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Exhibit No: Liberty-08
Witness: Thomas J. Bourassa

Liberty Utilities

(U-933-E)

2019 General Rate Case

Before the California Public Utilities Commission

Chapter 8: Cost of Capital

Tahoe Vista, California
November 30, 2018

I. INTRODUCTION

Q. Please state your name and address.

A. My name is Thomas J. Bourassa. My business address is 139 W. Wood Drive, Phoenix, Arizona 85029. I am an independent certified public accountant licensed in the State of Arizona and my principal business activity is providing consulting services to regulated utilities in the areas of cost of service, rate design, and cost of capital. I am testifying on behalf of Liberty Utilities (CalPeco Electric) LLC ("CalPeco" or the "Company").

Q. Please describe your education background.

A. I hold a Bachelor degree from the Northern Arizona University with a major in Chemistry and a minor in Accounting. I also hold an MBA from the University of Phoenix with an emphasis in Finance.

Q. Have you previously testified before Utility Regulatory Commissions?

A. Yes. I have testified in several states including Arizona, Alaska, Arkansas, Montana, California, and Texas. I have testified previously before the California Public Utilities Commission ("CPUC" or "Commission") on cost of capital in Application No. A.09-05-0002 (Valencia Electric Company) and Liberty Utilities (Park Water) Corp. in Application No. A.18.05.001, et. al. Exhibit TJB-1 provides details of my participation in regulatory proceedings.

Q. What is the purpose of this portion of your direct testimony?

A. The purpose of my testimony is to provide a recommended minimum return on common equity ("ROE") for CalPeco's electric distribution assets regulated by the CPUC. My analysis is based upon information available in October 2018.

Q. Please breifly describe the exhibits accompanying your testimony.

A. I have attached exhibits TJB-1 through TJB-5. Exhibit TJB-1 contains the details of my educational background and regulatory experience. Exhibit TJB-2 contains the recent Blue Chip Financial Forecasts (June 2018) and Value Line Selection and Opinion Quarterly Forecast (August 31, 2018). Exhibit TJB-3 contains my cost of capital analysis (Tables 1 through 11). The cost of

capital tables in Exhibit TJB-3 are described in further detail in my testimony. Exhibit TJB-4 contains the risk study I prepared for CalPeco. Exhibit TJB-5 contains my size study for CalPeco.

Q. Please describe how your testimony is organized.

A. In this Section I, a summary of my analysis and my approach is presented. In Section II, I discuss the meaning of just and reasonable rates. In Section III, I provide an overview of the risk and expected return on investment. In Section IV, I discuss the sample of twenty-eight publicly traded electric utilities in my sample group and provide a comparison to CalPeco. I then discuss recent developments in the electric utility industry and their impact on investments. In Section V, I provide an overview of each of the methods (Discounted Cash Flow and Risk Premium) that I employ in my analysis. In Section VI, I discuss the additional business risks faced by CalPeco, my comparative risk study, and my recommended risk premium for CalPeco. Finally, in Section VII, I summarize my testimony and present a summary of the equity costs of the proxy group and CalPeco.

Q. Please Summarize Your Findings Concerning Calpeco's Cost Of Common Equity.

A. I have determined that the cost of equity for the publicly traded electric utilities falls in the range of 8.8 percent to 10.3 percent with the midpoint of the range at 9.6 percent. After considering differences in financial risk and business risk between CalPeco and the publicly traded electric utilities, I am recommending the adoption of an ROE of 10.3 percent for CalPeco.

My recommendation is based on consideration of cost of equity estimates using the Discounted Cash Flow ("DCF") and three Risk Premium ("RP") approaches, including the Capital Asset Pricing Model ("CAPM"). All three are market-based methodologies and are designed to estimate the return required by investors on the common equity capital committed to CalPeco. I have applied the aforementioned methodologies to a sample group of publicly traded electric utilities. Further, my analysis considers (i) my review of the economic conditions expected to prevail during the period in which new rates will be in effect, (ii) my judgments about the risks associated with relatively small utilities like CalPeco that are not captured by the market data of publicly-traded electric utilities, (iii) the financial risk associated with the level of debt in

CalPeco's capital structure, and (iv) additional specific business and operational risks faced by CalPeco.

In reaching my recommendation, I have applied various cost of capital methodologies to a proxy group of electric utilities consisting of *Value Line* Western, Central and Eastern electric utilities. The results of these methodologies were adjusted upward by 70 basis points to account for CalPeco's higher than average business risk compared to the proxy group. My recommended ROE is based upon the Commission adoption of a 52.5 percent common equity ratio for ratemaking purposes.

Q. Why did you use more than one approach for estimating the cost of equity?

A. Because no single method provides the necessary level of precision for determining a fair rate of return. As Dr. Roger Morin states in *New Regulatory Finance*:

> Each methodology requires the exercise of considerable judgment on the reasonableness of the assumptions underlying the methodology and on the reasonableness of the proxies used to validate a theory. The inability of the DCF model to account for changes in relative market valuation, discussed below, is a vivid example of the potential shortcomings of the DCF model when applied to a given company. Similarly, the inability of the CAPM to account for variables that affect security returns other than beta tarnishes its use.
>
> No one individual method provides the necessary level of precision for determining a fair return, but each method provides useful evidence to facilitate the exercise of an informed judgment. Reliance on any single method or preset formula is inappropriate when dealing with investor expectations because of possible measurement difficulties and vagaries in individual companies' market data.
>
> When measuring equity costs, which essentially deals with the measurement of investor expectations, no single methodology provides a foolproof panacea. Each methodology requires the exercise of considerable judgment on the reasonableness of the assumptions underlying the methodology and on the reasonableness of the proxies used to validate the theory. It follows that more than one methodology should be employed in arriving at a judgment on the cost of equity and that these

> methodologies should be applied across a series of comparable risk companies.[1]

Q. Please summarize the approach you used to estimate the cost of equity for the company.

A. The cost of equity for CalPeco cannot be estimated directly because the Company's equity is not in the form of a publicly traded security so there is no market data for CalPeco. Consequently, I have assessed the market-based common equity cost rates of companies of similar, but not necessarily identical risk for insight into a recommended common equity cost rate applicable to CalPeco. The DCF, Risk Premium, and CAPM methodologies use data from a sample of publicly traded electric utilities, or proxy group, selected from the *Value Line Investment Survey* serve as a starting point in my analysis. Analysis of a proxy group serves as a starting point because no proxy group can be selected to be identical in risk to CalPeco. Therefore, the proxy group's results must be adjusted to reflect the unique relative financial and/or business risks of CalPeco, as I will discuss in detail.

There are 24 electric utilities in my electric utility proxy group, including *Value Line's* Western, Central and Eastern electric utilities. The electric utilities in my proxy group are listed in Table 2.

IV. THE MEANING OF "JUST AND REASONABLE" RATE OF RETURN

Q. Have the courts set forth any criteria that govern the rate of return that a utility's rates should produce?

A. Yes. In 1923, the U.S. Supreme Court set forth the following criteria for determining whether a rate of return is reasonable in *Bluefield Electric Works and Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679, 692-93 (1923):

> A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the

[1] Morin, Roger A., *New Regulatory Finance* (Public Utility Reports, Inc. 2006), pp. 428-429 ("Morin")..

> same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties … The return should be reasonably sufficient to assure confidence in the financial soundness of the utility, and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties. A rate of return may be reasonable at one time and become too high or too low by changes affecting opportunities for investment, the money market, and business conditions generally.

Then, in *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591, 603 (1944), the U.S. Supreme Court stated the following regarding the return to owners of an entity:

> [T]he return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.

In summary, under *Hope* and *Bluefield*:

(1) The rate of return should be similar to the return in businesses with similar or comparable risks;

(2) The return should be sufficient to ensure the confidence in the financial integrity of the utility; and

(3) The return should be sufficient to maintain and support the utility's credit.

Q. Have these criteria been applied in regulatory proceedings?

A. Yes, but the application of the "reasonableness" criteria laid down by the Supreme Court has resulted in controversy. The typical method of computing the overall cost of capital is quite straightforward; it is the composite, weighted cost of the various classes of capital (debt, preferred stock, and common equity) used by the utility. Calculating the proportion that each class of capital bears to total capital does the weighting. However, there is no consensus regarding the best method of estimating the cost of equity capital. The increasing regulatory use of market-based finance models in equity return determinations has not, at least to date, led to a universally accepted means of estimating the ROE. In addition, the market-based results are too often applied

to a book-value investment base, which, as I will discuss later in my testimony, understates the return expected by investors who invest in actual markets based on market values.

The cost of capital is based on the concept of opportunity cost, *i.e.*, the prospective return to investors must be comparable to investments of similar risk. If a utility's return is less than the returns on investments with similar risk, investors can and will invest elsewhere. As explained by Dr. Roger Morin *New Regulatory Finance*:

> The concept of cost of capital is firmly anchored in the opportunity cost notion of economics. The cost of a specific source of capital is basically determined by the riskiness of that investment in light of alternative opportunities and equals investor's current opportunity cost of investing in the securities of that utility. A rational investor is maximizing the performance of his or her portfolio only if returns expected on investor investments of comparable risk are the same. If not, the investor will switch out of those investments yielding low returns at a given risk level in favor of those investments offering higher returns for the same degree of risk. This implies that a utility will be unable to attract capital unless it can offer returns to capital suppliers comparable to those achieved on alternate competing investments of similar risk.[2]

The *Bluefield* decision suggests that opportunity cost is an appropriate measure of the actual cost of common equity for a utility. This necessarily involves the direct observation of returns on equity actually earned by firms with comparable risk to ensure that the authorized rate of return is equivalent to the returns those firms are earning.

III. OVERVIEW OF THE RELATIONSHIP BETWEEN RISK AND THE EXPECTED RETURN ON AN INVESTMENT

Q. How is the cost of equity typically analyzed?

A. The cost of equity is the rate of return that equity investors expect to receive on their investment. Investors can choose from numerous investment options, not simply publicly traded stocks. Investments have varying degrees of risk, ranging from relatively low risk assets such as

[2] Morin pp. 21-22..

Treasury securities to somewhat higher risk corporate bonds to even higher risk common stocks. As the level of risk increases, investors require higher returns on their investment. Finance models used to estimate the cost of equity often rely on this basic concept.

Q. How does the risk-return trade off concept work in the capital market?

A. The allocation of capital in a free market economy is based upon the relative risk of, and expected return from, an investment. In general, investors rank investment opportunities in the order of their relative risks. Investment alternatives in which the expected return is commensurate with the perceived risk become viable investment options. If all other factors remain equal, the greater the risk, the higher the rate of return investors will require to compensate them for the possibility of loss of either the principal amount invested or the expected annual income from such investment.

Short-term Treasury bills provide a high degree of certainty and in nominal terms (after considering inflation) are considered virtually risk free. Long-term bonds and preferred stocks, having priority claims to assets and fixed income payments, are relatively low risk, but are not risk free. The market values of long-term bonds often fluctuate when government policies or other factors cause interest rates to change. Common stocks are higher and to the right on the capital market line[3] ("CML") continuum, because they have greater investment risk. Common stock risk is impacted by the nature of the underlying business and the financial strength of the issuing corporation and market-wide factors, such as general changes in capital costs.

The capital markets reflect investor expectations and requirements each day through market prices. Prices for stocks and bonds change to reflect investor expectations and the attractiveness of one investment relative to others. Returns on common stocks are not directly

[3] The capital market line, in the CAPM, depicts the trade-off between risk and return.

observable in advance as compared to debt or preferred stocks with fixed payment terms. This means that these returns must be estimated from market data. Estimating the cost of equity capital should be a matter of informed judgment about the relative risk of the company in question and the expected rate of return characteristics of other alternative investments.

Q. How is the cost of equity to be determined for a particular company?

A. Estimating a company's cost of equity is complex. It requires an analysis of the factors influencing the cost of various types of capital, such as interest on long-term debt, dividends on preferred stock, and earnings on common equity. The data for such an analysis comes from highly competitive capital markets, where the firm raises funds by issuing common stock, selling bonds, and by borrowing (both long-term and short-term) from banks and other financial institutions. In the capital markets, the cost of capital, whether the capital is in the form of debt or equity, is determined by two important factors:

1) The pure or real rate of interest, often called the risk-free rate of interest; and

2) The uncertainty or risk premium (or the compensation the investor requires, over and above the real or pure rate of interest for subjecting his or her capital to additional risk).

Q. Please discuss these factors in greater detail.

A. The pure rate of interest essentially reflects both the time preference for and the productivity of capital. From the standpoint of the individual, it is the rate of interest required to induce the individual to forgo present consumption and offer the funds, thus saved, to others for a specified length of time. Moreover, the pure rate of interest concept is based on the assumption that no uncertainty affects the investment undertaken by the individual, *i.e.*, there is no doubt that the periodic interest payments will be made and the principal returned at the end of the time

period. In reality, investments without any risk do not exist. Every commitment of funds involves some degree of uncertainty.

Turning to the second factor affecting the cost of capital, it is generally accepted that the higher the degree of uncertainty, the higher the cost of capital. Investors are regarded as risk averse and require that the rate of return increase as the risks and uncertainty associated with an investment increases.

Q. Can you provide some perspective on your previous discussion with respect to returns on common stocks?

A. Yes. Conceptually, the required return on common stocks can be quantified by the following equation:

[1] Required Return for Common Stocks = Return on a risk-free asst + Risk Premium

The risk premium investors require for common stocks will be higher than the risk premium they require for investment grade bonds. As I will discuss later in this testimony, this concept is the basis of risk premium methods, such as the CAPM, that are used to estimate the cost of equity.

Q. Please discuss in more detail the impact of risk on capital costs.

A. With reference to specific utilities, risk is often discussed as consisting of two separate types of risk: business risk and financial risk.

Business risk, the basic risk associated with any business undertaking, is the uncertainty associated with the enterprise's day-to-day operations. In essence, it is a function of the normal day-to-day business environment, both locally and nationally. Business risks include the condition of the economy and capital markets, the state of labor markets, regional stability, government regulation, technological obsolescence, and other similar factors that may impact demand for the

business' products or services and its cost of production. For utilities, business risk also includes the volatility of revenues arising from abnormal weather conditions, degrees of operational leverage, regulation, and regulatory climate. Regulation, for example, can compound the business risk if it is unpredictable in reacting to cost increases, both in terms of the time lag and magnitude for recovery of such increases.

Financial risk, on the other hand, concerns the distribution of business risk to the various capital investors in the utility. Permanent capital is normally divided into three categories: long-term debt, preferred stock, and common equity. Because common equity owners have only a residual claim on earnings after debt and preferred stockholders are paid, financial risk tends to be concentrated in that element of the firm's capital. Thus, a decision by management to raise additional capital by issuing additional debt concentrates even more of the financial risk of the utility on the common equity owners.

Q. What are the determinants of the risk free rate in equation [1]?

A. The risk-free rate can be disaggregated into a "real" rate of interest and an inflation premium (expected future inflation).

Q. What are the determinants of the required risk premium from equation [1] above?

A. The risk premium can be disaggregated into five general components: (1) Interest Rate Risk; (2) Business Risk; (3) Regulatory Risk; (4) Financial Risk; and (5) Liquidity Risk.

Interest rate risk refers to the variability in return caused by subsequent changes in interest rates and stems from the inverse relationship between interest rates and asset prices. For example, bond prices fall when interest rates rise and vice versa.

Business risk, the basic risk associated with any business undertaking, is the uncertainty associated with the enterprise's day-to-day operations. In essence, it is a function of the normal

day-to-day business environment, both locally and nationally, that increases the probability that expected future income flows accruing to investors might not be realized. Business risks include the condition of the economy and capital markets, the state of labor markets, regional stability, technological obsolescence, degree of competition, sales volatility, government regulation, and other similar factors that may impact demand for the business product and its cost of production. For utilities, business risk also includes the volatility of revenues due to abnormal weather conditions and the degree of operational leverage.

Regulatory risk refers to the quality and consistency of regulation applied to a given regulated utility. Regulatory jurisdictions are evaluated on the basis of three major factors: (1) earnable return on equity, (2) regulatory quality, and (3) regulatory practices. Collectively, these three factors influence a utility's ability to earn its authorized return. The type of test year employed (historical or future), capital structure and rate base issues, and the length of regulatory lag are among the reasons a utility may or may not have a reasonable opportunity to earn its authorized return.

Financial risk concerns the distribution of business risk to the various capital investors in the utility. It relates to the additional variability imparted to income available to common shareholders stemming from the entity's method of financing its capital needs. As I discussed earlier, because common equity owners have only a residual claim on earnings after debt and preferred stockholders are paid, financial risk tends to be concentrated in that element of the firm's capital.

Construction risk is an important component of financial risk. Construction risk is the risk of tying capital up in projects that are not earning returns, or not having sufficient capital to build the assets needed to keep generating returns. If an entity has a large construction budget relative to

internally generated cash flows, it will require external financing, which will result in greater financial risk. It is essential that such entities have access to capital funds on reasonable terms and conditions.

Utilities are more susceptible to construction risk. Utilities have a mandated obligation to serve, leaving less flexibility both in the timing and discretion of scheduling capital projects. This is compounded by the limited ability to wait for more favorable market conditions to raise the capital necessary to fund the capital projects, and then the lag between when a plant can be built and when rates can be approved to provide returns on and of that capital. It is imperative that the utility maintain access to needed capital and on reasonable terms and conditions. The return allowed on common equity will have a critical role in determining those terms and conditions.

Finally, Liquidity Risk refers to the ability to readily convert an investment into cash without sustaining a loss. Capital market theory generally assumes that investments are liquid and observations about risk and return are drawn from information about liquid investments. Non-publicly traded or privately-held investments possess little liquidity.

Although often discussed separately, two types of risks (business and financial) are interrelated. A study by Scott and Martin found statistically significant results for unregulated firms in twelve industries that "smaller equity ratios (higher leverage use) are generally associated with larger companies."[4] While unregulated enterprises would be expected to seek the optimal balance between debt and equity to achieve the lowest overall cost of capital, the findings of Scott and Martin suggest smaller firms found it prudent to offset higher business risks related to being small by reducing financial risk. This evidence suggests the lowest cost equity ratio for CalPeco may be higher than the average equity ratio for the benchmark proxy group.

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[4] Scott, D.F. and Martin, J.D., "Industry Influence on Financial Structure," *Financial Management*, Spring 1975, pp. 67-71.

Q. Is investment risk impacted by company size?

A. Yes. Investment risk bears a direct relationship to size and increases as company size decreases. Investment liquidity may be a significant factor explaining this relationship. However, the illiquidity of smaller stocks does not capture the size effect completely. Size may be a proxy for one or more true unknown factors correlated with size.[5]

III. THE PUBLICLY TRADED UTILITIES THAT COMPRISE THE SAMPLE GROUP USED TO ESTIMATE THE COST OF EQUITY

Q. Which companies comprise your electric proxy group?

A. There are 24 electric distribution utilities in my sample. For the methods employed in my analysis, I used data on entities from a sample of publicly traded electric utilities, or proxy group, selected from the *Value Line Investment Survey* as a starting point.

The 24 electric distribution companies comprising the proxy group were selected by meeting the following criteria: (1) they are followed by the *Value Line Investment Survey*; (2) they have at least ten years of historical financial and market information; (3) they have a *Value Line* adjusted beta; (4) they have not cut or omitted their common dividends during the five years ending 2017 or through time of the preparation of this testimony; (5) they have operating revenues primarily from regulated operations in the U.S.; and (6) at the time of the preparation of this testimony, they had not publicly announced that they were involved in any major merger or acquisition activity. A copy of the most recent *Value Line* report on the electric industry along with each electric utility in my proxy group is attached as Exhibit TJB-2.

Q. But the electric utilities in your sample are not directly comparable to CalPeco?

[5] Rolf W. Banz, "The Relationship between Return and Market Value of Common Stocks", *Journal of Financial Economics*, March 1981, pp. 3-18.

A. That is correct. However, they are utilities for which market data is available. All of them primarily provide electric distribution and their primary source of revenues is from regulated services. They are also commonly used in regulatory proceedings where sample companies are selected to measure the cost of equity. Therefore, they provide a useful *starting point* for developing the cost of equity for CalPeco while recognizing that the proxies are not perfectly comparable.

Q. Briefly, why is a proxy group necessary for comparison in a cost of capital analysis?

A. First, a fair rate of return for a specific utility is the return required by investors to hold assets with corresponding levels of risk. Market data for a sample of comparable companies provides insight into the investors' required return, and such data comports with the guidance from the U.S. Supreme Court's decisions in *Bluefield* and *Hope*, which I discussed earlier. The comparable earnings standard set forth in the *Hope* and *Bluefield* decisions requires that the rate of return afforded to utilities be similar to the return for businesses with similar or comparable risks. It follows that a proxy group of companies with comparable risk is the starting point in a cost of capital analysis.

Second, a primary objective of rate regulation is to determine an authorized ROE that is both fair to customers and provides reasonable returns for the subject utility. The best estimate of that ROE is the cost of equity for CalPeco. The cost of equity is a cost of service fairly recovered from customers through rates. For investors in CalPeco, the cost of equity is commensurate with returns an investor in these utilities would expect to earn from investments of comparable risk. To estimate the cost of equity requires market data that reveal investor-required returns. Since CalPeco is not publicly traded, there is no market information to determine the cost of equity. This necessitates the selection and use of a proxy group.

Q. Please provide a general description of the electric utilities in your electric proxy group?

A. Table 2 in Exhibit TJB-3 lists the percentages of regulated revenues, operating revenues, net plant, the number of customers or population served, *Value Line* Financial strength, *Value Line* betas, market capitalization, and market size category for the eight electric utilities. Comparative data for CalPeco (where available) is also shown in Table 2. The electric utilities in the electric proxy group consist primarily of Mid-Cap and Large-Cap companies.[6] The market capitalizations range from about $2.3 billion to over $58 billion with an average of approximately $16.4 billion. Operating revenues range from about $563 million to over $23.5 billion with an average of over $7 billion. Net plant ranges from $1.34 billion to nearly $86.4 billion, with an average of nearly $22.4 billion.

Q. How does CalPeco compare to the utilites in your proxy group?

A. On average, the utilities in the electric proxy group are much larger and, according to the empirical financial data, they are less risky than CalPeco. CalPeco is much smaller with fewer customers and has far less revenues, far less net plant and a relatively small and limited service territory. At the end of 2017, CalPeco had approximately 49,000 electric connections as compared to the average of the electric proxy group of 3.0 million connections. CalPeco's revenues totaled approximately $85 million, and net plant-in-service was approximately $357 million. The average revenues of the electric proxy group are nearly 83 times greater than CalPeco, and those entities have on average nearly 63 times the net plant of CalPeco.

[6] Based upon 2018 market data from the Center for Research in Security Prices: Micro-Cap companies are Decile 9-10 with market capitalization less than $657 million; Low-Cap companies are Decile 6-8 with market capitalization over $657 million but less than $2,760 million; Mid-Cap companies are Decile 3-5 companies with market capitalization of over $2,760 million but less than $11,979 million; and, Large-Cap companies are Decile 1 -2 companies and have market capitalization of over $11,979 million.

Q. What other risk factors distinguish CalPeco from the larger electric utilities in your proxy group?

A. First, electric utilities are capital intensive and typically have large construction budgets. Firms with large construction budgets face greater construction risk (a form of financial risk). The size of a utility's capital budget relative to the size of the utility itself often increases construction risk. Large utilities are better able to fund their capital budgets from their earnings, cash flows, and short-term borrowings. For smaller utilities, the ability to fund their capital budgets from earnings, cash flows, and short-term debt is difficult, if not impossible, and must rely on additional outside capital.

Second, smaller companies are simply less able to cope with significant events that affect sales, revenues and earnings. For example, the loss of revenues from a few larger customers or from trends in the reduction of usage by customers through conservation or the makeup of the customer base would have a greater effect on a small company than on a much larger company with a larger customer base.

Third, there are a number of other factors, including the differences in regulatory environments, differences in the type of test year used for rate making, and differences in the available regulatory mechanisms for recovery of costs outside of a rate case. The large electric utilities in my electric proxy group are generally not subject to the adverse impacts of an unfavorable regulatory environment of one jurisdiction.

In summary, there are several factors that impact the ability of a smaller utility to actually earn its authorized return. An inadequate opportunity to earn the revenues in a rate case leads to a greater variability of earnings for entities like CalPeco when compared to the proxy group. This

volatility means greater risk, and the greater risk requires higher returns to maintain and support the utility's credit.

Q. What quantitative measures that can be used to help identify differences in business risk?

A. There are a number of fundamental accounting-based business risk measures that can be used to assess the relative differences between firms. Those include: (1) the co-efficient of variance of ROE; (2) the co-efficient of variance of operating income; (3) the co-efficient of variance of operating margin; and (4) Operating Leverage. The first three reflect the distributions of earnings. These are meaningful when measured against the distribution of earnings of alternative investments, like the electric utilities in my electric proxy group. The fourth business risk measure reflects the impact of sales fluctuations and the impact of fixed operating costs on earnings.

The co-efficient of variance of ROE can be quantified using the following equation:

[2] Co-efficient of Variance of ROE = Standard Deviation of ROE/Mean of ROE

The co-efficient of variance of operating income can be quantified using a relatively simple equation:

[3] Co-efficient of Variance of Operating Income = Standard Deviation of Operating Income/Mean of Operating Income

The co-efficient of variance of operating margin can be quantified using the following equation:

[4] Co-efficient of Variance of Operating Margin = Standard Deviation of Operating Margin/Mean of Operating Margin

And, the Operating Leverage formula is expressed as:

[5] Operating Leverage = Percentage Change in Operating Income/Percentage Change in Sales

Using the business risk measures expressed in equations [2], [3], [4], and [5], the greater the co-efficient of variation or Operating Leverage, the greater the risk to investors of not receiving expected returns.[7] Table A below shows the computed co-efficient of variation for ROE, Operating Income, and Operating Margin, as well as Operating Leverage using the five most recent years of historical data for the electric proxy group and CalPeco. These metrics show that CalPeco is 1.2 to 5.2 times more risky than the average electric proxy group companies.

TABLE A

Company	Business Risk Co-efficient of variance of ROE	Business Risk Co-efficient of variance of Operating Income	Business Risk Co-efficient of variance of Operating Margin	Operating Leverage
Electric Proxy Group	0.0875	0.1025	0.0849	6.17
CalPeco	0.4542	0.2860	0.2193	7.25
Relative Risk of CalPeco relative to Proxy Group	5.19	2.79	2.58	1.18

Q. Can metrics like a company's co-efficient of variation in ROE, co-efficient of variation in operating income, and operating margin be used along with market data to develop company specific risk premiums?

A. Yes. Duff & Phelps publishes comparative risk characteristics using market data that provides a nexus between a market beta and the metrics operating margin, the coefficient of variation in operating margin, and the coefficient of variation in return on equity.[8] This

[7] Tuller, Lawrence W., *The Small Business Valuation* (Avon, MA: Adams Media Corporation, 1994), p. 89.

[8] Duff & Phelps, LLC. 2017 *Valuation Handbook; Guide to Cost of Capital*(Hoboken, NJ: John Wiley and Sons, 2017) ("Duff & Phelps"). *See also* online at www.dpcostofcapital.com: *Duff & Phelps* Cost of Capital Navigator platform (*"Duff & Phelps Cost of Capital Navigator"*) and the *Duff & Phelps 2018 Valuation Handbook – U.S. Guide to Cost of Capital ("Duff & Phelps 2018 Valuation Handbook")*.

information can be used to develop implied betas for CalPeco for use in the CAPM. By comparing the results of the CAPM for the electric proxy group with the CAPM for CalPeco using the implied betas, informed risk premiums can be developed. As one would expect, the implied beta for CalPeco is higher than the beta of the electric proxy group and the empirical financial data suggests a small company risk premium is appropriate. A risk premium of 60 to 236 basis points over the cost of equity of the electric proxy group is indicated for CalPeco. I will discuss the indicated risk premiums and implied betas and small company risk premium in more detail in the CalPeco Risk Premium section of this direct testimony.

