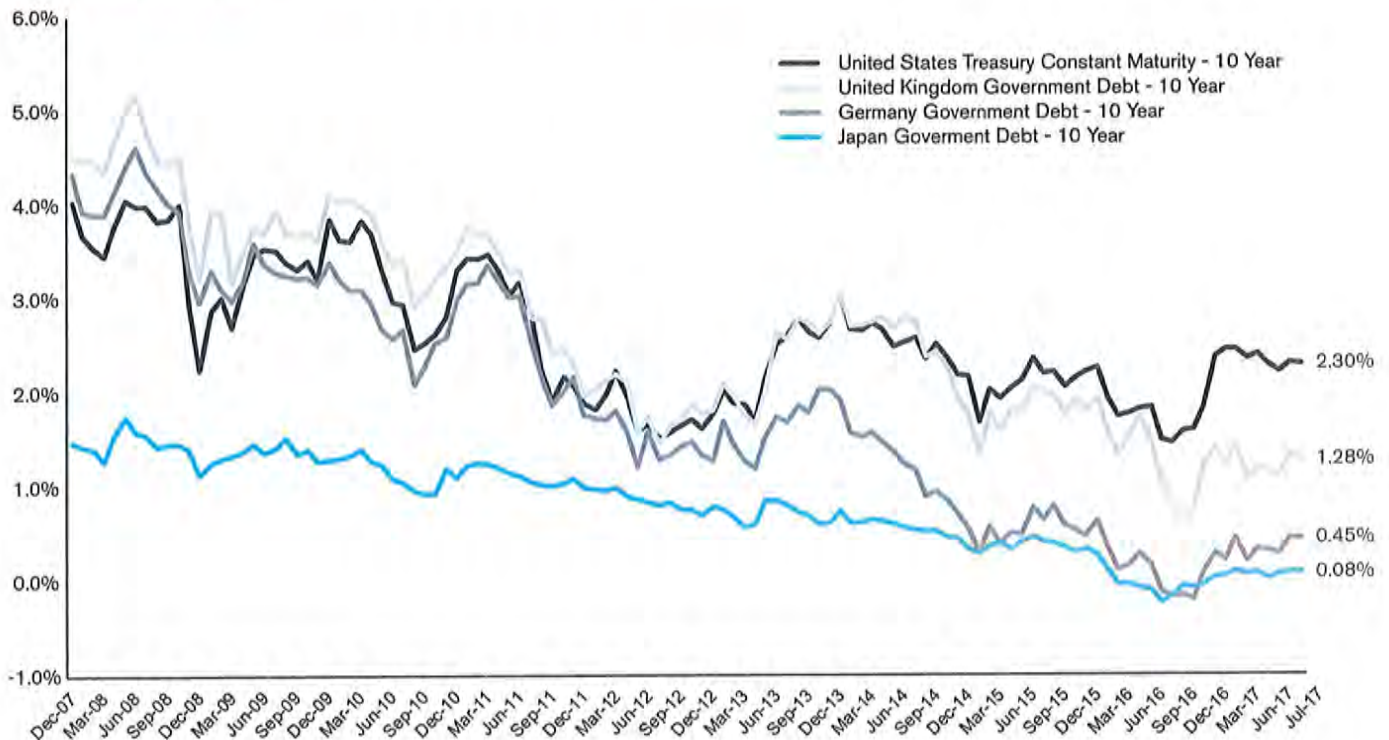
However, the U.S. labor force participation is hovering around its lowest level since the late 1970s and wages do not appear to be rising materially, especially given that the unemployment rate is near a 16-year low. Furthermore, the initial upward pressure on inflation observed in the latter half of 2016 due to rising oil prices (from a 12-year low reached back in January 2016) seems to have subsided: consumer price inflation measures remain stubbornly below the U.S. central bank's (the Federal Reserve, or the "Fed") target of 2.0%.<sup>15</sup> Finally, it is noted that in the near-term, U.S. economic indicators may temporarily reflect the negative impact of Hurricanes Harvey and Irma, which caused severe damage in Texas and Florida, respectively.

Thus far, the global economic recovery has been supported by unprecedented monetary policies introduced after the Financial Crisis began. Since the onset of the crisis, the Fed and other major central banks – including the European Central Bank ("ECB"), the Bank of England ("BOE"), and the Bank of Japan ("BOJ") – have (i) lowered their benchmark interest rates near or below 0.0% (zero); and (ii) implemented several rounds of unconventional quantitative easing ("QE") measures.



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**Exhibit 3: Yields on 10-year Government Bonds Issued by the U.S., U.K., Germany, and Japan  
 December 2007–July 2017**



Source of underlying data: Capital IQ

The resulting sizable increases in these central banks' balance sheets (largely due to holdings of long-term governments securities considered "safe" by investors), along with various flight-to-quality episodes, have continued to exert a downward pressure on global long-term interest rates (see Exhibit 3).<sup>16</sup>

In a recently-released academic study (June 2017), the authors showed empirical evidence suggesting that the composition of the Fed's balance sheet can significantly affect prices of U.S. Treasury securities (and therefore their yields), as well as the term structure of interest rates; this is contrary to most theoretical literature, which would suggest that the ability of the Fed to have an impact on long term interest rates is limited.<sup>17</sup> In a separate academic study, released in April 2017, the authors estimated that (at that time) the cumulative effect of the Fed's QE programs resulted in a reduction in the 10-year U.S. Treasury yield term premium of about 100 basis points ("b.p."). For practical purposes, this is what this estimate would translate into: in absence of QE actions by the Fed, the 10-year yield of 2.3% as of July 31, 2017 (see Exhibit 3) would likely have been around 3.3% instead.<sup>18</sup>

The Fed kept a zero-interest-rate policy (dubbed "ZIRP" in the financial press) for seven years, from December 2008 until December 2015. After a 10-year period with only one interest rate hike (in December 2015), the Fed finally embarked on a path of monetary policy normalization: the Fed raised the target range for its benchmark rate (the Federal Funds Rate) three times in six months, a 25 b.p. rise at each of its December 2016, March 2017, and June 2017 meetings. Another 25 b.p. rate rise is expected at the Fed's December meeting, with further hikes projected for 2018.<sup>19</sup> In addition, in the June 2017 meeting, the Fed revealed some details on its strategy to reduce its \$4.5 trillion balance sheet, corroborated at its July meeting – this slow and lengthy unwinding process is slotted to begin in October 2017.<sup>20</sup> The Fed has cited improvements in economic activity, labor market conditions, and a gradual

increase in inflation measures towards its target, as support for the rate increases and QE unwinding (or "QExit", as labeled in some of the financial press).

Nevertheless, the current range of 1.00% to 1.25% for the Fed's benchmark rate is well below historical levels, and is still providing a significant stimulus to the economy. Likewise, the outlined plan for QE unwinding means that only a small fraction of the Fed's large asset holdings will be coming off its balance sheet at a time, thereby contributing to only gradual increases in interest rates. As a starting point, the Fed plans to let an approximately combined \$10 billion in U.S. Treasuries, agency debt, and agency mortgage-backed securities expire on a monthly basis. Over time, these amounts will gradually increase to levels up to \$50 billion per month. The Fed will continue its policy of reinvesting the principal of its other maturing assets.<sup>21</sup>

For perspective, even a \$50 billion monthly amount of expiring securities represents just slightly-above 1% of the Fed's current balance sheet (or \$600 billion, around 13%, on an annual basis). This may partially help explain why U.S. government bond yields continue to be so low, despite the latest decisions by the Fed regarding monetary policy tightening. Other drivers may also include the expectation that loose monetary policies by other major central banks (e.g., ECB, BOJ) will continue in the foreseeable future, the belief that real rates could be permanently lower, and the perception that a U.S. political gridlock may thwart attempts to kickstart real economic growth to a 3.0% level – the historical long-term average prior to the Financial Crisis.<sup>22</sup> In other words, investors seem to be pricing a "lower for longer" scenario. The concept that investors may be pricing lower real (neutral) rates has been reiterated by Fed Chair Janet Yellen in the press conference following the Fed's September meeting:<sup>23,24</sup>

*"Market participants may have lower estimates or believe that a low neutral rate may be more persistent."*

Of course, this monetary policy path could be altered by President Trump's selection of a new Fed Chair. Dr. Yellen's current term is set to expire in February 2018. Failure to renew her term for another four years could have significant repercussions, not just for the interest rate policy in the United States, but also wider side effects to the global economy.

In Exhibit 4, we show how the 20-year U.S. Treasury yield – a typical proxy for the risk-free rate in U.S. dollars – has evolved from December 2007 through July 2017; in particular, notice the initial uptick in yields immediately after the November Presidential election, then a slight decrease followed by a standstill ever since.

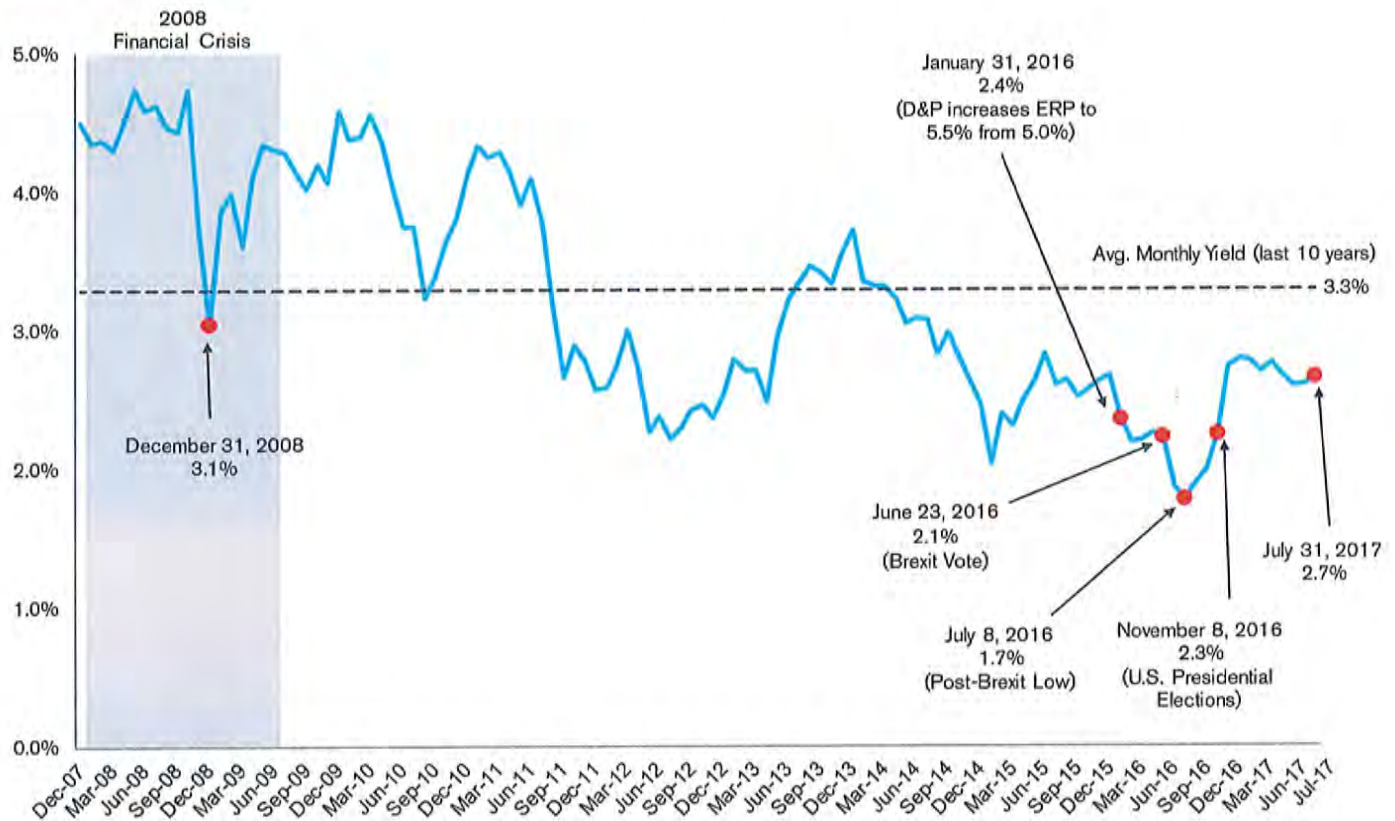
Looking at more recent data, the 20-year yield was 2.5% at the end of August and 2.4% on September 5, 2017, the effective date for the new Duff & Phelps U.S. ERP recommendation. Both are still below the 10-year trailing average of 3.3% for the 20-year U.S. Treasury yield.

The current range of 1.00% to 1.25% for the Fed's benchmark rate is well below historical levels.



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**Exhibit 4: Monthly 20-year U.S. Treasury Yield (spot rate) and Trailing 10-year Average Monthly 20-year U.S. Treasury Yield December 2007–July 2017**



Source of underlying data: Capital IQ

In summary, while current economic indicators are generally strong, there are still significant risks in the medium term. The International Monetary Fund (“IMF”) has recently emphasized the current positive global economic conditions in its semi-annual “World Economic Outlook”, but added a word of caution on the incompleteness of the recovery from the Financial Crisis and the possible sense of complacency by policymakers and financial markets:<sup>25</sup>

*“The global cyclical upswing that began midway through 2016 continues to gather strength. Only a year and a half ago, the world economy faced stalling growth and financial market turbulence. The picture now is very different, with accelerating growth in Europe, Japan, China, and the United States. Financial conditions remain buoyant across the world, and financial markets seem to be expecting little turbulence going forward, even as the Federal Reserve continues its monetary normalization process and the European Central Bank inches up to its own.*

*These positive developments give good cause for greater confidence, but neither policymakers nor markets should be lulled into complacency. A closer look suggests that the global recovery may not be sustainable—not all countries are participating, inflation often remains below target with weak wage growth, and the medium-term outlook still disappoints in many parts of the world. The recovery is also vulnerable to serious risks. Financial markets that ignore these risks are susceptible to disruptive repricing, and are sending a misleading message to policymakers.”*



### Current Financial Market Conditions

The last time Duff & Phelps changed its U.S. ERP recommendation was on January 31, 2016 (from 5.0% to 5.5%). Since then, aggregate risks in U.S. markets appear to have declined.

### U.S. Equity Markets

Looking back, 2016 turned out to be a year full of surprises and extreme events. Early 2016 saw financial markets in turmoil, with sharp declines in equity prices, further widening of credit spreads, and a general tightening of financial conditions. Although some financial markets rebounded from the beginning-of-the-year jitters, uncertainty increased in late June, when (contrary to analysts' and global investors' predictions) the U.K. electorate voted to end its membership in the European Union (known in the financial press as "Brexit"). Yields on U.S., German, and Japanese government securities fell sharply in safe-haven flows, while global equity prices declined significantly.

However, the second major surprising political event of the year – the outcome of the U.S. presidential election in November 2016 – marked a change in investor sentiment, accompanied initially by a rise in global interest rates, a sharp narrowing of credit spreads, a strengthening of the U.S. dollar, and a rally in equity markets to record highs.

While the so-called "reflation trade" abated at times during the first half 2017 (with government bond yields reversing some of the earlier gains), stock markets have continued their ascent. For perspective, as of July 31, 2017, the S&P 500 Index has increased 10.3% since year-end 2016 and is up 27.3% since January 2016 (see Exhibit 5). The S&P 500 closed at record highs in June and July 2017.

Exhibit 5: S&P 500 Index Performance Since January 31, 2016



Source of underlying data: Capital IQ

Since then, new records have been reached across U.S. equity markets in August, September, and through early October 2017.

Progress on the U.S. legislative front has been disappointing and expectations for a big fiscal stimulus package to be passed during 2017 have diminished. Yet, strong earnings growth, still-accommodative monetary policies, and benign global macroeconomic trends have buoyed U.S. stocks. Corporate earnings have surpassed expectations, fueling hopes for even higher dividend payouts and stock buybacks. More recently, the announcement of a high-level plan for U.S. corporate tax reform, including a corporate statutory tax rate cut from 35% to 20%, has spurred further stock market records.

Some analysts have characterized the current environment as a "goldilocks" children's tale of "not-too-hot and not-too-cold": modest growth, subdued inflation, low unemployment, and low interest rates, accompanied by high valuations and low implied volatility. In July 2017, Mohamed El-Erian, Chief Economic Advisor at Allianz, and a well-known market analyst, described the state of financial markets as follows:<sup>26</sup>

*"Over the past few months, government bond yields have fallen, the dollar has weakened and financials have underperformed, yet the major stock indexes are at or very near record highs, as persistently supportive liquidity conditions have more than compensated for policy and growth disappointments. By boosting returns and repressing volatility, ample liquidity is a gift for investors. It makes the investment journey pleasing, comfortable and lengthy. But it is not a destination. (...) The markets' overall sense of 'goldilocks' -- not too hot, not too cold -- explains much of the gap between buoyant stock indexes and lagging economic and policy fundamentals."*

In a later article, he justified the current levels in stock markets as follows:<sup>27</sup>

*"With plentiful liquidity having conditioned investors to 'buy on dips', it would take a major shock to dislodge investors from behaviour that, repeatedly, has proven highly remunerative, despite unusually fluid geopolitical, institutional and political conditions."*

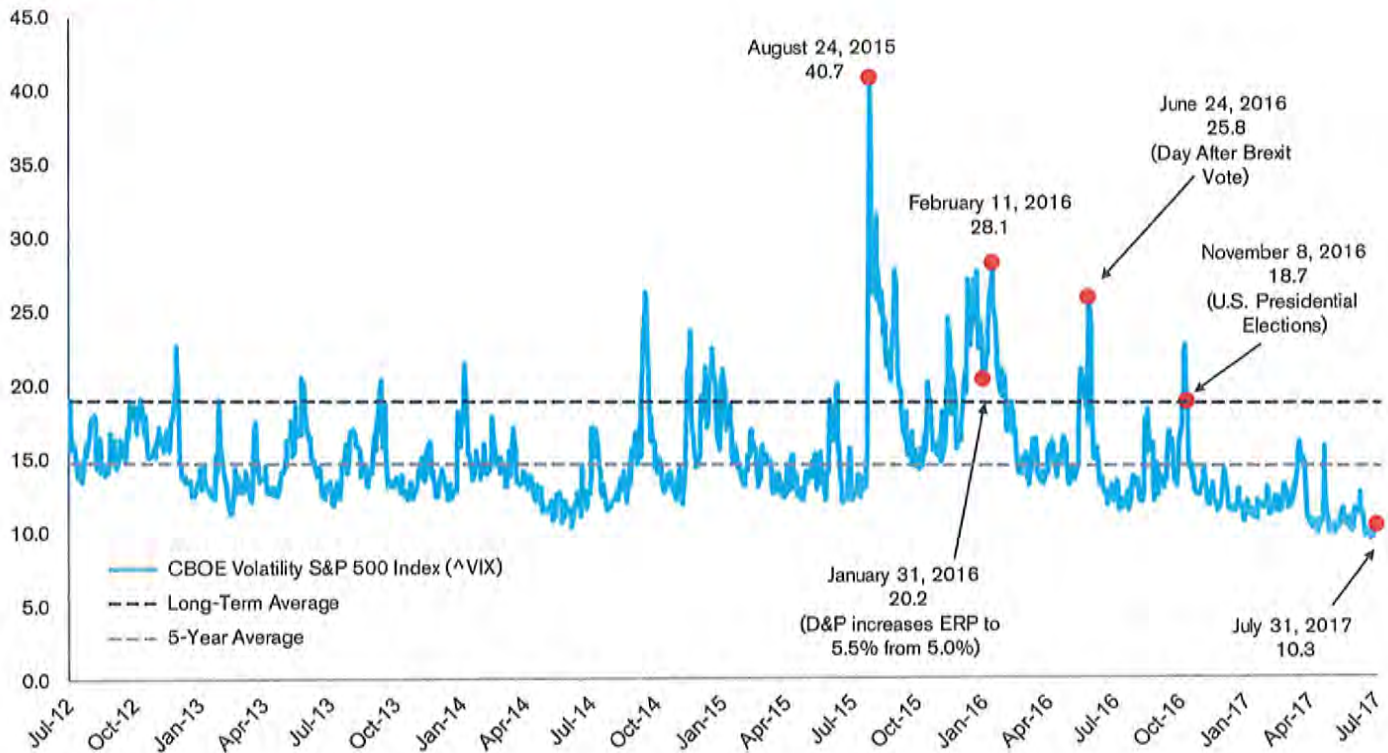
For the time being, there appears to be some justification for the positive investor sentiment particularly given the benign macroeconomic conditions and the support provided by major central banks' monetary policies. However, it remains to be seen what the impact will be to financial markets, when major central banks begin their monetary policy normalization and some of their support is removed.

Strong earnings growth, still-accommodative monetary policies, and benign global macroeconomic trends have buoyed U.S. stocks



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**Exhibit 6: Chicago Board Options Exchange (CBOE) "VIX" Index  
 July 2012–July 2017**



Source of underlying data: Capital IQ

**Implied Equity Volatility**

Implied equity volatility, as measured by the Chicago Board Options Exchange (CBOE) "VIX" Index, has been termed a "fear index" as it can be a gauge of investor apprehension. Volatility in U.S. equity markets has declined sharply since January 2016 (see Exhibit 6).

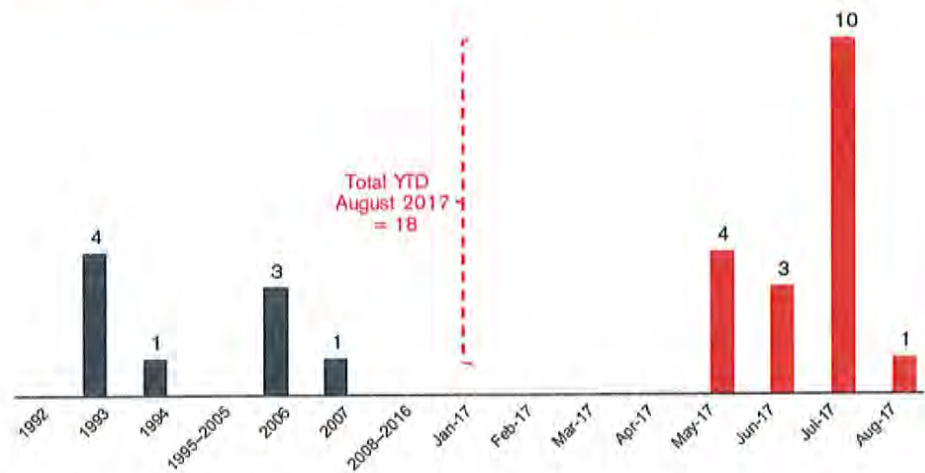
Investors appear remarkably upbeat, despite high valuations across many asset classes and considerable U.S. political uncertainty and elevated geopolitical tensions. Since the U.S. Presidential elections, the VIX Index has gradually decreased and it has now declined to levels well below the long-term average (see Exhibit 6).

In fact, since May 2017, the VIX Index has dipped several times below a level of 10.0, a rare occurrence prior to 2017. As shown in Exhibit 7, before 2017, there were only nine (9) times in the VIX history when the index was below 10.0. In contrast, since the beginning of the year until the end of August 2017, the VIX was below 10.0 in 18 separate occasions.

More recent data reveals that this trend has continued in September and early October. Remarkably, on October 5, 2017, the VIX recorded its lowest level in history of 9.19. The previous low-level record of 9.3 was reached in December 1993.



**Exhibit 7: Historical Number of Occurrences with "VIX" Index below 10.0  
January 1992–August 2017**



Source of underlying data: *Capitol IO*

It is true that various events that were forecasted in early 2017 to be potential sources of global geo-political risks were not as disruptive as anticipated. For instance, anti-establishment, anti-European Union candidates in major European elections have not gained power, as once feared. The Dutch parliamentary elections in March did not yield power to the nationalist populist candidate. Likewise, the French presidential elections in April and May ended in the decisive defeat of the far-right nationalist candidate and her party, offering significant relief to the future of the European Union. In June, the attempt to gain a clear mandate for Brexit negotiations by Prime Minister Theresa May ended with a failure to maintain her Conservative Party's majority in Parliament. While increasing political uncertainty for the United Kingdom, this made the possibility of a "Soft Brexit" more plausible.

More recently, however, tensions between the United States and North Korea have increased the threat of nuclear confrontation between the two countries. Elsewhere, the German far-right party has gained substantially more votes in parliamentary elections than anticipated, leading to a more fragmented government coalition led by Chancellor Angela Merkel, which may create new sources of instability in 2018.

Notwithstanding the current investor perception of negligible levels of risk, sentiment could quickly reverse if the U.S. Administration fails to implement its pro-growth policies, interest rates rise too quickly, global growth stalls, or one of the various sources of geopolitical risk comes to the forefront. Various economists and analysts have warned of excessive complacency in financial markets. Central bankers have also started to take notice. A recent article summarizes how their views on this matter may be interpreted:<sup>28</sup>

*"Central banks have taken note. The concerted policy message in the past couple of months has been to caution about complacency in global market valuations, as reflected in unusually low risk premia across assets and geographies. (...) In a nutshell, central banks are not necessarily turning more hawkish, in defiance of their inflation stability mandates. Rather they are clearly signalling that investors are becoming far too complacent about the policy outlook — and that risks financial stability."*

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**Exhibit 8: Spread of U.S. High-Yield Corporate Bond Yields over U.S. Investment Grade Corporate Bond Yields  
 July 2012–July 2017**



Source of underlying data: Capital IQ

**Corporate Credit Spreads**

Since February 2016, corporate credit spreads have tightened materially. As mentioned earlier, the outcome of the U.S. presidential elections in November marked a change in investor sentiment, which was accompanied initially by a rise in global interest rates and a sharp narrowing of credit spreads. Since early 2017, U.S. Treasury yields have plateaued, as an initial rise in inflation reversed course and hopes for an imminent U.S. fiscal expansion diminished. Corporate spreads, however, reached their lowest levels since mid-2014 (see Exhibit 8).

Since the onset of the 2008 Financial Crisis, fixed income markets have been significant beneficiaries of the QE policies implemented by major central banks across the globe. Large asset purchases by central banks have created an environment of ultra-low interest rates, encouraging new corporate debt issuance on a global basis. In addition, QE programs in the Eurozone, United Kingdom, and Japan include investment-grade corporate debt securities, thereby decreasing borrowing costs for those corporations even further.



Ratings agencies have started warning of the potential challenges that may ensue when central banks start normalizing their interest rate policies and unwinding their balance sheets. The most immediate danger comes from the United States, where the Fed has now embarked on its path to normalization. A recent report from Fitch Ratings cautions that despite a current positive environment, the unwinding of QE will create challenges to both lenders (investors) and borrowers (corporations):<sup>29</sup>

*"(...) the improving outlook for global credit quality is underpinned by years of loose central bank monetary policy, including quantitative easing (QE), as well as what are now the strongest world growth conditions since 2010. 'Looking ahead in the rating cycle, the most benign credit market conditions in modern history will gradually begin to normalise as central bank assistance is withdrawn and world growth peaks in 2018. This could begin to temper the otherwise upbeat rating outlook trend' (...) Unwinding QE will pose challenges to both borrowers and lenders."*

#### Additional Indicators Supporting the ERP Change – Quantitative Models

In addition to the general economic factors and financial market conditions described above, Duff & Phelps monitors other indicators that may provide a more quantitative view of where we are within the range of reasonable long-term estimates for the U.S. ERP.

Duff & Phelps currently uses several models as corroborating evidence. We reviewed the following indicators at the end of July and August 2017:

- **Damodaran Implied ERP Model** – New York University Professor Aswath Damodaran calculates implied ERP estimates for the S&P 500 and publishes his estimates on his website. Prof. Damodaran estimates an implied ERP by first solving for the discount rate that equates the current S&P 500 index level with his estimates of cash distributions (dividends and stock buybacks) in future years. He then subtracts the current yield on 10-year U.S. government bonds to arrive at an implied ERP. Prof. Damodaran allows the user to select a variety of methods to project cash flow yields, as well as several expected growth rate choices for the terminal year in the valuation. Duff & Phelps converts Prof. Damodaran's implied ERP estimates to an arithmetic average equivalent measured against the 20-year U.S. government bond yield, relying primarily on two measures of projected cash flows: (i) the trailing 12-month cash flow yield (dividends plus buybacks) of S&P 500 constituents; and (ii) the trailing 10-year average cash flow yield (dividends plus buybacks) of S&P 500 constituents.<sup>30</sup>

Based on Prof. Damodaran's estimates of the trailing 12-month cash flow yield, the implied ERP (converted into an arithmetic average equivalent) was approximately 6.07% at end of July 2017, when measured against an abnormally low 20-year U.S. government bond yield (2.66%).<sup>31</sup> The equivalent normalized implied ERP estimate was 5.23% measured against a normalized 20-year U.S. government bond yield of 3.5%. At the end of August 2017, the implied ERP (converted into an arithmetic average equivalent) was approximately 6.09%, when measured against the spot 20-year U.S. government bond yield (2.47%).<sup>32</sup> The equivalent normalized implied ERP estimate was 5.06% measured against a 3.5% normalized 20-year risk-free rate. These July and August normalized implied ERP estimates represent a decline of 62 b.p. and 79 b.p. respectively, relative to the January 2016 estimate (5.85%).

Implied ERP indications have declined substantially since January 2016



- **Default Spread Model (DSM)** – The Default Spread Model is based on the premise that the long-term average ERP (the unconditional ERP) is constant and deviations from that average over an economic cycle can be measured by reference to deviations from the long-term average of the default spread between corporate bonds rated in the Baa category by Moody's versus those in the Aaa rating category. This model notably removes the risk-free rate itself as an input in the estimation of ERP.<sup>33</sup> However, the ERP indication resulting from the DSM is still interpreted as an estimate of the relative return of stocks in excess of risk-free securities.

At the end of July and August 2017, the conditional ERP calculated using the DSM model was 4.86% and 4.90%, respectively. These indications represent declines of 79 b.p. and 75 b.p. respectively, relative to the 5.65% ERP indication at the end of January 2016.

- **Hassett Implied ERP (Hassett)** – Stephen Hassett has developed a model for estimating the implied ERP, as well as the estimated S&P 500 index level, based on the current yield on long-term U.S. government bonds and a risk premium factor ("RPF").<sup>34</sup> The RPF is the empirically derived relationship between the risk-free rate, S&P 500 earnings, real interest rates, and real GDP growth to the S&P 500 index over time. The RPF appears to change only infrequently. The model can be used monthly to estimate the S&P 500 and the conditional ERP based on the current level of interest rates.<sup>35</sup>

Hassett's analysis uses the spot 10-year risk-free rate for the period from January 2008 through July 2011; thereafter, his analysis uses a normalized yield on U.S. Treasuries of 4.0% (2.0% real risk-free rate plus 2.0% inflation) and 4.5% (2.0% real risk-free rate plus 2.5% inflation).<sup>36</sup> Using a normalized 4.0% risk-free rate at the end of July and August 2017, the S&P 500 index appeared to be somewhat overvalued based on the Hassett model's predictions, whereas using a 4.5% normalized risk-free rate would imply the index is substantially overvalued. Alternatively, based on the S&P 500 index level at the end of July and August 2017, the implied risk-free rate commensurate with the index closing price was 3.58% and 3.57%, respectively. These indications for the risk-free rate are very close to the Duff & Phelps concluded normalized risk-free rate of 3.5%, effective November 15, 2016 and thereafter (reaffirmed on September 5, 2017 and until further notice).

Default Spread Model ERP indications have declined substantially since January 2016

& Client Alert - Duff & Phelps' U.S. Equity Risk Premium Recommendation Decreased from 5.5% to 5.0%, Effective September 5, 2017

## Duff & Phelps' U.S. Equity Risk Premium Recommendation and "Base" Cost of Equity as of September 5, 2017

Based on current market conditions, we find sufficient evidence for decreasing the Duff & Phelps U.S. ERP recommendation from 5.5% to 5.0%, for valuation dates as of September 5, 2017 and thereafter. We will maintain our recommendation to use a 5.0% U.S. ERP when developing discount rates until there is evidence indicating equity risk in financial markets has materially changed. We are continuing to closely monitor the aftermath of the U.S. presidential election held on November 8, 2016 and its impact on cost of capital assumptions.

The current ERP recommendation was developed in conjunction with a "normalized" 20-year yield on U.S. government bonds as a proxy for the risk-free rate. Based on recent academic literature and market evidence of a secular decrease in real interest rates (a.k.a. the "rental" rate) and lower long-term real GDP growth estimates for the U.S. economy, we are reaffirming our concluded normalized risk-free rate of 3.5%, established as of November 15, 2016.<sup>37</sup>

The combination of the new U.S. recommended ERP (5.0%) and the reaffirmed normalized risk-free rate (3.5%) results in an implied U.S. "base" cost of equity capital estimate of 8.5% (5.0% + 3.5%).

Adjusting the risk-free rate in conjunction with the ERP is only one of the alternatives available when estimating the cost of equity capital. Were we to use the spot yield-to-maturity of 2.4% on 20-year U.S. Treasuries as of September 5, 2017, one would have to increase the ERP assumption accordingly. One can determine the ERP against the spot 20-year yield as of September 5, 2017, inferred by Duff & Phelps' recommended U.S. ERP (used in conjunction with the normalized risk-free rate), by using the following formula:

U.S. ERP Against Spot 20-year Yield (Inferred) =

$$\begin{aligned} &= \text{D\&P Recommended U.S. ERP} + \text{Normalized Risk-Free Rate} - \text{Spot 20-year} \\ &\quad \text{U.S. Treasury Yield} \\ &= 5.0\% + 3.5\% - 2.4\% = 6.1\% \end{aligned}$$



## Endnotes

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1. For a discussion of some of the studies and factors we evaluate, refer to Chapter 3 of the Duff & Phelps *2017 Valuation Handbook – U.S. Guide to Cost of Capital*.
2. Refer to the Duff & Phelps Client Alert issued on March 16, 2016, which was titled "Duff & Phelps Increases U.S. Equity Risk Premium Recommendation to 5.5%, Effective January 31, 2016". To obtain a free copy of this Client Alert and prior ones documenting the Duff & Phelps' U.S. ERP recommendation over time, visit: [www.DuffandPhelps.com/CostofCapital](http://www.DuffandPhelps.com/CostofCapital).
3. See the Duff & Phelps Client Alert issued on January 12, 2017, which was titled "Duff & Phelps' U.S. Normalized Risk-Free Rate Decreased from 4.0% to 3.5%, Effective November 15, 2016", also found at: [www.DuffandPhelps.com/CostofCapital](http://www.DuffandPhelps.com/CostofCapital).
4. On June 23, 2016, the U.K. electorate voted to leave the European Union, which is known in the financial press as the "Brexit" vote. For further details, refer to the Duff & Phelps Client Alert "Brexit: The Impact on Cost of Capital", dated September 14, 2016, available at [www.DuffandPhelps.com/CostofCapital](http://www.DuffandPhelps.com/CostofCapital). In March 2017, the U.K. government officially triggered the two-year negotiation period to exit the European Union.
5. For a more detailed discussion of this decision, refer to Chapter 3 of the Duff & Phelps *2017 Valuation Handbook – U.S. Guide to Cost of Capital*.
6. See for example John Cochrane's "Discount Rates. American Finance Association Presidential Address" on January 6, 2011, where he presented research findings on the cyclical nature of discount rates in general. His remarks were published as Cochrane, J. H. (2011), "Presidential Address: Discount Rates," *The Journal of Finance*, 66: 1047–1108, available at: <http://onlinelibrary.wiley.com/doi/10.1111/j.1540-6261.2011.01671.x/full>. A video of his remarks is available at: <http://www.afajof.org/details/video/2870771/2011-Presidential-Address.html>.
7. The "conditional" ERP is the ERP estimate published by Duff & Phelps as the "Duff & Phelps Recommended ERP".
8. See Shannon P. Pratt and Roger J. Grabowski, *Cost of Capital: Applications and Examples*, Fifth Edition, Chapter 8 "Equity Risk Premium", and accompanying Appendices 8A and 8B, for a detailed discussion of the unconditional ERP. This discussion has been updated with more recent data in Chapter 3 of the Duff & Phelps *2017 Valuation Handbook – U.S. Guide to Cost of Capital*.
9. John C. Cochrane (2011), "Presidential Address: Discount Rates," *The Journal of Finance*, 66: 1047–1108 <http://onlinelibrary.wiley.com/doi/10.1111/j.1540-6261.2011.01671.x/full>.
10. The discussion in this article was based on the review of data for periods ended on or around July 31, 2017, with selected data updated through the end of August 2017. However, general information available through the time of writing (October 12, 2017) was also considered as corroborating evidence.
11. "U.S. Business Cycle Expansions and Contractions", National Bureau of Economic Research. Underlying data accessible here: <http://www.nber.org/cycles.html>.
12. Source of underlying real GDP data: the U.S. Bureau of Economic Analysis.
13. Source of underlying real GDP data: the U.S. Bureau of Economic Analysis.
14. For instance, the University of Michigan Consumer Sentiment Index registered a level of 93.4, compared to a long-term average (since 1978) of 85.6.
15. Source of underlying labor and inflation statistics: the U.S. Bureau of Labor Statistics.
16. For a more detailed discussion on the proportion of U.S. Treasury securities held by the Fed, as well as other factors that have contributed to lower global interest rates, refer to Chapter 3 of the Duff & Phelps *2017 Valuation Handbook – U.S. Guide to Cost of Capital*.
17. Huther, Jeffrey, Jane Ihrig, and Elizabeth Klee (2017). "The Federal Reserve's Portfolio and its Effect on Interest Rates," Finance and Economics Discussion Series 2017-075. Washington: Board of Governors of the Federal Reserve System, <https://doi.org/10.17016/FEDS.2017.075>.
18. For a discussion on the impact of the Federal Reserve's QE programs on the term premium (or maturity premium) and the yield on 10-year U.S. Treasury bonds, see "The Effect of the Federal Reserve's Securities Holdings on Longer-term Interest Rates", accessible here: <https://www.federalreserve.gov/econres/notes/feds-notes/effect-of-the-federal-reserves-securities-holdings-on-longer-term-interest-rates-20170420.htm>.
19. Minutes of the Federal Open Market Committee of the Board of Governors of the Federal Reserve System can be found by visiting: <http://www.federalreserve.gov/monetarypolicy/fomccalendars.htm>.
20. For the latest composition and size of the Fed's balance sheet, refer to the Federal Reserve Bank of Cleveland's Credit Easing data, available at: <https://www.clevelandfed.org/our-research/indicators-and-data/credit-easing.aspx>.
21. "FOMC issues addendum to the Policy Normalization Principles and Plans", June 14, 2017, available here: <https://www.federalreserve.gov/newsevents/pressreleases/monetary20170614c.htm>.



## Endnotes

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22. For a more detailed discussion on the trends behind the decline in real interest rates, refer to "Duff & Phelps' U.S. Normalized Risk-Free Rate Decreased from 4.0% to 3.5%, Effective November 15, 2016", which can be found here: [www.DuffandPhelps.com/CostofCapital](http://www.DuffandPhelps.com/CostofCapital).
23. "FOMC: Press Conference on September 20, 2017". The Transcript to this press conference can be found here: <https://www.federalreserve.gov/mediacenter/files/FOMCpresconf20170920.pdf>.
24. The neutral real rate, also called  $r^*$  ( $r$ -star), stands for the longer-run value of the neutral rate. This is what the inflation-adjusted interest rate (i.e., real rate) will be once the economy is back to full strength, i.e., consistent with the economy operating at maximum employment.
25. "World Economic Outlook, October 2017 Seeking Sustainable Growth: Short-Term Recovery, Long-Term Challenges", International Monetary Fund. For a copy of the report, visit: <https://www.imf.org/en/Publications/WEO/Issues/2017/09/19/world-economic-outlook-october-2017>.
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28. Komileva, Lena. "You are too complacent, central bankers warn markets." *Financial Times*, July 30, 2017. This article can be accessed here: <https://www.ft.com/content/8908f882-739b-11e7-93ff-99f383b09ff9>.
29. "Fitch: QE and World Growth Buoy Global Rating Outlooks", September 19, 2017. A summary of the report can be accessed here: [https://www.fitchratings.com/site/pr/1029367?cm\\_mmc=ExactTarget-](https://www.fitchratings.com/site/pr/1029367?cm_mmc=ExactTarget-).
30. Source of underlying data: downloadable dataset entitled "Spreadsheet to compute ERP for current month". To obtain a copy, visit: <http://pages.stern.nyu.edu/~adamodar/>.
31. Damodaran's implied rate of return (based on the actual 10-year yield) on the S&P 500 = 7.33% as of August 1, 2017, minus the actual 20-year U.S. Treasury yield of 2.66% plus an adjustment to equate the geometric average ERP to its arithmetic equivalent. The result reflects conversion of the implied ERP to an arithmetic average equivalent.
32. Damodaran's implied rate of return (based on the actual 10-year yield) on the S&P 500 = 7.16% as of September 1, 2017, minus the actual 20-year U.S. Treasury yield of 2.47% plus an adjustment to equate the geometric average ERP to its arithmetic equivalent. The result reflects conversion of the implied ERP to an arithmetic average equivalent.
33. The Default Spread Model presented herein is based on Jagannathan, Ravi, and Wang, Zhenyu, "The Conditional CAPM and the Cross-Section of Expected Returns," *The Journal of Finance*, Volume 51, Issue 1, March 1996: 3–53. See also Elton, Edwin J. and Gruber, Martin J., Agrawal, Deepak, and Mann, Christopher "Is There a Risk Premium in Corporate bonds?", Working Paper. Duff & Phelps uses (as did Jagannathan, Ravi, and Wang) the spread of high-grade corporates (proxied by yields on Aaa rated bonds) against lesser grade corporates (proxied by yields on Baa rated bonds). Corporate bond series used in analysis herein: Bloomberg Barclays US Corp Baa Long Yld USD (Yield) and Bloomberg Barclays US Corp Aaa Long Yld USD (Yield); Source: Morningstar *Direct*.
34. Stephen D. Hassett, "The RPF Model for Calculating the Equity Risk Premium and Explaining the Value of the S&P with Two Variables," *Journal of Applied Corporate Finance*, 22, 2 (Spring 2010): 118–130.
35. For a more detailed description of Hassett's Risk Premium Factor model see Pratt and Grabowski, op.cit., Chapter 8A, "Deriving ERP Estimates": 167–168.
36. To clarify, Stephen Hassett uses a 2.0% real rate in his analysis for a normalized yield on U.S. Treasuries. Duff & Phelps uses a range of 0.0% to 2.0% for the long-term real rate. Refer to Chapter 3 of the *2017 Valuation Handbook – U.S. Guide to Cost of Capital*.
37. Refer to "Duff & Phelps' U.S. Normalized Risk-Free Rate Decreased from 4.0% to 3.5%, Effective November 15, 2016". For a more detailed discussion on how Duff & Phelps estimates a normalized risk-free rate, refer to Chapter 3 of the *2017 Valuation Handbook – U.S. Guide to Cost of Capital*.

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Duff & Phelps is the premier global valuation and corporate finance advisor with expertise in complex valuation, disputes and investigations, M&A, real estate, restructuring, and compliance and regulatory consulting. The firm's more than 2,000 employees serve a diverse range of clients from offices around the world.

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Client Alert: January 12, 2017

## Duff & Phelps' U.S. Normalized Risk-Free Rate Decreased from 4.0% to 3.5% Effective November 15, 2016

### Executive Summary

The Equity Risk Premium (ERP) changes over time. Fluctuations in global economic and financial conditions warrant periodic reassessments of the selected ERP and accompanying risk-free rate.

Based on current market conditions, Duff & Phelps is reaffirming its U.S. Equity Risk Premium recommendation of 5.5% to be used in conjunction with a normalized risk-free rate. However, based on declining real interest rates and long-term growth estimates for the U.S. economy, **we are lowering the U.S. normalized risk-free rate from 4.0% to 3.5%**, when developing discount rates as of November 15, 2016 and thereafter, until further guidance is issued. In summary:

- Equity Risk Premium: Reaffirmed at 5.5%
- Risk-Free Rate: Decreased from 4.0% to 3.5% (normalized)
- Base U.S. Cost of Equity Capital: 9.0% (5.5% + 3.5%)

### Background

The Equity Risk Premium (ERP) is a key input used to calculate the cost of capital within the context of the Capital Asset Pricing Model (CAPM) and other models for developing discount rates to be used in discounting expected net cash flows. Duff & Phelps regularly reviews fluctuations in global economic and financial market conditions that warrant a periodic reassessment of the ERP.<sup>1</sup>

Based on current market conditions, we are reaffirming the recommended U.S. ERP of 5.5%, which was previously established as of January 31, 2016 and thereafter. We will maintain our recommendation to use a 5.5% U.S. ERP when developing discount rates until there is evidence indicating equity risk in financial markets has materially changed. We are closely monitoring the aftermath of the U.S. presidential election held on November 8, 2016 and its impact on cost of capital assumptions.

The current ERP recommendation was developed in conjunction with a "normalized" 20-year yield on U.S. government bonds as a proxy for the risk-free rate ( $R_f$ ). Based on recent academic literature and market evidence of a secular decrease in real interest rates (a.k.a. the "rental" rate) and lower long-term real GDP growth estimates for the U.S. economy, **we lowered our concluded normalized risk-free rate from 4.0% to 3.5%** for valuation dates as of November 15, 2016 and thereafter.



## Methods of Estimating a Normalized Risk-Free Rate

Estimating a normalized risk-free rate can be accomplished in a number of ways, including (i) simple averaging, and (ii) various "build-up" methods.<sup>2</sup>

**The first method** of estimating a normalized risk-free rate entails calculating averages of yields to maturity on long-term government securities over various periods. This method's implied assumption is that government bond yields revert to the mean. For example, as of October 31, 2016, the trailing 10-year average for the yield on 20-year U.S. Treasury bonds was 3.5%. In contrast, the corresponding spot yield on October 31, 2016 was 2.3%.

Taking the average over the last 10 years is a simple way of "normalizing" the risk-free rate. An issue with using historical averages, though, is selecting an appropriate comparison period that can be used as a reasonable proxy for the future.

**The second method** of estimating a normalized risk-free rate entails using a simple build-up method, where the components of the risk-free rate are estimated and then added together. Conceptually, the risk-free rate can be (loosely) illustrated as the return on the following two components:<sup>3</sup>

$$\text{Risk-Free Rate} = \text{Real Rate} + \text{Expected Inflation}$$

In Exhibit 1, we summarize long-term real rate estimates and inflation expectations for the United States at the end of October 2016, based on data assembled from a variety of sources. We also display the spot 20-year U.S. Treasury yield and its long-term (10-year) trailing average as of October 31, 2016.

### Exhibit 1: Long-Term Spot and Normalized Risk-Free Rates for the United States October 2016 (approximately)<sup>4, 5</sup>

|  |                     |
|--|---------------------|
| Estimated Long-term Real Risk-Free Rate    | 0.0% to 2.0%        |
| Expected Long-term Inflation               | 1.7% to 2.4%        |
| <b>Range of Normalized Risk-Free Rates</b> | <b>1.7% to 4.4%</b> |
| Midpoint                                   | 3.1%                |

|   |             |
|---|-------------|
| 20-Year U.S. Government Securities          |             |
| -Spot Rate                                  | 2.3%        |
| -Long-Term (10-year) Trailing Average Yield | 3.5%        |
| <b>Concluded Normalized Risk-Free Rate</b>  | <b>3.5%</b> |

Academics and economic analysts have documented a declining trend in global *real* interest rates

The long-term real rate estimate of 0.0% to 2.0% represents a lower range relative to prior Duff & Phelps analyses. Recently, research in this area has been very active. Academic researchers and economic analysts have proposed a number of explanations for the secular (i.e., not cyclical or temporary) decline in global real interest rates, which they argue precedes the onset of the 2008 global financial crisis. The following are some of the most-often-cited factors:<sup>6</sup>

- Lower global long-run output and productivity growth
- Shifting demographics (aging population leading to slower labor force expansion)
- Global "savings glut"
- Safe asset shortage (increased demand for safe-haven assets, accompanied by a declining supply)

With regards to long-term inflation expectations, the same declining trend has been taking hold in the United States and across several other developed markets over the last few years. Inflation has been persistently below the 2.0% target set by major central banks, such as the Federal Reserve Bank (Fed), the European Central Bank, the Bank of England, and the Bank of Japan. The sharp decline in oil prices from mid-2014 until early 2016 has put additional pressure on an already very low inflation environment.

However, the results of the U.S. presidential election seem to have spurred higher inflation expectations for global investors. Long-term government bond yields rose sharply in (for example) the United States, United Kingdom, and Germany in the short period between the election day and the date of writing this alert. This is the opposite of what happened following the June 23, 2016 vote by the U.K. electorate to leave the European Union (known in the financial press as "Brexit"). We will continue to monitor the aftermath of the U.S. presidential election and its potential impact on inflation expectations and consequent effects on the normalized long-term risk-free rate.

## Can the Normalized Risk-Free Rate Decline While the Spot Yield is Increasing?

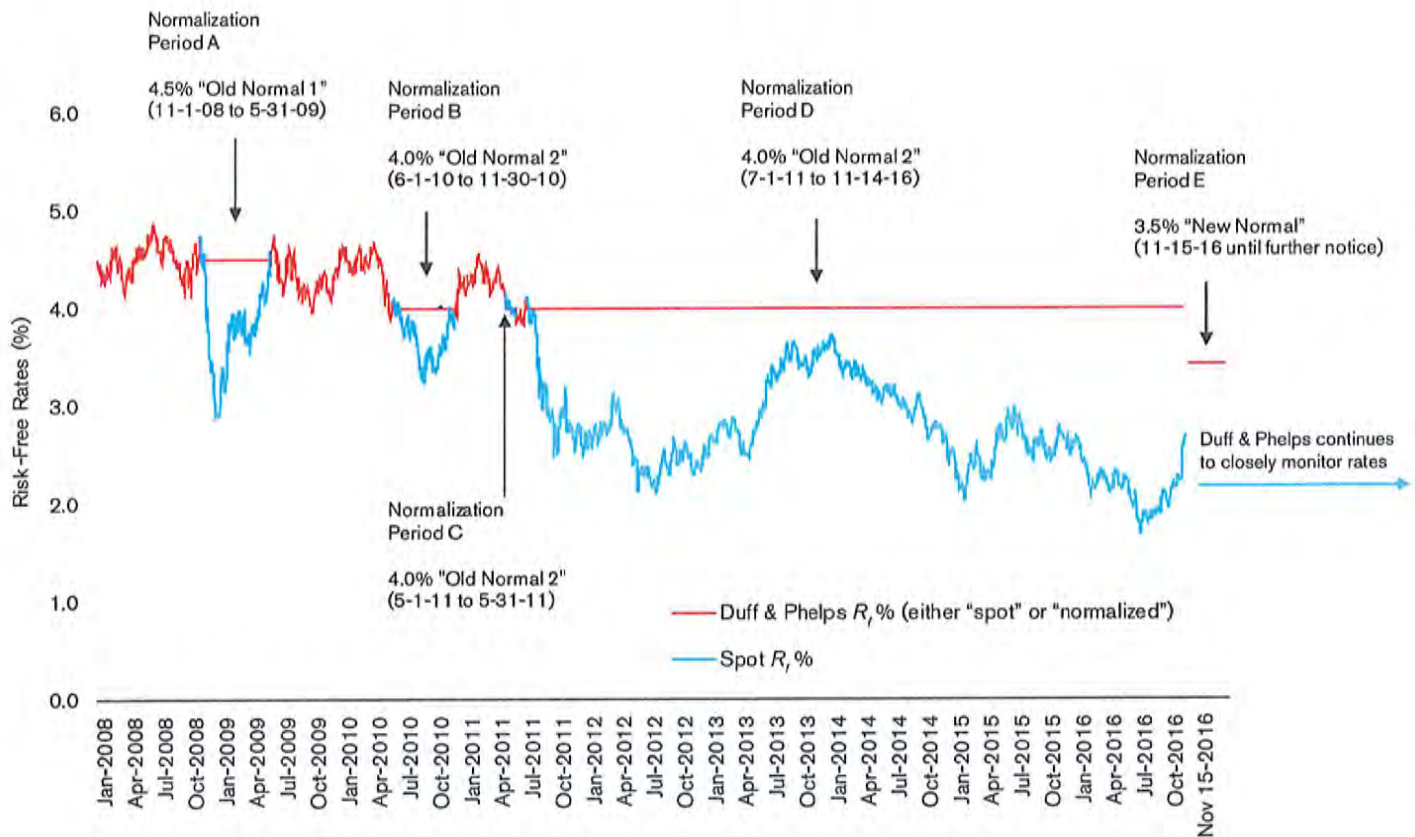
A long-term "normalized" risk-free rate attempts to capture the sustainable average return of long-term bonds issued by a government considered "safe" or free of default risk (e.g., U.S. Treasuries).<sup>7,8</sup> However, the use of a normalized risk-free rate during certain periods does *not* preclude "spot" rates from fluctuating during these periods.

Exhibit 2 is a graphical illustration of both the daily "spot" long-term U.S. risk-free rate (using 20-year U.S. Treasury yields), and the Duff & Phelps recommended "normalized" long-term U.S. risk-free rate from January 1, 2008 through November 15, 2016. The red line in Exhibit 2 is the Duff & Phelps suggested risk-free rate, which has been the "spot" rate during certain periods (the red, spiky areas in the graph) and has been a "normalized" rate during certain periods (the areas in the graph that are red, straight, horizontal lines). The blue lines in Exhibit 2 represent the "spot" rate (during times that Duff & Phelps suggested using a normalized rate).



Client Alert: Duff & Phelps U.S. Normalized Risk-Free Rate Decreased from 4.0% to 3.5%

**Exhibit 2: (i) Duff & Phelps Recommended U.S. Long-term Risk-Free Rate (both "spot" and "normalized"), and (ii) Spot 20-Year U.S. Treasury Yield During Normalization Periods<sup>9</sup>**  
 January 1, 2008–November 15, 2016



During periods that Duff & Phelps suggested using a normalized rate (the areas in the graph that are red, straight, horizontal lines), the spot rate (the blue lines) still fluctuated, at times significantly.<sup>10</sup> Spot rates will almost undoubtedly fluctuate during the current period as well, just as they have fluctuated in all previous periods of normalization. This fluctuation in itself does not alter our recommendation based on economic fundamentals.

Duff & Phelps will continue to monitor risk-free rates and other cost of capital inputs very closely. If and when (i) long-term spot yields increase to a level that approaches the Duff & Phelps recommended U.S. normalized risk-free rate (e.g., differences are lower than 50 b.p.), and (ii) there is evidence that this increase in spot yields is not transitory, we will then consider recommending a return to using the spot rate as the basis for the risk-free rate to be used in conjunction with our recommended U.S. ERP.



Client Alert: Duff & Phelps U.S. Normalized Risk-Free Rate Decreased from 4.0% to 3.5%

## Duff & Phelps' U.S. Equity Risk Premium Recommendation and "Base" Cost of Equity

Duff & Phelps last changed its U.S. ERP recommendation on January 31, 2016. On that date, our ERP recommendation was increased to 5.5% (from 5.0%) in response to evidence that suggested a heightened level of risk in financial markets and deteriorating economic conditions.

Duff & Phelps monitors various economic and financial market indicators, as well as two quantitative models as corroboration to arrive at its U.S. ERP recommendation. While the current evidence seems to be pointing to a decline in equity risk in financial markets relative to January 31, 2016, from a qualitative perspective we deem it prudent to let some time elapse, in order to better assess the impact of the U.S. presidential election's results on the forward-looking ERP. We took a similar "wait-and-see" approach when evaluating the impact of Brexit on cost of capital assumptions.

Accordingly, Duff & Phelps is reaffirming the recommended U.S. ERP of 5.5%, to be used in conjunction with a normalized risk-free rate of 3.5%, when developing discount rates as of November 15, 2016 and thereafter. The combination of the new normalized risk-free rate (3.5%) and the reaffirmed U.S. recommended ERP (5.5%) results in an implied U.S. "base" cost of equity capital estimate of 9.0% (3.5% + 5.5%). Were we to use the spot yield-to-maturity on 20-year U.S. Treasuries of 2.6% as of November 15, 2016, one would have to increase the ERP assumption accordingly. One can determine the ERP against the spot 20-year yield as of November 15, 2016, inferred by Duff & Phelps' recommended U.S. ERP (used in conjunction with the normalized risk-free rate), by using the following formula:

### U.S. ERP Against Spot 20-Year Yield (Inferred) =

$$\begin{aligned} &= \text{D\&P Recommended U.S. ERP} + \text{Normalized Risk-Free Rate} - \text{Spot 20-Year U.S. Treasury Yield} \\ &= 5.5\% + 3.5\% - 2.6\% = 6.4\% \end{aligned}$$

## Endnotes

- <sup>1</sup> For a discussion of some of the studies and factors we evaluate, refer to Chapter 3 of the Duff & Phelps 2016 *Valuation Handbook – Guide to Cost of Capital* or to Duff & Phelps' Client Alert entitled "Duff & Phelps Increases U.S. Equity Risk Premium Recommendation to 5.5%, Effective January 31, 2016". To obtain a free copy of this Client Alert, visit [www.duffandphelps.com/costofcapital](http://www.duffandphelps.com/costofcapital).
- <sup>2</sup> For a more detailed discussion on reasons for normalization and methods that can be used to normalize risk-free rates, refer to Chapter 3 of the Duff & Phelps 2016 *Valuation Handbook – Guide to Cost of Capital*.
- <sup>3</sup> This is a simplified version of the "Fisher equation", named after Irving Fisher. Fisher's "The Theory of Interest" was first published by Macmillan (New York), in 1930.
- <sup>4</sup> Sources of real rates: Haubrich, Joseph, George Pennacchi, and Peter Ritchken, "Inflation Expectations, Real Rates, and Risk Premia: Evidence from Inflation Swaps," *Review of Financial Studies* Vol. 25 (5) (2012): 1588-1629; Andrew Ang and Geert Bekaert "The Term Structure of Real Rates and Expected Inflation," *The Journal of Finance*, Vol. LXIII (2) (April 2008); Olesya V Grishchenko and Jing-zhi Huang "Inflation Risk Premium: Evidence From the TIPS Market," *The Journal of Fixed Income*, Vol. 22 (4) (2013); Pescatori, Andrea and Jarkko Turunen, "Lower for Longer: Neutral Rates in the United States", IMF Working Paper No. 15/135 (June 2015); Kiley, Michael T., "What Can the Data Tell Us About the Equilibrium Real Interest Rate?", Finance and Economics Discussion Series 2015-077, Washington: Board of Governors of the Federal Reserve System (August 2015); Lubik, Thomas A. and Christian Matthes "Calculating the Natural Rate of Interest: A Comparison of Two Alternative Approaches", Richmond Fed Economic Brief (October 2015); Reza, Abeer and Subrata Sarker, "Is Slower Growth The New Normal In Advanced Economies?", Bank Of Canada Review (Autumn 2015); Hamilton, James, Ethan Harris, Jan Hatzius, and Kenneth West, "The Equilibrium Real Funds Rate: Past, Present and Future", working paper (May 2016); Holston, Kathryn, Thomas Laubach, and John C. Williams, "Measuring the Natural Rate of Interest: International Trends and Determinants", Federal Reserve Bank of San Francisco Working Paper 2016-11 (August 2016); Lansing, Kevin J., "Projecting the Long-Run Natural Rate of Interest", FRBSF Economic Letter 2016-25 (August 2016).
- <sup>5</sup> Sources of long-term inflation expectations: The Livingston Survey, dated June 8, 2016; Survey of Professional Forecasters, Third Quarter 2016; (August 12, 2016) Cleveland Federal Reserve's Inflation Expectations, released October 18, 2016; *Blue Chip Financial Forecasts* dated June 1, 2016 and November 1, 2016; *Blue Chip Economic Indicators*, dated October 10, 2016; Philadelphia Federal Reserve, Aruoba Term Structure of Inflation, October 2016; the University of Michigan Inflation Expectations, October 2016.
- <sup>6</sup> For a more detailed discussion of some of these and other factors, see, for example, Rachel, Lukasz and Thomas D Smith "Secular drivers of the global real interest rate", Bank of England Staff Working Paper No. 571, December 2015. Also, consider reviewing Chapter 3 of the Duff & Phelps 2016 *Valuation Handbook – Guide to Cost of Capital* (Hoboken, NJ: John Wiley & Sons, 2016).
- <sup>7</sup> Beginning with the global financial crisis of 2008 (the "Financial Crisis"), analysts have had to reexamine whether the "spot" rate is still a reliable building block upon which to base their cost of equity capital estimates. The Financial Crisis challenged long-accepted practices and highlighted potential problems of simply continuing to use the spot yield-to-maturity on a safe government security as the risk-free rate, together with historical equity risk premiums, without any further adjustments.
- <sup>8</sup> The general framework for the normalization argument could be described as follows: (i) that the extremely-low rates we have experienced in recent years would not exist without the market intervention by "non-market" participants (i.e., central banks) pushing rates down "artificially", (ii) that these abnormally-low rates are not sustainable in the long-term, and (iii) that rates tend to revert to a mean that reflects the long-term relationship between nominal and real interest rates.
- <sup>9</sup> Source of government bond yields used herein is the Board of Governors of the Federal Reserve System website at: <https://www.federalreserve.gov/datadownload/Choose.aspx?rel=H15>.
- <sup>10</sup> For a complete table with Duff & Phelps recommended ERP and corresponding recommended risk-free rate since January 2008 through the present, visit: [www.duffandphelps.com/costofcapital](http://www.duffandphelps.com/costofcapital).



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## DUFF & PHELPS

September 5, 2017

Table: Equity Risk Premium & Risk-free Rates

**Duff & Phelps Recommended  
U.S. Equity Risk Premium (ERP) and  
Corresponding Risk-free Rates ( $R_f$ );  
January 2008–Present**

For additional information, please visit  
[www.duffandphelps.com/CostofCapital](http://www.duffandphelps.com/CostofCapital)

| <i>Date</i>   | <i>Risk-free Rate (<math>R_f</math>)</i>      | <i><math>R_f</math> (%)</i> | <i>Duff &amp; Phelps<br/>Recommended ERP<br/>(%)</i> | <i>What<br/>Changed</i> |
|---|---|-----------------------------|--|-------------------------|
| <b>Current Guidance:<br/>September 5, 2017 – UNTIL FURTHER NOTICE</b> | <b>Normalized 20-year U.S. Treasury yield</b> | <b>3.50</b>                 | <b>5.00</b>  | <b>ERP</b>              |
| November 15, 2016 – September 4, 2017                                 | Normalized 20-year U.S. Treasury yield        | 3.50                        | 5.50   | $R_f$                   |
| January 31, 2016 – November 14, 2016                                  | Normalized 20-year U.S. Treasury yield        | 4.00                        | 5.50   | ERP                     |
| December 31, 2015   | Normalized 20-year U.S. Treasury yield        | 4.00                        | 5.00   |                         |
| December 31, 2014   | Normalized 20-year U.S. Treasury yield        | 4.00                        | 5.00   |                         |
| December 31, 2013   | Normalized 20-year U.S. Treasury yield        | 4.00                        | 5.00   |                         |
| February 28, 2013 – January 30, 2016                                  | Normalized 20-year U.S. Treasury yield        | 4.00                        | 5.00   | ERP                     |
| December 31, 2012   | Normalized 20-year U.S. Treasury yield        | 4.00                        | 5.50   |                         |
| January 15, 2012 – February 27, 2013                                  | Normalized 20-year U.S. Treasury yield        | 4.00                        | 5.50   | ERP                     |
| December 31, 2011   | Normalized 20-year U.S. Treasury yield        | 4.00                        | 6.00   |                         |
| September 30, 2011 – January 14, 2012                                 | Normalized 20-year U.S. Treasury yield        | 4.00                        | 6.00   | ERP                     |
| July 1 2011 – September 29, 2011                                      | Normalized 20-year U.S. Treasury yield        | 4.00                        | 5.50   | $R_f$                   |
| June 1, 2011 – June 30, 2011  | Spot 20-year U.S. Treasury yield              | Spot                        | 5.50   | $R_f$                   |
| May 1, 2011 – May 31, 2011  | Normalized 20-year U.S. Treasury yield        | 4.00                        | 5.50   | $R_f$                   |
| December 31, 2010   | Spot 20-year U.S. Treasury yield              | Spot                        | 5.50   |                         |
| December 1, 2010 – April 30, 2011                                     | Spot 20-year U.S. Treasury yield              | Spot                        | 5.50   | $R_f$                   |
| June 1, 2010 – November 30, 2010                                      | Normalized 20-year U.S. Treasury yield        | 4.00                        | 5.50   | $R_f$                   |
| December 31, 2009   | Spot 20-year U.S. Treasury yield              | Spot                        | 5.50   |                         |
| December 1, 2009 – May 31, 2010                                       | Spot 20-year U.S. Treasury yield              | Spot                        | 5.50   | ERP                     |
| June 1, 2009 – November 30, 2009                                      | Spot 20-year U.S. Treasury yield              | Spot                        | 6.00   | $R_f$                   |
| December 31, 2008   | Normalized 20-year U.S. Treasury yield        | 4.50                        | 6.00   |                         |
| November 1, 2008 – May 31, 2009                                       | Normalized 20-year U.S. Treasury yield        | 4.50                        | 6.00   | $R_f$                   |
| October 27, 2008 – October 31, 2008                                   | Spot 20-year U.S. Treasury yield              | Spot                        | 6.00   | ERP                     |
| January 1, 2008 – October 26, 2008                                    | Spot 20-year U.S. Treasury yield              | Spot                        | 5.00   | Initialized             |

\*Normalized\* in this context means that in months where the risk-free rate is deemed to be abnormally low, a proxy for a longer-term sustainable risk-free rate is used.

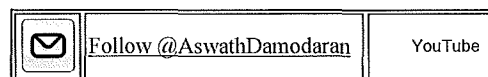
To learn more about cost of capital issues, and to ensure that you are using the most recent Duff & Phelps Recommended ERP, visit [www.duffandphelps.com/CostofCapital](http://www.duffandphelps.com/CostofCapital).

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*About Teaching Writing Data Tools Blog YouTube*



My name is Aswath Damodaran and I teach corporate finance and valuation at the Stern School of Business at New York University. I describe myself as a teacher first, who also happens to love untangling the puzzles of corporate finance and valuation, and writing about my experiences. As a result, I happen to be at the intersection of three businesses, education, publishing and financial services, that are all big, inefficiently run and deserve to be disrupted. I may not have the power to change the status quo in any of these businesses, but I can stir the pot, and this website is my attempt to do so.

Broadly speaking, the website is broken down into four sections. The first, teaching, includes all of my classes, starting with the MBA classes that I teach at Stern and including the shorter (2 to 3-day) executive sessions I have on corporate finance and valuation. You will find not only the material for the classes (lecture notes, quizzes) but also webcasts of the classes that you can access on different forums. I also have classes specifically tailored to an online audience on valuation, corporate finance and investment philosophies. The second, writing, includes links to almost everything I have written and continue to write, starting with my books and extending to my practitioner papers (on equity risk premiums, cash flows and other things valuation-related). The third, data, contains the annual updates that I provide on industry averages, for US and global companies, on both corporate finance and valuation metrics (including multiples). It is also where I provide my estimates of equity risk premiums and costs of capital. The fourth, tools, incorporates the spreadsheets that I have developed over time to value and analyze companies and short in-practice webcasts on how to analyze companies.

I have been told that my website is ugly and I apologize for its clunky look and feel. While some of you have offered to make it look better for me (and I thank you for your kindness), I need to be able to tweak, modify and adapt the website as I go along and to do that, I have to work with what I know about website design (which is not much). You can try the search engine below and if that does not work, try this [guide to the site](#).

#### Other Updates

##### Implied Equity Risk Premium Update

**Implied ERP on December 1, 2018**= 5.29% (Trailing 12 month, with adjusted payout), 5.68% (Trailing 12 month cash yield); 6.55% (Average CF yield last 10 years); 5.32% (Net cash yield); 4.00% (Normalized Earnings & Payout)

**Implied ERP in previous month**=5.32% (Trailing 12 month, with adjusted payout), 5.76% (Trailing 12 month cash yield); 6.64% (Average CF yield last 10 years); 5.38% (Net cash yield); 4.06% (Normalized Earnings & Payout)

##### Downloadable datasets:

1. [Implied ERP by month for previous months](#)
2. [Implied ERP \(annual\) from 1960 to Current](#)
3. [Spreadsheet to compute current ERP for current month](#)
4. [My annual update paper on ERP \(March 2018\)](#)
5. [My annual update paper on Country Risk \(July 2018\)](#)
6. My most recent data on ERP & CRP by country ([January 2018](#) & [July 2018](#))

**Teaching:** Corporate Finance ([MBA](#) and [undegraduate](#)) for Spring 2016 (and the Valuation class for Fall 2015 are now fully archived. The Valuation class for Fall 2016 is [archived here](#). The Spring 2017 Corporate Finance class can be [found here](#) and the Spring 2017 Valuation (undergraduate) class is [linked here](#). I will be back teaching both classes in the spring of 2019.

**Writing:** Paper on [valuing Tesla \(with Brad Cornell\)](#) won readers' award (Bernstein-Levy) in Journal of Portfolio Management. Download the latest version of my annual equity risk premium update by [clicking here](#) and the latest version of my annual country risk update by [clicking here](#). My book on Narrative and Numbers, from Columbia University Press, should be in bookstores and the third edition of The Dark Side of Valuation will be out in 2018.

**Data:** The latest overall data update was on January 5, 2018. My country risk premiums get updated midyear as well; here is the [July 2018 update](#). Check under data for downloads and links, as well as archived data from prior years.

**Tools:** Check under tools for additions to spreadsheets and webcast. uValue is available at the iTunes store.

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## The Equity Risk Premium in 2018

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### ABSTRACT

We analyze the history of the equity risk premium from surveys of U.S. Chief Financial Officers (CFOs) conducted every quarter from June 2000 to December 2017. The risk premium is the expected 10-year S&P 500 return relative to a 10-year U.S. Treasury bond yield. The average risk premium is 4.42% and is somewhat higher than the average observed over the past 18 years. We also provide results on the risk premium disagreement among respondents as well as asymmetry or skewness of risk premium estimates. We also link our risk premium results to survey-based measures of the weighted average cost of capital and investment hurdle rates. The hurdle rates are significantly higher than the cost of capital implied by the market risk premium estimates.

JEL Classification: *G11, G31, G12, G14*

Keywords: *Cost of capital, financial crisis, equity premium, WACC, hurdle rate, long-term market returns, stock return forecasts, long-term equity returns, expected excess returns, disagreement, individual uncertainty, skewness, asymmetry, survey methods, TIPS, VIX, credit spreads*

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## **Introduction**

We analyze the results of the most recent survey of Chief Financial Officers (CFOs) conducted by Duke University and *CFO Magazine*. The survey closed on December 7, 2017 and measures expectations beginning in the first quarter of 2018. In particular, we poll CFOs about their long-term expected return on the S&P 500. Given the current U.S. 10-year Treasury bond yield, we provide estimates of the equity risk premium and show how the premium changes through time. We also provide information on the disagreement over the risk premium as well as average confidence intervals. Finally, we link the equity risk premium to measures used to evaluate firm's investments: the weighted average cost of capital (WACC) and the investment hurdle rate.

### **1. Method**

#### *2.1 Design*

The quarterly survey of CFOs was initiated in the third quarter of 1996.<sup>1</sup> Every quarter, Duke University polls financial officers with a short survey on important topical issues (Graham and Harvey, 2009). The usual response rate for the quarterly survey is 5%-8%. Starting in June of 2000, a question on expected stock market returns was added to the survey. Fig. 1 summarizes the results from the risk premium question. While the survey asks for both the one-year and ten-year expected returns, we focus on the ten-year expected returns herein, as a proxy for the market risk premium.

The executives have the job title of CFO, Chief Accounting Officer, Treasurer, Assistant Treasurer, Controller, Assistant Controller, or Vice President (VP), Senior VP or Executive VP of Finance. Given that the majority of survey respondents hold the CFO title, for simplicity we refer to the entire group as CFOs.

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<sup>1</sup> The surveys from 1996Q3-2004Q2 were partnered with a national organization of financial executives. The 2004Q3 and 2004Q4 surveys were solely Duke University surveys, which used Duke mailing lists (previous survey respondents who volunteered their email addresses) and purchased email lists. The surveys from 2005Q1 to present are partnered with *CFO magazine*. The sample includes both the Duke mailing lists and the *CFO* subscribers that meet the criteria for policy-making positions.

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*2.2 Delivery and response*

In the early years of the survey, the surveys were faxed to executives. The delivery mechanism was changed to the Internet starting with the December 4, 2001 survey. Respondents are given four business days to fill out the survey, and then a reminder is sent allowing another four days. Usually, two-thirds of the surveys are returned within two business days.

The response rate of 5-8% could potentially lead to a non-response bias. There are six reasons why we are not overly concerned with the response rate. First, we do not manage our email list. If we deleted the email addresses that had not responded to the survey in the past 12 quarters, our response rate would be in the 15-20% range – which is a good response rate. Second, Graham and Harvey (2001) conduct a standard test for non-response biases (which involves comparing the results of those that fill out the survey early to the ones that fill it out late) and find no evidence of bias. Third, Brav, Graham, Harvey and Michaely (2005) conduct a captured sample survey at a national conference in addition to an Internet survey. The captured survey responses (to which over two-thirds participated) are qualitatively identical to those for the Internet survey (to which 8% responded), indicating that non-response bias does not significantly affect their results. Fourth, Brav et al. contrast survey responses to archival data from Compustat and find archival evidence for the universe of Compustat firms that is consistent with the responses from the survey sample. Fifth, Campello, Graham, and Harvey (2011) show that the December 2008 response sample is fairly representative of the firms included in the commonly used Compustat database. Sixth, Graham, Harvey, Popadak and Rajgopal (2017) update the non-response bias test in a survey of 1,900 CFOs and find no evidence of non-response bias.

*2.3 Data integrity*

In each quarter, implement a series of rules to ensure the integrity of the data. We have, on average, 351 responses each quarter. There are a total of 24,812 survey observations. There are six key pieces of data: 1) the 10-year forecast (LT); 2) lower 10% of 10-year forecast (LLT); and 3) upper 10% of the 10-year forecast (ULT). We collect the analogous information for the one-year

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S&P 500 forecasts too (ST). This paper focuses on the 10-year forecasts but the short-term forecasts factor into our data filters.

Our exclusion rules are the following:

1. Delete all missing forecasts, LT, ST
2. Delete all negative LT forecasts (not ST forecasts)
3. Delete all observations that failed to use percentages (forecasts<1.0 for both ST and LT)
4. Delete observations where they failed to annualize, i.e. delete if LT>30% (does not apply to ST)
5. Delete if ST>100%.
6. Delete if lower intervals inconsistent, i.e. LST>=ST or LLT>=LT.
7. Delete if upper intervals inconsistent, i.e. UST<=ST or ULT<=LT.
8. Delete if ST-LST and UST-ST both equal 1 (we call this a lazy answer)
9. Delete if LT-LLT and ULT-LT both equal 1 (again, a lazy answer)

#### *2.4 The 2018 results*

The expected market return questions are a subset of a larger set of questions in the quarterly survey of CFOs. The survey usually contains between eight and ten questions. Some of the questions are repeated every quarter and some change through time depending on economic conditions. The historical surveys can be accessed at <http://www.cfosurvey.org>. Appendix 1 shows the risk premium question in the most recent survey.

While the survey is anonymous, we collect demographic information on seven firm characteristics, including industry, sales revenue, number of employees, headquarters location, ownership (public or private), and proportion of foreign sales.

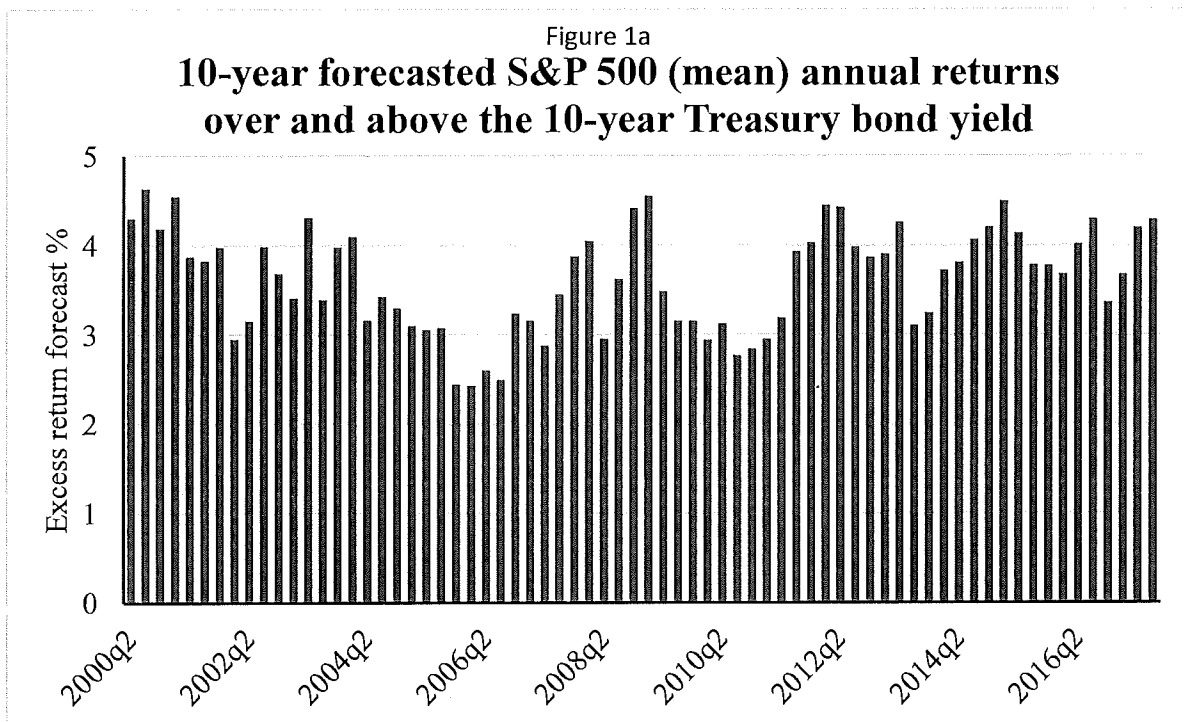
During the past 18 years, we have collected almost 25,000 responses to the survey. Panel A of Table 1 presents the date that the survey window opened, the number of responses for each survey, the 10-year Treasury bond rate, as well as the average and median expected excess returns. There is relatively little time variation in the risk premium. This is confirmed in Fig. 1a, which displays the historical risk premiums contained in Table 1. The current premium, 4.42%, is above the historical average of 3.64%. The December 2017 survey shows that the expected



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annual S&P 500 return is 6.79% (=4.42%+2.37%) which is slightly below the overall average of 7.11%. The total return forecasts are presented in Fig. 1b.<sup>2</sup>

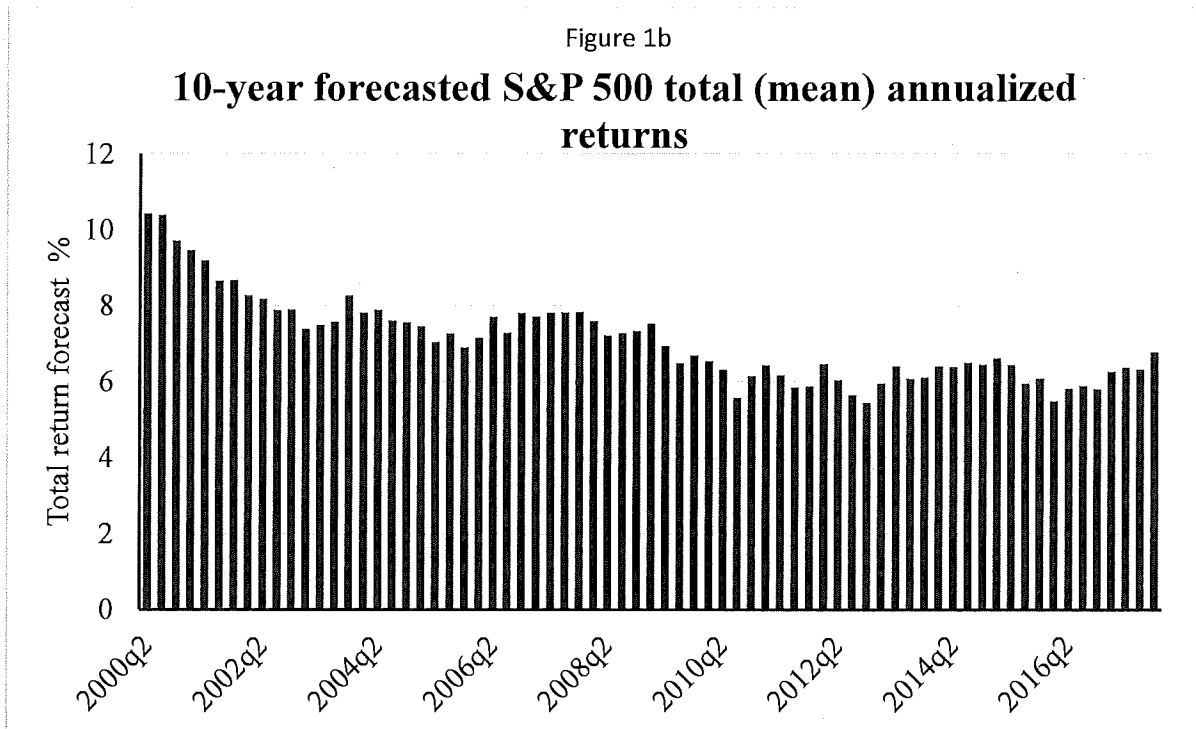
Panel B of Table 1 presents some summary statistics that pool all responses through the 18 year history of the survey. The overall average ten-year risk premium return is 3.64%.<sup>3</sup> The standard deviation of the individual responses is 2.93% (see Panel B). The standard deviation of the quarterly risk premium estimates is 0.58%.



<sup>2</sup> See, for example, Ghysels (1998), Welch (2000, 2001, 2009), Ghysels (1998), Fraser (2001), Harris and Marston (2001), Pástor and Stambaugh (2001), Fama and French (2002), Goyal and Welch (2003), Graham and Harvey (2003), Ang and Bekaert (2005), Fernandez (2004, 2006, 2009) for studies of the risk premium.

<sup>3</sup> Using the Ibbotson Associates data from January 1926 through July 2010, the arithmetic (geometric) average return on the S&P 500 over and above the 30-day U.S. Treasury bill is 7.75% (5.80%). Using data from April 1953-July 2010, the arithmetic (geometric) risk premium is 6.27% (5.12%). The risk premium over the 10 year bond should be reduced by 212 basis points for the arithmetic premium and 174 basis points for the geometric premium. Fama and French (2002) study the risk premium on the S&P 500 from 1872-2000 using fundamental data. They argue that the ex ante risk premia is between 2.55% and 4.32% for 1951-2000 period. Ibbotson and Chen (2001) estimate a long-term risk premium between 4 and 6%. Also see Siegel (1999), Asness (2000), Heaton and Lucas (2000) and Jagannathan, McGratten and Scherbina (2001). A recent treatment is Sharpe and Suarez (2013).