Q. What about liquidity risk?

A. A rational investor would not regard an investment in CalPeco as having the same level of risk as the much larger publicly traded electric utilities in the proxy group because of the previously mentioned small size characteristics of CalPeco and the fact that an investment in CalPeco is relatively illiquid compared to the publicly traded electric utilities. An investor in a publicly traded stock can sell stock in a very short period of time if dissatisfied with the returns. An investor in a privately held stock does not have this ability to sell quickly. Consequently, investors will require a greater risk premium, often called liquidity risk premium. As a consequence of these differences in risk, the results produced by the DCF and RP methodologies, utilizing data for the sample utilities, often understate the appropriate ROE for a small, regulated electric utility such as CalPeco.

Q. Is there a relationship between a utility's capital structure and its cost of capital?

A. Yes. Generally speaking, when an entity engages in debt financing, it exposes itself to greater risk. As debt grows relative to the total capital structure, the risk increases in a geometric fashion as compared to the linear percentage increase in the debt ratio itself. This risk is illustrated

by considering the effect of leverage on net earnings. For example, as leverage increases the equity ratio falls creating two adverse effects. First, equity earnings decline rapidly and may even disappear. Second, the "cushion" of equity protection for debt falls. A decline in the protection afforded debt holders, or the possibility of a serious decline in debt protection, will act to increase the cost of debt financing. Therefore, one may conclude that each new financing, whether through debt or equity, impacts the marginal cost of future financing by any alternative method.

For an entity already perceived as being over-leveraged, this additional borrowing would cause the marginal costs of both equity and debt to increase. On the other hand, if the same entity instead successfully employed equity funding, this could actually reduce the real marginal cost of additional borrowing, even if the particular equity issuance occurred at a higher unit cost than an equivalent amount of debt.

Q. How do the capital structures of the sample electric utilities compare to the proposed pro forma capital structures for CalPeco?

A. Table 3 in Exhibit TJB-3 shows that the debt and equity capital structure used to develop the cost of capital for CalPeco. This structure contains 52.5 percent equity and 47.5 percent debt, compared to the average of the electric utility sample of approximately 49.3 percent equity and 51.7 percent debt. Having less debt in its capital structure implies that the Company has lower financial risk than those in the electric proxy group. However, CalPeco's recommended capital structure is well within the range of capital structures found in the electric proxy group and only somewhat below the average. Accordingly, I do not recommend a financial risk adjustment.

V. OVERVIEW OF THE DCF AND RISK PREMIUM METHODS

Q. Please explain the general approaches to estimating the cost of capital.

A. There are two broad approaches:

1) identify comparable-risk sample companies and estimate the cost of capital directly; or

2) find the location on the CML and estimate the relative risk of the entity, which jointly determines the cost of capital.

The DCF method falls into the first approach. It is a direct method, but uses only a subset of the total capital market evidence. The DCF rests on the premise that the fundamental value of an asset (*i.e.*, stock) is its ability to generate future cash flows to the owner of that asset. The DCF is simply the sum of a stock's expected dividend yield and the expected long-term growth rate. Dividend yields are readily available, but long-term growth estimates are not. I will explain the DCF in greater detail below.

The RP methods fall into the second approach. An equity risk premium is established by determining the relationship between the cost of equity and an interest rate over time. The CAPM method falls into the category of RP methods. To implement, it is generally assumed that the past correlation will continue on into the future. The RP generally uses a small subset of the capital market evidence whereas the CAPM uses information on all securities, rather than a small subset. I will explain the RP methods in more detail below. For now, the RP methods reflect a risk-return relationship, often depicted graphically as the CML.

Each of these methods measures investor expectations. In the final analysis, ROE estimates are subjective and should be based on sound, informed judgment and supported by competent evidence. I applied one version of the DCF and three versions of the RP methods (including the CAPM as one of the RP methods). I believe these methods provide the foundation for evaluating the fair cost of equity capital for the publicly traded electric utilities in my proxy group. I then added a risk premium to the results of these models for the electric proxy group to

account for the differences in risk (business, regulatory, liquidity, size) between the electric proxy group and CalPeco.

B. Explanation of the DCF Model and Its Inputs

Q. Please explain the DCF method of estimating the cost of equity.

A. The DCF model is based on the concept that the current price of a share of stock is equal to the present value of future cash flows from the purchase of the stock. In other words, the DCF model seeks to replicate the market valuation process that sets the price investors are willing to pay for a share of an entity's stock. It rests on the assumption that investors rely on the expected returns (*i.e.*, cash flow they expect to receive) to set the price of a security. The DCF model in its most general form is:

$$[6] \quad P_0 = CF_1/(1+k) + CF_2/(1+k)^2 + \ldots. + CF_n/(1+k)$$

where k is the cost of equity; n is the number of years; P_0 is the current stock price; and, CF_1, through CF_n are the expected future cash flows expected to be received in periods 1 through n.

Equation [6] can be written to show that the current price (P_0) is also equal to:

$$[7] \quad P_0 = CF_1/(1+k) + CF_2/(1+k)^2 + \ldots + P_t/(1+k)^t$$

where P_t is the price expected to be received at the end of the period t. If the future price (P_t) included a premium (an expected increase in the stock price or capital gain), the price the investor would pay today (in anticipation of receiving that premium) would increase. In other words, by estimating the cash flows from the purchase of a stock in the form of dividends and capital gains, we can calculate the investor's required rate of return(*i.e.*, the rate of return an investor presumptively used in bidding the current price to the stock (P_0) to its current level).

Equation [7] is a Market Price version of the DCF model. As with the general form of the DCF model in equation [6], the current stock price (P_0) is the present value of the expected cash inflows in the Market Price approach. The cash flows are comprised of dividends and the final selling price of the stock. The estimated cost of equity (k) is the rate of return investors expect if they bought the stock at today's price, held the stock and received dividends through the transition period, and then sold it for price in period t (P_t).

Q. Can you provide an example to illustrate the market price version of the DCF model?

A. Yes. Assume an investor buys a share of common stock for $40. If the expected dividend during the coming year is $2.00, then the expected dividend yield is 5 percent ($2.00/$40 = 5.0 percent). If the stock price is also expected to increase to $43.00 after one year, this $3.00 expected gain adds an additional 7.5 percent to the expected total rate of return ($3.00/$40 = 7.5 percent). Thus, the investor buying the stock at $40 per share expects a total return of 12.5 percent (5 percent dividend yield plus 7.5 percent price appreciation). The total return of 12.5 percent is the appropriate measure of the cost of capital because this is the rate of return that caused the investor to commit $40 of his or her capital by purchasing the stock.

Q. Please continue with your description of the DCF model.

A. Under the assumption that future cash flow is expected to grow at a constant rate ("g"), equation [6] can be solved for k and rearranged into the simple form:

$$[8] \quad k = CF_1/P_0 + g$$

where CF_1/P_0 is the expected dividend yield (also expressed as D_0/P_0) and g is the expected long-term dividend (price) growth rate. The expected dividend yield is computed as the ratio of next period's expected dividend ("D_0") divided by the current stock price ("P_0").

This form of the DCF model is known as the "constant growth" DCF model and recognizes that investors expect to receive a portion of their total return in the form of current dividends and the remainder through future dividends and capital (*i.e.*, price) appreciation. A key assumption of this form of the model is that investors expect that same rate of return (k) every year and that market price grows at the same rate as dividends. As already discussed, this has not been historically true for the electric utility sample, as shown by the data in Table 4 in Exhibit TJB-3.

Q. Are there any concerns about applying the DCF model to utility stocks?

A. Yes, there are a number of reasons why caution must be used when applying the DCF model to utility stocks. First, a non-publicly traded company does not have a stock market price. Using the stock prices from a proxy group assumes that the stock of CalPeco would be similarly priced and has a dividend yield similar to the publicly traded electric companies. Second, the stock price and dividend yield components may be unduly influenced by structural changes in the industry, such as mergers and acquisitions, which influence investor expectations. Third, the DCF model is based on a number of assumptions that may not be realistic given the current capital market environment. The traditional DCF model assumes that the market price per share ("MPPS"), book value per share ("BVPS), earnings per share ("EPS"), and dividends per share ("DPS"), all grow at the same rate. This has not been historically true for the sample electric utility companies. For example, Table 4 in Exhibit TJB-3 shows than over the past 5 years the average MPPS growth has significantly exceeded the average BVPS, EPS, and DPS.

While dividend yields for the electric proxy group have been at all-time lows, 3, 5, and 10-year total returns for the electric proxy group as reported by Value Line are 12.34 percent, 12.33, and 12.14 percent, respectively, from advances in stock prices and reinvestment of dividends.[9]

[9] *Value Line Investment Analyzer* weekly data from March 29, 2018.

These returns are significantly higher than my DCF estimate of the cost of equity of just 8.8 percent and are a source of my concern in the application of the DCF at this time. The expected equity returns suggested by the market based DCF model does not line up with recent experience in the markets. As Dr. Morin notes:[10]

> To the extent that increases (decreases) in relative market valuation are anticipated by investors, especially myopic investors with short-term investment horizons, the standard DCF model will understate (overstate) the cost of equity.

Another way of stating this point is that the DCF model does not account for the ebb and flow of investor sentiments over the course of the business cycle. The problem was particularly acute in the mid 1990's and mid 2000's where investors, faced with very low returns on short-term fixed-income securities and an uncertain market outlook, sought higher yields offered by utility stocks in a so-called flight to quality, boosting utility stock price and lowering the dividend yield.[11] The circumstances then are not so different from what is occurring today.

Fourth, the application of the DCF model produces estimates of the cost of equity that are consistent with investor expectations only when the market price of a stock and the stock's book value are approximately the same. The DCF model will understate the cost of equity when the market-to-book ratio exceeds 1.0 and, conversely, the model will overstate the cost of equity when the market-to-book ratio is less than 1.0. The reason for this is that the market-derived return produced by the DCF is often applied to book value rate base by regulators.[12]

Fifth, the assumption of a constant growth rate may be unrealistic, and there may be difficulty in finding an adequate proxy for the growth rate. Historical growth rates can be downward biased as a result of the impact of anemic historical growth rates in earnings, mergers

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[10] Morin, p. 433.
[11] Morin, pp. 21-22.
[12] Morin, pp. 434-435.

and acquisitions, restructuring, unfavorable regulatory decisions, and even abnormal weather patterns. Conversely, historical growth rates can be upwardly biased as well, particularly under current market conditions as discussed previously.

Q. Is the DCF a superior methodology?

A. No. Again, I concur with Dr. Morin who states:

> While it is certainly appropriate to use the DCF methodology to estimate the cost of equity, there is no proof that the DCF produces a more accurate estimate of the cost of equity than other methodologies. Sole reliance on the DCF model ignores the capital market evidence and financial theory formalized in the CAPM and other risk premium methods. The DCF model is one of many tools to be employed in conjunction with other methods to estimate the cost of equity. It is not a superior methodology that supplants other financial theory and market evidence. *The broad usage of the DCF methodology in regulatory proceedings in contrast to its virtual disappearance in academic textbooks does not make it superior to other methods. The same is true of the Risk Premium and CAPM methodologies.* (emphasis added)[13]

Q. What data have you used to compute the expected dividend yield (D_1/P_0) in your DCF model?

A. First, I computed a current dividend yield (D_0/P_0). The time value of money should be taken into account when determining dividend yields. This adjustment is required because the basic model assumes dividends are paid once a year, but investors actually receive dividend payments on a quarterly basis. Prices they pay for the stock (P0), would reflect the anticipated payment and potential re-investment of quarterly dividends. To approximate the time value of money and the payment of quarterly dividends, I computed expected dividend yield (D_1/P_0) as the current dividend yield (D_0/P_0) times one plus the growth rate (g) divided by 2. I used the spot price for each of the stocks of the electric utilities in the sample group as reported by the *Value*

[13] Morin, p. 431.

Line Investment Analyzer for October 22, 2018 for P_0. The current dividend (CF_0) is the current indicated dividend as reported by Value Line. In my tables, the current dividend yield is denoted as (D_0/P_0), where D_0 is the current dividend and P_0 is the spot stock price. (D_1/P_0) is used to denote the expected dividend yield in the tables.

Q. What measures of growth ("g") have you used?

A. My projected estimate of growth is based upon analysts' estimates of EPS growth. For my forecast growth estimate, I have used the growth forecasts from *Value Line, Zacks Investment Research*, and *Yahoo Finance*. I report the historical growth and analysts' forecasts of future growth in Table 4 in Exhibit TJB-3.

Q. Did you consider any other method of estimating expected growth to apply the DCF model?

A. Yes. I considered using the so-called "sustainable growth" method. According to this method, future growth is estimated by multiplying the fraction of earnings expected to be retained by the company, 'b', by the expected return on book equity, ROE, as follows:

$$g = B \times ROE$$

where: g = expected growth rate in earnings/dividents

b = expected retention ratio

ROE = expected return on book equity

Q. Do you have any reservations in regards to the sustainable growth method?

A. Yes, for a least two reasons. First, the sustainable method of predicting growth is inherently circular.[14] This is because it relies upon an expected return on book common equity which is then used in a DCF analysis to establish a common equity cost rate related to the market

[14] Morin, p. 306.

value of common stock. If this common equity cost rate is authorized as the allowed return in a regulatory proceeding, it will become the expected return on book common equity. Second, the empirical finance literature demonstrates that the sustainable growth method of determining growth is not as significantly correlated to measures of value, such as stock prices and price/earnings ratios, as analysts' growth forecasts.[15] Because of these reasons, I chose not to rely on this method.

Q. Why did you use forecasted growth rates in your growth estimates?

A. The empirical evidence indicates that analyst estimates of EPS growth are the best measure of growth for use in the DCF for utility stocks.[16] Further, the DCF model requires estimates of growth that investors expect in the future and not past estimates of growth that have already occurred. Logically, in estimating future growth, financial institutions and analysts have taken into account all relevant historical information on an entity, as well as other more recent information.[17] To the extent that past results provide useful indications of future growth prospects, analysts' forecasts would already incorporate that information. In addition, the current price of a stock reflects known historic information on that entity, including its past earnings history. Any

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15 Morin, p. 307.

16 Gordon, David A., Gordon, Myron J. and Gould, Lawrence I., "Choice Among Methods of Estimating Share Yield," *Journal of Portfolio Management*, Spring 1989, pp. 50-55. Gordon, Gordon and Gould found that a consensus of analysts' forecasts of earnings per share growth for the next five years provides a more accurate estimate of growth required in the DCF model than three different historical measures of growth (historical EPS, historical DPS, and historical retention growth). They explain that this result makes sense because analysts would take into account such past growth as indicators of future growth as well as any new information. Other studies confirm the superiority of analysts' estimates such as Vander Weide, James H. and Carleton, Willard T., "Investor Growth Expectations: Analysts vs. History," *Journal of Portfolio Management*, Spring 1988, pp. 78-87; Brown, Lawrence D. and Rozeff, Michael S., "The Superiority of Analyst Forecasts as Measures of Expectations: Evidence from Earnings," *Journal of Finance*, March 1978, pp. 1-16; and Timme, Stephen G. and Eisemann, Peter C., "On the Use of Consensus Forecasts of Growth in the Constant Growth Model: The Case for Electric Utilities," *Journal of Financial Management*, Winter 1989, pp. 23-35. A 2004 study by the Kentucky Public Service Commission Advance Research Center updated the study by Vander Weide and Carleton (1988) and confirmed the superiority of analyst estimates over historical averages.

17 Gordon, Gordon, and Gould, p. 54.

further recognition of the past will double count what has already occurred. Therefore, forward-looking growth rates should be used.

Q. Did you apply a reasonableness test to the individual results the DCF?

A. Yes. DCF results that are less than the forecast Baa investment grade bond yield plus 100 basis points or 7.0 percent are excluded. 7.0 percent is the minimum plausible expected cost of equity. This reasonableness approach is consistent with methods the Federal Energy Regulatory Commission ("FERC") adopted in the past and consistent with common sense.[18] In my view, the 100 basis points above Baa bonds is conservative given that the 35-year average historical premium computed from annual total returns on the electric proxy group and Baa investment grade bond total returns is 270 basis points. Investors will not invest in risky common stocks if they can earn a higher return on less risky investments.

Q. Please summarize the equity cost estimates you make with the DCF approach.

A. In Table 6 in Exhibit TJB-3, my DCF estimate for the cost of equity of the electric proxy group is 8.8 percent. For CalPeco my estimate 9.5 percent. *See* Table 1 in Exhibit TJB-3.

C. Explanation of the RP and Its Inputs

Q. Please explain the RP methodology for estimating the cost of equity.

A. The RP method is sometimes referred to as the "bond yield plus risk premium method." The general approach is to determine the spread between the return on debt and the return on equity, and then add this spread to the current debt yield to derive an estimate of the cost of equity. To implement the RP, it is assumed that the past relationship will continue into the future. The RP is widely used by analysts and investors.[19]

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[18] In its 2008 Order for Southern California Edison, 122 FERC ¶61236 at p. 25, the FERC lists screens which included exclusion of any company whose low-end ROE fails to exceed the average bond yield by approximately 100 basis points, or more.

[19] Morin, p. 108.

The RPM formula provides a formal risk-return relationship and is stated as:

$$(9)\quad k = K_d + \text{bond-equity spread}$$

where k is the expected return on equity and K_d is the cost of debt or debt yield.

Q. Please turn to your risk premium equity cost estimates. How many RP analyses have you performed?

A. I performed two risk premium analyses aside from the CAPM. My first analysis is presented in Table 8 in Exhibit TJB-3. For this risk premium analysis a historical risk premium for the electric utility industry was estimated with an annual time series analysis applied to the utility industry as a whole over the 1963-2017 period, using *Standard and Poor's Utility Index* as an industry proxy. The historical risk premium was estimated by computing the actual realized return on equity capital for the S&P Utility Index for each year and then subtracting the long-term Treasury bond return for that year.

As shown on Table 8, the average risk premium over the period was 5.2 percent over long term Treasury bond yields. I adjusted upward the risk premium estimate by assuming the cost of equity changes by half as much as the difference in Treasury bond rates. Because the long-term Treasury rate of 3.7 percent that is expected in 2019 - 2021 is lower than the average historical Treasury rate of 6.5 percent for the period 1963 to 2017, the future risk premium is expected to be higher than the simple average RP based on past data. I computed a future risk premium of 6.6 percent based upon the assumption that equity costs change by 50 percent of the change in interest rates.

My adjustment to the risk premium is consistent with Commission orders. For example, in the past, the Commission has determined that risk premiums vary inversely with interest rates. In Decision 97-12-089, the Commission found that costs of equity for energy utilities move in the

same direction as interest rates but by less. More recently, in Decision 02-11-027, the Commission confirmed that its practice was to adjust returns on equity for energy utilities by one-half to two-thirds of the change in the benchmark interest rate. These findings are consistent with the findings of Dr. Morin.[20]

Q. Have others found an inverse relationship between risk premiums and interest rates?

A. Yes. Harris and Marston, in "Estimating Shareholders Risk Premia Using Analysts' Growth Rates," *Financial Management*, Summer 1992, found an inverse relationship.

Q. What is the result of your first approach?

A. Table 8 in Exhibit TJB-3 shows the indicated cost of equity for the electric proxy group is 10.3 percent. My estimate for CalPeco is 11.0 percent. *See* Table 1 in Exhibit TJB-3.

Q. Please explain your second RP approach.

A. In the second RP analysis, I examined the historical risk premiums implied in the ROEs allowed by regulatory commissions for electric utilities over the 2001-2017 period for which data were available, relative to the contemporaneous level of the long-term Treasury bond yield. This variation of the risk premium approach is reasonable because allowed risk premiums are presumably based on the results of market-based methodologies (DCF, Risk Premium, CAPM, etc.) presented to regulators in rate hearings and on the actions of objective investors in a competitive marketplace.

This RP approach relies on authorized ROEs as proxies for the costs of equity for electric utilities. Dr. Roger Morin adopted authorized returns on equity as proxies for costs of equity for electric utilities to conduct one of his risk premium analyses. My analysis is similar to Dr. Morin's approach and recognizes risk premiums are expected to increase (decrease) as interest rates

[20] Morin, pp. 128-129.

decrease (increase). Dr. Morin reports the following statistical relationship between risk premiums (RPm) and Treasury rates (Yield) for the period 1987 to 2005 for electric utilities[21]:

$$(10)\ RP_m = 8.2049 - 0.4833 \times Yield \qquad R^2 = .81$$

where averages of allowed equity returns reported by Regulatory Research Associates (also SNL) were adopted as the proxies for equity costs and yields were for Treasury bonds.

To obtain a cost of equity estimate, Dr. Morin inserts a current or projected Treasury bond yield in his estimated equation. He further explains, "the clear inverse relationship between the allowed risk premium and interest rates [is] revealed in past common equity decisions."[22]

I also use information reported by SNL and annual surveys from Public Utility Reports ("PUR") in my analysis. My analysis uses authorized returns from 2001 to 2017 and produces the following statistical relationship:

$$(11)\ RP_m = 9.332 - 0.7645 \times Yield \qquad R^2 = .56$$

Q. What is the result of your second approach?

A. Table 9 in Exhibit TJB-3 shows the indicated cost of equity for the electric proxy group is 10.2 percent. My estimate for CalPeco is 10.9 percent. *See* Table 1 in Exhibit TJB-3.

Q. Did you also consider a risk premium estimate using the equation estimated by Dr. Morin?

A. Yes. Inserting the expected Treasury bond yield of 3.7 percent in the formula estimated by Dr. Morin indicates a risk premium equity cost estimate for a typical electric utility of 6.42 percent and an equity cost estimate for the electric proxy group of 10.12 percent. Applying Dr. Morin's result indicates my analysis provides a similar estimate of the cost of equity for the electric proxy group.

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21 Morin, p. 123.
22 Morin, p. 124.

Q. Should studies of historical risk premiums rely on arithmetic average returns or on geometric average returns?

A. Whenever relying on historical risk premiums, only arithmetic average returns over long periods are appropriate for forecasting and estimating the cost of capital, and geometric average returns are not. As various finance experts have explained, an arithmetic mean is the correct approach to use in estimating the cost of capital, particularly for a risk premium model.[23] As Dr. Morin states:

> Because valuation is forward-looking, the appropriate average is the one that most accurately approximates the expected future rate of return. The best estimate of the expected returns over a future holding period is the arithmetic average. Only arithmetic means are correct for forecasting purposes and for estimating the cost of capital. There is no theoretical or empirical justification for the use of geometric rates of return as a measure of the appropriate discount rate in computing the cost of capital or in computing present values.[24]

The consensus among these experts makes sense. Only arithmetic mean return rates and yields are appropriate for cost of capital purposes because ex-post (historical) total returns and equity risk premiums differ in size and direction over time, providing insight into the variance and standard deviation of returns. The geometric mean of ex-post (after the fact) equity risk premiums provides no insight into the potential variance of future returns because the geometric mean relates the change over many periods to a constant rate of change, rather than the year-to-year fluctuations, or variance, which are critical to risk analysis. In short, the conclusion of these financial experts is that, while the geometric mean is useful in comparing what happened in the

[23] Zvi Bode, Alex Kane, Alan J. Marcus, Investments (McGraw-Hill 6th ed., 2005) ("Bode"), pp. 864 – 865; Richard A. Brealey, Stewart C. Myers, Frankin Allen, *Principles of Corporate Finance* (McGraw-Hill 11th ed.) ("Brealey"), pp. 162 – 163.

[24] Morin, pp. 116 – 117.

past, it should not be used to determine estimates of expected future returns or market risk premiums.

Q. Lets turn to the CAPM. Please explain the CAPM methodology for estimating the cost of equity.

A. Like all RP methods, the CAPM is the sum of a risk-free rate plus a risk premium. Like the RPM, it quantifies the additional return required by investors for bearing incremental risk. The CAPM was developed by William Sharpe and John Lintner in the mid-1960s and is a common topic in college finance textbooks. The CAPM provides a formal risk-return relationship premised on the idea that only market risk matters, as measured by beta. The traditional version of CAPM is represented by the formula:

$$[10] \quad k = R_f + \beta(R_m - R_f)$$

where k is the expected return, R_f is the risk-free rate (or zero beta asset), R_m is the market return, $(R_m - R_f)$ is the market risk premium, and β is beta.

Q. What is beta and what does it measure?

A. Beta is a measure of the relative risk of a security in relation to the market. In other words, it is a measure of the sensitivity of a security to the market as a whole. This sensitivity is also known as systematic risk. It is estimated by regressing a security's excess returns against a market portfolio's excess returns. The slope of the regression line is the beta.

Beta for the market is 1.0. A security with a beta greater than 1.0 is considered more risky than the market. A security with a beta less than 1.0 is considered less risky than the market.

Q. Are there any concerns about applying the CAPM model to utility stocks?

A. Yes. I have concerns with using this model in most periods because mechanical application of the model may produce unreasonable results. The traditional CAPM only captures a

single measure of systematic risk as measured by beta, but there are other forms of systematic risk priced by the market such as company size. A size premium is necessary because the empirical evidence indicates that beta alone does not measure the risk of smaller companies.[25] Further, there are computational problems surrounding beta since it depends on the return data, the time period used, its duration, the choice of the market index, and whether annual, monthly, or weekly return figures are used. Betas are estimated with error. Based on empirical evidence, high betas will tend to have a positive error (risk is overestimated) and low betas will have a negative error (risk is underestimated).[26]

Q. Are there alternatives to the traditional CAPM?

A. Yes, alternative versions of the CAPM have been developed that provide more robust explanations of returns required by investors. A version of the CAPM called the Empirical CAPM or ECAPM was developed to recognize that estimations of R_f are higher than the return on long-term Treasuries.[27] The ECPAM is represented as follows:

$$[11] \quad k = R_f + .25(R_m - R_f) + .75\beta(R_m - R_f)$$

The ECAPM was developed from the empirical findings that show the slope of the CML is flatter and the risk-free rate is at a higher point than predicted by the pure CAPM. The ECAPM has been shown to do a better job at predicting market returns.

Duff & Phelps also suggests a version of the CAPM in which a size premium is included.[28] This modified CAPM or MCAPM is represented as follows:

$$[12] \quad k = R_f + \beta(R_m - R_f) + RP_s$$

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25 *Duff & Phelps 2018 Valuation Handbook*, Chapter 2, p. 7.

26 Fama, Eugene F. and Kenneth R. French, "The Capital Asset Pricing Model: Theory and Evidence," *Journal of Economic Perspectives*, Summer 2004, pp. 25-46.

27 *See* Morin, pp.181-191, for a discussion of ECAPM.

28 *Duff & Phelps 2018 Valuation Handbook*, Chapter 2, p. 14.

where k is the expected return, R_f is the risk-free rate (or zero beta asset), R_m is the market return, (R_m-R_f) is the market risk premium, β is beta, and RP_s is the size premium. Both the ECAPM and MCAPM recognize the pure CAPM is incomplete and does not fully account for the higher returns that are needed on smaller company stocks. In other words, the higher risks associated with smaller firms are not fully accounted for by beta.[29]

Q. Is firm size a unique risk?

A. No, firm size is a systematic risk factor and is an adjustment to the pure CAPM.[30] Putting aside the empirical financial data, the need for a risk premium for size makes sense. Company size is a significant element of business risk for which investors expect to be compensated through greater returns. As discussed earlier, smaller companies are simply less able to cope with significant events that impact sales, revenues, and earnings. For example, smaller companies face more risk exposure to business cycles and economic conditions, both nationally and locally. Additionally, the loss of revenues from a few larger customers would have a greater effect on a small entity than on a much larger entity with a larger, more diverse, customer base. Moreover, smaller companies are generally less diverse in their operations and have less financial flexibility.

Q. Did you employ either of these alternative CAPM methods (equations 11 and 12) as part of your analysis?

A. Yes. I employed all three versions of the CAPM to estimate the cost of equity for the electric proxy group, which does somewhat mitigate my concerns about the traditional CAPM.

Q. What is the risk-free rate (Rf)?

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[29] Morningstar, *Ibbotson SBBI 2013 Valuation Yearbook,* pp. 85-88. (*"Morningstar"*)

[30] Pratt, Shannon P. and Roger J. Grabowski, *Cost of Capital: Applications and Examples* (John Wiley and Sons, 4th Ed. 2010), p. 56.