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The cross-sectional standard deviation across the individual CFO forecasts in a quarter is a measure of the disagreement or dispersion of the participants in each survey. Dispersion sharply increased during the global financial crisis. The average disagreement in 2005 was 2.39%. Disagreement increased in 2006 to 2.64%. As the crisis began in 2007, disagreement increased to 2.98 by March 2008. The peak disagreement was recorded in February 2009 (4.13%). The most recent observation is 3.49%.

We also report information on the average of the CFOs’ assessments of the one in ten chance that the market will exceed or fall below a certain level. In the most recent survey, the worst case total return is +0.85% which is lower than the historic average of 1.45%. The best-case return is 10.97% which is very close to the historical average of 10.90%.

With information on the 10% tails, we construct a probability distribution for each respondent. We use Davidson and Cooper’s (1976) method to recover each respondent’s probability distribution:

$$\text{Variance} = ([x(0.90)-x(0.10)]/2.65)^2$$

where  $x(0.90)$  and  $x(0.10)$  represent the 90<sup>th</sup> and 10<sup>th</sup> percentiles of the respondent’s distribution,

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ULT and LLT. Keefer and Bodily (1983) show that this simple approximation is the preferred method of estimating the variance of a probability distribution of random variables, given information about the 10<sup>th</sup> and 90<sup>th</sup> percentiles. Like disagreement, the average of individual volatilities peaked in February 2009 at 4.29%. The current level, 3.80%, is very close to the overall average, 3.52%.

There is also a natural measure of asymmetry in each respondent's response. We look at the difference between each individual's 90% tail and the mean forecast and the mean minus the 10% tail. Hence, if the respondent's forecast of the excess return is 6% and the tails are -8% and +11%, then the distribution is negatively skewed with a value of -9% (=5%-14%). As with the usual measure of skewness, we cube this quantity and standardize by dividing by the cube of the individual standard deviation. In every quarter's survey, there is on average negative skewness in the individual forecasts. The average asymmetry -0.66 which is slightly lower than the average of -0.48.



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Table 1  
Summary statistics based on the responses from the  
71 CFO Outlook Surveys from June 2000 to Sept 2017 (Maximums in red, minimums in green)

A. By quarter

| #                   | Survey date | Survey quarter | Number of survey responses | 10-year bond yield | Total market return forecast | Average risk premium | Median risk premium | Disagreement (standard deviation of risk premium estimates) | Average of individual standard deviations | Average of individuals' worst 10% market return scenario | Average of individuals' best 10% market return scenario | Skewness of risk premium estimates | Average of individuals' asymmetry | % who forecast negative excess return |
|---------------------|-------------|----------------|----------------------------|--------------------|------------------------------|----------------------|---------------------|---|---|--|---|------------------------------------|-----------------------------------|---------------------------------------|
| 1                   | 6/6/2000    | 2000Q2         | 209                        | 6.14               | 10.45                        | 4.31                 | 3.86                | 3.22  |   |  |   | 0.95                               |                                   | 9.09                                  |
| 2                   | 9/7/2000    | 2000Q3         | 188                        | 5.76               | 10.40                        | 4.64                 | 4.24                | 3.03  |   |  |   | 0.83                               |                                   | 4.79                                  |
| 3                   | 12/4/2000   | 2000Q4         | 243                        | 5.53               | 9.72                         | 4.19                 | 4.47                | 2.52  |   |  |   | 0.53                               |                                   | 4.12                                  |
| 4                   | 3/12/2001   | 2001Q1         | 140                        | 4.92               | 9.47                         | 4.55                 | 4.58                | 2.91  |   |  |   | 0.78                               |                                   | 3.57                                  |
| 5                   | 6/7/2001    | 2001Q2         | 208                        | 5.33               | 9.21                         | 3.88                 | 3.67                | 2.64  |   |  |   | 0.58                               |                                   | 5.77                                  |
| 6                   | 9/10/2001   | 2001Q3         | 199                        | 4.84               | 8.67                         | 3.83                 | 3.16                | 2.53  |   |  |   | 0.13                               |                                   | 3.52                                  |
| 7                   | 12/4/2001   | 2001Q4         | 279                        | 4.70               | 8.68                         | 3.98                 | 3.30                | 2.43  |   |  |   | 0.61                               |                                   | 2.15                                  |
| 8                   | 3/11/2002   | 2002Q1         | 233                        | 5.33               | 8.29                         | 2.96                 | 2.67                | 2.43  | 3.28                                      | 3.68   | 12.42   | 1.06                               | -0.28                             | 11.16                                 |
| 9                   | 6/4/2002    | 2002Q2         | 316                        | 5.04               | 8.20                         | 3.16                 | 2.96                | 2.61  | 3.50                                      | 3.00   | 12.28   | 1.86                               | -0.39                             | 10.44                                 |
| 10                  | 9/16/2002   | 2002Q3         | 361                        | 3.90               | 7.89                         | 3.99                 | 4.10                | 2.31  | 3.39                                      | 3.05   | 12.03   | 0.86                               | -0.25                             | 2.77                                  |
| 11                  | 12/2/2002   | 2002Q4         | 285                        | 4.22               | 7.91                         | 3.69                 | 3.78                | 2.56  | 3.23                                      | 3.32   | 11.87   | 1.24                               | -0.28                             | 4.91                                  |
| 12                  | 3/19/2003   | 2003Q1         | 184                        | 3.98               | 7.40                         | 3.42                 | 3.02                | 2.37  | 3.59                                      | 1.95   | 11.47   | 0.83                               | -0.62                             | 4.35                                  |
| 13                  | 6/16/2003   | 2003Q2         | 366                        | 3.18               | 7.50                         | 4.32                 | 4.82                | 2.34  | 3.74                                      | 2.16   | 12.07   | 0.90                               | -0.33                             | 3.28                                  |
| 14                  | 9/18/2003   | 2003Q3         | 167                        | 4.19               | 7.58                         | 3.39                 | 3.81                | 2.07  | 2.83                                      | 3.31   | 10.83   | 0.35                               | -0.43                             | 6.59                                  |
| 15                  | 12/10/2003  | 2003Q4         | 220                        | 4.30               | 8.29                         | 3.98                 | 3.70                | 2.66  | 3.29                                      | 3.40   | 12.10   | 1.74                               | -0.45                             | 2.27                                  |
| 16                  | 3/24/2004   | 2004Q1         | 206                        | 3.73               | 7.83                         | 4.10                 | 4.27                | 2.37  | 3.46                                      | 2.85   | 12.02   | 0.50                               | -0.29                             | 3.88                                  |
| 17                  | 6/16/2004   | 2004Q2         | 177                        | 4.74               | 7.90                         | 3.16                 | 3.26                | 2.61  | 3.10                                      | 3.14   | 11.34   | 2.14                               | -0.40                             | 6.21                                  |
| 18                  | 9/10/2004   | 2004Q3         | 179                        | 4.19               | 7.62                         | 3.43                 | 3.31                | 2.92  | 3.27                                      | 2.61   | 11.29   | 2.02                               | -0.52                             | 8.94                                  |
| 19                  | 12/3/2004   | 2004Q4         | 287                        | 4.27               | 7.57                         | 3.30                 | 3.23                | 2.66  | 3.05                                      | 3.10   | 11.17   | 1.89                               | -0.37                             | 5.92                                  |
| 20                  | 2/28/2005   | 2005Q1         | 272                        | 4.36               | 7.46                         | 3.10                 | 3.39                | 2.52  | 3.06                                      | 3.13   | 11.23   | 1.29                               | -0.33                             | 6.62                                  |
| 21                  | 5/31/2005   | 2005Q2         | 316                        | 4.00               | 7.06                         | 3.06                 | 3.00                | 2.22  | 3.22                                      | 2.39   | 10.93   | 0.46                               | -0.26                             | 6.65                                  |
| 22                  | 8/29/2005   | 2005Q3         | 321                        | 4.20               | 7.28                         | 3.08                 | 2.80                | 2.61  | 3.36                                      | 2.15   | 11.06   | 2.42                               | -0.52                             | 7.48                                  |
| 23                  | 11/21/2005  | 2005Q4         | 338                        | 4.46               | 6.91                         | 2.45                 | 2.54                | 2.20  | 3.48                                      | 2.23   | 11.44   | 0.41                               | -0.23                             | 9.76                                  |
| 24                  | 3/6/2006    | 2006Q1         | 276                        | 4.74               | 7.17                         | 2.43                 | 2.26                | 2.40  | 3.44                                      | 2.07   | 11.18   | 1.02                               | -0.37                             | 8.70                                  |
| 25                  | 6/1/2006    | 2006Q2         | 494                        | 5.11               | 7.72                         | 2.61                 | 2.89                | 2.74  | 3.29                                      | 3.00   | 11.70   | 1.84                               | -0.24                             | 18.02                                 |
| 26                  | 9/11/2006   | 2006Q3         | 460                        | 4.80               | 7.30                         | 2.50                 | 2.20                | 2.49  | 3.32                                      | 2.53   | 11.33   | 1.32                               | -0.33                             | 7.83                                  |
| 27                  | 11/21/2006  | 2006Q4         | 386                        | 4.58               | 7.82                         | 3.24                 | 3.42                | 2.93  | 3.36                                      | 2.94   | 11.82   | 1.91                               | -0.30                             | 6.99                                  |
| 28                  | 3/1/2007    | 2007Q1         | 380                        | 4.56               | 7.72                         | 3.16                 | 3.44                | 2.39  | 3.38                                      | 2.73   | 11.67   | 1.80                               | -0.39                             | 5.53                                  |
| 29                  | 6/1/2007    | 2007Q2         | 419                        | 4.95               | 7.83                         | 2.88                 | 3.05                | 2.14  | 3.21                                      | 3.08   | 11.58   | 0.56                               | -0.37                             | 3.58                                  |
| 30                  | 9/7/2007    | 2007Q3         | 479                        | 4.38               | 7.84                         | 3.46                 | 3.62                | 2.82  | 3.12                                      | 3.33   | 11.59   | 1.80                               | -0.34                             | 5.22                                  |
| 31                  | 11/30/2007  | 2007Q4         | 458                        | 3.97               | 7.85                         | 3.88                 | 4.03                | 2.75  | 3.31                                      | 2.93   | 11.70   | 1.38                               | -0.32                             | 3.28                                  |
| 32                  | 3/7/2008    | 2008Q1         | 381                        | 3.56               | 7.61                         | 4.05                 | 4.44                | 2.99  | 3.21                                      | 3.08   | 11.58   | 2.23                               | -0.30                             | 3.94                                  |
| 33                  | 6/13/2008   | 2008Q2         | 384                        | 4.27               | 7.23                         | 2.96                 | 2.73                | 2.60  | 3.32                                      | 2.44   | 11.24   | 1.50                               | -0.41                             | 9.38                                  |
| 34                  | 9/5/2008    | 2008Q3         | 432                        | 3.66               | 7.29                         | 3.63                 | 3.34                | 2.79  | 3.31                                      | 2.30   | 11.06   | 1.71                               | -0.42                             | 4.63                                  |
| 35                  | 11/28/2008  | 2008Q4         | 534                        | 2.93               | 7.35                         | 4.42                 | 4.07                | 3.19  | 3.73                                      | 1.77   | 11.64   | 1.94                               | -0.37                             | 2.81                                  |
| 36                  | 2/26/2009   | 2009Q1         | 443                        | 2.98               | 7.54                         | 4.56                 | 4.02                | 4.13  | 4.29                                      | 1.18   | 12.54   | 1.80                               | -0.47                             | 5.87                                  |
| 37                  | 5/29/2009   | 2009Q2         | 427                        | 3.47               | 6.96                         | 3.49                 | 3.53                | 3.12  | 3.73                                      | 1.37   | 11.26   | 1.79                               | -0.42                             | 6.56                                  |
| 38                  | 9/11/2009   | 2009Q3         | 536                        | 3.34               | 6.50                         | 3.16                 | 2.66                | 2.88  | 3.87                                      | 0.62   | 10.86   | 1.82                               | -0.46                             | 10.82                                 |
| 39                  | 12/11/2009  | 2009Q4         | 457                        | 3.55               | 6.71                         | 3.16                 | 2.45                | 3.56  | 3.86                                      | 0.64   | 10.88   | 2.38                               | -0.52                             | 9.85                                  |
| 40                  | 2/26/2010   | 2010Q1         | 478                        | 3.61               | 6.56                         | 2.95                 | 2.39                | 3.28  | 3.96                                      | 0.39   | 10.86   | 2.31                               | -0.68                             | 9.41                                  |
| 41                  | 6/4/2010    | 2010Q2         | 444                        | 3.20               | 6.33                         | 3.13                 | 2.80                | 3.08  | 3.90                                      | 0.33   | 10.64   | 2.61                               | -0.64                             | 9.91                                  |
| 42                  | 9/10/2010   | 2010Q3         | 451                        | 2.81               | 5.59                         | 2.78                 | 2.19                | 2.53  | 4.21                                      | -1.16  | 9.99  | 0.77                               | -0.67                             | 8.65                                  |
| 43                  | 12/10/2010  | 2010Q4         | 402                        | 3.32               | 6.17                         | 2.85                 | 2.68                | 2.62  | 3.91                                      | 0.26   | 10.63   | 1.89                               | -0.55                             | 10.70                                 |
| 44                  | 3/4/2011    | 2011Q1         | 429                        | 3.49               | 6.45                         | 2.96                 | 2.51                | 2.92  | 4.16                                      | -0.27  | 10.76   | 2.44                               | -0.70                             | 8.16                                  |
| 45                  | 6/3/2011    | 2011Q2         | 406                        | 2.99               | 6.18                         | 3.19                 | 3.01                | 2.90  | 3.90                                      | 0.12   | 10.45   | 2.09                               | -0.68                             | 5.17                                  |
| 46                  | 9/9/2011    | 2011Q3         | 397                        | 1.93               | 5.86                         | 3.93                 | 3.07                | 3.11  | 3.79                                      | 0.04   | 10.09   | 2.41                               | -0.54                             | 2.02                                  |
| 47                  | 12/16/2011  | 2011Q4         | 439                        | 1.86               | 5.89                         | 4.03                 | 3.14                | 2.98  | 4.07                                      | -0.11  | 10.68   | 1.91                               | -0.36                             | 3.42                                  |
| 48                  | 3/1/2012    | 2012Q1         | 406                        | 2.03               | 6.48                         | 4.45                 | 3.97                | 2.97  | 4.07                                      | 0.30   | 11.08   | 2.25                               | -0.59                             | 2.71                                  |
| 49                  | 5/30/2012   | 2012Q2         | 338                        | 1.63               | 6.06                         | 4.43                 | 4.37                | 2.96  | 3.94                                      | 0.00   | 10.42   | 1.96                               | -0.59                             | 2.37                                  |
| 50                  | 9/7/2012    | 2012Q3         | 675                        | 1.67               | 5.66                         | 3.99                 | 3.33                | 3.00  | 3.66                                      | -0.01  | 9.67  | 2.04                               | -0.58                             | 2.37                                  |
| 51                  | 12/6/2012   | 2012Q4         | 325                        | 1.59               | 5.46                         | 3.87                 | 3.41                | 2.59  | 3.69                                      | -0.49  | 9.25  | 1.42                               | -0.62                             | 3.08                                  |
| 52                  | 3/8/2013    | 2013Q1         | 418                        | 2.06               | 5.97                         | 3.91                 | 3.94                | 2.73  | 3.84                                      | -0.14  | 10.02   | 2.01                               | -0.64                             | 4.55                                  |
| 53                  | 5/31/2013   | 2013Q2         | 300                        | 2.16               | 6.43                         | 4.27                 | 3.84                | 2.91  | 4.02                                      | 0.10   | 10.76   | 1.63                               | -0.67                             | 2.67                                  |
| 54                  | 9/5/2013    | 2013Q3         | 404                        | 2.98               | 6.09                         | 3.11                 | 3.02                | 2.73  | 3.41                                      | 0.75   | 9.77  | 1.71                               | -0.53                             | 6.68                                  |
| 55                  | 12/5/2013   | 2013Q4         | 320                        | 2.88               | 6.13                         | 3.25                 | 3.12                | 2.95  | 3.81                                      | 0.18   | 10.26   | 1.69                               | -0.50                             | 7.19                                  |
| 56                  | 3/4/2014    | 2014Q1         | 291                        | 2.70               | 6.43                         | 3.73                 | 3.30                | 2.63  | 3.32                                      | 1.35   | 10.13   | 0.64                               | -0.69                             | 5.15                                  |
| 57                  | 6/5/2014    | 2014Q2         | 325                        | 2.59               | 6.41                         | 3.82                 | 3.41                | 3.23  | 3.76                                      | 0.50   | 10.46   | 1.89                               | -0.64                             | 7.08                                  |
| 58                  | 9/4/2014    | 2014Q3         | 316                        | 2.45               | 6.52                         | 4.07                 | 3.55                | 3.33  | 3.69                                      | 0.90   | 10.68   | 2.56                               | -0.60                             | 3.16                                  |
| 59                  | 12/4/2014   | 2014Q4         | 398                        | 2.25               | 6.46                         | 4.21                 | 4.50                | 2.51  | 3.79                                      | 0.46   | 10.51   | 1.22                               | -0.59                             | 2.26                                  |
| 60                  | 3/13/2015   | 2015Q1         | 414                        | 2.13               | 6.63                         | 4.50                 | 3.87                | 3.50  | 3.72                                      | 0.81   | 10.68   | 1.92                               | -0.55                             | 5.80                                  |
| 61                  | 6/4/2015    | 2015Q2         | 399                        | 2.31               | 6.45                         | 4.14                 | 3.69                | 3.03  | 3.96                                      | 0.20   | 10.68   | 1.93                               | -0.72                             | 4.26                                  |
| 62                  | 9/3/2015    | 2015Q3         | 376                        | 2.18               | 5.96                         | 3.78                 | 2.82                | 3.17  | 3.48                                      | 0.28   | 9.49  | 2.72                               | -0.72                             | 3.99                                  |
| 63                  | 12/3/2015   | 2015Q4         | 347                        | 2.33               | 6.11                         | 3.78                 | 2.67                | 3.58  | 3.55                                      | 0.54   | 9.94  | 1.92                               | -0.52                             | 9.22                                  |
| 64                  | 3/3/2016    | 2016Q1         | 476                        | 1.83               | 5.51                         | 3.68                 | 3.17                | 2.55  | 3.12                                      | 1.04   | 9.29  | 0.99                               | -0.34                             | 3.15                                  |
| 65                  | 6/2/2016    | 2016Q2         | 472                        | 1.81               | 5.83                         | 4.02                 | 3.19                | 3.24  | 3.52                                      | 0.39   | 9.71  | 2.14                               | -0.63                             | 2.54                                  |
| 66                  | 9/8/2016    | 2016Q3         | 372                        | 1.61               | 5.91                         | 4.30                 | 3.64                | 2.93  | 3.45                                      | 0.64   | 9.77  | 1.90                               | -0.55                             | 1.61                                  |
| 67                  | 12/1/2016   | 2016Q4         | 263                        | 2.45               | 5.82                         | 3.37                 | 3.55                | 2.69  | 3.34                                      | 0.56   | 9.39  | 2.24                               | -0.68                             | 5.32                                  |
| 68                  | 3/9/2017    | 2017Q1         | 278                        | 2.60               | 6.28                         | 3.68                 | 3.40                | 3.31  | 3.27                                      | 1.64   | 10.31   | 2.29                               | -0.42                             | 5.76                                  |
| 69                  | 6/8/2017    | 2017Q2         | 300                        | 2.19               | 6.39                         | 4.20                 | 3.81                | 3.06  | 3.60                                      | 0.90   | 10.43   | 2.60                               | -0.43                             | 2.67                                  |
| 70                  | 9/7/2017    | 2017Q3         | 301                        | 2.05               | 6.34                         | 4.29                 | 3.95                | 2.77  | 3.88                                      | 0.20   | 10.48   | 1.64                               | -0.52                             | 2.99                                  |
| 71                  | 12/7/2017   | 2017Q4         | 212                        | 2.37               | 6.79                         | 4.42                 | 3.63                | 3.49  | 3.80                                      | 0.85   | 10.97   | 2.06                               | -0.66                             | 4.25                                  |
| Average of quarters |             |                | 351                        | 3.48               | 7.11                         | 3.63                 | 3.39                | 2.81  | 3.56                                      | 1.46   | 10.90   | 1.58                               | -0.48                             | 5.73                                  |
| Standard deviation  |             |                |                            | 1.20               | 1.13                         | 0.58                 | 0.62                | 0.38  | 0.33                                      | 1.29   | 0.81  | 0.66                               | 0.14                              | 3.03                                  |

B. By individual responses

| Survey for |        |      |      |      |      |      |      |      |       |      |       |      |  |
|------------|--------|------|------|------|------|------|------|------|-------|------|-------|------|--|
| All dates  | 24,812 | 3.32 | 6.94 | 3.62 | 3.33 | 2.93 | 3.60 | 1.33 | 10.86 | 1.67 | -0.48 | 5.79 |  |

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*2.5 Risk premia, weighted average cost of capital and hurdle rates*

The risk premia that we measure can be used in the calculation of the cost of capital. In a simple capital asset pricing model, the cost of equity capital would be the product of the company's beta times the risk premium along with the risk free rate. The average firm's cost of equity capital would be 6.79% (assuming a beta=1). Assuming the Baa bond yield (4.22%) is the borrowing rate and a 25% marginal tax rate as well as a 75%-25% debt equity split, the weighted average cost of capital would be about 5.89%.

In previous surveys, we have asked CFOs about their weighted average cost of capital. For example, in March of 2011, companies told us that their internally calculated weighted average cost of capital was 10% (averaged across respondents). At the time, the cost of equity capital was similar to today, 6.45%. The bond yields were higher, with the Baa yielding 6.09%. The average firm (assuming average beta is 1.0) without any debt would have a WACC of 6.45%. When debt is introduced, the WACC would be less than 6.45% -- which is sharply lower than the reported 10%.

Why is there such a divergence? One possible reason is that companies consider other factors in calculating the WACC – perhaps a multifactor model.<sup>4</sup> However, there is no evidence supporting this hypothesis. For example, consultants often add a premium for smaller firms based on the results in many research papers of a size premium. However, in our survey the average WACC for firms with less than \$25 million in revenue is 10.6% and the WACC for the largest firms with annual revenue greater than \$10 billion is 10.5%.

This analysis was replicated in June of 2012 with similar results. Given the same assumptions, the WACC is 5.37%. However, the average self-reported WACC is 9.3%. Again, there is no evidence of a size premium. The smallest firms reported a WACC of 9.3% and the largest firms 9.7%.

The WACC should not be confused with the investment hurdle rate. The WACC is an analytical calculation that combines a model-based cost of equity (such as the CAPM) and the after-tax cost

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<sup>4</sup> Graham and Harvey (2001) find that most companies use a one-factor CAPM model for cost of capital calculations.

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of debt (reflected in current borrowing rates). Given capital constraints, firms often impose a higher hurdle rate on their investments. For example, to allocate capital to an investment that promises a projected return exactly at the firm's WACC is equivalent to accepting a zero net present value project.

The June 2012 survey also asked for the investment hurdle rates. They are much higher than the WACCs. The average rate was 13.5% (compared to the survey-reported WACC of 9.3% and the implied WACC from the survey based risk premium of 5.7%. Similar to the WACC results, there is no evidence that the hurdle rates are higher for small firms. Our evidence shows that the reported average hurdle rate for the smallest firms is 13.1% and for the largest firms the rate is 14.2%.

Even though we know from Graham and Harvey (2001) that three quarters of companies use the capital asset pricing model, there is a large gap between an imputed WACC and the WACC that people use. One way to reconcile this is that companies use very long term averages of equity and bond premia in their calculations. For example, suppose the cost of capital is being calculated with averages from 1926. Ibbotson (2013) reports an arithmetic average return of 11.8% over the 1926-2012 period. The average return on corporate bonds is 6.4%. Using the same parameters, we get an imputed WACC of 9.7%. This is very close to the average reported WACC and, indeed, identical to the WACC reported by the largest firms in our survey.

We learn the following: 1) the equity risk premium is much lower today than averages used over long-periods (e.g. from 1926) such as reported in Morningstar (2013) and Duff and Phelps (2015); 2) the survey questions asking directly about a company's WACC is consistent with companies routinely using long-horizon averages for inputs; and 3) WACCs should be thought as lower bounds – the Hurdle Rates used for actual investment decisions are 400bp higher than the stated WACCs.<sup>5</sup>

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<sup>5</sup> Also see Sharpe and Suarez (2013) and Jagannathan et al. (2016) who analyze our CFO survey data.



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*2.6 Recessions, the financial crisis and risk premia*

Our survey spans two recessions: March 2001-September 2001 as well as the recession that begins in December 2007 and ends in June 2009. Financial theory would suggest that risk premia should vary with the business cycle. Premiums should be highest during recessions and lowest during recoveries. Previous research has used a variety of methods including looking at ex post realized returns to investigate whether there is business-cycle like variation in risk premia.

While we only have 60 observations and this limits our statistical analysis, we almost no differences. During recessions, the risk premium is 3.52% and during non-recessions, the premium is 3.68%.

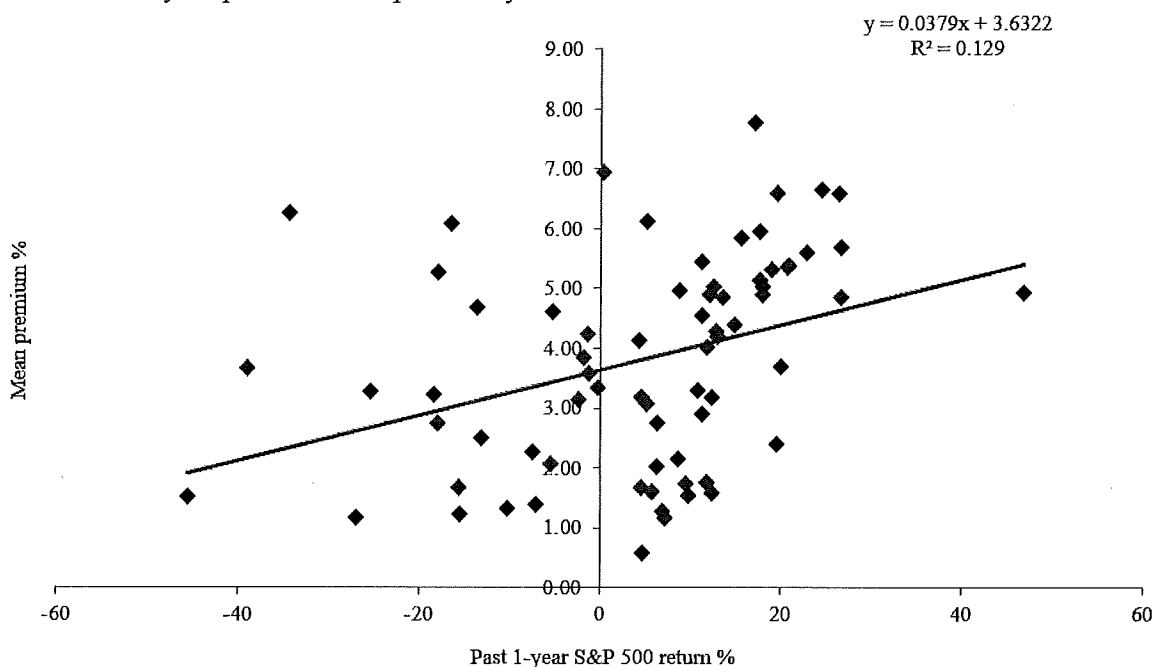
*2.7 Explaining variation in the risk premium*

While we document the level and a limited time-series of the long-run risk premium, statistical inference is complicated by the fact that the forecasting horizons are overlapping. First, we have no way of measuring the accuracy of the risk premiums as forecasts of equity returns. Second, any inference based on regression analysis is confounded by the fact that from one quarter to the next, there are 36 common quarters being forecasted. This naturally induces a moving-average process.

We do, however, try to characterize the time-variation in the risk premium without formal statistical tests. Figure 2 examines the relation between the mean premium and previous one-year returns on the S&P 500.

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Figure 2  
The mean one year premium and past one-year returns on the S&P 500 index



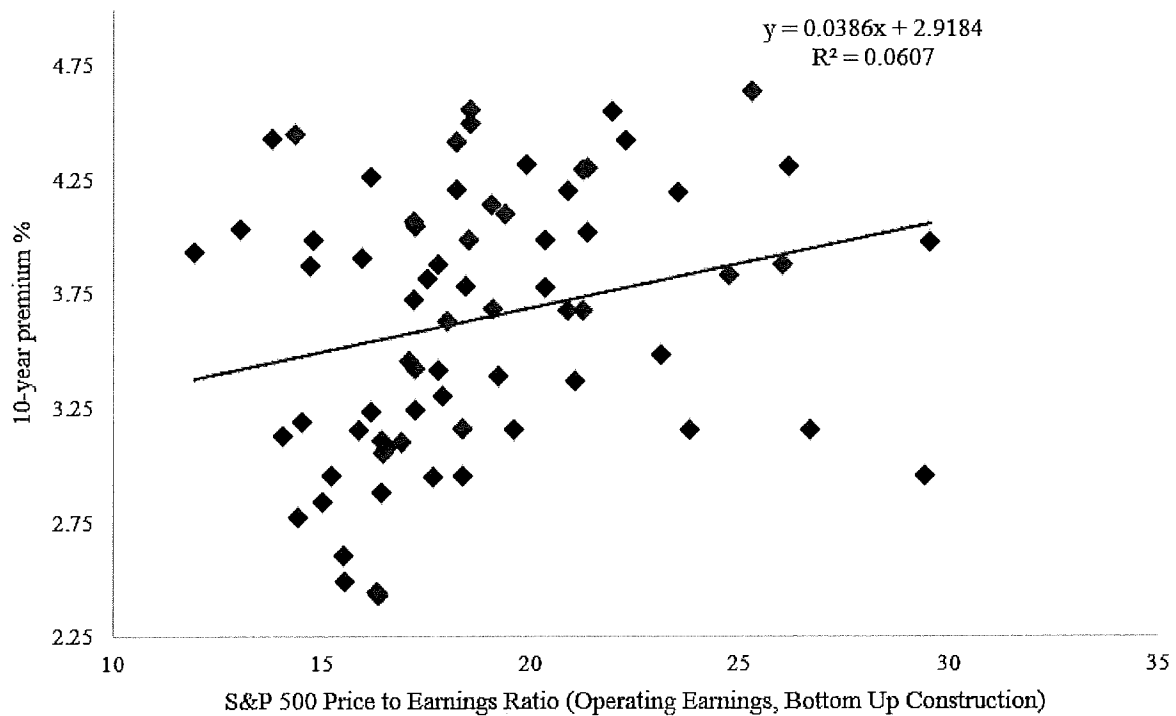
The evidence suggests that there is a weak negative correlation between past returns and the level of the long-run risk premium. This makes economic sense. When prices are low (after negative returns), expected return increase.

An alternative to using past-returns is to examine a measure of valuation. Figure 3 examines a scatter of the mean premium versus the forward price-to-earnings ratio of the S&P 500.

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Figure 3

The equity risk premium and the S&P 500 forward price-to-earnings ratio



Looking at the data in Figure 3, it appears that the inference may be complicated by a non-linear relation. At very high levels of valuation, the expected return (the risk premium) was low.

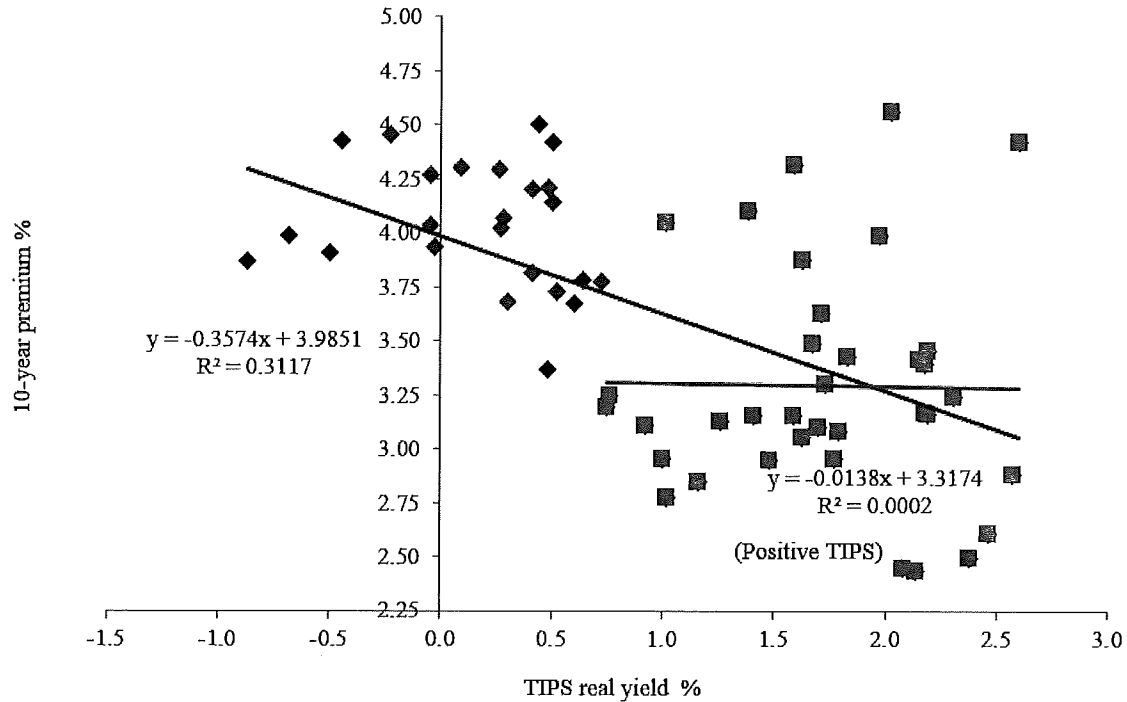
We also examine the real yield on Treasury Inflation Indexed Notes. The risk premium is like an expected real return on the equity market. It seems reasonable that there could be a correlation between expected real rates of return stocks and bonds. Figure 4 examines the 10-year on the run yield on the Treasury Inflation Indexed Notes.

Overall, there is a negative correlation of -0.517. However, this correlation is driven by the negative TIPS yields. This is consistent with the idea that in periods of heightened uncertainty, investors engage in a flight to safety and accept low or negative TIPS yields – and at the same time demand a high risk premium for investing in the equity market.



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Figure 4  
The equity risk premium and the real yield on Treasury Inflation Indexed Notes



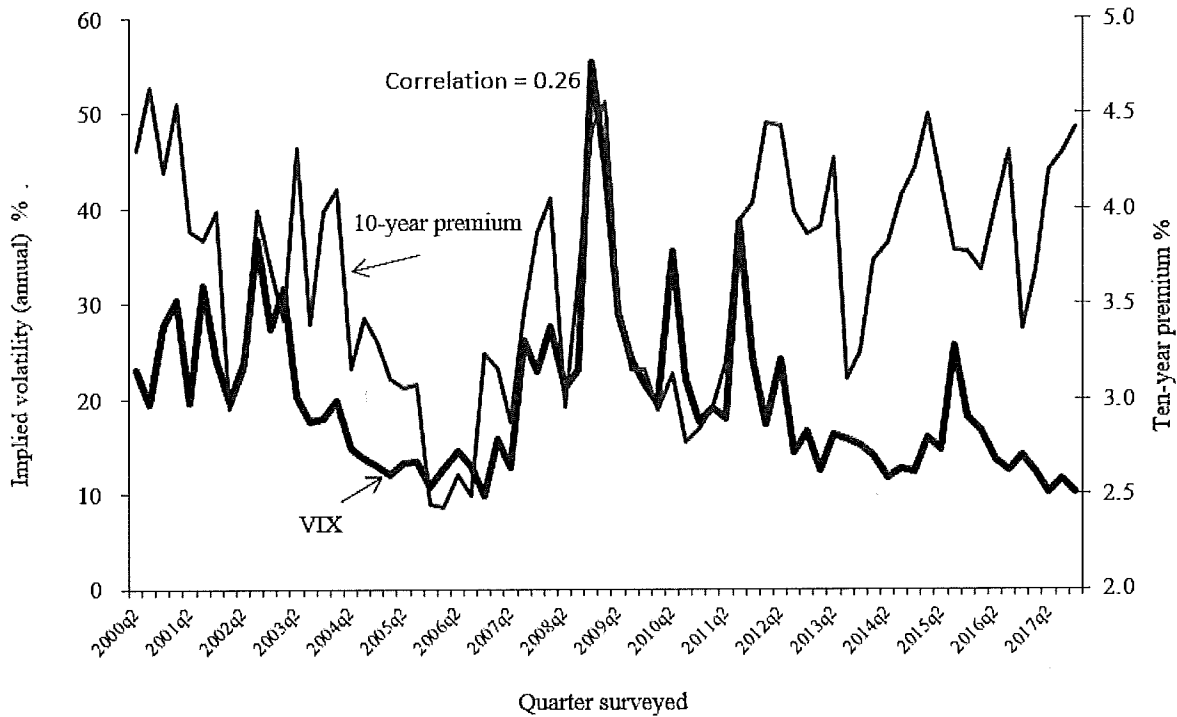
Finally, we consider two alternative measures of risk and the risk premium. Figure 5 shows that over our sample there is evidence of a strong positive correlation between market volatility and the long-term risk premium. We use a five-day moving average of the implied volatility on the S&P index option (VIX) as our volatility proxy. The correlation between the risk premium and volatility is 0.26. If the closing day of the survey is used, the correlation is roughly the same. Asset pricing theory suggests that there is a positive relation between risk and expected return. While our volatility proxy doesn't match the horizon of the risk premium, the evidence, nevertheless, is suggestive of a positive relation. Figure 5 also highlights a strong recent

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divergence between the risk premium and the VIX.

Figure 5

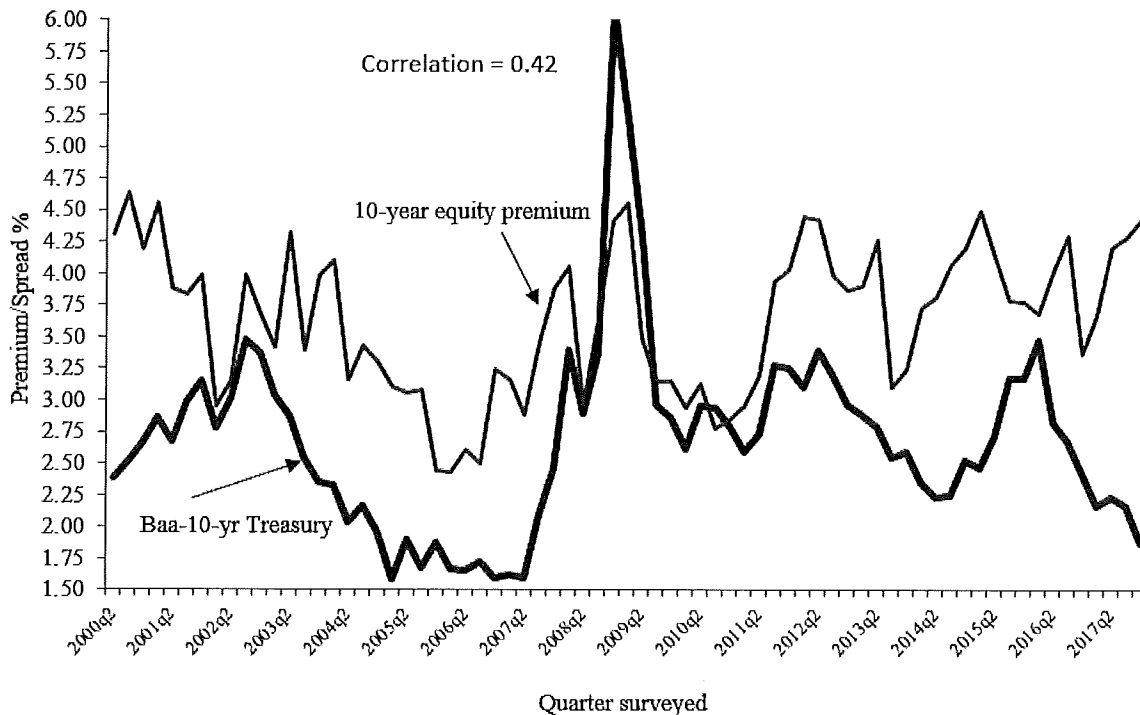
The equity risk premium and the implied volatility on the S&P 500 index option (VIX)



We also consider an alternative risk measure, the credit spread. We look at the correlation between Moody's Baa rated bond yields less the 10-year Treasury bond yield and the risk premium. Figure 6 shows a highly significant relation between the time-series with a correlation of 0.42. Similar to Figure 5, there is a strong recent divergence.

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Figure 6  
The equity risk premium and credit spreads



*2.8 Other survey questions*

The June 2016 survey contains a number of other questions. <http://www.cfosurvey.org> presents the full results of these questions. The site also presents results conditional on demographic firm characteristics. For example, one can examine the CFOs views of the risk premium conditional on the industry in which the CFO works.

*2.9 Risk premium data and corporate policies*

Research by Ben-David, Graham and Harvey (2013) uses the one-year risk premium forecasts as a measure of optimism and the 80% confidence intervals as a direct measure of overconfidence. By linking email addresses that respondents provide to archival corporate data, Ben-David et al. find that the tightness of the confidence intervals is correlated with corporate investment. Overconfident managers invest more.

Campello, Graham and Harvey (2010) use the survey during the financial crisis and the higher risk premiums to examine the implications of financial constraints on the real activities of the



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firm. They provide new evidence on the negative impact of financial constraints on firms' investment plans.

Campello, Giambona, Graham and Harvey (2011) use the survey during the financial crisis to study how firms managed liquidity during the financial crisis.

Graham, Harvey and Puri (2013) administer a psychometric test using the survey instrument and link CEO optimism and risk aversion to corporate financial policies.

Graham, Harvey and Puri (2015) use survey data to study how capital is allocated within the firm and the degree to which CEOs delegate decision making to CFOs.

Graham, Harvey and Rajgopal (2005) use survey data to study how managers manipulate earnings. Dichev, Graham, Harvey, and Rajgopal (2013) study earnings quality.

Graham, Harvey, Popadak and Rajgopal (2017) use a similar survey sample to study corporate culture.

*2.10 CFO Survey compared to other surveys*

Table 2 compares the predictive ability of the Duke-CFO survey with other popular surveys. The table reports the correlations between the current quarter Duke-CFO survey of either optimism about the economy or optimism about the firm's prospects with the subsequent quarter's realization for five surveys: UBS-Gallup, CEO Survey, Conference Board Consumer Confidence, University of Michigan Consumer Confidence and ISM Purchasing Manager's Index. Both of the Duke-CFO optimism measures significantly predict all five of these popular barometers of economic confidence. Related analysis shows that our CFO survey anticipates economic activity sooner (usually one quarter sooner) than do the other surveys.

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Table 2  
**The ability of the Duke CFO survey to predict other surveys**

| Survey                                     | Predictive correlations |                                 |
|--|-------------------------|---------------------------------|
|  | Optimism about economy  | Optimism about firm's prospects |
| UBS-Gallup                                 | 0.289                   | 0.380                           |
| CEO Survey                                 | 0.814                   | 0.824                           |
| Conference Board Consumer Confidence       | 0.513                   | 0.767                           |
| University of Michigan Consumer Confidence | 0.341                   | 0.253                           |
| ISM Purchasing Managers Index              | 0.694                   | 0.497                           |

**3. Conclusions**

We provide a direct measure of ten-year market returns based on a multi-year survey of Chief Financial Officers. Importantly, we have a ‘measure’ of expectations. We do not claim it is the true market expectation. Nevertheless, the CFO measure has not been studied before.

While there is relatively little time-variation in the risk premium, premia are higher during recessions and higher during periods of uncertainty. We also link our analysis to the actual investment decisions of financial managers. We are able to impute the weighted average cost of capital given the CFO estimates of equity risk premia, current corporate bond yields and marginal tax rates. This imputed measure is significantly less than the WACCs that CFOs report using in project evaluation. One way to reconcile this is that CFOs use very long-term averages of equity premia and bond rates when calculating WACCs. We provide evidence on the actual hurdle rates used by companies. These hurdle rates are, on average, 400bp higher than the reported WACCs.

While we have nearly 25,000 survey responses in 18 years, much of our analysis uses summary statistics for each survey. As such, with only 71 unique quarters of predictions and a variable of interest that has a 10-year horizon, it is impossible to evaluate the accuracy of the market excess return forecasts. For example, the November 30, 2007 10-year annual forecast was 7.85% and the realized annual S&P 500 return through December 7, 2017 is approximately 6%. Our analysis shows some weak correlation between past returns, real interest rates and the risk premium. In contrast, there is significant evidence on the relation between two common measures of economic risk and the risk premium. We find that both the implied volatility on the S&P index as

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well as a commonly used measure of credit spreads are correlated with our measured equity risk premium.

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Appendix A

Excerpt from the Survey Instrument

**10. On November 14, 2017 the annual yield on 10-yr treasury bonds was 2.37%. Please complete the following:**

**a. Over the next 10 years, I expect the average annual S&P 500 return will be:**

|  |  |  |
|--|--|--|
| Worst Case: There is a 1-in-10 chance the actual average return will be less than:<br><input type="text"/> % | <b>Best Guess:</b><br>I expect the return to be:<br><input type="text"/> % | Best Case: There is a 1-in-10 chance the actual average return will be greater than:<br><input type="text"/> % |
|--|--|--|

**b. During the next year, I expect the S&P 500 return will be:**

|  |  |  |
|--|--|--|
| Worst Case: There is a 1-in-10 chance the actual return will be less than:<br><input type="text"/> % | <b>Best Guess:</b><br>I expect the return to be:<br><input type="text"/> % | Best Case: There is a 1-in-10 chance the actual return will be greater than:<br><input type="text"/> % |
|--|--|--|

**Please check one from each category that best describes your company:**

**a. Industry (choose best option)**

|   |  |
|---|--|
| <input type="radio"/> Retail/Wholesale                      | <input type="radio"/> Public Administration            |
| <input type="radio"/> Banking/Finance/Insurance/Real Estate | <input type="radio"/> Communication/Media              |
| <input type="radio"/> Mining/Construction                   | <input type="radio"/> Tech [software/biotech/hardware] |
| <input type="radio"/> Transportation & Public Utilities     | <input type="radio"/> Manufacturing                    |
| <input type="radio"/> Energy                                | <input type="radio"/> Healthcare/Pharmaceutical        |
| <input type="radio"/> Services, Consulting                  | <input type="radio"/> Other: <input type="text"/>      |
| <input type="radio"/> Agriculture, Forestry, & Fishing      |  |

**b. Sales Revenue**

|  |  |
|--|--|
| <input type="radio"/> Less than \$25 million | <input type="radio"/> Fewer than 100   |
| <input type="radio"/> \$25-\$99 million      | <input type="radio"/> 100-499          |
| <input type="radio"/> \$100-\$499 million    | <input type="radio"/> 500-999          |
| <input type="radio"/> \$500-\$999 million    | <input type="radio"/> 1,000-2,499      |
| <input type="radio"/> \$1-\$4.9 billion      | <input type="radio"/> 2,500-4,999      |
| <input type="radio"/> \$5-\$9.9 billion      | <input type="radio"/> 5,000-9,999      |
| <input type="radio"/> More than \$10 billion | <input type="radio"/> More than 10,000 |

**c. Number of Employees**

**d. Where are you personally located?**

|   |                                     |
|---|-------------------------------------|
| <input type="radio"/> Northeast U.S.      | <input type="radio"/> Canada        |
| <input type="radio"/> Mountain U.S.       | <input type="radio"/> Latin America |
| <input type="radio"/> Midwest U.S.        | <input type="radio"/> Europe        |
| <input type="radio"/> South U.S.          | <input type="radio"/> Asia          |
| <input type="radio"/> South Atlantic U.S. | <input type="radio"/> Africa        |
| <input type="radio"/> Pacific U.S.        | <input type="radio"/> Other         |

**e. Ownership**

|   |
|---|
| <input type="radio"/> Public, NYSE        |
| <input type="radio"/> Public, NASDAQ/AMEX |
| <input type="radio"/> Private             |
| <input type="radio"/> Government          |
| <input type="radio"/> Nonprofit           |

**f. Foreign Sales**

|                                     |
|-------------------------------------|
| <input type="radio"/> 0%            |
| <input type="radio"/> 1-24%         |
| <input type="radio"/> 25-50%        |
| <input type="radio"/> More than 50% |

**g. Return on assets (ROA=operating earnings/assets) (e.g., -5%, 6.2%)**

|                      |                           |
|----------------------|---------------------------|
| <input type="text"/> | % Approximate ROA in 2017 |
| <input type="text"/> | % Expected ROA in 2018    |







## Market Risk Premium Used in 71 Countries in 2016: A Survey with 6,932 Answers

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### ABSTRACT

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This paper contains the statistics of the Equity Premium or Market Risk Premium (MRP) used in 2016 for 71 countries. We got answers for more countries, but we only report the results for 71 countries with more than eight answers. 54% of the MRP used in 2016 decreased (vs 2015), and 38% increased. Most previous surveys have been interested in the Expected MRP, but this survey asks about the Required MRP. The paper also contains the references used to justify the MRP, and comments from 46 persons.

#### Keywords:

Equity premium, Required equity premium,  
Expected equity premium, Historical equity  
premium

### 1. Market Risk Premium (MRP) used in 2016 in 71 countries

We sent a short email (see Exhibit 1) on April 2016 to more than 23,000 email addresses of finance and economics professors, analysts and managers of companies obtained from previous correspondence, papers and webs of companies and universities. We asked about the Market Risk Premium (MRP) used "to calculate the required return on equity in different countries". We also asked about "Books or articles that I use to support this number". By May 4, 2016, we had received 2,732 emails with 6,734 specific MRP used in 2016.<sup>1</sup> We considered 86 of them as outliers because they provided a very small MRP (for example, -4% for the USA) or a very high MRP (for example, 30% for the USA). Other 112 persons answered that they do not use MRP for different reasons (see table 1). We would like to thank sincerely everyone who took the time to answer us.

Table 1: MRP used in 2016: 6932 answers

|                                      | Professors | Analyst | Companies | Financial companies | Other | Total |
|--------------------------------------|------------|---------|-----------|---------------------|-------|-------|
| Answers reported (MRP figures)       | 3.006      | 430     | 1.337     | 983                 | 978   | 6.734 |
| Outliers                             | 2          | 4       | 23        | 20                  | 37    | 86    |
| Answers that do not provide a figure | 7          | 24      | 34        | 43                  | 4     | 112   |
| Total                                | 3.015      | 458     | 1.394     | 1.046               | 1.019 | 6.932 |

Some answers that do not provide a figure: "We use a minimum IRR"; "We use multiples"; "MRP is a concept that we do not use"; "It is confidential"; "The

CAPM is not very useful"; "I think about premia for particular stocks"; "I teach derivatives: I did not have to use an MRP"; "The MRP changes every day".

Table 2 contains the statistics of the MRP used in 2016 for 71 countries. We got answers for more countries, but we only report the results for 71 countries with more than eight answers. Fernandez et al. (2011a)<sup>2</sup> is an analysis of the answers for the USA; it also shows the evolution of the Market Risk Premium used for the USA in 2011, 2010, 2009 and 2008 according to previous surveys (Fernandez et al., 2009, 2010a and 2010b). Fernandez et al. (2011b)<sup>3</sup> is an analysis of the answers for Spain. Figures 1 and 2 are graphic representations of the MRPs reported in table 2.

| Surveys of previous years |  |   |
|---------------------------|--|---|
| 2015                      | Risk-Free Rate and MRP used for 41 countries in 2015 | <a href="http://ssrn.com/abstract=2598104">http://ssrn.com/abstract=2598104</a> |
| 2014                      | MRP used in 88 countries in 2014                     | <a href="http://ssrn.com/abstract=2450452">http://ssrn.com/abstract=2450452</a> |
| 2013                      | MRP and Risk-Free Rate used for 51 countries in 2013 | <a href="http://ssrn.com/abstract=914160">http://ssrn.com/abstract=914160</a>   |
| 2012                      | MRP used in 82 countries in 2012                     | <a href="http://ssrn.com/abstract=2084213">http://ssrn.com/abstract=2084213</a> |
| 2011                      | MRP used in 56 countries in 2011                     | <a href="http://ssrn.com/abstract=1822182">http://ssrn.com/abstract=1822182</a> |
| 2010                      | MRP used in 22 countries in 2010                     | <a href="http://ssrn.com/abstract=1609563">http://ssrn.com/abstract=1609563</a> |

<sup>1</sup> 1,217 emails contained MRP for more than one country.

<sup>2</sup> Fernandez, P., J. Aguirreamalloa and L. Corres (2011a), "US Market Risk Premium Used in 2011 by Professors, Analysts and Companies: A Survey...", downloadable in <http://ssrn.com/abstract=1805852>

<sup>3</sup> Fernandez, P., J. Aguirreamalloa and L. Corres (2011b), "The Equity Premium in Spain: Survey 2011 (in Spanish)", downloadable in <http://ssrn.com/abstract=1822422>

Table 2: Market Risk Premium (%) used in 71 countries in 2016

|    |              | Average | Median | St Dev | Max   | Min  | Q1   | Q3    | N    |
|----|--------------|---------|--------|--------|-------|------|------|-------|------|
| 1  | USA          | 5,3%    | 5,0%   | 1,3%   | 20,0% | 1,5% | 4,5% | 6,0%  | 2536 |
| 2  | Spain        | 6,2%    | 6,0%   | 1,4%   | 12,0% | 1,5% | 5,0% | 6,8%  | 817  |
| 3  | Germany      | 5,3%    | 5,0%   | 1,7%   | 12,4% | 1,2% | 4,0% | 6,0%  | 360  |
| 4  | UK           | 5,3%    | 5,0%   | 1,4%   | 12,8% | 1,5% | 4,5% | 6,0%  | 221  |
| 5  | Italy        | 5,6%    | 5,5%   | 1,5%   | 10,1% | 2,0% | 4,8% | 6,0%  | 152  |
| 6  | Canada       | 5,4%    | 5,2%   | 1,3%   | 10,5% | 3,0% | 4,6% | 6,0%  | 127  |
| 7  | Brazil       | 8,2%    | 7,0%   | 4,9%   | 30,0% | 1,8% | 5,5% | 8,7%  | 107  |
| 8  | France       | 5,8%    | 5,5%   | 1,6%   | 11,4% | 2,0% | 5,0% | 6,7%  | 105  |
| 9  | Mexico       | 7,4%    | 7,0%   | 2,3%   | 15,0% | 3,0% | 6,0% | 9,0%  | 103  |
| 10 | South Africa | 6,3%    | 6,0%   | 1,5%   | 11,8% | 3,0% | 5,5% | 7,0%  | 99   |
| 11 | China        | 8,3%    | 7,0%   | 4,4%   | 30,0% | 3,8% | 6,0% | 10,0% | 96   |
| 12 | Netherlands  | 5,1%    | 5,0%   | 1,2%   | 11,6% | 2,5% | 4,5% | 5,9%  | 93   |
| 13 | Switzerland  | 5,1%    | 5,0%   | 1,1%   | 9,6%  | 3,0% | 4,5% | 5,6%  | 88   |
| 14 | Australia    | 6,0%    | 6,0%   | 1,6%   | 15,0% | 3,0% | 5,0% | 6,2%  | 87   |
| 15 | India        | 8,1%    | 8,0%   | 2,4%   | 16,0% | 2,3% | 6,6% | 9,0%  | 82   |
| 16 | Russia       | 7,9%    | 7,0%   | 3,5%   | 25,0% | 2,7% | 6,0% | 9,0%  | 81   |
| 17 | Chile        | 6,1%    | 6,0%   | 1,6%   | 15,0% | 3,0% | 5,5% | 7,0%  | 72   |
| 18 | Sweden       | 5,2%    | 5,0%   | 1,0%   | 9,0%  | 3,0% | 4,5% | 5,9%  | 72   |
| 19 | Austria      | 5,4%    | 5,3%   | 1,4%   | 14,3% | 2,5% | 5,0% | 6,0%  | 71   |
| 20 | Belgium      | 5,6%    | 5,5%   | 1,1%   | 8,1%  | 3,6% | 5,0% | 6,4%  | 71   |
| 21 | Norway       | 5,5%    | 5,0%   | 1,8%   | 14,0% | 3,0% | 4,5% | 6,0%  | 70   |
| 22 | Denmark      | 5,3%    | 5,0%   | 1,7%   | 14,0% | 2,0% | 4,4% | 6,0%  | 63   |
| 23 | Japan        | 5,4%    | 5,0%   | 2,3%   | 16,7% | 2,0% | 4,0% | 6,8%  | 58   |
| 24 | Argentina    | 11,8%   | 11,0%  | 4,4%   | 28,7% | 5,0% | 9,0% | 14,0% | 57   |
| 25 | Colombia     | 8,1%    | 7,8%   | 3,9%   | 20,5% | 2,0% | 6,5% | 9,0%  | 56   |
| 26 | Portugal     | 7,9%    | 8,0%   | 2,1%   | 14,0% | 4,0% | 6,6% | 9,0%  | 55   |
| 27 | Finland      | 5,5%    | 5,0%   | 1,6%   | 12,0% | 3,0% | 4,7% | 6,0%  | 51   |
| 28 | Poland       | 6,2%    | 5,8%   | 1,5%   | 10,0% | 4,4% | 5,0% | 7,6%  | 50   |
| 29 | Peru         | 7,8%    | 7,5%   | 2,6%   | 15,0% | 3,5% | 6,3% | 8,3%  | 44   |
| 30 | New Zealand  | 5,8%    | 6,0%   | 1,4%   | 8,0%  | 2,0% | 5,0% | 7,0%  | 42   |
| 31 | Greece       | 13,0%   | 12,4%  | 5,2%   | 23,0% | 6,5% | 8,5% | 17,9% | 41   |

|    |                   |       |       |      |       |      |       |       |    |
|----|-------------------|-------|-------|------|-------|------|-------|-------|----|
| 32 | Luxembourg        | 4,7%  | 5,0%  | 1,1% | 7,0%  | 2,0% | 4,0%  | 5,4%  | 38 |
| 33 | Israel            | 5,9%  | 6,0%  | 2,2% | 15,0% | 2,5% | 5,0%  | 7,0%  | 37 |
| 34 | Turkey            | 8,1%  | 8,0%  | 3,4% | 18,0% | 2,5% | 5,5%  | 10,5% | 37 |
| 35 | Czech Republic    | 6,3%  | 6,5%  | 1,0% | 8,0%  | 4,3% | 5,5%  | 7,3%  | 32 |
| 36 | Egypt             | 13,8% | 13,0% | 6,2% | 30,3% | 3,5% | 9,0%  | 16,4% | 32 |
| 37 | Indonesia         | 8,0%  | 8,0%  | 2,1% | 14,5% | 4,5% | 6,1%  | 9,3%  | 29 |
| 38 | Ireland           | 6,6%  | 5,8%  | 2,2% | 12,3% | 4,0% | 5,0%  | 8,2%  | 28 |
| 39 | Pakistan          | 9,8%  | 6,5%  | 5,4% | 18,0% | 2,5% | 6,0%  | 16,0% | 26 |
| 40 | Taiwan            | 7,9%  | 7,2%  | 2,1% | 15,0% | 4,3% | 7,0%  | 8,4%  | 26 |
| 41 | Korea             | 6,7%  | 7,0%  | 1,8% | 11,1% | 2,0% | 6,0%  | 7,3%  | 25 |
| 42 | Singapore         | 5,9%  | 6,0%  | 1,3% | 9,6%  | 3,9% | 5,5%  | 6,3%  | 25 |
| 43 | Liechtenstein     | 4,8%  | 5,0%  | 1,0% | 7,3%  | 3,0% | 4,4%  | 5,0%  | 24 |
| 44 | Hong Kong         | 7,6%  | 6,9%  | 2,6% | 12,0% | 3,5% | 5,5%  | 10,0% | 21 |
| 45 | Malaysia          | 6,5%  | 6,8%  | 1,6% | 8,8%  | 3,4% | 6,0%  | 8,0%  | 21 |
| 46 | Hungary           | 8,1%  | 8,0%  | 2,5% | 13,8% | 5,0% | 6,0%  | 10,0% | 19 |
| 47 | Thailand          | 8,4%  | 8,0%  | 1,9% | 15,1% | 6,5% | 7,1%  | 9,0%  | 19 |
| 48 | Kazakhstan        | 6,9%  | 7,0%  | 1,4% | 9,2%  | 4,7% | 6,0%  | 8,0%  | 18 |
| 49 | Croatia           | 7,5%  | 6,5%  | 2,1% | 10,1% | 4,4% | 5,5%  | 9,6%  | 17 |
| 50 | Bulgaria          | 8,2%  | 8,3%  | 1,8% | 12,0% | 5,0% | 7,0%  | 9,2%  | 16 |
| 51 | Romania           | 7,4%  | 7,0%  | 1,7% | 10,0% | 5,0% | 6,1%  | 8,4%  | 16 |
| 52 | Saudi Arabia      | 6,6%  | 6,5%  | 1,3% | 10,6% | 5,5% | 5,5%  | 7,1%  | 15 |
| 53 | Ecuador           | 11,8% | 12,6% | 5,2% | 20,0% | 5,0% | 6,6%  | 16,3% | 14 |
| 54 | Vietnam           | 9,9%  | 9,9%  | 3,0% | 15,0% | 3,9% | 8,0%  | 12,0% | 14 |
| 55 | Nigeria           | 11,1% | 10,0% | 3,9% | 20,0% | 6,9% | 8,5%  | 12,0% | 13 |
| 56 | United Arab Emir. | 7,9%  | 7,5%  | 1,2% | 9,7%  | 5,7% | 7,0%  | 9,0%  | 12 |
| 57 | Bolivia           | 10,7% | 11,8% | 2,5% | 15,1% | 7,5% | 8,3%  | 12,0% | 11 |
| 58 | Philippines       | 8,1%  | 8,0%  | 1,3% | 10,0% | 6,4% | 7,1%  | 9,2%  | 11 |
| 59 | Kuwait            | 6,7%  | 6,8%  | 1,6% | 10,6% | 5,0% | 5,5%  | 7,0%  | 10 |
| 60 | Senegal           | 9,9%  | 10,0% | 2,7% | 13,2% | 5,0% | 8,5%  | 12,3% | 10 |
| 61 | Bahrain           | 7,7%  | 8,3%  | 2,2% | 11,1% | 5,5% | 5,5%  | 9,6%  | 9  |
| 62 | Slovenia          | 7,1%  | 6,0%  | 2,4% | 10,0% | 3,6% | 5,5%  | 9,6%  | 9  |
| 63 | Ukraine           | 14,6% | 13,8% | 5,0% | 21,7% | 8,0% | 12,0% | 18,0% | 9  |
| 64 | Costa Rica        | 9,2%  | 10,0% | 2,4% | 12,0% | 3,8% | 8,8%  | 10,1% | 8  |
| 65 | Malta             | 6,8%  | 8,1%  | 2,5% | 9,3%  | 3,1% | 5,3%  | 8,1%  | 8  |
| 66 | Oman              | 6,9%  | 7,1%  | 2,0% | 11,1% | 5,0% | 5,0%  | 7,3%  | 8  |
| 67 | Panama            | 9,4%  | 9,2%  | 1,8% | 11,3% | 6,0% | 9,1%  | 10,5% | 8  |

|   |           |       |       |      |       |      |       |       |   |
|---|-----------|-------|-------|------|-------|------|-------|-------|---|
| 6 | Qatar     | 7,5%  | 7,0%  | 1,1% | 10,1% | 7,0% | 7,0%  | 7,1%  | 8 |
| 6 | Serbia    | 11,3% | 12,4% | 3,0% | 13,2% | 5,5% | 11,1% | 13,2% | 8 |
| 7 | Uruguay   | 8,2%  | 9,2%  | 2,1% | 10,4% | 5,0% | 6,8%  | 9,6%  | 8 |
| 7 | Venezuela | 15,3% | 17,8% | 6,5% | 21,7% | 6,0% | 11,0% | 19,8% | 8 |

answers for USA and Germany. 155 provided us with answers for USA and UK.

Table 3: Difference in the Market Risk Premium used in 2016 by the same person for two countries

| MRP             | Average | Number of answers |    |     |     |
|-----------------|---------|-------------------|----|-----|-----|
|                 |         | Total             | <0 | 0   | >0  |
| US - Germany    | -0,2%   | 312               | 92 | 151 | 69  |
| US - UK         | -0,3%   | 155               | 63 | 70  | 22  |
| Germany - UK    | 0,1%    | 80                | 17 | 43  | 20  |
| Spain - Germany | 1,0%    | 122               | 9  | 48  | 65  |
| Spain - US      | 1,1%    | 397               | 33 | 90  | 274 |

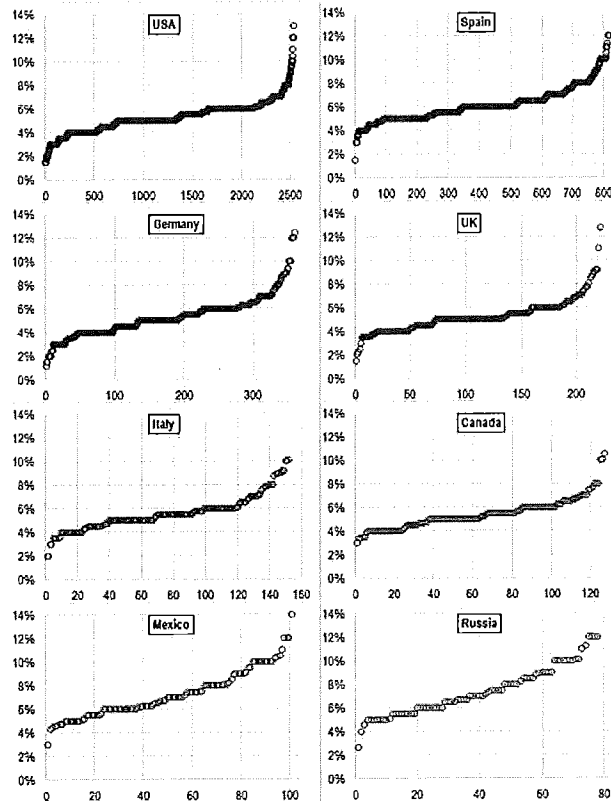


Figure 1: Market Risk Premium used in 2016 for some countries (plot of answers)

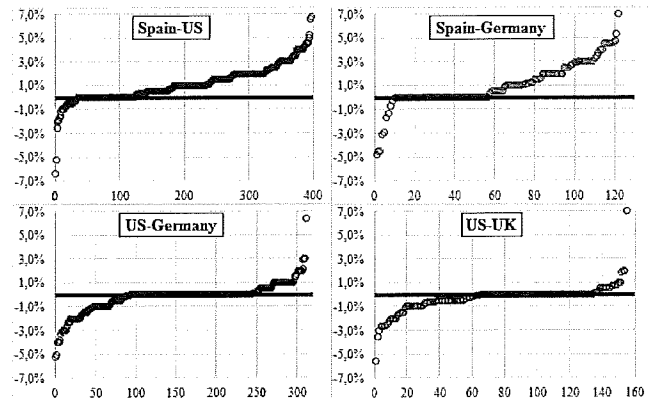


Figure 3: Difference in the MRP used by the same person in 2016 for several countries

3. References Used to Justify The MRP Figure

Some respondents indicated which books and papers they use as a reference to justify the MRP that they use. The most cited references were: Damodaran, Internal estimate, Duff&Phelps, Ibbotson/Morningstar, Fernandez, DMS, Graham-Harvey, Bloomberg, Analysts, Experience, Own judgement, Grabowski, Pratt's & Grabowski, Brealy & Myers, Siegel.

4. Comparison with Previous Surveys

Table 4 compares some results of this survey with the results of 2011, 2012, 2013, 2014 and 2015.

Table 4: Comparison of some results of the surveys of 2011, 2012, 2013, 2014, 2015 and 2016 (%)

|             | Average |      |      |      |      |      | St. Dev. |      |      |      |      |      |
|-------------|---------|------|------|------|------|------|----------|------|------|------|------|------|
|             | 2016    | 2015 | 2014 | 2013 | 2012 | 2011 | 2016     | 2015 | 2014 | 2013 | 2012 | 2011 |
| Switzerland | 5,1     | 5,4  | 5,2  | 5,6  | 5,4  | 5,7  | 1,1      | 1,2  | 1,1  | 1,5  | 1,2  | 1,3  |
| Netherlands | 5,1     | 5,9  | 5,2  | 6,0  | 5,4  | 5,5  | 1,2      | 0,6  | 1,2  | 1,3  | 1,3  | 1,9  |
| Sweden      | 5,2     | 5,4  | 5,3  | 6,0  | 5,9  | 5,9  | 1,0      | 1,3  | 1,0  | 1,7  | 1,2  | 1,4  |
| Denmark     | 5,3     | 5,5  | 5,1  | 6,4  | 5,5  | 5,4  | 1,7      | 1,2  | 1,8  | 0,8  | 1,9  | 3,3  |
| Germany     | 5,3     | 5,3  | 5,4  | 5,5  | 5,5  | 5,4  | 1,7      | 1,5  | 1,7  | 1,7  | 1,9  | 1,4  |
| UK          | 5,3     | 5,2  | 5,1  | 5,5  | 5,5  | 5,3  | 1,4      | 1,7  | 1,4  | 1,4  | 1,9  | 2,2  |
| USA         | 5,3     | 5,5  | 5,4  | 5,7  | 5,5  | 5,5  | 1,3      | 1,4  | 1,4  | 1,6  | 1,6  | 1,7  |

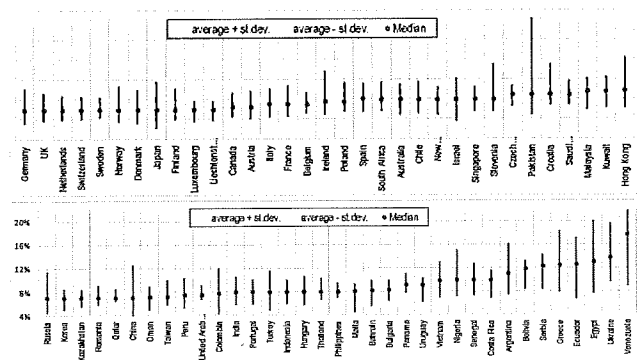


Figure 2: Market Risk Premium used in 2016. Median and dispersion of the answers by country

2. Differences among respondents

Table 3 and Figure 3 show the differences in Market Risk Premium used by the same person for two countries. 312 respondents provided us with



|                |      |      |      |      |      |     |     |      |     |     |     |     |
|----------------|------|------|------|------|------|-----|-----|------|-----|-----|-----|-----|
| Austria        | 5,4  | 5,7  | 5,5  | 6,0  | 5,7  | 6,0 | 1,4 | 0,3  | 1,5 | 1,9 | 1,6 | 1,8 |
| Canada         | 5,4  | 5,9  | 5,3  | 5,4  | 5,4  | 5,9 | 1,3 | 1,3  | 1,2 | 1,3 | 1,3 | 2,1 |
| Japan          | 5,4  | 5,8  | 5,3  | 6,6  | 5,5  | 5,0 | 2,3 | 2,0  | 2,4 | 2,7 | 2,7 | 3,7 |
| Finland        | 5,5  | 5,7  | 5,6  | 6,8  | 6,0  | 5,4 | 1,6 | 1,1  | 1,6 | 1,2 | 1,6 | 2,0 |
| Norway         | 5,5  | 5,5  | 5,8  | 6,0  | 5,8  | 5,5 | 1,8 | 1,2  | 2,0 | 1,8 | 1,6 | 1,6 |
| Belgium        | 5,6  | 5,5  | 5,6  | 6,1  | 6,0  | 6,1 | 1,1 | 1,3  | 1,1 | 1,8 | 1,1 | 1,0 |
| Italy          | 5,6  | 5,4  | 5,6  | 5,7  | 5,6  | 5,5 | 1,5 | 1,5  | 1,5 | 1,5 | 1,4 | 1,4 |
| France         | 5,8  | 5,6  | 5,8  | 6,1  | 5,9  | 6,0 | 1,6 | 1,4  | 1,5 | 1,6 | 1,5 | 1,5 |
| New Zealand    | 5,8  | 6,6  | 5,6  | 5,4  | 6,2  | 6,0 | 1,4 | 1,3  | 1,4 | 1,8 | 1,1 | 1,0 |
| Israel         | 5,9  | 5,2  | 5,8  | 6,4  | 6,0  | 5,6 | 2,2 | 1,1  | 2,1 | 1,1 | 2,3 | 1,7 |
| Australia      | 6,0  | 6,0  | 5,9  | 6,8  | 5,9  | 5,8 | 1,6 | 4,0  | 1,6 | 4,9 | 1,4 | 1,9 |
| Chile          | 6,1  | 6,5  | 6,0  | 5,0  | 6,1  | 5,7 | 1,6 | 0,9  | 1,5 | 2,2 | 1,7 | 2,1 |
| Poland         | 6,2  | 5,2  | 6,3  | 6,3  | 6,4  | 6,2 | 1,5 | 1,0  | 1,5 | 1,0 | 1,6 | 1,1 |
| Spain          | 6,2  | 5,9  | 6,2  | 6,0  | 6,0  | 5,9 | 1,4 | 1,6  | 1,6 | 1,7 | 1,6 | 1,6 |
| Czech Republic | 6,3  | 5,6  | 6,5  | 6,5  | 6,8  | 6,1 | 1,0 | 0,7  | 1,6 | 1,1 | 1,6 | 0,9 |
| South Africa   | 6,3  | 7,7  | 6,3  | 6,8  | 6,5  | 6,3 | 1,5 | 2,3  | 1,4 | 1,4 | 1,5 | 1,5 |
| Ireland        | 6,6  | 5,5  | 6,8  | 6,2  | 6,6  | 6,0 | 2,2 | 1,3  | 2,4 | 3,3 | 2,3 | 2,2 |
| Korea (South)  | 6,7  | 6,2  | 6,3  | 7,0  | 6,7  | 6,4 | 1,8 | 1,5  | 1,8 | 1,8 | 1,4 | 2,5 |
| Mexico         | 7,4  | 8,0  | 7,4  | 6,7  | 7,5  | 7,3 | 2,3 | 1,5  | 2,4 | 2,4 | 2,6 | 2,7 |
| Peru           | 7,8  | 7,2  | 7,8  | 6,5  | 8,1  | 7,8 | 2,6 | 1,2  | 2,5 | 2,1 | 2,5 | 2,8 |
| Portugal       | 7,9  | 5,7  | 8,5  | 6,1  | 7,2  | 6,5 | 2,1 | 1,5  | 2,0 | 2,3 | 2,0 | 1,7 |
| Russia         | 7,9  | 9,7  | 7,9  | 7,3  | 7,6  | 7,5 | 3,5 | 2,9  | 3,4 | 4,1 | 2,9 | 3,7 |
| Indonesia      | 8,0  | 8,9  | 7,9  | 7,8  | 8,1  | 7,3 | 2,1 | 1,2  | 2,0 | 1,4 | 1,7 | 2,3 |
| Colombia       | 8,1  | 8,3  | 8,1  | 8,4  | 7,9  | 7,5 | 3,9 | 1,4  | 3,8 | 3,4 | 3,7 | 4,3 |
| Hungary        | 8,1  | 8,8  | 8,3  | 8,2  | 7,4  | 8,0 | 2,5 | 0,8  | 2,3 | 1,6 | 2,3 | 2,4 |
| India          | 8,1  | 8,4  | 8,0  | 8,5  | 8,0  | 8,5 | 2,4 | 2,5  | 2,4 | 2,9 | 2,4 | 2,8 |
| Turkey         | 8,1  | 9,3  | 7,9  | 8,2  | 8,4  | 8,1 | 3,4 | 2,5  | 3,3 | 2,9 | 3,4 | 3,0 |
| Brazil         | 8,2  | 7,5  | 7,8  | 6,5  | 7,9  | 7,7 | 4,9 | 2,1  | 4,2 | 2,1 | 4,7 | 4,6 |
| China          | 8,3  | 8,1  | 8,1  | 7,7  | 8,7  | 9,4 | 4,4 | 5,6  | 3,5 | 2,3 | 4,6 | 5,1 |
| Thailand       | 8,4  | 7,3  | 8,0  | 7,6  | 8,1  | 7,9 | 1,9 | 0,9  | 1,8 | 0,6 | 1,8 | 2,8 |
| Argentina      | 11,8 | 22,9 | 11,8 | 10,6 | 10,9 | 9,9 | 4,4 | 12,3 | 4,2 | 8,1 | 3,6 | 3,4 |
| Greece         | 13,0 | 14,3 | 15,0 | 7,3  | 9,6  | 7,4 | 5,2 | 5,8  | 4,7 | 4,1 | 4,4 | 2,7 |

Welch (2000) performed two surveys with finance professors in 1997 and 1998, asking them what they thought the Expected MRP would be over the next 30 years. He obtained 226 replies, ranging from 1% to 15%, with an average arithmetic EEP of 7% above T-Bonds.<sup>4</sup> Welch (2001) presented the results of a survey of 510 finance and economics professors performed in August 2001 and the consensus for the 30-year arithmetic EEP was 5.5%, much lower than just three years earlier. In an update published in 2008 Welch reports that the MRP "used in class" in December 2007 by about 400 finance professors was on average 5.89%, and 90% of the professors used equity premiums between 4% and 8.5%.

Johnson et al. (2007) report the results of a survey of 116 finance professors in North America done in March 2007: 90% of the professors

<sup>4</sup> At that time, the most recent Ibbotson Associates Yearbook reported an arithmetic EEP versus T-bills of 8.9% (1926-1997).

believed the Expected MRP during the next 30 years to range from 3% to 7%.

Graham and Harvey (2007) indicate that U.S. CFOs reduced their average EEP from 4.65% in September 2000 to 2.93% by September 2006 (st. dev. of the 465 responses = 2.47%). In the 2008 survey, they report an average EEP of 3.80%, ranging from 3.1% to 11.5% at the tenth percentile at each end of the spectrum. They show that average EEP changes through time. Goldman Sachs (O'Neill, Wilson and Masih 2002) surveyed its global clients in July 2002, and the average long-run EEP was 3.9%, with most responses between 3.5% and 4.5%.

Ilmanen (2003) argues that surveys tend to be optimistic: "survey-based expected returns may tell us more about hoped-for returns than about required returns". Damodaran (2008) points out that "the risk premiums in academic surveys indicate how far removed most academics are from the real world of valuation and corporate finance and how much of their thinking is framed by the historical risk premiums. The risk premiums that are presented in classroom settings are not only much higher than the risk premiums in practice but also contradict other academic research".

Table 5: Comparison of previous surveys

|                   | Surveys of Ivo Welch |                           |             |            | Fernandez et al. (2009, 2010) |         |             |         |             |
|-------------------|----------------------|---------------------------|-------------|------------|-------------------------------|---------|-------------|---------|-------------|
|                   | Oct 97 - Feb 98*     | Jan - May 99 <sup>+</sup> | Sept 2001** | Dec 2007 # | January 2009 <sup>++</sup>    | US 2008 | Europe 2008 | US 2009 | Europe 2009 |
| Number of answers | 226                  | 112                       | 510         | 360        | 143                           | 487     | 224         | 462     | 194         |
| Average           | 7.2                  | 6.8                       | 4.7         | 5.96       | 6.2                           | 6.3     | 5.3         | 6.0     | 5.3         |
| Std. Deviation    | 2.0                  | 2.0                       | 2.2         | 1.7        | 1.7                           | 2.2     | 1.5         | 1.7     | 1.7         |
| Max               | 15                   | 15                        | 20          | 20         |                               | 19.0    | 10.0        | 12.0    | 12.0        |
| Q3                | 8.4                  | 8                         | 6           | 7.0        | 7                             | 7.2     | 6.0         | 7.0     | 6.0         |
| Median            | 7                    | 7                         | 4.5         | 6.0        | 6                             | 6.0     | 5.0         | 6.0     | 5.0         |
| Q1                | 6                    | 5                         | 3           | 5.0        | 5                             | 5.0     | 4.1         | 5.0     | 5.3         |
| Min               | 1.5                  | 1.5                       | 0           | 2          |                               | 0.8     | 1.0         | 2.0     | 2.0         |

\* 30-Year Forecast. Welch (2000) First survey + 30-Year Forecast. Welch (2000) Second survey

\*\* 30-year Equity Premium Forecast (Geometric). "The Equity Premium Consensus Forecast Revisited" (2001)

# 30-Year Geo Eq Prem Used in class. Welch, I. (2008), "The Consensus Estimate for the Equity Premium by Academic Financial Economists in December 2007". <http://ssrn.com/abstract=1084918>

++ In your classes, what is the main number you are recommending for long-term CAPM purposes? "Short Academic Equity Premium Survey

for January 2009". <http://welch.econ.brown.edu/academics/equpdate-results2009.html>

**Table 6:** Estimates of the EEP (Expected Equity Premium) according to other surveys

| Authors                                | Conclusion about EEP                        | Respondents               |
|--|---|---------------------------|
| <i>Pensions and Investments</i> (1998) | 3%  | Institutional investors   |
| Graham and Harvey (2007)               | Sep. 2000. Mean: 4.65%. Std. Dev. = 2.7%    | CFOs                      |
| Graham and Harvey (2007)               | Sep. 2006. Mean: 2.93%. Std. Dev. = 2.47%   | CFOs                      |
| Graham and Harvey (2014)               | 3.73%.                                      | CFOs                      |
| Welch update                           | December 2007. Mean: 5.69%. Range 2% to 12% | Finance professors        |
| O'Neill, Wilson and Masih (2002)       | 3.9%  | Global clients<br>Goldman |

The magazine *Pensions and Investments* (12/1/1998) carried out a survey among professionals working for institutional investors: the average EEP was 3%. Shiller<sup>5</sup> publishes and updates an index of investor sentiment since the crash of 1987. While neither survey provides a direct measure of the equity risk premium, they yield a broad measure of where investors or professors expect stock prices to go in the near future. The 2004 survey of the Securities Industry Association (SIA) found that the median EEP of 1500 U.S. investors was about 8.3%. Merrill Lynch surveys more than 300 institutional investors globally in July 2008: the average EEP was 3.5%.

The main difference of this survey with previous ones is that this survey asks about the Required MRP, while most surveys are interested in the Expected MRP.

#### 5. MRP or EP (Equity Premium): 4 Different Concepts

As Fernandez (2007, 2009b) claims, the term "equity premium" is used to designate four different concepts:

1. Historical equity premium (HEP): a historical differential return of the stock market over treasuries.
2. Expected equity premium (EEP): an expected differential return of the stock market over treasuries.
3. Required equity premium (REP): an incremental return of a diversified portfolio (the market) over the risk-free rate required by an investor. It is used for calculating the required return on equity.
4. Implied equity premium (IEP): the required equity premium that arises from assuming that the market price is correct.

The four concepts (HEP, REP, EEP and IEP) designate different realities. The HEP is easy to calculate and is equal for all investors, provided they use the same time frame, the same market index, the same risk-free instrument and the same average (arithmetic or geometric). But the EEP, the REP and the IEP may be different for different investors and are not observable.