A. It is the return on an investment with no risk. The U.S. Treasury rate serves as the basis for the risk-free rate because the yields are directly observable in the market and are backed by the U.S. government. Practically speaking, short-term rates are volatile, fluctuate widely and are subject to more random disturbances than long-term rates. In short, long-term Treasury rates are preferred for these reasons and because long-term rates are more appropriately matched to securities with an indefinite life or long-term investment horizon.

Q. What do you use as the risk free rate (Rf)?

A. I used the expected U.S. long-term Treasury rate for 2018 as the basis for the risk free rate. Since the cost of capital is an opportunity cost and is prospective, it necessarily requires the use of a forward-looking bond yield. In recent years, interest rates have dropped to very low levels when compared to interest rates for similar securities in the past. From 1999 to 2007, the annual average yield for long-term Treasury bonds was 5.24 percent, ranging from a low of 4.84 percent in 2007 to a high of 5.94 percent in 2000. In 2008, and during the recent recession, that annual average dropped to 4.24 percent and dropped further in 2012 to 2.9 percent.

The drop in long-term Treasury rates has been largely attributed to the market intervention by the Federal Reserve through its quantitative easing programs. Long-term Treasury rates for 2013 and 2014 averaged 3.45 percent and 3.34 percent, respectively. For 2017, long-term Treasury rates have averaged 2.90 percent. More recently, the long-term interest rates have increased to about 3.00 percent. *Valine Line Selection & Opinion* (August 31, 2018) notes that the Federal Reserve raised the key interest rate twice thus far in 2018. Tight labor markets, above-trend GDP growth through the rest of 2018, and somewhat higher rates of inflation makes the case for another two rate hikes by the end of 2018. Further, economists expect the Federal Reserve to hike rates another three times in 2019.

Notwithstanding the most recent rate hikes and the potential for more, interest rates remain at historically low levels, but have been surging. Economists expect the 30-year U.S. Treasury yields to rise to 3.7 percent in 2019-2021 timeframe.

Q. Why do you use long-term U.S. Treasury yields?

A. The yields on long-term Treasury bonds match more closely with the perpetual nature of common stock investments.[31] In addition, short-term rates are more volatile, fluctuate widely and are subject to more random disturbances than long-term rates. Long-term Treasury rates are more appropriately matched to securities with an indefinite life or long-term investment horizon. For these reasons, long-term rates are preferred.

Q. What do you adopt as the return for the risk-free rate?

A. I used long-term expected Treasury bond rates as the measure of the risk-free return for use with CAPM cost of equity estimates from two sources: the *Blue Chip Financial Forecasts* and the *Value Line Quarterly Forecast*.[32] The appropriate choice for the risk-free rate is the *expected* return for long-term Treasury securities.[33] Thus, when determining an estimate of the risk-free rate, it is appropriate to adopt a return that is no less than the expected return on the long-term Treasury bond rate. Models to determine the cost of capital are prospective in nature, which require expectational inputs, such as forecasted interest rates.[34] The CAPM, ECAPM, and MCAPM estimates are based on expected yields of the long-term Treasury rates for 2018 (from *Blue Chip Financial Forecasts* and *Value Line Quarterly Forecasts*), the average of which is 3.7 percent. See Table 7 in Exhibit TJB-3.

Q. What did you use as the proxy of the beta in your CAPM models?

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31 Morin, p. 112.
32 *See* Table 9 in Exhibit TJB-3.
33 *Duff & Phelps*, Chapter 3, p. 1.
34 Morin, p 172.

A. I used the average beta of the sample electric utility companies. These betas were obtained from *Value Line Investment Analyzer* (weekly data as of October 22, 2018). *Value Line* is the source for estimated betas that I regularly employ. The average *Value Line* beta for my electric proxy group as shown on Table 2 is 0.63.

I should note that because CalPeco is not publicly traded, it has no beta. In my expert opinion, I strongly believe CalPeco, if it were publicly traded, would have a higher *Value Line* beta and sum beta than the sample electric utility companies. *Morningstar* reports that when betas (a measure of market risk) are properly estimated, betas are greater for small companies than for larger companies.[35] *Morningstar* also finds that even after accounting for differences in beta risk, small firms require an additional risk premium over and above the added risk premium indicated by differences in beta risk.

Q. Please explain the market risk premium.

A. The market-risk premium (R_m-R_f) is the return an investor expects to receive as compensation for market risk. It is the expected market return minus the risk-free rate. Approaches for estimating the market risk premium can be historical or prospective. Since expected returns are not directly observable, historical realized returns are often used as a proxy for expected returns on the basis that the historical market risk premium follows what is known in statistics as a "random walk." If the historical risk premium does follow the random walk, then one should expect the risk premium to remain at its historical mean. Based on this, the best estimate of the future market risk premium is the historical mean. *Duff & Phelps* provides historical market returns for various asset classes from various historical time periods. This

[35] *Morningstar*, Chapter 7.

publication also provides market risk premiums over U.S. Treasury bonds, which makes it an excellent source for historical market risk premiums.

A current market risk premium estimation approache necessarily requires examining the returns expected from common equities and bonds. One method employs application of the DCF model to a representative market index such as the Value Line 1700 stocks. The expected return from the DCF is measured for a number of periods of time, and then subtracted from the prevailing risk-free rate for each period to arrive at market risk premium for each period. The market risk premium that is subsequently employed in the CAPM is the average market risk premium of the overall period.

Q. How did you estimate the market risk premiums for use in the CAPM models?

A. For the traditional CAPM and ECAPM, I averaged two market risk premium estimates: an average of an historical market risk premium (1926-2017) and a current market risk premium. For the MCAPM, I used an historical market risk premium (1963-2017) and a current market risk premium.

For the historical market risk premiums, I used the *Duff & Phelps* measure of the average premium of the market over long-term Treasury securities from 1926 through 2017 and 1963 through 2017, both of which use the S&P 500 market index (which is considered a large-cap index). The average historical market risk premium over long-term Treasury securities is 7.1 percent for the 1926 to 2017 time period and 5.3 percent for the 1963 through 2017 time period.

For the current market risk premium, I derived a market risk premium by first using the DCF model to compute an expected market return for each of the past 12 months using *Value Line's* projections of the average dividend yield for the dividend yield in the DCF and an average of the median EPS, DPS and BVPS growth on the *Value Line* 1700 stocks. I then subtracted the

historical monthly average 30-year Treasury yield for each month from the expected market returns to arrive at the expected market risk premiums. Finally, I averaged the computed market risk premiums to determine the current market risk premium for the last 12 months, 9 months, 6 months, and 3 months. The data and computations are shown on Table 10 in Exhibit TJB-3. Estimates of the current market risk premium have ranged from 7.95 percent to 9.05 percent over the past 12 months. My recommended market risk premium is based on the recent 12-month average estimate of 8.50 percent, which is somewhat below the mid-point of the range for the past 12-months of 8.53 percent.

Q. Why use two different historical risk premium estimates?

A. I have typically used a historical market risk premium (1926-2017) in my CAPM and ECAPM. I concur with *Morningstar,* which recommends use of a historical market risk premium based upon the longest time period practicable.[36] Given that the *Duff & Phelps* Risk Premium Report size and risk premia are calculated over the time horizon 1963 – 2017, I used the historical market risk premium for this time period for the MCAPM.

Q. Why is it necessary to use a current market risk premium?

A. Long-term historical interest rates used to estimate market risk premiums are much higher than current interest rates. As a result, risk premiums are higher today than the average long-term historical risk premium.

Q. Why?

A. As discussed above, risk premiums vary inversely with interest rates. The average long-term U.S. Treasury bond rate for 1926 to 2017 and the 1963 to 2017 time periods were 5.0 percent

[36] *Morningstar*, p. 59.

and 6.4 percent, respectively. The current long-term U.S Treasury bond rate is approximately 3 percent and suggests risk premiums today are higher than the historical average.

Q. How did you estimate the size premium for the electric proxy group for use in the MCAPM?

A. *Duff & Phelps's* Size Study sorts companies by eight measures of size, breaking down the NYSE universe of companies into 25 size-ranked portfolios.[37] The Size Study provides two ways to match a company's size (or risk) characteristics to the appropriate size (or risk) premium – a guideline portfolio method and a regression equation method. I used the regression equation method to find the CAPM size risk premium for each of the publicly traded utilities in the proxy group for six measures of size (market value of equity, book equity, market value of invested capital, 5-year average of net income, total assets, and earnings before interest, taxes, depreciation and amortization).[38] I determined the average size premium of all size measures for the proxy group (2.57 percent) and then adjusted the average size premium to reflect the lower risk of the electric proxy group compared to the companies that make up the respective size-ranked portfolios. This comparative risk study uses the fundamental measures of company risk (operating margin, coefficient of variation in operating income, and coefficient of variation in return on book equity) to gauge how alike or different the electric proxy group is compared to the companies that make up the size-ranked portfolios in the Size Study. In the instant case, the estimated reduction in risk is -1.01 percent. Thus, the market risk premium for size for the proxy group is 1.56 percent

[37] The size measures include: 1) Market Capitalization; 2) Book Value of Equity; 3) 5-year Average Net Income; 4) Market Value of Invested Capital; 5) Total Assets; 6) 5-year Average Earnings Before Interest, Taxes, Depreciation and Amortization ("EBITDA"); 7) Sales; and 8) Number of Employees. See *2018 Valuation Handbook*, Chapter 7, p. 6.

[38] *Duff & Phelps Cost of Capital Navigator*, 2018 Supplementary Size Study data and 2018 Supplementary Data Regression Equations.

(2.57% - 1.01%) (rounded). Using the same procedure, I determined the market risk premium for size for CalPeco is 4.43 percent. *See* Exhibit TJB-5**.**

Q. What are the results of your CAPM method?

A. As shown by Table 11 in Exhibit TJB-3, the traditional CAPM produces an indicated cost of equity of 8.6 percent. The ECAPM produces an indicated cost of equity of 9.30 percent. The MCAPM produces an indicated cost of equity of 9.6 percent. The average of these three methods is 9.2 percent. *See* Table 11. My estimate for CalPeco is 9.9 percent. *See* Table 1 in Exhibit TJB-3.

VI. REQUIRED RISK PREMIUM FOR CALPECO

Q. Please discuss your recommended risk premium for CalPeco.

A. As I testified earlier, CalPeco is not directly comparable to the publicly traded electric utilities in my electric proxy group. The characteristics associated with small size, such as the lack of diversification, limited revenue and cash flow, relatively small customer base, lack of investment liquidity, and earnings volatility, increase the risk faced by smaller electric utilities over the risk associated with the electric proxy group.

Q. Please discuss size risk for small utility companies.

A. Investment risk increases as the firm size decreases, all else remaining constant. There is a great deal of empirical evidence that the firm size phenomenon exists. Morningstar's *Ibbotson SBBI 2013 Valuation Yearbook* (Chapter 7) reports that smaller companies have experienced market higher returns that are not fully explainable by their higher betas, and that beta is inversely related to firm size. In other words, smaller companies, not only have higher betas, but also higher market returns than larger ones. Even after accounting for differences in beta risk, small

companies require an additional risk premium over and above the added risk premium indicated by differences in beta risk.

Q. Please explain the comparative risk study you prepared to develop a risk premium for CalPeco to be added to the results for the electric proxy group?

A. Yes. The risk study I prepared for CalPeco is attached as Exhibit TJB-4. To conduct my comparative risk study, I started by computing the 5-year historical operating margin, coefficient of variation of operating margin, and coefficient of variation of ROE for CalPeco. Operating margin is a measure of profitability. The co-efficients of variation of operating margin and ROE are measures of earnings variability. All three of these metrics are highly correlated with size and risk.

Q. Are these the metrics for the electric proxy group and CalPeco you presented earlier in your testimony?

A. Yes, on pages 20 through 22.

Q. Please continue.

A. Next, I cross-referenced these metrics with data from *Duff & Phelps Cost of Capital Navigator* Supplementary Data Risk Study and identified the corresponding market portfolio beta for the Company and for my electric proxy group.[39] I then computed the relative difference in beta between and the electric proxy group and CalPeco. Assuming that the relative difference in the market portfolio beta for all the publicly traded companies is the same for publicly traded electric utilities, I then computed implied betas for CalPeco using the difference in portfolio betas.[40]

[39] *Duff & Phelps Cost of Capital Navigator*, Supplementary Data Risk Study. *See* also p. 6 of Exhibit TJB-4.

[40] *See* p. 6 of Exhibit TJB-4.

Finally, I used the CAPM methods to compute the indicated cost of equity for each utility and compared the results to the CAPM results for the electric proxy group.[41] Based upon this analysis, I conclude that the required risk premium for CalPeco is in the range of 60 to 70 basis points.

Q. Is there another method which provides useful information about the risk premium for CalPeco?

A. Yes. Based upon my analysis of the size risk premium for use in the MCAPM, I found that CalPeco's size premium over the electric proxy group (and not dependent upon beta) is 236 basis points. *See* Exhibit TJB-5, page 1, line 38.

VII. SUMMARY AND CONCLUSIONS

Q. Please provide an overview of your testimony.

A. I recommend the Commission adopt the three-step method I presented above to determine the ROE for CalPeco. In the first step, an average of costs of equity for a sample of 24 electric utilities is determined with the DCF model and several RP models. I determined the cost of equity for the water proxy group lies in the range of 8.8 percent to 10.3 percent with a mid-point of 9.6 percent.

In the second step, I considered differences in financial risk between CalPeco and the proxy group. I determined that CalPeco's recommended capital structure is well within the range of capital structures of the proxy group and only somewhat below the average of the proxy group. I concluded that a financial risk adjustment was not necessary.

In the third step, a risk premium for CalPeco is determined to reflect the Company's higher risks. Quantitative evidence based on differences in CalPeco's business risk metrics compared to

[41] *See* p. 7 of Exhibit TJB-4.

the benchmark electric proxy group justifies a risk premium in the range of 60 to 236 basis points. I recommend a risk premium of 70 basis points.

In the final step, equity costs from step one and the risk premiums from step two and three are combined to determine a fair ROE for CalPeco. I recommend the Commission adopt an ROE for CalPeco of no less than 10.3 percent.

Q. Please summarize the equity cost estimates you made in step one.

A. I made four equity cost estimates for the electric proxy group, which are summarized in Table 1 in Exhibit TJB-3. Where data were available, the equity cost estimates were based on data for the eight electric utilities listed in Table 2. The first equity cost estimates were derived with the DCF model. Using the DCF model to estimate growth, the estimated equity cost for the electric proxy group is 8.6 percent. Next, I determined two risk premium estimates and CAPM method (a third risk premium method).

In the first RP approach, I determined an historical risk premium for the electric utility industry estimated with an annual time series analysis applied to the utility industry as a whole over the 1963-2017 period, using Standard and Poor's Utility Index as an industry proxy. The historical risk premium was estimated by computing the actual realized return on equity capital for the S&P Utility Index for each year and then subtracting the long-term Treasury bond return for that year. The estimated equity cost for the electric proxy group is 10.3 percent using this approach.

In the second RP approach, I relied on authorized ROEs as proxies for the costs of equity for electric utilities. I examined the historical risk premiums implied in the ROEs allowed by regulatory commissions for electric utilities over the 2001-2017 period for which data were available, relative to the contemporaneous level of the long-term Treasury bond yield. From this

data I developed a statistical relationship between risk premiums (RPm) and Treasury rates (Yield). The estimated equity cost for the electric proxy group is 10.2 percent using this approach. I also established a range of CAPM estimates using long-horizon estimates of the market risk premium as well as a current estimate of the market risk premium, which produced a cost of equity for the electric proxy group of 8.6 percent to 10.1 percent with an average of 9.3 percent.

I selected the mid-point of the range of my DCF and RP estimates including the CAPM to establish a cost of equity for the electric proxy group of 9.6 percent.

Q. Please summarize your estimate of the risk premium you determined in step 3.

A. I prepared a comparative risk study employing commonly used business risk metrics and data from *Duff & Phelps Cost of Capital Navigator* 2018 Supplementary Data Risk Study. Based upon this study, I conclude that the risk premium for CalPeco is in the range of 60 to 70 basis points. I also examined differences in the size premium between CalPeco and the electric proxy group based upon the *Duff & Phelps Cost of Capital Navigator* 2018 Supplementary Data Size Study and Risk Study. Based upon this analysis, I conclude that the risk premium for CalPeco is 236 basis points. Based on my consideration of that testimony and my judgment, I recommend a risk premium for CalPeco of no less than 70 basis points at this time.

Q. Given the results of your equity cost analyses, is an ROE of 10.3 percent for CalPeco reasonable?

A. Yes.

Q. Does this complete your testimony?

A. Yes.

Exhibit TJB-1

Thomas J. Bourassa Work Summary

RESUME OF THOMAS J. BOURASSA, CPA

EDUCATIONAL BACKGROUND

B.S. Northern Arizona University Chemistry/Accounting (1980)
M.B.A. University of Phoenix with Emphasis in Finance (1991)
C.P.A. State of Arizona (1995)
Continuing Professional Education – In areas of tax, accounting, management, economics, finance, business valuation, consulting, and ethics (80 hrs every two years)

MEMBERSHIPS

Arizona Society of CPAs
Water Utilities Association of Arizona
American Water Works Association

EMPLOYMENT EXPERIENCE

1995 – Present	CPA - Self Employed Consultant to utilities on regulatory matters including all aspects of rate applications (rate base, income statement, cost of capital, cost of service, and rate design), rate reviews, certificates of convenience and necessity (CC&N), CC&N extensions, financing applications, accounting order applications, and off-site facilities hook-up fee applications. Provide expert testimony as required. Consult on various aspects of business, financial and accounting matters including best business practices, generally accepted accounting principles, generally accepted ratemaking principles, project analysis, cash flow analysis, regulatory treatment of certain expenditures and investments, business valuations, and rate reviews. Litigation support services.
1992-1995	Employed by High-Tech Institute, Phoenix, Arizona as Controller and C.F.O.
1989-1992	Employed by Alta Technical School, a division of University of Phoenix as Division Controller.
1985-1989	Employed by M.L.R. Builders, Tampa and Pensacola, Florida as Operations/Accounting Manager
1982-1985	Employed by and part owner in Area Sand and Clay Company, Pensacola, Florida.

1981-1982	Employed by Purdue University, West Lafayette, Indiana as Teaching Assistant.

SUMMARY OF REGULATORY WORK EXPERIENCE AS SELF EMPLOYED CONSULTANT

COMPANY/CLIENT	**FUNCTION**
(Liberty Utilities (Park Water) Corp. and Liberty Utilities (Apple Valley Ranchos Water) Corp. CPUC Applications 18-05-001, et al.	Cost of Capital. Prepared Cost of Capital analysis and testimony.
Truxton Water Company ACC W-02168A-18-308	Permanent Rate Application –Water. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, and Rate Design.
Payson Water Company ACC W-03514A-18-0230	Permanent Rate Application – Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Farmers Water Company ACC W-01654A-18-0083	Permanent Rate Application – Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Liberty Utilities (Silverleaf Water) Corp. SOAH DOCKET NO. 473-18-3006.WS Texas P.U.C. DOCKET NO. 47976	Permanent Rate Application – Water and Wastewater. Prepared financing application. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Generic Proceeding - Income Tax "Savings" from reduction in Federal Income Tax Rate ACC AU-0000A-17-0379 ACC various dockets	Prepared computations of tax "savings" from the reduction in federal income tax rates and proposal for passing savings to rate payers through bill credits.
Liberty Utilities (Woodmark Sewer) Corp. Liberty Utilities (Tall Timbers Sewer) Corp. SOAH DOCKET NO. 473-17-1641.WS Texas P.U.C. DOCKET NO. 46256	Develop wastewater rates based upon water usage.
Cerbat Water Company	Permanent Rate Application –Water.

COMPANY/CLIENT	FUNCTION
ACC W-02391A-18-0018	Prepared financing application. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, and Rate Design.
Ajo Improvement Company ACC Docket No. WS-01025A-17-0361	Permanent Rate Application – Water, Wastewater, and Electric. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, and Rate Design,
East Slope Water Company ACC Docket No. W-02031A-17-317	Permanent Rate Application –Water Prepared short-form schedules on Rate Base, Plant, Income Statement, Revenue Requirement, and Rate Design.
Kachina Village Improvement District Flagstaff, Arizona	Prepared rate studies and rate designs. Participated in Board work sessions, customer work sessions, and open houses.
Liberty Utilities (Litchfield Park Water & Sewer) Corp. ACC Docket No. W-01428AA-17-0059 ACC Docket No. SW-01428AA-17-0058	Permanent Rate Application – Water and Wastewater. Prepared financing application. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Cost of Service, Rate Design, and Cost of Capital.
Pima Utility Company ACC Docket No. W-02199A-16-0421 ACC Docket No. SW-02199A-16-0422	Permanent Rate Application – Water and Wastewater. Prepared financing application. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Valley Pioneers Water Company ACC Docket No. W-02033-16-0412	Permanent Rate Application –Water. Prepared financing application. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, and Rate Design.
Yarnell Water Co-Op ACC Docket No. W-02255A-16-0153	Permanent Rate Application –Water Prepared short-form schedules on Rate Base, Plant, Income Statement, Revenue Requirement, and Rate Design.

COMPANY/CLIENT	FUNCTION
Oak Creek Water Company No. 1 ACC Docket No. W-01392A-16-0161	Permanent Rate Application –Water Prepared short-form schedules on Rate Base, Plant, Income Statement, Revenue Requirement, and Rate Design.
Epcor Water Arizona ACC Docket No. W-01303A-16-0145	Permanent Rate Application – Wastewater. Prepared Reconstruction Cost New Less Depreciation Plant for use in determining fair value rate base.
Mountain Water Company Montana PUC Docket No. D2016.2.15	Testified in the matter investigating whether Mountain Water Company's rates are just and reasonable.
Turner Ranches Water and Sanitation Company ACC Docket No. W-01677A-16-0076	Permanent Rate Application –Water Prepared short-form schedules on Rate Base, Plant, Income Statement, Revenue Requirement, and Rate Design.
Liberty Utilities (Entrada Del Oro Sewer) Corp. ACC Docket No. W-04316A-16-0078 ACC Docket No. W-04316A-16-0085	Permanent Rate Application –Wastewater. Prepared financing application. Prepared schedules and testified on Rate Base, Original Cost Less Depreciation Plant, Reconstruction Cost New less Depreciation Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Liberty Utilities (Rio Rico Water and Sewer) Corp. ACC Docket No. WS-02676A-15-0368 ACC Docket No. WS-02676A-15-0371	Permanent Rate Application – Water and Wastewater. Prepared financing application. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Liberty Utilities (Bella Vista Water) Corp. ACC Docket No. W-02465A-15-0367 ACC Docket No. W-02465A-15-0370	Permanent Rate Application – Water. Prepared financing application. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Community Water of Green Valley ACC Docket No. W-02304A-15-0263	Permanent Rate Application – Water. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue

COMPANY/CLIENT	FUNCTION
	Requirement, and Rate Design.
Sahuarita Water Company ACC Docket No. W-03718A-15-0213	Permanent Rate Application –Water. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Liberty Utilities (Black Mountain Sewer) Corp. ACC Docket No. SW-0236 1A- 15-0206 ACC Docket No. SW-0236 1A- 15-0207	Permanent Rate Application –Wastewater. Prepared financing application. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Cost of Service Study, Rate Design, and Cost of Capital.
Tierra Buena Water Company ACC Docket No. W-02076A-15-013	Permanent Rate Application – Water. Assisted in preparation of short-form schedules.
Red Rock Utilities, LLC ACC Docket No. W-04245A-14-0295	Permanent Rate Application – Water and Wastewater. Prepared short-form schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Quail Creek Water Company ACC Docket No. W-02514A-14-0370	Permanent Rate Application – Water. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Tonto Basin Water Company ACC Docket No. W-03515A-14-0310	Permanent Rate Application – Water. Prepared short-form schedules for Rate Base, Income Statement, Plant, Bill Counts, and Rate Design.
Navajo Water ACC Docket No. W-03511A-14-304	Permanent Rate Application – Water. Prepared short-form schedules for Rate Base, Income Statement, Plant, Bill Counts, and Rate Design.
Alaska Power Company Regulatory Commission of Alaska Docket No. U-14-002	Prepared schedules and testified on cost of capital.

COMPANY/CLIENT	FUNCTION
Anchorage Municipal Light & Power Regulatory Commission of Alaska Docket No. U-13-184	Prepared schedules and testified on cost of capital.
Liberty Utilities (Pine Bluff) Inc. Arkansas Public Service Commission Docket No. 14-020-U	Permanent Rate Application – Water. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Cost of Service, Rate Design, and Cost of Capital.
Abra Water Company ACC Docket No. W-01782A-14-0084	Permanent Rate Application – Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
EPCOR Water Arizona, Inc. ACC Docket No. W-01303A-14-0010	Permanent Rate Application – Prepared rate designs and cost of Service studies for Mohave Water District, Mohave Wastewater District, Paradise Valley Water District, Tubac Water District, and Sun City Water District.
Liberty Utilities (Midstates Natural Gas), Inc. Missouri Public Service Commission Case No. GR-2014-0152	Permanent Rate Application – Assist in preparing required rate application schedules for Rate Base, Plant, Income Statement, Revenue Requirement, and Rate Design.
Hydro Resources, LLC. ACC Docket No. W-20770A-13-0313	Certificate of Convenience and Necessity – Water. Prepared pro-forma balance sheets, income statements, plant schedules, rate base, and initial rates.
Little Park Water Company ACC Docket No. W-02192A-13-0336	Permanent Rate Application – Water. Prepared short-form schedules for Rate Base, Income Statement, Plant, Bill Counts, and Rate Design.
Utility Source, LLC. ACC Docket No. WS-04235A-13-0331	Permanent Rate Application – Water and Sewer. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and

COMPANY/CLIENT	FUNCTION
	Cost of Capital.
Payson Water Company ACC Docket No. W-03514A-13-0111 ACC Docket No. W-03514A-13-0142	Permanent Rate Application – Water. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital. Financing Application. Prepared financial ratios and debt surcharge mechanism.
Goodman Water Company	Valuation
Verde Santa Fe Wastewater ACC Docket No. SW-03437A-13-0292	Permanent Rate Application – Sewer. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Lago Del Oro Water Company ACC Docket No. W-01944A-13-0215	Permanent Rate Application – Water. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Cost of Service, Rate Design, and Cost of Capital.
Chaparral City Water Company ACC Docket No. W-02113A-13-0118	Permanent Rate Application – Prepared and testified on cost of service study.
Las Quintas Serenas Water Company ACC Docket No. W-01583A-13-0117	Permanent Rate Application – Water. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Southwest Environmental Utilities. Inc. ACC Docket No. WS-20878A-13-0065	Certificate of Convenience and Necessity – Water and Wastewater. Prepared pro-forma balance sheets, income statements, plant schedules, rate base, and initial rates.
Litchfield park Service Company ACC Docket No. SW-01428A-13-0043 ACC Docket No. W-01428A-13-0042	Permanent Rate Application – Water and Sewer. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, Cost of Service, and Cost of Capital.

COMPANY/CLIENT	FUNCTION
Beaver Dam Water Company ACC Docket No. WS-03067A-12-0232	Permanent Rate Application. Prepared schedules on Plant, Income Statement, Revenue Requirement, and Rate Design.
Rio Rico Utilities ACC Docket No. WS-02676A-12-0196	Permanent Rate Application – Water and Sewer. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Cost of Service, Rate Design, and Cost of Capital.
Vail Water Company ACC Docket No. W-01651B-12-0339	Permanent Rate Application. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Cost of Service, Rate Design, and Cost of Capital.
Avra Water Co-Op. ACC Docket No. W-02126A-11-0480	Permanent Rate Application. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Cost of Service, Rate Design, and Cost of Capital.
Pima Utility Company ACC Docket No. W-02199A-11-0329 ACC Docket No. SW-02199A-11-0330	Permanent Rate Application – Water and Sewer. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Cost of Service, Rate Design, and Cost of Capital. Work on financing application.
Liberty Utilities (CALPECO Electric), LLC) Docket No. 11202020	Work on preparation of permanent rate application. Prepared schedules on Rate Base, Plant, Income Statement, Revenue Requirement.
Livco Water Company ACC Docket No. SW-02563A-11-0213	Permanent Rate Application – Water and Sewer. Prepared short-form schedules for Rate Base, Income Statement, Plant, Bill Counts, and Rate Design.
Orange Grove Water Company ACC Docket No. W-02237A-11-0180	Permanent Rate Application. Prepared schedules on Plant, Income Statement, Revenue Requirement, and Rate Design.
Goodman Water Company	Permanent Rate Application – Water.

COMPANY/CLIENT	FUNCTION
ACC Docket No. W-02500A-10-0382	Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Doney Park Water ACC Docket No. W-01416A-10-0450	Permanent Rate Application – Water. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, and Rate Design.
Grimmelmann, et. al. v. Pulte Home Corporation, et. al., case no. CV-08-1878-PHX-FJM, the United States District Court for the District of Arizona.	Consultant to defendant and expert witness for defendant on rates and ratemaking.
Southern Arizona Home Builders Association	Consultant on ratemaking aspects to line extension policies (electric).
H2O Water Company	Valuation
Tierra Linda HOA Water Company	Valuation
Las Quintas Serenas Water Company ACC Docket No. W-01583A-09-0589	Permanent Rate Application – Water. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Coronado Utilities ACC Docket No. SW-04305A-09-0291	Permanent Rate Application – Wastewater. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Little Park Water Company ACC Docket No. W-02192A-09-0531	Permanent Rate Application. Prepared schedules on Plant, Income Statement, Revenue Requirement, and Rate Design.
Sahuarita Water Company ACC Docket No. W-03718A-09-0359	Permanent Rate Application – Water. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, Cost of Service, and Cost of Capital.
Bella Vista Water Company	Permanent Rate Application – Water.

COMPANY/CLIENT	FUNCTION
Southern Sunrise Water Company Northern Sunrise Water Company ACC Docket No. W-02465A-09-0414 ACC Docket No. W-02453A-09-0414 ACC Docket No. W-02454A-09-0414	Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, Cost of Service, and Cost of Capital.
Rio Rico Utilities, Inc ACC Docket No. WS-02676A-09-0257	Permanent Rate Application – Water and Sewer. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Litchfield park Service Company ACC Docket No. SW-01428A-09-0103 ACC Docket No. W-01428A-09-0104	Permanent Rate Application – Water and Sewer. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, Cost of Service, and Cost of Capital.
Town of Thatcher v. City of Safford, CV 2007-240, Superior Court of Arizona	Consultant to plaintiff on ratemaking and cost of service.
Valencia Water Company California Public Utility Commission Case No. 09-05-002	Cost of Capital
Valley Utilities ACC Docket No. W-01412A-08-0586	Permanent Rate Application. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, and Rate Design.
Black Mountain Sewer Company ACC Docket No. SW-02361A-08-0609	Permanent Rate Application – Sewer. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Far West Water and Sewer Company ACC Docket No. WS-03478A-08-0608	Interim Rate Application (Emergency Rates)
Farmers Water Company ACC Docket No. W-01654A-08-0502	Permanent Rate Application. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, and Rate Design.

COMPANY/CLIENT	FUNCTION
Far West Water and Sewer Company ACC Docket No. WS-03478A-08-0454	Permanent Rate Application. Sewer. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design and Cost of Capital.
Ridgeline Water Company, LLC ACC Docket No. W-20589A-08-0173	Certificate of Convenience and Necessity – Water. Prepared pro-forma balance sheets, income statements, plant schedules, rate base, financing, and intitial rates.
Sacramento Utilities, Inc. ACC Docket No. SW-20576A-08-0067	Certificate of Convenience and Necessity – Wastewater. Prepared pro-forma balance sheets, income statements, plant schedules, rate base, and financing.
Johnson Utilities ACC Docket No. WS-02987A-08-0180	Permanent Rate Application. Water and Sewer. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design and Cost of Capital. Participate in 40-252 proceeding.
Orange Grove Water Company ACC Docket No. W-02237A-08-0455	Permanent Rate Application. Prepared schedules on Plant, Income Statement, Revenue Requirement, and Rate Design.
Far West Water and Sewer Company ACC Docket No. WS-03478A-07-0442	Financing Application. Prepare schedules to support application.
Oak Creek Water No.1 ACC Docket No. W-01392A-07-0679	Permanent Rate Application. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, and Rate Design.
ICR Water Users Association Docket W-02824-07-0388	Permanent Rate Application. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, and Rate Design.
Johnson Utilities	Valuation consultant in the matter of the sale of Johnson Utilities assets to the

COMPANY/CLIENT	FUNCTION
	Town of Florence.
H2O, Inc ACC Docket No. W-02234A-07-0550	Permanent Rate Application. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Chaparral City Water Company ACC Docket No. W-02113A-07-0551	Permanent Rate Application. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Valley Utilities ACC Docket No. W-01412A-07-0561	Financing Application. Prepare schedules to support application.
Valley Utilities ACC Docket No. W-01412A-07-280	Emergency Rate Application. Prepare schedules to support application.
Valley Utilities ACC Docket No. W-01412A-07-0278	Accounting Order. Assist in preparing definition and scope of costs for deferral for future regulatory consideration and treatment.
Litchfield Park Service Company ACC Docket No. W-01427A-06-0807	Accounting Order. Assist in preparing definition and scope of costs for deferral for future regulatory consideration and treatment.
Golden Shores Water Company ACC Docket No. W-01815A-07-0117	Permanent Rate Application. Water. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Diablo Village Water Company ACC Docket No. W-02309A-07-0140	Off-site facilities hook-up fee application. Prepare schedules to support application.
Diablo Village Water Company ACC Docket No. W-02309A-07-0399	Permanent Rate Application (Class C). Water. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and

COMPANY/CLIENT	FUNCTION
	Cost of Capital.
Sahuarita Water Company (Rancho Sahuarita Water Co.) ACC Docket No. W-03718A-07-0687	Extension Certificate of Convenience and Necessity – Water. Prepared pro-forma balance sheets, income statements, plant schedules, rate base, and financing.
Utility Source, L.L.C. ACC Docket No. WS-04235A-06-0303	Permanent Rate Application- Water and Wastewater. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Tierra Buena Water Company	Valuation of Tierra Buena Water Company for estate purposes.
Goodman Water Company ACC Docket No. W-02500A-06-0281	Permanent Rate Application (Class C). Water. Prepared schedules and testified on Rate Base, Plant, Income Statement, and Cost of Capital.
Links at Coyote Wash Utilities ACC Docket No. SW-04210A-06-0220	Certificate of Convenience and Necessity – Sewer. Prepared pro-forma balance sheets, income statements, plant schedules, rate base, financing, and initial rate design.
New River Utilities ACC Docket No. W-0173A-06-0171	Extension Certificate of Convenience and Necessity – Water. Prepared pro-forma balance sheets, income statements, plant schedules, rate base, and financing.
Johnson Utilities ACC Docket No. WS-02987A-04-0501 Docket WS-02987A-04-0177	Extension of Certificate of Convenience and Necessity – Sewer. Prepared pro-forma balance sheets, income statements, plant schedules, rate base, financing, and initial rate design.
Bachmann Springs Utility ACC Docket No. WS-03953A-07-0073	Permanent Rate Application – Water and Sewer. Prepared short-form schedules for Rate Base, Income Statement, Plant, Bill Counts, and Rate Design.
Avra Water Cooperative ACC Docket No. W-02126A-06-0234	Permanent Rate Application – Water. Prepared schedules and testified on Rate

COMPANY/CLIENT	FUNCTION
	Base, Plant, Income Statement, Revenue Requirement, and Rate Design.
Gold Canyon Sewer Company ACC Docket No. SW-025191A-06-0015	Permanent Rate Application – Sewer. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
State of Arizona v. Far West Water and Sewer, No. 1 CA-CR 06-0160	Expert witness on behalf of defendant in penalty phase of case.
Far West Water and Sewer Company ACC Docket No. WS-03478A-05-0801	Permanent Rate Application – Sewer. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Black Mountain Sewer Company ACC Docket No. SW-02361A-05-0657	Permanent Rate Application – Sewer. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, Rate Design, and Cost of Capital.
Balterra Sewer Company ACC Docket No. SW-02304A-05-0586	Certificate of Convenience and Necessity – Sewer. Prepared pro-forma balance sheets, income statements, plant schedules, rate base, financing, and initial rate design.
Community Water Company of Green Valley ACC Docket No. W-02304A-05-0830	Permanent Rate Application – Water. Prepared schedules and testified on Rate Base, Plant, Income Statement, Revenue Requirement, and Rate Design.
McClain Water Systems Northern Sunrise Water Southern Sunrise Water ACC Docket No. W-020453A-06-0251	Certificate of Convenience and Necessity – Water. Prepared pro-forma balance sheets, income statements, plant schedules, rate base, financing, and initial rate design.
Valley Utilities Water Company ACC Docket No. W-01412A-04-0376	Off-site facilities hook-up fee application. Prepare schedules to support application.
Valley Utilities Water Company	Permanent Rate Application – Water.

COMPANY/CLIENT	FUNCTION
ACC Docket No. W-01412A-04-0376	Prepared schedules and testified on Rate Base, Plant, Income Statement, and Revenue Requirement. Assisted in preparation of Rate Design.
Beardsley Water Company ACC Docket No. W-02074A-04-0358	Permanent Rate Application – Water. Prepared short-form schedules for Rate Base, Income Statement, Plant, Bill Counts, and Rate Design.
Pine Water Company, Inc. ACC Docket No. W-03512A-03-0279	Interim and Permanent Rate Application, Financing Application - Water. Prepared schedules and testified on Rate Base, Plant, Income Statement, Cost of Capital, and Rate Design.
Chaparral City Water Company ACC Docket No. W-02113A-04-0616	Permanent Rate Application. Prepared schedules and testified on Rate Base, Plant, and Income Statement. Assisted in preparation Rate Design.
Tierra Linda Home Owners Association ACC Docket No. W-0423A-04-0075	Certificate of Convenience and Necessity – Water. Prepared pro-forma balance sheets, income statements, plant schedules, rate base, financing, and initial rate design.
Diamond Ventures - Red Rock Utilities ACC Docket No. WS-04245A-04-0184	Certificate of Convenience and Necessity – Water and Sewer. Prepared pro-forma balance sheets, income statements, plant schedules, rate base, financing, and initial rate design.
Arizona-American Water Company, Inc. ACC Docket No. WS-01303A-02-0867 ACC Docket No. WS-01303A-02-0868 ACC Docket No. WS-01303A-02-0869 ACC Docket No. WS-01303A-02-0870 ACC Docket No. WS-01303A-02-0908	Permanent Rate Application Water and Sewer (10 divisions). Prepared schedules and testimony on Rate Base, Plant, Income Statement, and Revenue Requirement. Assisted in preparation of Rate Design.
Bella Vista Water Company, Inc. ACC Docket No. W-02465A-01-0776	Permanent Rate Application - Water. Prepared schedules and testimony on Rate

COMPANY/CLIENT	FUNCTION
	Base, Plant, Income Statement, and Revenue Requirement. Assisted in preparation of Cost of Capital and Rate Design.
Green Valley Water Company Docket (2000 Not Filed)	Permanent Rate Application. Prepared schedules and testimony on Rate Base, Plant, Income Statement, and Revenue Requirement. Assisted in preparation of Cost of Capital and Rate Design.
Gold Canyon Sewer Company ACC Docket No. SW-02519A-00-0638	Permanent Rate Application - Sewer. Prepared schedules and testimony on Rate Base, Plant, Revenue Requirement, and Income Statement. Assisted in preparation of Cost of Capital and Rate Design.
Rio Verde Utilities, Inc. ACC Docket No. WS-02156A-00-0321	Permanent Rate Application – Water and Sewer. Prepared schedules and testimony on Rate Base, Plant, Revenue Requirement, and Income Statement. Assisted in preparation of Cost of Capital and Rate Design.
Livco Water Company Livco Sewer Company ACC Docket No. SW-02563A-05-0820	Permanent Rate Application – Water. Prepared short-form schedules for Rate Base, Income Statement, Plant, Bill Counts, and Rate Design.
Livco Water Company ACC Docket No. SW-02563A-07-0506	Permanent Rate Application – Water and Sewer. Prepared short-form schedules for Rate Base, Income Statement, Plant, Bill Counts, and Rate Design.
Cave Creek Sewer Company	Revenue Requirement, Rate Adjustment and Rate Design - Sewer.
Avra Water Cooperative ACC Docket No. W-02126A-00-0269	Permanent Rate Application – Water. Assisted in preparation of Rate Base, Plant, Income Statement, Revenue Requirement, and Rate Design.
Town of Oro Valley	Revenue Requirements, Water Rate Adjustments and Rate Design.

COMPANY/CLIENT	FUNCTION
Far West Water Company ACC Docket No. WS-03478A-99-0144	Permanent Rate Application – Water. Assisted in preparation of schedules for Rate Base, Income Statement, Revenue Requirement, Lead-Lag Study, Cost of Capital, and Rate Design.
MHC Operating Limited Partnership Sedona Venture Wastewater ACC Docket No. W-	Permanent Rate Application – Sewer. Assisted in preparation of schedules for Rate Base, Plant, Income Statement, and Rate Design.
Vail Water Company ACC Docket No. W-01651B-99-0406	Permanent Rate Application. Assisted in preparation of schedules for Rate Base, Plant, Income Statement, and Rate Design.
E&T Water Company ACC Docket No. W-01409A-95-0440	Permanent Rate Application - Water. Assisted in preparation of schedules for Rate Base, Plant, Income Statement, and Rate Design.
New River Utility ACC Docket No. W-01737A-99-0633	Permanent Rate Application - Water. Assisted in preparation of schedules for Rate Base, Plant, Income Statement, and Rate Design.
Golden Shores Water ACC Docket No. W-01815A-98-0645	Permanent Rate Application – Water. Assisted in preparation of schedules for Rate Base, Plant, Income Statement, and Rate Design.
Ponderosa Utility Company ACC Docket No. W-01717A-99-0572	Permanent Rate Application – Water. Assisted in preparation of schedules for Rate Base, Plant, Income Statement, and Rate Design.

Exhibit TJB-2

The Value Line Investment Survey and

Blue Chip Financial Forecasts

The Value Line Investment Survey

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Value Line®

Part 2 File in page order in the *Selection & Opinion* binder. | **SELECTION & OPINION** | August 31, 2018

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The Quarterly Economic Review

In This Issue

In Three Parts: Part 1 is the Summary & Index. This is Part 2, Selection & Opinion. Part 3 is Ratings & Reports. Volume LXXIV, Number 3.

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VALUE LINE ECONOMIC AND STOCK MARKET COMMENTARY

The economy really hit it out of the park in the second quarter, following long stretches in which the best it could do was get singles and doubles. Thus, after years in which gross domestic product growth had averaged a pedestrian 1.5% to 2.5%, the April-to-June period saw GDP surge 4.1%. (Note: Revised second-quarter GDP figures were set for release after this report went to press.) Helping the economy was strong consumer activity, with spending (boosted by lower taxes, steady job gains, and higher disposable income) climbing 4%. Also contributing to this solid showing were gains in exports and federal government spending. Now, the issue becomes one of sustainability. And on that count, after several false starts over the past decade—in which the economy would rush forward for a quarter or two before coming back to earth—the upturn finally seems firmly grounded. Accordingly,

The winning streak likely has further to go. That does not mean the advance will continue at the second quarter's eye-catching pace. In fact, we already are seeing moderating gains across several categories. For example, recent reports have shown lesser increases in employment, manufacturing activity, the non-manufacturing sector, and industrial production, while housing starts have eased. Moreover, exports are likely to slow following the second-quarter jump. Finally, despite a decent jobs outlook, which is headlined by near full-employment, wage growth is barely ahead of inflation. Of course, the likelihood is that further employment gains and additional declines in the jobless rate will gradually tip the scales in favor of better compensation. For now, though, labor is playing catch-up and that could cap GDP growth going forward. Meanwhile,

A little of the bloom likely will come off the rose later this year and in 2019. Our sense is that the recent choppier pattern in these industrial and consumer categories, the projected slowing in exports, and our uncertain trade relations with China—with the latter likely to be addressed assuming talks between the two countries are productive—could combine to yield a

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VALUE LINE FORECAST FOR THE U.S. ECONOMY

Statistical Summary for 2018-2019

	2018:2	2018:3	2018:4	2019:1	2019:2	2019:3	2019:4	2018	2019
GDP And Other Key Measures									
Real Gross Domestic Product	*18508*	*18664*	*18811*	*18942*	*19064*	*19177*	*19286*	*18577*	*19117*
Total Light Vehicle Sales (Mill. Units)	*17.2*	*16.7*	*16.8*	*16.8*	*16.8*	*16.7*	*16.7*	*17.0*	*16.8*
Housing Starts (Million Units)	*1.26*	*1.29*	*1.30*	*1.33*	*1.33*	*1.33*	*1.35*	*1.29*	*1.34*
After-Tax Profits ($Bill.)	*1897*	*1867*	*1942*	*1878*	*1992*	*1942*	*2020*	*1870*	*1958*
Annualized Rates of Change									
Gross Domestic Product (Real)	*4.1*	*3.4*	*3.2*	*2.8*	*2.6*	*2.4*	*2.3*	*2.9*	*2.9*
GDP Deflator	*3.0*	*2.2*	*2.2*	*2.3*	*2.3*	*2.5*	*2.5*	*2.4*	*2.4*
CPI-All Urban Consumers	*1.7*	*2.7*	*2.7*	*2.7*	*2.5*	*2.3*	*2.3*	*2.7*	*2.5*
Average For The Period									
National Unemployment Rate	*3.9*	*3.8*	*3.6*	*3.5*	*3.5*	*3.4*	*3.4*	*3.9*	*3.5*
Prime Rate	*4.8*	*5.0*	*5.3*	*5.6*	*5.6*	*5.8*	*6.0*	*4.9*	*5.8*
10-Year Treasury Note Rate	*2.9*	*2.9*	*3.0*	*3.2*	*3.3*	*3.3*	*3.3*	*2.9*	*3.3*

Value Line Forecast for the U.S. Economy

	Actual	Estimated						
	2018:1	2018:2	2018:3	2018:4	2019:1	2019:2	2019:3	2019:4
Gross Domestic Product and its Components (2012 Chain Weighted $) Billions of Dollars								
Final Sales	18274	18503	18595	18733	18849	18956	19060	19159
Total Consumption	12722	12848	12968	13086	13193	13291	13383	13469
Nonresidential Fixed Investment	2654	2701	2753	2803	2851	2893	2929	2957
Structures	533	550	560	568	577	586	594	602
Equipment & Software	1251	1263	1282	1304	1326	1345	1365	1385
Residential Fixed Investment	615	614	619	626	632	637	643	648
Exports	2518	2574	2574	2600	2632	2664	2696	2723
Imports	3420	3425	3471	3522	3586	3651	3722	3795
Federal Government	1213	1224	1247	1273	1289	1295	1298	1300
State & Local Governments	1938	1945	1952	1958	1963	1968	1973	1978
Gross Domestic Product	20040	20392	20675	20953	21218	21476	21738	21997
Real GDP (2012 Chain Weighted $)	18323	18508	18664	18811	18942	19064	19177	19286
Prices and Wages — Annual Rates of Change								
GDP Deflator	2.0	3.0	2.2	2.2	2.3	2.3	2.5	2.5
CPI-All Urban Consumers	3.5	1.7	2.7	2.7	2.7	2.5	2.3	2.3
PPI-Finished Goods	3.5	2.7	3.0	2.6	2.4	2.3	2.2	2.2
Employment Cost Index—Total Comp.	4.0	2.4	4.0	3.5	3.4	3.4	3.5	3.5
Productivity	0.4	2.8	2.0	1.5	1.4	1.3	1.3	1.3
Production and Other Key Measures								
Industrial Prod. (% Change, Annualized)	2.4	6.0	2.8	2.5	2.3	2.5	2.5	2.5
Factory Operating Rate (%)	75.3	75.4	75.6	75.5	75.5	75.5	75.4	75.4
Nonfarm Inven. Change (2012 Chain Weighted $)	35.9	-23.2	50.0	60.0	70.0	80.0	80.0	70.0
Housing Starts (Mill. Units)	1.32	1.26	1.29	1.30	1.33	1.33	1.33	1.35
Existing House Sales (Mill. Units)	5.51	5.41	5.45	5.50	5.60	5.70	5.65	5.60
Total Light Vehicle Sales (Mill. Units)	17.1	17.2	16.7	16.8	16.8	16.8	16.7	16.7
National Unemployment Rate (%)	4.1	3.9	3.8	3.6	3.5	3.5	3.4	3.4
Federal Budget Surplus (Unified, FY, $Bill)	-375	-7.0	-250	-280	-350	-50.0	-250	-300
Price of Oil ($Bbl., U.S. Refiners' Cost)	61.88	67.01	69.11	71.00	72.00	72.00	70.00	71.00
Money and Interest Rates								
3-Month Treasury Bill Rate (%)	1.6	1.8	2.1	2.4	2.5	2.7	2.8	2.8
Federal Funds Rate (%)	1.5	1.7	1.9	2.2	2.5	2.7	2.9	3.0
10-Year Treasury Note Rate (%)	2.8	2.9	2.9	3.0	3.2	3.3	3.3	3.3
Long-Term Treasury Bond Rate (%)	3.0	3.1	3.1	3.2	3.2	3.3	3.3	3.5
AAA Corporate Bond Rate (%)	3.8	3.9	4.0	3.9	3.8	3.6	3.5	3.5
Prime Rate (%)	4.5	4.8	5.0	5.3	5.6	5.6	5.8	6.0
Incomes								
Personal Income (Annualized % Change)	5.1	4.3	3.6	4.0	4.5	4.5	4.4	4.3
Real Disp. Inc. (Annualized % Change)	4.4	2.6	2.0	2.0	3.0	3.0	2.9	2.8
Personal Savings Rate (%)	7.2	6.8	6.5	6.0	6.0	6.5	6.5	6.5
After-Tax Profits (Annualized $Bill)	1772	1897	1867	1942	1878	1992	1942	2020
Yr-to-Yr % Change	2.9	5.6	5.0	6.0	6.0	5.0	4.0	4.0
Composition of Real GDP-Annual Rates of Change								
Gross Domestic Product	2.2	4.1	3.4	3.2	2.8	2.6	2.4	2.3
Final Sales	1.9	5.1	2.0	3.0	2.5	2.3	2.2	2.1
Total Consumption	0.5	4.0	3.8	3.7	3.3	3.0	2.8	2.6
Nonresidential Fixed Investment	11.5	7.3	8.0	7.5	7.0	6.0	5.0	4.0
Structures	13.9	13.3	7.0	6.0	6.5	6.5	6.0	5.0
Equipment & Software	8.5	3.9	6.0	7.0	7.0	6.0	6.0	6.0
Residential Fixed Investment	-3.4	-1.1	3.5	4.5	4.0	3.5	3.5	3.5
Exports	3.6	9.3	0.0	4.0	5.0	5.0	5.0	4.0
Imports	3.0	0.5	5.5	6.0	7.5	7.5	8.0	8.0
Federal Government	2.6	3.5	8.0	8.5	5.0	2.0	1.0	0.5
State & Local Governments	0.9	1.4	1.5	1.2	1.0	1.0	1.0	1.0

Value Line Forecast for the U.S. Economy

	Actual					*Estimated*				
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Gross Domestic Product and its Components (2012 Chain Weighted $) Billions of Dollars										
Final Sales	16386	16810	17254	17618	18011	***18526***	***19006***	***19386***	***19735***	***20071***
Total Consumption	11167	11494	11922	12248	12559	***12906***	***13334***	***13667***	***14009***	***14331***
Nonresidential Fixed Investment	2206	2357	2400	2411	2538	***2728***	***2908***	***3024***	***3145***	***3239***
Structures	486	537	521	495	517	***553***	***590***	***613***	***632***	***644***
Equipment & Software	1029	1099	1133	1116	1184	***1275***	***1355***	***1423***	***1480***	***1524***
Residential Fixed Investment	486	504	555	591	611	***618***	***640***	***659***	***679***	***693***
Exports	2270	2367	2381	2378	2450	***2566***	***2679***	***2813***	***2897***	***2984***
Imports	2802	2945	3105	3164	3309	***3459***	***3689***	***3928***	***4125***	***4290***
Federal Government	1215	1183	1183	1188	1196	***1239***	***1295***	***1302***	***1289***	***1270***
State & Local Governments	1845	1848	1904	1943	1932	***1948***	***1970***	***1990***	***2010***	***2030***
Gross Domestic Product	16785	17522	18219	18707	19487	***20515***	***21607***	***22635***	***23665***	***24644***
Real GDP (2012 Chain Weighted $)	16495	16900	17387	17659	18051	***18577***	***19117***	***19538***	***19928***	***20267***
Prices and Wages — Annual Rates of Change										
GDP Deflator	1.6	1.8	0.9	1.6	2.0	***2.4***	***2.4***	***2.5***	***2.5***	***2.4***
CPI-All Urban Consumers	1.5	1.6	0.4	1.8	2.1	***2.7***	***2.5***	***2.3***	***2.3***	***2.2***
PPI-Finished Goods	1.2	1.9	-3.3	1.0	7.1	***3.0***	***2.3***	***2.2***	***2.2***	***2.0***
Employment Cost Index—Total Comp.	1.9	2.1	1.9	2.2	2.6	***3.5***	***3.5***	***3.6***	***3.6***	***3.5***
Productivity	0.0	0.7	0.7	0.9	1.2	***1.7***	***1.3***	***1.3***	***1.3***	***1.2***
Production and Other Key Measures										
Industrial Prod. (% Change, Annualized)	1.9	3.7	-3.3	-0.6	3.1	***3.4***	***2.5***	***2.3***	***2.0***	***1.8***
Factory Operating Rate (%)	74.1	75.3	75.8	74.6	74.8	***75.5***	***75.5***	***75.0***	***74.5***	***74.0***
Nonfarm Inven. Change (2012 Chain Weighted $)	54.3	65.0	127.9	28.4	27.4	***30.7***	***75.0***	***70.0***	***65.0***	***60.0***
Housing Starts (Mill. Units)	0.93	1.00	1.11	1.18	1.21	***1.29***	***1.34***	***1.35***	***1.37***	***1.40***
Existing House Sales (Mill. Units)	5.07	4.92	5.23	5.44	5.54	***5.47***	***5.64***	***5.70***	***5.75***	***5.80***
Total Light Vehicle Sales (Mill. Units)	15.5	16.4	17.4	17.5	17.2	***17.0***	***16.8***	***16.6***	***16.5***	***16.5***
National Unemployment Rate (%)	7.4	6.2	5.3	4.9	4.4	***3.9***	***3.5***	***3.6***	***3.8***	***4.0***
Federal Budget Surplus (Unified, FY, $Bill)	-680	-483	-479	-582	-681	***-912***	***-950***	***-1000***	***-1100***	***-1250***
Price of Oil ($Bbl., U.S. Refiners' Cost)	100.47	92.23	48.40	40.60	50.69	***67.25***	***71.25***	***72.00***	***73.00***	***75.00***
Money and Interest Rates										
3-Month Treasury Bill Rate (%)	0.1	0.1	0.1	0.3	0.9	***2.0***	***2.7***	***3.0***	***3.1***	***3.0***
Federal Funds Rate (%)	0.1	0.1	0.1	0.4	1.0	***1.8***	***2.8***	***3.2***	***3.4***	***3.4***
10-Year Treasury Note Rate (%)	2.4	2.5	2.2	1.9	2.3	***2.9***	***3.3***	***3.3***	***3.4***	***3.3***
Long-Term Treasury Bond Rate (%)	3.5	3.3	2.9	2.6	2.9	***3.1***	***3.3***	***3.5***	***3.6***	***3.5***
AAA Corporate Bond Rate (%)	4.2	4.2	3.9	3.7	3.8	***3.9***	***3.6***	***3.6***	***3.7***	***3.8***
Prime Rate (%)	3.3	3.3	3.3	3.5	4.1	***4.9***	***5.8***	***6.5***	***7.0***	***7.0***
Incomes										
Personal Income (Annualized % Change)	1.1	4.4	3.8	3.0	4.6	***4.3***	***4.4***	***4.5***	***4.3***	***4.3***
Real Disp. Inc. (Annualized % Change)	-1.4	2.7	3.1	1.6	2.8	***2.8***	***2.9***	***2.5***	***2.4***	***2.2***
Personal Savings Rate (%)	4.8	4.8	7.6	6.7	6.7	***6.6***	***6.4***	***6.0***	***6.0***	***6.0***
After-Tax Profits (Annualized $Bill)	1693	1694	1737	1737	1782	***1870***	***1958***	***2036***	***2138***	***2245***
Yr-to-Yr % Change	0.6	0.1	2.5	0.0	2.6	***4.9***	***4.7***	***4.0***	***5.0***	***5.0***
Composition of Real GDP-Annual Rates of Change										
Gross Domestic Product	1.8	2.5	2.9	1.6	2.2	***2.9***	***2.9***	***2.2***	***2.0***	***1.7***
Final Sales	1.6	2.6	2.6	2.1	2.2	***2.9***	***2.6***	***2.0***	***1.8***	***1.7***
Total Consumption	1.5	2.9	3.7	2.7	2.5	***2.8***	***3.3***	***2.5***	***2.5***	***2.3***
Nonresidential Fixed Investment	4.1	6.9	1.8	0.5	5.3	***7.5***	***6.6***	***4.0***	***4.0***	***3.0***
Structures	1.3	10.6	-3.0	-5.0	4.6	***6.8***	***6.7***	***4.0***	***3.0***	***2.0***
Equipment & Software	4.7	6.7	3.1	-1.5	6.1	***7.7***	***6.3***	***5.0***	***4.0***	***3.0***
Residential Fixed Investment	12.4	3.8	10.1	6.5	3.3	***1.2***	***3.5***	***3.0***	***3.0***	***2.0***
Exports	3.6	4.3	0.6	-0.1	3.0	***4.8***	***4.4***	***5.0***	***3.0***	***3.0***
Imports	1.5	5.1	5.5	1.9	4.6	***4.6***	***6.6***	***6.5***	***5.0***	***4.0***
Federal Government	-5.5	-2.6	0.0	0.4	0.7	***3.6***	***4.5***	***0.5***	***-1.0***	***-1.5***
State & Local Governments	-0.3	0.2	3.0	2.0	-0.5	***0.8***	***1.1***	***1.0***	***1.0***	***1.0***

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Continued from front cover

more modest (3.3%-3.5%) rate of GDP growth in the current quarter. A continuation of this moderating trend is likely down the stretch this year and in 2019 even if subsequent trade talks between the leaders of the two countries bear fruit. Offsetting some of this slower growth figures to be inventory rebuilding—after stocks were drawn down in the second quarter—and a further tightening in the labor market. That would help the retail and housing markets, which have woven an uneven path recently. In all, growth should average 3%, or so, from late this year through mid-2019, before additional slowing develops as the decade concludes.