The HEP is the historical average differential return of the market portfolio over the risk-free debt. The most widely cited sources are Ibbotson Associates and Dimson et al. (2007).

Numerous papers and books assert or imply that there is a "market" EEP. However, it is obvious that investors and professors do not share "homogeneous expectations" and have different assessments of the EEP. As Brealey et al. (2005, page 154) affirm: "Do not trust anyone who claims to know what returns investors expect".

The REP is the answer to the following question: What incremental return do I require for investing in a diversified portfolio of shares over the risk-free rate? It is a crucial parameter because the REP is the key to determining the company's required return on equity and the WACC. Different companies may use, and in fact do use, different REPs.

The IEP is the implicit REP used in the valuation of stock (or market index) that matches the current market price. The most widely used model to calculate the IEP is the dividend discount model: the current price per share (P0) is the present value of expected dividends discounted at the required rate of return (Ke). If d1 is the dividend per share expected to be received in year 1, and g the expected long-term growth rate in dividends per share,

$$P0 = d1 / (Ke - g), \text{ which implies: } IEP = d1/P0 + g - RF \quad (1)$$

The estimates of the IEP depend on the particular assumption made for the expected growth (g). Even if market prices are correct for all investors, there is not an IEP common for all investors: there are many pairs (IEP, g) that accomplish equation (1). Even if equation (1) holds for every investor, there are many required returns (as many as expected growths, g) in the market. Many papers in the financial literature report different estimates of the IEP with great dispersion, as Claus and Thomas (2001, IEP = 3%), Harris and Marston (2001, IEP = 7.14%) and Ritter and Warr (2002, IEP = 12% in 1980 and -2% in 1999). There is no common IEP for all investors.

For a particular investor, the EEP is not necessarily equal to the REP (unless he considers that the market price is equal to the value of the shares). Apparently, an investor will hold a diversified portfolio of shares if his EEP is higher (or equal) than his REP and will not hold it otherwise. We can find out the REP and the EEP of an investor by asking him, although for many investors the REP is not an explicit parameter, rather, it is implicit in the price they are prepared to pay for the shares. However, it is not possible to determine the REP for the market as a whole, because it does not exist: even if we knew the REPs of all the investors in the market, it would be meaningless to talk of a REP for the market as a whole. There is a distribution of REPs, and we can only say that some percentage of investors have REPs contained in range. The average of that distribution cannot be interpreted as the REP of the market nor as the REP of a representative investor.

Much confusion arises from not distinguishing among the four concepts that the phrase equity premium designates: Historical equity premium, expected equity premium, Required equity premium and Implied equity premium. 129 of the books reviewed by Fernandez (2009b) identify Expected and Required equity premium and 82 books identify Expected and Historical equity premium.

Finance textbooks should clarify the MRP by incorporating distinguishing definitions of the four different concepts and conveying a clearer message about their sensible magnitudes.

<sup>5</sup> See <http://icf.som.yale.edu/Confidence.Index>

## 6. Conclusion

Most surveys have been interested in the Expected MRP, but this survey asks about the Required MRP. We provide the statistics of the Equity Premium or Market Risk Premium (MRP) used in 2016 for 71 countries.

Most previous surveys have been interested in the Expected MRP, but this survey asks about the Required MRP. The paper also contains the references used to justify the MRP, comments from several persons that do not use MRP, and comments from others that do use MRP. Fernandez et al. (2011a)<sup>6</sup> has additional comments. The comments illustrate the various interpretations of the required MRP and its usefulness.

This survey links with the Equity Premium Puzzle: Fernandez et al. (2009), argue that the equity premium puzzle may be explained by the fact that many market participants (equity investors, investment banks, analysts, companies) do not use standard theory (such as a standard representative consumer asset pricing model...) for determining their Required Equity Premium, but rather, they use historical data and advice from textbooks and finance professors. Consequently, ex-ante equity premia have been high, market prices have been consistently undervalued, and the ex-post risk premia have also been high. Many investors use historical data and textbook prescriptions to estimate the required and the expected equity premium.

### Exhibit 1. Mail sent on April 2016

We are surveying the Market Risk Premium (MRP), or Equity Premium used to calculate the required return on equity in different countries. We will be very grateful to you if you kindly reply to the following two questions. Of course, no companies, individuals or universities will be identified, and only aggregate data will be made public.  
Best regards and thanks, Pablo Fernandez

#### Two questions:

1. The Market Risk Premium that I am using in 2016

for USA is: \_\_\_\_\_ %  
for Germany is: \_\_\_\_\_ %  
for \_\_\_\_\_ is: \_\_\_\_\_ %  
for \_\_\_\_\_ is: \_\_\_\_\_ %

2. Books or articles that I use to support this number:

### Exhibit 2

#### Comments of Respondents to The Survey

I use Duff & Phelps: "Duff & Phelps has currently concluded on a 4.0% "normalised" risk-free rate in developing its U.S. ERP (as compared to the 2.4% "spot rate" as of January 31, 2016)". "Duff & Phelps Increases U.S. Equity Risk Premium Recommendation to 5.5%, Effective January 31, 2016."

The market risk premium for the USA is around 10%. Purely based on observation of deal flow and have seen upwards of 20% on some. Irrational exuberance at play in some gateway cities.

I'm not using any market premium. Just the old fashioned multiples and an overall view. For discounting, I just use a common sense kind of rate depending on the company (size, quality etc.), around 7.5%. With interest

rates at these levels (negative -9 bpt in Japan), what sense does a "market premium" make?  
Market valuations have already been "distorted".

I do not believe in modern portfolio theory, so I do not calculate required return using the CAPM. I use judgement based on my assessment of risk with the company's WACC as my floor for required return.

I only deal with small, private companies and do not calculate market risk.

In our fund, we use an outside investment advisor to manage the portfolio.

My approach considers the underlying value using traditional methods, and the value of an acquisition based on market opportunities of the combined units.

I do not use any MRP in my investment process. It is tough to estimate.

MRP for the USA is 10%. Use intuition and the fact that the RF is about 1% and historical return on the market is about 11%.

Mi modelo es diferente: cuando las economías son débiles, me concentro más en retornos intangibles que en retornos monetarios. Cuando las cosas son así, es cuando la gente nota cuales son los verdaderos amigos, y es cuando yo me concentro en afirmar relaciones.

We normally calculate market risk premium based on the market rate of interest less risk-free rate of return for a given portfolio. This form of calculation is accepted by Chartered Institute of Management Accountant (UK)

No utilizo risk premium, solo una tasa de 7% para actualizar cash flows, menos 1% de inflacion = 6%

You can estimate of the average equity risk premium for a particular set of firms by using the implied cost of capital using analysts forecasts. It is nonsense to talk about there being a risk premium for a particular country.

I can't be of much help in your survey: I believe in the doctrine of the "Absurdity of CAPM".

You can use an estimate of the average equity risk premium for a particular set of firms by using the implied cost of capital using analysts forecasts. It is nonsense to talk about there being a risk premium for a particular country.

Mi concepción de riesgo es la que Howard Marks profesa, y es simple y llanamente, la posibilidad de pérdida permanente de capital. Así pues, establezco una rentabilidad mínima a todas mis inversiones en bolsa con acciones de un +15% anual. No distingo entre países. No creo ni en el WACC, ni en la prima de riesgo ni en activo libre de riesgo (existe tal cosa??).

Dada la alta volatilidad y la incertidumbre política actual prefiero no hacer predicciones.

<sup>6</sup> Fernandez, P., J. Aguirreamalloa and L. Corres (2011a), "US Market Risk Premium Used in 2011 by Professors, Analysts and Companies: A Survey...", downloadable in <http://ssrn.com/abstract=1805852>



I would use the risk premium in each market defined not like the traditional risk premium: Avg return on the S&P less the risk free rate, but rather the avg return on a market index less the return on cash cow stocks that pay large dividends (you can construct an index for such stocks), especially that the risk free return is very close to 1-2 almost everywhere and is sometimes negative as is -the case in Japan. I will then weigh each risk premium by the country GDP to total GDP in the countries in the study.

We do not usually calculate MRP in China in the Private Equity sector. Instead, we usually calculate the IRR of those project, and will be in favour of IRR over 25%.

I do not use MRP. In evaluating today's equity opportunities, I look at historical P/E ratios. My conclusion regarding U.S equities is 4.5% for 2016.

The Market Risk Premium that I am using in 2016 for the USA is:  $(-5+7*i)\%$  (a complex number)

You don't define exactly what you mean by "Market Risk Premium". Different authorities define it in different ways. Is it expected return over short-term government securities (e.g. 30 or 90-day T-Bills), or longer-term government bonds? What about in countries with risky government debt, like Greece? You also don't specify what period. Given the literature on the predictability of stock returns, a particular period should be specified.

My starting point was a capm (beta) thinking, but I was not able to get reasonable/realistic return requirements for the low beta P&C insurance sector.

I believe there is an additional agent/volatility price that is not reflecting itself in the beta, but should be accounted for elsewhere. You would normally not let an agent invest in zero-beta assets for you. These risks should disappear in a well-diversified portfolio, but apparently, they do not.

I believe investors have some utility function (experience based) that might differ from the direct economic risk. A bad experience can change the view on the future performance and hence impact the price of equity, despite the financial impact in diversified portfolio disappears.

I backed out a reasonable RR across my sector and adjusted them individually (per company) according to the risk properties (in capm / beta thinking). Also, I disclosed the rate used in the valuation.

I do not know if it is helpful, but there were some consistent thinking behind my approach, but also an understanding that the market gives us some unobserved information through pricing. I believe that I had one of most scientific approaches in the sector.

As a Project Finance person, most of my projects looking at Equity Returns are in emerging markets, and my clients are greedy. The benchmark return since I started my job 20 years ago is 20% IRR and has never changed. In the end, people accept 17 to 18 %.

To my experience, large utilities go far below this (rather 10%), but would therefore never enter the real frontier states (i.e. Nigeria vs Turkey).

From my investment, the question is what is fair and what is realistic.

Germany yields 5-6% (over 20 years) and France 8% (over 15 years), both take the significant residual value of the assets risk, wind risk, but no tariff risk (price per kWh is fixed with France even adapting to (albeit non existing) inflation).

Compare this to a Lufthansa subordinated debt which yields 5%. What is the likelihood that the German Government will let Lufthansa go down, besides the fact that it is one of the best-capitalized airlines?

On the other hand, wind farms generate constant cash flows. Equities are pretty volatile.

What should I expect from a Daimler investment? A great dividend and some upside.

What is the real value of an Insurance (Allianz, Munich RE) in a negative interest environment?

Utilities are cancelling dividends, the world as we know it is changing rapidly.

Am I going to define my equity return requirement as a margin over ten year BUNDS? I hope I can do better than that.

So I go for cash flow is king and solid assets. I guess I take the 8% return from the French windfarm and consider it the less risky alternative to a portfolio of 5 top dividend payers in the DAX (which I also have, as a wise portfolio strategist).

I am curious on the following matters:

1) Does a risk-free asset exist, also in light of the recent events that have been characterizing the financial markets? 2) Do the role provided by the exchange rates is important for the valuation and the comparison of the MRPs across countries? 3) Do the visions of the academics and practitioners for estimating the MRPs are standardized to a common numeraire, regarding currency?

Somos una Pyme y sólo usamos en presupuesto 2016 un valor mínimo exigido de EBT/ingresos del 9%.

I don't use market risk premiums. We use bottom valuation analysis at a stock level for each region.

In the globe with listed real estate securities. Measures that we do consider are regional spreads.

On 10yr Govt bonds to; dividend yields and the direct property yields.

I am aware of academic debates on this issue and remember from university days of some debate that 6%.

Was too low. I would think that required risk premiums would move around and in the future how useful.

Will it be in a world of low investment returns coupled with periods of high volatility particularly as more

Govts and central banks interfere with the market pricing of so many different asset classes.

It is at the stock level that we determine return on equity but given the markets that we invest in being

A listed global real estate there is not a lot of ROE dispersion between stocks. What we have found to be more useful. At a regional market, level is compile forward-looking Net Asset Values (NAVs) compared to current pricing and then calculate warranted total returns for each region. So we build from the bottom-up for required returns at the stock level which feeds into regionally required returns.

The market risk premium used when calculating the required return on equity in our WACC-model is fixed at 5 percent. In the period 2007-2012, the market risk premium was fixed at 4 percent. The level of the premium is based on studies and surveys among Norwegian corporate finance utilities, member of The Norwegian society of financial analysts and the Oslo Stock Exchange. This is the market premium used in our regulation, other authorities and sectors might be using another premium. For more information about our WACC-model, please see

[http://www.icer-regulators.net/portal/page/portal/ICER\\_HOME/publications\\_press/ICER\\_Chronicle/Art4\\_09](http://www.icer-regulators.net/portal/page/portal/ICER_HOME/publications_press/ICER_Chronicle/Art4_09)

I use the following formula developed by Goldman Sachs for developing countries:

MRP for the US is 6%. I derive it myself in a simple fashion. Since a Forward PE can be conceptualized as  $1/(rE - g)$ , and  $rE$  for the market is  $rF + I*MRP$ , if we set  $rF = g$  (using insights on nominal productivity growth rates from Macro 101) and if we know the market's Forward PE, we can easily back out the MRP.

We use the Duff & Phelps 2015 Valuation Handbook as the source for the equity risk premium, and we use the long horizon (1926 to 2014) risk premium.

5.5% for the US based on Duff & Phelps suggested ERP and the supply-side ERP after adjustment for WWII interest rates (both from D&P Valuation Handbook).

In my team, we use a prudent 4% for developed Equity Markets. If the 10y were not so distorted, a lower rate of 2x the 10y yield could suffice.

<http://www.absolute-strategy.com/x/erp.html>

We apply a system of global enterprise (not equity) risk premiums in our valuation. Currently, they average 2.25% in the range of 0.75-4.50% depending on industries, not countries. The system was designed by ourselves from general experience.

S&P 500 return over the past five years is 7% compounded. You could do the same calculation for the respective stock exchange indices for countries you are interested in.

Use intuition and the fact that the RF is about 1% and historical return on the market is about 11%.

I regret that you dropped a question on a risk-free interest rate. Now that the negative interest policy is in effect in Euro Zone and Japan, I see several investment banks in Japan started to use negative risk-free rate in their CAPM application. 10Y Japanese Government Bond yield is indeed in negative territory so that it is not illogical to use negative risk-free rate.

However, I doubt that the negative JGB yield will be sustainable for long and that we should use it for our valuation of cash flows which survive much further than ten years.

I'm using in most of my classes an RFR of 3% and an MRP of 6% this year - but this is based upon your material and my bias on short-term rates (financial repression make them too low in the U.S.)

We use CAPM model to estimate Cost of Equity, where we use international benchmarks for Equity Risk Premium, i.e. 6% - 8% followed by estimation for 'beta' taken from Aswath Damodaran. We also add 'alpha' factor to address company-specific risk premium, to allow adjustments in respect of factors such as aggressive forecasts, quality of financial information, an experience of management, relative size, etc. Based on international practices adopted by almost every other professional services firm, we also consider valuation discounts, such as discounts for lack of marketability (private businesses), lack of liquidity (closely held stocks), size discounts (concerning the comparable market players), etc.

The market watch survey shows that average analyst expectation for S&P500 for the end of 2016 was 2193. The end of 2015 index value was 2043. So, the average expected return was around 7.5%. Since the t-bill yield is close to zero, the market risk premium for 2016 that I use is 7.5%.

The Equity Risk Premium in 2015 (Graham, Harvey): [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2611793](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2611793)

I use 3.0-3.5% with reference to Dimson, Marsh and Staunton (2011).

10 yr average of benchmark nifty index is about 16%, risk-free rate on the 364 Tbill is 7%, difference of 16-7 gives you 9%

[www.market-risk-premia.com](http://www.market-risk-premia.com)

I use an MRP of 7% which is the mid-point of the range quoted in "A Random Walk Down Wall Street" by Burton Malkiel. Professor Malkiel updates his rolling 25-year equity risk premiums every couple of years, and the 6 to 8% range is fairly consistent.

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I D E A  
**exchange**

## Building the Future From the Past\*



BY ROGER G. IBBOTSON

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UNTIL THE LAST TWO YEARS, INVESTORS had not seen consecutive negative annual stock market returns since the 1970s. In contrast, during the 1980s and 1990s the market produced its best 20-year performance ever. But neither the last two years nor the last two decades are good predictors of the long run.

A forecast usually begins by comparing the expected return on stocks with that of a low-risk asset, such as U.S. government bonds. This differ-

ence is called the equity (stock) risk premium, because it is likely to be positive and represents the extra payoff that an investor demands (but does not always get) for investing in something risky (stocks) compared with something nearly risk-free (government bonds). Thus, the bond yield is our starting point, and adding the equity risk premium gives us the expected return on stocks.

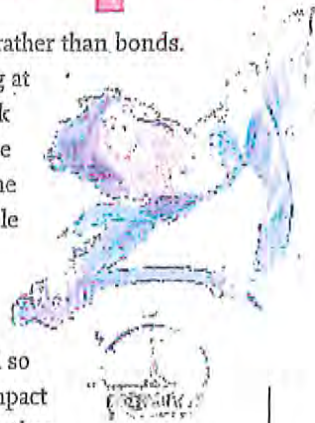
Generally, the best way to get a sense of what the future may bring is to look at the past. After all, the past is our primary source of data. But, as you already know from recent market results, the stock market is quite

volatile. The only way to get a good representation is to look back over a long period of time, so that the ups and downs of the market tend to cancel out and we get a reasonable average.

The compound average annual nominal rate of return (including inflation) for common stocks was 10.7 percent over the period 1926–2001. This return exceeded long-term U.S. Treasury yields by over 5 percent per year. That difference was the historical equity risk premium—the amount of extra return investors got over the last three-quarters of a century for invest-

ing in stocks rather than bonds.

But looking at historical stock returns relative to bond income is not the whole picture. The bull market of the 1980s and 1990s had so much of an impact on stock prices that the price of stocks in the S&P 500® Index is almost 30 times the earnings of the same companies. This contrasts with a price/earnings (P/E) ratio closer to 10 back in the 1970s—and only



about 14 over the whole 76 years. This growth in the P/E ratio is not expected to repeat in the future. Thus, to a certain extent, the stock market has outrun the underlying real earnings power of corporations.

A long-term forecast should not extrapolate the separation of the P/E ratio indefinitely. But today's high P/E ratios are not necessarily going to soon revert to historical levels, because the prices reflect the future outlook of investors—all those people and institutions that hold, buy, or sell stocks. In fact, if today's P/E ratio is higher than in the past, it has to mean one of three things: The price is now unrealistically high, people are willing to accept a much lower expected return for the

# Measuring Equity Risk

risk of stocks, or the market is optimistic that the earnings per share growth of corporations will be higher than it was in the past.

In fact, I believe in the market's optimism. Earnings per share will grow at faster rates for two reasons. First, corporations are paying out lower dividends and retaining more earnings. These extra retained earnings are reinvested back into firms. If the money is used productively, extra growth can be achieved.

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I D E A  
**exchange**

## Stock Returns for a New Century\*

BY JOHN Y. CAMPBELL



Professor of Applied  
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Harvard University

SARAWAN UNIVERSITY NEWS SERVICE

WHAT RETURNS SHOULD INVESTORS expect the U.S. stock market to deliver on average during this century? Does the experience of the last century provide a reliable guide to the future?

Perhaps the simplest way to try to forecast future returns is to use some average of past realized returns, but there are serious difficulties with this approach. Stock returns are so variable that even an average measured over a century is an unreliable guide to the true long-term average. Also, if the expected future stock return is not constant, but changes over time, it can have a perverse

have happened during the long bull market of the 1980s and 1990s.

An alternative approach is to forecast future returns using valuation ratios—ratios of stock prices to accounting measures of value, such as dividends or earnings.

One variant of this approach, known as the Gordon growth model, breaks returns into income

consistent with average realized returns. For instance, from 1871–2001, the average dividend/price ratio was just under 5 percent, while the average real growth rate was just over 2 percent, adding to about 7 percent, which is the long-term compound average realized stock return in real terms, that is, correcting for inflation. The average earnings/price ratio was also close to 7 percent.

But current valuation ratios are wildly different from historical averages, reflecting the unprecedented 20-year bull market that ended about two years ago. The dividend/price ratio, for example, has fallen dramatically to about 1.5 percent. In part, this may be due to a shift in corporate financial policy away from paying dividends and toward repurchasing shares. One way to correct for this is to add repurchases to conventional dividends, but this still implies a dividend/price ratio of only about 2.5 percent. The earnings/price ratio has also declined. In the short term, this ratio may be affected by temporary cyclical fluctuations in earnings. But even correcting for this, the earnings/price ratio is about half its long-term historical average.

The implications of current valuations for future returns depend on

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# ◀ Premium

effect on the average realized return: Consider what happens if the expected future stock return declines—perhaps because investors have become more comfortable with equity (stock) market risk and require a smaller compensation for bearing it. Investors' willingness to reduce their equity risk premium itself tends to drive up the price of stocks, causing an increase in realized returns. Thus, at precisely the wrong time, when the expected future stock return is declining, the average of past stock returns will actually increase. This may well

(the dividend/price ratio) and capital gains (the long-term average growth rate of dividends). Return is estimated by the dividend/price ratio plus the dividend growth rate. Another variant argues that stock returns come from corporate earnings: Earnings that are paid out generate income, while earnings that are reinvested generate growth. In the long run, both components of earnings are equally valuable and thus return should equal the earnings/price ratio.

Over long periods of time, these formulas have given results that are

\*Ibbotson's and Campbell's columns refer to returns on the S&P 500® Index, in nominal terms and real (inflation-adjusted) terms respectively.

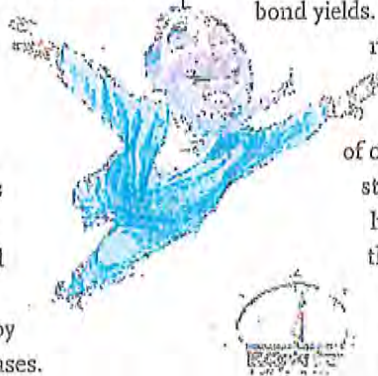


## exchange

### Building the Future From the Past continued from page 10

Second, investors are rationally willing to pay high prices for current earnings when they think future earnings will grow. The evidence demonstrates that over time investors who buy when the market's P/E ratios are high do just about as well as those who buy when the market's P/E ratios are low.

Stocks are predicted to outperform bonds in the future, but not by further P/E ratio increases.



Instead, stocks will tend to participate with the overall U.S. economy and earnings per share growth. My forecast for stocks is somewhat less than 4 percent in excess of long-term bond yields. Applying this premium to recent bond yields gives a long-term forecast of over 9 percent for the stock market. It is high, but lower than the historical stock market return. But, of course, there is no free lunch. The

reason stocks are expected to outperform bonds is that they are riskier than bonds. Although stocks belong in most people's portfolios, the smart investor will still want to diversify across different types of stocks, as well as across bonds and other asset classes.



To learn more about Ibbotson's research, go to <http://mba.yale.edu/faculty/professors/ibbotson.htm>.

### Stock Returns for a New Century continued from page 11

whether the market has reached a new steady state, in which current valuations will persist, or whether these valuations are the result of some transitory phenomenon.

If current valuations represent a new steady state, they imply a substantial decline in the equity returns that can be expected in the future. The future expected stock return might be 3.5 percent to 4.5 percent, rather than the historical average of 7 percent. This would allow for only a very modest equity premium relative to Treasury bills or inflation-indexed Treasury bonds, which currently offer a safe 3.5 percent real yield.

If current valuations are transitory, it matters critically what happens to restore traditional valuation ratios. Rapid earnings and dividend growth could restore traditional valuations without any decline in stock prices. While this is always a possibility, it would be historically unprecedented. The U.S. stock market has an extremely poor record of predicting

long-term earnings and dividend growth. Historically, stock prices have increased relative to earnings during decades of rapid earnings growth, such as the 1920s, 1960s, and 1990s, as if the stock market anticipates that rapid earnings growth will continue in the next decade. But there is no systematic tendency for a profitable decade to be followed by a second profitable decade. The 1920s, for example, were followed by the 1930s, and the 1960s by the 1970s. Thus, stock market optimism often fails to be justified by subsequent earnings growth.

A second possibility is that stock prices will decline or stagnate until traditional valuations are restored. This has occurred at various times in the past after periods of unusually high stock prices, notably in the 1900s, 1910s, 1930s, and 1970s. This would imply extremely low and perhaps even negative returns during the adjustment period and then higher returns afterward.

It is too soon to tell which of these

views is correct, and I believe it is sensible to put some weight on each. That is, I expect valuation ratios to return part way but not fully to traditional levels, with the adjustment coming primarily from stock prices rather than earnings growth. A rough guess for the long-term stock return, after the adjustment process is complete, might be a compound average real equity return of 5.0 percent to 5.5 percent, corresponding to an equity premium of 1.5 percent to 2.0 percent.



To learn more about Campbell's research, go to <http://post.economics.harvard.edu/faculty/campbell/campbell.html>.

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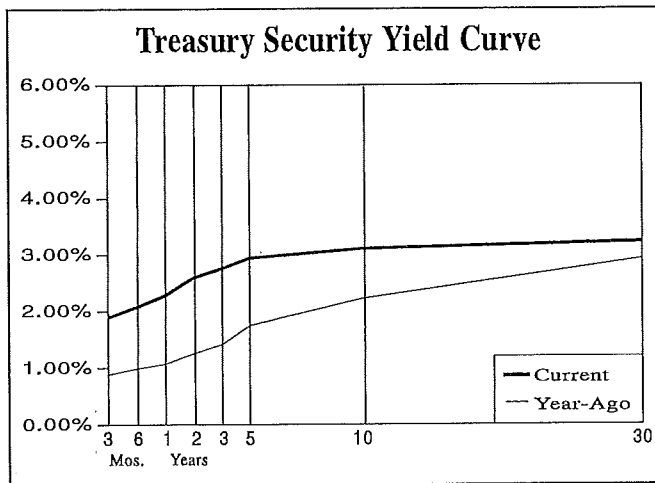


## Value Line Forecast for the U.S. Economy

|  | Actual |        |        |        | Estimated |        |        |        |
|--|--------|--------|--------|--------|-----------|--------|--------|--------|
|  | 2017:4 | 2018:1 | 2018:2 | 2018:3 | 2018:4    | 2019:1 | 2019:2 | 2019:3 |
| <b>Gross Domestic Product and its Components</b><br>(2009 Chain Weighted \$) Billions of Dollars |        |        |        |        |           |        |        |        |
| Final Sales  | 17335  | 17417  | 17546  | 17676  | 17808     | 17931  | 18051  | 18163  |
| Total Consumption  | 12035  | 12068  | 12158  | 12242  | 12327     | 12409  | 12489  | 12566  |
| Nonresidential Fixed Investment  | 2366   | 2401   | 2442   | 2478   | 2518      | 2555   | 2592   | 2624   |
| Structures   | 474    | 488    | 499    | 508    | 515       | 523    | 530    | 537    |
| Equipment & Software   | 1141   | 1154   | 1171   | 1191   | 1214      | 1237   | 1261   | 1283   |
| Residential Fixed Investment   | 605    | 605    | 613    | 619    | 624       | 629    | 634    | 639    |
| Exports  | 2229   | 2255   | 2289   | 2328   | 2365      | 2402   | 2437   | 2470   |
| Imports  | 2884   | 2903   | 2931   | 2967   | 3004      | 3048   | 3093   | 3142   |
| Federal Government   | 1126   | 1131   | 1139   | 1147   | 1157      | 1165   | 1171   | 1174   |
| State & Local Governments  | 1793   | 1797   | 1801   | 1806   | 1812      | 1819   | 1826   | 1831   |
| Gross Domestic Product   | 19756  | 19967  | 20229  | 20491  | 20755     | 21023  | 21310  | 21601  |
| Real GDP (2009 Chain Weighted \$)  | 17289  | 17387  | 17529  | 17667  | 17798     | 17922  | 18055  | 18180  |
| <b>Prices and Wages — Annual Rates of Change</b>   |        |        |        |        |           |        |        |        |
| GDP Deflator   | 2.3    | 2.0    | 2.0    | 2.0    | 2.2       | 2.4    | 2.5    | 2.7    |
| CPI-All Urban Consumers  | 3.3    | 3.5    | 2.5    | 2.5    | 2.5       | 2.5    | 2.5    | 2.6    |
| PPI-Finished Goods   | 5.9    | 3.6    | 2.8    | 3.0    | 2.5       | 2.5    | 2.6    | 2.6    |
| Employment Cost Index—Total Comp.  | 1.9    | 4.0    | 2.6    | 3.0    | 3.3       | 3.4    | 3.4    | 3.4    |
| Productivity   | 0.3    | 0.7    | 1.6    | 1.6    | 1.5       | 1.4    | 1.3    | 1.3    |
| <b>Production and Other Key Measures</b>   |        |        |        |        |           |        |        |        |
| Industrial Prod. (% Change, Annualized)  | 7.8    | 4.5    | 3.5    | 3.3    | 3.5       | 3.5    | 3.3    | 3.0    |
| Factory Operating Rate (%)   | 75.2   | 75.6   | 76.0   | 76.0   | 76.3      | 76.5   | 76.6   | 76.6   |
| Nonfarm Inven. Change (2009 Chain Weighted \$)   | 11.8   | 30.2   | 40.0   | 50.0   | 60.0      | 70.0   | 80.0   | 80.0   |
| Housing Starts (Mill. Units)   | 1.26   | 1.32   | 1.32   | 1.34   | 1.35      | 1.36   | 1.38   | 1.40   |
| Existing House Sales (Mill. Units)   | 5.59   | 5.51   | 5.60   | 5.65   | 5.68      | 5.70   | 5.70   | 5.75   |
| Total Light Vehicle Sales (Mill. Units)  | 17.7   | 17.2   | 16.9   | 16.9   | 16.9      | 16.9   | 16.8   | 16.8   |
| National Unemployment Rate (%)   | 4.1    | 4.1    | 3.9    | 3.8    | 3.7       | 3.7    | 3.7    | 3.7    |
| Federal Budget Surplus (Unified, FY, \$Bill)   | -225   | -375   | -25.0  | -225   | -250      | -350   | -50.0  | -250   |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)   | 50.35  | 60.00  | 65.00  | 64.00  | 63.00     | 62.00  | 60.00  | 60.00  |
| <b>Money and Interest Rates</b>  |        |        |        |        |           |        |        |        |
| 3-Month Treasury Bill Rate (%)   | 1.2    | 1.6    | 2.0    | 2.2    | 2.3       | 2.5    | 2.7    | 2.8    |
| Federal Funds Rate (%)   | 1.2    | 1.5    | 1.7    | 1.9    | 2.2       | 2.5    | 2.7    | 3.2    |
| 10-Year Treasury Note Rate (%)   | 2.4    | 2.8    | 3.0    | 3.2    | 3.3       | 3.4    | 3.5    | 3.5    |
| Long-Term Treasury Bond Rate (%)   | 3.5    | 3.3    | 3.4    | 3.5    | 3.6       | 3.8    | 3.8    | 3.8    |
| AAA Corporate Bond Rate (%)  | 4.0    | 4.2    | 4.2    | 4.5    | 4.7       | 4.8    | 5.0    | 5.0    |
| Prime Rate (%)   | 4.3    | 4.4    | 4.8    | 5.0    | 5.3       | 5.5    | 5.8    | 6.0    |
| <b>Incomes</b>   |        |        |        |        |           |        |        |        |
| Personal Income (Annualized % Change)  | 4.6    | 4.4    | 4.4    | 4.5    | 5.0       | 5.0    | 5.0    | 4.9    |
| Real Disp. Inc. (Annualized % Change)  | 1.1    | 3.4    | 3.3    | 3.0    | 3.3       | 3.5    | 3.5    | 3.3    |
| Personal Savings Rate (%)  | 2.6    | 3.1    | 3.1    | 3.0    | 3.3       | 3.3    | 3.5    | 3.5    |
| After-Tax Profits (Annualized \$Bill)  | 1664   | 1708   | 1948   | 1992   | 1780      | 1836   | 2084   | 2112   |
| Yr-to-Yr % Change  | -6.0   | -5.8   | 8.0    | 7.0    | 7.0       | 7.5    | 7.0    | 6.0    |
| <b>Composition of Real GDP—Annual Rates of Change</b>  |        |        |        |        |           |        |        |        |
| Gross Domestic Product   | 2.9    | 2.3    | 3.3    | 3.2    | 3.0       | 2.8    | 3.0    | 2.8    |
| Final Sales  | 3.4    | 1.9    | 3.0    | 3.0    | 3.0       | 2.8    | 2.7    | 2.5    |
| Total Consumption  | 4.0    | 1.1    | 3.0    | 2.8    | 2.8       | 2.7    | 2.6    | 2.5    |
| Nonresidential Fixed Investment  | 6.8    | 6.1    | 7.0    | 6.0    | 6.5       | 6.0    | 6.0    | 5.0    |
| Structures   | 6.3    | 12.3   | 9.0    | 7.0    | 6.0       | 6.0    | 6.0    | 5.0    |
| Equipment & Software   | 11.5   | 4.7    | 6.0    | 7.0    | 8.0       | 8.0    | 8.0    | 7.0    |
| Residential Fixed Investment   | 12.8   | 0.0    | 5.0    | 4.0    | 3.5       | 3.5    | 3.0    | 3.0    |
| Exports  | 7.0    | 4.8    | 6.0    | 7.0    | 6.5       | 6.5    | 6.0    | 5.5    |
| Imports  | 14.1   | 2.6    | 4.0    | 5.0    | 5.0       | 6.0    | 6.0    | 6.5    |
| Federal Government   | 3.2    | 1.7    | 3.0    | 3.0    | 3.2       | 3.0    | 2.0    | 1.0    |
| State & Local Governments  | 2.9    | 0.8    | 1.0    | 1.0    | 1.5       | 1.5    | 1.5    | 1.0    |

## Selected Yields

| TAXABLE                         | Recent<br>(5/23/18) | 3 Months Ago<br>(2/21/18) | Year Ago<br>(5/24/17) | TAXABLE                           | Recent<br>(5/23/18) | 3 Months Ago<br>(2/21/18) | Year Ago<br>(5/24/17) |
|---------------------------------|---------------------|---------------------------|-----------------------|-----------------------------------|---------------------|---------------------------|-----------------------|
| <b>Market Rates</b>             |                     |                           |                       | <b>Mortgage-Backed Securities</b> |                     |                           |                       |
| Discount Rate                   | 2.25                | 2.00                      | 1.50                  | GNMA 5.5%                         | 3.41                | 3.28                      | 2.33                  |
| Federal Funds                   | 1.50-1.75           | 1.25-1.50                 | 0.75-1.00             | FHLMC 5.5% (Gold)                 | 3.67                | 3.39                      | 2.38                  |
| Prime Rate                      | 4.75                | 4.50                      | 4.00                  | FNMA 5.5%                         | 3.51                | 3.35                      | 2.23                  |
| 30-day CP (A1/P1)               | 1.91                | 1.58                      | 0.97                  | FNMA ARM                          | 1.97                | 1.91                      | 1.74                  |
| 3-month LIBOR                   | 2.33                | 1.90                      | 1.19                  | <b>Corporate Bonds</b>            |                     |                           |                       |
| <b>U.S. Treasury Securities</b> |                     |                           |                       | Financial (10-year) A             | 4.07                | 3.85                      | 3.38                  |
| 3-month                         | 1.90                | 1.64                      | 0.92                  | Industrial (25/30-year) A         | 4.32                | 4.17                      | 4.00                  |
| 6-month                         | 2.09                | 1.85                      | 1.06                  | Utility (25/30-year) A            | 4.29                | 4.21                      | 4.10                  |
| 1-year                          | 2.27                | 2.00                      | 1.15                  | Utility (25/30-year) Baa/BBB      | 4.62                | 4.49                      | 4.45                  |
| 5-year                          | 2.82                | 2.69                      | 1.79                  | <b>Foreign Bonds (10-Year)</b>    |                     |                           |                       |
| 10-year                         | 2.99                | 2.95                      | 2.25                  | Canada                            | 2.44                | 2.35                      | 1.48                  |
| 10-year (inflation-protected)   | 0.86                | 0.83                      | 0.39                  | Germany                           | 0.49                | 0.72                      | 0.40                  |
| 30-year                         | 3.15                | 3.22                      | 2.92                  | Japan                             | 0.05                | 0.06                      | 0.05                  |
| 30-year Zero                    | 3.21                | 3.25                      | 3.04                  | United Kingdom                    | 1.43                | 1.56                      | 1.07                  |
| <b>Common Stocks</b>            |                     |                           |                       | <b>Preferred Stock</b>            |                     |                           |                       |
| VL Stocks (Median)              | 2.00                | 2.00                      | 2.10                  | Utility A                         | 5.84                | 6.04                      | 5.91                  |
| DJ Industrials (12-mo. est.)    | 2.30                | 2.20                      | 2.50                  | Financial BBB                     | 5.76                | 5.95                      | 5.73                  |
| VL Utilities                    | 3.50                | 3.50                      | 3.40                  | Financial Adjustable A            | 5.52                | 5.52                      | 5.52                  |



| <b>TAX-EXEMPT</b>                      |      |      |      |
|--|------|------|------|
| <b>Bond Buyer Indexes</b>              |      |      |      |
| 20-Bond Index (GOs)                    | 3.95 | 3.84 | 3.73 |
| 25-Bond Index (Revs)                   | 4.44 | 4.33 | 3.92 |
| <b>General Obligation Bonds (GOs)</b>  |      |      |      |
| 1-year AAA                             | 1.74 | 1.33 | 0.77 |
| 1-year A                               | 1.99 | 1.43 | 1.08 |
| 5-year AAA                             | 2.11 | 1.95 | 1.29 |
| 5-year A                               | 2.60 | 2.21 | 1.85 |
| 10-year AAA                            | 2.52 | 2.47 | 1.97 |
| 10-year A                              | 3.03 | 2.95 | 2.55 |
| 25/30-year AAA                         | 3.03 | 2.99 | 2.79 |
| 25/30-year A                           | 3.90 | 3.88 | 3.53 |
| <b>Revenue Bonds (Revs) (15 Years)</b> |      |      |      |
| Education AA                           | 3.12 | 3.16 | 2.70 |
| Electric AA                            | 3.02 | 2.99 | 2.62 |
| Housing AA                             | 3.08 | 3.10 | 2.61 |
| Hospital AA                            | 3.23 | 3.32 | 2.91 |
| Toll Road AA                           | 3.17 | 3.18 | 2.71 |

Source: Bloomberg Finance L.P.

## Federal Reserve Data

### BANK RESERVES (Two-Week Period; in Millions, Not Seasonally Adjusted)

|                            | Recent Levels |         |        | Average Level Over the Last... |         |         |
|----------------------------|---------------|---------|--------|--------------------------------|---------|---------|
|                            | 5/9/18        | 4/25/18 | Change | 12 Wks.                        | 26 Wks. | 52 Wks. |
| Excess Reserves            | 1878851       | 1968454 | -89603 | 2024132                        | 2079055 | 2107453 |
| Borrowed Reserves          | 102           | 49      | 53     | 36                             | 36      | 23      |
| Net Free/Borrowed Reserves | 1878749       | 1968405 | -89656 | 2024096                        | 2079020 | 2107430 |

### MONEY SUPPLY (One-Week Period; in Billions, Seasonally Adjusted)

|                                     | Recent Levels |         |        | Annual Growth Rates Over the Last... |        |         |
|-------------------------------------|---------------|---------|--------|--------------------------------------|--------|---------|
|                                     | 5/7/18        | 4/30/18 | Change | 3 Mos.                               | 6 Mos. | 12 Mos. |
| M1 (Currency+demand deposits)       | 3652.1        | 3661.1  | -9.0   | -0.3%                                | 3.9%   | 6.2%    |
| M2 (M1+savings+small time deposits) | 13971.2       | 13955.2 | 16.0   | 3.2%                                 | 3.1%   | 3.7%    |

Source: United States Federal Reserve Bank

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## Value Line Forecast for the U.S. Economy

|  | Actual |        | Estimated |        |        |        |        |        |
|--|--------|--------|-----------|--------|--------|--------|--------|--------|
|  | 2016:4 | 2017:1 | 2017:2    | 2017:3 | 2017:4 | 2018:1 | 2018:2 | 2018:3 |
| <b>Gross Domestic Product and its Components</b><br>(2009 Chain Weighted \$) Billions of Dollars |        |        |           |        |        |        |        |        |
| Final Sales  | 16707  | 16798  | 16935     | 17048  | 17162  | 17281  | 17396  | 17512  |
| Total Consumption  | 11671  | 11688  | 11769     | 11851  | 11933  | 12027  | 12131  | 12236  |
| Nonresidential Fixed Investment  | 2198   | 2259   | 2308      | 2336   | 2365   | 2399   | 2435   | 2470   |
| Structures   | 443    | 472    | 488       | 497    | 504    | 511    | 517    | 524    |
| Equipment & Software   | 1037   | 1056   | 1076      | 1092   | 1111   | 1124   | 1141   | 1157   |
| Residential Fixed Investment   | 596    | 615    | 627       | 635    | 641    | 647    | 654    | 662    |
| Exports  | 2138   | 2168   | 2189      | 2206   | 2216   | 2227   | 2239   | 2252   |
| Imports  | 2743   | 2769   | 2789      | 2810   | 2844   | 2879   | 2915   | 2957   |
| Federal Government   | 1121   | 1115   | 1121      | 1124   | 1121   | 1118   | 1116   | 1115   |
| State & Local Governments  | 1785   | 1782   | 1786      | 1795   | 1804   | 1813   | 1822   | 1831   |
| Gross Domestic Product   | 18869  | 19034  | 19261     | 19486  | 19713  | 19958  | 20221  | 20497  |
| Real GDP (2009 Chain Weighted \$)  | 16811  | 16862  | 16987     | 17092  | 17198  | 17317  | 17450  | 17588  |
| <b>Prices and Wages — Annual Rates of Change</b>   |        |        |           |        |        |        |        |        |
| GDP Deflator   | 2.1    | 2.3    | 1.8       | 2.2    | 2.2    | 2.2    | 2.2    | 2.3    |
| CPI-All Urban Consumers  | 3.0    | 3.1    | 2.0       | 2.5    | 2.3    | 2.0    | 2.2    | 2.3    |
| PPI-Finished Goods   | 3.4    | 6.2    | 3.0       | 2.5    | 2.0    | 1.7    | 2.0    | 2.1    |
| Employment Cost Index—Total Comp.  | 1.9    | 3.2    | 2.5       | 2.7    | 2.9    | 3.0    | 3.1    | 3.3    |
| Productivity   | 1.8    | -0.6   | 2.0       | 2.0    | 2.0    | 2.0    | 1.8    | 1.8    |
| <b>Production and Other Key Measures</b>   |        |        |           |        |        |        |        |        |
| Industrial Prod. (% Change, Annualized)  | 0.7    | 1.5    | 4.0       | 3.0    | 3.0    | 3.0    | 3.0    | 2.9    |
| Factory Operating Rate (%)   | 75.1   | 75.4   | 75.5      | 75.5   | 75.8   | 75.8   | 76.0   | 76.0   |
| Nonfarm Inven. Change (2009 Chain Weighted \$)   | 55.8   | 14.5   | 25.0      | 20.0   | 20.0   | 30.0   | 35.0   | 45.0   |
| Housing Starts (Mill. Units)   | 1.25   | 1.25   | 1.25      | 1.28   | 1.30   | 1.33   | 1.34   | 1.36   |
| Existing House Sales (Mill. Units)   | 5.55   | 5.62   | 5.63      | 5.60   | 5.55   | 5.50   | 5.50   | 5.48   |
| Total Light Vehicle Sales (Mill. Units)  | 18.0   | 17.2   | 17.3      | 17.4   | 17.5   | 17.5   | 17.5   | 17.5   |
| National Unemployment Rate (%)   | 4.7    | 4.7    | 4.5       | 4.4    | 4.4    | 4.3    | 4.2    | 4.2    |
| Federal Budget Surplus (Unified, FY, \$Bill)   | -210   | -317   | 70.0      | -150   | -150   | -275   | 25.0   | -200   |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)   | 46.65  | 49.25  | 47.00     | 48.00  | 48.00  | 50.00  | 50.00  | 47.00  |
| <b>Money and Interest Rates</b>  |        |        |           |        |        |        |        |        |
| 3-Month Treasury Bill Rate (%)   | 0.4    | 0.6    | 0.9       | 1.1    | 1.2    | 1.4    | 1.5    | 1.8    |
| Federal Funds Rate (%)   | 0.5    | 0.7    | 1.0       | 1.2    | 1.3    | 1.5    | 1.5    | 1.8    |
| 10-Year Treasury Note Rate (%)   | 2.1    | 2.4    | 2.4       | 2.6    | 2.8    | 3.0    | 3.1    | 3.3    |
| Long-Term Treasury Bond Rate (%)   | 2.8    | 3.1    | 2.9       | 3.2    | 3.3    | 3.5    | 3.7    | 3.8    |
| AAA Corporate Bond Rate (%)  | 3.8    | 4.0    | 4.0       | 4.2    | 4.4    | 4.6    | 4.7    | 4.8    |
| Prime Rate (%)   | 3.6    | 3.9    | 4.0       | 4.3    | 4.5    | 4.6    | 4.6    | 4.8    |
| <b>Incomes</b>   |        |        |           |        |        |        |        |        |
| Personal Income (Annualized % Change)  | 3.9    | 4.0    | 4.4       | 4.6    | 4.7    | 5.0    | 4.8    | 4.8    |
| Real Disp. Inc. (Annualized % Change)  | 2.0    | 1.0    | 3.7       | 2.7    | 3.0    | 3.5    | 3.5    | 3.5    |
| Personal Savings Rate (%)  | 5.5    | 5.7    | 5.7       | 5.8    | 5.9    | 6.0    | 6.2    | 6.4    |
| After-Tax Profits (Annualized \$Bill)  | 1722   | 1743   | 1830      | 1817   | 1808   | 1970   | 2105   | 2071   |
| Yr-to-Yr % Change  | 22.3   | 12.4   | 10.0      | 8.0    | 5.0    | 13.0   | 15.0   | 14.0   |
| <b>Composition of Real GDP—Annual Rates of Change</b>  |        |        |           |        |        |        |        |        |
| Gross Domestic Product   | 2.1    | 1.2    | 3.0       | 2.5    | 2.5    | 2.8    | 3.1    | 3.2    |
| Final Sales  | 1.1    | 2.2    | 3.3       | 2.7    | 2.7    | 2.8    | 2.7    | 2.7    |
| Total Consumption  | 3.5    | 0.6    | 2.8       | 2.8    | 2.8    | 3.2    | 3.5    | 3.5    |
| Nonresidential Fixed Investment  | 0.9    | 11.4   | 9.0       | 5.0    | 5.0    | 6.0    | 6.0    | 6.0    |
| Structures   | -1.9   | 28.4   | 14.0      | 8.0    | 6.0    | 5.0    | 5.0    | 6.0    |
| Equipment & Software   | 1.9    | 7.2    | 8.0       | 6.0    | 7.0    | 5.0    | 6.0    | 6.0    |
| Residential Fixed Investment   | 9.6    | 13.8   | 8.0       | 5.0    | 4.0    | 4.0    | 4.5    | 4.5    |
| Exports  | -4.5   | 5.8    | 4.0       | 3.0    | 2.0    | 2.0    | 2.0    | 2.5    |
| Imports  | 9.0    | 3.8    | 3.0       | 3.0    | 5.0    | 5.0    | 5.0    | 6.0    |
| Federal Government   | -1.2   | -2.0   | 2.0       | 1.0    | -1.0   | -1.0   | -0.5   | -0.5   |
| State & Local Governments  | 1.0    | -0.6   | 1.0       | 2.0    | 2.0    | 2.0    | 2.0    | 2.0    |



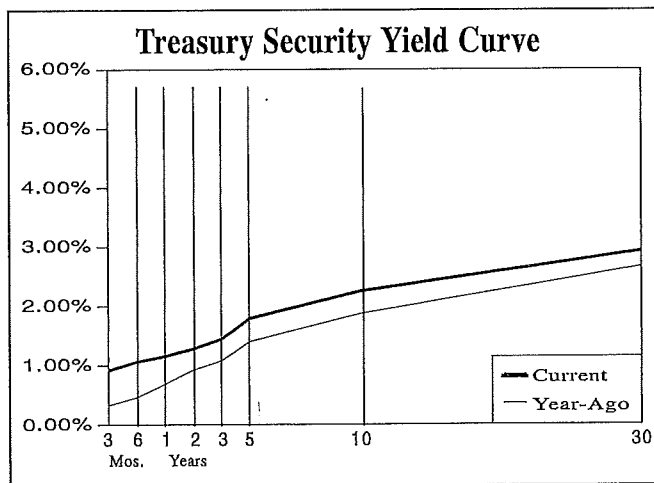
## Selected Yields

| TAXABLE                         | Recent<br>(5/24/17) | 3 Months Ago<br>(2/22/17) | Year Ago<br>(5/25/16) | TAXABLE                           | Recent<br>(5/24/17) | 3 Months Ago<br>(2/22/17) | Year Ago<br>(5/25/16) |
|---------------------------------|---------------------|---------------------------|-----------------------|-----------------------------------|---------------------|---------------------------|-----------------------|
| <b>Market Rates</b>             |                     |                           |                       | <b>Mortgage-Backed Securities</b> |                     |                           |                       |
| Discount Rate                   | 1.50                | 1.25                      | 1.00                  | GNMA 5.5%                         | 2.33                | 2.27                      | 1.93                  |
| Federal Funds                   | 0.75-1.00           | 0.50-0.75                 | 0.25-0.50             | FHLMC 5.5% (Gold)                 | 2.38                | 2.44                      | 1.86                  |
| Prime Rate                      | 4.00                | 3.75                      | 3.50                  | FNMA 5.5%                         | 2.23                | 2.26                      | 1.54                  |
| 30-day CP (A1/P1)               | 0.97                | 0.76                      | 0.42                  | FNMA ARM                          | 1.74                | 1.76                      | 1.84                  |
| 3-month LIBOR                   | 1.19                | 1.05                      | 0.67                  | <b>Corporate Bonds</b>            |                     |                           |                       |
| <b>U.S. Treasury Securities</b> |                     |                           |                       | Financial (10-year) A             | 3.38                | 3.54                      | 3.25                  |
| 3-month                         | 0.92                | 0.51                      | 0.33                  | Industrial (25/30-year) A         | 4.00                | 4.11                      | 3.96                  |
| 6-month                         | 1.06                | 0.67                      | 0.46                  | Utility (25/30-year) A            | 4.10                | 4.18                      | 3.99                  |
| 1-year                          | 1.15                | 0.80                      | 0.68                  | Utility (25/30-year) Baa/BBB      | 4.45                | 4.58                      | 4.44                  |
| 5-year                          | 1.79                | 1.91                      | 1.40                  | <b>Foreign Bonds (10-Year)</b>    |                     |                           |                       |
| 10-year                         | 2.25                | 2.41                      | 1.87                  | Canada                            | 1.48                | 1.72                      | 1.39                  |
| 10-year (inflation-protected)   | 0.39                | 0.34                      | 0.33                  | Germany                           | 0.40                | 0.28                      | 0.15                  |
| 30-year                         | 2.92                | 3.03                      | 2.66                  | Japan                             | 0.05                | 0.08                      | -0.08                 |
| 30-year Zero                    | 3.04                | 3.12                      | 2.79                  | United Kingdom                    | 1.07                | 1.20                      | 1.46                  |
| <b>Common Stocks</b>            |                     |                           |                       | <b>Preferred Stock</b>            |                     |                           |                       |
| VL Stocks (Median)              | 2.10                | 2.00                      | 2.30                  | Utility A                         | 5.91                | 5.69                      | 5.93                  |
| DJ Industrials (12-mo. est.)    | 2.50                | 2.40                      | 2.70                  | Financial BBB                     | 5.73                | 5.90                      | 5.84                  |
| VL Utilities                    | 3.40                | 3.50                      | 3.48                  | Financial Adjustable A            | 5.52                | 5.52                      | 5.52                  |

### TAX-EXEMPT

| <b>Bond Buyer Indexes</b>              |      |      |      |
|--|------|------|------|
| 20-Bond Index (GOs)                    | 3.73 | 3.94 | 3.26 |
| 25-Bond Index (Revs)                   | 3.92 | 4.11 | 3.48 |
| <b>General Obligation Bonds (GOs)</b>  |      |      |      |
| 1-year AAA                             | 0.77 | 0.87 | 0.60 |
| 1-year A                               | 1.08 | 1.34 | 1.00 |
| 5-year AAA                             | 1.29 | 1.65 | 1.06 |
| 5-year A                               | 1.85 | 2.15 | 1.81 |
| 10-year AAA                            | 1.97 | 2.37 | 1.62 |
| 10-year A                              | 2.55 | 2.90 | 2.51 |
| 25/30-year AAA                         | 2.79 | 3.11 | 2.37 |
| 25/30-year A                           | 3.53 | 3.96 | 3.48 |
| <b>Revenue Bonds (Revs) (15 Years)</b> |      |      |      |
| Education AA                           | 2.70 | 3.00 | 2.50 |
| Electric AA                            | 2.62 | 2.83 | 2.39 |
| Housing AA                             | 3.02 | 3.40 | 2.60 |
| Hospital AA                            | 2.91 | 3.21 | 2.56 |
| Toll Road AA                           | 2.71 | 3.05 | 2.50 |

Source: Bloomberg Finance L.P.



## Federal Reserve Data

### BANK RESERVES (Two-Week Period; in Millions, Not Seasonally Adjusted)

|                            | Recent Levels |         |        | Average Level Over the Last... |         |         |
|----------------------------|---------------|---------|--------|--------------------------------|---------|---------|
|                            | 5/10/17       | 4/26/17 | Change | 12 Wks.                        | 26 Wks. | 52 Wks. |
| Excess Reserves            | 2086489       | 2172981 | -86492 | 2166218                        | 2074395 | 2133930 |
| Borrowed Reserves          | 49            | 38      | 11     | 29                             | 30      | 93      |
| Net Free/Borrowed Reserves | 2086440       | 2172943 | -86503 | 2166190                        | 2074365 | 2133837 |

### MONEY SUPPLY (One-Week Period; in Billions, Seasonally Adjusted)

|                                     | Recent Levels |         |        | Annual Growth Rates Over the Last... |       |         |
|-------------------------------------|---------------|---------|--------|--------------------------------------|-------|---------|
|                                     | 5/8/17        | 5/1/17  | Change | 3 mo.                                | 6 mo. | 12 Mos. |
| M1 (Currency+demand deposits)       | 3434.8        | 3423.7  | 11.1   | 5.7%                                 | 7.5%  | 6.8%    |
| M2 (M1+savings+small time deposits) | 13460.3       | 13475.1 | -14.8  | 5.5%                                 | 5.8%  | 5.8%    |

Source: United States Federal Reserve Bank

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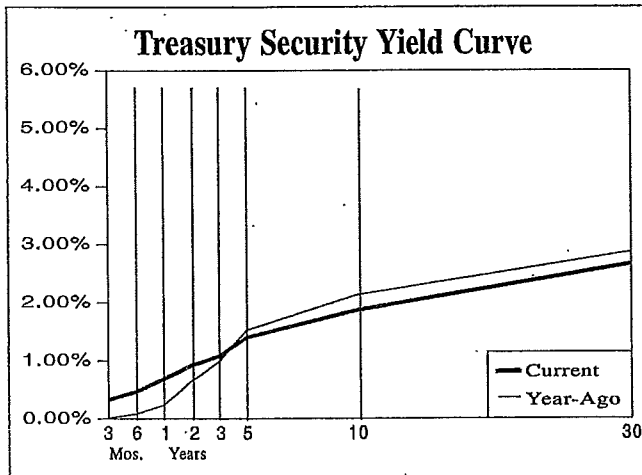
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## Value Line Forecast for the U.S. Economy

|   | ACTUAL |        |        |       |       | Estimated |       |       |       |       |
|---|--------|--------|--------|-------|-------|-----------|-------|-------|-------|-------|
|   | 2011   | 2012   | 2013   | 2014  | 2015  | 2016      | 2017  | 2018  | 2019  | 2020  |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS (2009 CHAIN WEIGHTED \$) BILLIONS OF DOLLARS</b> |        |        |        |       |       |           |       |       |       |       |
| Final Sales   | 14979  | 15292  | 15511  | 15882 | 16241 | 16608     | 17085 | 17564 | 17985 | 18399 |
| Total Consumption   | 10264  | 10413  | 10590  | 10876 | 11214 | 11524     | 11874 | 12230 | 12560 | 12874 |
| Nonresidential Fixed Investment   | 1803   | 1964   | 2024   | 2148  | 2209  | 2201      | 2286  | 2423  | 2544  | 2671  |
| Structures  | 375    | 423    | 430    | 465   | 458   | 445       | 458   | 481   | 503   | 523   |
| Equipment & Software  | 848    | 939    | 970    | 1026  | 1058  | 1060      | 1108  | 1174  | 1233  | 1289  |
| Residential Fixed Investment  | 385    | 437    | 478    | 486   | 529   | 586       | 624   | 662   | 695   | 723   |
| Exports   | 1898   | 1963   | 2018   | 2086  | 2110  | 2116      | 2192  | 2279  | 2389  | 2503  |
| Imports   | 2358   | 2410   | 2436   | 2529  | 2654  | 2695      | 2838  | 2985  | 3134  | 3276  |
| Federal Government  | 1236   | 1214   | 1144   | 1116  | 1113  | 1125      | 1141  | 1129  | 1118  | 1118  |
| State & Local Governments   | 1761   | 1728   | 1710   | 1721  | 1744  | 1768      | 1787  | 1806  | 1828  | 1846  |
| Gross Domestic Product  | 15518  | 16155  | 16664  | 17348 | 17945 | 18504     | 19320 | 20298 | 21283 | 22317 |
| Real GDP (2009 Chain Weighted \$)   | 15021  | 15355  | 15583  | 15962 | 16349 | 16655     | 17060 | 17538 | 17994 | 18444 |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>  |        |        |        |       |       |           |       |       |       |       |
| GDP Deflator  | 2.0    | 1.8    | 1.6    | 1.6   | 1.1   | 1.4       | 2.1   | 2.2   | 2.2   | 2.3   |
| CPI-All Urban Consumers   | 3.1    | 2.1    | 1.5    | 1.6   | 0.4   | 1.7       | 2.4   | 2.5   | 2.6   | 2.7   |
| PPI-Finished Goods  | 6.0    | 1.9    | 1.2    | 1.9   | -3.2  | -0.1      | 2.8   | 2.9   | 2.9   | 3.0   |
| Employment Cost Index--Total Comp.  | 2.1    | 1.9    | 1.9    | 2.1   | 1.9   | 2.4       | 2.8   | 3.1   | 3.2   | 3.2   |
| Productivity  | 0.5    | 0.9    | 0.0    | 0.7   | 0.7   | 0.6       | 1.5   | 2.0   | 1.9   | 1.8   |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>  |        |        |        |       |       |           |       |       |       |       |
| Industrial Prod. (% Change)   | 3.3    | 2.8    | 1.9    | 3.7   | -1.6  | 0.3       | 2.9   | 3.3   | 3.0   | 2.8   |
| Factory Operating Rate (%)  | 73.9   | 74.5   | 74.1   | 75.3  | 75.5  | 75.5      | 75.8  | 76.0  | 75.8  | 75.5  |
| Nonfarm Inven. Change (2009 Chain Weighted \$)  | 39.7   | 72.7   | 54.3   | 65.0  | 93.3  | 30.7      | 41.3  | 55.0  | 50.0  | 50.0  |
| Housing Starts (Mill. Units)  | 0.61   | 0.78   | 0.93   | 1.00  | 1.11  | 1.17      | 1.38  | 1.50  | 1.53  | 1.55  |
| Existing House Sales (Mill. Units)  | 4.28   | 4.66   | 5.07   | 4.92  | 5.23  | 5.38      | 5.45  | 5.45  | 5.40  | 5.40  |
| Total Light Vehicle Sales (Mill. Units)   | 12.7   | 14.4   | 15.5   | 16.4  | 17.4  | 17.7      | 18.2  | 18.0  | 17.8  | 17.5  |
| National Unemployment Rate (%)  | 8.9    | 8.1    | 7.4    | 6.2   | 5.3   | 4.9       | 4.8   | 4.7   | 4.8   | 4.8   |
| Federal Budget Surplus (Unified, FY, \$Bill)  | -1297  | -1089  | -680   | -483  | -479  | -545      | -550  | -600  | -700  | -750  |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)  | 101.75 | 101.00 | 100.47 | 92.23 | 48.41 | 43.25     | 49.75 | 51.00 | 53.00 | 63.00 |
| <b>MONEY AND INTEREST RATES</b>   |        |        |        |       |       |           |       |       |       |       |
| 3-Month Treasury Bill Rate (%)  | 0.1    | 0.1    | 0.1    | 0.1   | 0.3   | 0.5       | 1.4   | 2.3   | 2.6   | 2.8   |
| Federal Funds Rate (%)  | 0.1    | 0.1    | 0.1    | 0.1   | 0.1   | 0.6       | 1.4   | 2.5   | 3.0   | 3.3   |
| 10-Year Treasury Note Rate (%)  | 2.8    | 1.8    | 2.4    | 2.5   | 2.2   | 2.1       | 2.6   | 3.0   | 3.5   | 3.7   |
| Long-Term Treasury Bond Rate (%)  | 3.9    | 2.9    | 3.5    | 3.3   | 2.9   | 2.9       | 3.1   | 3.4   | 3.8   | 4.0   |
| AAA Corporate Bond Rate (%)   | 4.6    | 3.7    | 4.2    | 4.2   | 3.9   | 4.2       | 4.8   | 4.5   | 4.6   | 4.8   |
| Prime Rate (%)  | 3.3    | 3.3    | 3.3    | 3.3   | 3.3   | 3.8       | 4.8   | 5.0   | 5.5   | 6.0   |
| <b>INCOMES</b>  |        |        |        |       |       |           |       |       |       |       |
| Personal Income (% Change)  | 6.1    | 5.0    | 1.1    | 4.4   | 4.1   | 4.0       | 4.9   | 5.1   | 5.1   | 5.0   |
| Real Disp. Inc. (% Change)  | 2.4    | 3.1    | -1.4   | 2.7   | 3.0   | 2.8       | 3.1   | 3.2   | 3.0   | 2.8   |
| Personal Savings Rate (%)   | 5.7    | 7.6    | 4.8    | 4.8   | 5.1   | 5.1       | 5.3   | 6.0   | 6.3   | 6.5   |
| After-Tax Profits (\$Bill)  | 1473   | 1683   | 1693   | 1694  | 1751  | 1720      | 1814  | 1868  | 1999  | 2099  |
| Yr-to-Yr % Change   | 0.6    | 17.9   | 0.6    | 0.1   | 3.4   | -1.8      | 5.4   | 3.0   | 7.0   | 5.0   |
| <b>COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE</b>   |        |        |        |       |       |           |       |       |       |       |
| Gross Domestic Product  | 1.6    | 2.2    | 1.5    | 2.4   | 2.4   | 1.9       | 2.4   | 2.8   | 2.6   | 2.5   |
| Final Sales   | 1.7    | 2.1    | 0.1    | 2.4   | 2.3   | 2.3       | 2.9   | 2.8   | 2.4   | 2.3   |
| Total Consumption   | 2.3    | 1.5    | 1.7    | 2.7   | 3.1   | 2.8       | 3.0   | 3.0   | 2.7   | 2.5   |
| Nonresidential Fixed Investment   | 7.7    | 9.0    | 3.0    | 6.2   | 2.9   | -0.4      | 3.8   | 6.0   | 5.0   | 5.0   |
| Structures  | 2.3    | 12.9   | 1.6    | 8.1   | -1.6  | -2.8      | 3.1   | 5.0   | 4.5   | 4.0   |
| Equipment & Software  | 13.6   | 10.8   | 3.2    | 5.8   | 3.1   | 0.2       | 4.5   | 6.0   | 5.0   | 4.5   |
| Residential Fixed Investment  | 0.5    | 13.5   | 9.5    | 1.8   | 8.9   | 10.8      | 6.5   | 6.0   | 5.0   | 4.0   |
| Exports   | 6.9    | 3.4    | 2.8    | 3.4   | 1.2   | 0.3       | 3.6   | 4.0   | 4.8   | 4.8   |
| Imports   | 5.5    | 2.2    | 1.1    | 3.8   | 4.9   | 1.6       | 5.3   | 5.2   | 5.0   | 4.5   |
| Federal Government  | -2.7   | -1.9   | -5.7   | -2.4  | -0.3  | 1.1       | 1.4   | -1.0  | -1.0  | 0.0   |
| State & Local Governments   | -3.3   | -1.9   | -1.0   | 0.6   | 1.3   | 1.4       | 1.1   | 1.1   | 1.2   | 1.0   |

## Selected Yields

|                                   | Recent<br>(5/25/16) | 3 Months<br>Ago<br>(2/24/16) | Year<br>Ago<br>(5/27/15) |  | Recent<br>(5/25/16) | 3 Months<br>Ago<br>(2/24/16) | Year<br>Ago<br>(5/27/15) |
|-----------------------------------|---------------------|------------------------------|--------------------------|--|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>                    |                     |                              |                          |  |                     |                              |                          |
| <b>Market Rates</b>               |                     |                              |                          |  |                     |                              |                          |
| Discount Rate                     | 1.00                | 1.00                         | 0.75                     |  |                     |                              |                          |
| Federal Funds                     | 0.25-0.50           | 0.25-0.50                    | 0.00-0.25                |  |                     |                              |                          |
| Prime Rate                        | 3.50                | 3.50                         | 3.25                     |  |                     |                              |                          |
| 30-day CP (A1/P1)                 | 0.42                | 0.39                         | 0.12                     |  |                     |                              |                          |
| 3-month LIBOR                     | 0.67                | 0.63                         | 0.29                     |  |                     |                              |                          |
| <b>U.S. Treasury Securities</b>   |                     |                              |                          |  |                     |                              |                          |
| 3-month                           | 0.33                | 0.33                         | 0.01                     |  |                     |                              |                          |
| 6-month                           | 0.46                | 0.46                         | 0.08                     |  |                     |                              |                          |
| 1-year                            | 0.68                | 0.54                         | 0.23                     |  |                     |                              |                          |
| 5-year                            | 1.40                | 1.22                         | 1.53                     |  |                     |                              |                          |
| 10-year                           | 1.87                | 1.75                         | 2.13                     |  |                     |                              |                          |
| 10-year (inflation-protected)     | 0.33                | 0.42                         | 0.34                     |  |                     |                              |                          |
| 30-year                           | 2.66                | 2.61                         | 2.87                     |  |                     |                              |                          |
| 30-year Zero                      | 2.79                | 2.74                         | 2.98                     |  |                     |                              |                          |
| <b>Common Stocks</b>              |                     |                              |                          |  |                     |                              |                          |
| VL Stocks (Median)                | 2.30                | 2.50                         | 2.10                     |  |                     |                              |                          |
| DJ Industrials (12-mo. est.)      | 2.70                | 2.90                         | 2.40                     |  |                     |                              |                          |
| VL Utilities                      | 3.48                | 3.58                         | N/A                      |  |                     |                              |                          |
| <b>Mortgage-Backed Securities</b> |                     |                              |                          |  |                     |                              |                          |
| GNMA 5.5%                         | 1.93                | 1.83                         | 1.32                     |  |                     |                              |                          |
| FHLMC 5.5% (Gold)                 | 1.86                | 2.03                         | 1.47                     |  |                     |                              |                          |
| FNMA 5.5%                         | 1.54                | 1.57                         | 1.31                     |  |                     |                              |                          |
| FNMA ARM                          | 1.84                | 1.81                         | 1.85                     |  |                     |                              |                          |
| <b>Corporate Bonds</b>            |                     |                              |                          |  |                     |                              |                          |
| Financial (10-year) A             | 3.25                | 3.46                         | 3.40                     |  |                     |                              |                          |
| Industrial (25/30-year) A         | 3.96                | 4.18                         | 4.13                     |  |                     |                              |                          |
| Utility (25/30-year) A            | 3.99                | 4.08                         | 4.16                     |  |                     |                              |                          |
| Utility (25/30-year) Baa/BBB      | 4.44                | 4.77                         | 4.55                     |  |                     |                              |                          |
| <b>Foreign Bonds (10-Year)</b>    |                     |                              |                          |  |                     |                              |                          |
| Canada                            | 1.39                | 1.15                         | 1.67                     |  |                     |                              |                          |
| Germany                           | 0.15                | 0.15                         | 0.55                     |  |                     |                              |                          |
| Japan                             | -0.08               | -0.06                        | 0.39                     |  |                     |                              |                          |
| United Kingdom                    | 1.46                | 1.36                         | 1.88                     |  |                     |                              |                          |
| <b>Preferred Stocks</b>           |                     |                              |                          |  |                     |                              |                          |
| Utility A                         | 5.93                | 5.99                         | 5.94                     |  |                     |                              |                          |
| Financial BBB                     | 5.84                | 6.01                         | 6.08                     |  |                     |                              |                          |
| Financial Adjustable A            | 5.52                | 5.52                         | 5.53                     |  |                     |                              |                          |



### TAX-EXEMPT

|  |      |      |      |  |  |  |  |
|--|------|------|------|--|--|--|--|
| <b>Bond Buyer Indexes</b>              |      |      |      |  |  |  |  |
| 20-Bond Index (GOs)                    | 3.26 | 3.27 | 3.81 |  |  |  |  |
| 25-Bond Index (Revs)                   | 3.48 | 3.76 | 4.56 |  |  |  |  |
| <b>General Obligation Bonds (GOs)</b>  |      |      |      |  |  |  |  |
| 1-year AAA                             | 0.60 | 0.36 | 0.31 |  |  |  |  |
| 1-year A                               | 1.00 | 0.65 | 0.85 |  |  |  |  |
| 5-year AAA                             | 1.06 | 0.95 | 1.46 |  |  |  |  |
| 5-year A                               | 1.81 | 1.49 | 2.17 |  |  |  |  |
| 10-year AAA                            | 1.62 | 1.74 | 2.32 |  |  |  |  |
| 10-year A                              | 2.51 | 2.38 | 3.25 |  |  |  |  |
| 25/30-year AAA                         | 2.37 | 2.56 | 3.27 |  |  |  |  |
| 25/30-year A                           | 3.48 | 3.45 | 4.85 |  |  |  |  |
| <b>Revenue Bonds (Revs) (15 Years)</b> |      |      |      |  |  |  |  |
| Education AA                           | 2.50 | 2.66 | 3.29 |  |  |  |  |
| Electric AA                            | 2.39 | 2.42 | 3.29 |  |  |  |  |
| Housing AA                             | 2.60 | 2.92 | 3.59 |  |  |  |  |
| Hospital AA                            | 2.56 | 2.72 | 3.35 |  |  |  |  |
| Toll Road AA                           | 2.50 | 2.62 | 3.04 |  |  |  |  |

Source: Bloomberg Finance L.P.

## Federal Reserve Data

### BANK RESERVES

(Two-Week Period; in Millions, Not Seasonally Adjusted)

|                            | Recent Levels |         |        | Average Levels Over the Last... |         |         |
|----------------------------|---------------|---------|--------|---------------------------------|---------|---------|
|                            | 5/11/16       | 4/27/16 | Change | 12 Wks.                         | 26 Wks. | 52 Wks. |
| Excess Reserves            | 2282775       | 2316194 | -33419 | 2346647                         | 2361132 | 2435613 |
| Borrowed Reserves          | 71            | 85      | -14    | 43                              | 71      | 126     |
| Net Free/Borrowed Reserves | 2282704       | 2316109 | -33405 | 2346604                         | 2361061 | 2435487 |

### MONEY SUPPLY

(One-Week Period; in Billions, Seasonally Adjusted)

|                                     | Recent Levels |         |        | Ann'l Growth Rates Over the Last... |       |        |
|-------------------------------------|---------------|---------|--------|-------------------------------------|-------|--------|
|                                     | 5/9/16        | 5/2/16  | Change | 3 mo.                               | 6 mo. | 12 mo. |
| M1 (Currency+demand deposits)       | 3201.6        | 3184.8  | 16.8   | 18.0%                               | 10.0% | 6.9%   |
| M2 (M1+savings+small time deposits) | 12706.9       | 12716.6 | -9.7   | 9.4%                                | 7.7%  | 6.8%   |

Source: United States Federal Reserve Bank

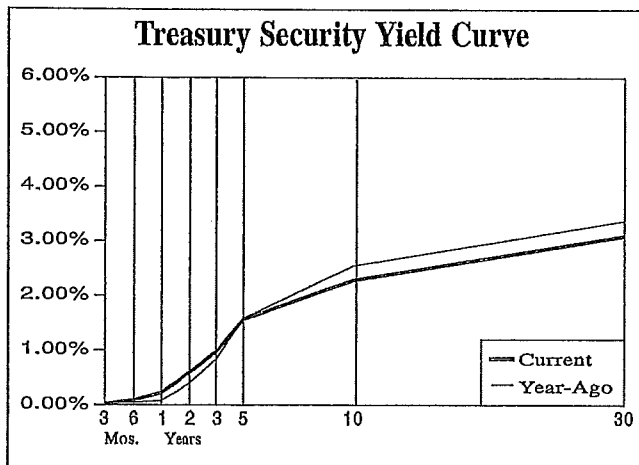


## Value Line Forecast for the U.S. Economy

|  | ACTUAL |        |        |        |       | ESTIMATED |       |       |       |       |
|--|--------|--------|--------|--------|-------|-----------|-------|-------|-------|-------|
|  | 2010   | 2011   | 2012   | 2013   | 2014  | 2015      | 2016  | 2017  | 2018  | 2019  |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS</b><br>(2009 CHAIN WEIGHTED \$) BILLIONS OF DOLLARS |        |        |        |        |       |           |       |       |       |       |
| Final Sales  | 14718  | 14979  | 15304  | 15637  | 16086 | 16456     | 16945 | 17487 | 18012 | 18516 |
| Total Consumption  | 10036  | 10264  | 10448  | 10700  | 10969 | 11311     | 11677 | 12039 | 12400 | 12747 |
| Nonresidential Fixed Investment  | 1674   | 1803   | 1932   | 1991   | 2116  | 2198      | 2343  | 2484  | 2608  | 2738  |
| Structures   | 366    | 375    | 424    | 422    | 456   | 427       | 438   | 477   | 510   | 541   |
| Equipment & Software   | 747    | 848    | 906    | 947    | 1008  | 1062      | 1151  | 1220  | 1281  | 1332  |
| Residential Fixed Investment   | 382    | 385    | 437    | 488    | 496   | 533       | 602   | 644   | 682   | 716   |
| Exports  | 1765   | 1898   | 1960   | 2020   | 2085  | 2119      | 2215  | 2326  | 2442  | 2576  |
| Imports  | 2228   | 2358   | 2413   | 2440   | 2537  | 2647      | 2811  | 2952  | 3085  | 3208  |
| Federal Government   | 1271   | 1236   | 1214   | 1145   | 1124  | 1127      | 1118  | 1107  | 1102  | 1096  |
| State & Local Governments  | 1821   | 1761   | 1740   | 1748   | 1765  | 1786      | 1812  | 1830  | 1848  | 1867  |
| Gross Domestic Product   | 14958  | 15518  | 16163  | 16768  | 17419 | 17986     | 18843 | 19815 | 20858 | 21914 |
| Real GDP (2009 Chain Weighted \$)  | 14779  | 15021  | 15389  | 15710  | 16086 | 16456     | 16934 | 17459 | 18018 | 18559 |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>   |        |        |        |        |       |           |       |       |       |       |
| GDP Deflator   | 1.2    | 2.0    | 1.8    | 1.5    | 1.5   | 1.2       | 2.0   | 2.0   | 2.0   | 2.0   |
| CPI-All Urban Consumers  | 1.6    | 3.1    | 2.1    | 1.5    | 1.6   | 0.3       | 2.2   | 2.5   | 2.5   | 2.6   |
| PPI-Finished Goods   | 4.2    | 6.0    | 1.9    | 1.2    | 1.9   | -3.3      | 2.3   | 2.7   | 2.8   | 2.8   |
| Employment Cost Index—Total Comp.  | 1.9    | 2.1    | 2.0    | 1.9    | 2.1   | 2.7       | 2.8   | 3.0   | 3.2   | 3.2   |
| Productivity   | 3.2    | 0.5    | 1.5    | 0.5    | 0.7   | 0.5       | 2.3   | 2.0   | 2.1   | 2.2   |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>   |        |        |        |        |       |           |       |       |       |       |
| Industrial Prod. (% Change)  | 5.7    | 3.3    | 3.8    | 2.9    | 4.2   | 0.5       | 3.6   | 3.5   | 3.2   | 3.0   |
| Factory Operating Rate (%)   | 71.3   | 73.9   | 75.5   | 76.1   | 77.2  | 77.1      | 77.7  | 77.8  | 78.0  | 78.0  |
| Nonfarm Inven. Change (2009 Chain Weighted \$)   | 65.9   | 39.7   | 68.7   | 58.3   | 65.2  | 68.9      | 60.0  | 50.0  | 45.0  | 40.0  |
| Housing Starts (Mill. Units)   | 0.59   | 0.61   | 0.78   | 0.93   | 1.00  | 1.09      | 1.31  | 1.40  | 1.50  | 1.55  |
| Existing House Sales (Mill. Units)   | 4.18   | 4.28   | 4.66   | 5.07   | 4.92  | 5.27      | 5.58  | 5.50  | 5.55  | 5.60  |
| Total Light Vehicle Sales (Mill. Units)  | 11.6   | 12.7   | 14.4   | 15.5   | 16.4  | 16.9      | 17.3  | 17.5  | 17.5  | 17.5  |
| National Unemployment Rate (%)   | 9.6    | 8.9    | 8.1    | 7.4    | 6.2   | 5.4       | 5.1   | 5.0   | 5.0   | 5.0   |
| Federal Budget Surplus (Unified, FY, \$Bill)   | -1294  | -1297  | -1089  | -680   | -483  | -463      | -375  | -450  | -500  | -530  |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)   | 76.70  | 101.75 | 101.00 | 100.47 | 92.20 | 54.50     | 61.75 | 65.00 | 75.00 | 85.00 |
| <b>MONEY AND INTEREST RATES</b>  |        |        |        |        |       |           |       |       |       |       |
| 3-Month Treasury Bill Rate (%)   | 0.1    | 0.1    | 0.1    | 0.1    | 0.1   | 0.3       | 1.2   | 2.8   | 3.2   | 3.5   |
| Federal Funds Rate (%)   | 0.2    | 0.1    | 0.1    | 0.1    | 0.1   | 0.3       | 1.2   | 3.0   | 3.5   | 3.8   |
| 10-Year Treasury Note Rate (%)   | 3.2    | 2.8    | 1.8    | 2.4    | 2.5   | 2.2       | 2.9   | 3.6   | 3.8   | 4.0   |
| Long-Term Treasury Bond Rate (%)   | 4.3    | 3.9    | 2.9    | 3.5    | 3.3   | 2.9       | 3.6   | 4.2   | 4.4   | 4.5   |
| AAA Corporate Bond Rate (%)  | 4.9    | 4.6    | 3.7    | 4.2    | 4.2   | 3.8       | 4.6   | 5.5   | 5.3   | 5.0   |
| Prime Rate (%)   | 3.3    | 3.3    | 3.3    | 3.3    | 3.3   | 3.2       | 3.2   | 3.5   | 5.0   | 6.0   |
| <b>INCOMES</b>   |        |        |        |        |       |           |       |       |       |       |
| Personal Income (% Change)   | 2.9    | 6.1    | 4.2    | 2.8    | 4.0   | 3.8       | 4.6   | 5.0   | 5.2   | 5.0   |
| Real Disp. Inc. (% Change)   | 1.1    | 2.4    | 2.0    | 0.7    | 2.5   | 3.2       | 2.8   | 3.5   | 3.2   | 3.0   |
| Personal Savings Rate (%)  | 5.6    | 5.7    | 5.6    | 4.5    | 4.9   | 5.1       | 4.5   | 5.0   | 5.5   | 6.0   |
| After-Tax Profits (\$Bill)   | 1464   | 1473   | 1755   | 1761   | 1827  | 2046      | 2198  | 2291  | 2428  | 2549  |
| Yr-to-Yr % Change  | 22.2   | 0.6    | 19.2   | 4.7    | 3.7   | 12.0      | 7.4   | 4.2   | 6.0   | 5.0   |
| <b>COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE</b>  |        |        |        |        |       |           |       |       |       |       |
| Gross Domestic Product   | 2.5    | 1.6    | 2.3    | 2.2    | 2.4   | 2.3       | 2.9   | 3.1   | 3.2   | 3.0   |
| Final Sales  | 1.0    | 1.7    | 2.2    | 2.2    | 2.3   | 2.3       | 3.0   | 3.2   | 3.0   | 2.8   |
| Total Consumption  | 2.0    | 2.3    | 1.8    | 2.4    | 2.5   | 3.1       | 3.2   | 3.1   | 3.0   | 2.8   |
| Nonresidential Fixed Investment  | 2.5    | 7.7    | 7.2    | 3.0    | 6.3   | 3.9       | 6.6   | 6.0   | 5.0   | 5.0   |
| Structures   | -16.4  | 2.3    | 13.1   | -0.5   | 8.2   | -6.4      | 2.5   | 9.0   | 7.0   | 6.0   |
| Equipment & Software   | 15.9   | 13.6   | 6.8    | 4.6    | 6.4   | 5.3       | 8.4   | 6.0   | 5.0   | 4.0   |
| Residential Fixed Investment   | -2.5   | 0.5    | 13.5   | 11.9   | 1.6   | 7.4       | 12.9  | 7.0   | 6.0   | 5.0   |
| Exports  | 11.5   | 6.9    | 3.3    | 3.0    | 3.2   | 1.6       | 4.5   | 5.0   | 5.0   | 5.5   |
| Imports  | 12.8   | 5.5    | 2.3    | 1.1    | 4.0   | 4.3       | 6.2   | 5.0   | 4.5   | 4.0   |
| Federal Government   | 4.3    | -2.7   | -1.8   | -5.7   | -1.9  | 0.3       | -0.8  | -1.0  | -0.5  | -0.5  |
| State & Local Governments  | -2.7   | -3.3   | -1.2   | 0.5    | 1.0   | 1.2       | 1.5   | 1.0   | 1.0   | 1.0   |

## Selected Yields

|                                   | Recent<br>(5/13/15) | 3 Months<br>Ago<br>(2/11/15) | Year<br>Ago<br>(5/14/14) |  | Recent<br>(5/13/15) | 3 Months<br>Ago<br>(2/11/15) | Year<br>Ago<br>(5/14/14) |
|-----------------------------------|---------------------|------------------------------|--------------------------|--|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>                    |                     |                              |                          |  |                     |                              |                          |
| <b>Market Rates</b>               |                     |                              |                          |  |                     |                              |                          |
| Discount Rate                     | 0.75                | 0.75                         | 0.75                     |  |                     |                              |                          |
| Federal Funds                     | 0.00-0.25           | 0.00-0.25                    | 0.00-0.25                |  |                     |                              |                          |
| Prime Rate                        | 3.25                | 3.25                         | 3.25                     |  |                     |                              |                          |
| 30-day CP (A1/P1)                 | 0.12                | 0.13                         | 0.10                     |  |                     |                              |                          |
| 3-month LIBOR                     | 0.28                | 0.26                         | 0.23                     |  |                     |                              |                          |
| <b>Bank CDs</b>                   |                     |                              |                          |  |                     |                              |                          |
| 6-month                           | 0.17                | 0.16                         | 0.06                     |  |                     |                              |                          |
| 1-year                            | 0.27                | 0.28                         | 0.09                     |  |                     |                              |                          |
| 5-year                            | 0.85                | 0.87                         | 0.53                     |  |                     |                              |                          |
| <b>U.S. Treasury Securities</b>   |                     |                              |                          |  |                     |                              |                          |
| 3-month                           | 0.02                | 0.01                         | 0.02                     |  |                     |                              |                          |
| 6-month                           | 0.08                | 0.07                         | 0.05                     |  |                     |                              |                          |
| 1-year                            | 0.22                | 0.23                         | 0.08                     |  |                     |                              |                          |
| 5-year                            | 1.57                | 1.54                         | 1.59                     |  |                     |                              |                          |
| 10-year                           | 2.29                | 2.02                         | 2.55                     |  |                     |                              |                          |
| 10-year (inflation-protected)     | 0.41                | 0.35                         | 0.35                     |  |                     |                              |                          |
| 30-year                           | 3.09                | 2.59                         | 3.37                     |  |                     |                              |                          |
| 30-year Zero                      | 3.21                | 2.67                         | 3.58                     |  |                     |                              |                          |
| <b>Mortgage-Backed Securities</b> |                     |                              |                          |  |                     |                              |                          |
| GNMA 5.5%                         | 1.39                | 1.49                         | 1.75                     |  |                     |                              |                          |
| FHLMC 5.5% (Gold)                 | 1.50                | 1.49                         | 1.78                     |  |                     |                              |                          |
| FNMA 5.5%                         | 1.29                | 1.24                         | 1.66                     |  |                     |                              |                          |
| FNMA ARM                          | 1.85                | 1.85                         | 1.86                     |  |                     |                              |                          |
| <b>Corporate Bonds</b>            |                     |                              |                          |  |                     |                              |                          |
| Financial (10-year) A             | 3.50                | 3.23                         | 3.50                     |  |                     |                              |                          |
| Industrial (25/30-year) A         | 4.26                | 3.85                         | 4.24                     |  |                     |                              |                          |
| Utility (25/30-year) A            | 4.29                | 3.70                         | 4.22                     |  |                     |                              |                          |
| Utility (25/30-year) Baa/BBB      | 4.62                | 4.05                         | 4.56                     |  |                     |                              |                          |
| <b>Foreign Bonds (10-Year)</b>    |                     |                              |                          |  |                     |                              |                          |
| Canada                            | 1.83                | 1.45                         | 2.29                     |  |                     |                              |                          |
| Germany                           | 0.72                | 0.36                         | 1.36                     |  |                     |                              |                          |
| Japan                             | 0.46                | 0.40                         | 0.60                     |  |                     |                              |                          |
| United Kingdom                    | 2.02                | 1.67                         | 2.58                     |  |                     |                              |                          |
| <b>Preferred Stocks</b>           |                     |                              |                          |  |                     |                              |                          |
| Utility A                         | 5.95                | 5.93                         | 5.93                     |  |                     |                              |                          |
| Financial BBB                     | 6.13                | 6.57                         | 6.42                     |  |                     |                              |                          |
| Financial Adjustable A            | 5.51                | 5.51                         | 5.51                     |  |                     |                              |                          |



| <b>TAX-EXEMPT</b>                      |      |      |      |  |  |  |  |
|--|------|------|------|--|--|--|--|
| <b>Bond Buyer Indexes</b>              |      |      |      |  |  |  |  |
| 20-Bond Index (GOs)                    | 3.74 | 3.49 | 4.31 |  |  |  |  |
| 25-Bond Index (Revs)                   | 4.47 | 4.16 | 4.97 |  |  |  |  |
| <b>General Obligation Bonds (GOs)</b>  |      |      |      |  |  |  |  |
| 1-year Aaa                             | 0.33 | 0.16 | 0.13 |  |  |  |  |
| 1-year A                               | 0.65 | 0.52 | 0.66 |  |  |  |  |
| 5-year Aaa                             | 1.45 | 1.08 | 1.28 |  |  |  |  |
| 5-year A                               | 1.81 | 1.64 | 2.01 |  |  |  |  |
| 10-year Aaa                            | 2.27 | 2.05 | 2.44 |  |  |  |  |
| 10-year A                              | 2.87 | 2.68 | 3.62 |  |  |  |  |
| 25/30-year Aaa                         | 3.19 | 2.86 | 3.84 |  |  |  |  |
| 25/30-year A                           | 3.73 | 3.75 | 5.59 |  |  |  |  |
| <b>Revenue Bonds (Revs) (15 Years)</b> |      |      |      |  |  |  |  |
| Education AA                           | 3.16 | 2.79 | 3.09 |  |  |  |  |
| Electric AA                            | 3.04 | 2.81 | 3.42 |  |  |  |  |
| Housing AA                             | 3.38 | 3.30 | 3.80 |  |  |  |  |
| Hospital AA                            | 2.78 | 2.66 | 3.09 |  |  |  |  |
| Toll Road Aaa                          | 3.06 | 2.65 | 2.75 |  |  |  |  |

Source: Bloomberg Finance L.P.