For now, we do not see a recession on the horizon. Our model assumes growth will ease to between 2.0% and 2.5% from the second half of 2019 through 2020, with further slowing as we enter the next decade. We sense there also may be times when GDP contracts, as demand is satisfied and interest rates rise. As to rates, we see two more Federal Reserve hikes being possible this year, three adjustments in 2019, and one or two increases in 2020. Such prospective tightening could cause businesses and consumers to turn more cautious. It also is true that expansions do not have expiration dates. So, given the muted levels of inflation, the probability of relatively low interest rates going forward, and the presumptive absence of excesses on either demand or pricing, it is possible this extended upturn could advance to the next decade before a recession takes hold.

Meantime, there are potential headwinds that investors should consider. These include a miscalculation by the Federal Reserve in which it tightens too aggressively (causing the economy to falter) or reacts too slowly (allowing inflationary excesses to build). Another possible risk would be a major misstep fiscally, in which government spending or tax policies change radically, yielding unintended consequences. Globally, potential risks would include the inability to settle trade disputes with China or with nations closer to home. There also is the chance that our already frayed relations with North Korea, Russia, or Iran could deteriorate still further leading to confrontations, with possible military implications. It also is possible the financial woes enveloping Turkey could spread and become the opening salvo in an emerging-nation crisis. Absent such events, the benign scenario we have outlined would appear to have a reasonable chance of unfolding. That said, at some point a recession will commence. In fact, one would seem to stand at least a modest chance of evolving within our extended projection period.

SOME SPECIFICS

Economic Growth: The second quarter was a watershed for this expansion, with growth really stepping it up. Indeed, not only did the economy flourish, but the composition of that growth was highly favorable, with consumer spending up nicely and consumers' balance sheets—thanks to a high savings rate—getting stronger. Also, the 4.1% GDP gain was accompanied by a decline in inventories. With leaner stockpiles, inventory rebuilding would seem logical in the current half and perhaps in 2019. That should help underpin growth as well.

In all, we look for steady, if moderating, increases in consumer expenditures, healthy job growth, declining unemployment, solid levels of business fixed investment, further inventory rebuilding, and intermittent pressures on the trade front to generate growth of 3.3%-3.5% this quarter and 3.0%-3.3% in the year's final stanza (Chart 1). As for the coming years, we look for modest gains in consumer spending (likely on the order of 2.0%-2.5% annually), an acceleration in business spending, increases in housing demand and industrial production (Chart 2), as well as some choppiness in exports, as our trade policies evolve.

Things become murkier as we move into the latter stages of our 3- to 5-year projection period, with such variables as monetary policy adjustments, fiscal developments, the ebb and flow of global events, and potential political realignments in our country, both in 2018 and 2020, all playing a role in this possible further business upturn. At a minimum, we see an additional slowdown in growth by 2021-2023, with the potential for a shallow recession.

Inflation: One of the hallmarks of this long and, until recently, understated expansion has been low inflation, with price gains often staying below the Federal Reserve's 2% target for long stretches. More recently, pricing pressures have started to build selectively. Looking ahead, we sense that inflation will run at, or just modestly over, the Fed's 2% target. And with GDP growth staying above trend for a spell, and with the labor market likely tightening in the coming quarters, we expect the Federal Reserve to continue raising the federal funds target at a gradual pace through 2020. For now, we think producer and consumer inflation will head higher for a time at both the headline (includes all components) and the core (excludes the volatile food and energy categories) levels, before subsequently easing as economic growth slows further (Chart 3).

Interest Rates: The Federal Open Market Committee (FOMC) continues to pursue a gradual approach to raising the federal funds rate. Thus far in 2018, the central bank has hiked borrowing costs twice (in March and June), opting for an alternating meeting schedule for such increases. The bank then held the line at its July 31st-August 1st gathering, leaving open the possibility it will boost rates at its September get together. Tight labor markets, above-trend GDP growth through the rest of 2018, and somewhat higher rates of inflation then make the case for a possible fourth rate increase this year, which would likely come in December.

We then would expect the FOMC to perhaps raise rates three times in 2019 and once more in 2020. That would leave the fed funds target at about 3.50%, a level that should restore some of the firepower needed by the bank should a recession ensue. Pursuing a course of monetary tightening is always a balancing act, with

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the Fed seeking to sustain a strong enough pace of GDP growth to support full employment without inviting an outbreak of inflation. Assuming the expansion remains in place through 2021-2023, even at a more restrained pace, borrowing costs would figure to hold in a tight band (Chart 4).

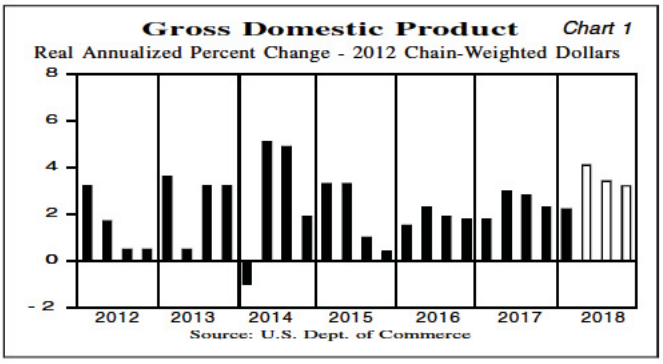
Corporate Profits: Until 2017, earnings had been gaining irregularly, with a surge in 2012 (when we were in the formative stages of this upturn and comparisons were still easy), followed by a multi-year stretch of unimposing performances. More recently, we saw some pickup in 2017, and further, notable improvement this year, highlighted by a solid showing for the S&P 500 companies in the second quarter. Not only were the gains impressive, but a healthy ratio of the companies in that index posted earnings-per-share surprises that were positive, while nearly as many corporations produced positive sales surprises. Lower taxes, healthy product demand, and the ability to raise prices sufficiently to maintain profit margins contributed to this enviable outcome.

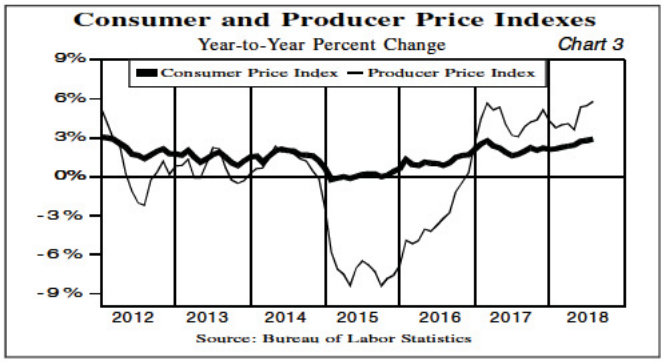
Our sense is that earnings will continue advancing through 2019, albeit with a gradual moderation in strength as economic growth eases somewhat over the next couple of years. The gains secured recently, both with respect to the economy and earnings, are helping the equity market retain its enviable perch, especially as global headwinds at times throw things off stride.

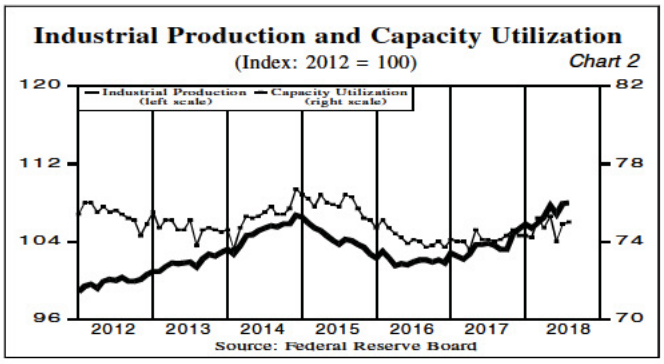
THE STOCK MARKET

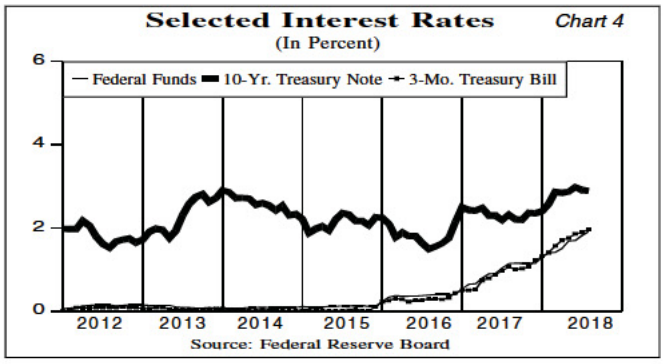
The beneficiaries of this headier pace of economic activity, benign Federal Reserve policies, and a brightening corporate earnings picture have been investors. Indeed, they have seen stocks gain ground steadily for nearly a decade, riding a tide that has enabled the Dow Jones Industrial Average to quadruple over this extended span. Impressively, this has been a steady advance, with few corrections along the way. Moreover, the fundamentals supporting this rise—a growing economy, the adoption of business-friendly policies, a benign Federal Reserve, and rising corporate earnings—appear set to continue in the near term. Importantly, it has been these fundamentals, which have served to successfully counter the uncertain and fast-changing trade and political landscape globally, and the intermittent headwinds in Washington, that have supported this market and kept the bears at bay. Now, the test will be whether this positive combination can continue, as GDP growth and profit improvement figure to slow and interest rates seem likely to rise.

Conclusion: The next few quarters and especially the coming several years will be more challenging for the stock market, as the low-hanging fruit is mostly gone. Does that mean the bull market is close to ending? Probably not, but it also is true that the gains going forward likely will be less assured. Please refer to the inside back cover of *Selection & Opinion* for our statistically-based Asset Allocation Model's current reading. ■









Model Portfolios: Recent Developments

PORTFOLIO I

We are making one change to Portfolio I this week. We are adding the shares of *Lowe's Companies* to replace AON stock, which is no longer timely. *Lowe's* operates a chain of over 2,000 hardware and home improvement superstores in North America. The company has established a long track record of bottom-line growth. The top line advanced at a moderate pace in its July quarter. Comparable-store sales increased about 5.2%. Sales of seasonal items picked up, after unfavorable weather in the April period had delayed outdoor projects. Sales to professionals were also healthy. Adjusted earnings increased over 30%. The company also announced that it is terminating the Orchard Supply Hardware business in order to focus on its core operations. Efforts by *Lowe's* to improve its supply chain, simplify its organizational structure, and expand omni-channel selling capabilities should also bear fruit.

Elsewhere in Portfolio I, *Home Depot* recently reported results for its July period. The company posted sales of $30.463 billion, a year-to-year advance of 8%. Comparable-store sales increased 8%, with broad-based strength across product categories and geographies. Growth in sales to professionals was somewhat faster than that of sales to the do-it-yourself crowd. Online sales increased 26%. Share earnings of $3.05 represented a 36% advance over the prior-year tally. The company will likely continue to benefit from a favorable operating environment in the coming quarters.

PORTFOLIO II

The near-term prospects for the U.S. economy remain bright. Nonetheless, labor markets seem to be tightening, though wages have yet to stage a pronounced upward move, and the Federal Reserve's measure of inflation is now in its targeted range. These developments, along with the myriad other factors the Fed considers when formulating monetary policy, suggests that the FOMC may elect to raise short-term interest rates as many as two more times this year. That said, the major market benchmarks are all currently trading near their 52-week highs, suggesting the long-running bull market still has some legs.

For its part, Portfolio II has performed reasonably well so far in the third quarter. Notable gains include those recorded by our holdings in *Johnson Controls*, *Walgreens Boots Alliance*, *Royal Caribbean*, *Delta Airlines*, and *UPS*. Meanwhile, the performance of our positions in *Western Digital* and *International Game* have been disappointing, though we will continue to hold both stocks in the portfolio, for now. Finally, the average dividend yield for the stocks now held in Portfolio II is 3.4%, nicely above the current *Value Line* median of 2.0% and benefiting from such holdings as *AT&T*, *W.P. Carey*, *Enterprise Products*, and *Kraft Heinz*.

PORTFOLIO III

As August draws to a close, Portfolio III and the broader market remain surprisingly resilient. There seems to be a lot for investors to be concerned about these days, from the political drama in Washington to the ongoing trade dispute between the U.S. and China. The Federal Reserve still appears intent on further interest rate hikes, too, with an increase in September likely in the cards. Nonetheless, stocks remain near record levels, and the multiyear bull market looks to be on a safe footing for the foreseeable future.

Many technology issues, benefiting from the boom in cloud computing and artificial intelligence, are still helping to lead the charge. In fact, *Apple* shares have continued to surge since the company reached the historic $1 trillion market-cap milestone. And the Dow component remains attractively valued on a relative basis, especially considering *Apple's* shareholder-friendly policies and the fast pace at which its high-margined services business is growing. Shares of software heavyweight *Adobe Systems*, meanwhile, also have remained standouts, thanks to strong demand for digital media. And *Facebook* stock has been slowly bouncing back after its recent selloff.

On the earnings front, things have been fairly quiet lately, though *Hormel* did post results for the third quarter of fiscal 2018 (year ends October 27th). Share net of $0.39 came in a bit lighter than we had anticipated, owing to tariff headwinds and less-than-favorable supply-and-demand dynamics. The food processor's future remains bright, however, with growth apt to be supported by accretive, tuck-in acquisitions and the rollout of additional value-added branded products. We are making no changes to Portfolio III this week.

PORTFOLIO IV

The U.S. stock market has had a choppy, but productive August thus far. Investors were generally pleased with second-quarter earnings and seem willing to discount potential headwinds, such as tariffs and political tensions. Looking ahead, the market will be keeping a close watch on what course of action the Federal Reserve takes at its September meeting.

In the current environment, Portfolio IV, which is aimed at income-oriented investors, continues to hold up reasonably well. This week we will take a look at our financial sector holdings. Shares of *Blackstone Group LP*, a leading alternative asset manager, have been making progress lately. The partnership posted strong second-quarter results, and the year-ahead outlook remains encouraging. Increased assets under management should lead to higher fee income, and a large hoard of capital waiting to be deployed ought to benefit investment results in the future. Further, this issue currently offers a better-than-6% dividend yield. Elsewhere, shares of *Prudential Financial*, a leading provider of life insurance, have stabilized lately after getting off to weak start in 2018. The business climate for insurers remains supportive, in our view, thanks to a vibrant economy, rising equity markets, and a favorable interest-rate outlook.

We are making no changes to Portfolio IV this week. ■

PORTFOLIO I: STOCKS WITH ABOVE-AVERAGE YEAR-AHEAD PRICE POTENTIAL

Primarily suitable for more aggressive investors

Ratings & Reports Page	Ticker	Company	Recent Price	Timeliness	Safety	P/E	Yield%	Beta	Financial Strength	Industry Name
1606	ABBV	AbbVie Inc.	97.74	1	3	12.3	3.9	1.20	A	Drug
973	ALSN	Allison Transmission	49.17	1	3	12.7	1.2	1.00	B+	Auto Parts
759	ALL	Allstate Corp.	101.44	1	1	12.9	1.8	0.85	A+	Insurance (Prop/Cas.)
2634	GOOG	Alphabet Inc.	1201.62	2	1	25.8	Nil	1.10	A++	Internet
1795	CBOE	Cboe Global Markets	97.84	2	2	21.2	1.3	0.75	A	Brokers & Exchanges
1022	CMCSA	Comcast Corp.	35.74	1	2	13.5	2.1	0.90	A	Cable TV
309	FDX	FedEx Corp.	251.11	1	1	14.1	1.0	1.15	A++	Air Transport
1141	HD	Home Depot	200.23	2	1	21.1	2.2	1.00	A++	Retail Building Supply
1799	ICE	Intercontinental Exch.	73.14	2	2	20.0	1.3	0.80	A	Brokers & Exchanges
2126	KAR	KAR Auction Svcs.	64.22	2	3	25.3	2.2	1.00	B+	Retail Automotive
812	LH	Laboratory Corp.	177.58	2	1	14.9	Nil	0.90	A	Medical Services
1715	LII	Lennox Int'l	222.14	2	3	21.9	1.2	1.10	B+	Machinery
1142	LOW	Lowe's Cos.	99.74	2	2	17.4	1.9	1.00	A+	Retail Building Supply
1362	MCHP	Microchip Technology	85.02	1	3	13.0	1.7	1.20	A	Semiconductor
954	MSI	Motorola Solutions	124.49	2	3	18.3	1.8	0.90	B++	Telecom. Equipment
165	PCAR	PACCAR Inc.	67.96	1	2	11.2	3.4	1.15	A	Heavy Truck & Equip
2575	TROW	Price (T. Rowe) Group	116.21	2	1	15.8	2.5	1.10	A+	Financial Svcs. (Div.)
1841	SCI	Service Corp. Int'l	42.20	2	3	23.1	1.6	1.00	B+	Funeral Services
1144	SHW	Sherwin-Williams	444.80	2	2	22.9	0.8	1.10	A+	Retail Building Supply
350	UNP	Union Pacific	151.56	2	1	18.9	2.1	1.05	A++	Railroad

To qualify for purchase in the above portfolio, a stock must have a Timeliness Rank of 1 or 2 and a Financial Strength Rating of at least B+. If a stock's Timeliness rank falls to 3, or lower, it will be automatically removed. Stocks in the above portfolio are selected and monitored by Michael F. Napoli, Senior Analyst.

PORTFOLIO II: STOCKS FOR INCOME AND POTENTIAL PRICE APPRECIATION

Primarily suitable for more conservative investors

Ratings & Reports Page	Ticker	Company	Recent Price	Timeliness	Safety	P/E	Yield%	Beta	Financial Strength	Industry Name
919	T	AT&T Inc.	33.40	3	1	9.7	6.0	0.75	A++	Telecom. Services
2510	CM.TO	Can. Imperial Bank	121.59	3	1	10.3	4.5	0.85	A+	Bank
308	DAL	Delta Air Lines	57.60	3	3	10.1	2.4	1.25	B+	Air Transport
1975	DEO	Diageo plc	142.11	3	1	23.1	2.3	0.95	A+	Beverage
633	EPD	Enterprise Products	29.00	3	3	18.5	6.2	1.30	B+	Pipeline MLPs
2357	IGT	Int'l Game Tech. PLC	20.78	3	3	13.4	3.8	1.25	B	Hotel/Gaming
2564	IVZ	Invesco Ltd.	24.79	4	3	8.6	4.8	1.40	A	Financial Svcs. (Div.)
215	JNJ	Johnson & Johnson	135.35	3	1	18.7	2.7	0.90	A++	Med Supp Non-Invasive
1760	JCI	Johnson Ctrls. Int'l plc	40.01	3	3	12.9	2.6	1.25	A	Diversified Co.
1922	KHC	Kraft Heinz Co.	59.84	4	2	15.3	4.3	0.90	A+	Food Processing
718	LMT	Lockheed Martin	324.39	2	1	20.7	2.6	0.75	A++	Aerospace/Defense
1142	LOW	Lowe's Cos.	99.74	2	2	17.4	1.9	1.00	A+	Retail Building Supply
1928	MDLZ	Mondelez Int'l	42.56	3	2	16.6	2.4	1.00	A	Food Processing
2319	RCL	Royal Caribbean	118.50	3	3	14.1	2.0	1.10	B++	Recreation
1777	MMM	3M Company	205.69	3	1	19.6	2.6	0.95	A++	Diversified Co.
316	UPS	United Parcel Serv.	123.01	3	1	16.9	3.0	0.90	A	Air Transport
1549	WPC	W.P. Carey Inc.	66.32	4	3	27.0	6.2	0.80	B+	R.E.I.T.
970	WBA	Walgreens Boots	70.25	3	2	11.2	2.5	0.90	A+	Pharmacy Services
418	WM	Waste Management	90.88	2	1	21.7	2.0	0.75	A	Environmental
1407	WDC	Western Digital	64.89	1	3	5.2	3.1	1.30	A	Computers/Peripherals

To qualify for purchase in the above portfolio, a stock must have a yield that is in the top half of the *Value Line* universe and a Safety Rank of 3 or better. Stocks are selected and monitored by Charles Clark, Associate Research Director.

PORTFOLIO III: STOCKS WITH LONG-TERM PRICE GROWTH POTENTIAL

Primarily suitable for investors with a 3- to 5-year horizon

Ratings & Reports Page	Ticker	Company	Recent Price	Timeliness	Safety	P/E	Yield%	Beta	3- to 5-Yr. Apprec. Potential	Industry Name
1606	ABBV	AbbVie Inc.	97.74	1	3	12.3	3.9	1.20	30-90%	Drug
2588	ADBE	Adobe Systems	251.50	3	2	46.3	Nil	1.15	15-55	Computer Software
759	ALL	Allstate Corp.	101.44	1	1	12.9	1.8	0.85	50-75	Insurance (Prop/Cas.)
1992	MO	Altria Group	59.93	3	2	14.8	4.7	0.70	35-85	Tobacco
1393	AAPL	Apple Inc.	215.04	2	2	17.5	1.4	0.95	10-50	Computers/Peripherals
2120	AN	AutoNation, Inc.	47.59	3	3	9.4	Nil	1.15	70-150	Retail Automotive
2508	BK	Bank of NY Mellon	52.54	3	2	12.2	2.1	1.10	50-110	Bank
1613	CELG	Celgene Corp.	91.20	3	3	19.2	Nil	1.20	35-110	Drug
437	CSGP	CoStar Group	429.89	3	3	51.5	Nil	1.20	10-65	Information Services
2641	FB	Facebook Inc.	172.62	3	3	22.1	Nil	1.00	90-180	Internet
309	FDX	FedEx Corp.	251.11	1	1	14.1	1.0	1.15	20-50	Air Transport
1917	HRL	Hormel Foods	38.46	3	2	20.0	2.0	0.70	15-55	Food Processing
1358	INTC	Intel Corp.	47.62	1	1	11.1	2.5	1.05	70-100	Semiconductor
1167	IP	Int'l Paper	52.37	1	3	10.2	3.6	1.20	70-160	Paper/Forest Products
2111	PVH	PVH Corp.	152.55	2	3	16.2	0.1	1.05	10-65	Apparel
413	RSG	Republic Services	73.77	3	2	23.6	2.0	0.75	15-55	Environmental
313	LUV	Southwest Airlines	61.00	3	3	14.2	1.0	1.15	15-80	Air Transport
373	SBUX	Starbucks Corp.	54.00	3	1	22.0	2.7	0.95	75-115	Restaurant
821	UNH	UnitedHealth Group	261.69	2	1	20.1	1.4	0.95	0-20	Medical Services
2581	V	Visa Inc.	140.04	3	1	29.4	0.7	1.00	10-30	Financial Svcs. (Div.)

To qualify for purchase in the above portfolio, a stock must have above-average 3- to 5-year price-appreciation potential. As the price of a stock in this Portfolio rises, the computed appreciation potential may fall; it may still be held. This portfolio is most appropriate for investors focused on long-term capital gains. Stocks in the above portfolio are selected and monitored by Justin Hellman, Editorial Analyst.

PORTFOLIO IV: STOCKS WITH ABOVE-AVERAGE DIVIDEND YIELDS

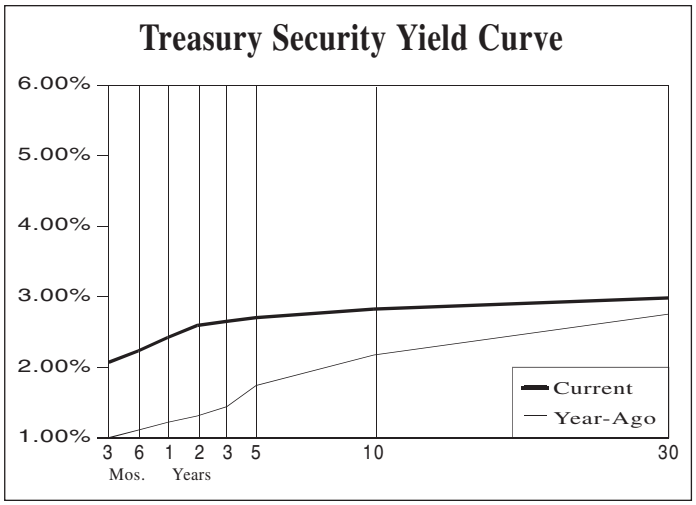
Primarily suitable for investors interested in current income

Ratings & Reports Page	Ticker	Company	Recent Price	Timeliness	Safety	P/E	Yield%	Beta	Financial Strength	Industry Name
919	T	AT&T Inc.	33.40	3	1	9.7	6.0	0.75	A++	Telecom. Services
903	LNT	Alliant Energy	43.20	4	2	20.4	3.1	0.65	A	Electric Util. (Central)
2660	BX	Blackstone Group LP	36.49	2	3	10.7	6.4	1.30	B++	Public/Private Equity
706	BA	Boeing	353.77	2	1	22.0	2.1	1.10	A++	Aerospace/Defense
1993	BTI	Brit. Am. Tobacco ADR	53.33	3	2	12.4	4.3	1.00	B++	Tobacco
154	CAT	Caterpillar Inc.	139.99	1	2	12.1	2.5	1.20	A+	Heavy Truck & Equip
1969	KO	Coca-Cola	46.22	5	1	21.7	3.5	0.70	A++	Beverage
139	ED	Consol. Edison	79.62	4	1	18.6	3.7	0.45	A+	Electric Utility (East)
984	ETN	Eaton Corp. plc	82.03	3	2	14.5	3.2	1.20	A+	Auto Parts
1358	INTC	Intel Corp.	47.62	1	1	11.1	2.5	1.05	A++	Semiconductor
1197	KMB	Kimberly-Clark	116.94	4	1	17.1	3.4	0.75	A++	Household Products
579	LYB	LyondellBasell Inds.	114.94	2	3	6.9	3.5	1.35	A	Chemical (Specialty)
366	MCD	McDonald's Corp.	161.04	3	1	20.8	2.6	0.80	A++	Restaurant
1621	MRK	Merck & Co.	69.17	4	1	16.2	2.8	0.95	A++	Drug
2628	PAYX	Paychex, Inc.	72.51	3	1	26.1	3.2	1.00	A	IT Services
1629	PFE	Pfizer, Inc.	42.16	2	1	19.5	3.2	0.90	A++	Drug
1561	PRU	Prudential Fin'l	99.67	1	3	8.0	3.6	1.30	B++	Insurance (Life)
149	SO	Southern Co.	46.00	3	2	16.0	5.3	0.50	A	Electric Utility (East)
316	UPS	United Parcel Serv.	123.01	3	1	16.9	3.0	0.90	A	Air Transport
418	WM	Waste Management	90.88	2	1	21.7	2.0	0.75	A	Environmental

To qualify for purchase in the above portfolio, a stock must have a yield that is at least 1% above the median for the *Value Line* universe, and a Financial Strength Rating of at least B+. Stocks are selected and monitored by Adam Rosner, Editorial Analyst.