## Federal Reserve Data

| <b>BANK RESERVES</b>   |               |         |         |                                     |         |         |  |
|--|---------------|---------|---------|-------------------------------------|---------|---------|--|
| <i>(Two-Week Period; in Millions, Not Seasonally Adjusted)</i> |               |         |         |                                     |         |         |  |
|  | Recent Levels |         |         | Average Levels Over the Last...     |         |         |  |
|  | 4/29/15       | 4/15/15 | Change  | 12 Wks.                             | 26 Wks. | 52 Wks. |  |
| Excess Reserves  | 2536553       | 2683716 | -147163 | 2540478                             | 2529146 | 2575497 |  |
| Borrowed Reserves  | 57            | 47      | 10      | 31                                  | 77      | 146     |  |
| Net Free/Borrowed Reserves                                     | 2536496       | 2683669 | -147173 | 2540447                             | 2529069 | 2575351 |  |
| <b>MONEY SUPPLY</b>  |               |         |         |                                     |         |         |  |
| <i>(One-Week Period; in Billions, Seasonally Adjusted)</i>     |               |         |         |                                     |         |         |  |
|  | Recent Levels |         |         | Ann'l Growth Rates Over the Last... |         |         |  |
|  | 4/27/15       | 4/20/15 | Change  | 3 Mos.                              | 6 Mos.  | 12 Mos. |  |
| M1 (Currency+demand deposits)                                  | 2992.0        | 2995.7  | -3.7    | 10.5%                               | 9.7%    | 8.0%    |  |
| M2 (M1+savings+small time deposits)                            | 11863.0       | 11890.4 | -27.4   | 5.0%                                | 5.2%    | 5.4%    |  |

Source: United States Federal Reserve Bank

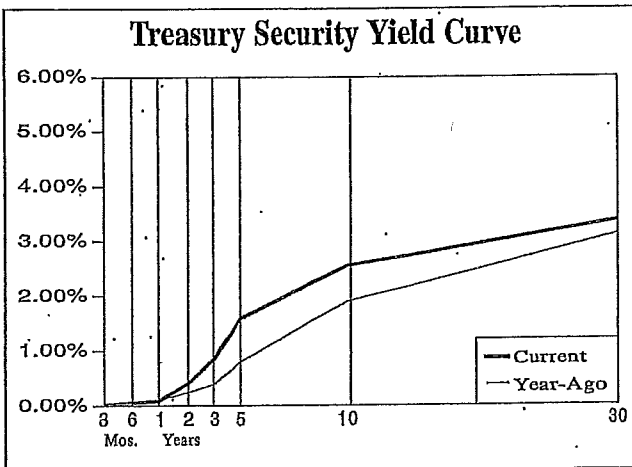
## Value Line Forecast for the U.S. Economy

|   | ACTUAL |       |        |        |        | ESTIMATED |       |       |       |        |
|---|--------|-------|--------|--------|--------|-----------|-------|-------|-------|--------|
|   | 2009   | 2010  | 2011   | 2012   | 2013   | 2014      | 2015  | 2016  | 2017  | 2018   |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS</b>      |        |       |        |        |        |           |       |       |       |        |
| <b>(2009 CHAIN WEIGHTED \$) BILLIONS OF DOLLARS</b>   |        |       |        |        |        |           |       |       |       |        |
| Final Sales   | 14566  | 14718 | 15014  | 15403  | 15670  | 16036     | 16572 | 17152 | 17718 | 18285  |
| Total Consumption                                     | 9843   | 10036 | 10291  | 10518  | 10728  | 11034     | 11392 | 11768 | 12144 | 12508  |
| Nonresidential Fixed Investment                       | 1633   | 1674  | 1801   | 1932   | 1985   | 2070      | 2221  | 2376  | 2519  | 2645   |
| Structures  | 438    | 366   | 374    | 422    | 427    | 447       | 474   | 512   | 563   | 619    |
| Equipment & Software                                  | 644    | 747   | 842    | 906    | 935    | 977       | 1069  | 1144  | 1212  | 1273   |
| Residential Fixed Investment                          | 392    | 382   | 384    | 434    | 487    | 507       | 602   | 662   | 708   | 744    |
| Exports   | 1584   | 1765  | 1891   | 1957   | 2010   | 2067      | 2175  | 2284  | 2421  | 2566   |
| Imports   | 1976   | 2228  | 2336   | 2388   | 2422   | 2468      | 2616  | 2773  | 2912  | 3058   |
| Federal Government                                    | 1218   | 1271  | 1238   | 1220   | 1158   | 1132      | 1128  | 1117  | 1111  | 1106   |
| State & Local Governments                             | 1871   | 1821  | 1755   | 1743   | 1739   | 1747      | 1765  | 1782  | 1806  | 1833   |
| Gross Domestic Product                                | 14418  | 14958 | 15534  | 16245  | 16800  | 17472     | 18363 | 19291 | 20267 | 21292  |
| Real GDP (2009 Chain Weighted \$)                     | 14418  | 14779 | 15052  | 15471  | 15761  | 16120     | 16637 | 17203 | 17771 | 18339  |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>        |        |       |        |        |        |           |       |       |       |        |
| GDP Deflator  | 0.8    | 1.2   | 2.0    | 1.7    | 1.4    | 1.9       | 1.6   | 1.6   | 1.7   | 1.8    |
| CPI-All Urban Consumers                               | -0.3   | 1.6   | 3.1    | 2.1    | 1.5    | 2.2       | 2.0   | 1.8   | 2.0   | 2.3    |
| PPI-Finished Goods                                    | -2.5   | 4.2   | 6.0    | 1.9    | 1.2    | 3.3       | 1.7   | 1.5   | 1.8   | 2.2    |
| Employment Cost Index—Total Comp.                     | 1.5    | 1.9   | 2.2    | 1.9    | 1.9    | 1.9       | 2.6   | 2.8   | 3.0   | 3.2    |
| Productivity  | 3.2    | 3.2   | 0.5    | 1.5    | 0.5    | 0.2       | 1.3   | 1.7   | 1.7   | 1.8    |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>              |        |       |        |        |        |           |       |       |       |        |
| Industrial Prod. (% Change)                           | -11.3  | 5.7   | 3.4    | 3.6    | 2.9    | 3.0       | 3.3   | 3.8   | 3.5   | 3.3    |
| Factory Operating Rate (%)                            | 65.7   | 71.3  | 74.0   | 75.8   | 76.1   | 76.9      | 78.2  | 78.5  | 78.7  | 78.5   |
| Nonfarm Inven. Change (2009 Chain Weighted \$)        | -146.0 | 65.9  | 39.7   | 68.7   | 58.3   | 65.0      | 53.8  | 55.0  | 45.0  | 40.0   |
| Housing Starts (Mill. Units)                          | 0.55   | 0.59  | 0.61   | 0.78   | 0.93   | 1.02      | 1.39  | 1.55  | 1.60  | 1.60   |
| Existing House Sales (Mill. Units)                    | 4.33   | 4.18  | 4.28   | 4.66   | 5.07   | 4.95      | 5.65  | 5.70  | 5.65  | 5.60   |
| Total Light Vehicle Sales (Mill. Units)               | 10.4   | 11.6  | 12.7   | 14.4   | 15.5   | 16.0      | 16.4  | 16.7  | 16.6  | 16.5   |
| National Unemployment Rate (%)                        | 9.3    | 9.6   | 8.9    | 8.1    | 7.4    | 6.5       | 6.0   | 5.6   | 5.3   | 5.2    |
| Federal Budget Surplus (Unified, FY, \$Bill)          | -1416  | -1294 | -1297  | -1089  | -680   | -541      | -570  | -500  | -550  | -600   |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)            | 59.20  | 76.70 | 101.75 | 101.00 | 100.47 | 98.25     | 92.50 | 95.00 | 97.00 | 100.00 |
| <b>MONEY AND INTEREST RATES</b>                       |        |       |        |        |        |           |       |       |       |        |
| 3-Month Treasury Bill Rate (%)                        | 0.2    | 0.1   | 0.1    | 0.1    | 0.1    | 0.1       | 0.4   | 2.5   | 3.0   | 3.5    |
| Federal Funds Rate (%)                                | 0.2    | 0.2   | 0.1    | 0.1    | 0.1    | 0.1       | 0.3   | 2.0   | 3.5   | 4.0    |
| 10-Year Treasury Note Rate (%)                        | 3.3    | 3.2   | 2.8    | 1.8    | 2.4    | 2.9       | 3.3   | 3.8   | 4.3   | 4.5    |
| Long-Term Treasury Bond Rate (%)                      | 4.1    | 4.3   | 3.9    | 2.9    | 3.5    | 3.8       | 4.3   | 4.5   | 4.8   | 5.0    |
| AAA Corporate Bond Rate (%)                           | 5.3    | 4.9   | 4.6    | 3.7    | 4.2    | 4.4       | 4.8   | 5.5   | 5.8   | 6.0    |
| Prime Rate (%)  | 3.3    | 3.3   | 3.3    | 3.3    | 3.3    | 3.5       | 5.3   | 5.5   | 6.0   | 6.5    |
| <b>INCOMES</b>  |        |       |        |        |        |           |       |       |       |        |
| Personal Income (% Change)                            | -2.8   | 2.9   | 6.1    | 4.2    | 2.8    | 4.3       | 4.7   | 5.3   | 5.5   | 5.3    |
| Real Disp. Inc. (% Change)                            | -0.5   | 1.1   | 2.4    | 2.0    | 0.7    | 2.4       | 3.9   | 4.0   | 4.1   | 4.0    |
| Personal Savings Rate (%)                             | 6.1    | 5.6   | 5.7    | 5.6    | 4.5    | 4.0       | 4.4   | 5.0   | 5.4   | 5.5    |
| After-Tax Profits (\$Bill)                            | 1199   | 1464  | 1473   | 1755   | 1845   | 2032      | 2129  | 2235  | 2369  | 2535   |
| Yr-to-Yr % Change                                     | 11.7   | 22.2  | 0.6    | 19.2   | 5.1    | 10.1      | 4.8   | 5.0   | 6.0   | 7.0    |
| <b>COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE</b> |        |       |        |        |        |           |       |       |       |        |
| Gross Domestic Product                                | -2.8   | 2.5   | 1.8    | 2.8    | 1.9    | 2.3       | 3.2   | 3.4   | 3.3   | 3.2    |
| Final Sales   | -2.0   | 1.0   | 2.0    | 2.6    | 1.7    | 2.3       | 3.3   | 3.5   | 3.3   | 3.2    |
| Total Consumption                                     | -1.6   | 2.0   | 2.5    | 2.2    | 2.0    | 2.9       | 3.2   | 3.3   | 3.2   | 3.0    |
| Nonresidential Fixed Investment                       | -15.6  | 2.5   | 7.6    | 7.3    | 2.7    | 4.3       | 7.3   | 7.0   | 6.0   | 5.0    |
| Structures  | -18.9  | -16.4 | 2.1    | 12.7   | 1.3    | 4.7       | 6.1   | 8.0   | 10.0  | 10.0   |
| Equipment & Software                                  | -22.9  | 15.9  | 12.7   | 7.6    | 3.1    | 4.5       | 9.4   | 7.0   | 6.0   | 5.0    |
| Residential Fixed Investment                          | -21.2  | -2.5  | 0.5    | 12.9   | 12.2   | 4.3       | 18.6  | 10.0  | 7.0   | 5.0    |
| Exports   | -9.1   | 11.5  | 7.1    | 3.5    | 2.7    | 2.8       | 5.2   | 5.0   | 6.0   | 6.0    |
| Imports   | -13.7  | 12.8  | 4.9    | 2.2    | 1.4    | 1.9       | 6.0   | 6.0   | 5.0   | 5.0    |
| Federal Government                                    | 5.7    | 4.3   | -2.6   | -1.4   | -5.2   | -2.2      | -0.3  | -1.0  | -0.5  | -0.5   |
| State & Local Governments                             | 1.6    | -2.7  | -3.6   | -0.7   | -0.2   | 0.4       | 1.0   | 1.0   | 1.3   | 1.5    |



## Selected Yields

|                                 | Recent<br>(5/14/14) | 3 Months<br>Ago<br>(2/11/14) | Year<br>Ago<br>(5/15/13) |                                   | Recent<br>(5/14/14) | 3 Months<br>Ago<br>(2/11/14) | Year<br>Ago<br>(5/15/13) |
|---------------------------------|---------------------|------------------------------|--------------------------|-----------------------------------|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>                  |                     |                              |                          |                                   |                     |                              |                          |
| <b>Market Rates</b>             |                     |                              |                          |                                   |                     |                              |                          |
| Discount Rate                   | 0.75                | 0.75                         | 0.75                     | <b>Mortgage-Backed Securities</b> |                     |                              |                          |
| Federal Funds                   | 0.00-0.25           | 0.00-0.25                    | 0.00-0.25                | GNMA 5.5%                         | 1.75                | 1.82                         | 2.08                     |
| Prime Rate                      | 3.25                | 3.25                         | 3.25                     | FHLMC 5.5% (Cold)                 | 1.78                | 1.92                         | 2.22                     |
| 30-day CP (A1/P1)               | 0.10                | 0.11                         | 0.19                     | FNMA 5.5%                         | 1.66                | 1.68                         | 1.87                     |
| 3-month LIBOR                   | 0.23                | 0.24                         | 0.27                     | FNMA ARM                          | 1.86                | 1.94                         | 2.12                     |
| <b>Bank CDs</b>                 |                     |                              |                          |                                   |                     |                              |                          |
| 6-month                         | 0.14                | 0.07                         | 0.09                     | <b>Corporate Bonds</b>            |                     |                              |                          |
| 1-year                          | 0.24                | 0.09                         | 0.11                     | Financial (10-year) A             | 3.50                | 3.90                         | 2.96                     |
| 5-year                          | 0.80                | 0.53                         | 0.64                     | Industrial (25/30-year) A         | 4.24                | 4.57                         | 4.13                     |
| <b>U.S. Treasury Securities</b> |                     |                              |                          |                                   |                     |                              |                          |
| 3-month                         | 0.02                | 0.05                         | 0.03                     | Utility (25/30-year) A            | 4.22                | 4.65                         | 4.07                     |
| 6-month                         | 0.05                | 0.08                         | 0.07                     | Utility (25/30-year) Baa/BBB      | 4.56                | 4.91                         | 4.42                     |
| 1-year                          | 0.08                | 0.11                         | 0.10                     | <b>Foreign Bonds (10-Year)</b>    |                     |                              |                          |
| 5-year                          | 1.59                | 1.56                         | 0.80                     | Canada                            | 2.29                | 2.46                         | 1.92                     |
| 10-year                         | 2.55                | 2.75                         | 1.90                     | Germany                           | 1.36                | 1.69                         | 1.38                     |
| 10-year (inflation-protected)   | 0.35                | 0.45                         | -0.40                    | Japan                             | 0.60                | 0.61                         | 0.86                     |
| 30-year                         | 3.37                | 3.71                         | 3.12                     | United Kingdom                    | 2.58                | 2.74                         | 1.92                     |
| 30-year Zero                    | 3.58                | 3.94                         | 3.41                     | <b>Preferred Stocks</b>           |                     |                              |                          |
|                                 |                     |                              |                          | Utility A                         | 5.93                | 6.03                         | 5.47                     |
|                                 |                     |                              |                          | Financial BBB                     | 6.42                | 6.56                         | 6.22                     |
|                                 |                     |                              |                          | Financial Adjustable A            | 5.51                | 5.51                         | 5.51                     |



| <b>TAX-EXEMPT</b>                        |      |      |      |  |  |  |  |
|--|------|------|------|--|--|--|--|
| <b>Bond Buyer Indexes</b>                |      |      |      |  |  |  |  |
| 20-Bond Index (GOs)                      | 4.31 | 4.46 | 3.67 |  |  |  |  |
| 25-Bond Index (Revs)                     | 4.97 | 5.32 | 4.22 |  |  |  |  |
| <b>General Obligation Bonds (GOs)</b>    |      |      |      |  |  |  |  |
| 1-year Aaa                               | 0.13 | 0.13 | 0.17 |  |  |  |  |
| 1-year A                                 | 0.66 | 0.77 | 0.82 |  |  |  |  |
| 5-year Aaa                               | 1.28 | 1.25 | 0.85 |  |  |  |  |
| 5-year A                                 | 2.01 | 2.20 | 1.78 |  |  |  |  |
| 10-year Aaa                              | 2.44 | 2.90 | 1.99 |  |  |  |  |
| 10-year A                                | 3.62 | 3.73 | 2.99 |  |  |  |  |
| 25/30-year Aaa                           | 3.84 | 4.32 | 3.19 |  |  |  |  |
| 25/30-year A                             | 5.59 | 5.87 | 4.94 |  |  |  |  |
| <b>Revenue Bonds (Revs) (25/30-Year)</b> |      |      |      |  |  |  |  |
| Education AA                             | 4.97 | 4.99 | 4.24 |  |  |  |  |
| Electric AA                              | 5.04 | 5.06 | 4.37 |  |  |  |  |
| Housing AA                               | 5.46 | 5.49 | 4.69 |  |  |  |  |
| Hospital AA                              | 5.21 | 5.28 | 4.54 |  |  |  |  |
| Toll Road Aaa                            | 4.62 | 4.78 | 4.39 |  |  |  |  |

Source: Bloomberg Finance L.P.

## Federal Reserve Data

| <b>BANK RESERVES</b>   |               |         |        |                                 |         |         |  |
|--|---------------|---------|--------|---------------------------------|---------|---------|--|
| <i>(Two-Week Period; in Millions, Not Seasonally Adjusted)</i> |               |         |        |                                 |         |         |  |
|  | Recent Levels |         |        | Average Levels Over the Last... |         |         |  |
|  | 4/30/14       | 4/16/14 | Change | 12 Wks.                         | 26 Wks. | 52 Wks. |  |
| Excess Reserves  | 2538116       | 2631260 | -93144 | 2538859                         | 2466051 | 2263296 |  |
| Borrowed Reserves  | 135           | 101     | 34     | 110                             | 142     | 237     |  |
| Net Free/Borrowed Reserves                                     | 2537981       | 2631159 | -93178 | 2538749                         | 2465909 | 2263059 |  |

| <b>MONEY SUPPLY</b>  |               |         |        |                                     |        |         |  |
|--|---------------|---------|--------|-------------------------------------|--------|---------|--|
| <i>(One-Week Period; in Billions, Seasonally Adjusted)</i> |               |         |        |                                     |        |         |  |
|  | Recent Levels |         |        | Ann'l Growth Rates Over the Last... |        |         |  |
|  | 4/28/14       | 4/21/14 | Change | 3 Mos.                              | 6 Mos. | 12 Mos. |  |
| M1 (Currency+demand deposits)                              | 2774.9        | 2763.7  | 11.2   | 19.4%                               | 11.6%  | 10.2%   |  |
| M2 (M1+savings+small time deposits)                        | 11242.6       | 11191.4 | 51.2   | 6.9%                                | 5.5%   | 6.3%    |  |

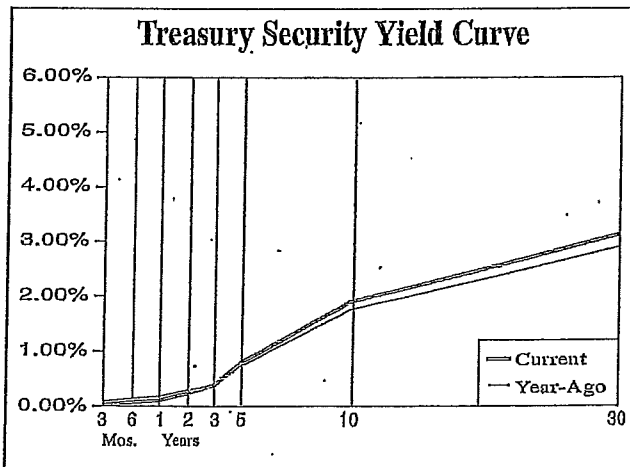
Source: United States Federal Reserve Bank

## Value Line Forecast for the U.S. Economy

|  | ACTUAL |        |       |        |        | ESTIMATED |        |        |        |        |
|--|--------|--------|-------|--------|--------|-----------|--------|--------|--------|--------|
|  | 2008   | 2009   | 2010  | 2011   | 2012   | 2013      | 2014   | 2015   | 2016   | 2017   |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS</b><br>(2005 CHAIN WEIGHTED \$) BILLIONS OF DOLLARS |        |        |       |        |        |           |        |        |        |        |
| Final Sales  | 13201  | 12853  | 13029 | 13282  | 13539  | 13788     | 14152  | 14577  | 15014  | 15479  |
| Total Consumption  | 9212   | 9038   | 9221  | 9421   | 9603   | 9814      | 10052  | 10303  | 10571  | 10856  |
| Nonresidential Fixed Investment  | 1538   | 1263   | 1319  | 1436   | 1488   | 1558      | 1660   | 1768   | 1874   | 1968   |
| Structures   | 466    | 367    | 309   | 323    | 354    | 366       | 387    | 410    | 439    | 469    |
| Equipment & Software   | 1059   | 890    | 1019  | 1126   | 1144   | 1206      | 1299   | 1390   | 1473   | 1547   |
| Residential Fixed Investment   | 444    | 346    | 331   | 326    | 367    | 419       | 490    | 578    | 625    | 656    |
| Exports  | 1649   | 1494   | 1663  | 1774   | 1837   | 1876      | 1978   | 2087   | 2212   | 2367   |
| Imports  | 2144   | 1853   | 2085  | 2188   | 2238   | 2274      | 2392   | 2511   | 2624   | 2729   |
| Federal Government   | 971    | 1030   | 1076  | 1055   | 1024   | 967       | 986    | 966    | 952    | 942    |
| State & Local Governments  | 1528   | 1514   | 1487  | 1454   | 1462   | 1445      | 1441   | 1451   | 1461   | 1473   |
| Gross Domestic Product   | 14292  | 13939  | 14527 | 15088  | 15685  | 16183     | 16899  | 17720  | 18580  | 19519  |
| Real GDP (2005 Chain Weighted \$)  | 13162  | 12703  | 13088 | 13315  | 13593  | 13835     | 14190  | 14616  | 15054  | 15536  |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>   |        |        |       |        |        |           |        |        |        |        |
| GDP Deflator   | 2.2    | 1.1    | 1.2   | 2.1    | 1.8    | 1.6       | 1.7    | 1.7    | 1.8    | 1.8    |
| CPI-All Urban Consumers  | 3.8    | -0.3   | 1.6   | 3.1    | 2.1    | 1.2       | 1.7    | 1.8    | 1.9    | 2.0    |
| PPI-Finished Goods   | 6.4    | -2.5   | 4.2   | 6.0    | 1.9    | 0.6       | 1.0    | 1.2    | 1.5    | 1.8    |
| Employment Cost Index—Total Comp.  | 2.9    | 1.4    | 1.9   | 2.2    | 1.9    | 1.9       | 2.4    | 2.5    | 2.7    | 2.8    |
| Productivity   | 0.6    | 2.3    | 4.1   | 0.6    | 0.9    | 0.8       | 1.0    | 1.2    | 1.4    | 1.5    |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>   |        |        |       |        |        |           |        |        |        |        |
| Industrial Prod. (% Change)  | -3.7   | -11.2  | 5.3   | 4.1    | 3.6    | 4.0       | 3.0    | 3.0    | 3.0    | 3.0    |
| Factory Operating Rate (%)   | 74.9   | 66.2   | 71.7  | 75.0   | 75.8   | 76.8      | 77.9   | 78.3   | 78.5   | 79.0   |
| Nonfarm Inven. Change (2005 Chain Weighted \$)   | -37.6  | -143.8 | 60.7  | 44.3   | 59.6   | 48.2      | 45.0   | 50.0   | 45.0   | 40.0   |
| Housing Starts (Mill. Units)   | 0.90   | 0.55   | 0.59  | 0.61   | 0.78   | 0.99      | 1.24   | 1.50   | 1.55   | 1.60   |
| Existing House Sales (Mill. Units)   | 4.89   | 5.15   | 4.92  | 4.28   | 4.66   | 5.06      | 5.53   | 5.80   | 5.75   | 5.70   |
| Total Light Vehicle Sales (Mill. Units)  | 13.2   | 10.4   | 11.6  | 12.7   | 14.4   | 15.2      | 15.6   | 16.2   | 16.3   | 16.5   |
| National Unemployment Rate (%)   | 5.8    | 9.3    | 9.6   | 9.0    | 8.1    | 7.5       | 7.1    | 6.5    | 6.2    | 6.0    |
| Federal Budget Surplus (Unified, FY, \$Bill)   | -455.0 | -1416  | -1294 | -1297  | -1089  | -857      | -750   | -600   | -550   | -500   |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)   | 95.29  | 59.20  | 76.70 | 101.80 | 101.01 | 100.00    | 102.50 | 105.00 | 107.50 | 110.00 |
| <b>MONEY AND INTEREST RATES</b>  |        |        |       |        |        |           |        |        |        |        |
| 3-Month Treasury Bill Rate (%)   | 1.4    | 0.2    | 0.1   | 0.1    | 0.1    | 0.1       | -0.1   | 0.5    | 1.5    | 3.0    |
| Federal Funds Rate (%)   | 1.9    | 0.2    | 0.2   | 0.1    | 0.1    | 0.2       | 0.2    | 0.5    | 1.5    | 3.5    |
| 10-Year Treasury Note Rate (%)   | 3.7    | 3.3    | 3.2   | 2.8    | 1.8    | 2.1       | 2.7    | 3.0    | 3.5    | 3.8    |
| Long-Term Treasury Bond Rate (%)   | 4.3    | 4.1    | 4.3   | 3.9    | 2.9    | 3.1       | 3.6    | 4.0    | 4.3    | 4.5    |
| AAA Corporate Bond Rate (%)  | 5.6    | 5.3    | 4.9   | 4.6    | 3.7    | 3.9       | 4.3    | 4.7    | 5.3    | 5.8    |
| Prime Rate (%)   | 5.1    | 3.3    | 3.3   | 3.3    | 3.3    | 3.3       | 3.8    | 6.0    | 6.5    | 7.0    |
| <b>INCOMES</b>   |        |        |       |        |        |           |        |        |        |        |
| Personal Income (% Change)   | 4.6    | -4.3   | 3.7   | 5.1    | 3.6    | 2.2       | 4.6    | 4.8    | 4.9    | 5.0    |
| Real Disp. Inc. (% Change)   | 2.4    | -2.3   | 1.8   | 1.3    | 1.5    | 0.7       | 3.5    | 3.0    | 3.1    | 3.2    |
| Personal Savings Rate (%)  | 5.4    | 5.2    | 5.3   | 4.7    | 3.9    | 2.9       | 3.3    | 4.0    | 4.5    | 4.8    |
| After-Tax Profits (\$Bill)   | 1051   | 1183   | 1408  | 1480   | 1713   | 1757      | 1933   | 2029   | 2151   | 2302   |
| Yr-to-Yr % Change  | -18.7  | 12.6   | 19.0  | 5.1    | 16.1   | 2.6       | 10.0   | 5.0    | 6.0    | 7.0    |
| <b>COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE</b>  |        |        |       |        |        |           |        |        |        |        |
| Gross Domestic Product   | -0.3   | -3.5   | 3.0   | 1.7    | 2.2    | 1.8       | 2.6    | 3.0    | 3.0    | 3.2    |
| Final Sales  | 0.2    | -2.6   | 1.4   | 2.0    | 2.1    | 1.8       | 2.6    | 3.0    | 3.0    | 3.1    |
| Total Consumption  | -0.6   | -1.9   | 2.0   | 2.2    | 1.9    | 2.2       | 2.4    | 2.5    | 2.6    | 2.7    |
| Nonresidential Fixed Investment  | -0.8   | -17.9  | 4.4   | 8.8    | 8.0    | 4.7       | 6.6    | 6.5    | 6.0    | 5.0    |
| Structures   | 6.4    | -21.2  | -15.8 | 4.6    | 10.8   | 3.5       | 5.7    | 6.0    | 7.0    | 7.0    |
| Equipment & Software   | -4.3   | -16.0  | 14.6  | 10.4   | 6.9    | 5.5       | 7.7    | 7.0    | 6.0    | 5.0    |
| Residential Fixed Investment   | -23.9  | -22.2  | -4.3  | -1.3   | 12.1   | 14.3      | 16.8   | 18.0   | 8.0    | 5.0    |
| Exports  | 6.1    | -9.4   | 11.3  | 6.7    | 3.4    | 2.1       | 5.4    | 5.5    | 6.0    | 7.0    |
| Imports  | -2.7   | -13.6  | 12.5  | 4.9    | 2.4    | 1.6       | 5.2    | 5.0    | 4.5    | 4.0    |
| Federal Government   | 7.2    | 6.0    | 4.5   | -1.9   | -2.2   | -5.5      | 1.9    | -2.0   | -1.5   | -1.0   |
| State & Local Governments  | 0.0    | -0.9   | -1.8  | -2.2   | -1.4   | -1.2      | -0.3   | 0.7    | 0.7    | 0.8    |

## Selected Yields

|                                 | Recent<br>(5/15/13) | 3 Months<br>Ago<br>(2/13/13) | Year<br>Ago<br>(5/16/12) |                              | Recent<br>(5/15/13) | 3 Months<br>Ago<br>(2/13/13) | Year<br>Ago<br>(5/16/12) |
|---------------------------------|---------------------|------------------------------|--------------------------|------------------------------|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>                  |                     |                              |                          |                              |                     |                              |                          |
| <b>Market Rates</b>             |                     |                              |                          |                              |                     |                              |                          |
| Discount Rate                   | 0.75                | 0.75                         | 0.75                     | Mortgage-Backed Securities   |                     |                              |                          |
| Federal Funds                   | 0.00-0.25           | 0.00-0.25                    | 0.00-0.25                | GNMA 5.5%                    | 2.08                | 1.85                         | 1.13                     |
| Prime Rate                      | 3.25                | 3.25                         | 3.25                     | FHLMC 5.5% (Gold)            | 2.22                | 2.16                         | 2.09                     |
| 30-day CP (A1/P1)               | 0.19                | 0.21                         | 0.31                     | FNMA 5.5%                    | 1.87                | 1.90                         | 1.87                     |
| 3-month LIBOR                   | 0.27                | 0.29                         | 0.47                     | FNMA ARM                     | 2.12                | 2.23                         | 2.32                     |
| <b>Bank CDs</b>                 |                     |                              |                          |                              |                     |                              |                          |
| 6-month                         | 0.09                | 0.10                         | 0.22                     | Corporate Bonds              |                     |                              |                          |
| 1-year                          | 0.11                | 0.13                         | 0.33                     | Financial (10-year) A        | 2.96                | 3.23                         | 3.36                     |
| 5-year                          | 0.64                | 0.70                         | 1.12                     | Industrial (25/30-year) A    | 4.13                | 4.18                         | 4.05                     |
| <b>U.S. Treasury Securities</b> |                     |                              |                          |                              |                     |                              |                          |
| 3-month                         | 0.03                | 0.09                         | 0.09                     | Utility (25/30-year) A       | 4.07                | 4.15                         | 4.00                     |
| 6-month                         | 0.07                | 0.12                         | 0.14                     | Utility (25/30-year) Baa/BBB | 4.42                | 4.50                         | 4.48                     |
| 1-year                          | 0.10                | 0.15                         | 0.18                     | Foreign Bonds (10-Year)      |                     |                              |                          |
| 5-year                          | 0.80                | 0.89                         | 0.74                     | Canada                       | 1.92                | 2.04                         | 1.92                     |
| 10-year                         | 1.90                | 2.04                         | 1.76                     | Germany                      | 1.38                | 1.67                         | 1.47                     |
| 10-year (inflation-protected)   | -0.40               | -0.68                        | -0.38                    | Japan                        | 0.86                | 0.75                         | 0.83                     |
| 30-year                         | 3.12                | 3.22                         | 2.90                     | United Kingdom               | 1.92                | 2.21                         | 1.88                     |
| 30-year Zero                    | 3.41                | 3.48                         | 3.13                     | Preferred Stocks             |                     |                              |                          |
|                                 |                     |                              |                          | Utility A                    | 5.47                | 5.50                         | 5.31                     |
|                                 |                     |                              |                          | Financial BBB                | 6.22                | 5.92                         | 6.69                     |
|                                 |                     |                              |                          | Financial Adjustable A       | 5.51                | 5.51                         | 5.52                     |



### TAX-EXEMPT

|  |      |      |      |
|--|------|------|------|
| Bond Buyer Indexes                       |      |      |      |
| 20-Bond Index (GOs)                      | 3.67 | 3.68 | 3.71 |
| 25-Bond Index (Revs)                     | 4.22 | 4.29 | 4.73 |
| <b>General Obligation Bonds (GOs)</b>    |      |      |      |
| 1-year Aaa                               | 0.17 | 0.20 | 0.21 |
| 1-year A                                 | 0.82 | 0.78 | 0.95 |
| 5-year Aaa                               | 0.85 | 0.83 | 0.78 |
| 5-year A                                 | 1.78 | 1.83 | 1.78 |
| 10-year Aaa                              | 1.99 | 1.99 | 1.92 |
| 10-year A                                | 2.99 | 2.90 | 3.06 |
| 25/30-year Aaa                           | 3.19 | 3.12 | 3.50 |
| 25/30-year A                             | 4.94 | 4.83 | 4.95 |
| <b>Revenue Bonds (Revs) (25/30-Year)</b> |      |      |      |
| Education AA                             | 4.24 | 4.21 | 4.30 |
| Electric AA                              | 4.37 | 4.31 | 4.60 |
| Housing AA                               | 4.69 | 4.68 | 4.70 |
| Hospital AA                              | 4.54 | 4.43 | 4.56 |
| Toll Road Aaa                            | 4.39 | 4.36 | 4.42 |

Source: Bloomberg Finance L.P.

## Federal Reserve Data

### BANK RESERVES

(Two-Week Period; in Millions, Not Seasonally Adjusted)

|                            | Recent Levels |         |        | Average Levels Over the Last... |         |         |
|----------------------------|---------------|---------|--------|---------------------------------|---------|---------|
|                            | 5/1/13        | 4/17/13 | Change | 12 Wks.                         | 26 Wks. | 52 Wks. |
| Excess Reserves            | 1751987       | 1793542 | -41555 | 1687300                         | 1571604 | 1514671 |
| Borrowed Reserves          | 407           | 397     | 10     | 428                             | 666     | 2320    |
| Net Free/Borrowed Reserves | 1751580       | 1793145 | -41565 | 1686872                         | 1570938 | 1512351 |

### MONEY SUPPLY

(One-Week Period; in Billions, Seasonally Adjusted)

|                                     | Recent Levels |         |        | Ann'l Growth Rates Over the Last... |        |         |
|-------------------------------------|---------------|---------|--------|-------------------------------------|--------|---------|
|                                     | 4/29/13       | 4/22/13 | Change | 3 Mos.                              | 6 Mos. | 12 Mos. |
| M1 (Currency+demand deposits)       | 2523.1        | 2508.5  | 14.6   | 10.1%                               | 8.4%   | 12.0%   |
| M2 (M1+savings+small time deposits) | 10535.0       | 10501.4 | 33.6   | 4.4%                                | 4.8%   | 6.9%    |

Source: United States Federal Reserve Bank

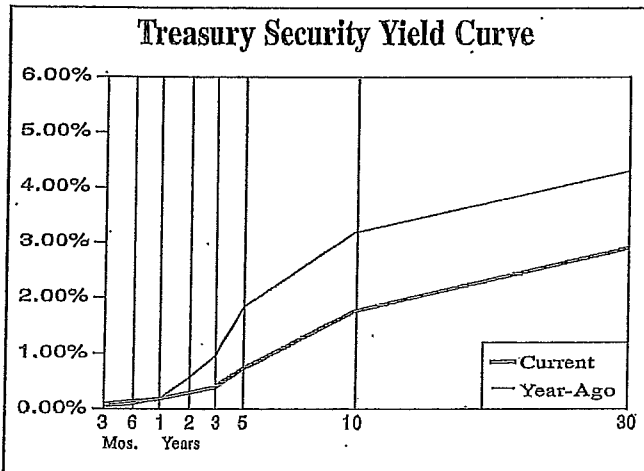


## Value Line Forecast for the U.S. Economy

|  | ACTUAL |        |        |       |        | ESTIMATED |        |        |        |        |
|--|--------|--------|--------|-------|--------|-----------|--------|--------|--------|--------|
|  | 2007   | 2008   | 2009   | 2010  | 2011   | 2012      | 2013   | 2014   | 2015   | 2016   |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS</b><br>(2005 CHAIN WEIGHTED \$) BILLIONS OF DOLLARS |        |        |        |       |        |           |        |        |        |        |
| Final Sales  | 13178  | 13201  | 12853  | 13029 | 13282  | 13540     | 13884  | 14273  | 14687  | 15127  |
| Total Consumption  | 9263   | 9212   | 9038   | 9221  | 9421   | 9645      | 9879   | 10097  | 10329  | 10567  |
| Nonresidential Fixed Investment  | 1550   | 1538   | 1263   | 1319  | 1436   | 1519      | 1617   | 1730   | 1834   | 1944   |
| Structures   | 438    | 466    | 367    | 309   | 323    | 324       | 337    | 360    | 389    | 420    |
| Equipment & Software   | 1107   | 1059   | 890    | 1019  | 1126   | 1218      | 1318   | 1410   | 1495   | 1584   |
| Residential Fixed Investment   | 584    | 444    | 346    | 331   | 326    | 363       | 422    | 498    | 567    | 624    |
| Exports  | 1554   | 1649   | 1494   | 1663  | 1774   | 1858      | 1985   | 2124   | 2273   | 2432   |
| Imports  | 2203   | 2144   | 1853   | 2085  | 2188   | 2266      | 2355   | 2461   | 2560   | 2662   |
| Federal Government   | 906    | 971    | 1030   | 1076  | 1055   | 1035      | 1012   | 981    | 962    | 952    |
| State & Local Governments  | 1528   | 1528   | 1514   | 1487  | 1454   | 1432      | 1418   | 1418   | 1425   | 1440   |
| Gross Domestic Product   | 14029  | 14292  | 13939  | 14527 | 15088  | 15639     | 16249  | 17038  | 17900  | 18823  |
| Real GDP (2005 Chain Weighted \$)  | 13206  | 13162  | 12703  | 13088 | 13315  | 13616     | 13950  | 14369  | 14829  | 15318  |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>   |        |        |        |       |        |           |        |        |        |        |
| GDP Deflator   | 2.9    | 2.2    | 1.1    | 1.2   | 2.1    | 1.4       | 1.5    | 1.7    | 1.8    | 1.8    |
| CPI-All Urban Consumers  | 2.9    | 3.8    | -0.3   | 1.6   | 3.1    | 1.9       | 2.1    | 2.2    | 2.3    | 2.5    |
| PPI-Finished Goods   | 3.9    | 6.4    | -2.5   | 4.2   | 6.0    | 0.8       | 1.8    | 1.8    | 2.0    | 2.3    |
| Employment Cost Index—Total Comp.  | 3.1    | 2.9    | 1.4    | 1.9   | 2.2    | 2.0       | 2.3    | 2.6    | 2.8    | 3.0    |
| Productivity   | 1.5    | 0.6    | 2.3    | 4.1   | 0.6    | 0.1       | 1.1    | 1.4    | 1.4    | 1.5    |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>   |        |        |        |       |        |           |        |        |        |        |
| Industrial Prod. (% Change)  | 2.7    | -3.7   | -11.2  | 5.3   | 4.1    | 4.0       | 3.3    | 3.5    | 3.5    | 3.5    |
| Factory Operating Rate (%)   | 79.2   | 74.9   | 66.2   | 71.7  | 75.0   | 78.3      | 79.2   | 80.0   | 80.5   | 81.0   |
| Nonfarm Inven. Change (2005 Chain Weighted \$)   | 28.7   | -37.6  | -143.8 | 60.7  | 44.3   | 49.1      | 50.0   | 40.0   | 40.0   | 40.0   |
| Housing Starts (Mill. Units)   | 1.34   | 0.90   | 0.55   | 0.59  | 0.61   | 0.75      | 1.00   | 1.20   | 1.40   | 1.60   |
| Existing House Sales (Mill. Units)   | 5.68   | 4.89   | 5.15   | 4.92  | 4.28   | 4.71      | 5.03   | 5.25   | 5.60   | 5.70   |
| Total Light Vehicle Sales (Mill. Units)  | 16.1   | 13.2   | 10.4   | 11.6  | 12.7   | 14.3      | 14.9   | 15.5   | 16.0   | 16.5   |
| National Unemployment Rate (%)   | 4.6    | 5.8    | 9.3    | 9.6   | 9.0    | 8.1       | 7.8    | 7.5    | 7.0    | 6.5    |
| Federal Budget Surplus (Unified, FY, \$Bill)   | -162.0 | -455.0 | -1416  | -1294 | -1297  | -1107     | -825   | -650   | -550   | -500   |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)   | 67.98  | 95.29  | 59.20  | 76.70 | 101.80 | 101.50    | 107.00 | 112.00 | 117.00 | 120.00 |
| <b>MONEY AND INTEREST RATES</b>  |        |        |        |       |        |           |        |        |        |        |
| 3-Month Treasury Bill Rate (%)   | 4.4    | 1.4    | 0.2    | 0.1   | 0.1    | 0.1       | 0.1    | 0.3    | 1.8    | 3.0    |
| Federal Funds Rate (%)   | 5.0    | 1.9    | 0.2    | 0.2   | 0.1    | 0.1       | 0.1    | 0.2    | 1.8    | 3.5    |
| 10-Year Treasury Note Rate (%)   | 4.6    | 3.7    | 3.3    | 3.2   | 2.8    | 2.1       | 2.6    | 3.0    | 4.0    | 4.5    |
| Long-Term Treasury Bond Rate (%)   | 4.8    | 4.3    | 4.1    | 4.3   | 3.9    | 3.2       | 3.7    | 4.0    | 4.8    | 5.3    |
| AAA Corporate Bond Rate (%)  | 5.6    | 5.6    | 5.3    | 4.9   | 4.6    | 4.0       | 4.4    | 4.7    | 5.3    | 6.0    |
| Prime Rate (%)   | 8.1    | 5.1    | 3.3    | 3.3   | 3.3    | 3.3       | 3.3    | 3.5    | 4.5    | 6.5    |
| <b>INCOMES</b>   |        |        |        |       |        |           |        |        |        |        |
| Personal Income (% Change)   | 5.7    | 4.6    | -4.3   | 3.7   | 5.1    | 4.2       | 4.0    | 4.7    | 5.0    | 5.1    |
| Real Disp. Inc. (% Change)   | 2.4    | 2.4    | -2.3   | 1.8   | 1.3    | 1.6       | 1.8    | 3.0    | 3.0    | 3.2    |
| Personal Savings Rate (%)  | 2.4    | 5.4    | 5.2    | 5.3   | 4.7    | 4.0       | 3.5    | 3.7    | 4.0    | 4.5    |
| After-Tax Profits (\$Bill)   | 1293   | 1051   | 1183   | 1408  | 1480   | 1684      | 1807   | 1897   | 1992   | 2092   |
| Yr-to-Yr % Change  | -4.2   | -18.7  | 12.6   | 19.0  | 5.1    | 13.8      | 7.3    | 5.0    | 5.0    | 5.0    |
| <b>COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE</b>  |        |        |        |       |        |           |        |        |        |        |
| Gross Domestic Product   | 1.9    | -0.3   | -3.5   | 3.0   | 1.7    | 2.3       | 2.5    | 3.0    | 3.2    | 3.3    |
| Final Sales  | 2.2    | 0.2    | -2.6   | 1.4   | 2.0    | 1.9       | 2.5    | 2.8    | 2.9    | 3.0    |
| Total Consumption  | 2.3    | -0.6   | -1.9   | 2.0   | 2.2    | 2.4       | 2.4    | 2.2    | 2.3    | 2.3    |
| Nonresidential Fixed Investment  | 6.5    | -0.8   | -17.9  | 4.4   | 8.8    | 5.8       | 6.5    | 7.0    | 6.0    | 6.0    |
| Structures   | 14.1   | 6.4    | -21.2  | -15.8 | 4.6    | 0.2       | 4.0    | 7.0    | 8.0    | 8.0    |
| Equipment & Software   | 3.3    | -4.3   | -16.0  | 14.6  | 10.4   | 8.2       | 8.2    | 7.0    | 6.0    | 6.0    |
| Residential Fixed Investment   | -18.7  | -23.9  | -22.2  | -4.3  | -1.3   | 11.2      | 16.3   | 18.0   | 14.0   | 10.0   |
| Exports  | 9.3    | 6.1    | -9.4   | 11.3  | 6.7    | 4.8       | 6.8    | 7.0    | 7.0    | 7.0    |
| Imports  | 2.4    | -2.7   | -13.6  | 12.5  | 4.9    | 3.6       | 3.9    | 4.5    | 4.0    | 4.0    |
| Federal Government   | 1.2    | 7.2    | 6.0    | 4.5   | -1.9   | -1.9      | -2.3   | -3.0   | -2.0   | -1.0   |
| State & Local Governments  | 1.4    | 0.0    | -0.9   | -1.8  | -2.2   | -1.5      | -1.0   | 0.0    | 0.5    | 1.0    |

## Selected Yields

|                                 | Recent<br>(5/16/12) | 3 Months<br>Ago<br>(2/15/12) | Year<br>Ago<br>(5/18/11) |                                   | Recent<br>(5/16/12) | 3 Months<br>Ago<br>(2/15/12) | Year<br>Ago<br>(5/18/11) |
|---------------------------------|---------------------|------------------------------|--------------------------|-----------------------------------|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>                  |                     |                              |                          |                                   |                     |                              |                          |
| <b>Market Rates</b>             |                     |                              |                          | <b>Mortgage-Backed Securities</b> |                     |                              |                          |
| Discount Rate                   | 0.75                | 0.75                         | 0.75                     | GNMA 5.5%                         | 1.13                | 1.41                         | 2.05                     |
| Federal Funds                   | 0.00-0.25           | 0.00-0.25                    | 0.00-0.25                | FHLMC 5.5% (Gold)                 | 2.09                | 1.79                         | 2.60                     |
| Prime Rate                      | 3.25                | 3.25                         | 3.25                     | FNMA 5.5%                         | 1.87                | 1.82                         | 2.53                     |
| 30-day CP (A1/P1)               | 0.31                | 0.29                         | 0.16                     | FNMA ARM                          | 2.32                | 2.37                         | 2.60                     |
| 3-month LIBOR                   | 0.47                | 0.50                         | 0.27                     | <b>Corporate Bonds</b>            |                     |                              |                          |
| <b>Bank CDs</b>                 |                     |                              |                          | Financial (10-year) A             | 3.36                | 3.91                         | 4.52                     |
| 6-month                         | 0.22                | 0.22                         | 0.27                     | Industrial (25/30-year) A         | 4.05                | 4.30                         | 5.25                     |
| 1-year                          | 0.33                | 0.35                         | 0.45                     | Utility (25/30-year) A            | 4.00                | 4.10                         | 5.30                     |
| 5-year                          | 1.12                | 1.15                         | 1.71                     | Utility (25/30-year) Baa/BBB      | 4.48                | 4.58                         | 5.79                     |
| <b>U.S. Treasury Securities</b> |                     |                              |                          | <b>Foreign Bonds (10-Year)</b>    |                     |                              |                          |
| 3-month                         | 0.09                | 0.11                         | 0.04                     | Canada                            | 1.92                | 2.01                         | 3.23                     |
| 6-month                         | 0.14                | 0.12                         | 0.08                     | Germany                           | 1.47                | 1.86                         | 3.12                     |
| 1-year                          | 0.18                | 0.15                         | 0.17                     | Japan                             | 0.83                | 0.97                         | 1.16                     |
| 5-year                          | 0.74                | 0.79                         | 1.85                     | United Kingdom                    | 1.88                | 2.08                         | 3.39                     |
| 10-year                         | 1.76                | 1.93                         | 3.18                     | <b>Preferred Stocks</b>           |                     |                              |                          |
| 10-year (inflation-protected)   | -0.38               | -0.42                        | 0.78                     | Utility A                         | 5.31                | 5.61                         | 5.71                     |
| 30-year                         | 2.90                | 3.09                         | 4.30                     | Financial A                       | 6.69                | 6.07                         | 6.48                     |
| 30-year Zero                    | 3.13                | 3.32                         | 4.63                     | Financial Adjustable A            | 5.52                | 5.51                         | 5.52                     |



### TAX-EXEMPT

|  |      |      |      |
|--|------|------|------|
| <b>Bond Buyer Indexes</b>                |      |      |      |
| 20-Bond Index (GOs)                      | 3.71 | 3.70 | 4.61 |
| 25-Bond Index (Revs)                     | 4.73 | 4.77 | 5.41 |
| <b>General Obligation Bonds (GOs)</b>    |      |      |      |
| 1-year Aaa                               | 0.21 | 0.17 | 0.25 |
| 1-year A                                 | 0.95 | 1.09 | 1.10 |
| 5-year Aaa                               | 0.78 | 0.70 | 1.34 |
| 5-year A                                 | 1.78 | 1.98 | 2.53 |
| 10-year Aaa                              | 1.92 | 1.95 | 2.84 |
| 10-year A                                | 3.06 | 2.95 | 4.21 |
| 25/30-year Aaa                           | 3.50 | 3.56 | 4.43 |
| 25/30-year A                             | 4.95 | 4.98 | 5.95 |
| <b>Revenue Bonds (Revs) (25/30-Year)</b> |      |      |      |
| Education AA                             | 4.30 | 4.44 | 4.91 |
| Electric AA                              | 4.60 | 4.53 | 5.19 |
| Housing AA                               | 4.70 | 4.86 | 5.86 |
| Hospital AA                              | 4.56 | 4.63 | 5.35 |
| Toll Road Aaa                            | 4.42 | 4.47 | 5.07 |

## Federal Reserve Data

### BANK RESERVES

(Two-Week Period; in Millions, Not Seasonally Adjusted)

|                            | Recent Levels |         |        | Average Levels Over the Last... |         |         |
|----------------------------|---------------|---------|--------|---------------------------------|---------|---------|
|                            | 5/2/12        | 4/18/12 | Change | 12 Wks.                         | 26 Wks. | 52 Wks. |
| Excess Reserves            | 1457763       | 1510011 | -52248 | 1518025                         | 1512031 | 1536369 |
| Borrowed Reserves          | 6627          | 7009    | -382   | 7403                            | 8577    | 10664   |
| Net Free/Borrowed Reserves | 1451136       | 1503002 | -51866 | 1510622                         | 1503454 | 1525705 |

### MONEY SUPPLY

(One-Week Period; in Billions, Seasonally Adjusted)

|                                     | Recent Levels |         |        | Ann'l Growth Rates Over the Last... |        |         |
|-------------------------------------|---------------|---------|--------|-------------------------------------|--------|---------|
|                                     | 4/30/12       | 4/23/12 | Change | 3 Mos.                              | 6 Mos. | 12 Mos. |
| M1 (Currency+demand deposits)       | 2248.5        | 2246.3  | 2.2    | 5.3%                                | 10.8%  | 18.0%   |
| M2 (M1+savings+small time deposits) | 9871.3        | 9814.2  | 57.1   | 4.6%                                | 6.9%   | 9.5%    |

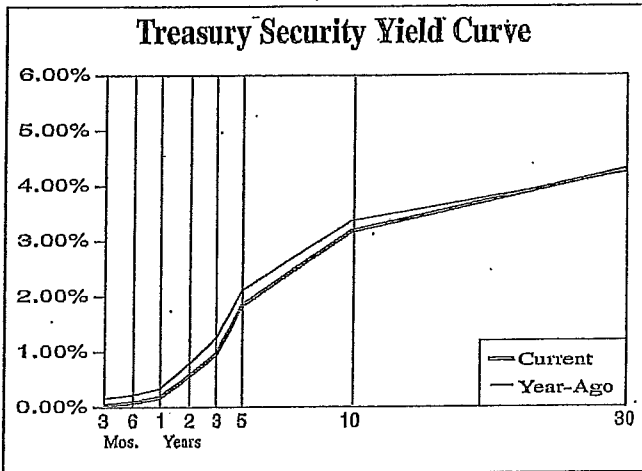
## Value Line Forecast for the U.S. Economy

|  | ACTUAL |        |        |        |       | ESTIMATED |        |        |        |        |
|--|--------|--------|--------|--------|-------|-----------|--------|--------|--------|--------|
|  | 2006   | 2007   | 2008   | 2009   | 2010  | 2011      | 2012   | 2013   | 2014   | 2015   |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS</b><br>(2005 CHAIN WEIGHTED \$) BILLIONS OF DOLLARS |        |        |        |        |       |           |        |        |        |        |
| Final Sales  | 12917  | 13234  | 13341  | 13111  | 13177 | 13540     | 13977  | 14453  | 14944  | 15467  |
| Total Consumption  | 9074   | 9314   | 9265   | 9154   | 9314  | 9580      | 9850   | 10047  | 10288  | 10566  |
| Nonresidential Fixed Investment  | 1454   | 1544   | 1557   | 1291   | 1365  | 1477      | 1623   | 1721   | 1875   | 2026   |
| Structures   | 384    | 441    | 464    | 370    | 319   | 310       | 308    | 338    | 365    | 391    |
| Equipment & Software   | 1070   | 1097   | 1082   | 916    | 1056  | 1186      | 1326   | 1458   | 1560   | 1638   |
| Residential Fixed Investment   | 718    | 585    | 444    | 343    | 333   | 337       | 420    | 517    | 569    | 597    |
| Exports  | 1422   | 1546   | 1648   | 1491   | 1666  | 1801      | 1973   | 2140   | 2312   | 2473   |
| Imports  | 2151   | 2194   | 2152   | 1854   | 2088  | 2183      | 2320   | 2413   | 2546   | 2648   |
| Federal Government   | 895    | 906    | 972    | 1028   | 1076  | 1081      | 1058   | 1021   | 1000   | 980    |
| State & Local Governments  | 1507   | 1537   | 1533   | 1519   | 1497  | 1475      | 1460   | 1467   | 1482   | 1497   |
| Gross Domestic Product   | 13399  | 14062  | 14369  | 14119  | 14660 | 15317     | 16091  | 16921  | 17811  | 18785  |
| Real GDP (2005 Chain Weighted \$)  | 12976  | 13229  | 13229  | 12881  | 13249 | 13594     | 14034  | 14497  | 14975  | 15484  |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>   |        |        |        |        |       |           |        |        |        |        |
| GDP Deflator   | 3.2    | 2.7    | 2.2    | 0.9    | 1.0   | 2.1       | 1.8    | 1.8    | 1.9    | 2.0    |
| CPI-All Urban Consumers  | 3.2    | 2.9    | 3.8    | -0.3   | 1.6   | 3.1       | 1.7    | 2.2    | 2.3    | 2.5    |
| PPI-Finished Goods   | 3.0    | 3.9    | 6.4    | -2.5   | 4.2   | 5.4       | 1.7    | 2.2    | 2.4    | 2.5    |
| Employment Cost Index—Total Comp.  | 2.9    | 3.1    | 2.8    | 1.5    | 1.9   | 2.0       | 2.4    | 2.5    | 2.7    | 2.8    |
| Productivity   | 1.0    | 1.4    | 2.8    | 3.5    | 3.8   | 1.0       | 1.0    | 1.0    | 1.3    | 1.5    |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>   |        |        |        |        |       |           |        |        |        |        |
| Industrial Prod. (% Change)  | 2.2    | 1.7    | -2.2   | -9.3   | 5.3   | 4.9       | 2.8    | 3.0    | 3.3    | 3.5    |
| Factory Operating Rate (%)   | 79.4   | 79.4   | 75.1   | 67.2   | 71.7  | 76.1      | 78.6   | 79.0   | 80.0   | 80.0   |
| Nonfarm Inven. Change (2005 Chain Weighted \$)   | 46.3   | -3.7   | -34.3  | -116.9 | 57.3  | 61.5      | 67.5   | 50.0   | 55.0   | 60.0   |
| Housing Starts (Mill. Units)   | 1.81   | 1.34   | 0.90   | 0.55   | 0.59  | 0.62      | 1.03   | 1.35   | 1.55   | 1.70   |
| Existing House Sales (Mill. Units)   | 6.51   | 5.67   | 4.89   | 5.16   | 4.92  | 5.26      | 5.70   | 5.85   | 6.10   | 6.40   |
| Total Light Vehicle Sales (Mill. Units)  | 16.5   | 16.1   | 13.1   | 10.4   | 11.6  | 12.8      | 14.3   | 15.5   | 16.0   | 17.0   |
| National Unemployment Rate (%)   | 4.6    | 4.6    | 5.8    | 9.3    | 9.6   | 8.8       | 8.3    | 7.8    | 7.5    | 7.2    |
| Federal Budget Surplus (Unified, FY, \$Bill)   | -248.0 | -162.0 | -455.0 | -1416  | -1294 | -1440     | -1000  | -750   | -675   | -600   |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)   | 66.12  | 72.18  | 99.75  | 59.40  | 76.70 | 99.19     | 103.50 | 104.00 | 112.00 | 120.00 |
| <b>MONEY AND INTEREST RATES</b>  |        |        |        |        |       |           |        |        |        |        |
| 3-Month Treasury Bill Rate (%)   | 4.7    | 4.4    | 1.4    | 0.2    | 0.1   | 0.2       | 1.5    | 3.0    | 3.5    | 4.0    |
| Federal Funds Rate (%)   | 5.0    | 5.0    | 1.9    | 0.2    | 0.2   | 0.1       | 1.3    | 3.3    | 3.7    | 4.0    |
| 10-Year Treasury Note Rate (%)   | 4.8    | 4.6    | 3.7    | 3.3    | 3.2   | 3.5       | 3.9    | 4.3    | 4.5    | 5.0    |
| Long-Term Treasury Bond Rate (%)   | 4.9    | 4.8    | 4.3    | 4.1    | 4.7   | 4.8       | 5.2    | 5.5    | 5.7    | 6.0    |
| AAA Corporate Bond Rate (%)  | 5.6    | 5.6    | 5.6    | 5.3    | 4.9   | 5.1       | 5.4    | 5.8    | 6.2    | 6.5    |
| Prime Rate (%)   | 8.0    | 8.0    | 5.1    | 3.3    | 3.3   | 3.3       | 4.8    | 6.0    | 6.5    | 7.0    |
| <b>INCOMES</b>   |        |        |        |        |       |           |        |        |        |        |
| Personal Income (% Change)   | 7.1    | 6.1    | 3.8    | -1.7   | 3.1   | 5.6       | 4.3    | 4.7    | 4.8    | 5.0    |
| Real Disp. Inc. (% Change)   | 3.5    | 2.8    | 1.3    | 0.6    | 1.4   | 2.5       | 2.0    | 2.0    | 2.5    | 3.0    |
| Personal Savings Rate (%)  | 0.7    | 0.6    | 1.8    | 5.9    | 5.8   | 5.5       | 4.8    | 4.5    | 4.5    | 4.5    |
| After-Tax Profits (\$Bill)   | 1405   | 1436   | 1231   | 1062   | 1384  | 1407      | 1517   | 1668   | 1785   | 1928   |
| Yr-to-Yr % Change  | 16.4   | 2.2    | -14.3  | -13.7  | 30.4  | 1.7       | 7.8    | 10.0   | 7.0    | 8.0    |
| <b>COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE</b>  |        |        |        |        |       |           |        |        |        |        |
| Gross Domestic Product   | 2.7    | 2.1    | 0.4    | -2.6   | 2.9   | 2.6       | 3.2    | 3.3    | 3.3    | 3.4    |
| Final Sales  | 2.8    | 2.4    | 1.4    | -2.1   | 1.4   | 2.8       | 3.2    | 3.4    | 3.4    | 3.5    |
| Total Consumption  | 3.0    | 2.8    | 0.2    | -1.2   | 1.7   | 2.9       | 2.8    | 2.0    | 2.4    | 2.7    |
| Nonresidential Fixed Investment  | 7.5    | 4.9    | 1.6    | -17.1  | 5.7   | 8.2       | 9.9    | 6.0    | 9.0    | 8.0    |
| Structures   | 8.2    | 12.7   | 11.2   | -20.4  | -13.7 | -2.7      | -0.9   | 10.0   | 8.0    | 7.0    |
| Equipment & Software   | 7.2    | 1.7    | -3.0   | -15.3  | 15.3  | 12.3      | 11.8   | 10.0   | 7.0    | 5.0    |
| Residential Fixed Investment   | -7.1   | -17.9  | -20.8  | -22.9  | -3.0  | 1.2       | 24.6   | 23.0   | 10.0   | 5.0    |
| Exports  | 9.1    | 8.4    | 6.2    | -9.5   | 11.7  | 8.1       | 9.5    | 8.5    | 8.0    | 7.0    |
| Imports  | 6.0    | 2.2    | -3.5   | -13.8  | 12.6  | 4.6       | 6.3    | 4.0    | 5.5    | 4.0    |
| Federal Government   | 2.3    | 1.6    | 6.0    | 5.7    | 4.8   | 0.5       | -2.2   | -3.5   | -2.0   | -2.0   |
| State & Local Governments  | 1.3    | 2.3    | 1.1    | -0.9   | -1.4  | -1.5      | -1.0   | 0.5    | 1.0    | 1.0    |



## Selected Yields

|                                 | Recent<br>(5/18/11) | 3 Months<br>Ago<br>(2/16/11) | Year<br>Ago<br>(5/19/10) |                                   | Recent<br>(5/18/11) | 3 Months<br>Ago<br>(2/16/11) | Year<br>Ago<br>(5/19/10) |
|---------------------------------|---------------------|------------------------------|--------------------------|-----------------------------------|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>                  |                     |                              |                          |                                   |                     |                              |                          |
| <b>Market Rates</b>             |                     |                              |                          | <b>Mortgage-Backed Securities</b> |                     |                              |                          |
| Discount Rate                   | 0.75                | 0.75                         | 0.75                     | GNMA 6.5%                         | 2.05                | 2.96                         | 1.70                     |
| Federal Funds                   | 0.00-0.25           | 0.00-0.25                    | 0.00-0.25                | FHLMC 6.5% (Gold)                 | 2.60                | 3.51                         | 1.14                     |
| Prime Rate                      | 3.25                | 3.25                         | 3.25                     | FNMA 6.5%                         | 2.53                | 3.45                         | 1.19                     |
| 30-day CP (A1/P1)               | 0.16                | 0.31                         | 0.33                     | FNMA ARM                          | 2.60                | 2.66                         | 3.01                     |
| 3-month LIBOR                   | 0.27                | 0.31                         | 0.48                     | <b>Corporate Bonds</b>            |                     |                              |                          |
| <b>Bank CDs</b>                 |                     |                              |                          | Financial (10-year) A             | 4.52                | 4.85                         | 4.74                     |
| 6-month                         | 0.27                | 0.21                         | 0.25                     | Industrial (25/30-year) A         | 5.25                | 5.65                         | 5.37                     |
| 1-year                          | 0.45                | 0.29                         | 0.43                     | Utility (25/30-year) A            | 5.30                | 5.77                         | 5.53                     |
| 5-year                          | 1.71                | 1.65                         | 1.99                     | Utility (25/30-year) Baa/BBB      | 5.79                | 6.15                         | 5.93                     |
| <b>U.S. Treasury Securities</b> |                     |                              |                          | <b>Foreign Bonds (10-Year)</b>    |                     |                              |                          |
| 3-month                         | 0.04                | 0.11                         | 0.16                     | Canada                            | 3.23                | 3.50                         | 3.40                     |
| 6-month                         | 0.08                | 0.15                         | 0.22                     | Germany                           | 3.12                | 3.24                         | 2.77                     |
| 1-year                          | 0.17                | 0.27                         | 0.33                     | Japan                             | 1.16                | 1.36                         | 1.30                     |
| 5-year                          | 1.85                | 2.35                         | 2.12                     | United Kingdom                    | 3.39                | 3.81                         | 3.66                     |
| 10-year                         | 3.18                | 3.62                         | 3.37                     | <b>Preferred Stocks</b>           |                     |                              |                          |
| 10-year (inflation-protected)   | 0.78                | 1.25                         | 1.29                     | Utility A                         | 5.71                | 5.79                         | 6.01                     |
| 30-year                         | 4.30                | 4.68                         | 4.24                     | Financial A                       | 6.48                | 6.07                         | 6.56                     |
| 30-year Zero                    | 4.63                | 5.01                         | 4.46                     | Financial Adjustable A            | 5.52                | 5.52                         | 5.52                     |



| <b>TAX-EXEMPT</b>                        |      |      |      |  |  |  |  |
|--|------|------|------|--|--|--|--|
| <b>Bond Buyer Indexes</b>                |      |      |      |  |  |  |  |
| 20-Bond Index (GOs)                      | 4.61 | 5.29 | 4.32 |  |  |  |  |
| 25-Bond Index (Revs)                     | 5.41 | 5.67 | 4.90 |  |  |  |  |
| <b>General Obligation Bonds (GOs)</b>    |      |      |      |  |  |  |  |
| 1-year Aaa                               | 0.25 | 0.38 | 0.37 |  |  |  |  |
| 1-year A                                 | 1.10 | 1.16 | 1.20 |  |  |  |  |
| 5-year Aaa                               | 1.34 | 1.95 | 1.76 |  |  |  |  |
| 5-year A                                 | 2.53 | 2.87 | 2.70 |  |  |  |  |
| 10-year Aaa                              | 2.84 | 3.52 | 3.12 |  |  |  |  |
| 10-year A                                | 4.21 | 4.52 | 4.09 |  |  |  |  |
| 25/30-year Aaa                           | 4.43 | 4.94 | 4.39 |  |  |  |  |
| 25/30-year A                             | 5.95 | 6.25 | 5.46 |  |  |  |  |
| <b>Revenue Bonds (Revs) (25/30-Year)</b> |      |      |      |  |  |  |  |
| Education AA                             | 4.91 | 5.33 | 4.74 |  |  |  |  |
| Electric AA                              | 5.19 | 5.48 | 4.74 |  |  |  |  |
| Housing AA                               | 5.86 | 6.42 | 5.64 |  |  |  |  |
| Hospital AA                              | 5.35 | 5.71 | 5.08 |  |  |  |  |
| Toll Road Aaa                            | 5.07 | 5.46 | 4.72 |  |  |  |  |

## Federal Reserve Data

| <b>BANK RESERVES</b>                                       |         |         |        | <b>Average Levels Over the Last...</b> |         |         |
|--|---------|---------|--------|--|---------|---------|
| <i>(Two-Week Period; in Millions, Seasonally Adjusted)</i> |         |         |        | 12 Wks.                                | 26 Wks. | 52 Wks. |
| Recent Levels  |         |         |        |  |         |         |
|  | 5/4/11  | 4/20/11 | Change |  |         |         |
| Excess Reserves  | 1433322 | 1474432 | -41110 | 1330196                                | 1163742 | 1092180 |
| Borrowed Reserves  | 16908   | 17930   | -1022  | 19864                                  | 31461   | 47019   |
| Net Free/Borrowed Reserves                                 | 1416414 | 1456502 | -40088 | 1310332                                | 1132281 | 1045161 |

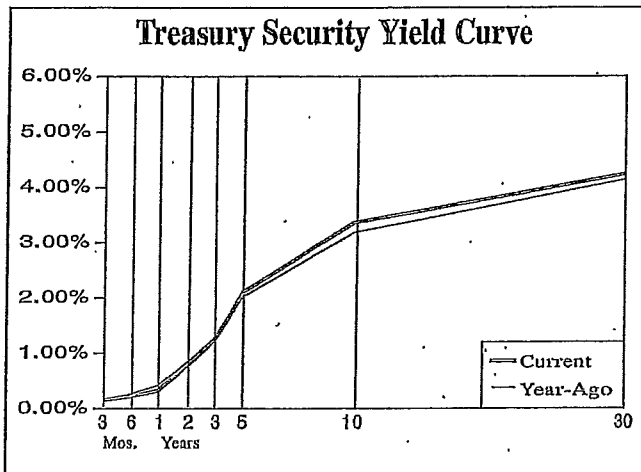
| <b>MONEY SUPPLY</b>  |        |         |        | <b>Growth Rates Over the Last...</b> |        |         |
|--|--------|---------|--------|--------------------------------------|--------|---------|
| <i>(One-Week Period; in Billions, Seasonally Adjusted)</i> |        |         |        | 3 Mos.                               | 6 Mos. | 12 Mos. |
| Recent Levels  |        |         |        |                                      |        |         |
|  | 5/2/11 | 4/25/11 | Change |                                      |        |         |
| M1 (Currency+demand deposits)                              | 1937.1 | 1916.9  | 20.2   | 8.9%                                 | 19.9%  | 12.3%   |
| M2 (M1+savings+small time deposits)                        | 8992.6 | 8964.5  | 28.1   | 5.7%                                 | 4.9%   | 5.1%    |

## Value Line Forecast for the U.S. Economy

|  | ACTUAL |       |       |       |        | ESTIMATED |       |       |       |       |
|--|--------|-------|-------|-------|--------|-----------|-------|-------|-------|-------|
|  | 2005   | 2006  | 2007  | 2008  | 2009   | 2010      | 2011  | 2012  | 2013  | 2014  |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS</b><br>(2005 CHAIN WEIGHTED \$) BILLIONS OF DOLLARS |        |       |       |       |        |           |       |       |       |       |
| Final Sales  | 12588  | 12917 | 13234 | 13341 | 13111  | 13405     | 13797 | 14239 | 14708 | 15194 |
| Total Consumption  | 8819   | 9074  | 9314  | 9291  | 9235   | 9495      | 9794  | 10038 | 10289 | 10547 |
| Nonresidential Fixed Investment  | 1347   | 1454  | 1544  | 1570  | 1291   | 1342      | 1444  | 1588  | 1731  | 1870  |
| Structures   | 351    | 384   | 441   | 487   | 390    | 340       | 326   | 365   | 412   | 466   |
| Equipment & Software   | 996    | 1070  | 1097  | 1069  | 891    | 1004      | 1138  | 1252  | 1390  | 1529  |
| Residential Fixed Investment   | 775    | 718   | 585   | 451   | 359    | 369       | 451   | 541   | 595   | 643   |
| Exports  | 1305   | 1422  | 1546  | 1629  | 1472   | 1646      | 1765  | 1897  | 2060  | 2225  |
| Imports  | 2028   | 2151  | 2194  | 2124  | 1828   | 2040      | 2211  | 2333  | 2435  | 2533  |
| Federal Government   | 876    | 895   | 906   | 976   | 1027   | 1061      | 1039  | 1002  | 984   | 970   |
| State & Local Governments  | 1494   | 1507  | 1537  | 1544  | 1541   | 1527      | 1538  | 1554  | 1574  | 1598  |
| Gross Domestic Product   | 12638  | 13399 | 14078 | 14441 | 14377  | 14904     | 15612 | 16417 | 17298 | 18244 |
| Real GDP (2005 Chain Weighted \$)  | 12638  | 12976 | 13254 | 13312 | 12987  | 13425     | 13849 | 14306 | 14792 | 15295 |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>   |        |       |       |       |        |           |       |       |       |       |
| GDP Deflator   | 3.3    | 3.2   | 2.7   | 2.2   | 1.2    | 1.4       | 1.6   | 1.8   | 1.9   | 2.0   |
| CPI-All Urban Consumers  | 3.4    | 3.2   | 2.9   | 3.8   | -0.3   | 1.4       | 2.1   | 2.2   | 2.4   | 2.6   |
| PPI-Finished Goods   | 4.9    | 3.0   | 3.9   | 6.4   | -2.5   | 2.7       | 2.2   | 2.3   | 2.5   | 2.8   |
| Employment Cost Index—Total Comp.  | 3.1    | 2.9   | 3.1   | 2.8   | 1.5    | 2.0       | 2.5   | 2.5   | 2.6   | 2.8   |
| Productivity   | 1.8    | 1.0   | 1.4   | 2.8   | 3.7    | 2.2       | 0.6   | 0.8   | 1.0   | 1.5   |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>   |        |       |       |       |        |           |       |       |       |       |
| Industrial Prod. (% Change)  | 3.3    | 2.2   | 1.7   | -2.2  | -9.7   | 6.5       | 4.4   | 3.5   | 3.6   | 3.8   |
| Factory Operating Rate (%)   | 78.6   | 79.4  | 79.4  | 75.1  | 66.8   | 72.0      | 75.0  | 76.0  | 77.0  | 78.0  |
| Nonfarm Inven. Change (2005 Chain Weighted \$)   | 39.1   | 46.3  | -3.7  | -34.3 | -108.3 | 50.0      | 60.0  | 55.0  | 50.0  | 50.0  |
| Housing Starts (Mill. Units)   | 2.07   | 1.81  | 1.34  | 0.90  | 0.55   | 0.71      | 1.18  | 1.55  | 1.70  | 1.80  |
| Existing House Sales (Mill. Units)   | 7.08   | 6.51  | 5.67  | 4.89  | 5.16   | 5.53      | 5.74  | 6.10  | 6.30  | 6.50  |
| Total Light Vehicle Sales (Mill. Units)  | 17.0   | 16.5  | 16.1  | 13.1  | 10.4   | 11.8      | 13.8  | 15.0  | 16.0  | 17.0  |
| National Unemployment Rate (%)   | 5.1    | 4.6   | 4.6   | 5.8   | 9.3    | 9.7       | 9.1   | 8.3   | 7.7   | 7.2   |
| Federal Budget Surplus (Unified, FY, \$Bill)   | -321   | -248  | -162  | -455  | -1416  | -1280     | -990  | -850  | -650  | -600  |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)   | 56.56  | 66.12 | 72.18 | 99.75 | 59.40  | 73.30     | 81.00 | 85.00 | 90.00 | 95.00 |
| <b>MONEY AND INTEREST RATES</b>  |        |       |       |       |        |           |       |       |       |       |
| 3-Month Treasury Bill Rate (%)   | 3.1    | 4.7   | 4.4   | 1.4   | 0.2    | 0.3       | 1.8   | 3.4   | 3.8   | 4.2   |
| Federal Funds Rate (%)   | 3.2    | 5.0   | 5.0   | 1.9   | 0.2    | 0.2       | 1.6   | 3.3   | 3.7   | 4.3   |
| 10-Year Treasury Note Rate (%)   | 4.3    | 4.8   | 4.6   | 3.7   | 3.3    | 3.7       | 4.1   | 4.6   | 5.0   | 5.5   |
| Long-Term Treasury Bond Rate (%)   | 4.6    | 4.9   | 4.8   | 4.3   | 4.1    | 4.5       | 4.9   | 5.2   | 5.6   | 6.0   |
| AAA Corporate Bond Rate (%)  | 5.2    | 5.6   | 5.6   | 5.6   | 5.3    | 5.5       | 5.7   | 6.0   | 6.4   | 6.8   |
| Prime Rate (%)   | 6.2    | 8.0   | 8.0   | 5.1   | 3.3    | 3.4       | 4.3   | 6.0   | 6.5   | 7.0   |
| <b>INCOMES</b>   |        |       |       |       |        |           |       |       |       |       |
| Personal Income (% Change)   | 5.6    | 7.1   | 6.1   | 3.8   | -1.7   | 4.0       | 4.5   | 5.0   | 5.2   | 5.5   |
| Real Disp. Inc. (% Change)   | 1.4    | 3.5   | 2.8   | 1.3   | 0.9    | 2.8       | 1.9   | 2.3   | 2.6   | 3.0   |
| Personal Savings Rate (%)  | 0.4    | 0.7   | 0.6   | 1.8   | 4.2    | 3.4       | 2.5   | 2.3   | 2.1   | 2.0   |
| After-Tax Profits (\$Bill)   | 1207   | 1405  | 1436  | 1231  | 1113   | 1417      | 1462  | 1535  | 1627  | 1741  |
| Yr-to-Yr % Change  | 34.5   | 16.4  | 2.2   | -14.3 | -9.6   | 27.3      | 3.2   | 5.0   | 6.0   | 7.0   |
| <b>COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE</b>  |        |       |       |       |        |           |       |       |       |       |
| Gross Domestic Product   | 3.1    | 2.7   | 2.1   | 0.4   | -2.4   | 3.4       | 3.2   | 3.3   | 3.4   | 3.4   |
| Final Sales  | 3.1    | 2.8   | 2.4   | 1.4   | -1.7   | 2.2       | 2.9   | 3.2   | 3.3   | 3.3   |
| Total Consumption  | 3.0    | 3.0   | 2.8   | 0.2   | -0.6   | 2.8       | 3.1   | 2.5   | 2.5   | 2.5   |
| Nonresidential Fixed Investment  | 7.2    | 7.5   | 4.9   | 1.6   | -17.8  | 3.9       | 7.6   | 10.0  | 9.0   | 8.0   |
| Structures   | 1.3    | 8.2   | 12.7  | 11.2  | -19.8  | -12.8     | -4.2  | 12.0  | 13.0  | 13.0  |
| Equipment & Software   | 9.3    | 7.2   | 1.7   | -3.0  | -16.6  | 12.7      | 13.3  | 10.0  | 11.0  | 10.0  |
| Residential Fixed Investment   | 6.3    | -7.1  | -17.9 | -20.8 | -20.5  | 2.7       | 22.3  | 20.0  | 10.0  | 8.0   |
| Exports  | 7.0    | 9.1   | 8.4   | 6.2   | -9.6   | 11.8      | 7.2   | 7.5   | 8.6   | 8.0   |
| Imports  | 5.9    | 6.0   | 2.2   | -3.5  | -13.9  | 11.6      | 8.4   | 5.5   | 4.4   | 4.0   |
| Federal Government   | 1.2    | 2.3   | 1.6   | 6.0   | 5.2    | 3.3       | -2.1  | -3.5  | -1.8  | -1.5  |
| State & Local Governments  | -0.1   | 1.3   | 2.3   | 1.1   | -0.2   | -0.9      | 0.7   | 1.0   | 1.3   | 1.5   |

## Selected Yields

|                                 | Recent<br>(5/19/10) | 3 Months<br>Ago<br>(2/17/10) | Year<br>Ago<br>(5/20/09) |                                   | Recent<br>(5/19/10) | 3 Months<br>Ago<br>(2/17/10) | Year<br>Ago<br>(5/20/09) |
|---------------------------------|---------------------|------------------------------|--------------------------|-----------------------------------|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>                  |                     |                              |                          |                                   |                     |                              |                          |
| <b>Market Rates</b>             |                     |                              |                          |                                   |                     |                              |                          |
| Discount Rate                   | 0.75                | 0.50                         | 0.50                     | <b>Mortgage-Backed Securities</b> |                     |                              |                          |
| Federal Funds                   | 0.00-0.25           | 0.00-0.25                    | 0.00-0.25                | GNMA 6.5%                         | 1.70                | 2.99                         | 3.02                     |
| Prime Rate                      | 3.25                | 3.25                         | 3.25                     | FHLMC 6.5% (Gold)                 | 1.14                | 1.75                         | 2.27                     |
| 30-day CP (A1/P1)               | 0.33                | 0.16                         | 0.26                     | FNMA 6.5%                         | 1.19                | 2.61                         | 2.03                     |
| 3-month LIBOR                   | 0.48                | 0.25                         | 0.72                     | FNMA ARM                          | 3.01                | 2.98                         | 2.78                     |
| <b>Bank CDs</b>                 |                     |                              |                          |                                   |                     |                              |                          |
| 6-month                         | 0.25                | 0.25                         | 0.72                     | <b>Corporate Bonds</b>            |                     |                              |                          |
| 1-year                          | 0.43                | 0.45                         | 0.97                     | Financial (10-year) A             | 4.74                | 5.41                         | 6.66                     |
| 5-year                          | 1.99                | 1.97                         | 1.92                     | Industrial (25/30-year) A         | 5.37                | 5.85                         | 6.21                     |
| <b>U.S. Treasury Securities</b> |                     |                              |                          |                                   |                     |                              |                          |
| 3-month                         | 0.16                | 0.09                         | 0.17                     | Utility (25/30-year) A            | 5.53                | 5.93                         | 6.01                     |
| 6-month                         | 0.22                | 0.18                         | 0.27                     | Utility (25/30-year) Baa/BBB      | 5.93                | 6.44                         | 7.59                     |
| 1-year                          | 0.33                | 0.34                         | 0.42                     | <b>Foreign Bonds (10-Year)</b>    |                     |                              |                          |
| 5-year                          | 2.12                | 2.38                         | 2.03                     | Canada                            | 3.40                | 3.47                         | 3.14                     |
| 10-year                         | 3.37                | 3.73                         | 3.19                     | Germany                           | 2.77                | 3.19                         | 3.43                     |
| 10-year (inflation-protected)   | 1.29                | 1.44                         | 1.51                     | Japan                             | 1.30                | 1.33                         | 1.43                     |
| 30-year                         | 4.24                | 4.70                         | 4.14                     | United Kingdom                    | 3.66                | 4.03                         | 3.58                     |
| 30-year Zero                    | 4.46                | 4.96                         | 4.26                     | <b>Preferred Stocks</b>           |                     |                              |                          |
|                                 |                     |                              |                          | Utility A                         | 6.01                | 5.40                         | 6.09                     |
|                                 |                     |                              |                          | Financial A                       | 6.56                | 7.14                         | 8.37                     |
|                                 |                     |                              |                          | Financial Adjustable A            | 5.52                | 5.52                         | 5.52                     |



### TAX-EXEMPT

|  |      |      |      |  |  |  |  |
|--|------|------|------|--|--|--|--|
| <b>Bond Buyer Indexes</b>                |      |      |      |  |  |  |  |
| 20-Bond Index (GOs)                      | 4.32 | 4.34 | 4.61 |  |  |  |  |
| 25-Bond Index (Revs)                     | 4.90 | 4.96 | 5.53 |  |  |  |  |
| <b>General Obligation Bonds (GOs)</b>    |      |      |      |  |  |  |  |
| 1-year Aaa                               | 0.37 | 0.31 | 0.43 |  |  |  |  |
| 1-year A                                 | 1.20 | 1.10 | 1.16 |  |  |  |  |
| 5-year Aaa                               | 1.76 | 1.55 | 1.82 |  |  |  |  |
| 5-year A                                 | 2.70 | 2.59 | 3.25 |  |  |  |  |
| 10-year Aaa                              | 3.12 | 3.12 | 2.81 |  |  |  |  |
| 10-year A                                | 4.09 | 4.10 | 4.35 |  |  |  |  |
| 25/30-year Aaa                           | 4.39 | 4.45 | 4.40 |  |  |  |  |
| 25/30-year A                             | 5.46 | 5.50 | 5.92 |  |  |  |  |
| <b>Revenue Bonds (Revs) (25/30-Year)</b> |      |      |      |  |  |  |  |
| Education AA                             | 4.74 | 4.77 | 5.97 |  |  |  |  |
| Electric AA                              | 4.74 | 4.76 | 6.02 |  |  |  |  |
| Housing AA                               | 5.64 | 5.63 | 6.32 |  |  |  |  |
| Hospital AA                              | 5.08 | 5.03 | 6.27 |  |  |  |  |
| Toll Road Aaa                            | 4.72 | 4.83 | 6.07 |  |  |  |  |

## Federal Reserve Data

### BANK RESERVES

(Two-Week Period; in Millions, Seasonally Adjusted)

|                            | Recent Levels |         |        | Average Levels Over the Last... |         |         |
|----------------------------|---------------|---------|--------|---------------------------------|---------|---------|
|                            | 5/5/10        | 4/21/10 | Change | 12 Wks.                         | 26 Wks. | 52 Wks. |
| Excess Reserves            | 1009469       | 1055015 | -45546 | 1105241                         | 1084241 | 952250  |
| Borrowed Reserves          | 78088         | 79450   | -1362  | 94490                           | 139947  | 258022  |
| Net Free/Borrowed Reserves | 931381        | 975565  | -44184 | 1010751                         | 944294  | 694228  |

### MONEY SUPPLY

(One-Week Period; in Billions, Seasonally Adjusted)

|                                     | Recent Levels |         |        | Growth Rates Over the Last... |        |         |
|-------------------------------------|---------------|---------|--------|-------------------------------|--------|---------|
|                                     | 5/3/10        | 4/26/10 | Change | 3 Mos.                        | 6 Mos. | 12 Mos. |
| M1 (Currency+demand deposits)       | 1736.1        | 1694.6  | 41.5   | 10.1%                         | 7.1%   | 8.7%    |
| M2 (M1+savings+small time deposits) | 8504.3        | 8470.0  | 34.3   | 0.5%                          | -0.1%  | 1.5%    |

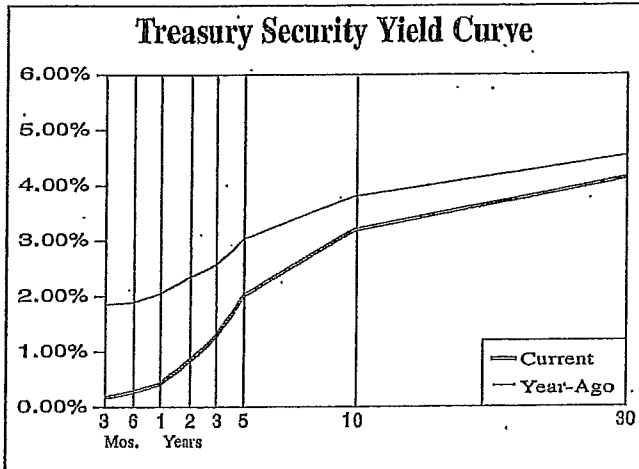


## Value Line Forecast for the U.S. Economy

|  | ACTUAL |        |        |        |        | ESTIMATED |         |        |        |        |
|--|--------|--------|--------|--------|--------|-----------|---------|--------|--------|--------|
|  | 2004   | 2005   | 2006   | 2007   | 2008   | 2009      | 2010    | 2011   | 2012   | 2013   |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS</b><br>(2000 CHAIN WEIGHTED \$) BILLIONS OF DOLLARS |        |        |        |        |        |           |         |        |        |        |
| Final Sales  | 10620  | 10947  | 11249  | 11523  | 11681  | 11376     | 11441   | 11784  | 12173  | 12599  |
| Total Consumption  | 7561   | 7792   | 8029   | 8253   | 8272   | 8242      | 8397    | 8565   | 8770   | 8998   |
| Nonresidential Fixed Investment  | 1144   | 1226   | 1318   | 1383   | 1405   | 1132      | 1132    | 1279   | 1432   | 1576   |
| Structures   | 247    | 250    | 270    | 305    | 339    | 268       | 236     | 248    | 273    | 306    |
| Equipment & Software   | 905    | 990    | 1061   | 1079   | 1047   | 853       | 911     | 1048   | 1184   | 1302   |
| Residential Fixed Investment   | 560    | 595    | 553    | 454    | 360    | 275       | 307     | 384    | 441    | 485    |
| Exports  | 1126   | 1205   | 1315   | 1426   | 1514   | 1303      | 1304    | 1426   | 1579   | 1737   |
| Imports  | 1720   | 1822   | 1930   | 1972   | 1904   | 1639      | 1740    | 1866   | 1992   | 2088   |
| Federal Government   | 716    | 724    | 741    | 753    | 798    | 830       | 838     | 807    | 793    | 787    |
| State & Local Governments  | 1216   | 1214   | 1230   | 1259   | 1273   | 1253      | 1249    | 1243   | 1246   | 1267   |
| Gross Domestic Product   | 11686  | 12422  | 13178  | 13808  | 14265  | 14015     | 14324   | 14916  | 15625  | 16415  |
| Real GDP (2000 Chain Weighted \$)  | 10676  | 10990  | 11295  | 11524  | 11652  | 11296     | 11454   | 11775  | 12151  | 12552  |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>   |        |        |        |        |        |           |         |        |        |        |
| GDP Deflator   | 2.9    | 3.3    | 3.2    | 2.7    | 2.2    | 0.8       | 1.2     | 1.3    | 1.5    | 1.7    |
| CPI-All Urban Consumers  | 2.7    | 3.4    | 3.2    | 2.9    | 3.8    | 0.0       | 2.0     | 2.3    | 2.5    | 2.8    |
| PPI-Finished Goods   | 3.6    | 4.9    | 3.0    | 3.9    | 6.4    | -2.1      | 1.6     | 2.4    | 2.8    | 3.0    |
| Employment Cost Index—Total Comp.  | 3.8    | 3.1    | 2.9    | 3.1    | 2.8    | 1.3       | 1.6     | 1.5    | 2.0    | 2.5    |
| Productivity   | 2.7    | 1.8    | 1.0    | 1.4    | 2.8    | 1.5       | 2.6     | 1.5    | 1.7    | 2.0    |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>   |        |        |        |        |        |           |         |        |        |        |
| Industrial Prod. (% Change)  | 2.5    | 3.3    | 2.2    | 1.7    | -2.2   | -6.8      | 2.5     | 4.0    | 5.0    | 5.0    |
| Factory Operating Rate (%)   | 76.6   | 78.6   | 79.4   | 79.4   | 75.1   | 65.8      | 67.0    | 70.0   | 72.0   | 74.0   |
| Nonfarm Inven. Change (2000 Chain Weighted \$)   | 48.2   | 39.1   | 46.3   | -3.7   | -34.3  | -85.4     | -1.3    | 35.0   | 45.0   | 50.0   |
| Housing Starts (Mill. Units)   | 1.95   | 2.07   | 1.81   | 1.34   | 0.90   | 0.54      | 0.86    | 1.25   | 1.55   | 1.75   |
| Existing House Sales (Mill. Units)   | 6.73   | 7.08   | 6.51   | 5.67   | 4.89   | 4.41      | 4.48    | 5.00   | 5.90   | 6.40   |
| Total Light Vehicle Sales (Mill. Units)  | 16.9   | 17.0   | 16.5   | 16.1   | 13.1   | 9.7       | 11.4    | 14.0   | 15.5   | 16.5   |
| National Unemployment Rate (%)   | 5.5    | 5.1    | 4.6    | 4.6    | 5.8    | 9.2       | 9.9     | 9.0    | 8.0    | 7.0    |
| Federal Budget Surplus (Unified, FY, \$Bill)   | -411.0 | -321.0 | -248.0 | -162.0 | -455.0 | -1585.0   | -1350.0 | -900.0 | -600.0 | -500.0 |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)   | 36.91  | 50.31  | 60.09  | 67.95  | 94.30  | 42.85     | 50.45   | 59.00  | 71.50  | 80.00  |
| <b>MONEY AND INTEREST RATES</b>  |        |        |        |        |        |           |         |        |        |        |
| 3-Month Treasury Bill Rate (%)   | 1.4    | 3.1    | 4.7    | 4.4    | 1.4    | 0.2       | 0.5     | 2.0    | 3.0    | 3.5    |
| Federal Funds Rate (%)   | 1.4    | 3.2    | 5.0    | 5.0    | 1.9    | 0.2       | 0.4     | 2.0    | 3.0    | 3.5    |
| 10-Year Treasury Note Rate (%)   | 4.3    | 4.3    | 4.8    | 4.6    | 3.7    | 3.1       | 3.3     | 3.7    | 4.2    | 4.7    |
| Long-Term Treasury Bond Rate (%)   | 5.1    | 4.6    | 4.9    | 4.8    | 4.3    | 4.0       | 4.3     | 4.5    | 5.0    | 5.5    |
| AAA Corporate Bond Rate (%)  | 5.6    | 5.2    | 5.6    | 5.6    | 5.6    | 5.5       | 5.7     | 5.8    | 6.2    | 6.7    |
| Prime Rate (%)   | 4.3    | 6.2    | 8.0    | 8.0    | 5.1    | 3.3       | 3.9     | 4.7    | 6.0    | 7.0    |
| <b>INCOMES</b>   |        |        |        |        |        |           |         |        |        |        |
| Personal Income (% Change)   | 6.2    | 5.6    | 7.1    | 6.1    | 3.8    | -0.1      | 2.9     | 4.0    | 5.0    | 5.5    |
| Real Disp. Inc. (% Change)   | 3.6    | 1.4    | 3.5    | 2.8    | 1.3    | 1.8       | 0.6     | 1.5    | 2.0    | 2.5    |
| Personal Savings Rate (%)  | 2.1    | 0.4    | 0.7    | 0.6    | 1.8    | 4.5       | 3.1     | 2.2    | 2.1    | 2.0    |
| After-Tax Profits (\$Bill)   | 897    | 1207   | 1405   | 1436   | 1231   | 1053      | 1191    | 1333   | 1440   | 1526   |
| Yr-to-Yr % Change  | 35.0   | 34.5   | 16.4   | 2.2    | -14.3  | -14.4     | 13.0    | 12.0   | 8.0    | 6.0    |
| <b>COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE</b>  |        |        |        |        |        |           |         |        |        |        |
| Gross Domestic Product   | 3.6    | 2.9    | 2.8    | 2.0    | 1.1    | -3.1      | 1.4     | 2.8    | 3.2    | 3.3    |
| Final Sales  | 3.3    | 3.1    | 2.8    | 2.4    | 1.4    | -2.6      | 0.6     | 3.0    | 3.3    | 3.5    |
| Total Consumption  | 3.6    | 3.0    | 3.0    | 2.8    | 0.2    | -0.4      | 1.9     | 2.0    | 2.4    | 2.6    |
| Nonresidential Fixed Investment  | 5.8    | 7.2    | 7.5    | 4.9    | 1.6    | -19.4     | 0.0     | 13.0   | 12.0   | 10.0   |
| Structures   | 1.3    | 1.3    | 8.2    | 12.7   | 11.2   | -21.1     | -11.7   | 5.0    | 10.0   | 12.0   |
| Equipment & Software   | 7.4    | 9.3    | 7.2    | 1.7    | -3.0   | -18.5     | 6.8     | 15.0   | 13.0   | 10.0   |
| Residential Fixed Investment   | 10.0   | 6.3    | -7.1   | -17.9  | -20.8  | -23.7     | 11.7    | 25.0   | 15.0   | 10.0   |
| Exports  | 9.7    | 7.0    | 9.1    | 8.4    | 6.2    | -13.9     | 0.1     | 9.3    | 10.8   | 10.0   |
| Imports  | 11.3   | 5.9    | 6.0    | 2.2    | -3.5   | -13.9     | 6.2     | 7.2    | 6.8    | 4.8    |
| Federal Government   | 4.2    | 1.2    | 2.3    | 1.6    | 6.0    | 4.0       | 1.0     | -3.7   | -1.8   | -0.7   |
| State & Local Governments  | -0.2   | -0.1   | 1.3    | 2.3    | 1.1    | -1.6      | -0.3    | -0.5   | 0.2    | 1.7    |

## Selected Yields

|                                 | Recent<br>(5/20/09) | 3 Months<br>Ago<br>(2/18/09) | Year<br>Ago<br>(5/21/08) |                                   | Recent<br>(5/20/09) | 3 Months<br>Ago<br>(2/18/09) | Year<br>Ago<br>(5/21/08) |
|---------------------------------|---------------------|------------------------------|--------------------------|-----------------------------------|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>                  |                     |                              |                          |                                   |                     |                              |                          |
| <b>Market Rates</b>             |                     |                              |                          | <b>Mortgage-Backed Securities</b> |                     |                              |                          |
| Discount Rate                   | 0.50                | 0.50                         | 2.25                     | GNMA 6.5%                         | 3.02                | 4.05                         | 4.98                     |
| Federal Funds                   | 0.00-0.25           | 0.00-0.25                    | 2.00                     | FHLMC 6.5% (Gold)                 | 2.27                | 3.92                         | 5.11                     |
| Prime Rate                      | 3.25                | 3.25                         | 5.00                     | FNMA 6.5%                         | 2.03                | 3.78                         | 4.89                     |
| 30-day CP (A1/P1)               | 0.26                | 0.52                         | 2.55                     | FNMA ARM                          | 2.78                | 3.90                         | 4.41                     |
| 3-month LIBOR                   | 0.72                | 1.25                         | 2.64                     | <b>Corporate Bonds</b>            |                     |                              |                          |
| <b>Bank CDs</b>                 |                     |                              |                          | Financial (10-year) A             | 6.66                | 8.33                         | 5.54                     |
| 6-month                         | 0.72                | 0.87                         | 1.77                     | Industrial (25/30-year) A         | 6.21                | 6.14                         | 6.03                     |
| 1-year                          | 0.97                | 1.20                         | 2.05                     | Utility (25/30-year) A            | 6.01                | 5.74                         | 6.04                     |
| 5-year                          | 1.92                | 2.14                         | 3.17                     | Utility (25/30-year) Baa/BBB      | 7.59                | 7.07                         | 6.36                     |
| <b>U.S. Treasury Securities</b> |                     |                              |                          | <b>Foreign Bonds (10-Year)</b>    |                     |                              |                          |
| 3-month                         | 0.17                | 0.30                         | 1.86                     | Canada                            | 3.14                | 2.86                         | 3.58                     |
| 6-month                         | 0.27                | 0.48                         | 1.89                     | Germany                           | 3.43                | 2.99                         | 4.27                     |
| 1-year                          | 0.42                | 0.63                         | 2.05                     | Japan                             | 1.43                | 1.26                         | 1.62                     |
| 5-year                          | 2.03                | 1.80                         | 3.04                     | United Kingdom                    | 3.58                | 3.39                         | 4.88                     |
| 10-year                         | 3.19                | 2.76                         | 3.81                     | <b>Preferred Stocks</b>           |                     |                              |                          |
| 10-year (inflation-protected)   | 1.51                | 1.61                         | 1.16                     | Utility A                         | 6.09                | 6.03                         | 6.31                     |
| 30-year                         | 4.14                | 3.55                         | 4.54                     | Financial A                       | 8.37                | 13.57                        | 6.73                     |
| 30-year Zero                    | 4.26                | 3.43                         | 4.64                     | Financial Adjustable A            | 5.52                | 5.52                         | 5.52                     |



| <b>TAX-EXEMPT</b>                        |      |      |      |  |  |  |  |
|--|------|------|------|--|--|--|--|
| <b>Bond Buyer Indexes</b>                |      |      |      |  |  |  |  |
| 20-Bond Index (GOs)                      | 4.61 | 4.89 | 4.53 |  |  |  |  |
| 25-Bond Index (Revs)                     | 5.53 | 5.67 | 4.98 |  |  |  |  |
| <b>General Obligation Bonds (GOs)</b>    |      |      |      |  |  |  |  |
| 1-year Aaa                               | 0.43 | 0.55 | 1.80 |  |  |  |  |
| 1-year A                                 | 1.16 | 0.65 | 1.90 |  |  |  |  |
| 5-year Aaa                               | 1.82 | 1.85 | 2.92 |  |  |  |  |
| 5-year A                                 | 3.25 | 2.15 | 3.02 |  |  |  |  |
| 10-year Aaa                              | 2.81 | 2.90 | 3.56 |  |  |  |  |
| 10-year A                                | 4.35 | 3.40 | 3.76 |  |  |  |  |
| 25/30-year Aaa                           | 4.40 | 4.72 | 4.45 |  |  |  |  |
| 25/30-year A                             | 5.92 | 5.72 | 4.65 |  |  |  |  |
| <b>Revenue Bonds (Revs) (25/30-Year)</b> |      |      |      |  |  |  |  |
| Education AA                             | 5.97 | 5.80 | 4.75 |  |  |  |  |
| Electric AA                              | 6.02 | 5.90 | 4.80 |  |  |  |  |
| Housing AA                               | 6.32 | 6.15 | 5.00 |  |  |  |  |
| Hospital AA                              | 6.27 | 6.10 | 5.05 |  |  |  |  |
| Toll Road Aaa                            | 6.07 | 5.95 | 4.80 |  |  |  |  |

## Federal Reserve Data

| <b>BANK RESERVES</b>                                       |               |         |        |                                 |         |         |  |
|--|---------------|---------|--------|---------------------------------|---------|---------|--|
| <i>(Two-Week Period; in Millions, Seasonally Adjusted)</i> |               |         |        |                                 |         |         |  |
|  | Recent Levels |         |        | Average Levels Over the Last... |         |         |  |
|  | 5/6/09        | 4/22/09 | Change | 12 Wks.                         | 26 Wks. | 52 Wks. |  |
| Excess Reserves  | 777464        | 862393  | -84929 | 731759                          | 706418  | 385094  |  |
| Borrowed Reserves  | 507911        | 565360  | -57449 | 579211                          | 611473  | 433308  |  |
| Net Free/Borrowed Reserves                                 | 269553        | 297033  | -27480 | 152548                          | 94946   | -48213  |  |

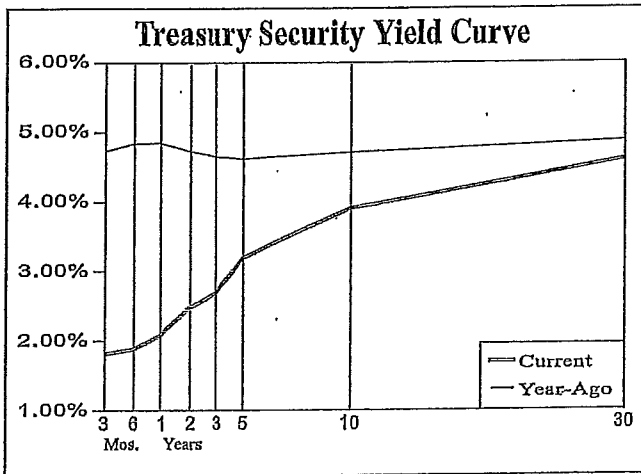
| <b>MONEY SUPPLY</b>  |               |         |        |                               |        |         |  |
|--|---------------|---------|--------|-------------------------------|--------|---------|--|
| <i>(One-Week Period; in Billions, Seasonally Adjusted)</i> |               |         |        |                               |        |         |  |
|  | Recent Levels |         |        | Growth Rates Over the Last... |        |         |  |
|  | 5/4/09        | 4/27/09 | Change | 3 Mos.                        | 6 Mos. | 12 Mos. |  |
| M1 (Currency+demand deposits)                              | 1608.2        | 1576.7  | 31.5   | 10.0%                         | 11.2%  | -16.6%  |  |
| M2 (M1+savings+small time deposits)                        | 8303.9        | 8285.0  | 18.9   | 4.2%                          | 10.4%  | 9.1%    |  |

## Value Line Forecast for the U.S. Economy

|   | ACTUAL |        |        |        |        | ESTIMATED |        |        |        |        |
|---|--------|--------|--------|--------|--------|-----------|--------|--------|--------|--------|
|   | 2003   | 2004   | 2005   | 2006   | 2007   | 2008      | 2009   | 2010   | 2011   | 2012   |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS<br/>(2000 CHAIN WEIGHTED \$) BILLIONS OF DOLLARS</b> |        |        |        |        |        |           |        |        |        |        |
| Final Sales   | 10285  | 10620  | 10967  | 11276  | 11562  | 11736     | 11917  | 12275  | 12655  | 13035  |
| Total Consumption   | 7295   | 7561   | 7804   | 8044   | 8278   | 8413      | 8546   | 8785   | 9058   | 9338   |
| Nonresidential Fixed Investment   | 1082   | 1144   | 1226   | 1307   | 1368   | 1384      | 1376   | 1431   | 1495   | 1570   |
| Structures  | 244    | 247    | 248    | 269    | 303    | 311       | 288    | 280    | 291    | 311    |
| Equipment & Software  | 843    | 905    | 992    | 1051   | 1064   | 1069      | 1069   | 1133   | 1213   | 1285   |
| Residential Fixed Investment  | 509    | 560    | 597    | 570    | 473    | 365       | 349    | 391    | 430    | 464    |
| Exports   | 1026   | 1126   | 1203   | 1304   | 1410   | 1527      | 1653   | 1784   | 1900   | 2010   |
| Imports   | 1545   | 1720   | 1822   | 1929   | 1966   | 1970      | 2006   | 2120   | 2260   | 2387   |
| Federal Government  | 687    | 716    | 726    | 742    | 755    | 783       | 793    | 787    | 781    | 779    |
| State & Local Governments   | 1218   | 1216   | 1220   | 1239   | 1266   | 1279      | 1268   | 1265   | 1277   | 1294   |
| Gross Domestic Product  | 10961  | 11686  | 12434  | 13195  | 13841  | 14310     | 14835  | 15569  | 16395  | 17294  |
| Real GDP (2000 Chain Weighted \$)   | 10301  | 10676  | 11004  | 11319  | 11567  | 11720     | 11901  | 12258  | 12650  | 13067  |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>  |        |        |        |        |        |           |        |        |        |        |
| GDP Deflator  | 2.1    | 2.9    | 3.2    | 3.2    | 2.7    | 2.1       | 2.3    | 2.3    | 2.3    | 2.5    |
| CPI-All Urban Consumers   | 2.3    | 2.7    | 3.4    | 3.2    | 2.9    | 3.3       | 2.4    | 2.4    | 2.5    | 2.7    |
| PPI-Finished Goods  | 3.2    | 3.6    | 4.9    | 2.9    | 3.9    | 4.6       | 1.9    | 2.2    | 2.3    | 2.4    |
| Employment Cost Index—Total Comp.   | 3.8    | 3.8    | 3.1    | 2.9    | 3.1    | 3.1       | 2.9    | 3.0    | 3.2    | 3.4    |
| Productivity  | 3.9    | 2.7    | 1.9    | 1.0    | 1.8    | 1.2       | 1.8    | 2.7    | 3.0    | 3.2    |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>  |        |        |        |        |        |           |        |        |        |        |
| Industrial Prod. (% Change)   | 0.6    | 2.5    | 3.2    | 4.0    | 1.7    | 0.4       | 2.5    | 3.0    | 3.1    | 3.3    |
| Factory Operating Rate (%)  | 73.7   | 76.6   | 78.8   | 80.4   | 79.4   | 78.2      | 78.1   | 80.0   | 80.5   | 81.0   |
| Nonfarm Inven. Change (2000 Chain Weighted \$)  | 14.0   | 48.2   | 34.0   | 41.7   | 0.0    | -22.1     | -1.3   | 45.0   | 50.0   | 40.0   |
| Housing Starts (Mill. Units)  | 1.85   | 1.95   | 2.07   | 1.81   | 1.34   | 0.92      | 1.05   | 1.40   | 1.60   | 1.70   |
| Existing House Sales (Mill. Units)  | 6.18   | 6.73   | 7.08   | 6.51   | 5.67   | 4.64      | 4.75   | 5.25   | 5.70   | 6.10   |
| Total Light Vehicle Sales (Mill. Units)   | 16.6   | 16.9   | 16.9   | 16.5   | 16.1   | 14.9      | 15.1   | 15.5   | 16.0   | 17.0   |
| National Unemployment Rate (%)  | 6.0    | 5.5    | 5.1    | 4.6    | 4.6    | 5.2       | 5.7    | 5.7    | 5.5    | 5.2    |
| Federal Budget Surplus (Unified, FY, \$Bill)  | -377.0 | -411.0 | -321.0 | -248.0 | -163.0 | -400.0    | -335.0 | -400.0 | -335.0 | -315.0 |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)  | 28.60  | 36.91  | 50.31  | 60.09  | 67.95  | 107.65    | 115.00 | 113.00 | 112.00 | 112.00 |
| <b>MONEY AND INTEREST RATES</b>   |        |        |        |        |        |           |        |        |        |        |
| 3-Month Treasury Bill Rate (%)  | 1.0    | 1.4    | 3.1    | 4.7    | 4.4    | 1.6       | 2.3    | 3.0    | 3.7    | 4.0    |
| Federal Funds Rate (%)  | 1.1    | 1.4    | 3.2    | 5.0    | 5.0    | 2.4       | 2.8    | 4.0    | 4.7    | 5.0    |
| 10-Year Treasury Note Rate (%)  | 4.0    | 4.3    | 4.3    | 4.8    | 4.6    | 3.6       | 3.8    | 4.8    | 5.3    | 5.5    |
| Long-Term Treasury Bond Rate (%)  | 5.0    | 5.1    | 4.6    | 4.9    | 4.8    | 4.0       | 4.2    | 5.1    | 5.6    | 5.8    |
| AAA Corporate Bond Rate (%)   | 5.7    | 5.6    | 5.2    | 5.6    | 5.6    | 4.7       | 4.9    | 5.8    | 6.3    | 6.5    |
| Prime Rate (%)  | 4.1    | 4.3    | 6.2    | 8.0    | 8.0    | 5.2       | 5.7    | 7.0    | 7.7    | 8.0    |
| <b>INCOMES</b>  |        |        |        |        |        |           |        |        |        |        |
| Personal Income (% Change)  | 3.2    | 6.2    | 5.9    | 6.6    | 6.2    | 3.9       | 4.4    | 5.0    | 5.4    | 5.5    |
| Real Disp. Inc. (% Change)  | 2.2    | 3.6    | 1.7    | 3.1    | 3.1    | 1.4       | 2.1    | 3.2    | 3.5    | 3.5    |
| Personal Savings Rate (%)   | 2.1    | 2.1    | 0.5    | 0.4    | 0.4    | 1.3       | 1.0    | 1.7    | 1.8    | 2.0    |
| Corporate Economic Profits (\$Bill)   | 993    | 1231   | 1373   | 1554   | 1595   | 1609      | 1686   | 1804   | 1939   | 2094   |
| Yr-to-Yr % Change   | 12.1   | 24.0   | 11.5   | 13.2   | 2.7    | 0.9       | 4.8    | 7.0    | 7.5    | 8.0    |
| <b>COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE</b>   |        |        |        |        |        |           |        |        |        |        |
| Gross Domestic Product  | -2.5   | 3.6    | 3.1    | 2.9    | 2.2    | 1.3       | 1.5    | 3.0    | 3.2    | 3.3    |
| Final Sales   | 2.5    | 3.3    | 3.3    | 2.8    | 2.5    | 1.5       | 1.5    | 3.0    | 3.1    | 3.0    |
| Total Consumption   | 2.8    | 3.6    | 3.2    | 3.1    | 2.9    | 1.6       | 1.6    | 2.8    | 3.1    | 3.1    |
| Nonresidential Fixed Investment   | 1.0    | 5.8    | 7.1    | 6.6    | 4.7    | 1.2       | -0.6   | 4.0    | 4.5    | 5.0    |
| Structures  | -4.1   | 1.3    | 0.5    | 8.4    | 12.9   | 2.8       | -7.4   | -3.0   | 4.0    | 7.0    |
| Equipment & Software  | 2.8    | 7.4    | 9.6    | 5.9    | 1.3    | 0.5       | 0.0    | 6.0    | 7.0    | 6.0    |
| Residential Fixed Investment  | 8.4    | 10.0   | 6.6    | -4.6   | -17.0  | -22.9     | -4.3   | 12.0   | 10.0   | 8.0    |
| Exports   | 1.3    | 9.7    | 6.9    | 8.4    | 8.1    | 8.3       | 8.3    | 7.9    | 6.5    | 5.8    |
| Imports   | 4.1    | 11.3   | 5.9    | 5.9    | 1.9    | 0.2       | 1.8    | 5.7    | 6.6    | 5.6    |
| Federal Government  | 6.8    | 4.2    | 1.5    | 2.2    | 1.7    | 3.8       | 1.2    | -0.7   | -0.8   | -0.3   |
| State & Local Governments   | 0.2    | -0.2   | 0.3    | 1.6    | 2.2    | 1.0       | -0.9   | -0.2   | 0.9    | 1.4    |

## Selected Yields

|                                 | Recent<br>(5/14/08) | 3 Months<br>Ago<br>(2/13/08) | Year<br>Ago<br>(5/16/07) |                              | Recent<br>(5/14/08) | 3 Months<br>Ago<br>(2/13/08) | Year<br>Ago<br>(5/16/07) |
|---------------------------------|---------------------|------------------------------|--------------------------|------------------------------|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>                  |                     |                              |                          |                              |                     |                              |                          |
| <b>Market Rates</b>             |                     |                              |                          |                              |                     |                              |                          |
| Discount Rate                   | 2.25                | 3.50                         | 6.25                     | Mortgage-Backed Securities   |                     |                              |                          |
| Federal Funds                   | 2.00                | 3.00                         | 5.25                     | GNMA 6.5%                    | 5.04                | 4.46                         | 5.58                     |
| Prime Rate                      | 5.00                | 6.00                         | 8.25                     | FHLMC 6.5% (Gold)            | 5.16                | 5.10                         | 5.80                     |
| 30-day CP (A1/P1)               | 2.70                | 3.00                         | 5.24                     | FNMA 6.5%                    | 4.90                | 4.71                         | 5.73                     |
| 3-month LIBOR                   | 2.72                | 3.07                         | 5.36                     | FNMA ARM                     | 4.41                | 5.18                         | 5.49                     |
| <b>Bank CDs</b>                 |                     |                              |                          |                              |                     |                              |                          |
| 6-month                         | 1.77                | 2.15                         | 3.11                     | Corporate Bonds              |                     |                              |                          |
| 1-year                          | 2.05                | 2.34                         | 3.73                     | Financial (10-year) A        | 5.68                | 5.78                         | 5.69                     |
| 5-year                          | 3.16                | 2.85                         | 3.91                     | Industrial (25/30-year) A    | 6.06                | 6.29                         | 5.89                     |
| <b>U.S. Treasury Securities</b> |                     |                              |                          |                              |                     |                              |                          |
| 3-month                         | 1.82                | 2.26                         | 4.73                     | Utility (25/30-year) A       | 6.10                | 6.20                         | 6.07                     |
| 6-month                         | 1.88                | 2.09                         | 4.84                     | Utility (25/30-year) Baa/BBB | 6.41                | 6.35                         | 6.21                     |
| 1-year                          | 2.08                | 2.06                         | 4.85                     | Foreign Bonds (10-Year)      |                     |                              |                          |
| 5-year                          | 3.20                | 2.73                         | 4.62                     | Canada                       | 3.60                | 3.87                         | 4.24                     |
| 10-year                         | 3.91                | 3.73                         | 4.71                     | Germany                      | 4.17                | 3.96                         | 4.30                     |
| 10-year (inflation-protected)   | 1.35                | 1.34                         | 2.37                     | Japan                        | 1.68                | 1.43                         | 1.67                     |
| 30-year                         | 4.61                | 4.54                         | 4.88                     | United Kingdom               | 4.82                | 4.62                         | 5.13                     |
| 30-year Zero                    | 4.71                | 4.65                         | 4.85                     | Preferred Stocks             |                     |                              |                          |
|                                 |                     |                              |                          | Utility A                    | 6.28                | 6.13                         | 6.07                     |
|                                 |                     |                              |                          | Financial A                  | 7.69                | 7.00                         | 6.48                     |
|                                 |                     |                              |                          | Financial Adjustable A       | 5.51                | 5.51                         | 5.52                     |



### TAX-EXEMPT

|  |      |      |      |  |  |  |  |
|--|------|------|------|--|--|--|--|
| <b>Bond Buyer Indexes</b>                |      |      |      |  |  |  |  |
| 20-Bond Index (GOs)                      | 4.62 | 4.33 | 4.24 |  |  |  |  |
| 25-Bond Index (Revs)                     | 5.07 | 4.72 | 4.44 |  |  |  |  |
| <b>General Obligation Bonds (GOs)</b>    |      |      |      |  |  |  |  |
| 1-year Aaa                               | 1.83 | 1.05 | 3.60 |  |  |  |  |
| 1-year A                                 | 1.93 | 1.15 | 3.70 |  |  |  |  |
| 5-year Aaa                               | 2.97 | 2.67 | 3.63 |  |  |  |  |
| 5-year A                                 | 3.07 | 2.77 | 3.74 |  |  |  |  |
| 10-year Aaa                              | 3.62 | 3.40 | 3.76 |  |  |  |  |
| 10-year A                                | 3.83 | 3.60 | 4.26 |  |  |  |  |
| 25/30-year Aaa                           | 4.55 | 4.36 | 4.13 |  |  |  |  |
| 25/30-year A                             | 4.75 | 4.56 | 4.43 |  |  |  |  |
| <b>Revenue Bonds (Revs) (25/30-Year)</b> |      |      |      |  |  |  |  |
| Education AA                             | 4.80 | 4.60 | 4.55 |  |  |  |  |
| Electric AA                              | 4.85 | 4.65 | 4.45 |  |  |  |  |
| Housing AA                               | 5.00 | 4.80 | 4.63 |  |  |  |  |
| Hospital AA                              | 5.05 | 4.85 | 4.65 |  |  |  |  |
| Toll Road Aaa                            | 4.85 | 4.65 | 4.55 |  |  |  |  |

## Federal Reserve Data

### BANK RESERVES

(Two-Week Period; in Millions, Seasonally Adjusted)

|                            | Recent Levels |         |        | Average Levels Over the Last... |         |         |
|----------------------------|---------------|---------|--------|---------------------------------|---------|---------|
|                            | 5/7/08        | 4/23/08 | Change | 12 Wks.                         | 26 Wks. | 52 Wks. |
| Excess Reserves            | 1980          | 1718    | 262    | 2201                            | 1953    | 2042    |
| Borrowed Reserves          | 129197        | 133027  | -3830  | 89011                           | 52907   | 27699   |
| Net Free/Borrowed Reserves | -127217       | -131309 | 4092   | -86810                          | -50954  | -25657  |

### MONEY SUPPLY

(One-Week Period; in Billions, Seasonally Adjusted)

|                                     | Recent Levels |         |        | Growth Rates Over the Last... |        |         |
|-------------------------------------|---------------|---------|--------|-------------------------------|--------|---------|
|                                     | 4/28/08       | 4/21/08 | Change | 3 Mos.                        | 6 Mos. | 12 Mos. |
| M1 (Currency+demand deposits)       | 1379.9        | 1372.1  | 7.8    | 4.6%                          | 1.4%   | -0.2%   |
| M2 (M1+savings+small time deposits) | 7654.1        | 7693.3  | -39.2  | 7.6%                          | 7.1%   | 6.1%    |

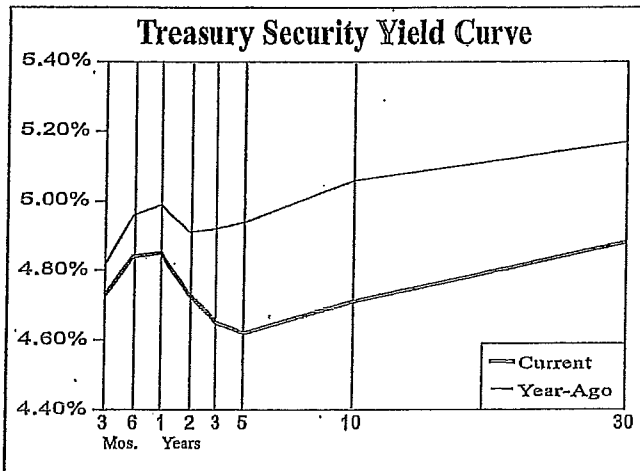


## Value Line Forecast for the U.S. Economy

|   | ACTUAL |        |        |        |        | ESTIMATED |        |        |        |        |
|---|--------|--------|--------|--------|--------|-----------|--------|--------|--------|--------|
|   | 2002   | 2003   | 2004   | 2005   | 2006   | 2007      | 2008   | 2009   | 2010   | 2011   |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS<br/>(2000 CHAIN WEIGHTED \$) BILLIONS OF DOLLARS</b> |        |        |        |        |        |           |        |        |        |        |
| Final Sales   | 10036  | 10285  | 10648  | 11025  | 11366  | 11629     | 11938  | 12296  | 12677  | 13070  |
| Total Consumption   | 7099   | 7295   | 7577   | 7841   | 8091   | 8348      | 8588   | 8854   | 9137   | 9439   |
| Nonresidential Fixed Investment   | 1072   | 1082   | 1146   | 1224   | 1312   | 1356      | 1409   | 1465   | 1524   | 1589   |
| Structures  | 254    | 244    | 249    | 252    | 274    | 293       | 298    | 301    | 307    | 316    |
| Equipment & Software  | 820    | 843    | 904    | 985    | 1049   | 1065      | 1116   | 1172   | 1237   | 1311   |
| Residential Fixed Investment  | 470    | 509    | 560    | 608    | 582    | 494       | 479    | 493    | 518    | 560    |
| Exports   | 1013   | 1026   | 1120   | 1196   | 1303   | 1386      | 1513   | 1649   | 1783   | 1908   |
| Imports   | 1485   | 1545   | 1711   | 1815   | 1921   | 1964      | 2044   | 2161   | 2286   | 2414   |
| Federal Government  | 643    | 687    | 717    | 728    | 742    | 756       | 770    | 768    | 771    | 768    |
| State & Local Governments   | 1216   | 1218   | 1224   | 1230   | 1256   | 1286      | 1300   | 1313   | 1331   | 1350   |
| Gross Domestic Product  | 10470  | 10961  | 11712  | 12456  | 13247  | 13853     | 14487  | 15220  | 16041  | 16928  |
| Real GDP (2000 Chain Weighted \$)   | 10049  | 10301  | 10704  | 11049  | 11415  | 11647     | 11946  | 12304  | 12698  | 13117  |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>  |        |        |        |        |        |           |        |        |        |        |
| GDP Deflator  | 1.7    | 2.1    | 2.8    | 3.0    | 2.9    | 2.5       | 2.0    | 2.1    | 2.2    | 2.3    |
| CPI-All Urban Consumers   | 1.6    | 2.3    | 2.7    | 3.4    | 3.2    | 3.5       | 2.4    | 2.4    | 2.5    | 2.5    |
| PPI-Finished Goods  | -1.3   | 3.2    | 3.6    | 4.9    | 2.9    | 4.8       | 2.0    | 2.0    | 2.2    | 2.3    |
| Employment Cost Index—Total Comp.   | 3.8    | 3.8    | 3.8    | 3.1    | 2.9    | 3.0       | 3.1    | 3.3    | 3.5    | 3.6    |
| Productivity  | 4.3    | 3.9    | 3.4    | 2.7    | 1.6    | 1.7       | 2.5    | 2.5    | 2.6    | 2.8    |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>  |        |        |        |        |        |           |        |        |        |        |
| Industrial Prod. (% Change)   | -0.3   | -0.6   | 4.1    | 3.2    | 4.0    | 1.9       | 2.5    | 2.5    | 2.6    | 2.6    |
| Factory Operating Rate (%)  | 73.5   | 73.7   | 77.1   | 78.9   | 80.4   | 80.1      | 80.2   | 79.8   | 80.0   | 80.2   |
| Nonfarm Inven. Change (2000 Chain Weighted \$)  | 15.2   | 14.0   | 47.0   | 19.6   | 40.6   | 15.0      | 30.0   | 40.0   | 42.0   | 45.0   |
| Housing Starts (Mill. Units)  | 1.71   | 1.85   | 1.95   | 2.07   | 1.82   | 1.44      | 1.49   | 1.60   | 1.70   | 1.80   |
| Existing House Sales (Mill. Units)  | 5.65   | 6.18   | 6.72   | 7.06   | 6.51   | 6.03      | 5.89   | 6.00   | 6.20   | 6.40   |
| Total Light Vehicle Sales (Mill. Units)   | 16.8   | 16.6   | 16.9   | 16.9   | 16.5   | 16.5      | 16.6   | 16.8   | 17.0   | 17.3   |
| National Unemployment Rate (%)  | 5.8    | 6.0    | 5.5    | 5.1    | 4.6    | 4.6       | 4.9    | 4.7    | 4.7    | 4.6    |
| Federal Budget Surplus (Unified, FY, \$Bill)  | -157.8 | -377.0 | -413.0 | -318.0 | -248.0 | -190.0    | -220.0 | -230.0 | -215.0 | -185.0 |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)  | 24.00  | 28.60  | 36.91  | 50.31  | 60.09  | 57.60     | 55.85  | 56.25  | 56.25  | 56.25  |
| <b>MONEY AND INTEREST RATES</b>   |        |        |        |        |        |           |        |        |        |        |
| 3-Month Treasury Bill Rate (%)  | 1.6    | 1.0    | 1.4    | 3.1    | 4.7    | 4.9       | 4.9    | 4.9    | 5.0    | 5.2    |
| Federal Funds Rate (%)  | 1.7    | 1.1    | 1.4    | 3.2    | 5.0    | 5.3       | 4.9    | 5.0    | 5.2    | 5.5    |
| 10-Year Treasury Note Rate (%)  | 4.6    | 4.0    | 4.3    | 4.3    | 4.8    | 4.7       | 4.8    | 5.1    | 5.4    | 5.6    |
| Long-Term Treasury Bond Rate (%)  | 5.4    | 5.0    | 5.1    | 4.6    | 4.9    | 4.8       | 5.0    | 5.3    | 5.6    | 5.8    |
| AAA Corporate Bond Rate (%)   | 6.5    | 5.7    | 5.6    | 5.2    | 5.6    | 5.4       | 5.6    | 6.1    | 6.4    | 6.6    |
| Prime Rate (%)  | 4.7    | 4.1    | 4.3    | 6.2    | 8.0    | 8.3       | 7.9    | 8.0    | 8.2    | 8.5    |
| <b>INCOMES</b>  |        |        |        |        |        |           |        |        |        |        |
| Personal Income (% Change)  | 1.8    | 3.2    | 6.2    | 5.2    | 6.3    | 5.9       | 5.7    | 5.5    | 5.6    | 5.8    |
| Real Disp. Inc. (% Change)  | 3.1    | 2.2    | 3.6    | 1.2    | 2.6    | 3.6       | 3.6    | 3.5    | 3.6    | 3.7    |
| Personal Savings Rate (%)   | 2.4    | 2.1    | 2.0    | -0.4   | -1.1   | -1.1      | -0.4   | 0.2    | 0.6    | 0.9    |
| Corporate Economic Profits (\$Bill)   | 886    | 993    | 1183   | 1331   | 1616   | 1735      | 1852   | 1963   | 2100   | 2268   |
| Yr-to-Yr % Change   | 15.5   | 12.1   | 19.1   | 12.5   | 21.4   | 7.4       | 6.7    | 6.0    | 7.0    | 8.0    |
| <b>COMPOSITION OF REAL GDP-<br/>ANNUAL RATES OF CHANGE</b>  |        |        |        |        |        |           |        |        |        |        |
| Gross Domestic Product  | 1.6    | 2.5    | 3.9    | 3.2    | 3.3    | 2.0       | 2.6    | 3.0    | 3.2    | 3.3    |
| Final Sales   | 1.2    | 2.5    | 3.5    | 3.5    | 3.1    | 2.3       | 2.7    | 3.0    | 3.1    | 3.1    |
| Total Consumption   | 2.7    | 2.8    | 3.9    | 3.5    | 3.2    | 3.2       | 2.9    | 3.1    | 3.2    | 3.3    |
| Nonresidential Fixed Investment   | -9.2   | 1.0    | 5.9    | 6.8    | 7.2    | 3.4       | 3.9    | 4.0    | 4.0    | 4.3    |
| Structures  | -17.0  | -4.1   | 2.2    | 1.1    | 9.0    | 6.8       | 1.9    | 1.0    | 2.0    | 3.0    |
| Equipment & Software  | -6.2   | 2.8    | 7.3    | 8.9    | 6.5    | 1.6       | 4.8    | 5.0    | 5.5    | 6.0    |
| Residential Fixed Investment  | 4.9    | 8.4    | 9.9    | 8.6    | -4.2   | -15.1     | -3.0   | 3.0    | 5.0    | 8.0    |
| Exports   | -2.3   | 1.3    | 9.2    | 6.8    | 8.9    | 6.3       | 9.2    | 9.0    | 8.1    | 7.0    |
| Imports   | 3.4    | 4.1    | 10.8   | 6.1    | 5.8    | 2.3       | 4.1    | 5.7    | 5.8    | 5.6    |
| Federal Government  | 7.0    | 6.8    | 4.3    | 1.5    | 2.0    | 1.9       | 1.8    | -0.2   | 0.4    | -0.4   |
| State & Local Governments   | 3.1    | 0.2    | 0.5    | 0.5    | 2.1    | 2.4       | 1.1    | 1.0    | 1.4    | 1.4    |

## Selected Yields

|                                 | Recent<br>(5/16/07) | 3 Months<br>Ago<br>(2/14/07) | Year<br>Ago<br>(5/18/06) |                                   | Recent<br>(5/16/07) | 3 Months<br>Ago<br>(2/14/07) | Year<br>Ago<br>(5/18/06) |
|---------------------------------|---------------------|------------------------------|--------------------------|-----------------------------------|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>                  |                     |                              |                          |                                   |                     |                              |                          |
| <b>Market Rates</b>             |                     |                              |                          | <b>Mortgage-Backed Securities</b> |                     |                              |                          |
| Discount Rate                   | 6.25                | 6.25                         | 6.00                     | GNMA 6.5%                         | 5.58                | 5.72                         | 6.01                     |
| Federal Funds                   | 5.25                | 5.25                         | 5.00                     | FHLMC 6.5% (Gold)                 | 5.80                | 5.82                         | 6.19                     |
| Prime Rate                      | 8.25                | 8.25                         | 8.00                     | FNMA 6.5%                         | 5.73                | 5.74                         | 6.15                     |
| 30-day CP (A1/P1)               | 5.24                | 5.23                         | 5.00                     | FNMA ARM                          | 5.49                | 5.62                         | 4.81                     |
| 3-month LIBOR                   | 5.36                | 5.36                         | 5.19                     | <b>Corporate Bonds</b>            |                     |                              |                          |
| <b>Bank CDs</b>                 |                     |                              |                          | Financial (10-year) A             | 5.69                | 5.52                         | 6.01                     |
| 6-month                         | 3.11                | 3.27                         | 3.06                     | Industrial (25/30-year) A         | 5.89                | 5.77                         | 6.28                     |
| 1-year                          | 3.73                | 3.86                         | 3.87                     | Utility (25/30-year) A            | 6.07                | 5.77                         | 6.28                     |
| 5-year                          | 3.91                | 3.91                         | 4.03                     | Utility (25/30-year) Baa/BBB      | 6.21                | 6.02                         | 6.59                     |
| <b>U.S. Treasury Securities</b> |                     |                              |                          | <b>Foreign Bonds (10-Year)</b>    |                     |                              |                          |
| 3-month                         | 4.73                | 5.15                         | 4.82                     | Canada                            | 4.24                | 4.15                         | 4.32                     |
| 6-month                         | 4.84                | 5.14                         | 4.96                     | Germany                           | 4.30                | 4.10                         | 4.03                     |
| 1-year                          | 4.85                | 5.10                         | 4.99                     | Japan                             | 1.67                | 1.74                         | 1.95                     |
| 5-year                          | 4.62                | 4.72                         | 4.94                     | United Kingdom                    | 5.13                | 4.95                         | 4.58                     |
| 10-year                         | 4.71                | 4.74                         | 5.06                     | <b>Preferred Stocks</b>           |                     |                              |                          |
| 10-year (inflation-protected)   | 2.37                | 2.39                         | 2.37                     | Utility A                         | 7.29                | 7.24                         | 7.25                     |
| 30-year                         | 4.88                | 4.83                         | 5.17                     | Financial A                       | 6.30                | 6.32                         | 6.37                     |
| 30-year Zero                    | 4.85                | 4.76                         | 5.06                     | Financial Adjustable A            | 5.52                | 5.51                         | 5.52                     |



### TAX-EXEMPT

|  |      |      |      |
|--|------|------|------|
| <b>Bond Buyer Indexes</b>                |      |      |      |
| 20-Bond Index (GOs)                      | 4.24 | 4.21 | 4.58 |
| 25-Bond Index (Revs)                     | 4.44 | 4.53 | 5.24 |
| <b>General Obligation Bonds (GOs)</b>    |      |      |      |
| 1-year Aaa                               | 3.60 | 3.60 | 3.62 |
| 1-year A                                 | 3.70 | 3.70 | 3.75 |
| 5-year Aaa                               | 3.63 | 3.63 | 3.67 |
| 5-year A                                 | 3.74 | 3.72 | 3.95 |
| 10-year Aaa                              | 3.76 | 3.78 | 4.10 |
| 10-year A                                | 4.26 | 4.30 | 4.42 |
| 25/30-year Aaa                           | 4.13 | 4.08 | 4.53 |
| 25/30-year A                             | 4.43 | 4.39 | 4.79 |
| <b>Revenue Bonds (Revs) (25/30-Year)</b> |      |      |      |
| Education AA                             | 4.55 | 4.49 | 4.65 |
| Electric AA                              | 4.45 | 4.48 | 4.66 |
| Housing AA                               | 4.63 | 4.54 | 4.70 |
| Hospital AA                              | 4.65 | 4.55 | 4.90 |
| Toll Road Aaa                            | 4.55 | 4.49 | 4.77 |

## Federal Reserve Data

### BANK RESERVES

(Two-Week Period; in Millions, Not Seasonally Adjusted)

|                            | Recent Levels |         |        | Average Levels Over the Last... |         |         |
|----------------------------|---------------|---------|--------|---------------------------------|---------|---------|
|                            | 5/9/07        | 4/25/07 | Change | 12 Wks.                         | 26 Wks. | 52 Wks. |
| Excess Reserves            | 1467          | 1334    | 133    | 1554                            | 1617    | 1655    |
| Borrowed Reserves          | 71            | 83      | -12    | 57                              | 122     | 206     |
| Net Free/Borrowed Reserves | 1396          | 1251    | 145    | 1497                            | 1495    | 1449    |

### MONEY SUPPLY

(One-Week Period; in Billions, Seasonally Adjusted)

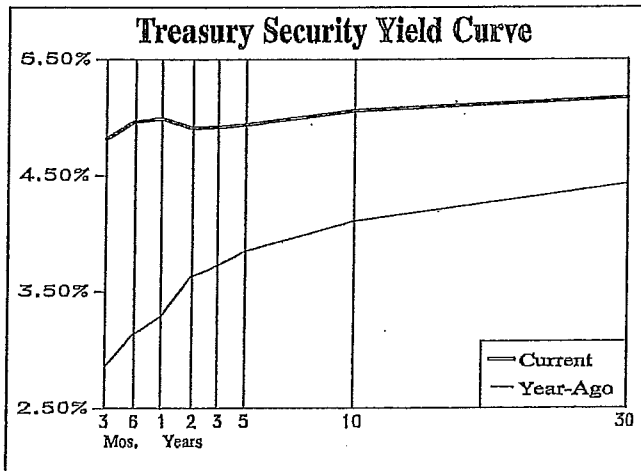
|                                     | Recent Levels |         |        | Growth Rates Over the Last... |        |         |
|-------------------------------------|---------------|---------|--------|-------------------------------|--------|---------|
|                                     | 4/30/07       | 4/23/07 | Change | 3 Mos.                        | 6 Mos. | 12 Mos. |
| M1 (Currency+demand deposits)       | 1383.3        | 1367.4  | 15.9   | 4.1%                          | 1.2%   | 0.8%    |
| M2 (M1+savings+small time deposits) | 7211.9        | 7237.3  | -25.4  | 6.6%                          | 7.5%   | 6.2%    |

## Value Line Forecast for the U.S. Economy

|   | ACTUAL |        |        |        |        | ESTIMATED |        |        |        |        |
|---|--------|--------|--------|--------|--------|-----------|--------|--------|--------|--------|
|   | 2001   | 2002   | 2003   | 2004   | 2005   | 2006      | 2007   | 2008   | 2009   | 2010   |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS<br/>(2000 CHAIN WEIGHTED \$) BILLIONS OF DOLLARS</b> |        |        |        |        |        |           |        |        |        |        |
| Final Sales   | 9921   | 10036  | 10304  | 10702  | 11113  | 11484     | 11804  | 12158  | 12547  | 12974  |
| Total Consumption   | 6910   | 7099   | 7306   | 7589   | 7857   | 8121      | 8360   | 8611   | 8878   | 9171   |
| Nonresidential Fixed Investment   | 1180   | 1072   | 1085   | 1187   | 1289   | 1413      | 1507   | 1583   | 1662   | 1778   |
| Structures  | 306    | 254    | 243    | 248    | 253    | 271       | 287    | 296    | 308    | 323    |
| Equipment & Software  | 874    | 820    | 847    | 948    | 1051   | 1160      | 1233   | 1295   | 1373   | 1483   |
| Residential Fixed Investment  | 448    | 470    | 509    | 562    | 602    | 603       | 562    | 551    | 557    | 573    |
| Exports   | 1037   | 1013   | 1031   | 1118   | 1195   | 1287      | 1401   | 1539   | 1683   | 1811   |
| Imports   | 1436   | 1485   | 1553   | 1719   | 1828   | 1953      | 2038   | 2111   | 2225   | 2348   |
| Federal Government  | 601    | 643    | 688    | 724    | 740    | 760       | 765    | 772    | 777    | 786    |
| State & Local Governments   | 1179   | 1216   | 1223   | 1228   | 1246   | 1254      | 1279   | 1296   | 1321   | 1339   |
| Gross Domestic Product  | 10128  | 10470  | 10971  | 11734  | 12487  | 13296     | 13935  | 14614  | 15369  | 16194  |
| Real GDP (2000 Chain Weighted \$)   | 9891   | 10049  | 10321  | 10756  | 11135  | 11520     | 11865  | 12233  | 12637  | 13079  |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>  |        |        |        |        |        |           |        |        |        |        |
| GDP Deflator  | 2.4    | 1.7    | 2.0    | 2.6    | 2.8    | 2.8       | 2.2    | 2.0    | 2.1    | 2.2    |
| CPI-All Urban Consumers   | 2.8    | 1.6    | 2.3    | 2.7    | 3.4    | 2.7       | 2.4    | 2.2    | 2.3    | 2.5    |
| PPI-Finished Goods  | 1.9    | -1.3   | 3.2    | 3.6    | 4.9    | 2.0       | 1.7    | 1.3    | 1.5    | 2.0    |
| Employment Cost Index—Total Comp.   | 4.1    | 3.8    | 4.0    | 3.9    | 3.1    | 3.2       | 3.4    | 3.3    | 3.4    | 3.5    |
| Productivity  | 2.2    | 4.3    | 3.8    | 3.4    | 2.7    | 2.4       | 1.8    | 2.0    | 2.3    | 2.5    |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>  |        |        |        |        |        |           |        |        |        |        |
| Industrial Prod. (% Change)   | -3.4   | -0.3   | 0.0    | 4.1    | 3.2    | 4.4       | 2.7    | 2.5    | 2.7    | 3.0    |
| Factory Operating Rate (%)  | 75.4   | 73.5   | 73.7   | 76.7   | 78.9   | 80.6      | 80.1   | 79.5   | 80.0   | 80.5   |
| Inventory Change (2000 Chain Weighted \$)   | -31.7  | 15.2   | 15.4   | 49.9   | 25.0   | 36.0      | 61.0   | 75.0   | 90.0   | 105.0  |
| Housing Starts (Mill. Units)  | 1.60   | 1.71   | 1.85   | 1.95   | 2.07   | 1.92      | 1.79   | 1.75   | 1.73   | 1.80   |
| Existing House Sales (Mill. Units)  | 5.29   | 5.65   | 6.17   | 6.72   | 7.06   | 6.54      | 6.05   | 6.00   | 6.05   | 6.10   |
| Total Light Vehicle Sales (Mill. Units)   | 17.1   | 16.8   | 16.6   | 16.9   | 16.9   | 16.5      | 16.4   | 16.7   | 17.0   | 17.5   |
| National Unemployment Rate (%)  | 4.8    | 5.8    | 6.0    | 5.5    | 5.1    | 4.7       | 4.9    | 4.8    | 4.7    | 4.8    |
| Federal Budget Surplus (Unified, FY, \$Bill)  | 127.3  | -157.8 | -377.0 | -413.0 | -318.0 | -310.0    | -260.0 | -315.0 | -295.0 | -280.0 |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)  | 22.95  | 24.00  | 28.60  | 36.91  | 50.31  | 61.50     | 60.00  | 56.35  | 50.75  | 45.00  |
| <b>MONEY AND INTEREST RATES</b>   |        |        |        |        |        |           |        |        |        |        |
| 3-Month Treasury Bill Rate (%)  | 3.4    | 1.6    | 1.0    | 1.4    | 3.1    | 4.8       | 4.8    | 4.6    | 4.7    | 4.8    |
| Federal Funds Rate (%)  | 3.9    | 1.7    | 1.1    | 1.4    | 3.2    | 5.0       | 5.0    | 4.8    | 5.0    | 5.2    |
| 10-Year Treasury Note Rate (%)  | 5.0    | 4.6    | 4.0    | 4.3    | 4.3    | 5.0       | 5.1    | 5.3    | 5.4    | 5.5    |
| Long-Term Treasury Bond Rate (%)  | 5.5    | 5.4    | 5.0    | 5.1    | 4.6    | 5.2       | 5.3    | 5.5    | 5.6    | 5.8    |
| AAA Corporate Bond Rate (%)   | 7.1    | 6.5    | 5.7    | 5.6    | 5.2    | 6.0       | 6.1    | 6.4    | 6.6    | 6.6    |
| Prime Rate (%)  | 6.9    | 4.7    | 4.1    | 4.3    | 6.2    | 8.0       | 8.0    | 7.8    | 7.9    | 8.0    |
| <b>INCOMES</b>  |        |        |        |        |        |           |        |        |        |        |
| Personal Income (% Change)  | 3.5    | 1.8    | 3.2    | 5.9    | 5.5    | 6.1       | 5.5    | 5.6    | 5.7    | 5.8    |
| Real Disp. Inc. (% Change)  | 1.9    | 3.1    | 2.4    | 3.4    | 1.5    | 3.5       | 3.7    | 3.7    | 3.8    | 3.8    |
| Personal Savings Rate (%)   | 1.8    | 2.4    | 2.1    | 1.7    | -0.4   | -0.5      | 0.3    | 0.8    | 1.0    | 1.2    |
| Corporate Economic Profits (\$Bill)   | 767.0  | 886.0  | 1032.0 | 1162.0 | 1352.0 | 1468.0    | 1527.0 | 1603.0 | 1715.0 | 1852.0 |
| Yr-to-Yr % Change   | -6.2   | 15.5   | 16.4   | 12.6   | 16.4   | 8.6       | 4.0    | 5.0    | 7.0    | 8.0    |
| <b>COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE</b>   |        |        |        |        |        |           |        |        |        |        |
| Gross Domestic Product  | 0.8    | 1.6    | 2.7    | 4.2    | 3.5    | 3.5       | 3.0    | 3.1    | 3.3    | 3.5    |
| Final Sales   | 1.6    | 1.2    | 2.7    | 3.9    | 3.8    | 3.3       | 2.8    | 3.0    | 3.2    | 3.4    |
| Total Consumption   | 2.5    | 2.7    | 2.9    | 3.9    | 3.5    | 3.4       | 2.9    | 3.0    | 3.1    | 3.3    |
| Nonresidential Fixed Investment   | -4.2   | -9.2   | 1.2    | 9.4    | 8.6    | 9.7       | 6.6    | 5.0    | 5.0    | 7.0    |
| Structures  | -2.2   | -17.0  | -4.3   | 2.2    | 2.0    | 7.0       | 6.1    | 3.0    | 4.0    | 5.0    |
| Equipment & Software  | -4.9   | -6.2   | 3.3    | 11.9   | 10.9   | 10.4      | 6.3    | 5.0    | 6.0    | 8.0    |
| Residential Fixed Investment  | 0.2    | 4.9    | 8.3    | 10.3   | 7.1    | 0.2       | -6.8   | -2.0   | 1.9    | 3.0    |
| Exports   | -5.4   | -2.3   | 1.8    | 8.4    | 6.9    | 7.7       | 8.8    | 9.9    | 9.3    | 7.6    |
| Imports   | -2.7   | 3.4    | 4.6    | 10.7   | 6.3    | 6.9       | 4.3    | 3.6    | 5.4    | 5.5    |
| Federal Government  | 3.8    | 7.0    | 7.0    | 5.2    | 2.3    | 2.8       | 0.6    | 0.9    | 0.7    | 1.1    |
| State & Local Governments   | 3.1    | 3.1    | 0.6    | 0.4    | 1.5    | 0.6       | 2.0    | 1.3    | 1.9    | 1.4    |

## Selected Yields

|                                 | Recent<br>(5/18/06) | 3 Months<br>Ago<br>(2/16/06) | Year<br>Ago<br>(5/19/05) |                                   | Recent<br>(5/18/06) | 3 Months<br>Ago<br>(2/16/06) | Year<br>Ago<br>(5/19/05) |
|---------------------------------|---------------------|------------------------------|--------------------------|-----------------------------------|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>                  |                     |                              |                          |                                   |                     |                              |                          |
| <b>Market Rates</b>             |                     |                              |                          | <b>Mortgage-Backed Securities</b> |                     |                              |                          |
| Discount Rate                   | 6.00                | 5.50                         | 4.00                     | GNMA 6.5%                         | 6.01                | 5.33                         | 4.96                     |
| Federal Funds                   | 5.00                | 4.50                         | 3.00                     | FHLMC 6.5% (Gold)                 | 6.19                | 5.88                         | 5.09                     |
| Prime Rate                      | 8.00                | 7.50                         | 6.00                     | FNMA 6.5%                         | 6.15                | 5.74                         | 4.86                     |
| 30-day CP (A1/P1)               | 5.00                | 4.49                         | 3.02                     | FNMA ARM                          | 4.81                | 4.47                         | 3.48                     |
| 3-month LIBOR                   | 5.19                | 4.77                         | 3.28                     | <b>Corporate Bonds</b>            |                     |                              |                          |
| <b>Bank CDs</b>                 |                     |                              |                          | Financial (10-year) A             | 6.01                | 5.50                         | 4.89                     |
| 6-month                         | 3.06                | 2.89                         | 2.26                     | Industrial (25/30-year) A         | 6.28                | 5.68                         | 5.36                     |
| 1-year                          | 3.87                | 3.46                         | 2.77                     | Utility (25/30-year) A            | 6.28                | 5.63                         | 5.25                     |
| 5-year                          | 4.03                | 3.97                         | 3.80                     | Utility (25/30-year) Baa/BBB      | 6.59                | 5.98                         | 5.61                     |
| <b>U.S. Treasury Securities</b> |                     |                              |                          | <b>Foreign Bonds (10-Year)</b>    |                     |                              |                          |
| 3-month                         | 4.82                | 4.53                         | 2.86                     | Canada                            | 4.32                | 4.19                         | 4.09                     |
| 6-month                         | 4.96                | 4.68                         | 3.13                     | Germany                           | 4.03                | 3.51                         | 3.35                     |
| 1-year                          | 4.99                | 4.70                         | 3.29                     | Japan                             | 1.95                | 1.57                         | 1.27                     |
| 5-year                          | 4.94                | 4.58                         | 3.85                     | United Kingdom                    | 4.58                | 4.17                         | 4.37                     |
| 10-year                         | 5.06                | 4.58                         | 4.11                     | <b>Preferred Stocks</b>           |                     |                              |                          |
| 10-year (Inflation-protected)   | 2.37                | 2.08                         | 1.64                     | Utility A                         | 7.25                | 7.07                         | 6.96                     |
| 30-year                         | 5.17                | 4.57                         | 4.43                     | Financial A                       | 6.37                | 6.22                         | 5.94                     |
| 30-year Zero                    | 5.06                | 4.62                         | 4.45                     | Financial Adjustable A            | 5.52                | 5.52                         | 5.52                     |



| <b>TAX-EXEMPT</b>                        |      |      |      |  |  |  |  |
|--|------|------|------|--|--|--|--|
| <b>Bond Buyer Indexes</b>                |      |      |      |  |  |  |  |
| 20-Bond Index (GOs)                      | 4.58 | 4.42 | 4.25 |  |  |  |  |
| 25-Bond Index (Revs)                     | 5.24 | 5.14 | 4.81 |  |  |  |  |
| <b>General Obligation Bonds (GOs)</b>    |      |      |      |  |  |  |  |
| 1-year Aaa                               | 3.62 | 3.26 | 2.72 |  |  |  |  |
| 1-year A                                 | 3.75 | 3.38 | 2.89 |  |  |  |  |
| 5-year Aaa                               | 3.67 | 3.50 | 2.98 |  |  |  |  |
| 5-year A                                 | 3.95 | 3.78 | 3.28 |  |  |  |  |
| 10-year Aaa                              | 4.10 | 3.86 | 3.49 |  |  |  |  |
| 10-year A                                | 4.42 | 4.17 | 3.84 |  |  |  |  |
| 25/30-year Aaa                           | 4.53 | 4.36 | 4.30 |  |  |  |  |
| 25/30-year A                             | 4.79 | 4.61 | 4.54 |  |  |  |  |
| <b>Revenue Bonds (Revs) (25/30-Year)</b> |      |      |      |  |  |  |  |
| Education AA                             | 4.65 | 4.37 | 4.31 |  |  |  |  |
| Electric AA                              | 4.66 | 4.44 | 4.44 |  |  |  |  |
| Housing AA                               | 4.70 | 4.63 | 4.65 |  |  |  |  |
| Hospital AA                              | 4.90 | 4.79 | 4.48 |  |  |  |  |
| Toll Road Aaa                            | 4.77 | 4.63 | 4.44 |  |  |  |  |

## Federal Reserve Data

| <b>BANK RESERVES</b>   |               |         |        |                                 |         |         |  |
|--|---------------|---------|--------|---------------------------------|---------|---------|--|
| <i>(Two-Week Period; in Millions, Not Seasonally Adjusted)</i> |               |         |        |                                 |         |         |  |
|  | Recent Levels |         |        | Average Levels Over the Last... |         |         |  |
|  | 5/10/06       | 4/26/06 | Change | 12 Wks.                         | 26 Wks. | 52 Wks. |  |
| Excess Reserves  | 2145          | 1466    | 679    | 1678                            | 1694    | 1730    |  |
| Borrowed Reserves  | 156           | 103     | 53     | 160                             | 147     | 221     |  |
| Net Free/Borrowed Reserves                                     | 1989          | 1363    | 626    | 1518                            | 1547    | 1509    |  |

| <b>MONEY SUPPLY</b>  |               |        |        |                               |        |         |  |
|--|---------------|--------|--------|-------------------------------|--------|---------|--|
| <i>(One-Week Period; in Billions, Seasonally Adjusted)</i> |               |        |        |                               |        |         |  |
|  | Recent Levels |        |        | Growth Rates Over the Last... |        |         |  |
|  | 5/8/06        | 5/1/06 | Change | 3 Mos.                        | 6 Mos. | 12 Mos. |  |
| M1 (Currency+demand deposits)                              | 1382.8        | 1388.3 | -5.5   | -0.1%                         | 3.5%   | 1.2%    |  |
| M2 (M1+savings+small time deposits)                        | 6770.9        | 6794.8 | -23.9  | 2.2%                          | 4.2%   | 4.4%    |  |

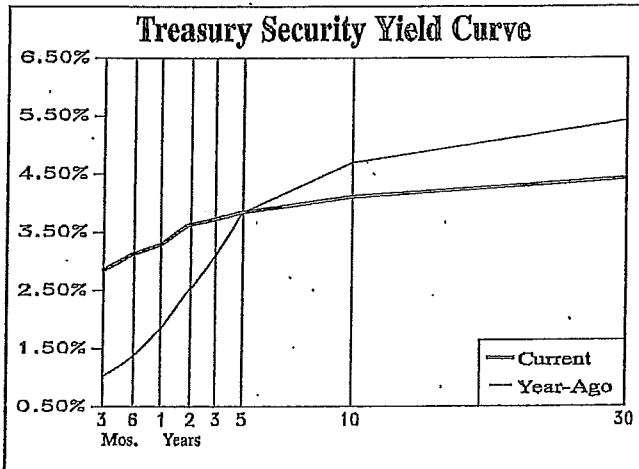


## Value Line Forecast for the U.S. Economy

|   | ACTUAL |       |        |        |        | ESTIMATED |        |        |        |        |
|---|--------|-------|--------|--------|--------|-----------|--------|--------|--------|--------|
|   | 2000   | 2001  | 2002   | 2003   | 2004   | 2005      | 2006   | 2007   | 2008   | 2009   |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS</b>      |        |       |        |        |        |           |        |        |        |        |
| <b>(2000 CHAIN WEIGHTED \$) BILLIONS OF DOLLARS</b>   |        |       |        |        |        |           |        |        |        |        |
| Final Sales   | 9760   | 9921  | 10063  | 10380  | 10795  | 11153     | 11513  | 11881  | 12273  | 12691  |
| Total Consumption                                     | 6739   | 6910  | 7123   | 7356   | 7632   | 7894      | 8110   | 8353   | 8604   | 8862   |
| Nonresidential Fixed Investment                       | 1232   | 1180  | 1076   | 1111   | 1229   | 1344      | 1447   | 1534   | 1641   | 1772   |
| Structures  | 313    | 306   | 252    | 237    | 241    | 246       | 270    | 280    | 294    | 312    |
| Equipment & Software                                  | 919    | 874   | 826    | 879    | 999    | 1112      | 1190   | 1249   | 1324   | 1404   |
| Residential Fixed Investment                          | 447    | 448   | 470    | 511    | 561    | 591       | 578    | 566    | 578    | 607    |
| Exports   | 1096   | 1037  | 1012   | 1032   | 1120   | 1191      | 1282   | 1412   | 1547   | 1676   |
| Imports   | 1476   | 1436  | 1484   | 1550   | 1704   | 1837      | 1901   | 1989   | 2098   | 2205   |
| Federal Government                                    | 579    | 601   | 647    | 690    | 722    | 744       | 760    | 766    | 772    | 778    |
| State & Local Governments                             | 1143   | 1179  | 1211   | 1220   | 1225   | 1237      | 1268   | 1293   | 1314   | 1335   |
| Gross Domestic Product                                | 9817   | 10128 | 10487  | 11004  | 11735  | 12443     | 13103  | 13789  | 14578  | 15437  |
| Real GDP (2000 Chain Weighted \$)                     | 9817   | 9891  | 10075  | 10381  | 10842  | 11210     | 11558  | 11917  | 12310  | 12741  |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>        |        |       |        |        |        |           |        |        |        |        |
| GDP Deflator  | 2.2    | 2.4   | 1.7    | 1.8    | 2.2    | 2.6       | 2.1    | 2.1    | 2.2    | 2.3    |
| CPI-All Urban Consumers                               | 3.4    | 2.8   | 1.6    | 2.3    | 2.7    | 2.8       | 2.5    | 2.3    | 2.4    | 2.5    |
| PPI-Finished Goods                                    | 3.7    | 2.0   | -1.3   | 3.2    | 3.6    | 3.2       | 2.4    | 2.0    | 2.1    | 2.2    |
| Employment Cost Index—Total Comp.                     | 4.6    | 4.1   | 3.8    | 4.0    | 3.9    | 3.3       | 4.0    | 4.0    | 4.0    | 4.0    |
| Productivity  | 2.7    | 2.2   | 4.9    | 4.5    | 4.0    | 1.8       | 1.8    | 2.3    | 2.4    | 2.6    |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>              |        |       |        |        |        |           |        |        |        |        |
| Industrial Prod. (% Change)                           | 4.4    | -3.4  | -0.6   | 0.0    | 4.1    | 2.9       | 2.4    | 3.0    | 3.2    | 3.3    |
| Factory Operating Rate (%)                            | 81.1   | 75.4  | 73.9   | 73.7   | 76.7   | 78.2      | 78.4   | 79.0   | 79.5   | 80.0   |
| Inventory Change (2000 Chain Weighted \$)             | 56.5   | -31.7 | 11.8   | -0.7   | 42.4   | 57.0      | 45.0   | 35.0   | 36.0   | 50.0   |
| Housing Starts (Mill. Units)                          | 1.57   | 1.60  | 1.71   | 1.85   | 1.95   | 2.10      | 1.86   | 1.80   | 1.77   | 1.80   |
| Existing House Sales (Mill. Units)                    | 5.16   | 5.29  | 5.59   | 6.10   | 6.72   | 6.71      | 6.36   | 6.10   | 5.90   | 6.00   |
| Total Light Vehicle Sales (Mill. Units)               | 17.4   | 17.1  | 16.8   | 16.6   | 16.8   | 16.8      | 17.0   | 17.3   | 17.5   | 17.7   |
| National Unemployment Rate (%)                        | 4.0    | 4.8   | 5.8    | 6.0    | 5.5    | 5.2       | 5.2    | 5.2    | 5.2    | 5.2    |
| Federal Budget Surplus (Unified, FY, \$Bill)          | 236.9  | 127.3 | -157.8 | -377.0 | -413.0 | -370.0    | -335.0 | -325.0 | -325.0 | -300.0 |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)            | 28.21  | 22.95 | 24.00  | 28.60  | 36.91  | 44.35     | 44.00  | 42.00  | 41.00  | 40.00  |
| <b>MONEY AND INTEREST RATES</b>                       |        |       |        |        |        |           |        |        |        |        |
| 3-Month Treasury Bill Rate (%)                        | 5.8    | 3.4   | 1.6    | 1.0    | 1.4    | 3.2       | 3.8    | 3.9    | 4.1    | 4.2    |
| Federal Funds Rate (%)                                | 6.2    | 3.9   | 1.7    | 1.1    | 1.4    | 3.2       | 4.0    | 4.2    | 4.5    | 4.7    |
| 10-Year Treasury Note Rate (%)                        | 6.0    | 5.0   | 4.6    | 4.0    | 4.3    | 4.5       | 4.8    | 5.4    | 5.5    | 5.7    |
| Long-Term Treasury Bond Rate (%)                      | 5.9    | 5.5   | 5.4    | 5.0    | 5.1    | 4.8       | 5.3    | 5.9    | 6.0    | 6.2    |
| AAA Corporate Bond Rate (%)                           | 7.6    | 7.1   | 6.5    | 5.7    | 5.6    | 5.4       | 5.8    | 6.5    | 6.6    | 6.8    |
| Prime Rate (%)  | 9.2    | 6.9   | 4.7    | 4.1    | 4.3    | 6.1       | 7.0    | 7.2    | 7.5    | 7.8    |
| <b>INCOMES</b>  |        |       |        |        |        |           |        |        |        |        |
| Personal Income (% Change)                            | 8.0    | 3.5   | 1.8    | 3.2    | 5.6    | 4.6       | 5.3    | 5.3    | 5.6    | 5.8    |
| Real Disp. Inc. (% Change)                            | 4.8    | 1.9   | 3.1    | 2.3    | 3.5    | 1.6       | 3.3    | 3.4    | 3.5    | 3.5    |
| Personal Savings Rate (%)                             | 2.4    | 1.8   | 2.0    | 1.4    | 1.2    | 0.3       | 0.8    | 1.0    | 1.5    | 1.5    |
| Corporate Economic Profits (\$Bill)                   | 818.0  | 767.0 | 875.0  | 1021.0 | 1182.0 | 1327.0    | 1384.0 | 1453.0 | 1555.0 | 1679.0 |
| Yr-to-Yr % Change                                     | -3.9   | -6.2  | 14.0   | 16.8   | 15.7   | 12.3      | 4.3    | 5.0    | 7.0    | 8.0    |
| <b>COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE</b> |        |       |        |        |        |           |        |        |        |        |
| Gross Domestic Product                                | 3.7    | 0.8   | 1.9    | 3.0    | 4.4    | 3.4       | 3.1    | 3.1    | 3.3    | 3.5    |
| Final Sales   | 3.8    | 1.6   | 1.4    | 3.2    | 4.0    | 3.3       | 3.2    | 3.2    | 3.3    | 3.4    |
| Total Consumption                                     | 4.7    | 2.5   | 3.1    | 3.3    | 3.8    | 3.4       | 2.7    | 3.0    | 3.0    | 3.0    |
| Nonresidential Fixed Investment                       | 8.7    | -4.2  | -8.8   | 3.3    | 10.6   | 9.3       | 7.7    | 6.0    | 7.0    | 8.0    |
| Structures  | 6.8    | -2.2  | -17.6  | -5.6   | 1.4    | 2.2       | 9.5    | 4.0    | 5.0    | 6.0    |
| Equipment & Software                                  | 9.4    | -4.9  | -5.5   | 6.4    | 13.6   | 11.3      | 7.0    | 5.0    | 6.0    | 6.0    |
| Residential Fixed Investment                          | 0.7    | 0.2   | 4.9    | 8.7    | 9.7    | 5.3       | -2.2   | -2.0   | 2.0    | 5.0    |
| Exports   | 8.7    | -5.4  | -2.4   | 2.0    | 8.6    | 6.4       | 7.6    | 10.1   | 9.6    | 8.3    |
| Imports   | 13.2   | -2.7  | 3.3    | 4.4    | 9.9    | 7.8       | 3.5    | 4.6    | 5.5    | 5.1    |
| Federal Government                                    | 0.9    | 3.8   | 7.7    | 6.6    | 4.7    | 3.1       | 2.0    | 0.8    | 0.8    | 0.8    |
| State & Local Governments                             | 2.7    | 3.1   | 2.7    | 0.7    | 0.4    | 1.0       | 2.5    | 2.0    | 1.6    | 1.6    |