Selected Yields

TAXABLE	Recent (8/22/18)	3 Months Ago (5/23/18)	Year Ago (8/23/17)
Market Rates			
Discount Rate	2.25	2.25	1.75
Federal Funds	1.75-2.00	1.50-1.75	1.00-1.25
Prime Rate	5.00	4.75	4.25
30-day CP (A1/P1)	2.01	1.91	1.21
3-month LIBOR	2.31	2.33	1.32
U.S. Treasury Securities			
3-month	2.07	1.90	1.00
6-month	2.23	2.09	1.11
1-year	2.42	2.27	1.22
5-year	2.70	2.82	1.74
10-year	2.82	2.99	2.17
10-year (inflation-protected)	0.78	0.86	0.44
30-year	2.98	3.15	2.75
30-year Zero	3.00	3.21	2.85
Common Stocks			
VL Stocks (Median)	2.00	2.00	2.20
DJ Industrials (12-mo. est.)	2.30	2.30	2.40
VL Utilities	3.30	3.50	3.30



TAXABLE	Recent (8/22/18)	3 Months Ago (5/23/18)	Year Ago (8/23/17)
Mortgage-Backed Securities			
GNMA 5.5%	3.46	3.41	2.31
FHLMC 5.5% (Gold)	3.61	3.67	2.84
FNMA 5.5%	3.54	3.51	2.38
FNMA ARM	2.04	1.97	1.82
Corporate Bonds			
Financial (10-year) A	3.85	4.07	3.22
Industrial (25/30-year) A	4.14	4.32	3.85
Utility (25/30-year) A	4.17	4.29	3.83
Utility (25/30-year) Baa/BBB	4.51	4.62	4.15
Foreign Bonds (10-Year)			
Canada	2.26	2.44	1.88
Germany	0.34	0.49	0.38
Japan	0.10	0.05	0.04
United Kingdom	1.27	1.43	1.06
Preferred Stock			
Utility A	6.02	5.84	6.01
Financial BBB	5.89	5.76	5.68
Financial Adjustable A	5.52	5.52	5.52

TAX-EXEMPT

Bond Buyer Indexes			
20-Bond Index (GOs)	3.95	3.95	3.57
25-Bond Index (Revs)	4.45	4.44	3.78
General Obligation Bonds (GOs)			
1-year AAA	1.51	1.74	0.78
1-year A	1.91	1.99	0.84
5-year AAA	1.98	2.11	1.14
5-year A	2.61	2.60	1.51
10-year AAA	2.45	2.52	1.87
10-year A	3.20	3.03	2.27
25/30-year AAA	2.95	3.03	2.68
25/30-year A	4.02	3.90	3.24
Revenue Bonds (Revs) (15 Years)			
Education AA	3.00	3.12	2.54
Electric AA	2.91	3.02	2.48
Housing AA	2.96	3.08	2.54
Hospital AA	3.18	3.23	2.84
Toll Road AA	3.03	3.17	2.57

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...		
	8/15/18	8/1/18	Change	12 Wks.	26 Wks.	52 Wks.
Excess Reserves	1821595	1809193	12402	1852589	1938361	2042257
Borrowed Reserves	235	234	1	171	104	65
Net Free/Borrowed Reserves	1821360	1808959	12401	1852417	1938257	2042192

MONEY SUPPLY *(One-Week Period; in Billions, Seasonally Adjusted)*

	Recent Levels			Annual Growth Rates Over the Last...		
	8/6/18	7/30/18	Change	3 Mos.	6 Mos.	12 Mos.
M1 (Currency+demand deposits)	3664.1	3668.8	-4.6	1.2%	0.5%	3.9%
M2 (M1+savings+small time deposits)	14148.2	14156.4	-8.2	5.0%	4.1%	3.8%

Source: United States Federal Reserve Bank

Closing Stock Market Averages as of Press Time

	8/15/2018	8/22/2018	1 week	12 months
Dow Jones Industrial Average	25162.41	25733.60	+2.3%	+17.5%
Standard & Poor's 500	2818.37	2861.82	+1.5%	+16.7%
N.Y. Stock Exchange Composite	12723.09	12990.51	+2.1%	+10.0%
NASDAQ Composite	7774.12	7889.10	+1.5%	+25.3%
NASDAQ 100	7354.66	7424.60	+1.0%	+26.4%
Amex Major Market Index	2597.52	2660.72	+2.4%	+6.9%
Value Line (Geometric)	574.52	588.93	+2.5%	+15.9%
Value Line (Arithmetic)	6407.87	6573.03	+2.6%	+21.3%
London (FT-SE 100)	7497.87	7574.24	+1.0%	+2.6%
Tokyo (Nikkei)	22204.22	22362.55	+0.7%	+15.4%
Russell 2000	1670.67	1722.54	+3.1%	+25.6%

Major Insider Transactions†

PURCHASES

Latest Full-Page Report	Company	Insider, Title	Date	Shares Traded	Shares Held	Price Range	Recent Price
623	Andeavor Logistics LP	J. A. Stevens, Dir.	8/9/18-8/16/18	148,330	468,449	$48.21-$49.46	49.76
1516	Camden Property Trust	D. K. Oden, Pres.	8/16/18	43,070	265,716	$93.82	93.66
2354	Hilton Grand Vacations	L. Potter, Dir.	8/15/18	25,000	58,135	$31.98	33.31
2354	Hilton Grand Vacations	M. D. Wang, Dir.	8/15/18	16,000	328,481	$31.91	33.31
1198	Newell Brands	B. Icahn, Dir.	8/9/18	47,450	298,548	$21.00	21.80
2365	Penn Nat'l Gaming	T. J. Wilmott, Dir.	8/15/18	100,000	612,867	$30.85	34.43
1830	salesforce.com	S. Wojcicki, Dir.	8/14/18	6,000	83,426	$146.38	145.53

SALES

Latest Full-Page Report	Company	Insider, Title	Date	Shares Traded	Shares Held	Price Range	Recent Price
198	Align Techn.	J. M. Hogan, Pres.	8/14/18	25,000	105,713	$367.48	355.89
1516	Camden Property Trust	R. J. Campo, Chair.	8/15/18-8/16/18	80,588	248,581	$93.75-$93.82	93.66
1516	Camden Property Trust	M. H. Stewart, COO	8/15/18-8/16/18	65,039	196,496	$93.75-$93.82	93.66
2623	Fiserv Inc.	J. W. Yabuki, Pres.	8/15/18	50,000	467,380	$78.64	79.44
1308	Garmin Ltd.	M. H. Kao*	8/9/18-8/16/18	908,366	1,901,429	$63.67-$64.76	64.94
1828	Paylocity Holding	S. I. Sarowitz*	8/13/18-8/14/18	75,124	14,818,006	$63.50-$68.17	71.63
2586	Worldpay, Inc.	P. Jansen, Dir.	8/15/18-8/17/18	130,908	376,568	$91.32-$93.96	93.78

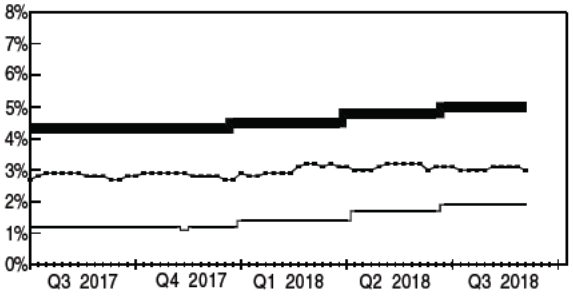
* Beneficial owner of more than 10% of common stock
† Includes only large transactions in U.S.-traded stocks; excludes shares held in the form of limited partnerships, excludes options & family trusts

Market Monitor

Valuations and Yields	8/22	8/15	13-week range	50-week range	Last market top (1-26-2018)	Last market bottom (3-9-2009)
Median price-earnings ratio of VL stocks	18.6	18.3	18.0 - 18.7	17.8 - 21.1	21.1	10.3
P/E (using 12-mo. est'd EPS) of DJ Industrials	16.5	16.3	15.8 - 16.7	15.8 - 21.3	21.3	17.3
Median dividend yield of VL stocks	2.0%	2.1%	2.0 - 2.1%	1.8 - 2.1%	1.8%	4.0%
Div'd yld. (12-mo. est.) of DJ Industrials	2.3%	2.3%	2.3 - 2.4%	2.1 - 2.4%	2.1%	4.0%
Prime Rate	5.0%	5.0%	4.8 - 5.0%	4.3 - 5.0%	4.5%	3.3%
Fed Funds	1.9%	1.9%	1.7 - 1.9%	1.1 - 1.9%	1.4%	0.2%
91-day T-bill rate	2.1%	2.1%	1.9 - 2.1%	1.0 - 2.1%	1.4%	0.3%
AAA Corporate bond yield	3.9%	3.9%	3.8 - 4.0%	3.5 - 4.1%	3.6%	5.5%
30-year Treasury bond yield	3.0%	3.1%	3.0 - 3.1%	2.7 - 3.2%	2.9%	3.7%
Bond yield minus average earnings yield	-1.5%	-1.5%	-1.7 - -1.5%	-1.7 - -1.2%	-1.2%	-4.3%
Market Sentiment						
Short interest/avg. daily volume (5 weeks)	18.2	18.1	14.2 - 18.3	13.8 - 18.9	17.6	8.6
CBOE put volume/call volume	.91	1.06	.81 - 1.19	.67 - 1.33	.81	.93

VALUE LINE ASSET ALLOCATION MODEL *(Based only on economic and financial factors)*

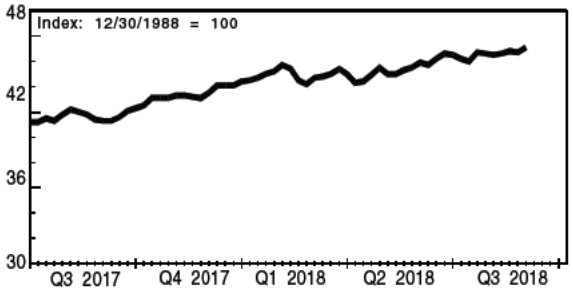
	Current (last adjusted at market open 2/20/18)	Previous (before 2/20/18)
Common Stocks	55%–65%	60%–70%
Cash and Treasury Issues	45%–35%	40%–30%



INTEREST RATES

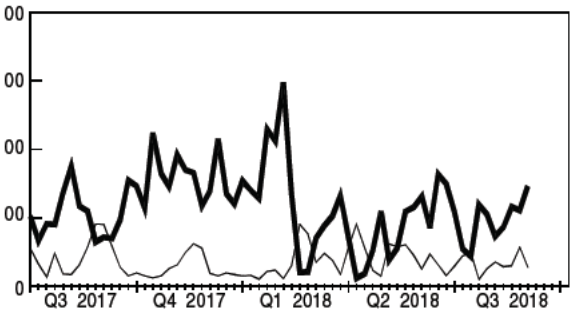
	Recent	Previous Week
Prime Rate	5.0%	5.0%
30-Yr. Treasury	3.0%	3.1%
Fed Funds	1.9%	1.9%

Prime Rate
30-Yr. Treasury
Fed Funds



VALUE LINE UNIVERSE

	Recent	Previous Week
Advances	1234	714
Declines	466	983
Issues Covered	1713	1710
Market Value ($ Trillion)	36.392	36.119



VALUE LINE UNIVERSE

	Recent	Previous Week
New Highs	292	222
New Lows	55	114

New Highs
New Lows

INDUSTRY PRICE PERFORMANCE LAST SIX WEEKS ENDING 8/21/2018

7 Best Performing Industries	
Electrical Equipment	+10.6%
Shoe	+9.3%
Railroad	+9.0%
Insurance (Prop/Cas.)	+7.1%
Pipeline MLPs	+6.9%
Retail Automotive	+6.8%
Drug	+6.2%
7 Worst Performing Industries	
Precious Metals	-16.7%
Office Equip/Supplies	-12.9%
Metals & Mining (Div.)	-12.1%
Maritime	-9.2%
Entertainment Tech.	-8.9%
Oilfield Svcs/Equip.	-8.7%
Natural Gas (Div.)	-8.4%

The corresponding change in the Value Line Arithmetic Average* is +1.3%

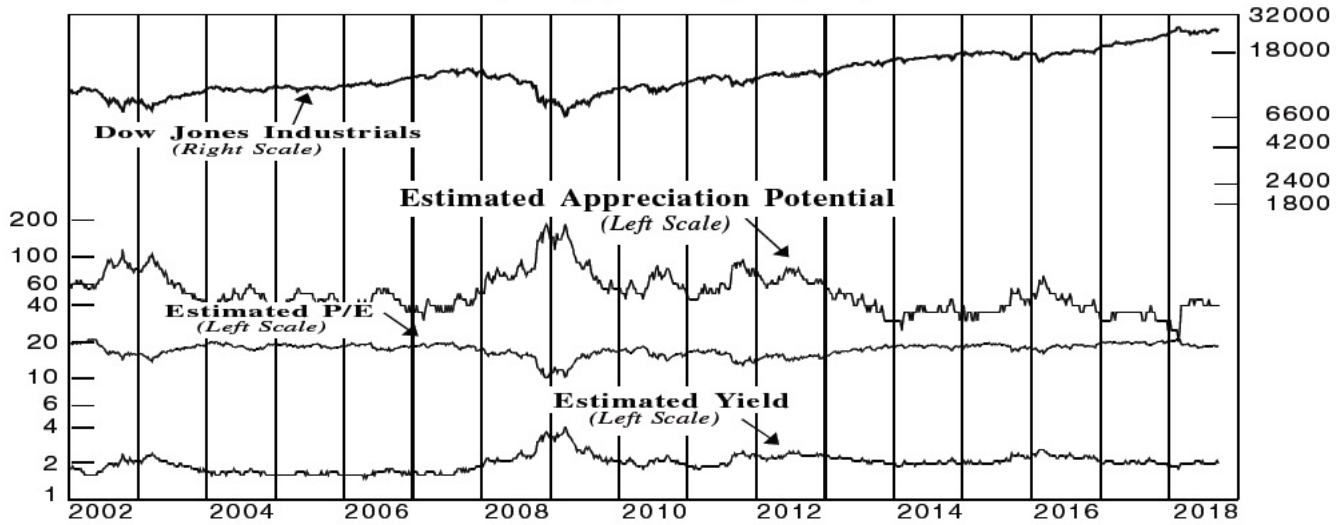
CHANGES IN FINANCIAL STRENGTH RATINGS

Company	Prior Rating	New Rating	Ratings & Reports Page
Encana Corp.	C++	B+	536
Fuller (H.B.)	B++	B+	570
WPX Energy	C++	B	547

Stock Market Averages

VALUE LINE ESTIMATED P/E, YIELD, APPRECIATION POTENTIAL VERSUS DOW JONES INDUSTRIALS

(January 2, 2002–August 21, 2018)



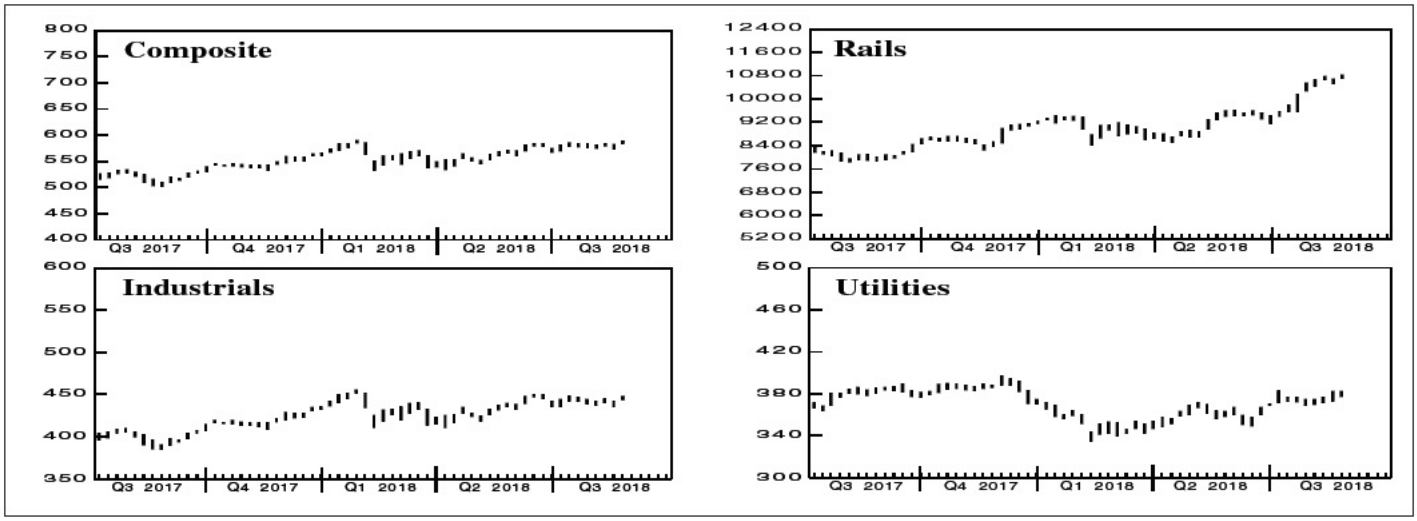
THE VALUE LINE GEOMETRIC AVERAGES

	Composite 1687 stocks	Industrials 1607 stocks	Rails 11 stocks	Utilities 69 stocks	Arithmetic* Composite 1687 stocks
8/16/2018	578.72	439.34	10616.39	380.44	6455.67
8/17/2018	581.71	441.65	10662.89	381.90	6489.69
8/20/2018	584.80	444.12	10717.98	381.56	6524.71
8/21/2018	588.76	447.07	10824.10	380.55	6570.33
8/22/2018	588.93	447.39	10752.78	377.36	6573.03
% Change last 4 weeks	+1.4%	+1.3%	+2.0%	+2.1%	+1.9%

THE DOW JONES AVERAGES

	Composite 65 stocks	Industrials 30 stocks	Transportation 20 stocks	Utilities 15 stocks
8/16/2018	8628.38	25558.73	11190.43	741.02
8/17/2018	8662.89	25669.32	11227.80	743.96
8/20/2018	8702.74	25758.69	11361.86	740.03
8/21/2018	8722.38	25822.29	11436.36	734.72
8/22/2018	8671.12	25733.60	11322.24	729.14
% Change last 4 weeks	+2.1%	+1.3%	+3.9%	+1.7%

WEEKLY VALUE LINE GEOMETRIC AVERAGES* *(July 3, 2017–August 22, 2018)*



Blue Chip Financial Forecasts®

Top Analysts' Forecasts Of U.S. And Foreign Interest Rates, Currency Values And The Factors That Influence Them

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June Rate Hike A Virtual Certainty, One Or Two More After That in 2018

Domestic Commentary All but one of our panelists predict the Federal Reserve's Open Market Committee (FOMC) will hike interest rates by a further 25 basis points at it June 12th-13th meeting, according to a special question asked as part of our May 21st-22nd survey. That would represent the second, 25 basis point hike of this year and lift the target range for the federal funds rate to 1.75%-2.00%.

Minutes of the FOMC's May 1st-2nd meeting that were released the day following completion of this month's survey tended to underscore our panelists' expectations of a June rate hike given the statement that "Most participants judged that if incoming information broadly confirmed their economic outlook, it would likely soon be appropriate for the Committee to take another step in removing policy accommodation."

In terms of total tightening in 2018, 4.8% of the panelists now predict the FOMC will hike rates by only 50 basis points this year, 38.1% foresee a total of 75 basis points of increases, while 57.1% forecast that the FOMC will enact a total of 100 basis points of interest rate increases this year. These results differ little from what was predicted by our panelists a month ago.

In 2019, 9.3% of the panelists now forecast only one 25 basis point hike, 32.6% foresee 50 basis points of increases, 32.6% predict 75 basis points of tightening, and 25.6% expect a full 100 basis points of increase in the target federal funds rate. One of our panelists, anticipating a marked weakening of GDP growth and inflation next year, predicts that the FOMC will actually opt to cut interest rates by the end of 2019.

The majority of our panelists' views of expected changes in FOMC policy this year and next continues to align closely with median expectations of FOMC members contained in the March Summary of Economic Projections (SEP). While the median forecast of the so-called "dot plot" had suggested since the December meeting a total of three 25 basis point rate hikes by the end of 2018, the March meeting's mean forecast rose by just enough to almost suggest 100 basis points of tightening this year.

The FOMC's March dot plot also indicated a steeper than previously anticipated trajectory for the federal funds rate in 2019 with the median forecast suggesting three 25 basis point increases next year rather than the previous forecast of slightly more than two. As this month's survey continued to suggest, not quite 60% of our panelists forecast at least 75 basis points of rate hikes in 2019.

At its June meeting, in addition to the widely expected rate hike, the FOMC will release an updated SEP. Currently, few analysts seem to anticipate major changes in the economic outlook or the "dot plot" compared to the SEP issued in March.

Of course, all remains contingent upon how the economy performs. The May FOMC minutes noted that a "temporary period of inflation modestly above 2 percent" would be tolerated by policymakers. If, on the other hand, inflation were to suddenly surge, or instead, begin to retreat from the FOMC's 2.0% target, policymakers would no doubt adjust their plans accordingly. The same would be true if economic growth and employment began to deviate considerably from FOMC members' current expectations.

What might conceivably derail the FOMC's and our panelists' relatively upbeat outlook? Some fear a spike in crude oil prices to $100 per barrel. However, given that the U.S. now is one of the world's leading oil producers the hit to energy consumers could be largely offset by the benefits to the domestic energy industry.

Trade tensions clearly remain a threat. The failure to successfully wrap up NAFTA negotiations, the potential imposition of large tariffs on autos, and continued threats directed at China and our European trading partners all hold the potential to create uncertainty among firms and markets, produce retaliatory action, and stymie growth. Outcomes of U.S. elections this November and the Mueller investigation are wildcards to the outlook. Slower than expected economic growth in Japan and Europe could dampen U.S. export growth and the ascension of Italy's new populist government could usher in a fresh period of political/financial problems in Europe if it chooses to disregard EU mandates and fiscal discipline. Another potential threat is increasing financial stress across a number of emerging market economies including Turkey, Argentina, Venezuela, and Indonesia. You also have to throw in the potential negative outcomes of the current Administration's decisions to scuttle the scheduled summit with North Korea and pull out of the Iranian nuclear accord.

In regard to our panelists' updated outlook for the economy, the consensus predicts real GDP will grow 3.2% (saar) in the current quarter, a marked improvement over the advance estimate from the Bureau of Economic Analysis (BEA) that real GDP grew 2.3% (saar) in Q1 of this year. Growth this quarter is expected to be especially supported by a sharp snapback in consumer spending after personal consumption expenditures grew only 1.1% (saar) in Q1, the slowest quarterly pace since Q2 2013. Real GDP is predicted by the consensus to continue growing at well above trend rates of 3.0% (saar) in Q3 and 2.8% in Q4. The Q2 consensus forecast is 0.1 of a percentage greater than a month ago, the Q3 estimate unchanged, and the Q4 forecast 0.1 of a point less than last month.

In 2019, the consensus predicts the pace of real GDP growth will moderate to 2.5% (saar) in Q1, 2.4% in Q2, and 2.2% in Q3. The only difference in these forecasts from a month earlier was a 0.1 of a percentage point increase in Q1 2019's rate of growth.

Consensus forecasts of inflation this quarter and next inched up slightly over the past month, most likely reflecting the strength in crude oil and related product prices. Thereafter, this month's consensus inflation forecasts look almost identical to those of a month ago.

The Consumer Price Index (saar) is forecast by the consensus to increase 2.2% (saar) this quarter, 2.5% in Q3, and 2.1% in Q4. That would represent a slowdown from the 3.3% (saar) registered in Q4 of last year and the 3.5% (saar) seen in Q1 of this year. However, measured on a year-over-year basis – a better measure of its trend – the CPI was up 2.5% in April from 1.6% in June of last year and the core CPI up 2.1% in April compared to1.7% in June 2017.

The GDP price index is predicted to increase 2.1% (saar) in the current quarter, up 0.1 of a percentage point from last month, but little different than the 2.0% seen in Q1 of this year. In Q3 and Q4 of this year it is forecast by the consensus to register respective increases of 2.2% (saar) and 2.1%, the same as last month. Over the first three quarters of 2019, the GDP price index is forecast to register respective increases of 2.2%, the same as last month with the exception of Q3 that came in 0.1 of a percentage point lower than last month.

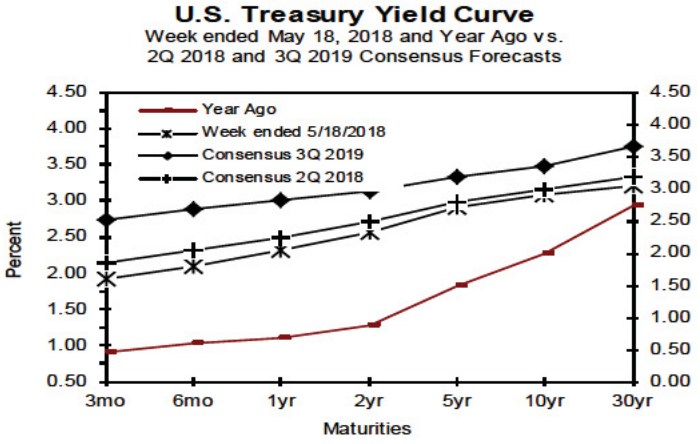
Consensus Forecast The consensus continues to predict that real GDP growth will average 3.0% (saar) over the remaining three quarters of 2018, but moderate to 2.4% during the first three quarters of 2019. Job growth will remain healthy and wage gains will gradually increase. Inflation on a y/y basis will continue to inch higher, meeting, and then exceeding somewhat the FOMC's 2.0% target. The FOMC will stick with its interest rate normalization process, most likely hiking rates by a total of 75 to 100 basis points this year and by an additional 50 to 75 basis points in 2019. The Treasury yield curve is expected to flatten further over the next six quarters. While the trade-weighted U.S. dollar has recently moved higher, the consensus suggests further upside movement will be limited *(see page 2)*.

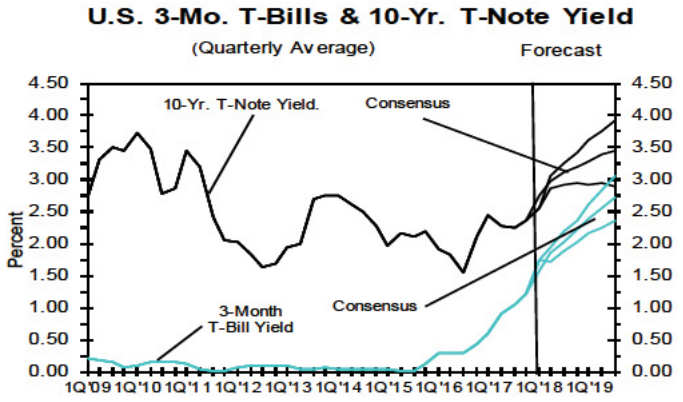
Special Questions On page 14 of this issue are results of our twice-yearly, long-range survey with consensus estimates for the years 2020 through 2024 and averages for the 5-year periods 2020-2024 and 2025-2029.

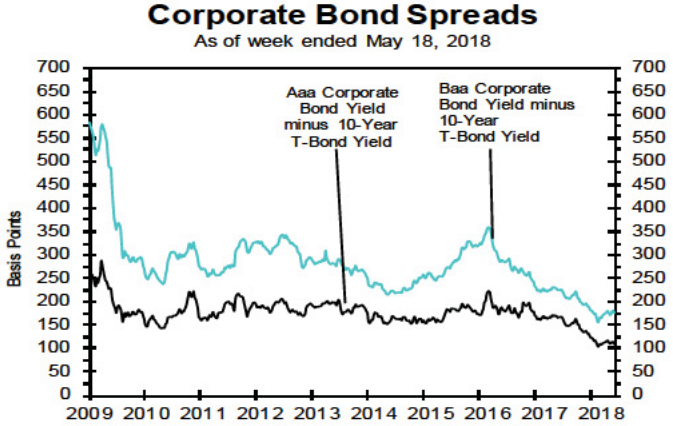
Consensus Forecasts Of U.S. Interest Rates And Key Assumptions[1]

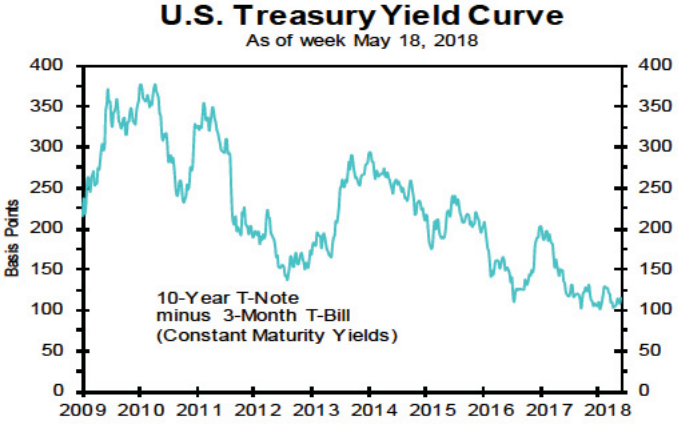
	History								Consensus Forecasts-Quarterly Avg.					
	Average For Week Ending				Average For Month			Latest Qtr	2Q	3Q	4Q	1Q	2Q	3Q
Interest Rates	May 18	May 11	May 4	Apr. 27	Apr.	Mar.	Feb.	1Q 2018	2018	2018	2018	2019	2019	2019
Federal Funds Rate	1.70	1.70	1.70	1.70	1.69	1.49	1.42	1.44	1.7	2.0	2.2	2.4	2.6	2.8
Prime Rate	4.75	4.75	4.75	4.75	4.75	4.75	4.50	4.58	4.8	5.0	5.2	5.4	5.6	5.8
LIBOR, 3-mo.	2.33	2.35	2.36	2.36	2.35	2.16	1.84	1.91	2.3	2.4	2.6	2.8	3.0	3.1
Commercial Paper, 1-mo.	1.81	1.79	1.85	1.82	1.82	1.76	1.52	1.59	1.8	2.1	2.3	2.5	2.7	2.9
Treasury bill, 3-mo.	1.92	1.89	1.85	1.85	1.79	1.72	1.56	1.57	1.9	2.0	2.2	2.4	2.6	2.7
Treasury bill, 6-mo.	2.09	2.05	2.03	2.03	1.98	1.91	1.76	1.76	2.0	2.2	2.4	2.6	2.7	2.9
Treasury bill, 1 yr.	2.31	2.27	2.24	2.25	2.15	2.06	1.94	1.93	2.2	2.4	2.6	2.7	2.9	3.0
Treasury note, 2 yr.	2.57	2.52	2.50	2.49	2.38	2.27	2.16	2.15	2.5	2.6	2.8	2.9	3.0	3.1
Treasury note, 5 yr.	2.91	2.82	2.79	2.82	2.70	2.63	2.59	2.53	2.8	2.9	3.0	3.1	3.2	3.3
Treasury note, 10 yr.	3.07	2.97	2.96	2.99	2.86	2.85	2.84	2.75	3.0	3.1	3.2	3.3	3.4	3.5
Treasury note, 30 yr.	3.20	3.13	3.12	3.17	3.07	3.10	3.11	3.02	3.2	3.3	3.4	3.5	3.7	3.8
Corporate Aaa bond	4.16	4.11	4.10	4.11	3.99	3.98	3.91	3.86	4.1	4.3	4.4	4.6	4.7	4.8
Corporate Baa bond	4.83	4.78	4.75	4.73	4.61	4.59	4.47	4.43	4.8	5.0	5.2	5.3	5.5	5.6
State & Local bonds	3.64	3.63	3.67	3.69	3.64	3.61	3.57	3.53	3.8	3.9	4.0	4.2	4.3	4.4
Home mortgage rate	4.66	4.61	4.55	4.55	4.47	4.44	4.33	4.27	4.6	4.7	4.8	4.9	5.1	5.1
	History								Consensus Forecasts-Quarterly					
	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q
Key Assumptions	2016	2016	2016	2017	2017	2017	2017	2018	2018	2018	2018	2019	2019	2019
Major Currency Index	89.6	90.3	93.7	94.4	93.0	88.3	88.9	86.1	87.3	87.6	87.3	87.0	87.0	87.1
Real GDP	2.2	2.8	1.8	1.2	3.1	3.2	2.9	2.3	3.2	3.0	2.8	2.4	2.4	2.2
GDP Price Index	2.4	1.4	2.0	2.0	1.0	2.1	2.3	2.0	2.1	2.2	2.1	2.2	2.2	2.2
Consumer Price Index	2.7	1.8	2.7	3.0	0.1	2.1	3.3	3.5	2.2	2.5	2.1	2.2	2.2	2.3

Forecasts for interest rates and the Federal Reserve's Major Currency Index represent averages for the quarter. Forecasts for Real GDP, GDP Price Index and Consumer Price Index are seasonally-adjusted annual rates of change (saar). Individual panel members' forecasts are on pages 4 through 9. Historical data: Treasury rates from the Federal Reserve Board's H.15; AAA-AA and A-BBB corporate bond yields from Bank of America-Merrill Lynch and are 15+ years, yield to maturity; State and local bond yields from Bank of America-Merrill Lynch, A-rated, yield to maturity; Mortgage rates from Freddie Mac, 30-year, fixed; LIBOR quotes from Intercontinental Exchange. All interest rate data is sourced from Haver Analytics. Historical data for Fed's Major Currency Index is from FRSR H.10. Historical data for Real GDP and GDP Chained Price Index are from the Bureau of Economic Analysis (BEA). Consumer Price Index (CPI) history is from the Department of Labor's Bureau of Labor Statistics (BLS).









----------3-Month Interest Rates[1]----------

	History			Consensus Forecasts Months From Now:		
	Latest:	Month Ago:	Year Ago:	3	6	12
U.S.	2.32	2.36	1.19	**2.50**	**2.62**	**2.77**
Japan	-0.03	-0.03	-0.01	**0.04**	**0.04**	**0.06**
U.K.	0.64	0.75	0.32	**0.82**	**0.85**	**1.10**
Switzerland	-0.72	-0.73	-0.73	**-0.65**	**-0.65**	**-0.65**
Canada	1.70	1.69	0.81	**1.95**	**2.00**	**2.28**
Australia	2.03	2.14	1.90	**1.90**	**2.05**	**2.40**
Eurozone	-0.33	-0.33	-0.33	**-0.31**	**-0.28**	**-0.12**

----------10-Yr. Government Bond Yields[2]------

	History			Consensus Forecasts Months From Now:		
	Latest:	Month Ago:	Year Ago:	3	6	12
U.S.	3.01	2.98	2.27	**3.12**	**3.18**	**3.30**
Germany	0.62	0.63	0.40	**0.73**	**0.86**	**1.04**
Japan	0.03	0.04	0.05	**0.07**	**0.07**	**0.09**
U.K.	1.56	1.59	1.11	**1.70**	**1.81**	**2.00**
France	0.84	0.84	0.84	**1.01**	**1.11**	**1.27**
Italy	2.13	1.78	2.13	**2.19**	**2.27**	**2.19**
Switzerland	0.14	0.18	-0.09	**0.18**	**0.24**	**0.41**
Canada	2.50	2.37	1.48	**2.63**	**2.74**	**2.93**
Australia	2.83	2.87	2.49	**2.89**	**2.98**	**3.05**
Spain	1.25	1.25	1.60	**1.60**	**1.74**	**1.96**

----------Foreign Exchange Rates[1]----------

	History			Consensus Forecasts Months From Now:		
	Latest:	Month Ago:	Year Ago:	3	6	12
U.S.	89.005	86.376	92.393	**88.6**	**88.3**	**88.2**
Japan	110.71	107.60	111.47	**108.5**	**108.5**	**109.4**
U.K.	1.3476	1.4033	1.3018	**1.39**	**1.42**	**1.44**
Switzerland	0.9970	0.9744	0.9754	**0.98**	**0.97**	**0.98**
Canada	1.2892	1.2740	1.3537	**1.27**	**1.26**	**1.25**
Australia	0.7511	0.7671	0.7449	**0.76**	**0.76**	**0.77**
Euro	1.1775	1.2282	1.1190	**1.22**	**1.24**	**1.25**

	Consensus 3-Month Rates vs. U.S. Rate			Consensus 10-Year Gov't Yields vs. U.S. Yield	
	Now	In 12 Mo.		Now	In 12
Japan	-2.35	**-2.70**	Germany	-2.39	**-2.26**
U.K.	-1.68	**-1.67**	Japan	-2.98	**-3.22**
Switzerland	-3.04	**-3.42**	U.K.	-1.45	**-1.31**
Canada	-0.62	**-0.49**	France	-2.17	**-2.04**
Australia	-0.29	**-0.37**	Italy	-0.88	**-1.12**
Eurozone	-2.65	**-2.88**	Switzerland	-2.87	**-2.89**
			Canada	-0.51	**-0.38**
			Australia	-0.18	**-0.25**
			Spain	-1.76	**-1.35**

Forecasts of panel members are on pages 10 and 11. Definitions of variables are as follows: [1]Three month rate on interest-earning money market deposits denominated in selected currencies. [2]Government bonds are yields to maturity. Foreign exchange rate forecasts for U.K., Australia and the Euro are U.S. dollars per currency unit. For the U.S dollar, forecasts are of the U.S. Federal Reserve Board's Major Currency Index.

International Commentary Financial market participants have tended to write-off the unanticipated growth slowdown in developed market (DM) economies during Q1 of this year, expecting the pace of GDP growth to rebound smartly in Q2, and along with it, firmer in inflation. To date, however, signs of a truly sharp bounce back in growth or inflation have failed to materialize. Analysts still look for the pace of global GDP growth in Q2 to easily exceed that seen in Q1, but some have begun to trim their estimates. As a result, expectations of when and how much central banks in some DM nations move to normalize their accommodative monetary policies are shifting.

The situation in emerging market (EM) economies looks even more troubling as rising geopolitical uncertainty, higher oil prices, and a stronger U.S. dollar weigh on their asset prices and currencies. Particularly troubling over the past month have been developments in Argentina and Turkey whose currencies have been in freefall.

Real GDP in the Eurozone grew only 1.7% (ar) in Q1, a full percentage point slower than in Q4. A harsh winter in Northern Europe and strikes in Germany and France likely contributed to the slowdown. Currently, consensus expectations have GDP growth in the Eurozone bouncing back to almost 3.0% (ar) in Q2, before registering second half 2018 growth of about 2.4%. However, May's flash composite PMI reading for currency bloc slipped for a fourth month to an 18-month low as business activity and new orders growth slowed. Consumer price inflation in the Eurozone, too, has pulled back. Its y/y rate slipped to 1.2% in April from 1.3% in March and the y/y rate of the core CPI fell 0.3 of a percentage point to 0.7%.

While most analysts still believe the European Central Bank will begin to taper the size of, if not completely end, its asset purchase program by the end of this year, fewer now appear to think the ECB will hike its deposit rate by the middle of 2019. Further complicating ECB policy is lingering trade tensions with the U.S. and developments in Italy where the populist Five-Star Movement has formed a coalition government with the anti-immigration League Party. The potential failure by Italy to uphold its EU commitments on fiscal discipline has sent its 10-year note yields sharply higher and could reignite fears of capital flight in Southern Europe, further roiling financial markets.

The Bank of England's Monetary Policy Committee left rates unchanged at its May 10th meeting after real GDP grew only 0.4% (ar) in Q1, the slowest pace in five years. Snowy weather likely contributed to the slowdown in GDP, but cannot explain all of the softness. Indeed, retail sales were weak in April, suggesting that personal consumption in Q2 may undershoot expectations. Nonetheless, most analysts look for GDP growth to rebound to about 2.0% over the remainder of this year. While BoE governor Mark Carney has stated that an interest rate increase this year "is likely", soft growth, Brexit uncertainties, and inflation that is falling faster than expected, has markets scaling back expectations for when and how much the MPC may hike rates over coming quarters. The y/y change in consumer price inflation fell to 2.4% in April, the lowest since March 2017, but higher energy prices may keep it from falling further in the near-term.

Real GDP in Japan contracted a worse-than-expected 0.6% (ar) in Q1, ending a nine-quarter streak of increases. Moreover, Q4's growth rate was slashed to 0.6% from 1.6% and May's flash manufacturing PMI fell to 52.5 from 53.8 in April as new orders growth dropped to a nine-month low. At its April meeting the Bank of Japan left policy unchanged, but dropped its timeline for achieving 2.0% inflation. Underscoring the BoJ's failure to push inflation higher, the y/y change in the core CPI fell for a second, straight month in April to 0.7%.

The Bank of Canada is expected to leave policy unchanged at its late-May meeting. The economy is running close to capacity, but inflation slipped back to 2.2% in April. According to the BoC, higher interest rates will likely be warranted over time, but some policy accommodation still will be required to keep inflation on track. Most analysts look for two more quarter point hikes in rates this year and more in 2019 *(see pages 10-11 for individual panelists' forecasts).*

Second Quarter 2018

Interest Rate Forecasts

Key Assumptions

Blue Chip Financial Forecasts Panel Members	Percent Per Annum -- Average For Quarter															Avg. For	(Q-Q % Change) (SAAR)		
	Short-Term							Intermediate-Term				Long-Term				Qtr.			
	1 Federal Funds Rate	2 Prime Bank Rate	3 LIBOR Rate 3-Mo.	4 Com. Paper 1-Mo.	5 Treas. Bills 3-Mo.	6 Treas. Bills 6-Mo.	7 Treas. Bills 1-Yr.	8 Treas. Notes 2-Yr.	9 Treas. Notes 5-Yr.	10 Treas. Notes 10-Yr.	11 Treas. Bond 30-Yr.	12 Aaa Corp. Bond	13 Baa Corp. Bond	14 State & Local Bonds	15 Home Mtg. Rate	A. Fed's Major Currency $ Index	B. Real GDP	C. GDP Price Index	D. Cons. Price Index
Scotiabank Group	2.0 H	5.0 H	na	na	2.1 H	na	na	2.6 H	2.8	3.0	3.1	na	na	na	na	na	2.5	2.0	2.4
ACIMA Private Wealth	1.9	4.9	2.4	2.0 H	1.9	2.1 H	2.2	2.6 H	2.9 H	3.0	3.2	4.0	4.9	3.9	4.6	85.5 L	2.2 L	2.3	3.0
Swiss Re	1.9	4.9	2.2	1.9	1.8	1.9	2.1	2.3 L	2.5 L	2.8	3.1	4.1	5.0	na	4.6	na	4.0	2.3	1.0 L
J.P. Morgan Chase	1.9	na	2.3	na	na	na	na	2.5	2.8	3.0	3.2	na	na	na	na	na	2.3	2.0	1.8
Bank of America Merrill Lynch	1.9	na	2.4	na	2.0	na	na	2.5	2.9 H	3.0	3.2	na	na	na	na	na	3.2	1.9	2.0
RBC Capital Markets	1.9	na	na	na	na	na	na	2.5	2.8	3.0	3.2	na	na	na	na	na	3.7	2.2	3.0
BNP Paribas Americas	1.9	na	2.1	na	na	na	na	2.5	2.9 H	3.1 H	na	na	na	na	na	na	4.2 H	na	1.1
Barclays	1.9	5.0 H	na	na	na	na	na	2.4	2.6	2.8 L	3.0 L	na	na	na	na	na	3.0	2.1	1.6
MacroFin Analytics	1.8	4.8	2.4	1.8	1.9	2.1 H	2.3	2.6 H	2.9 H	3.1 H	3.2	4.1	4.9	3.8	4.6	89.1 H	2.9	1.8	1.4
Action Economics	1.8	4.8	1.9	1.9	1.9	2.1 H	2.3	2.6 H	2.9 H	3.0	3.2	4.1	4.8	3.7	4.5	86.1	3.6	2.7	1.8
Daiwa Capital Markets America	1.8	4.8	2.4	1.9	1.9	2.1 H	2.2	2.5	2.9 H	3.0	3.3	4.1	4.9	na	4.6	87.0	3.1	2.0	2.0
Amherst Pierpont Securities	1.8	4.8	2.4	1.9	1.9	2.1 H	2.3	2.5	2.8	3.0	3.2	4.0	4.8	3.9	4.6	88.5	3.9	2.3	2.0
Nomura Securities, Inc.	1.8	4.8	na	na	na	na	na	2.5	2.8	3.0	na	4.1	4.7	na	na	na	3.1	1.9	2.1
Via Nova Investment Mgt.	1.8	4.8	2.3	1.7 L	1.7 L	1.8	2.1	2.4	2.8	2.9	3.2	4.1	4.6 L	3.8	4.6	86.8	3.2	2.0	2.3
Goldman Sachs & Co.	1.8	na	2.2	na	1.7 L	na	na	2.3 L	2.7	2.9	3.1	na	na	na	4.4 L	na	3.5	2.1	2.3
AIG	1.8	4.8	na	na	1.8	2.0	2.4 H	2.4	2.7	2.9	3.1	na	4.7	na	4.5	na	3.3	2.1	2.5
Societe Generale	1.7	4.8	na	na	1.9	na	na	2.5	na	2.9	3.0 L	na	na	na	na	na	2.6	2.0	1.6
Grant Thornton/Diane Swonk	1.7	4.8	2.1	1.9	2.0	2.1 H	2.3	2.6 H	2.9 H	3.0	3.2	3.5 L	4.8	3.4 L	4.6	88.5	2.9	1.7	1.8
NatWest Markets	1.7	4.8	2.4	1.8	1.8	2.0	2.2	2.4	2.8	3.0	3.2	4.3	4.9	3.8	4.8 H	87.0	3.3	1.7	2.0
DePrince & Assoc.	1.7	4.8	2.4	1.9	1.9	2.1 H	2.3	2.5	2.8	3.0	3.1	4.0	4.8	3.9	4.6	87.6	2.8	1.9	2.0
Regions Financial Corporation	1.7	4.7 L	2.4	1.8	1.9	2.1 H	2.3	2.5	2.8	3.0	3.2	4.2	4.9	3.9	4.6	87.2	3.3	2.0	2.9
Loomis, Sayles & Company	1.7	4.8	2.4	1.9	1.9	2.1 H	2.2	2.4	2.8	3.0	3.2	4.0	4.8	3.7	4.5	86.7	3.0	1.9	2.0
Fannie Mae	1.7	4.8	na	na	1.9	2.1 H	2.3	2.5	2.8	3.0	3.2	na	na	na	4.6	na	2.8	1.8	1.9
BMO Capital Markets	1.7	4.8	2.4	na	1.9	2.1 H	2.3	2.5	2.8	3.0	3.2	na	na	na	4.6	87.5	2.8	1.8	2.0
Economist Intelligence Unit	1.7	4.7 L	1.7 L	1.9	1.9	2.1 H	2.3	2.5	2.9 H	3.1 H	3.3	na	na	na	4.7	na	3.0	na	2.2
Moody's Analytics	1.7	4.8	2.3	1.8	1.8	1.9	2.2	2.4	2.7	3.1 H	3.5 H	4.2	5.1 H	3.5	4.6	na	3.5	2.8	3.5
Naroff Economic Advisors	1.7	4.8	2.4	1.9	1.9	2.1 H	2.3	2.5	2.8	3.0	3.3	4.4 H	5.0	4.0	4.6	87.6	3.3	2.6	3.7 H
S&P Global	1.7	5.0	2.1	na	1.7 L	1.9	2.2	2.4	2.7	3.0	3.2	na	na	na	4.4 L	86.1	3.4	2.8	1.6
Wells Fargo	1.7	4.7	2.3	1.8	2.0	2.1 H	2.2	2.6 H	2.9 H	3.1 H	3.2	4.3	5.0	3.8	4.7	86.3	3.3	2.0	1.7
Cycledata Corp.	1.7	4.8	2.2	1.7 L	1.8	2.0	2.2	2.4	2.7	2.9	3.1	4.0	4.8	3.7	4.6	87.0	3.2	2.0	1.9
Georgia State University	1.7	4.8	na	na	1.8	2.0	2.3	2.6 H	2.9 H	3.1 H	3.2	4.1	4.8	na	4.6	na	3.8	1.5	2.0
Chase Wealth Management	1.7	4.8	2.3	2.0	1.9	2.1 H	2.3	2.5	2.7	3.1 H	3.3	4.1	4.9	3.9	4.7	89.1	3.0	2.0	2.1
RDQ Economics	1.7	4.8	2.2	1.8	1.9	2.1 H	2.3	2.5	2.7	2.9	3.1	4.0	4.8	3.8	4.5	87.5	2.6	2.2	2.2
MUFG Union Bank	1.7	4.8	2.3	1.8	1.8	2.0	2.2	2.5	2.8	3.0	3.2	3.9	4.7	3.8	4.6	88.0	3.0	2.1	3.2
Natl Assn. of Realtors	1.7	4.7 L	na	1.8	1.9	2.1 H	2.3	2.5	2.8	3.0	3.1	4.0	4.7	na	4.5	na	2.9	2.2	3.2
PNC Financial Services Corp.	1.7	4.8	2.4	na	1.9	2.1 H	2.3	2.5	2.8	3.0	3.2	na	4.8	4.0 H	4.6	86.6	3.6	3.2 H	3.1
Comerica Bank	1.7	4.8	2.4	na	1.9	2.1 H	2.3	2.5	2.8	3.0	3.2	na	na	na	4.6	na	3.5	2.0	3.2
The Northern Trust Company	1.7	4.8	2.5 H	1.8	1.9	2.1 H	2.3	2.5	2.8	3.0	3.3	4.0	4.8	3.7	4.6	85.9	3.3	2.0	2.0
Chmura Economics & Analytics	1.7	4.8	2.4	1.8	1.8	2.0	2.2	2.5	2.8	2.9	3.1	4.0	na	na	4.5	87.8	2.5	2.0	2.2
Moody's Capital Markets Group	1.7	4.8	2.4	1.9	1.9	2.1 H	2.3	2.5	2.8	3.0	3.1	4.0	4.7	3.7	4.6	88.0	2.9	2.1	1.9
High Frequency Economics	1.7	4.8	na	na	1.7 L	1.9	2.1	2.6 H	2.7	2.8 L	3.1	na	na	na	na	na	3.7	2.0	2.0
GLC Financial Economics	1.7	4.8	2.3	1.8	1.8	2.0	2.1	2.4	2.7	2.9	3.0 L	4.0	4.6 L	3.5	4.4 L	88.8	3.3	2.4	3.3
Oxford Economics	1.7	4.8	2.4	na	1.8	2.0	2.2	2.5	2.8	3.0	3.3	na	na	na	4.6	87.6	3.6	1.4 L	1.9
Stone Harbor Investment Partners	1.6 L	4.8	2.2	2.0 H	1.7 L	1.8 L	2.0 L	2.3 L	2.8	3.0	3.2	4.2	5.0	na	4.6	86.0	3.0	2.4	1.7
June Consensus	**1.7**	**4.8**	**2.3**	**1.8**	**1.9**	**2.0**	**2.2**	**2.5**	**2.8**	**3.0**	**3.2**	**4.1**	**4.8**	**3.8**	**4.6**	**87.3**	**3.2**	**2.1**	**2.2**
Top 10 Avg.	1.9	4.9	2.4	1.9	1.9	2.1	2.3	2.6	2.9	3.1	3.3	4.2	4.9	3.9	4.6	88.3	3.8	2.6	3.2
Bottom 10 Avg.	1.7	4.7	2.1	1.8	1.7	1.9	2.1	2.4	2.7	2.9	3.1	3.9	4.7	3.6	4.5	86.3	2.6	1.7	1.5
May Consensus	1.7	4.8	2.3	1.8	1.8	2.0	2.2	2.4	2.7	2.9	3.2	4.0	4.8	3.8	4.5	86.6	3.1	2.0	1.9
Number of Forecasts Changed From A Month Ago:																			
Down	4	5	7	7	3	1	1	2	2	5	6	8	8	8	6	4	9	8	12
Same	30	27	16	10	13	11	9	10	12	12	20	8	8	6	7	8	18	21	12
Up	10	7	11	9	23	23	25	32	28	27	16	11	11	7	22	14	17	13	20
Diffusion Index	57 %	53 %	56 %	54 %	76 %	81 %	84 %	84 %	81 %	75 %	62 %	56 %	56 %	48 %	73 %	69 %	59 %	56 %	59 %