## Selected Yields

|                                 | Recent<br>(5/19/05) | 3 Months<br>Ago<br>(2/17/05) | Year<br>Ago<br>(5/20/04) |                                   | Recent<br>(5/19/05) | 3 Months<br>Ago<br>(2/17/05) | Year<br>Ago<br>(5/20/04) |
|---------------------------------|---------------------|------------------------------|--------------------------|-----------------------------------|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>                  |                     |                              |                          |                                   |                     |                              |                          |
| <b>Market Rates</b>             |                     |                              |                          | <b>Mortgage-Backed Securities</b> |                     |                              |                          |
| Discount Rate                   | 4.00                | 3.50                         | 2.00                     | GNMA 6.5%                         | 4.96                | 4.35                         | 5.38                     |
| Fed Funds (Target)              | 3.00                | 2.50                         | 1.00                     | FHLMC 6.5% (Gold)                 | 5.09                | 4.42                         | 5.48                     |
| Prime Rate                      | 6.00                | 5.50                         | 4.00                     | FNMA 6.5%                         | 4.86                | 4.34                         | 5.40                     |
| 30-day CP (A1/P1)               | 3.02                | 2.51                         | 1.02                     | FNMA ARM                          | 3.48                | 3.22                         | 2.78                     |
| 3-month LIBOR                   | 3.28                | 2.85                         | 1.28                     | <b>Corporate Bonds</b>            |                     |                              |                          |
| <b>Bank CDs</b>                 |                     |                              |                          | Financial (10-year) A             | 4.89                | 4.91                         | 5.60                     |
| 6-month                         | 2.26                | 1.79                         | 0.75                     | Industrial (25/30-year) A         | 5.36                | 5.30                         | 6.27                     |
| 1-year                          | 2.77                | 2.22                         | 1.11                     | Utility (25/30-year) A            | 5.25                | 5.17                         | 6.17                     |
| 5-year                          | 3.80                | 3.51                         | 3.33                     | Utility (25/30-year) Baa/BBB      | 5.61                | 5.64                         | 6.66                     |
| <b>U.S. Treasury Securities</b> |                     |                              |                          | <b>Foreign Bonds (10-Year)</b>    |                     |                              |                          |
| 3-month                         | 2.86                | 2.57                         | 1.02                     | Canada                            | 4.09                | 4.20                         | 4.83                     |
| 6-month                         | 3.13                | 2.84                         | 1.35                     | Germany                           | 3.35                | 3.57                         | 4.33                     |
| 1-year                          | 3.29                | 3.05                         | 1.85                     | Japan                             | 1.27                | 1.41                         | 1.48                     |
| 5-year                          | 3.85                | 3.77                         | 3.84                     | United Kingdom                    | 4.37                | 4.63                         | 5.16                     |
| 10-year                         | 4.11                | 4.18                         | 4.70                     | <b>Preferred Stocks</b>           |                     |                              |                          |
| 10-year (inflation-protected)   | 1.64                | 1.60                         | N/A                      | Utility A                         | 6.96                | 6.85                         | 6.83                     |
| 30-year                         | 4.43                | 4.57                         | 5.42                     | Financial A                       | 5.94                | 5.98                         | 6.38                     |
| 30-year Zero                    | 4.45                | 4.63                         | 5.53                     | Financial Adjustable A            | 5.52                | 5.33                         | 5.52                     |



### TAX-EXEMPT

|  |      |      |      |
|--|------|------|------|
| <b>Bond Buyer Indexes</b>                |      |      |      |
| 20-Bond Index (GOs)                      | 4.25 | 4.35 | 5.13 |
| 25-Bond Index (Revs)                     | 4.81 | 4.88 | 5.44 |
| <b>General Obligation Bonds (GOs)</b>    |      |      |      |
| 1-year Aaa                               | 2.72 | 2.25 | 1.52 |
| 1-year A                                 | 2.89 | 2.42 | 1.67 |
| 5-year Aaa                               | 2.98 | 2.87 | 3.25 |
| 5-year A                                 | 3.28 | 3.15 | 3.56 |
| 10-year Aaa                              | 3.49 | 3.51 | 4.11 |
| 10-year A                                | 3.84 | 3.82 | 4.46 |
| 25/30-year Aaa                           | 4.30 | 4.40 | 5.09 |
| 25/30-year A                             | 4.54 | 4.61 | 5.34 |
| <b>Revenue Bonds (Revs) (25/30-Year)</b> |      |      |      |
| Education AA                             | 4.31 | 4.44 | 5.29 |
| Electric AA                              | 4.44 | 4.45 | 5.23 |
| Housing AA                               | 4.65 | 4.63 | 5.40 |
| Hospital AA                              | 4.48 | 4.68 | 5.65 |
| Toll Road Aaa                            | 4.44 | 4.54 | 5.33 |

## Federal Reserve Data

### BANK RESERVES

(Two-Week Period; in Millions, Not Seasonally Adjusted)

|                            | Recent Levels |         |        | Average Levels Over the Last... |         |         |
|----------------------------|---------------|---------|--------|---------------------------------|---------|---------|
|                            | 5/11/05       | 4/27/05 | Change | 12 Wks.                         | 26 Wks. | 52 Wks. |
| Excess Reserves            | 1376          | 1631    | -255   | 1645                            | 1726    | 1689    |
| Borrowed Reserves          | 123           | 94      | 29     | 80                              | 91      | 149     |
| Net Free/Borrowed Reserves | 1253          | 1537    | -284   | 1565                            | 1635    | 1540    |

### MONEY SUPPLY

(One-Week Period; in Billions, Seasonally Adjusted)

|                                     | Recent Levels |        |        | Growth Rates Over the Last... |        |         |
|-------------------------------------|---------------|--------|--------|-------------------------------|--------|---------|
|                                     | 5/9/05        | 5/2/05 | Change | 3 Mos.                        | 6 Mos. | 12 Mos. |
| M1 (Currency+demand deposits)       | 1359.9        | 1358.3 | 1.6    | -0.1%                         | 0.8%   | 2.6%    |
| M2 (M1+savings+small time deposits) | 6466.7        | 6478.8 | -12.1  | -0.1%                         | 2.5%   | 3.3%    |
| M3 (M2+large time deposits)         | 9584.6        | 9590.3 | -5.7   | 3.4%                          | 4.1%   | 3.8%    |

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VALUE LINE SELECTION & OPINION

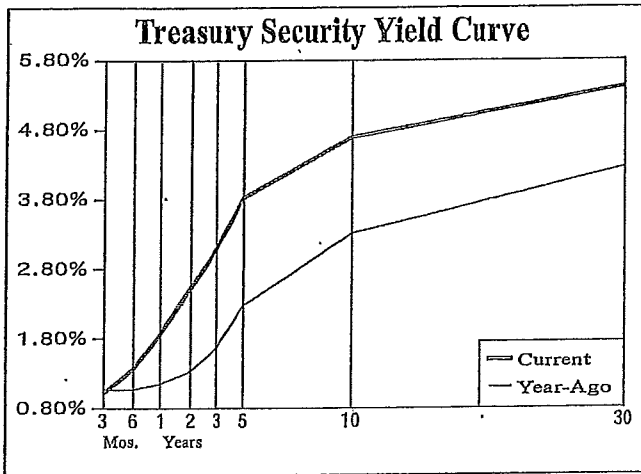
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## Value Line Forecast for the U.S. Economy

|  | ACTUAL |       |       |        |        | ESTIMATED |        |        |        |        |
|--|--------|-------|-------|--------|--------|-----------|--------|--------|--------|--------|
|  | 1999   | 2000  | 2001  | 2002   | 2003   | 2004      | 2005   | 2006   | 2007   | 2008   |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS</b><br>(2000 CHAIN WEIGHTED \$) BILLIONS OF DOLLARS |        |       |       |        |        |           |        |        |        |        |
| Final Sales  | 9404   | 9760  | 9901  | 10077  | 10395  | 10847     | 11237  | 11630  | 12014  | 12434  |
| Total Consumption  | 6439   | 6739  | 6905  | 7140   | 7365   | 7659      | 7881   | 8118   | 8361   | 8612   |
| Nonresidential Fixed Investment  | 1133   | 1232  | 1177  | 1093   | 1126   | 1239      | 1352   | 1460   | 1562   | 1671   |
| Construction   | 293    | 313   | 305   | 249    | 238    | 235       | 248    | 263    | 279    | 298    |
| Equipment & Software   | 840    | 919   | 871   | 847    | 894    | 1002      | 1085   | 1161   | 1248   | 1348   |
| Residential Fixed Investment   | 444    | 447   | 448   | 470    | 505    | 530       | 509    | 499    | 504    | 524    |
| Exports  | 1008   | 1096  | 1039  | 1014   | 1035   | 1143      | 1282   | 1410   | 1537   | 1660   |
| Imports  | 1304   | 1476  | 1437  | 1485   | 1544   | 1658      | 1748   | 1844   | 1946   | 2024   |
| Federal Government   | 574    | 579   | 600   | 648    | 704    | 747       | 757    | 761    | 765    | 768    |
| State & Local Governments  | 1113   | 1143  | 1168  | 1189   | 1195   | 1199      | 1234   | 1259   | 1284   | 1303   |
| Gross Domestic Product   | 9268   | 9817  | 10101 | 10481  | 10988  | 11709     | 12327  | 12970  | 13680  | 14478  |
| Real GDP (2000 Chain Weighted \$)  | 9470   | 9817  | 9867  | 10083  | 10398  | 10874     | 11271  | 11677  | 12085  | 12532  |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>   |        |       |       |        |        |           |        |        |        |        |
| GDP Deflator   | 1.4    | 2.2   | 2.4   | 1.5    | 1.7    | 2.1       | 1.6    | 1.7    | 1.8    | 2.0    |
| CPI-All Urban Consumers  | 2.2    | 3.4   | 2.8   | 1.6    | 2.3    | 2.8       | 2.1    | 2.3    | 2.4    | 2.5    |
| PPI-Finished Goods   | 1.8    | 3.7   | 2.0   | -1.3   | 3.2    | 2.8       | 1.5    | 1.3    | 1.5    | 1.8    |
| Employment Cost Index—Total  | 3.2    | 4.6   | 4.1   | 3.8    | 4.0    | 3.6       | 3.6    | 3.5    | 3.7    | 4.0    |
| Productivity   | 2.8    | 2.7   | 2.2   | 4.9    | 4.4    | 3.0       | 2.0    | 2.1    | 2.3    | 2.5    |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>   |        |       |       |        |        |           |        |        |        |        |
| Industrial Prod. (% Change)  | 4.4    | 4.4   | -3.4  | -0.6   | 0.3    | 5.7       | 4.9    | 4.5    | 4.0    | 4.5    |
| Factory Operating Rate (%)   | 81.4   | 81.1  | 75.4  | 73.9   | 73.4   | 76.5      | 78.5   | 79.0   | 79.5   | 80.0   |
| Nonfarm Inven. Chg. (2000 Chain Weighted \$)   | 71.5   | 57.8  | -36.3 | 9.3    | 0.5    | 30.0      | 48.8   | 45.0   | 40.0   | 40.0   |
| Housing Starts (Mill. Units)   | 1.65   | 1.57  | 1.60  | 1.71   | 1.85   | 1.92      | 1.75   | 1.65   | 1.68   | 1.70   |
| Existing House Sales (Mill. Units)   | 5.19   | 5.16  | 5.29  | 5.60   | 6.10   | 6.16      | 5.83   | 5.70   | 5.75   | 5.80   |
| Total Light Vehicle Sales (Mill. Units)  | 16.9   | 17.4  | 17.1  | 16.8   | 16.6   | 17.1      | 17.5   | 17.3   | 17.4   | 17.5   |
| National Unemployment Rate (%)   | 4.2    | 4.0   | 4.8   | 5.8    | 6.0    | 5.5       | 5.5    | 5.4    | 5.3    | 5.3    |
| Federal Budget Surplus (Unified, FY, \$Bill)   | 124.4  | 236.9 | 127.3 | -158.5 | -374.2 | -475.0    | -350.0 | -275.0 | -250.0 | -275.0 |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)   | 17.42  | 28.21 | 22.95 | 24.00  | 28.60  | 36.10     | 33.00  | 30.50  | 28.75  | 27.75  |
| <b>MONEY AND INTEREST RATES</b>  |        |       |       |        |        |           |        |        |        |        |
| 3-Month Treasury Bill Rate (%)   | 4.6    | 5.8   | 3.4   | 1.6    | 1.0    | 7.1       | 2.1    | 2.5    | 2.7    | 3.0    |
| Federal Funds Rate (%)   | 5.0    | 6.2   | 3.9   | 1.7    | 1.1    | 1.3       | 2.4    | 3.0    | 3.2    | 3.5    |
| 10-Year Treasury Note Rate (%)   | 5.6    | 6.0   | 5.0   | 4.6    | 4.0    | 4.6       | 5.3    | 5.4    | 5.6    | 5.7    |
| Long-Term Treasury Bond Rate (%)   | 5.9    | 5.9   | 5.5   | 5.4    | 5.0    | 5.4       | 5.9    | 6.0    | 6.2    | 6.3    |
| AAA Corporate Bond Rate (%)  | 7.0    | 7.6   | 7.1   | 6.5    | 5.7    | 6.0       | 6.5    | 6.5    | 6.6    | 6.8    |
| Prime Rate (%)   | 8.0    | 9.2   | 6.9   | 4.7    | 4.1    | 4.3       | 5.3    | 6.0    | 6.3    | 6.5    |
| <b>INCOMES</b>   |        |       |       |        |        |           |        |        |        |        |
| Personal Income (% Change)   | 5.1    | 8.0   | 3.4   | 2.3    | 3.3    | 5.2       | 4.6    | 5.5    | 5.5    | 5.5    |
| Real Disp. Inc. (% Change)   | 3.0    | 4.8   | 1.8   | 3.8    | 2.6    | 3.1       | 2.6    | 3.2    | 3.0    | 3.0    |
| Personal Savings Rate (%)  | 2.4    | 2.4   | 1.7   | 2.3    | 2.1    | 1.5       | 1.5    | 2.0    | 2.3    | 2.5    |
| Pretax Corporate Profits (\$Bill)  | 776.0  | 773.0 | 694.0 | 665.0  | 856.0  | 1105.0    | 1286.0 | 1389.0 | 1514.0 | 1665.0 |
| Aftertax Corporate Profits (\$Bill)  | 517.0  | 508.0 | 496.0 | 550.0  | 632.0  | 739.0     | 836.0  | 903.0  | 984.0  | 1082.0 |
| Yr-to-Yr % Change  | 10.1   | -1.7  | -2.5  | 11.0   | 14.8   | 17.1      | 13.1   | 8.0    | 9.0    | 10.0   |
| <b>COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE</b>  |        |       |       |        |        |           |        |        |        |        |
| Gross Domestic Product   | 4.4    | 3.7   | 0.5   | -2.2   | 3.1    | 4.6       | 3.7    | 3.6    | 3.5    | 3.7    |
| Final Sales  | 4.5    | 3.8   | 1.4   | 1.8    | 3.2    | 4.3       | 3.6    | 3.5    | 3.3    | 3.5    |
| Total Consumption  | 5.1    | 4.7   | 2.5   | 3.4    | 3.2    | 4.0       | 2.9    | 3.0    | 3.0    | 3.0    |
| Nonresidential Fixed Investment  | 9.2    | 8.7   | -4.5  | -7.1   | 3.0    | 10.1      | 9.0    | 8.0    | 7.0    | 7.0    |
| Construction   | -0.4   | 6.8   | -2.6  | -18.4  | -4.6   | -1.2      | 5.5    | 6.0    | 6.0    | 7.0    |
| Equipment & Software   | 12.7   | 9.4   | -5.2  | -2.8   | 5.5    | 12.1      | 8.3    | 7.0    | 7.5    | 8.0    |
| Residential Fixed Investment   | 6.0    | 0.7   | 0.2   | 4.9    | 7.5    | 4.9       | -3.9   | -2.0   | 1.0    | 4.0    |
| Exports  | 4.3    | 8.7   | -5.2  | -2.4   | 2.0    | 10.4      | 12.2   | 10.0   | 9.0    | 8.0    |
| Imports  | 11.5   | 13.2  | -2.6  | 3.3    | 4.0    | 7.4       | 5.5    | 5.5    | 5.5    | 4.0    |
| Federal Government   | 2.2    | 0.9   | 3.6   | 8.0    | 8.7    | 6.1       | 1.4    | 0.5    | 0.5    | 0.5    |
| State & Local Governments  | 4.7    | 2.7   | 2.2   | 1.8    | 0.5    | 0.3       | 2.9    | 2.0    | 2.0    | 1.5    |

## Selected Yields

|                                 | Recent<br>(5/20/04) | 3 Months<br>Ago<br>(2/19/04) | Year<br>Ago<br>(5/22/03) |                              | Recent<br>(5/20/04) | 3 Months<br>Ago<br>(2/19/04) | Year<br>Ago<br>(5/22/03) |
|---------------------------------|---------------------|------------------------------|--------------------------|------------------------------|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>                  |                     |                              |                          |                              |                     |                              |                          |
| <b>Market Rates</b>             |                     |                              |                          |                              |                     |                              |                          |
| Discount Rate                   | 2.00                | 2.00                         | 2.25                     | Mortgage-Backed Securities   |                     |                              |                          |
| Federal Funds                   | 1.00                | 1.00                         | 1.25                     | GNMA 6.5%                    | 5.38                | 3.42                         | 3.46                     |
| Prime Rate                      | 4.00                | 4.00                         | 4.25                     | FHLMC 6.5% (Gold)            | 5.48                | 3.49                         | 2.98                     |
| 30-day CP (A1/P1)               | 1.02                | 1.01                         | 1.23                     | FNMA 6.5%                    | 5.40                | 3.41                         | 2.79                     |
| 3-month LIBOR                   | 1.28                | 1.12                         | 1.28                     | FNMA ARM                     | 2.78                | 2.86                         | 2.97                     |
| <b>Bank CDs</b>                 |                     |                              |                          |                              |                     |                              |                          |
| 6-month                         | 0.75                | 0.72                         | 0.85                     | Corporate Bonds              |                     |                              |                          |
| 1-year                          | 1.11                | 0.92                         | 0.95                     | Financial (10-year) A        | 5.60                | 4.98                         | 4.40                     |
| 5-year                          | 3.33                | 2.93                         | 2.74                     | Industrial (25/30-year) A    | 6.27                | 5.57                         | 5.22                     |
| <b>U.S. Treasury Securities</b> |                     |                              |                          |                              |                     |                              |                          |
| 3-month                         | 1.02                | 0.93                         | 1.07                     | Utility (25/30-year) A       | 6.17                | 5.60                         | 5.48                     |
| 6-month                         | 1.35                | 0.99                         | 1.07                     | Utility (25/30-year) Baa/BBB | 6.66                | 6.04                         | 6.16                     |
| 1-year                          | 1.85                | 1.23                         | 1.15                     | Foreign Bonds (10-Year)      |                     |                              |                          |
| 5-year                          | 3.84                | 3.00                         | 2.29                     | Canada                       | 4.83                | 4.46                         | 4.67                     |
| 10-year                         | 4.70                | 4.03                         | 3.31                     | Germany                      | 4.33                | 4.12                         | 3.70                     |
| 30-year                         | 5.42                | 4.89                         | 4.26                     | Japan                        | 1.48                | 1.22                         | 0.57                     |
| 30-year Zero                    | 5.53                | 5.08                         | 4.53                     | United Kingdom               | 5.16                | 4.85                         | 4.03                     |
|                                 |                     |                              |                          | Preferred Stocks             |                     |                              |                          |
|                                 |                     |                              |                          | Utility A                    | 6.83                | 6.82                         | 6.83                     |
|                                 |                     |                              |                          | Financial A                  | 6.38                | 5.72                         | 5.90                     |
|                                 |                     |                              |                          | Financial Adjustable A       | 5.52                | 5.46                         | 5.01                     |



### TAX-EXEMPT

|  |      |      |      |
|--|------|------|------|
| <b>Bond Buyer Indexes</b>                |      |      |      |
| 20-Bond Index (GOs)                      | 5.13 | 4.50 | 4.30 |
| 25-Bond Index (Revs)                     | 5.44 | 4.83 | 4.82 |
| <b>General Obligation Bonds (GOs)</b>    |      |      |      |
| 1-year Aaa                               | 1.52 | 1.03 | 0.98 |
| 1-year A                                 | 1.67 | 1.20 | 1.20 |
| 5-year Aaa                               | 3.25 | 2.24 | 2.05 |
| 5-year A                                 | 3.56 | 2.55 | 2.40 |
| 10-year Aaa                              | 4.11 | 3.33 | 3.08 |
| 10-year A                                | 4.46 | 3.67 | 3.47 |
| 25/30-year Aaa                           | 5.09 | 4.47 | 4.31 |
| 25/30-year A                             | 5.34 | 4.75 | 4.61 |
| <b>Revenue Bonds (Revs) (25/30-Year)</b> |      |      |      |
| Education AA                             | 5.29 | 4.56 | 4.35 |
| Electric AA                              | 5.23 | 4.55 | 4.34 |
| Housing AA                               | 5.40 | 4.70 | 4.50 |
| Hospital AA                              | 5.65 | 4.90 | 4.74 |
| Toll Road Aaa                            | 5.33 | 4.63 | 4.50 |

## Federal Reserve Data

### BANK RESERVES

(Two-Week Period; in Millions, Not Seasonally Adjusted)

|                            | Recent Levels |         |        | Average Levels Over the Last... |         |         |
|----------------------------|---------------|---------|--------|---------------------------------|---------|---------|
|                            | 5/12/04       | 4/28/04 | Change | 12 Wks.                         | 26 Wks. | 52 Wks. |
| Excess Reserves            | 1518          | 1637    | -119   | 1782                            | 1682    | 1857    |
| Borrowed Reserves          | 99            | 91      | 8      | 63                              | 69      | 106     |
| Net Free/Borrowed Reserves | 1419          | 1546    | -127   | 1719                            | 1613    | 1751    |

### MONEY SUPPLY

(One-Week Period; in Billions, Seasonally Adjusted)

|                                     | Recent Levels |        |        | Growth Rates Over the Last... |        |         |
|-------------------------------------|---------------|--------|--------|-------------------------------|--------|---------|
|                                     | 5/10/04       | 5/3/04 | Change | 3 Mos.                        | 6 Mos. | 12 Mos. |
| M1 (Currency+demand deposits)       | 1299.8        | 1362.5 | -62.7  | 2.7%                          | 2.7%   | 4.0%    |
| M2 (M1+savings+small time deposits) | 6267.3        | 6274.8 | -7.5   | 11.5%                         | 6.3%   | 4.6%    |
| M3 (M2+large time deposits)         | 9172.8        | 9169.6 | 3.2    | 12.6%                         | 8.0%   | 5.3%    |

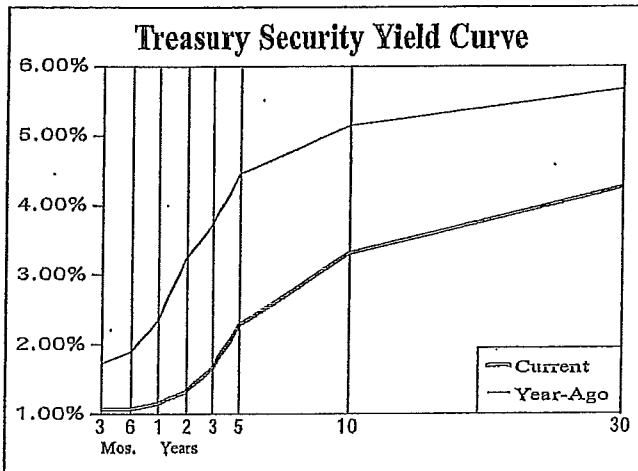


## Value Line Forecast for the U.S. Economy

|   | ACTUAL |       |       |       |        | ESTIMATED |        |        |        |        |
|---|--------|-------|-------|-------|--------|-----------|--------|--------|--------|--------|
|   | 1998   | 1999  | 2000  | 2001  | 2002   | 2003      | 2004   | 2005   | 2006   | 2007   |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS<br/>(1996 CHAIN WEIGHTED \$) BILLIONS OF DOLLARS</b> |        |       |       |       |        |           |        |        |        |        |
| Final Sales   | 8432   | 8794  | 9121  | 9258  | 9424   | 9639      | 9980   | 10329  | 10711  | 11118  |
| Total Consumption   | 5684   | 5965  | 6224  | 6377  | 6576   | 6729      | 6976   | 7220   | 7473   | 7742   |
| Nonresidential Fixed Investment   | 1136   | 1228  | 1324  | 1255  | 1183   | 1192      | 1284   | 1400   | 1498   | 1588   |
| Construction  | 262    | 259   | 276   | 271   | 226    | 213       | 222    | 242    | 254    | 264    |
| Equipment & Software  | 875    | 976   | 1056  | 988   | 971    | 1000      | 1093   | 1180   | 1263   | 1364   |
| Residential Fixed Investment  | 345    | 368   | 372   | 374   | 388    | 401       | 390    | 394    | 400    | 408    |
| Exports   | 1002   | 1036  | 1137  | 1076  | 1059   | 1086      | 1201   | 1306   | 1409   | 1516   |
| Imports   | 1224   | 1357  | 1536  | 1492  | 1547   | 1594      | 1718   | 1819   | 1914   | 2008   |
| Federal Government  | 525    | 538   | 544   | 571   | 613    | 660       | 689    | 699    | 704    | 713    |
| State & Local Governments   | 958    | 1002  | 1037  | 1069  | 1100   | 1105      | 1112   | 1133   | 1152   | 1169   |
| Gross Domestic Product  | 8782   | 9274  | 9825  | 10082 | 10446  | 10838     | 11348  | 11980  | 12655  | 13430  |
| Real GDP (1996 Chain Weighted \$)   | 8509   | 8859  | 9191  | 9215  | 9440   | 9626      | 9902   | 10229  | 10587  | 10978  |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>  |        |       |       |       |        |           |        |        |        |        |
| GDP Deflator  | 1.2    | 1.4   | 2.1   | 2.4   | 1.1    | 1.7       | 1.9    | 2.0    | 2.1    | 2.2    |
| CPI-All Urban Consumers   | 1.5    | 2.2   | 3.4   | 2.8   | 1.6    | 1.7       | 1.9    | 2.1    | 2.3    | 2.5    |
| PPI-Finished Goods  | -0.9   | 1.8   | 3.7   | 2.0   | -1.3   | 2.5       | 1.6    | 1.7    | 1.9    | 2.0    |
| Employment Cost Index—Total Comp.   | 3.5    | 3.2   | 4.6   | 4.1   | 3.8    | 3.6       | 3.3    | 3.1    | 3.2    | 3.3    |
| Productivity  | 2.6    | 2.4   | 2.9   | 1.1   | 4.8    | 2.5       | 3.0    | 2.5    | 2.5    | 2.5    |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>  |        |       |       |       |        |           |        |        |        |        |
| Industrial Prod. (% Change)   | 6.5    | 4.9   | 5.0   | -4.1  | -1.1   | 2.3       | 7.5    | 7.0    | 4.0    | 3.0    |
| Factory Operating Rate (%)  | 81.9   | 81.4  | 81.4  | 75.6  | 73.7   | 74.3      | 77.6   | 79.0   | 80.0   | 81.0   |
| Nonfarm Inven. Chg. (1996 Chain Weighted \$)  | 75.0   | 64.2  | 67.2  | -63.2 | 4.1    | 15.2      | 65.0   | 50.0   | 45.0   | 45.0   |
| Housing Starts (Mill. Units)  | 1.62   | 1.65  | 1.57  | 1.60  | 1.71   | 1.65      | 1.61   | 1.62   | 1.63   | 1.65   |
| Total Light Vehicle Sales (Mill. Units)   | 15.5   | 16.9  | 17.4  | 17.1  | 16.8   | 16.1      | 17.0   | 17.5   | 17.7   | 17.8   |
| Unit Car Sales (Mill. Units)  | 8.1    | 8.7   | 8.9   | 8.4   | 8.1    | 7.6       | 7.9    | 8.0    | 8.0    | 8.0    |
| National Unemployment Rate (%)  | 4.5    | 4.2   | 4.0   | 4.8   | 5.8    | 6.1       | 6.0    | 5.7    | 5.6    | 5.5    |
| Federal Budget Surplus (Unified, FY, \$Bill)  | 69.2   | 124.4 | 236.9 | 127.3 | -157.8 | -380.0    | -400.0 | -360.0 | -275.0 | -200.0 |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)  | 12.58  | 17.42 | 28.21 | 22.96 | 24.04  | 26.75     | 22.00  | 22.25  | 23.00  | 23.75  |
| <b>MONEY AND INTEREST RATES</b>   |        |       |       |       |        |           |        |        |        |        |
| 3-Month Treasury Bill Rate (%)  | 4.8    | 4.6   | 5.8   | 3.4   | 1.6    | 1.2       | 1.9    | 2.6    | 3.0    | 3.5    |
| Federal Funds Rate (%)  | 5.4    | 5.0   | 6.2   | 3.9   | 1.7    | 1.1       | 1.4    | 3.0    | 3.5    | 4.0    |
| 10-Year Treasury Note Rate (%)  | 5.3    | 5.6   | 6.0   | 5.0   | 4.6    | 3.8       | 4.2    | 5.5    | 5.7    | 6.0    |
| 30-Year Treasury Bond Rate (%)  | 5.6    | 5.9   | 5.9   | 5.5   | 5.4    | 4.7       | 5.1    | 6.2    | 6.4    | 6.7    |
| AAA Corporate Bond Rate (%)   | 6.5    | 7.0   | 7.6   | 7.1   | 6.5    | 5.3       | 5.7    | 6.7    | 7.0    | 7.5    |
| Prime Rate (%)  | 8.4    | 8.0   | 9.2   | 6.9   | 4.7    | 4.2       | 4.9    | 6.0    | 6.5    | 7.0    |
| <b>INCOMES</b>  |        |       |       |       |        |           |        |        |        |        |
| Personal Income (% Change)  | 7.0    | 4.9   | 8.0   | 3.3   | 2.8    | 3.4       | 4.3    | 5.0    | 5.3    | 5.5    |
| Real Disp. Inc. (% Change)  | 5.4    | 2.6   | 4.8   | 1.8   | 4.3    | 2.4       | 3.8    | 3.0    | 3.0    | 3.0    |
| Personal Savings Rate (%)   | 4.8    | 2.6   | 2.8   | 2.3   | 3.7    | 4.0       | 4.3    | 4.0    | 3.0    | 3.0    |
| Pretax Corporate Profits (\$Bill)   | 721.1  | 762.0 | 782.0 | 670.0 | 665.0  | 771.0     | 898.0  | 970.0  | 1037.0 | 1120.0 |
| Aftertax Corporate Profits (\$Bill)   | 482.3  | 514.0 | 523.0 | 471.0 | 452.0  | 515.0     | 593.0  | 640.0  | 685.0  | 739.0  |
| Yr-to-Yr % Change   | -13.1  | 6.6   | 1.7   | -10.0 | -4.0   | 14.0      | 15.0   | 8.0    | 7.0    | 8.0    |
| <b>COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE</b>   |        |       |       |       |        |           |        |        |        |        |
| Gross Domestic Product  | 4.3    | 4.1   | 3.8   | 0.3   | 2.4    | 2.0       | 2.9    | 3.3    | 3.5    | 3.7    |
| Final Sales   | 4.2    | 4.3   | 3.7   | 1.5   | 1.8    | 2.3       | 3.5    | 3.5    | 3.7    | 3.8    |
| Total Consumption   | 4.8    | 4.9   | 4.3   | 2.5   | 3.1    | 2.3       | 3.7    | 3.5    | 3.5    | 3.6    |
| Nonresidential Fixed Investment   | 12.5   | 8.1   | 7.8   | -5.2  | -5.7   | 0.7       | 7.7    | 9.0    | 7.0    | 6.0    |
| Construction  | 6.8    | -1.3  | 6.5   | -1.7  | -16.4  | -5.9      | 4.0    | 9.0    | 5.0    | 4.0    |
| Equipment & Software  | 14.6   | 11.5  | 8.2   | -6.4  | -1.7   | 3.0       | 9.3    | 8.0    | 7.0    | 8.0    |
| Residential Fixed Investment  | 8.0    | 6.8   | 1.1   | 0.3   | 3.9    | 3.4       | -2.8   | 1.0    | 1.5    | 2.0    |
| Exports   | 2.1    | 3.4   | 9.7   | -5.4  | -1.6   | 2.6       | 10.6   | 8.7    | 7.9    | 7.6    |
| Imports   | 11.8   | 10.8  | 13.2  | -2.9  | 3.7    | 3.0       | 7.8    | 5.9    | 5.2    | 4.9    |
| Federal Government  | -0.8   | 2.4   | 1.2   | 4.8   | 7.5    | 7.5       | 4.4    | 1.4    | 0.8    | 1.2    |
| State & Local Governments   | 3.4    | 4.6   | 3.5   | 3.1   | 2.9    | 0.4       | 0.7    | 1.8    | 1.7    | 1.5    |

## Selected Yields

|                          | Recent<br>(5/22/03) | 3 Months<br>Ago<br>(2/20/03) | Year<br>Ago<br>(5/23/02) |                                   | Recent<br>(5/22/03) | 3 Months<br>Ago<br>(2/20/03) | Year<br>Ago<br>(5/23/02) |
|--------------------------|---------------------|------------------------------|--------------------------|-----------------------------------|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>           |                     |                              |                          | <b>Mortgage-Backed Securities</b> |                     |                              |                          |
| Market Rates             |                     |                              |                          | GNMA 6.5%                         | 3.46                | 4.00                         | 5.94                     |
| Discount Rate            | 2.25                | 2.25                         | 1.25                     | FHLMC 6.5% (Gold)                 | 2.98                | 3.07                         | 5.69                     |
| Federal Funds            | 1.25                | 1.25                         | 1.75                     | FNMA 6.5%                         | 2.79                | 3.20                         | 5.57                     |
| Prime Rate               | 4.25                | 4.25                         | 4.75                     | FNMA ARM                          | 2.97                | 3.14                         | 3.82                     |
| 30-day CP (A1/P1)        | 1.23                | 1.24                         | 1.75                     | Corporate Bonds                   |                     |                              |                          |
| 3-month LIBOR            | 1.28                | 1.34                         | 1.90                     | Financial (10-year) A             | 4.40                | 5.11                         | 6.56                     |
| Bank CDs                 |                     |                              |                          | Industrial (25/30-year) A         | 5.22                | 5.87                         | 6.87                     |
| 6-month                  | 0.85                | 0.94                         | 1.63                     | Utility (25/30-year) A            | 5.48                | 6.73                         | 7.51                     |
| 1-year                   | 0.95                | 1.12                         | 2.03                     | Utility (25/30-year) Baa/BBB      | 6.16                | 7.26                         | 8.14                     |
| 5-year                   | 2.74                | 2.98                         | 4.31                     | Foreign Bonds (10-Year)           |                     |                              |                          |
| U.S. Treasury Securities |                     |                              |                          | Canada                            | 4.67                | 4.99                         | 5.61                     |
| 3-month                  | 1.07                | 1.18                         | 1.73                     | Germany                           | 3.70                | 3.90                         | 5.12                     |
| 6-month                  | 1.07                | 1.19                         | 1.89                     | Japan                             | 0.57                | 0.86                         | 1.43                     |
| 1-year                   | 1.15                | 1.31                         | 2.34                     | United Kingdom                    | 4.03                | 4.14                         | 5.01                     |
| 5-year                   | 2.29                | 2.83                         | 4.46                     | Preferred Stocks                  |                     |                              |                          |
| 10-year                  | 3.31                | 3.87                         | 5.15                     | Utility A                         | 6.83                | 6.81                         | 6.83                     |
| 30-year                  | 4.26                | 4.81                         | 5.67                     | Financial A                       | 5.90                | 6.18                         | 6.79                     |
| 30-year Zero             | 4.53                | 4.85                         | 5.58                     | Financial Adjustable A            | 5.01                | 5.01                         | 5.01                     |



### TAX-EXEMPT

|                                   |      |      |      |
|-----------------------------------|------|------|------|
| Bond Buyer Indexes                |      |      |      |
| 20-Bond Index (GOs)               | 4.30 | 4.79 | 5.19 |
| 25-Bond Index (Revs)              | 4.82 | 5.14 | 5.55 |
| General Obligation Bonds (GOs)    |      |      |      |
| 1-year Aaa                        | 0.98 | 1.10 | 1.80 |
| 1-year A                          | 1.20 | 1.32 | 2.01 |
| 5-year Aaa                        | 2.05 | 2.53 | 3.37 |
| 5-year A                          | 2.40 | 2.91 | 3.66 |
| 10-year Aaa                       | 3.08 | 3.72 | 4.23 |
| 10-year A                         | 3.47 | 4.15 | 4.55 |
| 25/30-year Aaa                    | 4.31 | 4.78 | 5.20 |
| 25/30-year A                      | 4.61 | 5.05 | 5.44 |
| Revenue Bonds (Revs) (25/30-Year) |      |      |      |
| Education AA                      | 4.35 | 4.97 | 5.35 |
| Electric AA                       | 4.34 | 4.84 | 5.35 |
| Housing AA                        | 4.50 | 5.05 | 5.45 |
| Hospital AA                       | 4.74 | 5.31 | 5.50 |
| Toll Road Aaa                     | 4.50 | 5.06 | 5.30 |

## Federal Reserve Data

### BANK RESERVES

(Two-Week Period; in Millions, Not Seasonally Adjusted)

|                            | Recent Levels |         |        | Average Levels Over the Last... |         |         |
|----------------------------|---------------|---------|--------|---------------------------------|---------|---------|
|                            | 5/14/03       | 4/30/03 | Change | 12 Wks.                         | 26 Wks. | 52 Wks. |
| Excess Reserves            | 1559          | 1566    | -7     | 1666                            | 1706    | 1521    |
| Borrowed Reserves          | 51            | 29      | 22     | 29                              | 76      | 112     |
| Net Free/Borrowed Reserves | 1508          | 1537    | -29    | 1637                            | 1630    | 1409    |

### MONEY SUPPLY

(One-Week Period; in Billions, Seasonally Adjusted)

|                                     | Recent Levels |        |        | Growth Rates Over the Last... |        |         |
|-------------------------------------|---------------|--------|--------|-------------------------------|--------|---------|
|                                     | 5/12/03       | 5/5/03 | Change | 3 Mos.                        | 6 Mos. | 12 Mos. |
| M1 (Currency+demand deposits)       | 1248.0        | 1252.8 | -4.8   | 10.1%                         | 8.3%   | 6.1%    |
| M2 (M1+savings+small time deposits) | 6002.1        | 5992.6 | 9.5    | 9.3%                          | 7.9%   | 8.1%    |
| M3 (M2+large time deposits)         | 8684.4        | 8673.8 | 10.6   | 6.0%                          | 6.3%   | 6.8%    |

MAY 31, 2002

VALUE LINE SELECTION & OPINION

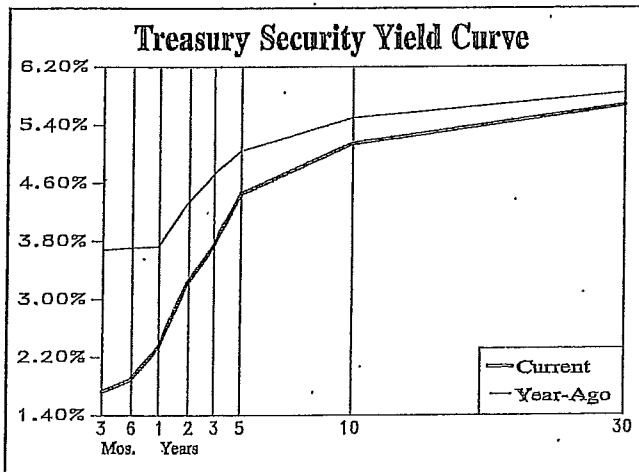
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## Value Line Forecast for the U.S. Economy

|  | ACTUAL |       |       |       |       | ESTIMATED |       |       |       |       |
|--|--------|-------|-------|-------|-------|-----------|-------|-------|-------|-------|
|  | 1997   | 1998  | 1999  | 2000  | 2001  | 2002      | 2003  | 2004  | 2005  | 2006  |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS</b><br>(1996 CHAIN WEIGHTED \$) BILLIONS OF DOLLARS |        |       |       |       |       |           |       |       |       |       |
| Final Sales  | 8095   | 8432  | 8792  | 9167  | 9377  | 9564      | 9906  | 10263 | 10642 | 11036 |
| Total Consumption  | 5424   | 5684  | 5968  | 6258  | 6450  | 6678      | 6897  | 7138  | 7388  | 7646  |
| Nonresidential Fixed Investment  | 1009   | 1136  | 1229  | 1351  | 1308  | 1243      | 1355  | 1450  | 1558  | 1683  |
| Construction   | 245    | 262   | 257   | 273   | 275   | 236       | 256   | 264   | 272   | 280   |
| Equipment & Software   | 764    | 875   | 978   | 1087  | 1039  | 1024      | 1116  | 1216  | 1337  | 1471  |
| Residential Fixed Investment   | 320    | 345   | 368   | 371   | 377   | 387       | 383   | 391   | 401   | 413   |
| Exports  | 981    | 1002  | 1035  | 1133  | 1082  | 1038      | 1102  | 1204  | 1301  | 1405  |
| Imports  | 1095   | 1224  | 1352  | 1532  | 1490  | 1535      | 1632  | 1717  | 1794  | 1866  |
| Federal Government   | 530    | 525   | 537   | 546   | 560   | 601       | 627   | 641   | 647   | 654   |
| State & Local Governments  | 926    | 958   | 995   | 1026  | 1067  | 1096      | 1107  | 1127  | 1149  | 1172  |
| Gross Domestic Product   | 8318   | 8782  | 9269  | 9873  | 10208 | 10621     | 11210 | 11847 | 12545 | 13289 |
| Real GDP (1996 Chain Weighted \$)  | 8159   | 8509  | 8857  | 9224  | 9334  | 9590      | 9928  | 10275 | 10655 | 11060 |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>   |        |       |       |       |       |           |       |       |       |       |
| GDP Price Index (1996 Chain Weighted)  | 1.9    | 1.2   | 1.4   | 2.3   | 2.2   | 1.7       | 2.5   | 2.5   | 2.5   | 2.6   |
| CPI-All Urban Consumers  | 2.3    | 1.5   | 2.2   | 3.4   | 2.8   | 2.4       | 2.5   | 2.6   | 2.6   | 2.7   |
| PPI-Finished Goods   | 0.4    | -0.9  | 1.8   | 3.7   | 2.0   | 1.7       | 2.1   | 2.1   | 2.2   | 2.2   |
| Employment Cost Index—Total Comp.  | 3.1    | 3.5   | 3.2   | 4.6   | 4.1   | 3.5       | 3.6   | 3.3   | 3.3   | 3.5   |
| Output per Hour-Nonfarm  | 1.2    | 2.6   | 2.3   | 3.3   | 1.8   | 4.6       | 3.1   | 3.5   | 3.2   | 3.0   |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>   |        |       |       |       |       |           |       |       |       |       |
| Industrial Prod. (% Change)  | 6.0    | 4.3   | 4.1   | 4.5   | -3.7  | 4.4       | 6.5   | 6.0   | 5.0   | 5.0   |
| Capacity Utilization Rate (%)  | 82.4   | 81.3  | 80.5  | 81.3  | 75.1  | 75.0      | 76.6  | 77.0  | 77.5  | 78.0  |
| Housing Starts (Mill. Units)   | 1.47   | 1.62  | 1.65  | 1.57  | 1.61  | 1.60      | 1.58  | 1.62  | 1.63  | 1.65  |
| Total Light Vehicle Sales (Mill. Units)  | 15.1   | 15.5  | 16.9  | 17.4  | 17.1  | 16.5      | 17.0  | 17.1  | 17.3  | 17.3  |
| Unit Car Sales (Mill. Units)   | 8.3    | 8.1   | 8.7   | 8.9   | 8.4   | 8.1       | 8.1   | 8.0   | 8.0   | 8.0   |
| National Unemployment Rate (%)   | 4.9    | 4.5   | 4.2   | 4.0   | 4.8   | 6.0       | 5.8   | 5.5   | 5.0   | 5.0   |
| Federal Budget Surplus (Unified, FY, \$Bill)   | -22.0  | 69.2  | 124.4 | 236.6 | 127.0 | -90.0     | -80.0 | -75.0 | -45.0 | -15.0 |
| Price of Oil (\$Bbl, U.S. Refiners' Cost)  | 19.11  | 12.58 | 17.42 | 28.21 | 22.96 | 22.80     | 21.75 | 22.25 | 23.25 | 24.00 |
| <b>MONEY AND INTEREST RATES</b>  |        |       |       |       |       |           |       |       |       |       |
| Annual Money Supply (M2)   | 4023   | 4352  | 4626  | 4910  | 5421  | 5673      | 5957  | 6247  | 6558  | 6884  |
| Yr-to-Yr % Change (Q4/Q4)  | 5.8    | 8.5   | 6.3   | 6.1   | 10.4  | 4.7       | 5.0   | 4.9   | 5.0   | 5.0   |
| 3-Month Treasury Bill Rate (%)   | 5.1    | 4.8   | 4.6   | 5.8   | 3.4   | 2.0       | 3.4   | 3.8   | 4.2   | 4.5   |
| Federal Funds Rate (%)   | 5.5    | 5.4   | 5.0   | 6.2   | 3.9   | 1.9       | 3.2   | 3.8   | 4.5   | 5.0   |
| 10-Year Treasury Note Rate (%)   | 6.4    | 5.3   | 5.6   | 6.0   | 5.0   | 5.3       | 5.9   | 5.9   | 6.0   | 6.2   |
| 30-Year Treasury Bond Rate (%)   | 6.6    | 5.6   | 5.9   | 5.9   | 5.5   | 5.7       | 6.3   | 6.3   | 6.4   | 6.5   |
| AAA Corporate Bond Rate (%)  | 7.3    | 6.5   | 7.0   | 7.6   | 7.1   | 6.9       | 7.3   | 7.2   | 7.2   | 7.3   |
| Prime Rate (%)   | 8.4    | 8.4   | 8.0   | 9.2   | 6.9   | 4.9       | 6.1   | 7.0   | 8.0   | 8.5   |
| <b>INCOMES</b>   |        |       |       |       |       |           |       |       |       |       |
| Personal Income (% Change)   | 6.0    | 7.0   | 4.7   | 7.0   | 4.9   | 4.8       | 6.0   | 5.5   | 5.3   | 5.3   |
| Real Disp. Inc. (% Change)   | 3.1    | 5.4   | 2.5   | 3.5   | 3.6   | 4.9       | 3.4   | 3.3   | 3.0   | 3.0   |
| Personal Savings Rate (%)  | 4.2    | 4.7   | 2.4   | 1.0   | 1.6   | 2.1       | 2.1   | 2.0   | 1.9   | 1.8   |
| Pretax Corporate Profits (\$Bill)  | 792.4  | 721.1 | 776.0 | 845.0 | 699.0 | 739.0     | 792.0 | 847.0 | 915.0 | 997.0 |
| Aftertax Corporate Profits (\$Bill)  | 555.2  | 482.3 | 523.0 | 574.0 | 483.0 | 489.0     | 523.0 | 559.0 | 604.0 | 658.0 |
| Yr-to-Yr % Change  | 7.5    | -13.1 | 8.5   | 9.7   | -15.9 | 1.4       | 6.8   | 7.0   | 8.0   | 9.0   |
| <b>COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE</b>  |        |       |       |       |       |           |       |       |       |       |
| Gross Domestic Product   | 4.4    | 4.3   | 4.1   | 4.1   | 1.2   | 2.7       | 3.5   | 3.5   | 3.7   | 3.8   |
| Final Sales  | 4.0    | 4.2   | 4.6   | 4.3   | 2.3   | 2.0       | 3.6   | 3.6   | 3.7   | 3.7   |
| Total Consumption  | 3.6    | 4.7   | 5.0   | 4.9   | 3.1   | 3.5       | 3.3   | 3.5   | 3.5   | 3.5   |
| Nonresidential Fixed Investment  | 12.2   | 12.6  | 10.1  | 9.9   | -3.2  | -5.0      | 9.0   | 7.0   | 7.5   | 8.0   |
| Construction   | 9.1    | 7.2   | -1.4  | 6.2   | 0.9   | -14.2     | 8.6   | 3.0   | 3.0   | 3.0   |
| Equipment & Software   | 13.3   | 15.0  | 14.1  | 11.1  | -4.4  | -1.5      | 9.0   | 9.0   | 10.0  | 10.0  |
| Residential Fixed Investment   | 2.0    | 8.3   | 6.4   | 0.8   | 1.5   | 2.6       | -0.9  | 2.0   | 2.5   | 3.0   |
| Exports  | 12.3   | 2.3   | 2.9   | 9.5   | -4.5  | -4.1      | 6.2   | 9.3   | 8.0   | 8.0   |
| Imports  | 13.7   | 11.8  | 10.7  | 13.4  | -2.7  | 3.0       | 6.3   | 5.2   | 4.5   | 4.0   |
| Federal Government   | -0.4   | -0.5  | 2.5   | 1.7   | 2.7   | 7.3       | 4.3   | 2.3   | 1.0   | 1.0   |
| State & Local Governments  | 4.0    | 3.6   | 3.8   | 3.2   | 4.0   | 2.7       | 1.0   | 1.8   | 2.0   | 2.0   |

## Selected Yields

|                                 | Recent<br>(5/23/02) | 3 Months<br>Ago<br>(2/21/02) | Year<br>Ago<br>(5/24/01) |                                   | Recent<br>(5/23/02) | 3 Months<br>Ago<br>(2/21/02) | Year<br>Ago<br>(5/24/01) |
|---------------------------------|---------------------|------------------------------|--------------------------|-----------------------------------|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>                  |                     |                              |                          | <b>Mortgage-Backed Securities</b> |                     |                              |                          |
| Market Rates                    |                     |                              |                          | GNMA 8%                           | 5.22                | 5.15                         | 6.74                     |
| Discount Rate                   | 1.25                | 1.25                         | 3.50                     | FHLMC 8%                          | 4.98                | 4.98                         | 6.51                     |
| Federal Funds                   | 1.75                | 1.75                         | 4.00                     | FNMA 8%                           | 5.00                | 5.07                         | 6.44                     |
| Prime Rate                      | 4.75                | 4.75                         | 7.00                     | FNMA ARM                          | 3.82                | 4.22                         | 6.37                     |
| 30-day CP (A1/P1)               | 1.75                | 1.75                         | 3.98                     | <b>Corporate Bonds</b>            |                     |                              |                          |
| 3-month LIBOR                   | 1.90                | 1.90                         | 4.03                     | Financial (10-year) A             | 6.56                | 6.38                         | 7.02                     |
| <b>Bank CDs</b>                 |                     |                              |                          | Industrial (25/30-year) A         | 6.87                | 6.63                         | 7.36                     |
| 6-month                         | 1.63                | 1.52                         | 3.41                     | Utility (25/30-year) A            | 7.51                | 7.12                         | 8.07                     |
| 1-year                          | 2.03                | 1.83                         | 3.50                     | Utility (25/30-year) Baa/BBB      | 8.14                | 7.39                         | 8.45                     |
| 5-year                          | 4.31                | 4.10                         | 4.41                     | <b>Foreign Bonds (10-Year)</b>    |                     |                              |                          |
| <b>U.S. Treasury Securities</b> |                     |                              |                          | Canada                            | 5.31                | 5.02                         | 5.87                     |
| 3-month                         | 1.73                | 1.75                         | 3.68                     | Germany                           | 5.12                | 4.98                         | 5.18                     |
| 6-month                         | 1.89                | 1.85                         | 3.71                     | Japan                             | 1.43                | 1.49                         | 1.29                     |
| 1-year                          | 2.34                | 1.68                         | 3.73                     | United Kingdom                    | 5.01                | 4.99                         | 5.21                     |
| 5-year                          | 4.46                | 4.16                         | 5.05                     | <b>Preferred Stocks</b>           |                     |                              |                          |
| 10-year                         | 5.15                | 4.85                         | 5.50                     | Utility A                         | 6.83                | 6.74                         | 6.37                     |
| 30-year                         | 5.67                | 5.37                         | 5.84                     | Financial A                       | 6.79                | 6.38                         | 6.57                     |
| 30-year Zero                    | 5.58                | 5.60                         | 5.96                     | Financial Adjustable A            | 5.01                | 5.01                         | 4.96                     |



| <b>TAX-EXEMPT</b>                        |      |      |      |
|--|------|------|------|
| <b>Bond Buyer Indexes</b>                |      |      |      |
| 20-Bond Index (GOs)                      | 5.19 | 5.10 | 5.30 |
| 25-Bond Index (Revs)                     | 5.55 | 5.43 | 5.65 |
| <b>General Obligation Bonds (GOs)</b>    |      |      |      |
| 1-year Aaa                               | 1.80 | 1.58 | 2.73 |
| 1-year A                                 | 2.01 | 1.79 | 2.85 |
| 5-year Aaa                               | 3.37 | 3.40 | 3.79 |
| 5-year A                                 | 3.66 | 3.68 | 4.00 |
| 10-year Aaa                              | 4.23 | 4.15 | 4.41 |
| 10-year A                                | 4.55 | 4.44 | 4.63 |
| 25/30-year Aaa                           | 5.20 | 5.06 | 5.29 |
| 25/30-year A                             | 5.44 | 5.32 | 5.49 |
| <b>Revenue Bonds (Revs) (25/30-Year)</b> |      |      |      |
| Education AA                             | 5.35 | 5.20 | 5.48 |
| Electric AA                              | 5.35 | 5.26 | 5.39 |
| Housing AA                               | 5.45 | 5.35 | 5.65 |
| Hospital AA                              | 5.50 | 5.35 | 5.55 |
| Toll Road Aaa                            | 5.30 | 5.29 | 5.39 |

## Federal Reserve Data

|                            | <b>BANK RESERVES</b>   |        |        | <b>Average Levels Over the Last...</b> |         |         |
|----------------------------|--|--------|--------|--|---------|---------|
|                            | <i>(Two-Week Period; in Millions, Not Seasonally Adjusted)</i> |        |        |  |         |         |
|                            | 5/15/02  | 5/1/02 | Change | 12 Wks.                                | 26 Wks. | 52 Wks. |
| Excess Reserves            | 1188   | 1194   | -6     | 1306                                   | 1405    | 2738    |
| Borrowed Reserves          | 100  | 71     | 29     | 69                                     | 67      | 383     |
| Net Free/Borrowed Reserves | 1088   | 1123   | -35    | 1237                                   | 1338    | 2355    |

|                                     | <b>MONEY SUPPLY</b>  |        |        | <b>Growth Rates Over the Last...</b> |        |         |
|-------------------------------------|--|--------|--------|--------------------------------------|--------|---------|
|                                     | <i>(One-Week Period; in Billions, Seasonally Adjusted)</i> |        |        |                                      |        |         |
|                                     | 5/13/02  | 5/6/02 | Change | 3 Mos.                               | 6 Mos. | 12 Mos. |
| M1 (Currency+demand deposits)       | 1166.7   | 1171.6 | -4.9   | -3.2%                                | 1.6%   | 5.1%    |
| M2 (M1+savings+small time deposits) | 5535.3   | 5517.1 | 18.2   | 3.0%                                 | 4.9%   | 7.8%    |
| M3 (M2+large time deposits)         | 8131.5   | 8098.4 | 33.1   | 4.0%                                 | 4.2%   | 8.3%    |



JUNE 1, 2001

VALUE LINE SELECTION & OPINION

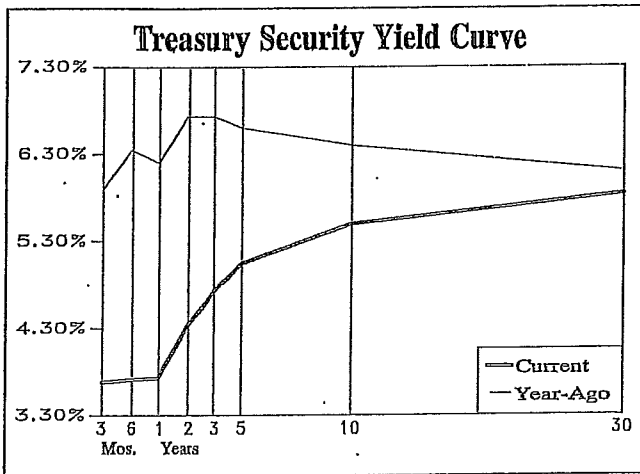
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## Value Line Forecast for the U.S. Economy

|   | ACTUAL |       |       |       |       | ESTIMATED |        |        |        |        |
|---|--------|-------|-------|-------|-------|-----------|--------|--------|--------|--------|
|   | 1996   | 1997  | 1998  | 1999  | 2000  | 2001      | 2002   | 2003   | 2004   | 2005   |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS</b><br>(1996 CHAIN WEIGHTED \$)<br>BILLIONS OF DOLLARS |        |       |       |       |       |           |        |        |        |        |
| Final Sales   | 7783   | 8095  | 8435  | 8827  | 9251  | 9471      | 9681   | 10001  | 10341  | 10703  |
| Total Consumption   | 5237   | 5424  | 5679  | 5979  | 6294  | 6475      | 6685   | 6919   | 7168   | 7433   |
| Nonresidential Fixed Investment   | 899    | 1009  | 1140  | 1255  | 1414  | 1440      | 1478   | 1566   | 1660   | 1768   |
| Construction  | .225   | .245  | .263  | .259  | .283  | .307      | .295   | .298   | .301   | .306   |
| Equipment & Software  | 674    | 764   | 879   | 1003  | 1141  | 1143      | 1200   | 1284   | 1387   | 1498   |
| Residential Fixed Investment  | 313    | 320   | 346   | 368   | 366   | 355       | 347    | 360    | 375    | 394    |
| Exports   | 874    | 981   | 1004  | 1033  | 1126  | 1146      | 1205   | 1295   | 1391   | 1495   |
| Imports   | 963    | 1095  | 1225  | 1355  | 1539  | 1575      | 1666   | 1775   | 1883   | 1996   |
| Federal Government  | 532    | 530   | 527   | 540   | 548   | 565       | 579    | 591    | 602    | 612    |
| State & Local Governments   | 890    | 926   | 959   | 996   | 1031  | 1060      | 1088   | 1113   | 1136   | 1159   |
| Gross Domestic Product  | 7813   | 8318  | 8790  | 9299  | 9963  | 10369     | 10902  | 11488  | 12109  | 12775  |
| Real GDP (1996 Chain Weighted \$)   | 7813   | 8159  | 8516  | 8876  | 9318  | 9472      | 9758   | 10100  | 10473  | 10871  |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>  |        |       |       |       |       |           |        |        |        |        |
| GDP Price Index (1996 Chain Weighted)   | 2.1    | 1.9   | 1.2   | 1.5   | 2.1   | 2.4       | 2.2    | 2.2    | 2.3    | 2.3    |
| CPI-All Urban Consumers   | 2.9    | 2.3   | 1.6   | 2.2   | 3.4   | 3.0       | 2.7    | 2.7    | 2.7    | 2.8    |
| PPI-Finished Goods  | 2.6    | 0.4   | -0.9  | 1.8   | 3.7   | 2.5       | 1.8    | 2.0    | 2.1    | 2.2    |
| Employment Cost Index—Total Comp.   | 2.8    | 3.1   | 3.5   | 3.2   | 4.6   | 4.5       | 3.8    | 3.7    | 3.5    | 3.5    |
| Output per Hour-Nonfarm   | 0.8    | 1.2   | 2.8   | 2.9   | 4.3   | 2.0       | 2.8    | 3.2    | 3.2    | 3.3    |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>  |        |       |       |       |       |           |        |        |        |        |
| Industrial Prod. (% Change)   | 2.8    | 6.0   | 4.3   | 4.1   | 5.6   | -0.3      | 2.4    | 3.3    | 3.4    | 3.5    |
| Capacity Utilization Rate (%)   | 81.5   | 82.4  | 80.9  | 80.5  | 81.3  | 77.7      | 77.4   | 78.0   | 79.0   | 80.0   |
| Housing Starts (Mill. Units)  | 1.47   | 1.47  | 1.62  | 1.68  | 1.61  | 1.54      | 1.47   | 1.53   | 1.57   | 1.60   |
| Total Light Vehicle Sales (Mill. Units)   | 15.1   | 15.1  | 15.6  | 16.9  | 17.4  | 16.4      | 16.6   | 17.0   | 17.3   | 17.5   |
| Unit Car Sales (Mill. Units)  | 8.5    | 8.3   | 8.1   | 8.7   | 8.8   | 8.4       | 8.4    | 8.5    | 8.5    | 8.5    |
| National Unemployment Rate (%)  | 5.4    | 4.9   | 4.5   | 4.2   | 4.0   | 4.7       | 5.2    | 5.0    | 4.9    | 4.8    |
| Federal Budget Surplus (Unified, FY, \$Bill)  | -107.0 | -22.0 | 69.2  | 158.3 | 131.4 | 132.0     | 135.0  | 135.0  | 137.0  | 139.0  |
| Price of Oil (\$/Bbl., U.S. Refiners' Cost)   | 20.69  | 19.11 | 12.58 | 17.42 | 28.21 | 26.50     | 24.75  | 23.50  | 22.50  | 22.00  |
| <b>MONEY AND INTEREST RATES</b>   |        |       |       |       |       |           |        |        |        |        |
| Annual Money Supply (M2)  | 3806   | 4023  | 4363  | 4624  | 4912  | 5498      | 5946   | 6279   | 6591   | 6907   |
| Yr-to-Yr % Change (Q4/Q4)   | 4.6    | 5.8   | 8.5   | 6.3   | 6.2   | 11.9      | 8.2    | 5.6    | 5.0    | 4.8    |
| 3-Month Treasury Bill Rate (%)  | 5.0    | 5.1   | 4.8   | 4.6   | 5.8   | 4.0       | 3.8    | 3.9    | 4.2    | 4.5    |
| Federal Funds Rate (%)  | 5.3    | 5.5   | 5.4   | 5.0   | 6.2   | 4.2       | 3.9    | 4.2    | 4.7    | 5.0    |
| 10-Year Treasury Note Rate (%)  | 6.4    | 6.4   | 5.3   | 5.6   | 6.0   | 5.1       | 5.5    | 5.5    | 5.6    | 5.7    |
| 30-Year Treasury Bond Rate (%)  | 6.7    | 6.6   | 5.6   | 5.9   | 5.9   | 5.6       | 5.9    | 5.9    | 5.9    | 6.0    |
| AAA Corporate Bond Rate (%)   | 7.4    | 7.3   | 6.5   | 7.0   | 7.7   | 7.6       | 7.9    | 8.0    | 8.0    | 8.0    |
| Prime Rate (%)  | 8.3    | 8.4   | 8.4   | 8.0   | 9.2   | 7.2       | 7.0    | 7.3    | 7.5    | 8.0    |
| <b>INCOMES</b>  |        |       |       |       |       |           |        |        |        |        |
| Personal Income (% Change)  | 5.6    | 6.0   | 6.5   | 5.4   | 6.3   | 4.4       | 4.8    | 5.7    | 5.5    | 5.5    |
| Real Disp. Inc. (% Change)  | 2.5    | 3.1   | 4.8   | 3.2   | 2.8   | 3.0       | 3.8    | 4.3    | 4.2    | 4.0    |
| Personal Savings Rate (%)   | 4.8    | 4.2   | 4.2   | 2.2   | -0.1  | -0.8      | -0.2   | 0.2    | 0.4    | 0.4    |
| Pretax Corporate Profits (\$/Bill)  | 726.4  | 792.4 | 758.2 | 823.0 | 926.0 | 931.0     | 1008.0 | 1079.0 | 1160.0 | 1252.0 |
| Aftertax Corporate Profits (\$/Bill)  | 502.7  | 555.2 | 513.4 | 567.0 | 641.0 | 622.0     | 665.0  | 712.0  | 765.0  | 827.0  |
| Yr-to-Yr % Change   | 9.3    | 7.5   | -2.9  | 10.4  | 13.1  | -3.1      | 7.0    | 7.0    | 7.5    | 8.0    |
| <b>COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE</b>   |        |       |       |       |       |           |        |        |        |        |
| Gross Domestic Product  | 3.6    | 4.4   | 4.4   | 4.2   | 5.0   | 1.6       | 3.0    | 3.5    | 3.7    | 3.8    |
| Final Sales   | 3.6    | 4.0   | 4.2   | 4.6   | 4.8   | 2.4       | 2.2    | 3.3    | 3.4    | 3.5    |
| Total Consumption   | 3.2    | 3.6   | 4.7   | 5.3   | 5.3   | 2.9       | 3.2    | 3.5    | 3.6    | 3.7    |
| Nonresidential Fixed Investment   | 10.0   | 12.2  | 13.0  | 10.1  | 12.6  | 1.9       | 2.6    | 6.0    | 6.0    | 6.5    |
| Construction  | 7.1    | 9.1   | 7.2   | -1.4  | 9.1   | 8.4       | -3.9   | 1.0    | 1.2    | 1.5    |
| Equipment & Software  | 11.0   | 13.3  | 15.0  | 14.1  | 13.7  | 0.2       | 5.0    | 7.0    | 8.0    | 8.0    |
| Residential Fixed Investment  | 7.4    | 2.0   | 8.3   | 6.4   | -0.5  | -3.0      | -2.4   | 4.0    | 4.0    | 5.0    |
| Exports   | 8.2    | 12.3  | 2.3   | 2.9   | 9.0   | 1.8       | 5.1    | 7.5    | 7.4    | 7.5    |
| Imports   | 8.6    | 13.7  | 11.9  | 10.7  | 13.5  | 2.4       | 5.8    | 6.5    | 6.1    | 6.0    |
| Federal Government  | -0.9   | -0.4  | -0.5  | 2.5   | 1.5   | 3.0       | 2.6    | 2.0    | 1.8    | 1.7    |
| State & Local Governments   | 2.3    | 4.0   | 3.6   | 3.8   | 3.5   | 2.9       | 2.6    | 2.3    | 2.1    | 2.0    |

## Selected Yields

|                                 | Recent<br>(5/24/01) | 3 Months<br>Ago<br>(2/22/01) | Year<br>Ago<br>(5/25/00) |                                   | Recent<br>(5/24/01) | 3 Months<br>Ago<br>(2/22/01) | Year<br>Ago<br>(5/25/00) |
|---------------------------------|---------------------|------------------------------|--------------------------|-----------------------------------|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>                  |                     |                              |                          | <b>Mortgage-Backed Securities</b> |                     |                              |                          |
| Market Rates                    |                     |                              |                          | GNMA 8%                           | 6.74                | 7.08                         | 8.11                     |
| Discount Rate                   | 3.50                | 5.00                         | 6.00                     | FHLMC 8%                          | 6.51                | 6.94                         | 8.24                     |
| Federal Funds                   | 4.00                | 5.50                         | 6.50                     | FNMA 8%                           | 6.44                | 6.89                         | 8.23                     |
| Prime Rate                      | 7.00                | 8.50                         | 9.50                     | FNMA ARM                          | 6.37                | 6.88                         | 6.57                     |
| 30-day CP (A1/P1)               | 3.98                | 5.37                         | 6.48                     | <b>Corporate Bonds</b>            |                     |                              |                          |
| 3-month LIBOR                   | 4.03                | 5.35                         | 6.83                     | Financial (10-year) A             | 7.02                | 6.92                         | 8.33                     |
| <b>Bank CDs</b>                 |                     |                              |                          | Industrial (25/30-year) A         | 7.36                | 7.21                         | 8.32                     |
| 6-month                         | 3.41                | 4.43                         | 5.02                     | Utility (25/30-year) A            | 8.07                | 7.77                         | 8.41                     |
| 1-year                          | 3.50                | 4.47                         | 5.42                     | Utility (25/30-year) Baa/BBB      | 8.45                | 8.07                         | 8.66                     |
| 5-year                          | 4.41                | 4.84                         | 6.00                     | <b>Foreign Bonds (10-Year)</b>    |                     |                              |                          |
| <b>U.S. Treasury Securities</b> |                     |                              |                          | Canada                            | 5.87                | 5.40                         | 6.32                     |
| 3-month                         | 3.68                | 4.99                         | 5.90                     | Germany                           | 5.18                | 4.85                         | 5.31                     |
| 6-month                         | 3.71                | 4.85                         | 6.35                     | Japan                             | 1.29                | 1.46                         | 1.70                     |
| 1-year                          | 3.73                | 4.73                         | 6.20                     | United Kingdom                    | 5.21                | 4.99                         | 5.40                     |
| 5-year                          | 5.05                | 4.90                         | 6.60                     | <b>Preferred Stocks</b>           |                     |                              |                          |
| 10-year                         | 5.50                | 5.15                         | 6.40                     | Utility A                         | 6.37                | 6.83                         | 6.80                     |
| 30-year                         | 5.84                | 5.52                         | 6.10                     | Financial A                       | 6.57                | 6.57                         | 6.20                     |
| 30-year Zero                    | 5.96                | 5.75                         | 6.14                     | Financial Adjustable A            | 4.96                | 5.01                         | 4.96                     |



### TAX-EXEMPT

|  |      |      |      |
|--|------|------|------|
| <b>Bond Buyer Indexes</b>                |      |      |      |
| 20-Bond Index (GOs)                      | 5.30 | 5.21 | 6.01 |
| 25-Bond Index (Revs)                     | 5.65 | 5.52 | 6.27 |
| <b>General Obligation Bonds (GOs)</b>    |      |      |      |
| 1-year Aaa                               | 2.73 | 3.30 | 4.55 |
| 1-year A                                 | 2.85 | 3.42 | 4.75 |
| 5-year Aaa                               | 3.79 | 3.85 | 5.08 |
| 5-year A                                 | 4.00 | 4.05 | 5.35 |
| 10-year Aaa                              | 4.41 | 4.32 | 5.35 |
| 10-year A                                | 4.63 | 4.56 | 5.64 |
| 25/30-year Aaa                           | 5.29 | 5.20 | 5.99 |
| 25/30-year A                             | 5.49 | 5.44 | 6.26 |
| <b>Revenue Bonds (Revs) (25/30-Year)</b> |      |      |      |
| Education AA                             | 5.48 | 5.33 | 6.14 |
| Electric AA                              | 5.39 | 5.31 | 6.19 |
| Housing AA                               | 5.65 | 5.55 | 6.40 |
| Hospital AA                              | 5.55 | 5.60 | 6.40 |
| Toll Road Aaa                            | 5.39 | 5.33 | 6.32 |

## Federal Reserve Data

### BANK RESERVES

(Two-Week Period; in Millions, Not Seasonally Adjusted)

|                            | Recent Levels |          |        | Average Levels Over the Last... |         |         |
|----------------------------|---------------|----------|--------|---------------------------------|---------|---------|
|                            | 05/16/01      | 05/02/01 | Change | 12 Wks.                         | 26 Wks. | 52 Wks. |
| Excess Reserves            | 892           | 1216     | -324   | 1305                            | 1281    | 1186    |
| Borrowed Reserves          | 346           | 59       | 287    | 97                              | 137     | 314     |
| Net Free/Borrowed Reserves | 546           | 1157     | -611   | 1209                            | 1144    | 872     |

### MONEY SUPPLY

(One-Week Period; in Billions, Seasonally Adjusted)

|                                     | Recent Levels |          |        | Growth Rates Over the Last... |        |         |
|-------------------------------------|---------------|----------|--------|-------------------------------|--------|---------|
|                                     | 05/14/01      | 05/07/01 | Change | 3 Mos.                        | 6 Mos. | 12 Mos. |
| M1 (Currency+demand deposits)       | 1102.6        | 1106.7   | -4.1   | 5.1%                          | 3.8%   | -0.3%   |
| M2 (M1+savings+small time deposits) | 5153.9        | 5150.6   | 3.3    | 10.6%                         | 10.7%  | 8.4%    |
| M3 (M2+large time deposits)         | 7493.1        | 7467.2   | 25.9   | 14.0%                         | 14.4%  | 11.0%   |

JUNE 2, 2000

VALUE LINE SELECTION & OPINION

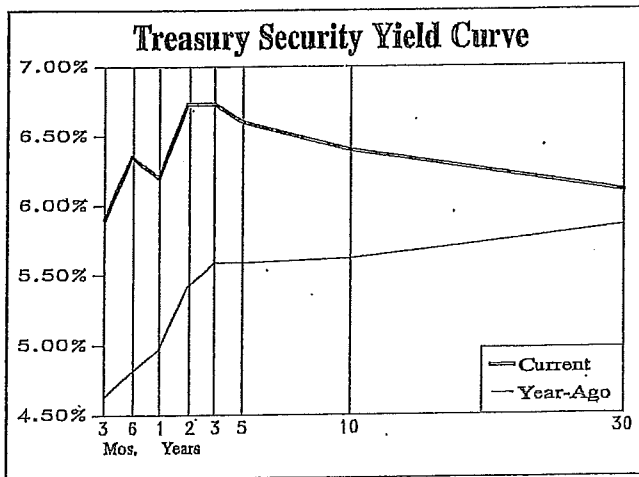
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## Value Line Forecast for the U.S. Economy

|   | ACTUAL |        |       |       |       | ESTIMATED |        |        |        |        |
|---|--------|--------|-------|-------|-------|-----------|--------|--------|--------|--------|
|   | 1995   | 1996   | 1997  | 1998  | 1999  | 2000      | 2001   | 2002   | 2003   | 2004   |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS</b>      |        |        |       |       |       |           |        |        |        |        |
| <b>(1996 CHAIN WEIGHTED \$)</b>                       |        |        |       |       |       |           |        |        |        |        |
| <b>BILLIONS OF DOLLARS</b>                            |        |        |       |       |       |           |        |        |        |        |
| Total Consumption                                     | 5076   | 5237   | 5417  | 5682  | 5984  | 6271      | 6491   | 6685   | 6892   | 7113   |
| Nonresidential Fixed Investment                       | 818    | 899    | 996   | 1122  | 1216  | 1355      | 1443   | 1529   | 1621   | 1718   |
| Residential Fixed Investment                          | 292    | 313    | 321   | 350   | 376   | 371       | 363    | 367    | 374    | 386    |
| Exports   | 808    | 874    | 983   | 1005  | 1042  | 1113      | 1197   | 1303   | 1421   | 1541   |
| Imports   | 887    | 963    | 1095  | 1222  | 1365  | 1512      | 1624   | 1717   | 1830   | 1964   |
| Federal Government                                    | 536    | 532    | 531   | 526   | 541   | 540       | 544    | 542    | 543    | 545    |
| State & Local Governments                             | 870    | 890    | 923   | 953   | 993   | 1034      | 1062   | 1087   | 1111   | 1134   |
| Gross Domestic Product                                | 7401   | 7813   | 8301  | 8760  | 9256  | 9843      | 10247  | 10759  | 11337  | 11711  |
| Real GDP (1996 Chain Weighted \$)                     | 7544   | 7813   | 8145  | 8496  | 8848  | 9246      | 9542   | 9847   | 10172  | 10508  |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>        |        |        |       |       |       |           |        |        |        |        |
| GDP Price Index (1996 Chain Weighted)                 | 2.5    | 2.1    | 1.9   | 1.2   | 1.4   | 2.3       | 1.8    | 1.8    | 2.0    | 2.0    |
| CPI-All Urban Consumers                               | 2.8    | 2.9    | 2.3   | 1.6   | 2.2   | 3.1       | 2.5    | 2.5    | 2.6    | 2.7    |
| PPI-Finished Goods                                    | 1.9    | 2.6    | 0.4   | -0.9  | 1.8   | 2.7       | 1.8    | 1.8    | 1.9    | 2.0    |
| Employment Cost Index—Total Comp.                     | 2.8    | 2.8    | 3.1   | 3.5   | 3.2   | 4.8       | 4.3    | 4.0    | 3.8    | 3.8    |
| Output per Hour-Nonfarm                               | 0.6    | 0.8    | 1.2   | 2.8   | 3.0   | 3.3       | 2.0    | 2.2    | 2.2    | 2.3    |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>              |        |        |       |       |       |           |        |        |        |        |
| Industrial Prod. (% Change)                           | 3.3    | 2.8    | 6.0   | 4.3   | 3.5   | 4.5       | 1.5    | 2.5    | 3.0    | 3.3    |
| Capacity Utilization Rate (%)                         | 83.1   | 82.1   | 82.0  | 80.9  | 79.8  | 81.0      | 79.5   | 80.0   | 80.2   | 80.3   |
| Housing Starts (Mill. Units)                          | 1.36   | 1.47   | 1.48  | 1.62  | 1.68  | 1.63      | 1.55   | 1.55   | 1.58   | 1.60   |
| Total Light Vehicle Sales (Mill. Units)               | 14.8   | 15.1   | 15.1  | 15.6  | 16.9  | 17.8      | 17.0   | 16.5   | 16.5   | 16.7   |
| Unit Car Sales (Mill. Units)                          | 8.6    | 8.5    | 8.2   | 8.2   | 8.7   | 9.1       | 8.8    | 8.5    | 8.5    | 8.5    |
| U.S. Dollar Exchange Rate (% Change)                  | -5.7   | 4.9    | 8.0   | 5.0   | -2.3  | 1.7       | -2.7   | -4.9   | -2.2   | -1.4   |
| National Unemployment Rate (%)                        | 5.6    | 5.4    | 4.9   | 4.5   | 4.2   | 4.0       | 4.0    | 4.2    | 4.3    | 4.4    |
| Federal Budget Surplus (Unified, FY, \$Bill)          | -163.9 | -107.0 | -22.0 | 69.2  | 124.4 | 163.0     | 210.0  | 210.0  | 270.0  | 265.0  |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)            | 17.24  | 20.69  | 19.11 | 12.58 | 17.42 | 26.55     | 24.40  | 23.15  | 22.75  | 21.50  |
| <b>MONEY AND INTEREST RATES</b>                       |        |        |       |       |       |           |        |        |        |        |
| Annual Money Supply (M2)                              | 3638   | 3806   | 4023  | 4363  | 4627  | 4854      | 5072   | 5316   | 5587   | 5872   |
| Yr-to-Yr % Change (Q4/Q4)                             | 3.9    | 4.6    | 5.8   | 8.5   | 6.1   | 4.9       | 4.5    | 4.8    | 5.1    | 5.1    |
| 3-Month Treasury Bill Rate (%)                        | 5.5    | 5.0    | 5.1   | 4.8   | 4.6   | 6.0       | 6.2    | 6.0    | 5.7    | 5.5    |
| Federal Funds Rate (%)                                | 5.8    | 5.3    | 5.5   | 5.4   | 5.0   | 6.4       | 6.5    | 6.4    | 6.2    | 6.0    |
| 30-Year Treasury Bond Rate (%)                        | 6.9    | 6.7    | 6.6   | 5.6   | 5.9   | 6.2       | 5.9    | 5.9    | 5.8    | 5.8    |
| AAA Corporate Bond Rate (%)                           | 7.6    | 7.4    | 7.3   | 6.5   | 7.0   | 7.5       | 7.2    | 7.5    | 7.5    | 7.5    |
| Prime Rate (%)  | 8.8    | 8.3    | 8.4   | 8.4   | 8.0   | 9.3       | 9.4    | 9.3    | 9.1    | 9.0    |
| <b>INCOMES</b>  |        |        |       |       |       |           |        |        |        |        |
| Personal Income (% Change)                            | 6.3    | 5.5    | 5.6   | 5.9   | 5.9   | 6.3       | 5.8    | 5.5    | 5.3    | 5.3    |
| Real Disp. Inc. (% Change)                            | 3.5    | 2.9    | 2.8   | 4.1   | 4.0   | 4.1       | 4.8    | 3.5    | 3.0    | 3.0    |
| Personal Savings Rate (%)                             | 4.7    | 4.9    | 2.1   | 3.7   | 2.4   | 1.0       | 1.6    | 1.8    | 1.5    | 1.5    |
| Pretax Corporate Profits (\$Bill)                     | 668.4  | 726.4  | 795.9 | 781.9 | 848.0 | 973.0     | 1021.0 | 1083.0 | 1158.0 | 1251.0 |
| Aftertax Corporate Profits (\$Bill)                   | 457.5  | 502.7  | 557.6 | 541.6 | 589.0 | 642.0     | 674.0  | 715.0  | 765.0  | 826.0  |
| Yr-to-Yr % Change                                     | 18.3   | 9.3    | 7.5   | -2.9  | 8.8   | 9.0       | 5.0    | 6.0    | 7.0    | 8.0    |
| <b>COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE</b> |        |        |       |       |       |           |        |        |        |        |
| Gross Domestic Product                                | 2.7    | 3.6    | 4.2   | 4.3   | 4.2   | 4.5       | 3.2    | 3.2    | 3.3    | 3.3    |
| Final Sales   | 5.1    | 5.0    | 5.2   | 4.3   | 4.5   | 4.0       | 3.3    | 3.3    | 3.3    | 3.3    |
| Total Consumption                                     | 3.0    | 3.2    | 3.4   | 4.9   | 5.3   | 4.5       | 3.5    | 3.0    | 3.1    | 3.2    |
| Nonresidential Fixed Investment                       | 9.8    | 9.9    | 10.8  | 12.7  | 8.3   | 11.5      | 6.5    | 6.0    | 6.0    | 6.0    |
| Construction  | 4.5    | 7.1    | 8.4   | 4.1   | -2.4  | 6.0       | 5.5    | 4.0    | 3.0    | 3.0    |
| Equipment & Software                                  | 11.6   | 10.8   | 12.1  | 15.8  | 12.0  | 12.5      | 7.0    | 8.0    | 8.0    | 8.0    |
| Residential Fixed Investment                          | -3.6   | 7.2    | 2.6   | 9.2   | 7.4   | -1.0      | -2.0   | 1.0    | 2.0    | 3.0    |
| Exports   | 10.2   | 8.2    | 12.5  | 2.2   | 3.8   | 6.6       | 7.6    | 8.8    | 9.1    | 8.4    |
| Imports   | 8.3    | 8.6    | 13.7  | 11.6  | 11.7  | 10.7      | 7.4    | 5.7    | 6.6    | 7.3    |
| Federal Government                                    | -2.7   | -0.7   | -0.2  | -0.9  | 2.8   | -0.1      | 0.7    | -0.4   | 0.1    | 0.4    |
| State & Local Governments                             | 2.5    | 2.3    | 3.7   | 3.2   | 4.2   | 4.0       | 2.7    | 2.4    | 2.2    | 2.1    |