Third Quarter 2018

Interest Rate Forecasts

Key Assumptions

Blue Chip Financial Forecasts Panel Members	Percent Per Annum -- Average For Quarter: Short-Term: 1 Federal Funds Rate	2 Prime Bank Rate	3 LIBOR Rate 3-Mo.	4 Com. Paper 1-Mo.	5 Treas. Bills 3-Mo.	6 Treas. Bills 6-Mo.	7 Treas. Bills 1-Yr.	Intermediate-Term: 8 Treas. Notes 2-Yr.	9 Treas. Notes 5-Yr.	10 Treas. Notes 10-Yr.	Long-Term: 11 Treas. Bond 30-Yr.	12 Aaa Corp. Bond	13 Baa Corp. Bond	14 State & Local Bonds	15 Home Mtg. Rate	Avg. For Qtr.: A. Fed's Major Currency $ Index	(Q-Q % Change) (SAAR): B. Real GDP	C. GDP Price Index	D. Cons. Price Index
ACIMA Private Wealth	2 3 H	5 3 H	2.5	2 3 H	2.3 H	2.4 H	2.4	2 6	2.8	2 8 L	3.1	4 0	4.9	3.9	4.5	85.5	3 2	1.4	1.0 L
Scotiabank Group	2 3 H	5 3 H	na	na	2.3 H	na	na	2 6	2.9	3 0	3.2	na	na	na	na	na	2 5	2 5	2.4
Bank of America Merrill Lynch	2.1	na	2.6 H	na	2.2	na	na	2.7	3.1 H	3 2	3.3	na	na	na	na	na	3 6	1 9	2.5
J.P. Morgan Chase	2.1	na	2.5	na	na	na	na	2.7	3.0	3.1	3.2	na	na	na	na	na	2 5	2 3	3.0
Swiss Re	2.1	5.1	2.3	2.1	2.0	2.1	2.2	2.4 L	2.6 L	2 9	3.3	4 6	5.5	na	4.7	na	2 5	3.7 H	3.7
RBC Capital Markets	2.1	na	na	na	na	na	na	2.7	3.0	3 2	3.5	na	na	na	na	na	2 8	1 3 L	4.2 H
BNP Paribas Americas	2.1	na	2.3	na	na	na	na	2 6	3.0	3 2	na	na	na	na	na	na	3 5	na	2.3
Barclays	2.1	5 3 H	na	na	na	na	na	2 5	2.7	2 8 L	3.0 L	na	na	na	na	na	3 5	2 5	3.0
Moody's Analytics	2 0	5.1	2.4	2 0	1.9	2.1	2.4	2 6	3.0	3 3	4.0 H	4 8 H	5.7 H	3.9	4.8	na	3 5	2.4	2.1
Chase Wealth Management	2 0	5 0	2.4	2 2	2.1	2 3	2.5	2.7	2.9	3 2	3.5	4 3	5.1	4.1	4.8	89.2	2 9	2.1	2.2
Via Nova Investment Mgt.	2 0	5 0	2.5	1 9 L	1.9	2.1	2.3	2.7	3.1 H	3 3	3.5	4.4	4.9	4.2 H	4.9	87.0	3.1	2.1	2.3
Goldman Sachs	2 0	na	2.3	na	1.9	na	na	2 5	2.9	3 2	3.4	na	na	na	4.4 L	na	3 0	2 6	3.0
Nomura Securities, Inc.	2 0	5 0	na	na	na	na	na	2 8 H	3.0	3 3	na	4 3	4.8	na	na	na	3.4	2.1	3.5
NatWest Markets	2 0	5.1	2.5	2 0	2.1	2 3	2.5	2.7	3.0	3 3	3.4	4 6	5.2	3.9	5.0 H	89.0	2.7	2 0	2.7
Amherst Pierpont Securities	2 0	5.1	2.6 H	2.1	2.1	2 3	2.5	2.7	3.0	3 3	3.5	4 3	5.2	4.1	4.9	89.5	3 2	2.4	3.0
BMO Capital Markets	2 0	5.1	2.6 H	na	2.1	2 3	2.5	2.7	3.0	3 2	3.3	na	na	na	4.8	86.7	2 9	2 2	2.4
Action Economics	2 0	5.1	2.3	2.1	2.1	2.1	2.4	2 6	2.9	3.1	3.3	4 2	5.0	3.8	4.7	87.7	3.4	2 3	2.4
Societe Generale	2 0	5 0	na	na	2.1	na	na	2 6	na	3 0	3.1	na	na	na	na	na	2 3 L	2 0	1.8
DePrince & Associates	2 0	5 0	2.4	2.1	2.1	2 2	2.5	2.7	3.0	3.1	3.3	4 2	5.1	4.0	4.8	89.0	3.1	2.1	2.2
MUFG Union Bank	2 0	5 0	2.5	1 9 L	2.0	2.1	2.3	2 6	2.9	3 0	3.4	4 0	4.8	3.9	4.6	87.0	3.1	1.7	2.6
Loomis, Sayles & Company	1 9	5 0	2.5	2.1	2.1	2 2	2.4	2 5	2.8	3.1	3.3	4.1	4.8	3.8	4.6	87.1	3 3	1 9	2.3
MacroFin Analytics	1 9	5 0	2.6 H	2 0	2.1	2 3	2.5	2.7	3.1 H	3 3	3.4	4 2	5.1	4.0	4.8	89.3	2 8	2 2	2.3
Economist Intelligence Unit	1 9	5 0	2.0 L	2.1	2.1	2 2	2.4	2.7	3.0	3 2	3.4	na	na	na	4.8	na	2.4	na	2.3
Grant Thornton/Diane Swonk	1 9	5 0	2.3	2.1	2.2	2 3	2.6 H	2 8 H	3.0	3 2	3.3	3.7 L	4.9	3.5 L	4.8	89.9 H	3 2	2 0	2.8
The Northern Trust Company	1 9	5.1	2.5	2 0	2.1	2 2	2.4	2 6	3.0	3 2	3.5	4.4	5.1	4.0	4.8	85.5	2 9	2 3	2.3
S&P Global	1 9	5.0	2.2	na	1.9	2.1	2.3	2 5	2.8	3.1	3.4	na	na	na	4.4 L	84.6 L	3 9 H	2 5	1.9
High Frequency Economics	1 9	5.0	na	na	2.0	2.1	2.3	2.7	2.8	3 0	3.3	na	na	na	na	na	3 0	2 2	2.2
AIG	1 9	5.0	na	na	1.9	2 2	2.5	2 6	2.9	3.1	3.4	na	4.9	na	4.6	na	2.4	2.1	2.4
Regions Financial Corporation	1 9	4.9	2.5	2 0	2.0	2 2	2.4	2 6	3.0	3.1	3.3	4 3	5.0	4.1	4.7	87.8	3 0	2.1	2.4
Oxford Economics	1 9	5.2	2.6 H	na	1.9	2.1	2.3	2 6	2.8	3.1	3.4	na	na	na	4.8	86.8	2 6	1 8	2.1
Chmura Economics & Analytics	1 9	5.0	2.6 H	2 0	2.1	2 3	2.5	2.7	3.0	3.1	3.3	4 2	na	na	4.7	88.2	2 8	2 0	2.2
Comerica Bank	1 9	5.0	2.6 H	na	2.1	2 3	2.4	2.7	3.0	3 2	3.4	na	na	na	4.8	na	2 8	2 0	2.6
Wells Fargo	1 9	4.9	2.4	2 0	2.2	2 3	2.4	2.7	3.0	3 2	3.3	4.4	5.1	3.9	4.8	88.0	3 2	1 9	2.1
Daiwa Capital Markets America	1 9	5.0	2.5	2 0	2.0	2 2	2.3	2.7	3.0	3 2	3.4	4 2	5.0	na	4.8	88.0	2.7	2 0	2.2
Cycledata Corp.	1 9	5.0	2.3	2 0	1.9	2.1	2.3	2 5	2.8	3 0	3.3	4 2	5.0	4.0	4.7	87.0	2 9	2.1	2.2
RDQ Economics	1 9	5.0	2.3	2 0	2.0	2 2	2.4	2 6	2.8	3 0	3.2	4 2	5.0	3.9	4.6	88.8	2 6	2 2	2.3
Naroff Economic Advisors	1 9	5.0	2.5	2.1	2.1	2 3	2.5	2 6	3.0	3 2	3.4	4 6	5.3	4.2 H	4.9	86.3	3.1	2.4	3.0
PNC Financial Services Corp.	1 9	5.0	2.6 H	na	2.1	2 3	2.5	2 8 H	3.0	3 2	3.5	na	5.1	4.2 H	4.7	86.8	3.1	1 9	1.9
Moody's Capital Markets Group	1 9	5.0	2.6	2.1	2.1	2 3	2.4	2 6	2.8	3 0	3.1	4 0	4.7 L	3.6	4.7	88.8	2.7	2 0	2.1
Georgia State University	1 9	5.0	na	na	1.9	2 2	2.4	2.7	3.1 H	3.4 H	3.6	4 5	5.2	na	4.8	na	3 0	2 3	2.8
GLC Financial Economics	1 9	4.9	2.4	2 0	2.0	2 2	2.4	2 6	2.9	3.1	3.2	4.4	5.0	3.7	4.7	88.5	3.4	2 2	2.9
Fannie Mae	1 9	5.0	na	na	2.3 H	2.4 H	2.5	2.7	3.0	3.1	3.2	na	na	na	4.7	na	2 9	2.7	2.9
Stone Harbor Investment Partners	1 9	5.0	2.4	2 2	1.8 L	1 9 L	2.1 L	2 5	2.9	3 2	3.5	4.4	5.2	na	4.8	85.0	3 2	2.4	2.0
Nat'l Assn. of Realtors	1 8 L	4.8 L	na	1 9 L	2.0	2 2	2.4	2 6	2.9	3.1	3.3	4 2	5.0	na	4.6	na	3 0	2 3	3.3
June Consensus	**2.0**	**5.0**	**2.4**	**2.1**	**2.0**	**2.2**	**2.4**	**2.6**	**2.9**	**3.1**	**3.3**	**4.3**	**5.0**	**3.9**	**4.7**	**87.6**	**3.0**	**2.2**	**2.5**
Top 10 Avg.	2.1	5 2	2.6	2.1	2.2	2.3	2.5	2.7	3.0	3.3	3.5	4.5	5.3	4.1	4.8	89.0	3.5	2.6	3.3
Bottom 10 Avg.	1.9	4 9	2.2	2.0	1.9	2.1	2.3	2.5	2.8	2.9	3.1	4.1	4.9	3.8	4.6	86.1	2.5	1.8	1.9
May Consensus	2 0	5 0	2.4	2.1	2.0	2 2	2.3	2 6	2.9	3.1	3.3	4 2	5.0	3.9	4.7	86.7	3 0	2 2	2.3
Number of Forecasts Changed From A Month Ago:																			
Down	5	4	4	5	5	5	3	2	2	3	11	8	5	5	3	2	11	8	3
Same	32	29	19	12	16	11	9	13	13	19	18	8	11	6	12	7	26	21	17
Up	7	6	11	8	18	19	23	29	28	22	13	10	11	10	20	18	7	13	24
Diffusion Index	52 %	53 %	60 %	56 %	67 %	70 %	79 %	81 %	80 %	72 %	52 %	54 %	61 %	62 %	74 %	80 %	45 %	56 %	74 %

Fourth Quarter 2018

Interest Rate Forecasts

Key Assumptions

Blue Chip Financial Forecasts Panel Members	Percent Per Annum -- Average For Quarter															Avg. For	(Q-Q % Change) (SAAR)		
	Short-Term							Intermediate-Term				Long-Term				Qtr.			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	A.	B.	C.	D.
	Federal Funds Rate	Prime Bank Rate	LIBOR Rate 3-Mo.	Com. Paper 1-Mo.	Treas. Bills 3-Mo.	Treas. Bills 6-Mo.	Treas. Bills 1-Yr.	Treas. Notes 2-Yr.	Treas. Notes 5-Yr.	Treas. Notes 10-Yr.	Treas. Bond 30-Yr.	Aaa Corp. Bond	Baa Corp. Bond	State & Local Bonds	Home Mtg. Rate	Fed's Major Currency $ Index	Real GDP	GDP Price Index	Cons. Price Index
RBC Capital Markets	2.4 H	na	na	na	na	na	na	2 8	3.1	3.3	3 6	na	na	na	na	na	2.8	2.2	0.5 L
Swiss Re	2.4 H	5.4	2 5	2 3	2 2	2.4	2.5	2 6	2.7	2.9	3.4	4.7	5.6	na	4 8	na	2.8	0.7 L	1.6
J.P. Morgan Chase	2.4 H	na	2.7	na	na	na	na	2 8	3 0	3.1	3 2	na	na	na	na	na	2.5	2.1	2.3
Barclays Capital	2.4 H	5.5 H	na	na	na	na	na	2 6	2.7	2.8	3 0	na	na	na	na	na	3.0	2.1	2.0
BNP Paribas Americas	2.4 H	na	2 5	na	na	na	na	2.7	3.1	3.2	na	na	na	na	na	na	3.0	na	2.4
Moody's Analytics	2.4 H	5.5 H	2.7	2 3	2 2	2.3	2.7	2 9	3 3	3.6 H	4 3 H	5 2 H	6.1 H	4.1	5.1 H	na	3.2	3.0 H	2.3
AC MA Private Wealth	2.3	5.3	2 6	2 5 H	2 3	2.4	2.4	2.4 L	2 6 L	2.5 L	2 9	4 0	4.9	3 9	4 3 L	84 5	2.5	2.1	1.6
Goldman Sachs & Co.	2.3	na	2 6	na	2 2	na	na	2 6	3.1	3.2	3 5	na	na	na	4 6	na	2.5	1.8	2.0
Scotiabank Group	2.3	5.3	na	na	2 3	na	na	2.7	2 9	3.1	3 2	na	na	na	na	na	2.4	2.5	2.4
Nomura Securities, Inc.	2.3	5.3	na	na	na	na	na	3 0 H	3.1	3.3	na	4 3	4.8	na	na	na	3.4 H	2.1	2.6
NatWest Markets	2.2	5.3	2.7	2 3	2 3	2.5	2.7	2 9	3 2	3.3	3 5	4 6	5.3	4 0	5.1 H	90 0	3.0	2.0	1.8
DePrince & Assoc.	2.2	5.2	2 6	2.4	2 3	2.5	2.7	2 9	3.1	3.3	3.4	4.4	5.5	4 3	4 9	89.4	2.9	2.2	2.3
MacroFin Analytics	2.2	5.3	2 8 H	2 3	2.4	2.6	2.8 H	3 0 H	3.4 H	3.5	3.7	4 5	5.4	4 3	5 0	89 6	2.7	2.2	2.3
BMO Capital Markets	2.2	5.3	2.7	na	2 3	2.4	2.6	2 8	3.1	3.2	3.4	na	na	na	4 9	85 2	2.9	2.2	2.4
Amherst Pierpont Securities	2.2	5.3	2 8 H	2 3	2 3	2.5	2.7	2 9	3 2	3.5	3 8	4.7	5.5	4.4 H	5.1 H	90 5	3.2	2.5	3.0
Wells Fargo	2.2	5.2	2 6	2 2	2.4	2.5	2.6	2 8	3.1	3.3	3.4	4 5	5.2	4 0	4 8	86 8	3.1	2.0	2.0
S&P Global	2.2	5.2	2.4	na	2.1	2.3	2.4	2.7	2 9	3.2	3 5	na	na	na	4 6	84 3	3.1	2.1	2.0
Chase Wealth Management	2.2	5.3	2 6	2 5	2 3	2.5	2.7	2 8	3 0	3.3	3 6	4.4	5.2	4 2	4 9	89.1	2.8	2.2	2.1
Daiwa Capital Markets America	2.2	5.3	2.7	2 3	2 3	2.4	2.6	2 9	3 2	3.3	3 6	4.4	5.2	na	5 0	89 0	2.6	2.2	2.3
RDQ Economics	2.2	5.3	2 6	2 3	2.4	2.6 H	2.7	2.7	3 0	3.2	3.4	4 6	5.3	4 0	4 8	90.1	2.4	2.3	2.3
Naroff Economic Advisors	2.2	5.3	2 6	2 3	2.4	2.6	2.7	2 8	3.1	3.3	3 6	4 8	5.5	4.4 H	5.1 H	84 5	2.6	2.6	2.9
MUFG Union Bank	2.2	5.3	2 6	2 2	2 2	2.3	2.6	2.7	3 0	3.1	3 5	4.1	4.9	4 0	4.7	82 0 L	3.3	2.1	3.3 H
Societe Generale	2.2	5.3	na	na	2 2	na	na	2 8	na	3.0	3.1	na	na	na	na	na	2.3	2.0	1.7
The Northern Trust Company	2.2	5.3	2 6	2 3	2 3	2.4	2.6	2 8	3.1	3.4	3.7	4.7	5.5	4 3	5 0	84.7	3.0	2.2	2.2
High Frequency Economics	2.2	5.3	na	na	2 2	2.4	2.6	2 8	3 0	3.1	3.4	na	na	na	na	na	2.8	2.3	2.3
Regions Financial Corporation	2.2	5.2	2 6	2.1	2 2	2.3	2.5	2.7	3.1	3.2	3 5	4 5	5.1	4 2	4 8	88.1	2.9	1.9	2.1
Chmura Economics & Analytics	2.2	5.3	2 8	2 3	2 3	2.5	2.7	2 9	3.1	3.3	2 6 L	4 3	na	na	4 8	88.1	2.9	2.1	2.2
Economist Intelligence Unit	2.2	5.2	2 2 L	2 3	2 3	2.4	2.6	2 9	3 2	3.4	3 6	na	na	na	5 0	na	2.2 L	na	2.2
Grant Thornton/Diane Swonk	2.2	5.2	2 6	2.4	2 2	2.5	2.8 H	3 0 H	3 2	3.4	3 6	3 9 L	5.1	3 5 L	4 9	90.7 H	2.9	2.2	1.1
Oxford Economics	2.2	5.3	2.7	na	2 0	2.3	2.4	2 6	2 9	3.2	3 5	na	na	na	4 8	85.1	2.5	2.0	1.9
Loomis, Sayles & Company	2.1	5.2	2.7	2 3	2 3	2.4	2.5	2 6	2 8	3.1	3.4	4.1	4.9	3 8	4 6	87 2	3.4 H	2.4	2.1
Action Economics	2.1	5.3	2.4	2 3	2 2	2.2	2.5	2 6	2 9	3.2	3 3	4 2	5.0	3.7	4 8	87 8	3.2	2.2	2.3
Bank of America Merrill Lynch	2.1	na	2 6	na	2 3	na	na	2 8	3 2	3.3	3 3	na	na	na	na	na	3.1	1.8	2.4
Comerica Bank	2.1	5.2	2.7	na	2 2	2.3	2.5	2.7	3.1	3.2	3 5	na	na	na	4 9	na	3.0	2.0	2.6
Stone Harbor Investment Partners	2.1	5.3	2 6	2.4	2 0	2.1 L	2.3 L	2 6	3 0	3.4	3 6	4 6	5.4	na	5 0	84 0	2.8	2.4	2.3
GLC Financial Economics	2.1	5.1	2 5	2 2	2 2	2.4	2.5	2.7	3.1	3.3	3.4	4 5	5.1	3 9	4 8	88 0	3.0	2.0	2.5
Via Nova Investment Mgt.	2.1	5.1	2 6	2 0 L	2 0	2.1 L	2.4	2.7	3 2	3.3	3 6	4 5	4.9	4 3	4 9	87 0	3.0	2.2	2.3
AIG	2.0	5.0 L	na	na	1 9	2.3	2.6	2.7	3 0	3.2	3 5	na	4.9	na	4.7	na	2.7	2.1	1.9
Nat'l Assn. of Realtors	2.0	5.0 L	na	2.1	2 2	2.3	2.5	2.7	3 0	3.2	3.4	4 3	5.1	na	4.7	na	3.1	2.4	3.2
Georgia State University	1.9 L	5.0 L	na	na	1 9 L	2.3	2.5	2 8	3 3	3.5	3 8	4.7	5.4	na	5 0	na	2.4	2.3	1.9
Moody's Capital Markets Group	1.9 L	5.0 L	2 6	2 2	2 2	2.3	2.4	2 5	2 8	2.9	3.1	3 9 L	4.7 L	3 5 L	4 6	89.4	2.4	1.9	1.5
Fannie Mae	1.9 L	5.0 L	na	na	2 5 H	2.6 H	2.7	2 8	3 0	3.1	3 2	na	na	na	4.7	na	2.7	2.3	0.9
PNC Financial Services Corp.	1.9 L	5.0 L	2.7	na	2 2	2.4	2.6	2 8	3.1	3.3	3 6	na	5.2	4 2	4 8	86 8	3.3	1.9	2.0
Cycledata Corp.	1.9 L	5.0 L	2 3	2 0 L	1 9 L	2.1 L	2.3 L	2 5	2 8	3.0	3 3	4 2	5.0	4 0	4.7	87 0	2.9	2.2	2.1
June Consensus	**2.2**	**5.2**	**2.6**	**2.3**	**2.2**	**2.4**	**2.6**	**2.8**	**3.0**	**3.2**	**3.4**	**4.4**	**5.2**	**4.0**	**4.8**	**87.3**	**2.8**	**2.1**	**2.1**
Top 10 Avg.	2.3	5.4	2.7	2.4	2.4	2.5	2.7	2.9	3.2	3.4	3.7	4.7	5.5	4.3	5.0	89.6	3.2	2.5	2.7
Bottom 10 Avg.	2.0	5.0	2.5	2.1	2 0	2.2	2.4	2.6	2.8	2.9	3.1	4.1	4.9	3.8	4.6	84.8	2.4	1.8	1.4
May Consensus	2.2	5.2	2 6	2 3	2 2	2.4	2.5	2.7	3 0	3.2	3 5	4.4	5.2	4 0	4 8	86.7	2.9	2.1	2.1
Number of Forecasts Changed From A Month Ago:																			
Down	4	5	5	7	7	6	4	4	4	6	11	6	5	8	7	5	9	9	10
Same	36	31	18	14	17	12	12	17	18	21	21	9	10	6	12	8	28	21	24
Up	3	2	11	5	15	17	19	23	21	17	10	11	12	7	16	14	7	12	10
Diffusion Index	49 %	46 %	59 %	46 %	60 %	66 %	71 %	72 %	70 %	63 %	49 %	60 %	63 %	48 %	63 %	67 %	48 %	54 %	50 %

First Quarter 2019

Interest Rate Forecasts

Key Assumptions

Blue Chip Financial Forecasts Panel Members	Percent Per Annum -- Average For Quarter															Avg. For	(Q-Q % Change) (SAAR)		
	Short-Term							Intermediate-Term				Long-Term				Qtr.			
	1 Federal Funds Rate	2 Prime Bank Rate	3 LIBOR Rate 3-Mo.	4 Com. Paper 1-Mo.	5 Treas. Bills 3-Mo.	6 Treas. Bills 6-Mo.	7 Treas. Bills 1-Yr.	8 Treas. Notes 2-Yr.	9 Treas. Notes 5-Yr.	10 Treas. Notes 10-Yr.	11 Treas. Bond 30-Yr.	12 Aaa Corp. Bond	13 Baa Corp. Bond	14 State & Local Bonds	15 Home Mtg. Rate	A. Fed's Major Currency $ Index	B. Real GDP	C. GDP Price Index	D. Cons. Price Index
Moody's Analytics	3 0 H	6.1 H	3 3 H	3.0 H	2 8 H	2 8	3.1 H	3 3 H	3.6	3 8 H	4.5 H	5.4 H	6 3 H	4 3	5.2	na	2.7	3.0 H	2 6
RBC Capital Markets	2 6	na	na	na	na	na	na	3 0	3.3	3 5	3.7	na	na	na	na	na	2.4	2.4	1 9
J.P. Morgan Chase	2 6	na	3 0	na	na	na	na	3 0	3.1	3 2	3.3	na	na	na	na	na	2 3	2.2	2 3
Barclays	2 6	5.8	na	na	na	na	na	2.7	2.7	2 8	3.0	na	na	na	na	na	2 5	2.1	1 8
BNP Paribas Americas	2 6	na	2 6	na	na	na	na	2 8	3.1	3 3	na	na	na	na	na	na	1.1 L	na	2 0
Nomura Securities, Inc.	2 5	5.5	na	na	na	na	na	3 0	3.1	3 3	na	4 3	4 8	na	na	na	2.4	2.0	2 3
Goldman Sachs & Co.	2 5	na	2 8	na	2.4	na	na	2 8	3.2	3 3	3.5	na	na	na	4.7	na	1 9	2.4	2.4
Scotiabank Group	2 5	5.5	na	na	2 6	na	na	2 8	3.0	3.1	3.3	na	na	na	na	na	2.4	2.5	2.4
Naroff Economic Advisors	2 5	5.5	2 8	2.6	2 6	2 9 H	3.0	3.1	3.3	3 5	3.9	5 0	5 8	4.7 H	5.3 H	83 2	3 2 H	2.4	2 5
Swiss Re	2 5	5.5	2 6	2.4	2.4	2 5	2.6	2 8	2.7	2 9	3.5	4.7	5 6	na	4.8	na	1 9	1.6 L	3.1
NatWest Markets	2 5	5.6	2 9	2.5	2 6	2 8	3.0	3 0	3.3	3 3	3.5	4 6	5 3	4.1	5.1	89 0	2 8	2.3	2 3
MacroFin Analytics	2 5	5.5	3.1	2.6	2 6	2 8	3.1 H	3 3 H	3.7 H	3 8	4.0	4 8	5 6	4 6	5.3 H	89 8	2 3	2.3	2 2
DePrince & Assoc.	2 5	5.5	2 8	2.6	2 5	2.7	2.8	3.1	3.3	3.4	3.6	4 6	5.7	4.4	5.1	89.7	2 8	2.2	2.4
Amherst Pierpont Securities	2 5	5.6	2 9	2.5	2 5	2.7	2.9	3.1	3.4	3.7	4.1	5 0	5 8	4 5	5.3 H	91 0	2.7	2.6	3 2 H
S&P Global	2 5	5.3	2.7	na	2 3	2 6	2.7	2 8	3.0	3 3	3.5	na	na	na	4.7	84 0	2 3	2.1	1 9
BMO Capital Markets	2 5	5.6	2 9	na	2.4	2 6	2.7	2 9	3.2	3 3	3.5	na	na	na	4.9	84.4	2.7	2.2	2.4
MUFG Union Bank	2 5	5.5	2 8	2.4	2.4	2 5	2.9	2 8	3.1	3 2	3.5	4 2	5 0	4.1	4.8	81 0 L	2.7	2.1	3 0
The Northern Trust Company	2.4	5.6	2 9	2.5	2 6	2.7	2.8	3 0	3.3	3 6	3.9	5 0	5 9	4 6	5.2	84 5	2 0	2.0	2 0
High Frequency Economics	2.4	5.5	na	na	2 5	2 6	2.8	2 9	3.1	3 3	3.5	na	na	na	na	na	2 6	2.7	2.7
Chmura Economics & Analytics	2.4	5.5	3 0	2.5	2 5	2.7	2.9	3.1	3.3	3.4	3.8	4 5	na	na	5.0	87 8	3 2	2.1	2 3
Oxford Economics	2.4	5.3	2 9	na	2 3	2 5	2.6	2 8	2.9	3 2	3.6	na	na	na	4.8	84 5	2 0	2.5	2.1
Chase Wealth Management	2.4	5.5	2 9	2.7	2 5	2.7	2.8	2 9	3.1	3 3	3.6	4.4	5 2	4 2	4.9	89 0	1.7	2.1	2 2
RDQ Economics	2.4	5.5	2 8	2.5	2 6	2 8	2.9	2 9	3.2	3.4	3.6	4 9	5 5	4 3	5.0	90 6	2 3	2.3	2 3
Daiwa Capital Markets America	2.4	5.5	2 9	2.6	2 5	2 6	2.8	3.1	3.4	3 5	3.8	4 6	5.4	na	5.2	89 0	2 5	2.3	2.4
Wells Fargo	2.4	5.4	2.7	2.3	2 6	2.7	2.7	3 0	3.2	3.4	3.5	4 5	5 3	4 0	4.9	85 5	2 2	2.3	2 6
Bank of America Merrill Lynch	2.4	na	2 9	na	2 5	na	na	2 9	3.2	3 3	3.4	na	na	na	na	na	1 9	1.8	1 9
Regions Financial Corporation	2 3	5.4	2 8	2.3	2 3	2 5	2.6	2 8	3.2	3 3	3.6	4 6	5 3	4 3	4.9	88 0	2.4	2.1	2 0
Via Nova Investment Mgt.	2 3	5.3	2 8	2.2	2 2	2.4	2.6	2 8	3.3	3 6	3.8	4.7	5 2	4.7 H	5.2	88 0	2 8	2.2	2 3
GLC Financial Economics	2 3	5.3	2.7	2.4	2.4	2 5	2.7	2 9	3.3	3 5	3.6	4 8	5 5	4 2	5.1	86 6	2.4	2.1	2 2
Grant Thornton/Diane Swonk	2 3	5.3	2 8	2.6	2 3	2.7	2.9	3.1	3.3	3.4	3.7	4 0 L	5 2	3 6	5.0	91.7 H	2.7	2.5	0 9
ACIMA Private Wealth	2 3	5.3	2.7	2.6	2 2	2 3	2.2 L	2 3 L	2.2 L	2 2 L	2.7 L	4 0 L	5 0	3 8	4.3 L	83 5	1 9	2.1	1 3
AIG	2 3	5.3	na	na	2.1	2 5	2.8	2 8	3.1	3 3	3.7	na	5.1	na	4.8	na	2 6	2.3	1 3
Loomis, Sayles & Company	2 3	5.4	2 8	2.4	2 3	2 5	2.6	2 6	2.9	3 2	3.4	4 2	4 9	3 9	4.7	87 3	3.1	2.6	2 2
Societe Generale	2 2	5.5	na	na	2 5	na	na	3 0	na	3 0	3.1	na	na	na	na	na	1.7	1.9	1 8
Action Economics	2 2	5.3	2 5	2.3	2 3	2.4	2.6	2 8	3.0	3 2	3.4	4 3	5.1	3 8	4.8	87 2	2 5	1.9	2 6
Economist Intelligence Unit	2 2	5.2 L	2 3 L	2.3	2.4	2.4	2.6	3 