## Selected Yields

|                                 | Recent<br>(5/25/00) | 3 Months<br>Ago<br>(2/24/00) | Year<br>Ago<br>(5/27/99) |                                   | Recent<br>(5/25/00) | 3 Months<br>Ago<br>(2/24/00) | Year<br>Ago<br>(5/27/99) |
|---------------------------------|---------------------|------------------------------|--------------------------|-----------------------------------|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>                  |                     |                              |                          | <b>Mortgage-Backed Securities</b> |                     |                              |                          |
| Market Rates                    |                     |                              |                          | GNMA 8%                           | 8.11                | 8.01                         | 6.94                     |
| Discount Rate                   | 6.00                | 5.25                         | 4.50                     | FHLMC 8%                          | 8.24                | 8.03                         | 6.88                     |
| Federal Funds                   | 6.50                | 5.75                         | 4.75                     | FNMA 8%                           | 8.23                | 8.00                         | 6.84                     |
| Prime Rate                      | 9.50                | 8.75                         | 7.75                     | FNMA ARM                          | 6.57                | 6.55                         | 5.83                     |
| 30-day CP (A1/P1)               | 6.48                | 5.75                         | 4.80                     | <b>Corporate Bonds</b>            |                     |                              |                          |
| 3-month LIBOR                   | 6.83                | 6.10                         | 5.07                     | Financial (10-year) A             | 8.33                | 7.68                         | 6.80                     |
| <b>Bank CDs</b>                 |                     |                              |                          | Industrial (25/30-year) A         | 8.32                | 7.69                         | 7.16                     |
| 6-month                         | 5.02                | 4.97                         | 4.00                     | Utility (25/30-year) A            | 8.41                | 7.95                         | 7.17                     |
| 1-year                          | 5.42                | 5.12                         | 4.12                     | Utility (25/30-year) Baa/BBB      | 8.66                | 8.07                         | 7.54                     |
| 5-year                          | 6.00                | 6.05                         | 4.57                     | <b>Foreign Bonds (10-Year)</b>    |                     |                              |                          |
| <b>U.S. Treasury Securities</b> |                     |                              |                          | Canada                            | 6.32                | 6.11                         | 5.47                     |
| 3-month                         | 5.90                | 5.80                         | 4.63                     | Germany                           | 5.31                | 5.40                         | 4.07                     |
| 6-month                         | 6.35                | 6.00                         | 4.81                     | Japan                             | 1.70                | 1.85                         | 1.50                     |
| 1-year                          | 6.20                | 6.20                         | 4.97                     | United Kingdom                    | 5.40                | 5.35                         | 4.96                     |
| 5-year                          | 6.60                | 6.55                         | 5.59                     | <b>Preferred Stocks</b>           |                     |                              |                          |
| 10-year                         | 6.40                | 6.36                         | 5.62                     | Utility A                         | 6.80                | 6.80                         | 6.83                     |
| 30-year                         | 6.10                | 6.13                         | 5.85                     | Financial A                       | 6.20                | 5.94                         | 4.95                     |
| 30-year Zero                    | 6.14                | 6.04                         | 5.95                     | Financial Adjustable A            | 4.96                | 5.53                         | 5.01                     |



### TAX-EXEMPT

|  |      |      |      |
|--|------|------|------|
| <b>Bond Buyer Indexes</b>                |      |      |      |
| 20-Bond Index (GOs)                      | 6.01 | 5.94 | 5.23 |
| 25-Bond Index (Revs)                     | 6.27 | 6.27 | 5.41 |
| <b>General Obligation Bonds (GOs)</b>    |      |      |      |
| 1-year Aaa                               | 4.55 | 4.10 | 3.15 |
| 1-year A                                 | 4.75 | 4.25 | 3.33 |
| 5-year Aaa                               | 5.08 | 4.94 | 4.00 |
| 5-year A                                 | 5.35 | 5.21 | 4.23 |
| 10-year Aaa                              | 5.35 | 5.23 | 4.48 |
| 10-year A                                | 5.64 | 5.50 | 4.75 |
| 25/30-year Aaa                           | 5.99 | 5.90 | 5.16 |
| 25/30-year A                             | 6.26 | 6.16 | 5.40 |
| <b>Revenue Bonds (Revs) (25/30-Year)</b> |      |      |      |
| Education AA                             | 6.14 | 6.09 | 5.42 |
| Electric AA                              | 6.19 | 6.14 | 5.31 |
| Housing AA                               | 6.40 | 6.37 | 5.45 |
| Hospital AA                              | 6.40 | 6.45 | 5.50 |
| Toll Road Aaa                            | 6.32 | 6.25 | 5.40 |

## Federal Reserve Data

### BANK RESERVES

(Two-Week Period; in Millions, Not Seasonally Adjusted)

|                            | Recent Levels |          |        | Average Levels Over the Last... |         |         |
|----------------------------|---------------|----------|--------|---------------------------------|---------|---------|
|                            | 05/17/00      | 05/03/00 | Change | 12 Wks.                         | 26 Wks. | 52 Wks. |
| Excess Reserves            | 922           | 1019     | -97    | 1129                            | 1334    | 1256    |
| Borrowed Reserves          | 303           | 276      | 27     | 223                             | 259     | 258     |
| Net Free/Borrowed Reserves | 619           | 743      | -124   | 906                             | 1075    | 997     |

### MONEY SUPPLY

(One-Week Period; in Billions, Seasonally Adjusted)

|                                     | Recent Levels |          |        | Growth Rates Over the Last... |        |         |
|-------------------------------------|---------------|----------|--------|-------------------------------|--------|---------|
|                                     | 05/15/00      | 05/08/00 | Change | 3 Mos.                        | 6 Mos. | 12 Mos. |
| M1 (Currency+demand deposits)       | 1103.1        | 1093.4   | 9.7    | 0.3%                          | -1.1%  | 0.4%    |
| M2 (M1+savings+small time deposits) | 4753.5        | 4739.6   | 13.9   | 6.5%                          | 5.8%   | 5.4%    |
| M3 (M2+large time deposits)         | 6660.1        | 6636.0   | 24.1   | 8.9%                          | 8.9%   | 8.2%    |



MAY 28, 1999

VALUE LINE SELECTION & OPINION

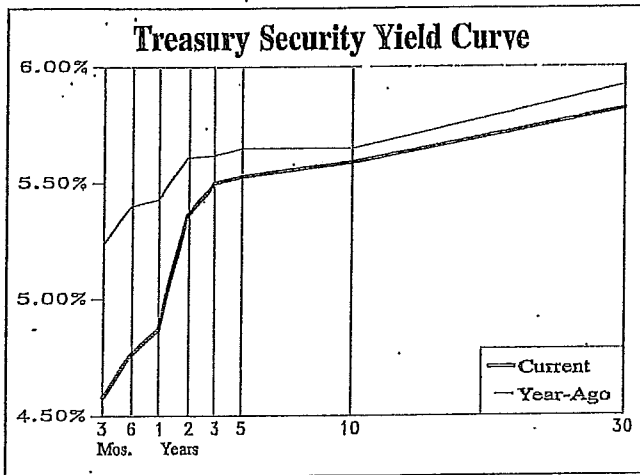
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## Value Line Forecast for the U.S. Economy

|   | ACTUAL |        |        |       |       | ESTIMATED |       |       |       |       |
|---|--------|--------|--------|-------|-------|-----------|-------|-------|-------|-------|
|   | 1994   | 1995   | 1996   | 1997  | 1998  | 1999      | 2000  | 2001  | 2002  | 2003  |
| <b>GROSS DOMESTIC PRODUCT AND ITS COMPONENTS</b>      |        |        |        |       |       |           |       |       |       |       |
| <b>(1992 CHAIN WEIGHTED \$)</b>                       |        |        |        |       |       |           |       |       |       |       |
| <b>BILLIONS OF DOLLARS</b>                            |        |        |        |       |       |           |       |       |       |       |
| Total Consumption                                     | 4486   | 4606   | 4752   | 4914  | 5153  | 5390      | 5554  | 5720  | 5892  | 6069  |
| Nonresidential Fixed Investment                       | 648    | 711    | 777    | 859   | 961   | 1043      | 1110  | 1165  | 1229  | 1303  |
| Residential Fixed Investment                          | 267    | 257    | 276    | 283   | 312   | 334       | 323   | 320   | 323   | 330   |
| Exports   | 712    | 793    | 860    | 970   | 985   | 1003      | 1057  | 1138  | 1228  | 1325  |
| Imports   | 817    | 889    | 971    | 1106  | 1223  | 1334      | 1407  | 1467  | 1546  | 1662  |
| Federal Government                                    | 487    | 471    | 466    | 458   | 453   | 464       | 471   | 463   | 458   | 456   |
| State & Local Governments                             | 766    | 784    | 803    | 827   | 844   | 872       | 897   | 919   | 942   | 964   |
| Gross Domestic Product                                | 6947   | 7270   | 7662   | 8111  | 8511  | 8932      | 9265  | 9663  | 10111 | 10605 |
| Real GDP (1992 Chain Weighted \$)                     | 6611   | 6762   | 6995   | 7270  | 7552  | 7843      | 8024  | 8225  | 8447  | 8684  |
| <b>PRICES AND WAGES-ANNUAL RATES OF CHANGE</b>        |        |        |        |       |       |           |       |       |       |       |
| GDP Price Index (1992 Chain Weighted)                 | 2.3    | 2.5    | 2.1    | 1.9   | 1.0   | 2.0       | 2.1   | 2.1   | 2.2   | 2.3   |
| CPI-All Urban Consumers                               | 2.6    | 2.8    | 2.9    | 2.3   | 1.6   | 2.8       | 2.5   | 2.5   | 2.6   | 2.7   |
| PPI-Finished Goods                                    | 0.6    | 1.9    | 2.6    | 0.4   | -0.9  | 2.3       | 1.6   | 1.6   | 1.8   | 2.0   |
| Employment Cost Index—Total Comp.                     | 3.2    | 2.8    | 2.8    | 3.1   | 3.5   | 3.5       | 3.5   | 3.5   | 3.5   | 3.5   |
| Output per Hour-Nonfarm                               | 0.5    | 0.6    | 0.8    | 1.2   | 2.2   | 2.3       | 1.5   | 1.6   | 1.7   | 1.7   |
| <b>PRODUCTION AND OTHER KEY MEASURES</b>              |        |        |        |       |       |           |       |       |       |       |
| Industrial Prod. (% Change)                           | 5.8    | 3.3    | 2.8    | 6.0   | 3.7   | 2.3       | 2.5   | 3.0   | 3.0   | 3.0   |
| Capacity Utilization Rate (%)                         | 83.1   | 83.1   | 82.1   | 82.0  | 80.8  | 80.3      | 80.2  | 80.7  | 81.3  | 82.0  |
| Housing Starts (Mill. Units)                          | 1.45   | 1.36   | 1.47   | 1.48  | 1.62  | 1.63      | 1.55  | 1.50  | 1.50  | 1.50  |
| Total Light Vehicle Sales (Mill. Units)               | 15.0   | 14.8   | 15.1   | 15.1  | 15.6  | 15.8      | 15.4  | 15.4  | 15.6  | 15.8  |
| Unit Car Sales (Mill. Units)                          | 9.0    | 8.6    | 8.5    | 8.2   | 8.2   | 8.1       | 7.8   | 7.7   | 7.6   | 7.6   |
| U.S. Dollar Exchange Rate (% Change)                  | -1.5   | -5.7   | 4.9    | 8.0   | 5.0   | -1.0      | -2.2  | -3.3  | -2.6  | -1.8  |
| National Unemployment Rate (%)                        | 6.1    | 5.6    | 5.4    | 4.9   | 4.5   | 4.3       | 4.4   | 4.6   | 4.7   | 4.8   |
| Federal Budget Surplus (Unified, FY, \$Bil)           | -203.1 | -163.9 | -107.0 | -22.0 | 70.2  | 117.0     | 108.0 | 90.0  | 115.0 | 125.0 |
| Price of Oil (\$Bbl., U.S. Refiners' Cost)            | 15.52  | 17.24  | 20.69  | 19.11 | 12.66 | 14.90     | 16.60 | 17.25 | 17.90 | 18.75 |
| <b>MONEY AND INTEREST RATES</b>                       |        |        |        |       |       |           |       |       |       |       |
| Annual Money Supply (M2)                              | 3502   | 3638   | 3806   | 4023  | 4365  | 4609      | 4812  | 5010  | 5220  | 5444  |
| Yr-to-Yr % Change (Q4/Q4)                             | 0.6    | 3.9    | 4.6    | 5.8   | 8.5   | 5.6       | 4.4   | 4.1   | 4.2   | 4.3   |
| 3-Month Treasury Bill Rate (%)                        | 4.2    | 5.5    | 5.0    | 5.1   | 4.8   | 4.6       | 4.8   | 4.8   | 4.8   | 4.8   |
| Federal Funds Rate (%)                                | 4.2    | 5.8    | 5.3    | 5.5   | 5.4   | 4.8       | 5.0   | 5.0   | 5.1   | 5.2   |
| 30-Year Treasury Bond Rate (%)                        | 7.4    | 6.9    | 6.7    | 6.6   | 5.6   | 5.6       | 5.6   | 5.6   | 5.7   | 5.8   |
| AAA Corporate Bond Rate (%)                           | 8.0    | 7.6    | 7.4    | 7.3   | 6.5   | 6.1       | 6.1   | 6.1   | 6.2   | 6.3   |
| Prime Rate (%)  | 7.1    | 8.8    | 8.3    | 8.4   | 8.4   | 7.8       | 8.0   | 8.2   | 8.3   | 8.5   |
| <b>INCOMES</b>  |        |        |        |       |       |           |       |       |       |       |
| Personal Income (% Change)                            | 5.0    | 6.3    | 5.5    | 5.6   | 5.0   | 4.8       | 4.6   | 4.6   | 4.6   | 4.7   |
| Real Disp. Inc. (% Change)                            | 2.4    | 3.5    | 2.9    | 2.8   | 3.2   | 3.1       | 3.3   | 3.0   | 3.0   | 3.0   |
| Personal Savings Rate (%)                             | 3.8    | 4.7    | 4.9    | 2.1   | 0.5   | -0.4      | 0.3   | 0.4   | 0.5   | 0.6   |
| Pretax Corporate Profits (\$Bil)                      | 531.2  | 635.6  | 680.2  | 734.4 | 717.8 | 760.0     | 798.0 | 846.0 | 905.0 | 977.0 |
| Aftertax Corporate Profits (\$Bil)                    | 335.9  | 424.6  | 454.1  | 488.3 | 477.7 | 502.0     | 527.0 | 558.0 | 597.0 | 645.0 |
| Yr-to-Yr % Change                                     | 11.9   | 26.4   | 9.3    | 7.5   | -2.2  | 5.0       | 5.0   | 6.0   | 7.0   | 8.0   |
| <b>COMPOSITION OF REAL GDP-ANNUAL RATES OF CHANGE</b> |        |        |        |       |       |           |       |       |       |       |
| Gross Domestic Product                                | 3.5    | 2.3    | 3.4    | 3.9   | 3.9   | 3.8       | 2.3   | 2.5   | 2.7   | 2.8   |
| Final Sales   | 2.9    | 2.5    | 2.8    | 3.5   | 4.0   | 2.7       | 2.5   | 2.5   | 2.6   | 2.7   |
| Total Consumption                                     | 3.3    | 2.4    | 2.6    | 3.4   | 4.9   | 4.6       | 3.0   | 3.0   | 3.0   | 3.0   |
| Nonresidential Fixed Investment                       | 8.0    | 9.0    | 9.2    | 10.7  | 11.8  | 8.6       | 6.4   | 5.0   | 5.5   | 6.0   |
| Construction  | 1.0    | 4.3    | 4.8    | 7.1   | -0.1  | 1.0       | 2.5   | 2.5   | 3.0   | 3.5   |
| Durable Equipment                                     | 11.0   | 10.8   | 10.9   | 12.1  | 16.5  | 12.0      | 7.0   | 5.0   | 6.0   | 7.0   |
| Residential Fixed Investment                          | 10.1   | -3.8   | 5.9    | 2.5   | 10.4  | 7.0       | -3.0  | -1.0  | 1.0   | 2.0   |
| Exports   | 8.2    | 11.1   | 8.3    | 12.8  | 1.5   | 1.8       | 5.3   | 7.7   | 7.9   | 7.9   |
| Imports   | 12.2   | 8.9    | 9.1    | 13.9  | 10.6  | 9.1       | 5.5   | 4.2   | 5.4   | 7.5   |
| Federal Government                                    | -3.8   | -3.3   | -1.3   | -1.6  | -1.0  | 2.4       | 1.4   | -1.6  | -1.0  | -0.6  |
| State & Local Governments                             | 2.6    | 2.1    | 1.6    | 3.1   | 2.0   | 3.3       | 3.0   | 2.4   | 2.5   | 2.4   |

## Selected Yields

|                                 | Recent<br>(5/20/99) | 3 Months<br>Ago<br>(2/18/99) | Year<br>Ago<br>(5/21/98) |                                   | Recent<br>(5/20/99) | 3 Months<br>Ago<br>(2/18/99) | Year<br>Ago<br>(5/21/98) |
|---------------------------------|---------------------|------------------------------|--------------------------|-----------------------------------|---------------------|------------------------------|--------------------------|
| <b>TAXABLE</b>                  |                     |                              |                          | <b>Mortgage-Backed Securities</b> |                     |                              |                          |
| Market Rates                    |                     |                              |                          | GNMA 8%                           | 6.93                | 6.57                         | 6.93                     |
| Discount Rate                   | 4.50                | 4.50                         | 5.00                     | FHLMC 8%                          | 6.88                | 6.49                         | 6.88                     |
| Federal Funds                   | 4.75                | 4.75                         | 5.50                     | FNMA 8%                           | 6.83                | 6.38                         | 6.87                     |
| Prime Rate                      | 7.75                | 7.75                         | 8.50                     | FNMA ARM                          | 5.72                | 5.70                         | 6.17                     |
| 30-day CP (A1/P1)               | 4.80                | 4.80                         | 5.49                     | <b>Corporate Bonds</b>            |                     |                              |                          |
| 3-month LIBOR                   | 5.05                | 5.00                         | 5.69                     | Financial (10-year) A             | 6.75                | 6.19                         | 6.41                     |
| <b>Bank CDs</b>                 |                     |                              |                          | Industrial (25/30-year) A         | 7.05                | 6.61                         | 6.80                     |
| 6-month                         | 4.00                | 3.97                         | 4.45                     | Utility (25/30-year) A            | 7.06                | 6.55                         | 6.71                     |
| 1-year                          | 4.09                | 3.97                         | 4.61                     | Utility (25/30-year) Baa/BBB      | 7.46                | 6.97                         | 7.05                     |
| 5-year                          | 4.52                | 4.19                         | 4.97                     | <b>Foreign Bonds (10-Year)</b>    |                     |                              |                          |
| <b>U.S. Treasury Securities</b> |                     |                              |                          | Canada                            | 5.38                | 5.14                         | 5.37                     |
| 3-month                         | 4.58                | 4.52                         | 5.24                     | Germany                           | 4.09                | 3.92                         | 4.94                     |
| 6-month                         | 4.76                | 4.60                         | 5.40                     | Japan                             | 1.33                | 1.99                         | 1.55                     |
| 1-year                          | 4.87                | 4.70                         | 5.43                     | United Kingdom                    | 4.98                | 4.52                         | 5.85                     |
| 5-year                          | 5.53                | 4.95                         | 5.65                     | <b>Preferred Stocks</b>           |                     |                              |                          |
| 10-year                         | 5.59                | 5.04                         | 5.65                     | Utility A                         | 6.82                | 6.82                         | 6.83                     |
| 30-year                         | 5.82                | 5.37                         | 5.92                     | Financial A                       | 4.95                | 4.80                         | 5.14                     |
| 30-year Zero                    | 6.00                | 5.46                         | 5.99                     | Financial Adjustable A            | 5.01                | 4.88                         | 4.85                     |



### TAX-EXEMPT

|  |      |      |      |
|--|------|------|------|
| <b>Bond Buyer Indexes</b>                |      |      |      |
| 20-Bond Index (GOs)                      | 5.21 | 5.01 | 5.16 |
| 25-Bond Index (Revs)                     | 5.37 | 5.23 | 5.42 |
| <b>General Obligation Bonds (GOs)</b>    |      |      |      |
| 1-year Aaa                               | 3.15 | 2.95 | 3.70 |
| 1-year A                                 | 3.33 | 3.10 | 3.90 |
| 5-year Aaa                               | 3.98 | 3.70 | 4.15 |
| 5-year A                                 | 4.20 | 3.90 | 4.25 |
| 10-year Aaa                              | 4.45 | 4.13 | 4.45 |
| 10-year A                                | 4.70 | 4.35 | 4.65 |
| 25/30-year Aaa                           | 5.15 | 4.93 | 5.08 |
| 25/30-year A                             | 5.36 | 5.11 | 5.28 |
| <b>Revenue Bonds (Revs) (25/30-Year)</b> |      |      |      |
| Education AA                             | 5.40 | 5.11 | 5.25 |
| Electric AA                              | 5.28 | 5.12 | 5.19 |
| Housing AA                               | 5.40 | 5.32 | 5.38 |
| Hospital AA                              | 5.47 | 5.28 | 5.32 |
| Toll Road Aaa                            | 5.36 | 5.18 | 5.30 |

## Federal Reserve Data

### BANK RESERVES

(Two-Week Period; in Millions, Not Seasonally Adjusted)

|                            | Recent Levels |        |        | Average Levels Over the Last... |         |         |
|----------------------------|---------------|--------|--------|---------------------------------|---------|---------|
|                            | 5/19/99       | 5/5/99 | Change | 12 Wks.                         | 26 Wks. | 52 Wks. |
| Excess Reserves            | 1072          | 1285   | -213   | 1213                            | 1356    | 1448    |
| Borrowed Reserves          | 103           | 223    | -120   | 115                             | 131     | 177     |
| Net Free/Borrowed Reserves | 969           | 1062   | -93    | 1098                            | 1226    | 1271    |

### MONEY SUPPLY

(One-Week Period; in Billions, Seasonally Adjusted)

|                                     | Recent Levels |        |        | Growth Rates Over the Last... |        |         |
|-------------------------------------|---------------|--------|--------|-------------------------------|--------|---------|
|                                     | 5/10/99       | 5/3/99 | Change | 3 Mos.                        | 6 Mos. | 12 Mos. |
| M1 (Currency+demand deposits)       | 1096.4        | 1116.9 | -20.5  | 4.8%                          | 2.3%   | 2.0%    |
| M2 (M1+savings+small time deposits) | 4500.7        | 4490.3 | 10.4   | 6.3%                          | 6.9%   | 8.0%    |
| M3 (M2+large time deposits)         | 6102.7        | 6091.6 | 11.1   | 3.4%                          | 6.3%   | 8.6%    |

Indiana-American Water Company  
Revenues at Present Rates

Explanation of Adjustments from Base Year to Step 1 Present Rates

| Adjustment Category                   | Residential   | Commercial    | Industrial    | OPC         | Miscellaneous | SFR           | File          | Unbilled Revenue | Late Fees  | Other Miscellaneous Revenue | Total          | Rate Revenue   | Miscellaneous Revenue |
|---------------------------------------|---------------|---------------|---------------|-------------|---------------|---------------|---------------|------------------|------------|-----------------------------|----------------|----------------|-----------------------|
| TCIA Impact                           | (\$5,388,205) | (\$2,182,661) | (\$751,977)   | (\$393,826) | (\$2,668)     | (\$567,901)   | (\$1,302,631) | \$0              | (\$63,156) | \$0                         | (\$10,653,025) | (\$10,589,869) | (\$63,156)            |
| Declining Use                         | (2,854,679)   | x             | x             | x           | x             | x             | x             | 0                | (17,025)   | 0                           | (2,871,704)    | (2,854,679)    | (17,025)              |
| Normalization of Billing Units        | (683,751)     | 984,621       | (160,923)     | (164,919)   | x             | (542,604)     | x             | 0                | (5,770)    | 131,782                     | (841,564)      | (967,576)      | 126,012               |
| Organic Growth                        | 1,862,510     | 101,538       | x             | 39,955      | x             | x             | 551,543       | 0                | 15,479     | 0                           | 2,611,025      | 2,595,545      | 15,479                |
| Acquisitions                          | 1,784,807     | 312,882       | 530,785       | 21,896      | x             | x             | x             | 0                | 15,806     | 0                           | 2,666,175      | 2,650,368      | 15,806                |
| Miscellaneous Adjustments             | (54,013)      | 22,290        | (50,440)      | (138)       | (52,101)      | (290,441)     | (109,677)     | (253,198)        | (3,188)    | 0                           | (790,906)      | (787,718)      | (3,188)               |
| BSIC Revenue                          | 7,569,944     | 1,651,963     | (845,317)     | 178,394     | 20,678        | (1,400,946)   | x             | 0                | 51,144     | 0                           | 8,626,805      | 8,575,661      | 51,144                |
| Total Adjustments                     | 2,236,612     | 490,653       | (1,277,872)   | (318,659)   | (94,092)      | (1,400,946)   | (820,765)     | 0                | (6,710)    | 131,782                     | (1,253,195)    | (1,378,268)    | 125,072               |
| Base Year                             | 112,206,022   | 44,190,004    | 15,719,359    | 8,282,993   | 107,378       | 12,375,429    | 25,330,041    | 253,198          | 1,301,369  | 2,300,495                   | 222,066,288    |                |                       |
| F.Y. - Present Rates (TCIA)           | 114,442,654   | 44,680,657    | 14,441,487    | 7,964,354   | 73,286        | 10,974,483    | 24,509,276    | 0                | 1,294,659  | 2,482,277                   | 220,813,093    |                |                       |
| Total Variance                        | \$2,236,612   | \$490,653     | (\$1,277,872) | (\$318,659) | (\$94,092)    | (\$1,400,946) | (\$820,765)   | (\$253,198)      | (\$6,710)  | \$131,782                   | (\$1,253,195)  |                |                       |
| Area 1 - Usage Adjustment             | (\$801,563)   | \$155,575     | (\$70,223)    | (\$43,307)  |               |               |               |                  |            |                             |                |                |                       |
| Area 2 Winchester - Usage Adjustment  | (3,879)       | 373           | 14,604        | (864)       |               |               |               |                  |            |                             |                |                |                       |
| Area 2 Mooresville - Usage Adjustment | (8,995)       | (216)         | 152           | (3,205)     |               |               |               |                  |            |                             |                |                |                       |
| Area 1 - Organic Growth               | 4,258         | 59            | 0             | 9           |               |               |               |                  |            |                             |                |                |                       |
| Customers                             | 200,579       | 19,169        | 0             | 10,229      |               |               |               |                  |            |                             |                |                |                       |
| Usage                                 |               |               |               |             |               |               |               |                  |            |                             |                |                |                       |
| Area 2 Winchester - Organic Growth    | 13            | (2)           | 0             | (2)         |               |               |               |                  |            |                             |                |                |                       |
| Customers                             | 520           | (431)         | 0             | (880)       |               |               |               |                  |            |                             |                |                |                       |
| Usage                                 |               |               |               |             |               |               |               |                  |            |                             |                |                |                       |
| Area 2 Mooresville - Organic Growth   | 33            | 7             | 0             | 0           |               |               |               |                  |            |                             |                |                |                       |
| Customers                             | 1,489         | 1,306         | (0)           | 0           |               |               |               |                  |            |                             |                |                |                       |
| Usage                                 |               |               |               |             |               |               |               |                  |            |                             |                |                |                       |
| Acquisitions                          | 3,842         | 155           | 16            | 12          |               |               |               |                  |            |                             |                |                |                       |
| Customers                             | 203,432       | 66,252        | 173,204       | 3,930       |               |               |               |                  |            |                             |                |                |                       |
| Usage                                 |               |               |               |             |               |               |               |                  |            |                             |                |                |                       |
| Total Usage Decline                   | (408,416)     | 242,026       | (52,579)      | (94,097)    |               |               |               |                  |            |                             |                |                |                       |
|                                       | (408,416)     | 242,026       | 117,737       | (34,097)    |               |               |               |                  |            |                             |                |                |                       |
| Area 1 - Usage Adjustment             |               |               |               |             |               |               |               |                  |            |                             |                |                |                       |
| Usage Step 1                          | (752,605)     | 37,848        | (1,096)       | (3,786)     |               |               |               |                  |            |                             |                |                |                       |
| Usage Step 2                          | (48,949)      | 117,089       | (37,883)      | (36,874)    |               |               |               |                  |            |                             |                |                |                       |
| Usage Step 3                          | (8)           | 637           | (31,245)      | (2,647)     |               |               |               |                  |            |                             |                |                |                       |
| Revenue                               | (\$3,315,754) | \$166,748     | (\$4,830)     | (\$16,680)  |               |               |               |                  |            |                             |                |                |                       |
| Revenue                               | (173,946)     | 416,087       | (134,620)     | (131,035)   |               |               |               |                  |            |                             |                |                |                       |
| Revenue                               | (16)          | 1,292         | (63,298)      | (5,362)     |               |               |               |                  |            |                             |                |                |                       |
|                                       | (\$3,489,716) | \$584,127     | (\$202,747)   | (\$153,077) |               |               |               |                  |            |                             |                |                |                       |

0.00596 late fee ratio

0.19324 percentage of residential usage adjustment related to weather

INDIANA AMERICAN WATER  
 Residential Customer and Consumption Data  
 January 1990 - April 2014

| DATE   | Day   | USAGE (KGAL) | # Cust. | Mo. Usage<br>per cust. | 4-MONTH WINTER JANUARY - APRIL                    |                        |  |                        |  |
|--------|-------|--------------|---------|------------------------|---|------------------------|--|------------------------|--|
|        |       |              |         |                        | Winter Avg.<br>Mo. Usage Per Cust.<br>(JAN - APR) | 10-YEAR                |  | 5-YEAR                 |  |
|        |       |              |         |                        |   | Trendline<br>2004-2013 | % Base<br>92.1%                        | Trendline<br>2009-2013 | % Base<br>92.1%                        |
|        |       |              |         |                        |   |                        | Non-Base Usage (gal/cust/mo)<br>391.67 |                        | Non-Base Usage (gal/cust/mo)<br>391.67 |
| Jan-90 | 32874 | 378,371      | 75,018  | 5,044                  |   |                        |  |                        |  |
| Feb-90 | 32905 | 375,006      | 75,059  | 4,996                  |   |                        |  |                        |  |
| Mar-90 | 32933 | 350,515      | 75,123  | 4,666                  |   |                        |  |                        |  |
| Apr-90 | 32964 | 359,489      | 75,329  | 4,772                  |   |                        |  |                        |  |
| May-90 | 32994 | 361,322      | 75,505  | 4,785                  |   |                        |  |                        |  |
| Jun-90 | 33025 | 397,832      | 75,590  | 5,263                  |   |                        |  |                        |  |
| Jul-90 | 33055 | 448,662      | 75,648  | 5,931                  |   |                        |  |                        |  |
| Aug-90 | 33086 | 461,142      | 75,803  | 6,083                  |   |                        |  |                        |  |
| Sep-90 | 33117 | 459,538      | 75,945  | 6,051                  |   |                        |  |                        |  |
| Oct-90 | 33147 | 406,227      | 76,874  | 5,354                  |   |                        |  |                        |  |
| Nov-90 | 33178 | 364,437      | 75,749  | 4,811                  |   |                        |  |                        |  |
| Dec-90 | 33208 | 362,034      | 75,705  | 4,782                  |   |                        |  |                        |  |
| Jan-91 | 33239 | 395,441      | 75,840  | 5,214                  |   |                        |  |                        |  |
| Feb-91 | 33270 | 391,913      | 75,862  | 5,166                  |   |                        |  |                        |  |
| Mar-91 | 33298 | 366,320      | 75,940  | 4,824                  |   |                        |  |                        |  |
| Apr-91 | 33329 | 375,712      | 76,172  | 4,932                  |   |                        |  |                        |  |
| May-91 | 33359 | 377,597      | 76,421  | 4,941                  |   |                        |  |                        |  |
| Jun-91 | 33390 | 415,775      | 76,566  | 5,430                  |   |                        |  |                        |  |
| Jul-91 | 33420 | 468,853      | 76,652  | 6,117                  |   |                        |  |                        |  |
| Aug-91 | 33451 | 481,857      | 76,873  | 6,268                  |   |                        |  |                        |  |
| Sep-91 | 33482 | 480,244      | 77,071  | 6,231                  |   |                        |  |                        |  |
| Oct-91 | 33512 | 424,559      | 76,925  | 5,519                  |   |                        |  |                        |  |
| Nov-91 | 33543 | 380,980      | 76,719  | 4,966                  |   |                        |  |                        |  |
| Dec-91 | 33573 | 378,419      | 76,636  | 4,938                  |   |                        |  |                        |  |
| Jan-92 | 33604 | 385,651      | 76,740  | 5,025                  |   |                        |  |                        |  |
| Feb-92 | 33635 | 382,466      | 76,765  | 4,982                  |   |                        |  |                        |  |
| Mar-92 | 33664 | 357,433      | 76,844  | 4,651                  |   |                        |  |                        |  |
| Apr-92 | 33695 | 366,499      | 77,092  | 4,754                  |   |                        |  |                        |  |
| May-92 | 33725 | 368,264      | 77,349  | 4,761                  |   |                        |  |                        |  |
| Jun-92 | 33756 | 405,688      | 77,485  | 5,234                  |   |                        |  |                        |  |
| Jul-92 | 33786 | 457,466      | 77,568  | 5,898                  |   |                        |  |                        |  |
| Aug-92 | 33817 | 470,073      | 77,769  | 6,044                  |   |                        |  |                        |  |
| Sep-92 | 33848 | 468,479      | 77,957  | 6,009                  |   |                        |  |                        |  |
| Oct-92 | 33878 | 414,190      | 77,810  | 5,323                  |   |                        |  |                        |  |
| Nov-92 | 33909 | 371,585      | 77,607  | 4,788                  |   |                        |  |                        |  |
| Dec-92 | 33939 | 369,105      | 77,540  | 4,760                  |   |                        |  |                        |  |
| Jan-93 | 33970 | 381,470      | 77,725  | 4,908                  |   |                        |  |                        |  |
| Feb-93 | 34001 | 378,162      | 77,730  | 4,885                  |   |                        |  |                        |  |
| Mar-93 | 34029 | 353,424      | 77,810  | 4,542                  |   |                        |  |                        |  |
| Apr-93 | 34060 | 362,463      | 78,023  | 4,646                  |   |                        |  |                        |  |
| May-93 | 34090 | 364,300      | 78,293  | 4,653                  |   |                        |  |                        |  |
| Jun-93 | 34121 | 401,167      | 78,458  | 5,113                  |   |                        |  |                        |  |
| Jul-93 | 34151 | 452,477      | 78,548  | 5,761                  |   |                        |  |                        |  |
| Aug-93 | 34182 | 465,022      | 78,748  | 5,905                  |   |                        |  |                        |  |
| Sep-93 | 34213 | 463,332      | 78,935  | 5,870                  |   |                        |  |                        |  |
| Oct-93 | 34243 | 409,558      | 78,765  | 5,200                  |   |                        |  |                        |  |
| Nov-93 | 34274 | 367,390      | 78,546  | 4,677                  |   |                        |  |                        |  |
| Dec-93 | 34304 | 364,947      | 78,483  | 4,651                  |   |                        |  |                        |  |
| Jan-94 | 34335 | 612,495      | 137,151 | 5,924                  |   |                        |  |                        |  |
| Feb-94 | 34366 | 756,409      | 137,160 | 5,529                  |   |                        |  |                        |  |
| Mar-94 | 34394 | 744,142      | 137,348 | 5,418                  |   |                        |  |                        |  |
| Apr-94 | 34425 | 745,247      | 137,744 | 5,410                  |   |                        |  |                        |  |
| May-94 | 34455 | 724,990      | 138,129 | 5,249                  |   |                        |  |                        |  |
| Jun-94 | 34486 | 816,762      | 138,485 | 5,898                  |   |                        |  |                        |  |
| Jul-94 | 34516 | 926,396      | 138,747 | 6,677                  |   |                        |  |                        |  |
| Aug-94 | 34547 | 809,184      | 139,000 | 6,541                  |   |                        |  |                        |  |
| Sep-94 | 34578 | 906,288      | 139,224 | 6,510                  |   |                        |  |                        |  |
| Oct-94 | 34608 | 830,567      | 139,238 | 5,965                  |   |                        |  |                        |  |
| Nov-94 | 34639 | 759,512      | 139,195 | 5,456                  |   |                        |  |                        |  |
| Dec-94 | 34669 | 746,092      | 139,249 | 5,358                  |   |                        |  |                        |  |
| Jan-95 | 34700 | 796,409      | 139,264 | 5,719                  |   |                        |  |                        |  |
| Feb-95 | 34731 | 749,545      | 139,473 | 5,374                  |   |                        |  |                        |  |
| Mar-95 | 34759 | 709,879      | 139,816 | 5,077                  |   |                        |  |                        |  |
| Apr-95 | 34790 | 730,404      | 140,290 | 5,206                  |   |                        |  |                        |  |
| May-95 | 34820 | 720,188      | 140,770 | 5,116                  |   |                        |  |                        |  |
| Jun-95 | 34851 | 814,732      | 141,154 | 5,772                  |   |                        |  |                        |  |
| Jul-95 | 34881 | 915,429      | 141,253 | 6,481                  |   |                        |  |                        |  |
| Aug-95 | 34912 | 951,518      | 141,544 | 6,722                  |   |                        |  |                        |  |
| Sep-95 | 34943 | 1,009,997    | 141,872 | 7,119                  |   |                        |  |                        |  |
| Oct-95 | 34973 | 879,657      | 142,038 | 6,193                  |   |                        |  |                        |  |
| Nov-95 | 35004 | 773,089      | 141,688 | 5,456                  |   |                        |  |                        |  |
| Dec-95 | 35034 | 768,122      | 141,812 | 5,416                  |   |                        |  |                        |  |
| Jan-96 | 35065 | 778,405      | 141,854 | 5,487                  |   |                        |  |                        |  |
| Feb-96 | 35096 | 784,103      | 141,808 | 5,529                  |   |                        |  |                        |  |
| Mar-96 | 35125 | 757,132      | 142,056 | 5,330                  |   |                        |  |                        |  |
| Apr-96 | 35156 | 740,399      | 142,505 | 5,196                  |   |                        |  |                        |  |
| May-96 | 35186 | 746,510      | 143,081 | 5,217                  |   |                        |  |                        |  |
| Jun-96 | 35217 | 800,951      | 143,275 | 5,590                  |   |                        |  |                        |  |
| Jul-96 | 35247 | 930,063      | 143,264 | 6,492                  |   |                        |  |                        |  |
| Aug-96 | 35278 | 982,229      | 143,877 | 6,827                  |   |                        |  |                        |  |
| Sep-96 | 35309 | 977,739      | 144,089 | 6,786                  |   |                        |  |                        |  |
| Oct-96 | 35339 | 845,913      | 144,174 | 5,867                  |   |                        |  |                        |  |
| Nov-96 | 35370 | 756,648      | 143,866 | 5,259                  |   |                        |  |                        |  |
| Dec-96 | 35400 | 750,636      | 143,880 | 5,217                  |   |                        |  |                        |  |
| Jan-97 | 35431 | 802,587      | 143,917 | 5,577                  |   |                        |  |                        |  |
| Feb-97 | 35462 | 798,350      | 144,069 | 5,541                  |   |                        |  |                        |  |
| Mar-97 | 35490 | 728,711      | 144,203 | 5,053                  |   |                        |  |                        |  |
| Apr-97 | 35521 | 712,955      | 144,740 | 4,926                  |   |                        |  |                        |  |
| May-97 | 35551 | 761,875      | 145,217 | 5,246                  |   |                        |  |                        |  |
| Jun-97 | 35582 | 806,468      | 145,768 | 5,533                  |   |                        |  |                        |  |
| Jul-97 | 35612 | 916,264      | 146,113 | 6,285                  |   |                        |  |                        |  |
| Aug-97 | 35643 | 1,044,363    | 146,349 | 7,136                  |   |                        |  |                        |  |
| Sep-97 | 35674 | 965,902      | 146,855 | 6,586                  |   |                        |  |                        |  |
| Oct-97 | 35704 | 849,090      | 146,448 | 5,797                  |   |                        |  |                        |  |
| Nov-97 | 35735 | 817,976      | 146,284 | 5,592                  |   |                        |  |                        |  |
| Dec-97 | 35765 | 749,970      | 146,313 | 5,126                  |   |                        |  |                        |  |



|        |       |           |         |       |       |  |  |
|--------|-------|-----------|---------|-------|-------|--|--|
| Jan-98 | 35796 | 797,203   | 146,268 | 5,450 |       |  |  |
| Feb-98 | 35827 | 761,670   | 146,476 | 5,200 |       |  |  |
| Mar-98 | 35855 | 722,911   | 146,707 | 4,926 |       |  |  |
| Apr-98 | 35886 | 742,803   | 147,252 | 5,044 |       |  |  |
| May-98 | 35916 | 758,127   | 147,878 | 5,127 |       |  |  |
| Jun-98 | 35947 | 827,165   | 148,190 | 5,682 |       |  |  |
| Jul-98 | 35977 | 910,159   | 148,438 | 6,132 |       |  |  |
| Aug-98 | 36008 | 1,009,456 | 148,790 | 6,784 |       |  |  |
| Sep-98 | 36039 | 1,001,877 | 149,131 | 6,718 |       |  |  |
| Oct-98 | 36069 | 958,247   | 149,982 | 6,432 |       |  |  |
| Nov-98 | 36100 | 800,791   | 148,721 | 5,385 |       |  |  |
| Dec-98 | 36130 | 751,657   | 148,779 | 5,052 |       |  |  |
| Jan-99 | 36161 | 825,048   | 149,431 | 5,521 |       |  |  |
| Feb-99 | 36192 | 780,266   | 149,534 | 5,218 |       |  |  |
| Mar-99 | 36220 | 745,594   | 149,826 | 4,976 |       |  |  |
| Apr-99 | 36251 | 766,923   | 150,432 | 5,098 |       |  |  |
| May-99 | 36281 | 776,649   | 151,153 | 5,138 |       |  |  |
| Jun-99 | 36312 | 895,421   | 151,574 | 5,914 |       |  |  |
| Jul-99 | 36342 | 985,495   | 152,024 | 6,482 |       |  |  |
| Aug-99 | 36373 | 1,056,284 | 152,416 | 6,930 |       |  |  |
| Sep-99 | 36404 | 1,092,488 | 152,713 | 7,154 |       |  |  |
| Oct-99 | 36434 | 969,652   | 152,512 | 6,358 |       |  |  |
| Nov-99 | 36465 | 792,414   | 152,370 | 5,201 |       |  |  |
| Dec-99 | 36495 | 773,403   | 152,312 | 5,078 |       |  |  |
| Jan-00 | 36526 | 1,209,426 | 223,947 | 5,401 |       |  |  |
| Feb-00 | 36557 | 1,194,276 | 224,214 | 5,327 |       |  |  |
| Mar-00 | 36588 | 1,094,771 | 224,741 | 4,871 |       |  |  |
| Apr-00 | 36617 | 1,136,606 | 225,641 | 5,037 |       |  |  |
| May-00 | 36647 | 1,161,784 | 226,453 | 5,130 |       |  |  |
| Jun-00 | 36678 | 1,373,754 | 227,003 | 6,052 |       |  |  |
| Jul-00 | 36708 | 1,355,734 | 227,560 | 5,958 |       |  |  |
| Aug-00 | 36739 | 1,447,797 | 228,582 | 6,334 |       |  |  |
| Sep-00 | 36770 | 1,411,012 | 228,803 | 6,167 |       |  |  |
| Oct-00 | 36800 | 1,289,678 | 228,344 | 5,648 |       |  |  |
| Nov-00 | 36831 | 1,144,047 | 228,108 | 5,015 |       |  |  |
| Dec-00 | 36861 | 1,163,041 | 228,008 | 5,101 |       |  |  |
| Jan-01 | 36892 | 1,228,247 | 227,747 | 5,393 |       |  |  |
| Feb-01 | 36923 | 1,196,959 | 228,249 | 5,253 |       |  |  |
| Mar-01 | 36951 | 1,098,659 | 228,244 | 4,814 |       |  |  |
| Apr-01 | 36982 | 1,147,544 | 229,117 | 5,009 |       |  |  |
| May-01 | 37012 | 1,253,258 | 230,386 | 5,440 |       |  |  |
| Jun-01 | 37043 | 1,374,285 | 230,792 | 5,955 |       |  |  |
| Jul-01 | 37073 | 1,409,787 | 231,096 | 6,100 |       |  |  |
| Aug-01 | 37104 | 1,598,735 | 231,647 | 6,902 |       |  |  |
| Sep-01 | 37135 | 1,369,909 | 232,044 | 6,033 |       |  |  |
| Oct-01 | 37165 | 1,290,914 | 231,529 | 5,576 |       |  |  |
| Nov-01 | 37196 | 1,046,903 | 231,284 | 4,535 |       |  |  |
| Dec-01 | 37226 | 1,177,416 | 231,253 | 5,091 |       |  |  |
| Jan-02 | 37257 | 1,113,663 | 232,365 | 4,793 |       |  |  |
| Feb-02 | 37288 | 1,158,350 | 232,691 | 4,978 |       |  |  |
| Mar-02 | 37316 | 1,057,745 | 233,023 | 4,539 |       |  |  |
| Apr-02 | 37347 | 1,113,663 | 233,887 | 4,760 |       |  |  |
| May-02 | 37377 | 1,137,349 | 234,821 | 4,843 |       |  |  |
| Jun-02 | 37408 | 1,336,197 | 235,724 | 5,668 |       |  |  |
| Jul-02 | 37438 | 1,568,954 | 236,223 | 6,642 |       |  |  |
| Aug-02 | 37469 | 1,846,208 | 236,053 | 7,821 |       |  |  |
| Sep-02 | 37500 | 1,589,047 | 235,263 | 6,750 |       |  |  |
| Oct-02 | 37530 | 1,422,578 | 234,324 | 6,071 |       |  |  |
| Nov-02 | 37561 | 1,149,594 | 233,833 | 4,916 |       |  |  |
| Dec-02 | 37591 | 1,184,946 | 233,799 | 5,068 |       |  |  |
| Jan-03 | 37622 | 961,538   | 234,766 | 4,095 |       |  |  |
| Feb-03 | 37653 | 1,113,461 | 234,870 | 4,741 |       |  |  |
| Mar-03 | 37681 | 1,336,316 | 235,051 | 5,685 | 4,894 |  |  |
| Apr-03 | 37712 | 1,003,727 | 235,928 | 4,254 |       |  |  |
| May-03 | 37742 | 1,070,162 | 236,546 | 4,624 |       |  |  |
| Jun-03 | 37773 | 1,465,664 | 237,363 | 6,174 |       |  |  |
| Jul-03 | 37803 | 1,219,620 | 237,913 | 5,126 |       |  |  |
| Aug-03 | 37834 | 1,227,849 | 238,292 | 5,153 |       |  |  |
| Sep-03 | 37865 | 1,655,157 | 238,359 | 6,844 |       |  |  |
| Oct-03 | 37895 | 1,257,308 | 237,631 | 5,291 |       |  |  |
| Nov-03 | 37926 | 1,051,183 | 236,945 | 4,436 |       |  |  |
| Dec-03 | 37956 | 1,287,824 | 236,817 | 5,354 |       |  |  |
| Jan-04 | 37987 | 1,267,824 | 236,525 | 5,360 |       |  |  |
| Feb-04 | 38018 | 1,171,218 | 236,546 | 4,951 | 4,985 |  |  |
| Mar-04 | 38047 | 1,121,945 | 237,630 | 4,721 |       |  |  |
| Apr-04 | 38078 | 1,174,557 | 239,216 | 4,910 |       |  |  |
| May-04 | 38108 | 1,115,445 | 239,946 | 4,649 |       |  |  |
| Jun-04 | 38139 | 1,371,070 | 240,693 | 5,696 |       |  |  |
| Jul-04 | 38169 | 1,341,666 | 241,203 | 5,562 |       |  |  |
| Aug-04 | 38200 | 1,475,337 | 241,435 | 6,111 |       |  |  |
| Sep-04 | 38231 | 1,315,349 | 242,113 | 5,433 |       |  |  |
| Oct-04 | 38261 | 1,421,742 | 241,834 | 5,879 |       |  |  |
| Nov-04 | 38292 | 923,424   | 241,093 | 3,830 |       |  |  |
| Dec-04 | 38322 | 1,302,342 | 241,055 | 5,403 |       |  |  |
| Jan-05 | 38353 | 1,196,061 | 240,775 | 4,968 |       |  |  |
| Feb-05 | 38384 | 1,134,327 | 241,122 | 4,704 | 4,789 |  |  |
| Mar-05 | 38412 | 1,098,499 | 241,561 | 4,548 |       |  |  |
| Apr-05 | 38443 | 1,201,460 | 243,322 | 4,938 |       |  |  |
| May-05 | 38473 | 1,111,813 | 244,200 | 4,553 |       |  |  |
| Jun-05 | 38504 | 1,496,849 | 244,896 | 6,112 |       |  |  |
| Jul-05 | 38534 | 1,502,193 | 245,360 | 6,122 |       |  |  |
| Aug-05 | 38565 | 1,697,675 | 245,687 | 6,910 |       |  |  |
| Sep-05 | 38596 | 1,406,058 | 246,439 | 5,706 |       |  |  |
| Oct-05 | 38626 | 1,369,733 | 246,138 | 5,595 |       |  |  |
| Nov-05 | 38657 | 1,127,403 | 245,600 | 4,590 |       |  |  |
| Dec-05 | 38687 | 1,216,965 | 245,469 | 4,958 |       |  |  |
| Jan-06 | 38718 | 1,112,945 | 245,378 | 4,536 |       |  |  |
| Feb-06 | 38749 | 1,092,310 | 245,853 | 4,443 | 4,451 |  |  |
| Mar-06 | 38777 | 1,082,413 | 246,569 | 4,390 |       |  |  |
| Apr-06 | 38808 | 1,097,848 | 247,480 | 4,436 |       |  |  |
| May-06 | 38838 | 1,146,447 | 248,793 | 4,616 |       |  |  |
| Jun-06 | 38869 | 1,420,158 | 249,660 | 5,688 |       |  |  |
| Jul-06 | 38899 | 1,299,419 | 249,910 | 5,200 |       |  |  |
| Aug-06 | 38930 | 1,621,974 | 250,650 | 6,471 |       |  |  |
| Sep-06 | 38961 | 1,274,651 | 250,701 | 5,084 |       |  |  |
| Oct-06 | 38991 | 1,297,009 | 249,824 | 5,192 |       |  |  |
| Nov-06 | 39022 | 1,020,744 | 249,036 | 4,099 |       |  |  |
| Dec-06 | 39052 | 1,161,239 | 248,274 | 4,677 |       |  |  |

$y = -0.2494x + 14376$   
 $R^2 = 0.867$

|          |       |           |         |       |                             |               |                     |
|----------|-------|-----------|---------|-------|-----------------------------|---------------|---------------------|
| Jan-07   | 39083 | 1,228,257 | 248,418 | 4,944 |                             | 4629          |                     |
| Feb-07   | 39114 | 1,118,318 | 248,648 | 4,498 | 4,626                       | 4621          |                     |
| Mar-07   | 39142 | 1,135,255 | 249,217 | 4,555 |                             | 4614          |                     |
| Apr-07   | 39173 | 1,127,557 | 250,151 | 4,508 |                             | 4606          |                     |
| May-07   | 39203 | 1,176,886 | 251,460 | 4,680 |                             | 4599          |                     |
| Jun-07   | 39234 | 1,561,505 | 251,876 | 6,199 |                             | 4591          |                     |
| Jul-07   | 39264 | 1,515,749 | 251,716 | 6,022 |                             | 4584          |                     |
| Aug-07   | 39295 | 1,758,501 | 252,395 | 6,967 |                             | 4576          |                     |
| Sep-07   | 39326 | 1,387,137 | 252,667 | 5,490 |                             | 4568          |                     |
| Oct-07   | 39356 | 1,483,495 | 251,635 | 5,895 |                             | 4561          |                     |
| Nov-07   | 39387 | 1,085,329 | 250,611 | 4,331 |                             | 4553          |                     |
| Dec-07   | 39417 | 1,155,180 | 250,305 | 4,615 |                             | 4545          |                     |
| Jan-08   | 39448 | 1,217,778 | 250,243 | 4,866 |                             | 4538          |                     |
| Feb-08   | 39479 | 1,131,986 | 250,224 | 4,524 | 4,641                       | 4530          |                     |
| Mar-08   | 39508 | 1,085,493 | 250,433 | 4,334 |                             | 4523          |                     |
| Apr-08   | 39539 | 1,214,989 | 251,085 | 4,839 |                             | 4515          |                     |
| May-08   | 39569 | 1,110,572 | 251,611 | 4,414 |                             | 4507          |                     |
| Jun-08   | 39600 | 1,307,994 | 251,916 | 5,192 |                             | 4500          |                     |
| Jul-08   | 39630 | 1,306,458 | 251,885 | 5,187 |                             | 4492          |                     |
| Aug-08   | 39661 | 1,594,220 | 252,180 | 5,985 |                             | 4485          |                     |
| Sep-08   | 39692 | 1,427,088 | 252,199 | 5,659 |                             | 4477          |                     |
| Oct-08   | 39722 | 1,420,486 | 250,738 | 5,665 |                             | 4469          |                     |
| Nov-08   | 39753 | 995,127   | 249,751 | 3,988 |                             | 4462          |                     |
| Dec-08   | 39783 | 1,169,203 | 250,848 | 4,661 |                             | 4454          |                     |
| Jan-09   | 39814 | 1,227,159 | 249,372 | 4,921 |                             | 4446          | 4,637               |
| Feb-09   | 39845 | 1,135,389 | 249,124 | 4,558 | 4,535                       | 4439          | 4,520               |
| Mar-09   | 39873 | 1,041,017 | 249,199 | 4,177 |                             | 4432          | 4,517               |
| Apr-09   | 39904 | 1,120,730 | 249,887 | 4,485 |                             | 4424          | 4,506               |
| May-09   | 39934 | 1,062,135 | 250,850 | 4,234 |                             | 4416          | 4,498               |
| Jun-09   | 39965 | 1,273,019 | 251,240 | 5,067 |                             | 4409          | 4,484               |
| Jul-09   | 39995 | 1,325,504 | 251,285 | 5,275 |                             | 4401          | 4,474               |
| Aug-09   | 40026 | 1,422,251 | 251,638 | 5,652 |                             | 4394          | 4,463               |
| Sep-09   | 40057 | 1,270,172 | 251,498 | 5,050 |                             | 4386          | 4,452               |
| Oct-09   | 40087 | 1,265,091 | 250,062 | 5,059 |                             | 4378          | 4,441               |
| Nov-09   | 40118 | 1,024,284 | 249,384 | 4,107 |                             | 4371          | 4,431               |
| Dec-09   | 40148 | 1,108,549 | 248,860 | 4,455 |                             | 4363          | 4,420               |
| Jan-10   | 40179 | 1,149,216 | 248,697 | 4,621 |                             | 4355          | 4,409               |
| Feb-10   | 40210 | 1,057,577 | 249,161 | 4,245 | 4,402                       | 4348          | 4,398               |
| Mar-10   | 40238 | 1,028,280 | 249,839 | 4,116 |                             | 4341          | 4,386               |
| Apr-10   | 40269 | 1,163,043 | 251,276 | 4,629 |                             | 4333          | 4,378               |
| May-10   | 40299 | 1,046,427 | 252,529 | 4,144 |                             | 4325          | 4,367               |
| Jun-10   | 40330 | 1,276,333 | 252,974 | 5,045 |                             | 4318          | 4,356               |
| Jul-10   | 40360 | 1,312,745 | 252,988 | 5,189 |                             | 4310          | 4,346               |
| Aug-10   | 40391 | 1,465,935 | 253,457 | 5,784 |                             | 4302          | 4,335               |
| Sep-10   | 40422 | 1,430,705 | 253,832 | 5,636 |                             | 4295          | 4,324               |
| Oct-10   | 40452 | 1,387,247 | 253,092 | 5,481 |                             | 4287          | 4,313               |
| Nov-10   | 40483 | 1,064,729 | 251,617 | 4,232 |                             | 4280          | 4,302               |
| Dec-10   | 40513 | 1,173,518 | 250,949 | 4,676 |                             | 4272          | 4,292               |
| Jan-11   | 40544 | 1,102,203 | 250,640 | 4,398 |                             | 4264          | 4,281               |
| Feb-11   | 40575 | 1,041,970 | 250,868 | 4,153 | 4,232                       | 4257          | 4,270               |
| Mar-11   | 40603 | 1,029,570 | 251,098 | 4,100 |                             | 4250          | 4,260               |
| Apr-11   | 40634 | 1,077,702 | 251,977 | 4,277 |                             | 4242          | 4,249               |
| May-11   | 40664 | 1,017,368 | 252,681 | 4,026 |                             | 4234          | 4,239               |
| Jun-11   | 40695 | 1,254,736 | 253,493 | 4,950 |                             | 4227          | 4,228               |
| Jul-11   | 40725 | 1,280,440 | 253,655 | 5,048 |                             | 4219          | 4,218               |
| Aug-11   | 40756 | 1,543,000 | 254,120 | 6,072 |                             | 4211          | 4,207               |
| Sep-11   | 40787 | 1,362,615 | 253,850 | 5,368 |                             | 4204          | 4,196               |
| Oct-11   | 40817 | 1,193,261 | 252,670 | 4,723 |                             | 4196          | 4,185               |
| Nov-11   | 40848 | 982,929   | 251,721 | 3,905 |                             | 4189          | 4,174               |
| Dec-11   | 40878 | 1,060,582 | 251,493 | 4,217 |                             | 4181          | 4,164               |
| Jan-12   | 40909 | 1,086,465 | 251,309 | 4,323 |                             | 4173          | 4,153               |
| Feb-12   | 40940 | 1,049,893 | 251,538 | 4,174 | 4,158                       | 4166          | 4,142               |
| Mar-12   | 40969 | 990,147   | 252,287 | 3,925 |                             | 4158          | 4,132               |
| Apr-12   | 41000 | 1,066,849 | 253,452 | 4,209 |                             | 4151          | 4,121               |
| May-12   | 41030 | 1,042,345 | 254,668 | 4,093 |                             | 4143          | 4,110               |
| Jun-12   | 41061 | 1,867,322 | 256,955 | 6,100 |                             | 4135          | 4,100               |
| Jul-12   | 41091 | 1,635,769 | 256,926 | 6,367 |                             | 4128          | 4,089               |
| Aug-12   | 41122 | 1,633,877 | 257,276 | 6,351 |                             | 4120          | 4,078               |
| Sep-12   | 41153 | 1,216,820 | 256,965 | 4,735 |                             | 4112          | 4,067               |
| Oct-12   | 41183 | 1,156,348 | 255,659 | 4,523 |                             | 4105          | 4,057               |
| Nov-12   | 41214 | 1,008,544 | 255,021 | 3,956 |                             | 4097          | 4,046               |
| Dec-12   | 41244 | 1,059,072 | 255,268 | 4,145 |                             | 4090          | 4,035               |
| Jan-13   | 41277 | 1,049,887 | 255,161 | 4,114 | 4,012                       | 4079          | 4,020               |
| Feb-13   | 41316 | 1,036,980 | 255,753 | 4,055 |                             | 4071          | 4,009               |
| Mar-13   | 41346 | 1,008,132 | 256,137 | 3,936 |                             | 4064          | 4,000               |
| Apr-13   | 41377 | 1,014,216 | 257,120 | 3,945 |                             | 4057          | 3,989               |
| May-13   | 41407 |           |         |       |                             | 4049          | 3,978               |
| Jun-13   | 41438 |           |         |       |                             | 4041          | 3,967               |
| Jul-13   | 41468 |           |         |       |                             | 4034          | 3,957               |
| Aug-13   | 41499 |           |         |       |                             | 4026          | 3,946               |
| Sep-13   | 41530 |           |         |       |                             | 4018          | 3,935               |
| Oct-13   | 41560 |           |         |       |                             | 4011          | 3,924               |
| Nov-13   | 41591 |           |         |       |                             | 4003          | 3,914               |
| Dec-13   | 41621 |           |         |       |                             | 3996          | 3,903               |
| 7/1/2013 | 41466 |           |         |       | Base to Total at 7/1/2013 = | WINTER (BASE) | TOTAL               |
| 7/1/2014 | 41821 |           |         |       | 7/1/2014                    | 4037          | 3,961               |
| 7/1/2015 | 42186 |           |         |       | 7/1/2015                    | 3946          | 4,224               |
| 7/1/2016 | 42552 |           |         |       | 7/1/2016                    | 3855          | 4,096               |
| 7/1/2017 | 42917 |           |         |       | 7/1/2017                    | 3764          | 3,968               |
| 7/1/2018 | 43282 |           |         |       | 7/1/2018                    | 3673          | 3,840               |
|          |       |           |         |       |                             | 3561          | 3,712               |
|          |       |           |         |       |                             | -91           | gal/cust/month      |
|          |       |           |         |       |                             | -1092         | gal/cust/year       |
|          |       |           |         |       |                             | -120          | gal/cust/month      |
|          |       |           |         |       |                             | -1,538        | gal/cust/year       |
|          |       |           |         |       | Annual rate at 2013         | -2.06%        | Annual rate at 2013 |
|          |       |           |         |       |                             |               | -2.94%              |

2000 Acquisition of United Water's water utilities in Mooresville, Warsaw, West Lafayette, and Winchester.  
This added approximately 17,500 water customers

1994 acquisition of 11 water utilities from Avatar (Indiana Cities Water Corporation) Crawfordsville, Franklin, Greenwood, Jeffersonville, New Albany, Newburgh, Noblesville, Shelbyville, Somerset, Summitville, Wabash (Approx. Population 188,400)



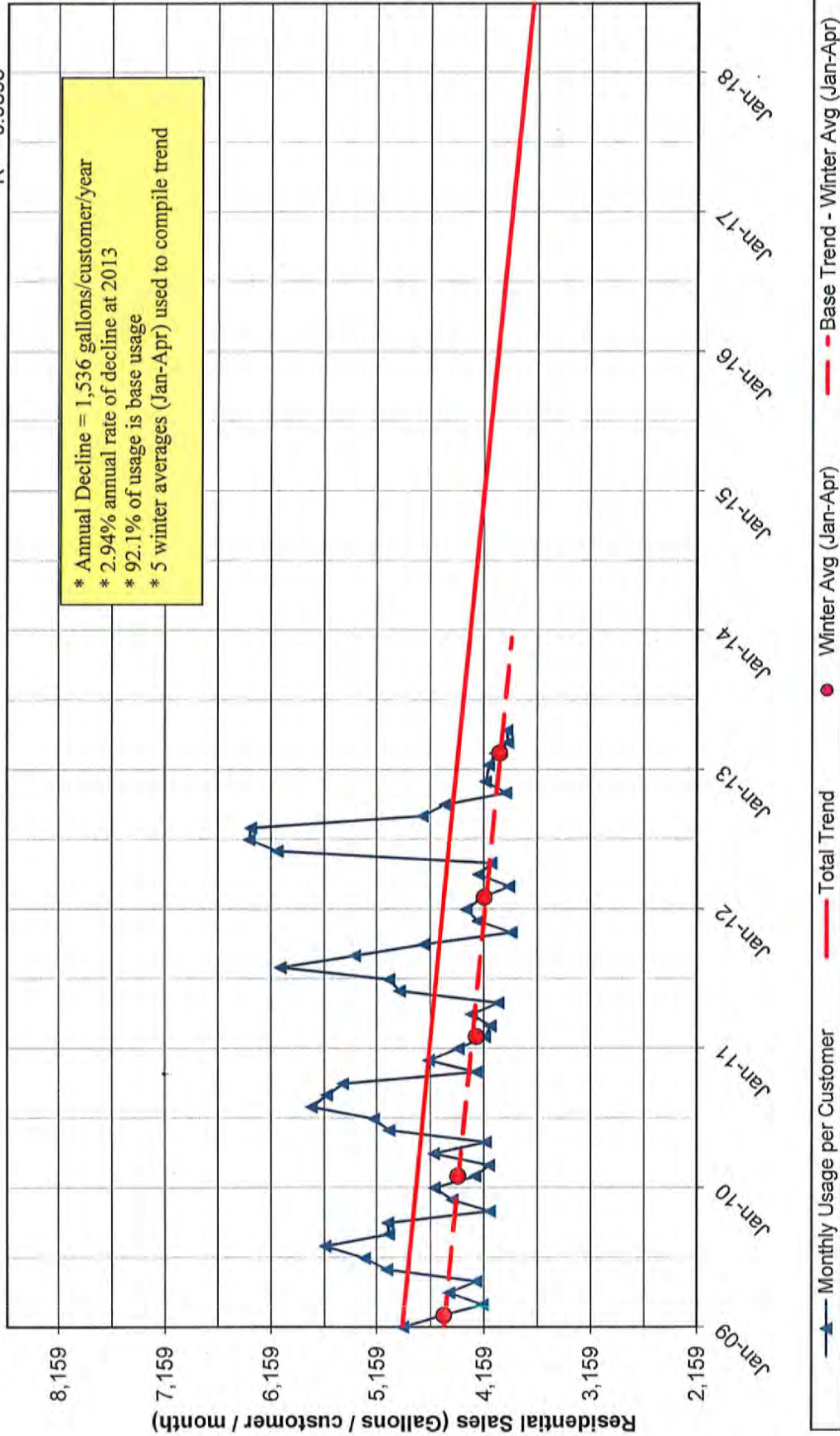


### Indiana American Water Residential Sales Per Customer (5-Year Winter Trend)

$$y = -0.351x + 18512$$

$$R^2 = 0.9893$$

\* Annual Decline = 1,536 gallons/customer/year  
 \* 2.94% annual rate of decline at 2013  
 \* 92.1% of usage is base usage  
 \* 5 winter averages (Jan-Apr) used to compile trend







| CHEVRON CORP. NYSE-CVX                                       |                  | RECENT PRICE   | 119.42                | P/E RATIO | 14.5 (Trailing: 18.7 Median: 11.0) | RELATIVE P/E RATIO | 0.88   | DIV'D YLD | 3.8%   | VALUE LINE |        |                             |        |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
|--|------------------|--|-----------------------|-----------|------------------------------------|--------------------|--------|-----------|--------|------------|--------|-----------------------------|--------|--------|--------------|---------------------------------------|--------|-----------------------------------|-----------------------|------|------|------|------|------|------|------|------|-----------------------|------|------|------|------|------|-----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------------------------|--------|-------|-------|-------|-------|---------------------------|--------|-------|-------|-------|-------|-------|-------|-----------------------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------------|-------|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|-------|-------|---------------------|-------|-------|-------|------------------------------|-------|-------|-------|-------|------|------|-------|-------|-------|-----------------|-------|------|------|------|-------|-------|------|------|------|-----------------------------------|------|------|------|-------------------|------|--------|-------|-------|-------|-------|-------|-------|--------|-------|-------|------|------|------------------------|-------|-----------------------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------------|-------|-------|-------|--------|--------|--------|--------|-------------------|--------|--------|--------|--------|--------|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------------------------------|--------|-------|-------|-------|-------|-------|-------|-------|------|-----|------|------|-------|-----------------------|-------|-------|------|---------------------------------------|-------|---------------------|------|------|-----|-----|-----|------|------|--------------------|------|-----|-----|-----|-----|-----|------|-----|------|-----|-----|--------------------|-----|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|--|-----------------------|------|
| <b>TIMELINESS</b> 2  | Raised 6/15/18   | High: 95.5   | 95.5                  | 104.6     | 79.8                               | 92.4               | 110.0  | 118.5     | 127.8  | 135.1      | 113.0  | 119.0                       | 126.2  | 133.9  | Target Price | Range                                 |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| <b>SAFETY</b> 1  | Raised 1/4/91    | Low: 55.5  | 55.5                  | 56.1      | 66.8                               | 66.8               | 86.7   | 95.7      | 108.7  | 100.1      | 69.6   | 75.3                        | 102.6  | 107.5  | 2021         | 2022                                  | 2023   |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| <b>TECHNICAL</b> 3   | Lowered 11/30/18 | <b>LEGENDS</b><br>— 7.0 x "Cash Flow" p sh<br>..... Relative Price Strength<br>Options: Yes<br>Shaded area indicates recession   |                       |           |                                    |                    |        |           |        |            |        |                             |        |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| <b>BETA</b> 1.25   | (1.00 = Market)  | <b>2021-23 PROJECTIONS</b><br>Price High 160 Low 130<br>Gain (+35%)<br>Ann'l Total Return 11%<br>6%  |                       |           |                                    |                    |        |           |        |            |        |                             |        |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| <b>Insider Decisions</b>                                     |                  | <table border="1"> <tr><th>J</th><th>F</th><th>M</th><th>A</th><th>M</th><th>J</th><th>J</th><th>A</th><th>S</th></tr> <tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>5</td><td>0</td><td>1</td><td>6</td><td>10</td><td>1</td><td>0</td><td>1</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>0</td><td>1</td><td>6</td><td>1</td><td>1</td><td>0</td><td>1</td></tr> </table>   |                       |           |                                    |                    |        |           |        |            |        |                             |        |        |              | J                                     | F      | M                                 | A                     | M    | J    | J    | A    | S    | 0    | 0    | 0    | 0                     | 0    | 0    | 0    | 0    | 0    | 5                           | 0      | 1      | 6      | 10     | 1      | 0      | 1      | 0      | 0      | 0      | 0      | 1      | 6      | 1                           | 1      | 0     | 1     |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| J  | F                | M  | A                     | M         | J                                  | J                  | A      | S         |        |            |        |                             |        |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 0  | 0                | 0  | 0                     | 0         | 0                                  | 0                  | 0      | 0         |        |            |        |                             |        |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 5  | 0                | 1  | 6                     | 10        | 1                                  | 0                  | 1      | 0         |        |            |        |                             |        |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 0  | 0                | 0  | 1                     | 6         | 1                                  | 1                  | 0      | 1         |        |            |        |                             |        |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| <b>Institutional Decisions</b>                               |                  | <table border="1"> <tr><th>4Q2017</th><th>1Q2018</th><th>2Q2018</th><th>Percent shares traded</th></tr> <tr><td>876</td><td>983</td><td>997</td><td>18</td></tr> <tr><td>834</td><td>1006</td><td>1001</td><td>12</td></tr> <tr><td>123345012372681250664</td><td></td><td></td><td>6</td></tr> </table>   |                       |           |                                    |                    |        |           |        |            |        |                             |        |        |              | 4Q2017                                | 1Q2018 | 2Q2018                            | Percent shares traded | 876  | 983  | 997  | 18   | 834  | 1006 | 1001 | 12   | 123345012372681250664 |      |      | 6    |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 4Q2017   | 1Q2018           | 2Q2018   | Percent shares traded |           |                                    |                    |        |           |        |            |        |                             |        |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 876  | 983              | 997  | 18                    |           |                                    |                    |        |           |        |            |        |                             |        |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 834  | 1006             | 1001   | 12                    |           |                                    |                    |        |           |        |            |        |                             |        |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 123345012372681250664  |                  |  | 6                     |           |                                    |                    |        |           |        |            |        |                             |        |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| <b>2002</b>  |                  | <table border="1"> <tr><th>2002</th><th>2003</th><th>2004</th><th>2005</th><th>2006</th><th>2007</th><th>2008</th><th>2009</th><th>2010</th><th>2011</th><th>2012</th><th>2013</th><th>2014</th><th>2015</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th><th>© VALUE LINE PUB. LLC</th><th>21-23</th></tr> <tr><td>46.37</td><td>56.94</td><td>73.70</td><td>88.77</td><td>86.02</td><td>105.67</td><td>136.21</td><td>85.50</td><td>102.85</td><td>128.06</td><td>124.27</td><td>119.61</td><td>112.74</td><td>73.55</td><td>60.52</td><td>74.41</td><td>88.20</td><td>94.20</td><td>Sales per sh<sup>A</sup></td><td>105.40</td></tr> <tr><td>2.98</td><td>5.90</td><td>8.67</td><td>8.96</td><td>10.09</td><td>13.11</td><td>16.69</td><td>11.26</td><td>16.10</td><td>20.09</td><td>20.34</td><td>18.61</td><td>19.17</td><td>13.61</td><td>10.02</td><td>13.93</td><td>18.05</td><td>19.05</td><td>"Cash Flow" per sh</td><td>21.90</td></tr> <tr><td>.54</td><td>3.48</td><td>6.28</td><td>6.54</td><td>7.80</td><td>8.77</td><td>11.67</td><td>5.24</td><td>9.48</td><td>13.44</td><td>13.32</td><td>11.09</td><td>10.14</td><td>2.45</td><td>d.27</td><td>3.79</td><td>7.75</td><td>8.50</td><td>Earnings per sh<sup>B</sup></td><td>10.00</td></tr> <tr><td>1.40</td><td>1.43</td><td>1.54</td><td>1.75</td><td>2.01</td><td>2.26</td><td>2.53</td><td>2.66</td><td>2.84</td><td>3.09</td><td>3.51</td><td>3.90</td><td>4.21</td><td>4.28</td><td>4.29</td><td>4.32</td><td>4.48</td><td>4.56</td><td>Div'ds Decl'd per sh<sup>C</sup></td><td>5.00</td></tr> <tr><td>3.56</td><td>2.63</td><td>2.99</td><td>3.90</td><td>5.65</td><td>7.98</td><td>9.81</td><td>9.89</td><td>9.84</td><td>13.38</td><td>15.89</td><td>19.85</td><td>18.83</td><td>15.67</td><td>9.57</td><td>7.04</td><td>10.00</td><td>10.50</td><td>Cap'l Spending per sh</td><td>12.50</td></tr> <tr><td>14.79</td><td>16.97</td><td>21.47</td><td>28.07</td><td>28.22</td><td>36.88</td><td>43.23</td><td>45.79</td><td>52.74</td><td>61.67</td><td>70.80</td><td>78.62</td><td>83.07</td><td>81.11</td><td>76.95</td><td>77.77</td><td>80.15</td><td>83.30</td><td>Book Value per sh</td><td>96.20</td></tr> <tr><td>2136.3</td><td>2138.3</td><td>2107.1</td><td>2232.7</td><td>2442.7</td><td>2090.4</td><td>2004.2</td><td>2007.4</td><td>1992.5</td><td>1981.2</td><td>1946.7</td><td>1913.3</td><td>1880.2</td><td>1882.8</td><td>1891.5</td><td>1904.7</td><td>1905.0</td><td>1890.0</td><td>Common Shs Outst'g<sup>D</sup></td><td>1850.0</td></tr> <tr><td>74.4</td><td>10.2</td><td>7.6</td><td>8.8</td><td>8.1</td><td>9.4</td><td>7.3</td><td>13.4</td><td>8.2</td><td>7.5</td><td>8.1</td><td>10.9</td><td>11.9</td><td>39.4</td><td>--</td><td>29.4</td><td>Bold figures are Value Line estimates</td><td></td><td>Avg Ann'l P/E Ratio</td><td>14.5</td></tr> <tr><td>4.06</td><td>.58</td><td>.40</td><td>.47</td><td>.44</td><td>.50</td><td>4.4</td><td>.89</td><td>.52</td><td>.47</td><td>.52</td><td>.61</td><td>.63</td><td>1.98</td><td>--</td><td>1.48</td><td></td><td></td><td>Relative P/E Ratio</td><td>.80</td></tr> <tr><td>3.5%</td><td>4.0%</td><td>3.2%</td><td>3.0%</td><td>3.2%</td><td>2.7%</td><td>3.0%</td><td>3.8%</td><td>3.6%</td><td>3.1%</td><td>3.3%</td><td>3.2%</td><td>3.5%</td><td>4.4%</td><td>4.3%</td><td>3.9%</td><td></td><td></td><td>Avg Ann'l Div'd Yield</td><td>3.6%</td></tr> </table> |                       |           |                                    |                    |        |           |        |            |        |                             |        |        |              | 2002                                  | 2003   | 2004                              | 2005                  | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014                  | 2015 | 2016 | 2017 | 2018 | 2019 | © VALUE LINE PUB. LLC       | 21-23  | 46.37  | 56.94  | 73.70  | 88.77  | 86.02  | 105.67 | 136.21 | 85.50  | 102.85 | 128.06 | 124.27 | 119.61 | 112.74                      | 73.55  | 60.52 | 74.41 | 88.20 | 94.20 | Sales per sh <sup>A</sup> | 105.40 | 2.98  | 5.90  | 8.67  | 8.96  | 10.09 | 13.11 | 16.69                 | 11.26 | 16.10  | 20.09 | 20.34 | 18.61 | 19.17 | 13.61 | 10.02 | 13.93 | 18.05 | 19.05 | "Cash Flow" per sh | 21.90 | .54                   | 3.48  | 6.28  | 6.54  | 7.80  | 8.77  | 11.67 | 5.24  | 9.48  | 13.44  | 13.32  | 11.09  | 10.14 | 2.45  | d.27                | 3.79  | 7.75  | 8.50  | Earnings per sh <sup>B</sup> | 10.00 | 1.40  | 1.43  | 1.54  | 1.75 | 2.01 | 2.26  | 2.53  | 2.66  | 2.84            | 3.09  | 3.51 | 3.90 | 4.21 | 4.28  | 4.29  | 4.32 | 4.48 | 4.56 | Div'ds Decl'd per sh <sup>C</sup> | 5.00 | 3.56 | 2.63 | 2.99              | 3.90 | 5.65   | 7.98  | 9.81  | 9.89  | 9.84  | 13.38 | 15.89 | 19.85  | 18.83 | 15.67 | 9.57 | 7.04 | 10.00                  | 10.50 | Cap'l Spending per sh | 12.50 | 14.79 | 16.97  | 21.47 | 28.07 | 28.22 | 36.88 | 43.23 | 45.79 | 52.74 | 61.67 | 70.80                   | 78.62 | 83.07 | 81.11 | 76.95  | 77.77  | 80.15  | 83.30  | Book Value per sh | 96.20  | 2136.3 | 2138.3 | 2107.1 | 2232.7 | 2442.7               | 2090.4 | 2004.2 | 2007.4 | 1992.5 | 1981.2 | 1946.7 | 1913.3 | 1880.2 | 1882.8 | 1891.5 | 1904.7 | 1905.0 | 1890.0 | Common Shs Outst'g <sup>D</sup> | 1850.0 | 74.4  | 10.2  | 7.6   | 8.8   | 8.1   | 9.4   | 7.3   | 13.4 | 8.2 | 7.5  | 8.1  | 10.9  | 11.9                  | 39.4  | --    | 29.4 | Bold figures are Value Line estimates |       | Avg Ann'l P/E Ratio | 14.5 | 4.06 | .58 | .40 | .47 | .44  | .50  | 4.4                | .89  | .52 | .47 | .52 | .61 | .63 | 1.98 | --  | 1.48 |     |     | Relative P/E Ratio | .80 | 3.5%                   | 4.0% | 3.2% | 3.0% | 3.2% | 2.7% | 3.0% | 3.8% | 3.6% | 3.1% | 3.3% | 3.2% | 3.5% | 4.4% | 4.3% | 3.9% |  |  | Avg Ann'l Div'd Yield | 3.6% |
| 2002   | 2003             | 2004   | 2005                  | 2006      | 2007                               | 2008               | 2009   | 2010      | 2011   | 2012       | 2013   | 2014                        | 2015   | 2016   | 2017         | 2018                                  | 2019   | © VALUE LINE PUB. LLC             | 21-23                 |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 46.37  | 56.94            | 73.70  | 88.77                 | 86.02     | 105.67                             | 136.21             | 85.50  | 102.85    | 128.06 | 124.27     | 119.61 | 112.74                      | 73.55  | 60.52  | 74.41        | 88.20                                 | 94.20  | Sales per sh <sup>A</sup>         | 105.40                |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 2.98   | 5.90             | 8.67   | 8.96                  | 10.09     | 13.11                              | 16.69              | 11.26  | 16.10     | 20.09  | 20.34      | 18.61  | 19.17                       | 13.61  | 10.02  | 13.93        | 18.05                                 | 19.05  | "Cash Flow" per sh                | 21.90                 |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| .54  | 3.48             | 6.28   | 6.54                  | 7.80      | 8.77                               | 11.67              | 5.24   | 9.48      | 13.44  | 13.32      | 11.09  | 10.14                       | 2.45   | d.27   | 3.79         | 7.75                                  | 8.50   | Earnings per sh <sup>B</sup>      | 10.00                 |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 1.40   | 1.43             | 1.54   | 1.75                  | 2.01      | 2.26                               | 2.53               | 2.66   | 2.84      | 3.09   | 3.51       | 3.90   | 4.21                        | 4.28   | 4.29   | 4.32         | 4.48                                  | 4.56   | Div'ds Decl'd per sh <sup>C</sup> | 5.00                  |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 3.56   | 2.63             | 2.99   | 3.90                  | 5.65      | 7.98                               | 9.81               | 9.89   | 9.84      | 13.38  | 15.89      | 19.85  | 18.83                       | 15.67  | 9.57   | 7.04         | 10.00                                 | 10.50  | Cap'l Spending per sh             | 12.50                 |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 14.79  | 16.97            | 21.47  | 28.07                 | 28.22     | 36.88                              | 43.23              | 45.79  | 52.74     | 61.67  | 70.80      | 78.62  | 83.07                       | 81.11  | 76.95  | 77.77        | 80.15                                 | 83.30  | Book Value per sh                 | 96.20                 |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 2136.3   | 2138.3           | 2107.1   | 2232.7                | 2442.7    | 2090.4                             | 2004.2             | 2007.4 | 1992.5    | 1981.2 | 1946.7     | 1913.3 | 1880.2                      | 1882.8 | 1891.5 | 1904.7       | 1905.0                                | 1890.0 | Common Shs Outst'g <sup>D</sup>   | 1850.0                |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 74.4   | 10.2             | 7.6  | 8.8                   | 8.1       | 9.4                                | 7.3                | 13.4   | 8.2       | 7.5    | 8.1        | 10.9   | 11.9                        | 39.4   | --     | 29.4         | Bold figures are Value Line estimates |        | Avg Ann'l P/E Ratio               | 14.5                  |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 4.06   | .58              | .40  | .47                   | .44       | .50                                | 4.4                | .89    | .52       | .47    | .52        | .61    | .63                         | 1.98   | --     | 1.48         |                                       |        | Relative P/E Ratio                | .80                   |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 3.5%   | 4.0%             | 3.2%   | 3.0%                  | 3.2%      | 2.7%                               | 3.0%               | 3.8%   | 3.6%      | 3.1%   | 3.3%       | 3.2%   | 3.5%                        | 4.4%   | 4.3%   | 3.9%         |                                       |        | Avg Ann'l Div'd Yield             | 3.6%                  |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| <b>CAPITAL STRUCTURE as of 9/30/18</b>                       |                  | <table border="1"> <tr><th>2002</th><th>2003</th><th>2004</th><th>2005</th><th>2006</th><th>2007</th><th>2008</th><th>2009</th><th>2010</th><th>2011</th><th>2012</th><th>2013</th><th>2014</th><th>2015</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th><th>Sales (\$mill)<sup>A</sup></th><th>195000</th></tr> <tr><td>273005</td><td>171636</td><td>204928</td><td>253706</td><td>241909</td><td>228848</td><td>211970</td><td>138477</td><td>114472</td><td>141722</td><td>168000</td><td>178000</td><td>Sales (\$mill)<sup>A</sup></td><td>195000</td></tr> <tr><td>19.3%</td><td>18.2%</td><td>22.3%</td><td>24.0%</td><td>24.9%</td><td>22.2%</td><td>23.2%</td><td>19.7%</td><td>15.3%</td><td>20.4%</td><td>23.5%</td><td>24.0%</td><td>Operating Margin</td><td>25.0%</td></tr> <tr><td>9528.0</td><td>12110</td><td>13063</td><td>12911</td><td>13413</td><td>14186</td><td>16793</td><td>21037</td><td>19457</td><td>19349</td><td>19550</td><td>20000</td><td>Depreciation (\$mill)</td><td>23000</td></tr> <tr><td>23931</td><td>10483</td><td>19024</td><td>26895</td><td>26179</td><td>21423</td><td>19241</td><td>4587.0</td><td>d497.0</td><td>7175.0</td><td>14850</td><td>16050</td><td>Net Profit (\$mill)</td><td>18500</td></tr> <tr><td>44.3%</td><td>43.4%</td><td>40.7%</td><td>43.5%</td><td>43.5%</td><td>40.3%</td><td>38.3%</td><td>5.3%</td><td>5.3%</td><td>21.4%</td><td>29.0%</td><td>29.0%</td><td>Income Tax Rate</td><td>28.0%</td></tr> <tr><td>8.8%</td><td>6.1%</td><td>9.3%</td><td>10.6%</td><td>10.8%</td><td>9.4%</td><td>9.1%</td><td>3.3%</td><td>NMF</td><td>5.1%</td><td>8.8%</td><td>9.0%</td><td>Net Profit Margin</td><td>9.5%</td></tr> <tr><td>4447.0</td><td>11005</td><td>19829</td><td>19634</td><td>21508</td><td>17232</td><td>10306</td><td>8883.0</td><td>d2166</td><td>823.0</td><td>4000</td><td>3000</td><td>Working Cap'l (\$mill)</td><td>5000</td></tr> <tr><td>6083.0</td><td>10130</td><td>11289</td><td>9812.0</td><td>12065</td><td>20057</td><td>24028</td><td>33664</td><td>35286</td><td>33571</td><td>30000</td><td>30000</td><td>Long-Term Debt (\$mill)</td><td>35000</td></tr> <tr><td>86648</td><td>91914</td><td>105081</td><td>122181</td><td>137832</td><td>150427</td><td>156191</td><td>152716</td><td>145556</td><td>148124</td><td>152650</td><td>157500</td><td>Shr. Equity (\$mill)</td><td>178000</td></tr> <tr><td>26.0%</td><td>10.6%</td><td>16.6%</td><td>20.6%</td><td>17.7%</td><td>12.8%</td><td>11.0%</td><td>2.8%</td><td>NMF</td><td>4.2%</td><td>8.5%</td><td>9.0%</td><td>Return on Total Cap'l</td><td>9.0%</td></tr> <tr><td>27.6%</td><td>11.4%</td><td>18.1%</td><td>22.0%</td><td>19.0%</td><td>14.2%</td><td>12.3%</td><td>3.0%</td><td>NMF</td><td>4.8%</td><td>9.5%</td><td>10.0%</td><td>Return on Shr. Equity</td><td>10.5%</td></tr> <tr><td>21.7%</td><td>5.6%</td><td>12.7%</td><td>17.0%</td><td>14.0%</td><td>9.3%</td><td>7.2%</td><td>NMF</td><td>NMF</td><td>NMF</td><td>4.0%</td><td>4.5%</td><td>Retained to Com Eq</td><td>5.0%</td></tr> <tr><td>22%</td><td>51%</td><td>30%</td><td>23%</td><td>26%</td><td>35%</td><td>41%</td><td>NMF</td><td>NMF</td><td>NMF</td><td>58%</td><td>54%</td><td>All Div'ds to Net Prof</td><td>50%</td></tr> </table>   |                       |           |                                    |                    |        |           |        |            |        |                             |        |        |              | 2002                                  | 2003   | 2004                              | 2005                  | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014                  | 2015 | 2016 | 2017 | 2018 | 2019 | Sales (\$mill) <sup>A</sup> | 195000 | 273005 | 171636 | 204928 | 253706 | 241909 | 228848 | 211970 | 138477 | 114472 | 141722 | 168000 | 178000 | Sales (\$mill) <sup>A</sup> | 195000 | 19.3% | 18.2% | 22.3% | 24.0% | 24.9%                     | 22.2%  | 23.2% | 19.7% | 15.3% | 20.4% | 23.5% | 24.0% | Operating Margin      | 25.0% | 9528.0 | 12110 | 13063 | 12911 | 13413 | 14186 | 16793 | 21037 | 19457 | 19349 | 19550              | 20000 | Depreciation (\$mill) | 23000 | 23931 | 10483 | 19024 | 26895 | 26179 | 21423 | 19241 | 4587.0 | d497.0 | 7175.0 | 14850 | 16050 | Net Profit (\$mill) | 18500 | 44.3% | 43.4% | 40.7%                        | 43.5% | 43.5% | 40.3% | 38.3% | 5.3% | 5.3% | 21.4% | 29.0% | 29.0% | Income Tax Rate | 28.0% | 8.8% | 6.1% | 9.3% | 10.6% | 10.8% | 9.4% | 9.1% | 3.3% | NMF                               | 5.1% | 8.8% | 9.0% | Net Profit Margin | 9.5% | 4447.0 | 11005 | 19829 | 19634 | 21508 | 17232 | 10306 | 8883.0 | d2166 | 823.0 | 4000 | 3000 | Working Cap'l (\$mill) | 5000  | 6083.0                | 10130 | 11289 | 9812.0 | 12065 | 20057 | 24028 | 33664 | 35286 | 33571 | 30000 | 30000 | Long-Term Debt (\$mill) | 35000 | 86648 | 91914 | 105081 | 122181 | 137832 | 150427 | 156191            | 152716 | 145556 | 148124 | 152650 | 157500 | Shr. Equity (\$mill) | 178000 | 26.0%  | 10.6%  | 16.6%  | 20.6%  | 17.7%  | 12.8%  | 11.0%  | 2.8%   | NMF    | 4.2%   | 8.5%   | 9.0%   | Return on Total Cap'l           | 9.0%   | 27.6% | 11.4% | 18.1% | 22.0% | 19.0% | 14.2% | 12.3% | 3.0% | NMF | 4.8% | 9.5% | 10.0% | Return on Shr. Equity | 10.5% | 21.7% | 5.6% | 12.7%                                 | 17.0% | 14.0%               | 9.3% | 7.2% | NMF | NMF | NMF | 4.0% | 4.5% | Retained to Com Eq | 5.0% | 22% | 51% | 30% | 23% | 26% | 35%  | 41% | NMF  | NMF | NMF | 58%                | 54% | All Div'ds to Net Prof | 50%  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 2002   | 2003             | 2004   | 2005                  | 2006      | 2007                               | 2008               | 2009   | 2010      | 2011   | 2012       | 2013   | 2014                        | 2015   | 2016   | 2017         | 2018                                  | 2019   | Sales (\$mill) <sup>A</sup>       | 195000                |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 273005   | 171636           | 204928   | 253706                | 241909    | 228848                             | 211970             | 138477 | 114472    | 141722 | 168000     | 178000 | Sales (\$mill) <sup>A</sup> | 195000 |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 19.3%  | 18.2%            | 22.3%  | 24.0%                 | 24.9%     | 22.2%                              | 23.2%              | 19.7%  | 15.3%     | 20.4%  | 23.5%      | 24.0%  | Operating Margin            | 25.0%  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 9528.0   | 12110            | 13063  | 12911                 | 13413     | 14186                              | 16793              | 21037  | 19457     | 19349  | 19550      | 20000  | Depreciation (\$mill)       | 23000  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 23931  | 10483            | 19024  | 26895                 | 26179     | 21423                              | 19241              | 4587.0 | d497.0    | 7175.0 | 14850      | 16050  | Net Profit (\$mill)         | 18500  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 44.3%  | 43.4%            | 40.7%  | 43.5%                 | 43.5%     | 40.3%                              | 38.3%              | 5.3%   | 5.3%      | 21.4%  | 29.0%      | 29.0%  | Income Tax Rate             | 28.0%  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 8.8%   | 6.1%             | 9.3%   | 10.6%                 | 10.8%     | 9.4%                               | 9.1%               | 3.3%   | NMF       | 5.1%   | 8.8%       | 9.0%   | Net Profit Margin           | 9.5%   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 4447.0   | 11005            | 19829  | 19634                 | 21508     | 17232                              | 10306              | 8883.0 | d2166     | 823.0  | 4000       | 3000   | Working Cap'l (\$mill)      | 5000   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 6083.0   | 10130            | 11289  | 9812.0                | 12065     | 20057                              | 24028              | 33664  | 35286     | 33571  | 30000      | 30000  | Long-Term Debt (\$mill)     | 35000  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 86648  | 91914            | 105081   | 122181                | 137832    | 150427                             | 156191             | 152716 | 145556    | 148124 | 152650     | 157500 | Shr. Equity (\$mill)        | 178000 |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 26.0%  | 10.6%            | 16.6%  | 20.6%                 | 17.7%     | 12.8%                              | 11.0%              | 2.8%   | NMF       | 4.2%   | 8.5%       | 9.0%   | Return on Total Cap'l       | 9.0%   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 27.6%  | 11.4%            | 18.1%  | 22.0%                 | 19.0%     | 14.2%                              | 12.3%              | 3.0%   | NMF       | 4.8%   | 9.5%       | 10.0%  | Return on Shr. Equity       | 10.5%  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 21.7%  | 5.6%             | 12.7%  | 17.0%                 | 14.0%     | 9.3%                               | 7.2%               | NMF    | NMF       | NMF    | 4.0%       | 4.5%   | Retained to Com Eq          | 5.0%   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 22%  | 51%              | 30%  | 23%                   | 26%       | 35%                                | 41%                | NMF    | NMF       | NMF    | 58%        | 54%    | All Div'ds to Net Prof      | 50%    |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| <b>Leases, Uncapitalized Annual rentals \$693 mill.</b>      |                  | <table border="1"> <tr><th>2002</th><th>2003</th><th>2004</th><th>2005</th><th>2006</th><th>2007</th><th>2008</th><th>2009</th><th>2010</th><th>2011</th><th>2012</th><th>2013</th><th>2014</th><th>2015</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th><th>Operating Margin</th><th>25.0%</th></tr> <tr><td>273005</td><td>171636</td><td>204928</td><td>253706</td><td>241909</td><td>228848</td><td>211970</td><td>138477</td><td>114472</td><td>141722</td><td>168000</td><td>178000</td><td>Operating Margin</td><td>25.0%</td></tr> <tr><td>19.3%</td><td>18.2%</td><td>22.3%</td><td>24.0%</td><td>24.9%</td><td>22.2%</td><td>23.2%</td><td>19.7%</td><td>15.3%</td><td>20.4%</td><td>23.5%</td><td>24.0%</td><td>Operating Margin</td><td>25.0%</td></tr> <tr><td>9528.0</td><td>12110</td><td>13063</td><td>12911</td><td>13413</td><td>14186</td><td>16793</td><td>21037</td><td>19457</td><td>19349</td><td>19550</td><td>20000</td><td>Depreciation (\$mill)</td><td>23000</td></tr> <tr><td>23931</td><td>10483</td><td>19024</td><td>26895</td><td>26179</td><td>21423</td><td>19241</td><td>4587.0</td><td>d497.0</td><td>7175.0</td><td>14850</td><td>16050</td><td>Net Profit (\$mill)</td><td>18500</td></tr> <tr><td>44.3%</td><td>43.4%</td><td>40.7%</td><td>43.5%</td><td>43.5%</td><td>40.3%</td><td>38.3%</td><td>5.3%</td><td>5.3%</td><td>21.4%</td><td>29.0%</td><td>29.0%</td><td>Income Tax Rate</td><td>28.0%</td></tr> <tr><td>8.8%</td><td>6.1%</td><td>9.3%</td><td>10.6%</td><td>10.8%</td><td>9.4%</td><td>9.1%</td><td>3.3%</td><td>NMF</td><td>5.1%</td><td>8.8%</td><td>9.0%</td><td>Net Profit Margin</td><td>9.5%</td></tr> <tr><td>4447.0</td><td>11005</td><td>19829</td><td>19634</td><td>21508</td><td>17232</td><td>10306</td><td>8883.0</td><td>d2166</td><td>823.0</td><td>4000</td><td>3000</td><td>Working Cap'l (\$mill)</td><td>5000</td></tr> <tr><td>6083.0</td><td>10130</td><td>11289</td><td>9812.0</td><td>12065</td><td>20057</td><td>24028</td><td>33664</td><td>35286</td><td>33571</td><td>30000</td><td>30000</td><td>Long-Term Debt (\$mill)</td><td>35000</td></tr> <tr><td>86648</td><td>91914</td><td>105081</td><td>122181</td><td>137832</td><td>150427</td><td>156191</td><td>152716</td><td>145556</td><td>148124</td><td>152650</td><td>157500</td><td>Shr. Equity (\$mill)</td><td>178000</td></tr> <tr><td>26.0%</td><td>10.6%</td><td>16.6%</td><td>20.6%</td><td>17.7%</td><td>12.8%</td><td>11.0%</td><td>2.8%</td><td>NMF</td><td>4.2%</td><td>8.5%</td><td>9.0%</td><td>Return on Total Cap'l</td><td>9.0%</td></tr> <tr><td>27.6%</td><td>11.4%</td><td>18.1%</td><td>22.0%</td><td>19.0%</td><td>14.2%</td><td>12.3%</td><td>3.0%</td><td>NMF</td><td>4.8%</td><td>9.5%</td><td>10.0%</td><td>Return on Shr. Equity</td><td>10.5%</td></tr> <tr><td>21.7%</td><td>5.6%</td><td>12.7%</td><td>17.0%</td><td>14.0%</td><td>9.3%</td><td>7.2%</td><td>NMF</td><td>NMF</td><td>NMF</td><td>4.0%</td><td>4.5%</td><td>Retained to Com Eq</td><td>5.0%</td></tr> <tr><td>22%</td><td>51%</td><td>30%</td><td>23%</td><td>26%</td><td>35%</td><td>41%</td><td>NMF</td><td>NMF</td><td>NMF</td><td>58%</td><td>54%</td><td>All Div'ds to Net Prof</td><td>50%</td></tr> </table>   |                       |           |                                    |                    |        |           |        |            |        |                             |        |        |              | 2002                                  | 2003   | 2004                              | 2005                  | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014                  | 2015 | 2016 | 2017 | 2018 | 2019 | Operating Margin            | 25.0%  | 273005 | 171636 | 204928 | 253706 | 241909 | 228848 | 211970 | 138477 | 114472 | 141722 | 168000 | 178000 | Operating Margin            | 25.0%  | 19.3% | 18.2% | 22.3% | 24.0% | 24.9%                     | 22.2%  | 23.2% | 19.7% | 15.3% | 20.4% | 23.5% | 24.0% | Operating Margin      | 25.0% | 9528.0 | 12110 | 13063 | 12911 | 13413 | 14186 | 16793 | 21037 | 19457 | 19349 | 19550              | 20000 | Depreciation (\$mill) | 23000 | 23931 | 10483 | 19024 | 26895 | 26179 | 21423 | 19241 | 4587.0 | d497.0 | 7175.0 | 14850 | 16050 | Net Profit (\$mill) | 18500 | 44.3% | 43.4% | 40.7%                        | 43.5% | 43.5% | 40.3% | 38.3% | 5.3% | 5.3% | 21.4% | 29.0% | 29.0% | Income Tax Rate | 28.0% | 8.8% | 6.1% | 9.3% | 10.6% | 10.8% | 9.4% | 9.1% | 3.3% | NMF                               | 5.1% | 8.8% | 9.0% | Net Profit Margin | 9.5% | 4447.0 | 11005 | 19829 | 19634 | 21508 | 17232 | 10306 | 8883.0 | d2166 | 823.0 | 4000 | 3000 | Working Cap'l (\$mill) | 5000  | 6083.0                | 10130 | 11289 | 9812.0 | 12065 | 20057 | 24028 | 33664 | 35286 | 33571 | 30000 | 30000 | Long-Term Debt (\$mill) | 35000 | 86648 | 91914 | 105081 | 122181 | 137832 | 150427 | 156191            | 152716 | 145556 | 148124 | 152650 | 157500 | Shr. Equity (\$mill) | 178000 | 26.0%  | 10.6%  | 16.6%  | 20.6%  | 17.7%  | 12.8%  | 11.0%  | 2.8%   | NMF    | 4.2%   | 8.5%   | 9.0%   | Return on Total Cap'l           | 9.0%   | 27.6% | 11.4% | 18.1% | 22.0% | 19.0% | 14.2% | 12.3% | 3.0% | NMF | 4.8% | 9.5% | 10.0% | Return on Shr. Equity | 10.5% | 21.7% | 5.6% | 12.7%                                 | 17.0% | 14.0%               | 9.3% | 7.2% | NMF | NMF | NMF | 4.0% | 4.5% | Retained to Com Eq | 5.0% | 22% | 51% | 30% | 23% | 26% | 35%  | 41% | NMF  | NMF | NMF | 58%                | 54% | All Div'ds to Net Prof | 50%  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 2002   | 2003             | 2004   | 2005                  | 2006      | 2007                               | 2008               | 2009   | 2010      | 2011   | 2012       | 2013   | 2014                        | 2015   | 2016   | 2017         | 2018                                  | 2019   | Operating Margin                  | 25.0%                 |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 273005   | 171636           | 204928   | 253706                | 241909    | 228848                             | 211970             | 138477 | 114472    | 141722 | 168000     | 178000 | Operating Margin            | 25.0%  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 19.3%  | 18.2%            | 22.3%  | 24.0%                 | 24.9%     | 22.2%                              | 23.2%              | 19.7%  | 15.3%     | 20.4%  | 23.5%      | 24.0%  | Operating Margin            | 25.0%  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 9528.0   | 12110            | 13063  | 12911                 | 13413     | 14186                              | 16793              | 21037  | 19457     | 19349  | 19550      | 20000  | Depreciation (\$mill)       | 23000  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 23931  | 10483            | 19024  | 26895                 | 26179     | 21423                              | 19241              | 4587.0 | d497.0    | 7175.0 | 14850      | 16050  | Net Profit (\$mill)         | 18500  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 44.3%  | 43.4%            | 40.7%  | 43.5%                 | 43.5%     | 40.3%                              | 38.3%              | 5.3%   | 5.3%      | 21.4%  | 29.0%      | 29.0%  | Income Tax Rate             | 28.0%  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 8.8%   | 6.1%             | 9.3%   | 10.6%                 | 10.8%     | 9.4%                               | 9.1%               | 3.3%   | NMF       | 5.1%   | 8.8%       | 9.0%   | Net Profit Margin           | 9.5%   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 4447.0   | 11005            | 19829  | 19634                 | 21508     | 17232                              | 10306              | 8883.0 | d2166     | 823.0  | 4000       | 3000   | Working Cap'l (\$mill)      | 5000   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 6083.0   | 10130            | 11289  | 9812.0                | 12065     | 20057                              | 24028              | 33664  | 35286     | 33571  | 30000      | 30000  | Long-Term Debt (\$mill)     | 35000  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 86648  | 91914            | 105081   | 122181                | 137832    | 150427                             | 156191             | 152716 | 145556    | 148124 | 152650     | 157500 | Shr. Equity (\$mill)        | 178000 |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 26.0%  | 10.6%            | 16.6%  | 20.6%                 | 17.7%     | 12.8%                              | 11.0%              | 2.8%   | NMF       | 4.2%   | 8.5%       | 9.0%   | Return on Total Cap'l       | 9.0%   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 27.6%  | 11.4%            | 18.1%  | 22.0%                 | 19.0%     | 14.2%                              | 12.3%              | 3.0%   | NMF       | 4.8%   | 9.5%       | 10.0%  | Return on Shr. Equity       | 10.5%  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 21.7%  | 5.6%             | 12.7%  | 17.0%                 | 14.0%     | 9.3%                               | 7.2%               | NMF    | NMF       | NMF    | 4.0%       | 4.5%   | Retained to Com Eq          | 5.0%   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 22%  | 51%              | 30%  | 23%                   | 26%       | 35%                                | 41%                | NMF    | NMF       | NMF    | 58%        | 54%    | All Div'ds to Net Prof      | 50%    |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| <b>Pension Assets-12/17 \$14.7 bill. Oblig. \$19.1 bill.</b> |                  | <table border="1"> <tr><th>2002</th><th>2003</th><th>2004</th><th>2005</th><th>2006</th><th>2007</th><th>2008</th><th>2009</th><th>2010</th><th>2011</th><th>2012</th><th>2013</th><th>2014</th><th>2015</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th><th>Return on Total Cap'l</th><th>9.0%</th></tr> <tr><td>273005</td><td>171636</td><td>204928</td><td>253706</td><td>241909</td><td>228848</td><td>211970</td><td>138477</td><td>114472</td><td>141722</td><td>168000</td><td>178000</td><td>Return on Total Cap'l</td><td>9.0%</td></tr> <tr><td>19.3%</td><td>18.2%</td><td>22.3%</td><td>24.0%</td><td>24.9%</td><td>22.2%</td><td>23.2%</td><td>19.7%</td><td>15.3%</td><td>20.4%</td><td>23.5%</td><td>24.0%</td><td>Return on Total Cap'l</td><td>9.0%</td></tr> <tr><td>9528.0</td><td>12110</td><td>13063</td><td>12911</td><td>13413</td><td>14186</td><td>16793</td><td>21037</td><td>19457</td><td>19349</td><td>19550</td><td>20000</td><td>Depreciation (\$mill)</td><td>23000</td></tr> <tr><td>23931</td><td>10483</td><td>19024</td><td>26895</td><td>26179</td><td>21423</td><td>19241</td><td>4587.0</td><td>d497.0</td><td>7175.0</td><td>14850</td><td>16050</td><td>Net Profit (\$mill)</td><td>18500</td></tr> <tr><td>44.3%</td><td>43.4%</td><td>40.7%</td><td>43.5%</td><td>43.5%</td><td>40.3%</td><td>38.3%</td><td>5.3%</td><td>5.3%</td><td>21.4%</td><td>29.0%</td><td>29.0%</td><td>Income Tax Rate</td><td>28.0%</td></tr> <tr><td>8.8%</td><td>6.1%</td><td>9.3%</td><td>10.6%</td><td>10.8%</td><td>9.4%</td><td>9.1%</td><td>3.3%</td><td>NMF</td><td>5.1%</td><td>8.8%</td><td>9.0%</td><td>Net Profit Margin</td><td>9.5%</td></tr> <tr><td>4447.0</td><td>11005</td><td>19829</td><td>19634</td><td>21508</td><td>17232</td><td>10306</td><td>8883.0</td><td>d2166</td><td>823.0</td><td>4000</td><td>3000</td><td>Working Cap'l (\$mill)</td><td>5000</td></tr> <tr><td>6083.0</td><td>10130</td><td>11289</td><td>9812.0</td><td>12065</td><td>20057</td><td>24028</td><td>33664</td><td>35286</td><td>33571</td><td>30000</td><td>30000</td><td>Long-Term Debt (\$mill)</td><td>35000</td></tr> <tr><td>86648</td><td>91914</td><td>105081</td><td>122181</td><td>137832</td><td>150427</td><td>156191</td><td>152716</td><td>145556</td><td>148124</td><td>152650</td><td>157500</td><td>Shr. Equity (\$mill)</td><td>178000</td></tr> <tr><td>26.0%</td><td>10.6%</td><td>16.6%</td><td>20.6%</td><td>17.7%</td><td>12.8%</td><td>11.0%</td><td>2.8%</td><td>NMF</td><td>4.2%</td><td>8.5%</td><td>9.0%</td><td>Return on Total Cap'l</td><td>9.0%</td></tr> <tr><td>27.6%</td><td>11.4%</td><td>18.1%</td><td>22.0%</td><td>19.0%</td><td>14.2%</td><td>12.3%</td><td>3.0%</td><td>NMF</td><td>4.8%</td><td>9.5%</td><td>10.0%</td><td>Return on Shr. Equity</td><td>10.5%</td></tr> <tr><td>21.7%</td><td>5.6%</td><td>12.7%</td><td>17.0%</td><td>14.0%</td><td>9.3%</td><td>7.2%</td><td>NMF</td><td>NMF</td><td>NMF</td><td>4.0%</td><td>4.5%</td><td>Retained to Com Eq</td><td>5.0%</td></tr> <tr><td>22%</td><td>51%</td><td>30%</td><td>23%</td><td>26%</td><td>35%</td><td>41%</td><td>NMF</td><td>NMF</td><td>NMF</td><td>58%</td><td>54%</td><td>All Div'ds to Net Prof</td><td>50%</td></tr> </table>   |                       |           |                                    |                    |        |           |        |            |        |                             |        |        |              | 2002                                  | 2003   | 2004                              | 2005                  | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014                  | 2015 | 2016 | 2017 | 2018 | 2019 | Return on Total Cap'l       | 9.0%   | 273005 | 171636 | 204928 | 253706 | 241909 | 228848 | 211970 | 138477 | 114472 | 141722 | 168000 | 178000 | Return on Total Cap'l       | 9.0%   | 19.3% | 18.2% | 22.3% | 24.0% | 24.9%                     | 22.2%  | 23.2% | 19.7% | 15.3% | 20.4% | 23.5% | 24.0% | Return on Total Cap'l | 9.0%  | 9528.0 | 12110 | 13063 | 12911 | 13413 | 14186 | 16793 | 21037 | 19457 | 19349 | 19550              | 20000 | Depreciation (\$mill) | 23000 | 23931 | 10483 | 19024 | 26895 | 26179 | 21423 | 19241 | 4587.0 | d497.0 | 7175.0 | 14850 | 16050 | Net Profit (\$mill) | 18500 | 44.3% | 43.4% | 40.7%                        | 43.5% | 43.5% | 40.3% | 38.3% | 5.3% | 5.3% | 21.4% | 29.0% | 29.0% | Income Tax Rate | 28.0% | 8.8% | 6.1% | 9.3% | 10.6% | 10.8% | 9.4% | 9.1% | 3.3% | NMF                               | 5.1% | 8.8% | 9.0% | Net Profit Margin | 9.5% | 4447.0 | 11005 | 19829 | 19634 | 21508 | 17232 | 10306 | 8883.0 | d2166 | 823.0 | 4000 | 3000 | Working Cap'l (\$mill) | 5000  | 6083.0                | 10130 | 11289 | 9812.0 | 12065 | 20057 | 24028 | 33664 | 35286 | 33571 | 30000 | 30000 | Long-Term Debt (\$mill) | 35000 | 86648 | 91914 | 105081 | 122181 | 137832 | 150427 | 156191            | 152716 | 145556 | 148124 | 152650 | 157500 | Shr. Equity (\$mill) | 178000 | 26.0%  | 10.6%  | 16.6%  | 20.6%  | 17.7%  | 12.8%  | 11.0%  | 2.8%   | NMF    | 4.2%   | 8.5%   | 9.0%   | Return on Total Cap'l           | 9.0%   | 27.6% | 11.4% | 18.1% | 22.0% | 19.0% | 14.2% | 12.3% | 3.0% | NMF | 4.8% | 9.5% | 10.0% | Return on Shr. Equity | 10.5% | 21.7% | 5.6% | 12.7%                                 | 17.0% | 14.0%               | 9.3% | 7.2% | NMF | NMF | NMF | 4.0% | 4.5% | Retained to Com Eq | 5.0% | 22% | 51% | 30% | 23% | 26% | 35%  | 41% | NMF  | NMF | NMF | 58%                | 54% | All Div'ds to Net Prof | 50%  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 2002   | 2003             | 2004   | 2005                  | 2006      | 2007                               | 2008               | 2009   | 2010      | 2011   | 2012       | 2013   | 2014                        | 2015   | 2016   | 2017         | 2018                                  | 2019   | Return on Total Cap'l             | 9.0%                  |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 273005   | 171636           | 204928   | 253706                | 241909    | 228848                             | 211970             | 138477 | 114472    | 141722 | 168000     | 178000 | Return on Total Cap'l       | 9.0%   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 19.3%  | 18.2%            | 22.3%  | 24.0%                 | 24.9%     | 22.2%                              | 23.2%              | 19.7%  | 15.3%     | 20.4%  | 23.5%      | 24.0%  | Return on Total Cap'l       | 9.0%   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 9528.0   | 12110            | 13063  | 12911                 | 13413     | 14186                              | 16793              | 21037  | 19457     | 19349  | 19550      | 20000  | Depreciation (\$mill)       | 23000  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 23931  | 10483            | 19024  | 26895                 | 26179     | 21423                              | 19241              | 4587.0 | d497.0    | 7175.0 | 14850      | 16050  | Net Profit (\$mill)         | 18500  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 44.3%  | 43.4%            | 40.7%  | 43.5%                 | 43.5%     | 40.3%                              | 38.3%              | 5.3%   | 5.3%      | 21.4%  | 29.0%      | 29.0%  | Income Tax Rate             | 28.0%  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 8.8%   | 6.1%             | 9.3%   | 10.6%                 | 10.8%     | 9.4%                               | 9.1%               | 3.3%   | NMF       | 5.1%   | 8.8%       | 9.0%   | Net Profit Margin           | 9.5%   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 4447.0   | 11005            | 19829  | 19634                 | 21508     | 17232                              | 10306              | 8883.0 | d2166     | 823.0  | 4000       | 3000   | Working Cap'l (\$mill)      | 5000   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 6083.0   | 10130            | 11289  | 9812.0                | 12065     | 20057                              | 24028              | 33664  | 35286     | 33571  | 30000      | 30000  | Long-Term Debt (\$mill)     | 35000  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 86648  | 91914            | 105081   | 122181                | 137832    | 150427                             | 156191             | 152716 | 145556    | 148124 | 152650     | 157500 | Shr. Equity (\$mill)        | 178000 |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 26.0%  | 10.6%            | 16.6%  | 20.6%                 | 17.7%     | 12.8%                              | 11.0%              | 2.8%   | NMF       | 4.2%   | 8.5%       | 9.0%   | Return on Total Cap'l       | 9.0%   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 27.6%  | 11.4%            | 18.1%  | 22.0%                 | 19.0%     | 14.2%                              | 12.3%              | 3.0%   | NMF       | 4.8%   | 9.5%       | 10.0%  | Return on Shr. Equity       | 10.5%  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 21.7%  | 5.6%             | 12.7%  | 17.0%                 | 14.0%     | 9.3%                               | 7.2%               | NMF    | NMF       | NMF    | 4.0%       | 4.5%   | Retained to Com Eq          | 5.0%   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 22%  | 51%              | 30%  | 23%                   | 26%       | 35%                                | 41%                | NMF    | NMF       | NMF    | 58%        | 54%    | All Div'ds to Net Prof      | 50%    |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| <b>Prfd Stock None</b>                                       |                  | <table border="1"> <tr><th>2002</th><th>2003</th><th>2004</th><th>2005</th><th>2006</th><th>2007</th><th>2008</th><th>2009</th><th>2010</th><th>2011</th><th>2012</th><th>2013</th><th>2014</th><th>2015</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th><th>Return on Shr. Equity</th><th>10.5%</th></tr> <tr><td>273005</td><td>171636</td><td>204928</td><td>253706</td><td>241909</td><td>228848</td><td>211970</td><td>138477</td><td>114472</td><td>141722</td><td>168000</td><td>178000</td><td>Return on Shr. Equity</td><td>10.5%</td></tr> <tr><td>19.3%</td><td>18.2%</td><td>22.3%</td><td>24.0%</td><td>24.9%</td><td>22.2%</td><td>23.2%</td><td>19.7%</td><td>15.3%</td><td>20.4%</td><td>23.5%</td><td>24.0%</td><td>Return on Shr. Equity</td><td>10.5%</td></tr> <tr><td>9528.0</td><td>12110</td><td>13063</td><td>12911</td><td>13413</td><td>14186</td><td>16793</td><td>21037</td><td>19457</td><td>19349</td><td>19550</td><td>20000</td><td>Depreciation (\$mill)</td><td>23000</td></tr> <tr><td>23931</td><td>10483</td><td>19024</td><td>26895</td><td>26179</td><td>21423</td><td>19241</td><td>4587.0</td><td>d497.0</td><td>7175.0</td><td>14850</td><td>16050</td><td>Net Profit (\$mill)</td><td>18500</td></tr> <tr><td>44.3%</td><td>43.4%</td><td>40.7%</td><td>43.5%</td><td>43.5%</td><td>40.3%</td><td>38.3%</td><td>5.3%</td><td>5.3%</td><td>21.4%</td><td>29.0%</td><td>29.0%</td><td>Income Tax Rate</td><td>28.0%</td></tr> <tr><td>8.8%</td><td>6.1%</td><td>9.3%</td><td>10.6%</td><td>10.8%</td><td>9.4%</td><td>9.1%</td><td>3.3%</td><td>NMF</td><td>5.1%</td><td>8.8%</td><td>9.0%</td><td>Net Profit Margin</td><td>9.5%</td></tr> <tr><td>4447.0</td><td>11005</td><td>19829</td><td>19634</td><td>21508</td><td>17232</td><td>10306</td><td>8883.0</td><td>d2166</td><td>823.0</td><td>4000</td><td>3000</td><td>Working Cap'l (\$mill)</td><td>5000</td></tr> <tr><td>6083.0</td><td>10130</td><td>11289</td><td>9812.0</td><td>12065</td><td>20057</td><td>24028</td><td>33664</td><td>35286</td><td>33571</td><td>30000</td><td>30000</td><td>Long-Term Debt (\$mill)</td><td>35000</td></tr> <tr><td>86648</td><td>91914</td><td>105081</td><td>122181</td><td>137832</td><td>150427</td><td>156191</td><td>152716</td><td>145556</td><td>148124</td><td>152650</td><td>157500</td><td>Shr. Equity (\$mill)</td><td>178000</td></tr> <tr><td>26.0%</td><td>10.6%</td><td>16.6%</td><td>20.6%</td><td>17.7%</td><td>12.8%</td><td>11.0%</td><td>2.8%</td><td>NMF</td><td>4.2%</td><td>8.5%</td><td>9.0%</td><td>Return on Total Cap'l</td><td>9.0%</td></tr> <tr><td>27.6%</td><td>11.4%</td><td>18.1%</td><td>22.0%</td><td>19.0%</td><td>14.2%</td><td>12.3%</td><td>3.0%</td><td>NMF</td><td>4.8%</td><td>9.5%</td><td>10.0%</td><td>Return on Shr. Equity</td><td>10.5%</td></tr> <tr><td>21.7%</td><td>5.6%</td><td>12.7%</td><td>17.0%</td><td>14.0%</td><td>9.3%</td><td>7.2%</td><td>NMF</td><td>NMF</td><td>NMF</td><td>4.0%</td><td>4.5%</td><td>Retained to Com Eq</td><td>5.0%</td></tr> <tr><td>22%</td><td>51%</td><td>30%</td><td>23%</td><td>26%</td><td>35%</td><td>41%</td><td>NMF</td><td>NMF</td><td>NMF</td><td>58%</td><td>54%</td><td>All Div'ds to Net Prof</td><td>50%</td></tr> </table>  |                       |           |                                    |                    |        |           |        |            |        |                             |        |        |              | 2002                                  | 2003   | 2004                              | 2005                  | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014                  | 2015 | 2016 | 2017 | 2018 | 2019 | Return on Shr. Equity       | 10.5%  | 273005 | 171636 | 204928 | 253706 | 241909 | 228848 | 211970 | 138477 | 114472 | 141722 | 168000 | 178000 | Return on Shr. Equity       | 10.5%  | 19.3% | 18.2% | 22.3% | 24.0% | 24.9%                     | 22.2%  | 23.2% | 19.7% | 15.3% | 20.4% | 23.5% | 24.0% | Return on Shr. Equity | 10.5% | 9528.0 | 12110 | 13063 | 12911 | 13413 | 14186 | 16793 | 21037 | 19457 | 19349 | 19550              | 20000 | Depreciation (\$mill) | 23000 | 23931 | 10483 | 19024 | 26895 | 26179 | 21423 | 19241 | 4587.0 | d497.0 | 7175.0 | 14850 | 16050 | Net Profit (\$mill) | 18500 | 44.3% | 43.4% | 40.7%                        | 43.5% | 43.5% | 40.3% | 38.3% | 5.3% | 5.3% | 21.4% | 29.0% | 29.0% | Income Tax Rate | 28.0% | 8.8% | 6.1% | 9.3% | 10.6% | 10.8% | 9.4% | 9.1% | 3.3% | NMF                               | 5.1% | 8.8% | 9.0% | Net Profit Margin | 9.5% | 4447.0 | 11005 | 19829 | 19634 | 21508 | 17232 | 10306 | 8883.0 | d2166 | 823.0 | 4000 | 3000 | Working Cap'l (\$mill) | 5000  | 6083.0                | 10130 | 11289 | 9812.0 | 12065 | 20057 | 24028 | 33664 | 35286 | 33571 | 30000 | 30000 | Long-Term Debt (\$mill) | 35000 | 86648 | 91914 | 105081 | 122181 | 137832 | 150427 | 156191            | 152716 | 145556 | 148124 | 152650 | 157500 | Shr. Equity (\$mill) | 178000 | 26.0%  | 10.6%  | 16.6%  | 20.6%  | 17.7%  | 12.8%  | 11.0%  | 2.8%   | NMF    | 4.2%   | 8.5%   | 9.0%   | Return on Total Cap'l           | 9.0%   | 27.6% | 11.4% | 18.1% | 22.0% | 19.0% | 14.2% | 12.3% | 3.0% | NMF | 4.8% | 9.5% | 10.0% | Return on Shr. Equity | 10.5% | 21.7% | 5.6% | 12.7%                                 | 17.0% | 14.0%               | 9.3% | 7.2% | NMF | NMF | NMF | 4.0% | 4.5% | Retained to Com Eq | 5.0% | 22% | 51% | 30% | 23% | 26% | 35%  | 41% | NMF  | NMF | NMF | 58%                | 54% | All Div'ds to Net Prof | 50%  |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 2002   | 2003             | 2004   | 2005                  | 2006      | 2007                               | 2008               | 2009   | 2010      | 2011   | 2012       | 2013   | 2014                        | 2015   | 2016   | 2017         | 2018                                  | 2019   | Return on Shr. Equity             | 10.5%                 |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 273005   | 171636           | 204928   | 253706                | 241909    | 228848                             | 211970             | 138477 | 114472    | 141722 | 168000     | 178000 | Return on Shr. Equity       | 10.5%  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 19.3%  | 18.2%            | 22.3%  | 24.0%                 | 24.9%     | 22.2%                              | 23.2%              | 19.7%  | 15.3%     | 20.4%  | 23.5%      | 24.0%  | Return on Shr. Equity       | 10.5%  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 9528.0   | 12110            | 13063  | 12911                 | 13413     | 14186                              | 16793              | 21037  | 19457     | 19349  | 19550      | 20000  | Depreciation (\$mill)       | 23000  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 23931  | 10483            | 19024  | 26895                 | 26179     | 21423                              | 19241              | 4587.0 | d497.0    | 7175.0 | 14850      | 16050  | Net Profit (\$mill)         | 18500  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 44.3%  | 43.4%            | 40.7%  | 43.5%                 | 43.5%     | 40.3%                              | 38.3%              | 5.3%   | 5.3%      | 21.4%  | 29.0%      | 29.0%  | Income Tax Rate             | 28.0%  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 8.8%   | 6.1%             | 9.3%   | 10.6%                 | 10.8%     | 9.4%                               | 9.1%               | 3.3%   | NMF       | 5.1%   | 8.8%       | 9.0%   | Net Profit Margin           | 9.5%   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 4447.0   | 11005            | 19829  | 19634                 | 21508     | 17232                              | 10306              | 8883.0 | d2166     | 823.0  | 4000       | 3000   | Working Cap'l (\$mill)      | 5000   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 6083.0   | 10130            | 11289  | 9812.0                | 12065     | 20057                              | 24028              | 33664  | 35286     | 33571  | 30000      | 30000  | Long-Term Debt (\$mill)     | 35000  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 86648  | 91914            | 105081   | 122181                | 137832    | 150427                             | 156191             | 152716 | 145556    | 148124 | 152650     | 157500 | Shr. Equity (\$mill)        | 178000 |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 26.0%  | 10.6%            | 16.6%  | 20.6%                 | 17.7%     | 12.8%                              | 11.0%              | 2.8%   | NMF       | 4.2%   | 8.5%       | 9.0%   | Return on Total Cap'l       | 9.0%   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 27.6%  | 11.4%            | 18.1%  | 22.0%                 | 19.0%     | 14.2%                              | 12.3%              | 3.0%   | NMF       | 4.8%   | 9.5%       | 10.0%  | Return on Shr. Equity       | 10.5%  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 21.7%  | 5.6%             | 12.7%  | 17.0%                 | 14.0%     | 9.3%                               | 7.2%               | NMF    | NMF       | NMF    | 4.0%       | 4.5%   | Retained to Com Eq          | 5.0%   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 22%  | 51%              | 30%  | 23%                   | 26%       | 35%                                | 41%                | NMF    | NMF       | NMF    | 58%        | 54%    | All Div'ds to Net Prof      | 50%    |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| <b>Common Stock 1,910,774,369 shs.</b>                       |                  | <table border="1"> <tr><th>2002</th><th>2003</th><th>2004</th><th>2005</th><th>2006</th><th>2007</th><th>2008</th><th>2009</th><th>2010</th><th>2011</th><th>2012</th><th>2013</th><th>2014</th><th>2015</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th><th>Retained to Com Eq</th><th>5.0%</th></tr> <tr><td>273005</td><td>171636</td><td>204928</td><td>253706</td><td>241909</td><td>228848</td><td>211970</td><td>138477</td><td>114472</td><td>141722</td><td>168000</td><td>178000</td><td>Retained to Com Eq</td><td>5.0%</td></tr> <tr><td>19.3%</td><td>18.2%</td><td>22.3%</td><td>24.0%</td><td>24.9%</td><td>22.2%</td><td>23.2%</td><td>19.7%</td><td>15.3%</td><td>20.4%</td><td>23.5%</td><td>24.0%</td><td>Retained to Com Eq</td><td>5.0%</td></tr> <tr><td>9528.0</td><td>12110</td><td>13063</td><td>12911</td><td>13413</td><td>14186</td><td>16793</td><td>21037</td><td>19457</td><td>19349</td><td>19550</td><td>20000</td><td>Depreciation (\$mill)</td><td>23000</td></tr> <tr><td>23931</td><td>10483</td><td>19024</td><td>26895</td><td>26179</td><td>21423</td><td>19241</td><td>4587.0</td><td>d497.0</td><td>7175.0</td><td>14850</td><td>16050</td><td>Net Profit (\$mill)</td><td>18500</td></tr> <tr><td>44.3%</td><td>43.4%</td><td>40.7%</td><td>43.5%</td><td>43.5%</td><td>40.3%</td><td>38.3%</td><td>5.3%</td><td>5.3%</td><td>21.4%</td><td>29.0%</td><td>29.0%</td><td>Income Tax Rate</td><td>28.0%</td></tr> <tr><td>8.8%</td><td>6.1%</td><td>9.3%</td><td>10.6%</td></tr></table>  |                       |           |                                    |                    |        |           |        |            |        |                             |        |        |              | 2002                                  | 2003   | 2004                              | 2005                  | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014                  | 2015 | 2016 | 2017 | 2018 | 2019 | Retained to Com Eq          | 5.0%   | 273005 | 171636 | 204928 | 253706 | 241909 | 228848 | 211970 | 138477 | 114472 | 141722 | 168000 | 178000 | Retained to Com Eq          | 5.0%   | 19.3% | 18.2% | 22.3% | 24.0% | 24.9%                     | 22.2%  | 23.2% | 19.7% | 15.3% | 20.4% | 23.5% | 24.0% | Retained to Com Eq    | 5.0%  | 9528.0 | 12110 | 13063 | 12911 | 13413 | 14186 | 16793 | 21037 | 19457 | 19349 | 19550              | 20000 | Depreciation (\$mill) | 23000 | 23931 | 10483 | 19024 | 26895 | 26179 | 21423 | 19241 | 4587.0 | d497.0 | 7175.0 | 14850 | 16050 | Net Profit (\$mill) | 18500 | 44.3% | 43.4% | 40.7%                        | 43.5% | 43.5% | 40.3% | 38.3% | 5.3% | 5.3% | 21.4% | 29.0% | 29.0% | Income Tax Rate | 28.0% | 8.8% | 6.1% | 9.3% | 10.6% |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 2002   | 2003             | 2004   | 2005                  | 2006      | 2007                               | 2008               | 2009   | 2010      | 2011   | 2012       | 2013   | 2014                        | 2015   | 2016   | 2017         | 2018                                  | 2019   | Retained to Com Eq                | 5.0%                  |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 273005   | 171636           | 204928   | 253706                | 241909    | 228848                             | 211970             | 138477 | 114472    | 141722 | 168000     | 178000 | Retained to Com Eq          | 5.0%   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 19.3%  | 18.2%            | 22.3%  | 24.0%                 | 24.9%     | 22.2%                              | 23.2%              | 19.7%  | 15.3%     | 20.4%  | 23.5%      | 24.0%  | Retained to Com Eq          | 5.0%   |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 9528.0   | 12110            | 13063  | 12911                 | 13413     | 14186                              | 16793              | 21037  | 19457     | 19349  | 19550      | 20000  | Depreciation (\$mill)       | 23000  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 23931  | 10483            | 19024  | 26895                 | 26179     | 21423                              | 19241              | 4587.0 | d497.0    | 7175.0 | 14850      | 16050  | Net Profit (\$mill)         | 18500  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 44.3%  | 43.4%            | 40.7%  | 43.5%                 | 43.5%     | 40.3%                              | 38.3%              | 5.3%   | 5.3%      | 21.4%  | 29.0%      | 29.0%  | Income Tax Rate             | 28.0%  |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |
| 8.8%   | 6.1%             | 9.3%   | 10.6%                 |           |                                    |                    |        |           |        |            |        |                             |        |        |              |                                       |        |                                   |                       |      |      |      |      |      |      |      |      |                       |      |      |      |      |      |                             |        |        |        |        |        |        |        |        |        |        |        |        |        |                             |        |       |       |       |       |                           |        |       |       |       |       |       |       |                       |       |        |       |       |       |       |       |       |       |       |       |                    |       |                       |       |       |       |       |       |       |       |       |        |        |        |       |       |                     |       |       |       |                              |       |       |       |       |      |      |       |       |       |                 |       |      |      |      |       |       |      |      |      |                                   |      |      |      |                   |      |        |       |       |       |       |       |       |        |       |       |      |      |                        |       |                       |       |       |        |       |       |       |       |       |       |       |       |                         |       |       |       |        |        |        |        |                   |        |        |        |        |        |                      |        |        |        |        |        |        |        |        |        |        |        |        |        |                                 |        |       |       |       |       |       |       |       |      |     |      |      |       |                       |       |       |      |                                       |       |                     |      |      |     |     |     |      |      |                    |      |     |     |     |     |     |      |     |      |     |     |                    |     |                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |                       |      |

| AMAZON.COM NDQ-AMZN  |                                 | RECENT PRICE   | 1530.42 | P/E RATIO   | NMF (Trailing:NMF Median:NMF) | RELATIVE P/E RATIO                | NMF    | DIV'D YLD | Nil   | VALUE LINE |        |        |        |              |        |        |        |                       |                        |                         |       |
|--|---------------------------------|--|---------|-------------|-------------------------------|-----------------------------------|--------|-----------|---|------------|--------|--------|--------|--------------|--------|--------|--------|-----------------------|------------------------|-------------------------|-------|
| TIMELINESS   | 2 Raised 10/19/18               | High: 101.1  | 97.4    | 145.9       | 185.6                         | 246.7                             | 264.1  | 405.6     | 408.1   | 696.4      | 847.2  | 1213   | 2050   | Target Price | Range  |        |        |                       |                        |                         |       |
| SAFETY   | 3 Raised 5/25/07                | Low: 36.3  | 34.7    | 47.6        | 105.8                         | 160.6                             | 172.0  | 245.8     | 284.0   | 285.3      | 474.0  | 747.7  | 1170   | 2021         | 2022   |        |        |                       |                        |                         |       |
| TECHNICAL  | 3 Raised 10/19/18               | <b>LEGENDS</b><br>24.0 x "Cash Flow" p sh<br>.... Relative Price Strength<br>Options: Yes<br>Shaded area indicates recession |         |             |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| BETA   | 1.15 (1.00 = Market)            |  |         |             |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| 2021-23 PROJECTIONS  |                                 | Price  | Gain    | Ann'l Total |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| High   | 2460                            | (+60%)   | 13%     |             |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| Low  | 1640                            | (+5%)  | 2%      |             |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| Insider Decisions  |                                 | D  | J       | F           | M                             | A                                 | M      | J         | J   | A          |        |        |        |              |        |        |        |                       |                        |                         |       |
| to Buy   | 0                               | 0  | 0       | 0           | 0                             | 0                                 | 0      | 0         | 0   | 0          |        |        |        |              |        |        |        |                       |                        |                         |       |
| Options  | 0                               | 0  | 0       | 0           | 0                             | 0                                 | 0      | 0         | 0   | 0          |        |        |        |              |        |        |        |                       |                        |                         |       |
| to Sell  | 0                               | 0  | 0       | 0           | 0                             | 0                                 | 0      | 0         | 0   | 0          |        |        |        |              |        |        |        |                       |                        |                         |       |
| Institutional Decisions  |                                 | 4Q2017   | 1Q2018  | 2Q2018      | Percent                       |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| to Buy   | 1023                            | 1122   | 1222    | shares      | 75                            |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| to Sell  | 716                             | 1001   | 880     | traded      | 25                            |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| Hld's(000)   | 290169                          | 277109   | 278304  |             |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
|  |                                 | % TOT. RETURN 9/18   |         |             |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
|  |                                 | THIS STOCK VL ARITH. INDEX   |         |             |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
|  |                                 | 1 yr. 108.4 13.0   |         |             |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
|  |                                 | 3 yr. 291.3 54.8   |         |             |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
|  |                                 | 5 yr. 540.7 62.8   |         |             |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| 2002   | 2003                            | 2004   | 2005    | 2006        | 2007                          | 2008                              | 2009   | 2010      | 2011  | 2012       | 2013   | 2014   | 2015   | 2016         | 2017   | 2018   | 2019   | © VALUE LINE PUB. LLC | 21-23                  |                         |       |
| 10.14  | 13.05                           | 17.16  | 20.41   | 25.87       | 35.66                         | 44.78                             | 55.20  | 75.84     | 105.65  | 134.40     | 162.11 | 191.63 | 227.19 | 285.09       | 367.49 | 464.95 | 586.40 | Revenues per sh       | 961.60                 |                         |       |
| .21  | .60                             | 1.05   | 1.10    | .95         | 1.74                          | 2.07                              | 2.88   | 3.81      | 3.77  | 5.04       | 7.68   | 9.70   | 14.60  | 21.99        | 28.35  | 43.70  | 50.15  | "Cash Flow" per sh    | 80.80                  |                         |       |
| d.01   | .40                             | .82  | .79     | .45         | 1.12                          | 1.39                              | 2.04   | 2.53      | 1.37  | .29        | .59    | d.52   | 1.25   | 4.90         | 4.55   | 18.60  | 24.00  | Earnings per sh A     | 51.20                  |                         |       |
| --   | --                              | --   | --      | --          | --                            | --                                | --     | --        | --  | --         | --     | --     | --     | --           | --     | Nil    | Nil    | Div'ds Decl'd per sh  | Nil                    |                         |       |
| .10  | .11                             | .22  | .49     | .52         | .54                           | .78                               | .84    | 2.17      | 3.98  | 8.33       | 7.50   | 10.54  | 9.74   | 14.12        | 24.70  | 24.75  | 26.75  | Cap'l Spending per sh | 32.80                  |                         |       |
| d3.49  | d2.57                           | d5.56  | .59     | 1.04        | 2.88                          | 6.24                              | 11.84  | 15.22     | 17.95   | 18.02      | 21.22  | 23.13  | 28.42  | 40.43        | 57.25  | 79.20  | 107.10 | Book Value per sh     | 241.25                 |                         |       |
| 387.91   | 403.35                          | 403.35   | 416.00  | 414.00      | 416.00                        | 428.00                            | 444.00 | 451.00    | 455.07  | 454.55     | 459.26 | 464.38 | 471.00 | 477.00       | 484.00 | 485.00 | 486.00 | Common Shs Outst'g B  | 487.00                 |                         |       |
| --   | NMF                             | NMF  | 50.5    | NMF         | NMF                           | 50.3                              | 42.8   | NMF       | NMF   | NMF        | NMF    | --     | NMF    | NMF          | NMF    | NMF    | NMF    | Avg Ann'l P/E Ratio   | 40.0                   |                         |       |
| --   | NMF                             | NMF  | 2.69    | NMF         | NMF                           | 3.03                              | 2.85   | NMF       | NMF   | NMF        | NMF    | --     | NMF    | NMF          | NMF    | NMF    | NMF    | Relative P/E Ratio    | 2.20                   |                         |       |
| --   | --                              | --   | --      | --          | --                            | --                                | --     | --        | --  | --         | --     | --     | --     | --           | --     | --     | --     | Avg Ann'l Div'd Yield | Nil                    |                         |       |
| CAPITAL STRUCTURE as of 9/30/18  |                                 |  |         |             |                               | 19166                             | 24509  | 34204     | 48077   | 61093      | 74452  | 88988  | 107006 | 135987       | 177866 | 225505 | 285000 | Revenues (\$mill)     | 468305                 |                         |       |
| Total Debt \$24684.0 mill. Due in 5 Yrs \$8229.0 mill.   |                                 |  |         |             |                               | 5.8%                              | 6.6%   | 5.8%      | 4.0%  | 4.6%       | 5.4%   | 5.5%   | 8.0%   | 9.0%         | 8.8%   | 11.0%  | 10.0%  | Operating Margin      | 10.0%                  |                         |       |
| LT Debt \$24684.0 mill. LT Interest \$848.0 mill. (39% of Cap'l)   |                                 |  |         |             |                               | 287.0                             | 378.0  | 568.0     | 1083.0  | 2159.0     | 3253.0 | 4746.0 | 6281.0 | 8116.0       | 11478  | 12000  | 12500  | 14000                 | Depreciation (\$mill)  | 14000                   |       |
| Leases, Uncapitalized:\$2427.0 mill.   |                                 |  |         |             |                               | 600.0                             | 902.0  | 1152.0    | 631.0   | 130.0      | 274.0  | d241.0 | 596.0  | 2371.0       | 2244.0 | 9190   | 11880  | 25435                 | Net Profit (\$mill)    | 25435                   |       |
| No Defined Benefit Pension Plan  |                                 |  |         |             |                               | 26.1%                             | 21.8%  | 23.5%     | 31.2%   | NMF        | 31.8%  | --     | 60.6%  | 36.6%        | 25.5%  | 20.0%  | 20.0%  | Income Tax Rate       | 20.0%                  |                         |       |
| Common Stock 488,968,628 shs. As of 10/17/18   |                                 |  |         |             |                               | 3.1%                              | 3.7%   | 3.4%      | 1.3%  | 2%         | 4%     | NMF    | .6%    | 1.7%         | 1.3%   | 4.1%   | 4.2%   | Net Profit Margin     | 5.4%                   |                         |       |
| MARKET CAP: \$748 billion (Large Cap)  |                                 |  |         |             |                               | 1411.0                            | 2433.0 | 3375.0    | 2594.0  | 2294.0     | 1645.0 | 3238.0 | 2575.0 | 1965.0       | 2314.0 | 13335  | 27465  | 19335                 | Working Cap'l (\$mill) | 91395                   |       |
| CURRENT POSITION 2016 2017 9/30/18 (\$MILL.)   |                                 |  |         |             |                               | 687.0                             | 109.0  | 460.0     | 853.0   | 3084.0     | 3191.0 | 8265.0 | 8235.0 | 7694.0       | 24694  | 25000  | 26000  | 26000                 | 29000                  | Long-Term Debt (\$mill) | 29000 |
| Cash Assets  |                                 |  |         |             |                               | 25981                             | 30986  | 29765     | <b>BUSINESS:</b> Amazon.com is one of the largest online retailers. The company opened its virtual doors in 1995. Sales breakdown (2017): North America; 60% of sales. International sales, 31% of total. Amazon Web Services (AWS), 9%. Third-party sellers (Marketplace) account for about 20% of sales. Seasonality: Q4 accounted for 34% of '17 revenue. Acquired CDNow, '02, Audible.com, '08, Zappos, '09, Whole Foods Market, '17. Has about 230,800 employees. Officers/directors own 16.3% of outstanding common stock (including Mr. Bezos' 16.3%) (4/18 proxy). President, Chairman & Chief Executive Officer: Jeffrey Bezos. Incorporated: Delaware. Addr.: 410 Terry Avenue North, Seattle, WA 98109-5210. Tel.: 206-266-1000. Internet: www.amazon.com. |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| Inventory (Avg Cst)  |                                 |  |         |             |                               | 11461                             | 16047  | 15862     | <b>Shares of Amazon.com are trading markedly lower since our August review.</b> In fact, the equity has lost about 14.5% of its value over this time frame. This likely reflects the company posting somewhat mixed third-quarter financial results, as well as a general correction in the broader market averages.  |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| A/R & Other  |                                 |  |         |             |                               | 8339                              | 13164  | 14258     | <b>The September-period top line came in lighter than expected.</b> Revenues advanced 29.3%, to \$56.6 billion, due to double-digit gains in both products and services. This was slightly below our call for \$57 billion. On the profitability front, cost of goods sold and operating expenses declined 470 basis points and 110 basis points as a percentage of the top line, respectively. After accounting for a 3.4% drop in corporate taxes, AMZN's bottom line shot up tenfold, to \$5.75 a share. This bested our call for earnings of \$2.50.  |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| Current Assets   |                                 |  |         |             |                               | 45781                             | 60197  | 59885     | <b>We have raised our share-net outlook for this year by \$4.55, to \$18.60.</b> This would represent a fourfold annual earnings increase. It should be supported by a 25%-30% top-line increase. New offerings like the recently introduced family of Echo devices, Fire HD 8 tablet, and a host of Alexa-compatible products, just to name a few, are helping to drive volumes. Too, collaborations with J.Crew and Calvin Klein should bear fruit down the road. Finally, cost cuts and reduced taxes will likely aid margins.   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| Accts Payable  |                                 |  |         |             |                               | 25309                             | 34616  | 30904     | <b>The overall financial position is in good shape and improving.</b> Over the first nine months, of the year cash reserves remained stable at \$20.4 billion. And, the long-term debt load was reduced by low single digits, to \$24.7 billion, or approximately 39% of total capital.   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| Debt Due   |                                 |  |         |             |                               | --                                | --     | --        | <b>Short-term investors may want to utilize the recent correction to take a position in this growth stock.</b> Our Timeliness Ranking System has Amazon pegged to outpace the broader market averages in the coming year. However, despite the healthy earnings growth outlook, AMZN trades at such a high P/E multiple that any perceived slowdown in revenue growth can send the stock tumbling lower. From a fundamental standpoint, the equity is trading near the low end of our Target Price Range, thus limiting 3- to 5-year appreciation potential.  |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| Other  |                                 |  |         |             |                               | 18507                             | 23267  | 24420     | <i>Bryan J. Fong</i> November 9, 2018   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| Current Liab.  |                                 |  |         |             |                               | 43816                             | 57883  | 55324     |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| ANNUAL RATES   |                                 | Past   | Past    | Est'd       | '15-'17                       |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| of change (per sh)   |                                 | 10 Yrs.  | 5 Yrs.  | to '21-'23  |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| Revenues   |                                 | 27.0%  | 22.5%   | 22.0%       |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| "Cash Flow"  |                                 | 33.0%  | 39.0%   | 24.5%       |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| Earnings   |                                 | 16.5%  | 20.5%   | 56.0%       |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| Dividends  |                                 | --   | --      | Nil         |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| Book Value   |                                 | 39.5%  | 20.0%   | 34.0%       |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| Cal-endar  | QUARTERLY REVENUES (\$ mill.) A |  |         |             | Full Year                     |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
|  | Mar.31                          | Jun.30   | Sep.30  | Dec.31      |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| 2015   | 22717                           | 23185  | 25358   | 35747       | 107006                        |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| 2016   | 29128                           | 30404  | 32714   | 43741       | 135987                        |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| 2017   | 35714                           | 37955  | 43744   | 60453       | 177866                        |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| 2018   | 51042                           | 52886  | 56576   | 65001       | 225505                        |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| 2019   | 65915                           | 67760  | 71450   | 79875       | 285000                        |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| Cal-endar  | EARNINGS PER SHARE A            |  |         |             | Full Year                     |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
|  | Mar.31                          | Jun.30   | Sep.30  | Dec.31      |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| 2015   | d.12                            | .19  | .17     | 1.00        | 1.25                          |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| 2016   | 1.07                            | 1.78   | .52     | 1.54        | 4.90                          |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| 2017   | 1.48                            | .40  | .52     | 2.15        | 4.55                          |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| 2018   | 3.27                            | 5.07   | 5.75    | 4.51        | 18.60                         |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| 2019   | 4.60                            | 6.40   | 7.10    | 5.90        | 24.00                         |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| Cal-endar  | QUARTERLY DIVIDENDS PAID        |  |         |             | Full Year                     |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
|  | Mar.31                          | Jun.30   | Sep.30  | Dec.31      |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| 2014   | NO CASH DIVIDENDS BEING PAID    |  |         |             |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| 2015   | NO CASH DIVIDENDS BEING PAID    |  |         |             |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| 2016   | NO CASH DIVIDENDS BEING PAID    |  |         |             |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| 2017   | NO CASH DIVIDENDS BEING PAID    |  |         |             |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| 2018   | NO CASH DIVIDENDS BEING PAID    |  |         |             |                               |                                   |        |           |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
| (A) Diluted earnings. Excludes goodwill: '02, (1¢). Includes stock-based compensation: '02, (19¢); '03, (21¢); '04, (14¢); '05, (20¢); '06, (24¢); '07, (44¢); '08, (64¢); '09, (77¢). Excludes merger/acquisition costs: '02, (11¢); '03, (32¢). Excludes equity in losses: '02, (01¢). Excludes other nonrecurring items: '04, 54¢; '05, 5¢; '12, (37¢). Qly. revenues and eqs. may not sum due to rounding. Next earnings report due late Jan. (B) In millions.   |                                 |  |         |             |                               | Company's Financial Strength      |        | A+        |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
|  |                                 |  |         |             |                               | Stock's Price Stability           |        | 50        |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
|  |                                 |  |         |             |                               | Price Growth Persistence          |        | 100       |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
|  |                                 |  |         |             |                               | Earnings Predictability           |        | 10        |   |            |        |        |        |              |        |        |        |                       |                        |                         |       |
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| NETFLIX, INC. NDQ-NFLX  |   | RECENT PRICE | 333.16       | P/E RATIO | NMF (Trailing:NMF Median:NMF) | RELATIVE P/E RATIO | NMF     | DIV/D YLD | Nil    | VALUE LINE |         |   |              |                                      |        |                |
|---|---|--------------|--------------|-----------|-------------------------------|--------------------|---------|-----------|--------|------------|---------|---|--------------|--------------------------------------|--------|----------------|
| <b>TIMELINESS</b> 2 Raised 1/26/18  | High: 4.2   | 5.8          | 8.8          | 29.9      | 43.5                          | 19.1               | 55.6    | 69.9      | 133.3  | 129.3      | 204.4   | 423.2   | Target Price | Range                                |        |                |
| <b>SAFETY</b> 3 Raised 8/22/08  | Low: 2.2  | 2.6          | 4.1          | 6.9       | 8.9                           | 7.5                | 13.0    | 42.8      | 45.3   | 79.9       | 124.3   | 195.4   | 2021         | 2022                                 |        |                |
| <b>TECHNICAL</b> 3 Lowered 9/14/18  | LEGENDS<br>— 12.0 x "Cash Flow" p sh<br>.... Relative Price Strength<br>7-for-1 split 7/15<br>Options: Yes<br>Shaded area indicates recession |              | 7-for-1 7/15 |           |                               |                    |         |           |        |            |         |   | 2023         | 640                                  |        |                |
| <b>BETA</b> .95 (1.00 = Market)   | 2021-23 PROJECTIONS   |              |              |           |                               |                    |         |           |        |            |         |   | 480          |                                      |        |                |
| Ann'l Total   |   | Price        | Gain         | Return    |                               |                    |         |           |        |            |         |   |              |                                      | 400    |                |
| High  | 435   | (+30%)       | 7%           |           |                               |                    |         |           |        |            |         |   |              | 320                                  |        |                |
| Low   | 290   | (-15%)       | -3%          |           |                               |                    |         |           |        |            |         |   |              | 240                                  |        |                |
| <b>Insider Decisions</b>  |   |              |              |           |                               |                    |         |           |        |            |         | 200   |              |                                      |        |                |
| D   | J   | F            | M            | A         | M                             | J                  | J       | A         |        |            |         |   | 160          |                                      |        |                |
| to Buy  | 0   | 0            | 0            | 0         | 0                             | 0                  | 0       | 0         |        |            |         |   | 120          |                                      |        |                |
| Options   | 3   | 5            | 5            | 3         | 2                             | 7                  | 5       | 5         |        |            |         |   | 80           |                                      |        |                |
| to Sell   | 3   | 5            | 5            | 3         | 2                             | 7                  | 5       | 5         |        |            |         |   | 60           |                                      |        |                |
| <b>Institutional Decisions</b>  |   |              |              |           |                               |                    |         |           |        |            |         | % TOT. RETURN 9/18  |              |                                      |        |                |
| 4Q2017  | 1Q2018  | 2Q2018       | Percent      |           |                               |                    |         |           |        |            |         |   |              | 1 yr.                                | 106.3  | VL ARTH. INDEX |
| to Buy  | 453   | 598          | 180          |           |                               |                    |         |           |        |            |         |   |              | 3 yr.                                | 262.3  | 13.0           |
| to Sell   | 312   | 478          | 120          |           |                               |                    |         |           |        |            |         |   |              | 5 yr.                                | 747.0  | 54.8           |
| Hlds(000)   | 356568  | 336276       | 60           |           |                               |                    |         |           |        |            |         |   |              | © VALUE LINE PUB. LLC 21-23          |        |                |
| Netflix, Inc. was launched in 1999 and began renting movies in DVD format through its website. On May 22, 2002, it went public with an initial public offering of 5,500,000 shares at a price of \$7.50 per share (split adjusted). The offering was underwritten by Merrill Lynch, Thomas Weisel Partners LLC, and U.S. Bancorp Piper Jaffray. |   | 2008         | 2009         | 2010      | 2011                          | 2012               | 2013    | 2014      | 2015   | 2016       | 2017    | 2018  | 2019         |                                      |        |                |
|   |   | 3.31         | 4.47         | 5.85      | 8.26                          | 9.28               | 10.48   | 13.02     | 15.84  | 20.53      | 26.98   | 36.45   | 41.75        | Revenues per sh                      | 52.50  |                |
|   |   | .79          | 1.00         | 1.35      | 2.75                          | 4.42               | 5.68    | 7.12      | 8.58   | 11.89      | 15.90   | 18.40   | 20.85        | "Cash Flow" per sh                   | 26.60  |                |
|   |   | .19          | .28          | .42       | .59                           | .04                | .30     | .53       | .28    | .43        | 1.43    | 3.25  | 4.35         | Earnings per sh <sup>A</sup>         | 7.25   |                |
|   |   | --           | --           | --        | --                            | --                 | --      | --        | --     | --         | --      | Nil   | Nil          | Div'ds Decl'd per sh                 | Nil    |                |
|   |   | .50          | .64          | .43       | .35                           | .23                | .29     | .34       | .21    | .25        | .40     | .45   | .55          | Cap'l Spending per sh                | .90    |                |
|   |   | .84          | .53          | .79       | 1.66                          | 1.91               | 3.20    | 4.39      | 5.20   | 6.23       | 8.26    | 8.70  | 9.40         | Book Value per sh                    | 11.15  |                |
|   |   | 412.04       | 374.08       | 369.47    | 387.79                        | 389.11             | 417.25  | 422.91    | 427.94 | 430.05     | 433.39  | 432.00  | 425.00       | Common Shs Outst'g <sup>B</sup>      | 400.00 |                |
|   |   | 21.3         | 22.4         | 39.5      | 46.4                          | NMF                | NMF     | NMF       | NMF    | NMF        | NMF     | NMF   | NMF          | Avg Ann'l P/E Ratio                  | 50.0   |                |
|   |   | 1.28         | 1.49         | 2.51      | 2.91                          | NMF                | NMF     | NMF       | NMF    | NMF        | NMF     | NMF   | NMF          | Relative P/E Ratio                   | 2.80   |                |
|   |   | --           | --           | --        | --                            | --                 | --      | --        | --     | --         | --      | --  | --           | Avg Ann'l Div'd Yield                | Nil    |                |
| <b>CAPITAL STRUCTURE</b> as of 9/30/18  |   |              |              |           |                               |                    |         |           |        |            |         | Revenues (\$mill)   |              | 21000                                |        |                |
| Total Debt \$8336.6 mill. Due in 5 Yrs \$2700 mill.   |   | 1364.7       | 1670.3       | 2162.6    | 3204.6                        | 3609.3             | 4374.6  | 5504.7    | 6779.5 | 8830.7     | 11692.7 | 15750   | 17750        | Operating Margin                     | 67.0%  |                |
| LT Debt \$8336.6 mill. LT Interest \$220.0 mill. (64% of Cap'l)   |   | 26.2%        | 26.6%        | 28.5%     | 37.9%                         | 48.5%              | 56.5%   | 57.9%     | 56.8%  | 60.1%      | 61.3%   | 61.5%   | 62.5%        | Depreciation (\$mill) <sup>C E</sup> | 7750   |                |
|   |   | 242.2        | 257.5        | 338.7     | 839.6                         | 1702.1             | 2241.7  | 2781.8    | 3547.0 | 4925.0     | 6330.4  | 6550  | 7000         | Net Profit (\$mill)                  | 2890   |                |
| <b>Leases, Uncapitalized:</b> Annual rentals \$102 mill.  |   | 84.2         | 115.9        | 160.9     | 226.1                         | 17.2               | 128.3   | 228.2     | 122.6  | 186.7      | 558.9   | 1395  | 1855         | Income Tax Rate                      | 23.0%  |                |
| <b>No Defined Benefit Pension Plan</b>  |   | 36.0%        | 39.7%        | 39.9%     | 37.1%                         | 43.7%              | 25.0%   | 34.7%     | 13.6%  | 28.3%      | 31.5%   | 24.0%   | 24.5%        | Net Profit Margin                    | 13.8%  |                |
| <b>Pfd Stock None</b>   |   | 6.2%         | 6.9%         | 7.4%      | 7.1%                          | .5%                | 2.9%    | 4.1%      | 1.8%   | 2.1%       | 4.8%    | 8.9%  | 10.5%        | Working Cap'l (\$mill)               | 3000   |                |
| <b>Common Stock</b> 435,033,000 shs.  |   | 145.5        | 184.6        | 252.4     | 605.8                         | 564.9              | 904.6   | 1277.3    | 1902.2 | 1133.6     | 2203.7  | 2350  | 2350         | Long-Term Debt (\$mill)              | 8000   |                |
|   |   | --           | 200.0        | 200.0     | 400.0                         | 400.0              | 500.0   | 900.0     | 2371.4 | 3364.3     | 6499.4  | 6450  | 6750         | Shr. Equity (\$mill)                 | 4450   |                |
|   |   | 347.2        | 199.1        | 290.2     | 642.8                         | 744.7              | 1333.6  | 1857.7    | 2223.4 | 2679.8     | 3582.0  | 3750  | 4000         | Return on Total Cap'l                | 24.5%  |                |
|   |   | 24.3%        | 29.5%        | 34.8%     | 22.6%                         | 2.4%               | 7.8%    | 9.2%      | 4.1%   | 4.3%       | 6.7%    | 14.5%   | 19.0%        | Return on Shr. Equity                | 65.0%  |                |
|   |   | 24.3%        | 58.2%        | 55.4%     | 35.2%                         | 2.3%               | 9.6%    | 12.3%     | 5.5%   | 7.0%       | 15.6%   | 34.5%   | 46.5%        | Retained to Com Eq                   | 65.0%  |                |
|   |   | 24.3%        | 58.2%        | 55.4%     | 35.2%                         | 2.3%               | 9.6%    | 12.3%     | 5.5%   | 7.0%       | 15.6%   | 34.5%   | 46.5%        | All Div'ds to Net Prof               | Nil    |                |
| <b>MARKET CAP:</b> \$145 billion (Large Cap)  |   |              |              |           |                               |                    |         |           |        |            |         | BUSINESS: Netflix, Inc. is the world's largest Internet television network serving approximately 137.1 million (130.4 million paid) streaming memberships in over 190 countries, as of 9/30/18. Additionally, members in the United States can rent DVDs. Reportable segments: domestic streaming (49% of revenues at 9/30/18), international streaming (49%), and domestic DVD (2%). Has about 5,500 employees. Officers and directors own 4.9% of common stock; Capital Research Global Investors, 10.3%; Vanguard Group, Inc., 6.7%; BlackRock, Inc., 5.9%; FMR LLC, 5.7%; The Growth Fund of America, 5.2% (4/18 proxy). Chairman & CEO: Reed Hastings, Inc. DE. Address: 100 Winchester Circle, Los Gatos, California 95032. Tele.: (408) 540-3700. Internet: www.netflix.com.   |              |                                      |        |                |
| <b>CURRENT POSITION</b> 2016 2017 9/30/18 (\$MILL.)   |   |              |              |           |                               |                    |         |           |        |            |         | <b>Netflix bounced back in the third quarter.</b> The streaming giant turned its fortunes around, outperforming earnings forecasts handily and adding seven million paid accounts in the September period. The total paid subscriber count is now over 130 million. The early year stumbles, which stemmed from underwhelming subscriber growth at home and overseas and a swelling content production budget, appear to have been temporary. The worldwide expansion was one of the main drivers for the strength and now makes up a slightly larger share of revenues than the domestic streaming business. Accordingly, we have added to our 2018 earnings estimate. Noting the better-than-anticipated bottom-line figure in the third quarter, we have tacked \$0.25 to our share-net projection, to \$3.25. Netflix expects to add eight million paid subscribers during the fourth quarter, which would help to offset rising production costs related to the company's ambitious original programming push. On that last note, the content spending budget is likely to grow to \$13 billion this year, with about 85% of that sum earmarked for original material. By the end of the year, the company will have released 82 new movies (compared to 23 by Warner Brothers and 10 by Disney) and a whopping 700 exclusive television shows. The streaming market is about to get a lot more crowded. In addition to competing products from HBO, Hulu, Amazon, and others, a slew of new, cash-rich entrants into the over-the-top subscription sector could threaten to steal away market share and slow growth in the coming years. Namely, competing products from Disney (boosted by the \$71 billion Fox entertainment acquisition) and Apple are both shaping up to be formidable challengers. Interested long-term subscribers are advised to wait for a more attractive entry point. The market price sits near the middle of our Target Price Range, effectively eliminating the issue's appeal for investors seeking returns in the next three to five years. However, momentum seekers will want to consider the timely (rank: 2) shares. Robert L. Harrington November 2, 2018 |              |                                      |        |                |
| Cash Assets   |   | 1733.8       | 2822.8       | 3067.5    |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| Receivables   |   | --           | --           | --        |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| Other   |   | 3986.5       | 4847.2       | 5662.5    |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| Current Assets  |   | 5720.3       | 7670.0       | 8730.0    |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| Accts Payable   |   | 312.8        | 359.5        | 441.4     |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| Debt Due  |   | --           | --           | --        |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| Other   |   | 4273.9       | 5106.8       | 5856.8    |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| Current Liab.   |   | 4586.7       | 5466.3       | 6298.2    |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| <b>ANNUAL RATES</b> Past Past Est'd '14-'16 of change (per sh) 10 Yrs. 5 Yrs. to '21-'23  |   |              |              |           |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| Revenues  |   | 25.0%        | 21.5%        | 16.5%     |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| "Cash Flow"   |   | 39.0%        | 40.0%        | 14.0%     |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| Earnings  |   | 21.5%        | -1.0%        | 47.0%     |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| Dividends   |   | --           | --           | Nil       |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| Book Value  |   | 24.0%        | 39.5%        | 9.0%      |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| <b>QUARTERLY REVENUES</b> (\$mill.) <sup>P</sup>  |   | Full Year    |              |           |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| Cal-endar   | Mar.31  | Jun.30       | Sep.30       | Dec.31    | 2015                          | 2016               | 2017    | 2018      | 2019   |            |         |   |              |                                      |        |                |
|   | 1573.1  | 1644.7       | 1738.4       | 1823.3    | 6779.5                        | 8830.7             | 11692.7 | 15750     | 17750  |            |         |   |              |                                      |        |                |
|   | 1957.7  | 2105.2       | 2290.2       | 2477.5    |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
|   | 2636.6  | 2785.5       | 2984.9       | 3285.7    |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
|   | 3700.9  | 3905.0       | 3999.4       | 4144.7    |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
|   | 4175  | 4425         | 4450         | 4700      |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| <b>EARNINGS PER SHARE</b> <sup>A D</sup>  |   | Full Year    |              |           |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| Cal-endar   | Mar.31  | Jun.30       | Sep.30       | Dec.31    | 2015                          | 2016               | 2017    | 2018      | 2019   |            |         |   |              |                                      |        |                |
|   | .05   | .06          | .07          | .10       | .28                           | .43                | 1.43    | 3.25      | 4.35   |            |         |   |              |                                      |        |                |
|   | .06   | .09          | .12          | .15       |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
|   | .40   | .15          | .29          | .59       |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
|   | .64   | .85          | .89          | .87       |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
|   | .90   | 1.05         | 1.08         | 1.32      |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| <b>QUARTERLY DIVIDENDS PAID</b>   |   | Full Year    |              |           |                               |                    |         |           |        |            |         |   |              |                                      |        |                |
| Cal-endar   | Mar.31  | Jun.30       | Sep.30       | Dec.31    | 2014                          | 2015               | 2016    | 2017      | 2018   |            |         |   |              |                                      |        |                |
|   | NO CASH DIVIDENDS BEING PAID  |              |              |           |                               |                    |         |           |        |            |         |   |              |                                      |        |                |

(A) Diluted earnings. Excludes nonrecurring gains/(losses): '13, 4¢; '14, 9¢; '17, 18¢. Next earnings report due late February. (B) In millions, adjusted for splits. (C) Content library being amortized: At 6/30/18, \$1748.8 mill. (D) Total may not sum due to rounding. (E) Amortization of streaming content classified as depreciation. In 2017, totaled \$6.2 billion.

|                              |    |
|------------------------------|----|
| Company's Financial Strength | A  |
| Stock's Price Stability      | 15 |
| Price Growth Persistence     | 95 |
| Earnings Predictability      | 30 |

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**OUCC 19-013**

**DATA INFORMATION REQUEST**  
**Indiana-American Water Company**  
**Cause No. 45142**

**Information Requested:**

Refer to Petitioner's Excel file titled "IN Average Use 2008-2018" in the worksheet titled: "Total Usage." For each month in 2018, please provide actual "Total Water usage," "System Delivery" and the "Non-Revenue Water"

**Information Provided:**

See OUCC 19-013\_Attachment 1.

Indiana-American Water Company  
2018

|                   | <u>Jan</u> | <u>Feb</u> | <u>Mar</u> | <u>Apr</u> | <u>May</u> | <u>Jun</u> | <u>Jul</u> | <u>Aug</u> | <u>Sep</u> | <u>Oct</u> |
|-------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Water Sales       | 2,591,347  | 2,542,931  | 2,366,359  | 2,421,995  | 2,584,673  | 3,051,073  | 3,217,978  | 3,240,911  | 3,243,133  | 2,872,110  |
| System Delivery   | 3,522,716  | 3,007,767  | 3,209,584  | 3,144,791  | 3,646,397  | 3,721,044  | 3,967,357  | 3,891,614  | 3,617,086  | 3,428,594  |
| Non-Revenue Water | 931,369    | 464,836    | 843,224    | 722,797    | 1,061,724  | 669,971    | 749,379    | 650,702    | 373,953    | 566,484    |

**OUCC 19-014**

**DATA INFORMATION REQUEST**  
**Indiana-American Water Company**  
**Cause No. 45142**

**Information Requested:**

Refer to Petitioner's Excel file titled "IN Average Use 2008-2018" in the worksheet titled: "In Total State" For each month in 2018, please state the number of Residential customers, Commercial customers, Industrial customers, OCA customers and SRF customers.

**Information Provided:**

See OUCC 19-014\_Attachment 1.

**Indiana-American Water Company  
2018 Customer Count**

Cause No. 45152  
OUCC 19-014\_Attachment 1  
Page 1 of 1

|             | Jan     | Feb     | Mar     | Apr     | May     | Jun     | Jul     | Aug     | Sep     | Oct     |
|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Residential | 267,131 | 267,200 | 267,513 | 268,457 | 269,894 | 270,379 | 270,603 | 270,973 | 270,745 | 269,761 |
| Commercial  | 27,394  | 27,390  | 27,414  | 27,584  | 27,801  | 27,884  | 27,893  | 27,898  | 27,863  | 27,704  |
| Industrial  | 621     | 619     | 619     | 621     | 622     | 622     | 622     | 623     | 622     | 618     |
| OPA         | 1,608   | 1,618   | 1,649   | 1,712   | 1,734   | 1,743   | 1,746   | 1,739   | 1,691   | 1,661   |
| SFR         | 21      | 21      | 21      | 21      | 21      | 21      | 21      | 21      | 21      | 21      |



**OUCC 19-015**

**DATA INFORMATION REQUEST**  
**Indiana-American Water Company**  
**Cause No. 45142**

**Information Requested:**

Refer to Petitioner's Excel file titled "IN Average Use 2008-2018" in the worksheet titled: "In Total State" For each month in 2018, please state the average customer consumption for Residential, Commercial, Industrial, OPA, and SRF.

**Information Provided:**

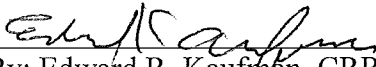
See OUCC 19-015\_Attachment 1

Indiana-American Water Company  
2018 Average Consumption (1000 gallons)

|             | <u>Jan</u> | <u>Feb</u> | <u>Mar</u> | <u>Apr</u> | <u>May</u> | <u>Jun</u> | <u>Jul</u> | <u>Aug</u> | <u>Sep</u> | <u>Oct</u> |
|-------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Residential | 4.28       | 3.94       | 3.53       | 3.64       | 3.94       | 4.78       | 4.93       | 4.71       | 4.64       | 4.06       |
| Commercial  | 24.72      | 24.74      | 23.20      | 24.25      | 23.72      | 27.89      | 29.10      | 28.98      | 30.73      | 27.74      |
| Industrial  | 581.69     | 630.92     | 605.45     | 597.87     | 663.06     | 716.99     | 742.88     | 850.70     | 806.23     | 678.58     |
| OPA         | 72.24      | 79.88      | 73.94      | 75.82      | 95.23      | 93.82      | 109.09     | 110.21     | 127.42     | 100.39     |
| SFR         | 13,926.55  | 13,966.37  | 13,806.60  | 13,054.17  | 13,493.82  | 17,755.41  | 19,933.45  | 20,604.44  | 19,642.87  | 14,885.39  |

**AFFIRMATION**

I affirm the representations I made in the foregoing testimony are true to the best of my knowledge, information, and belief.

  
By: Edward R. Kaufman, CRRA  
Cause No. 45142  
Indiana Office of  
Utility Consumer Counselor

12/21/2018  
Date: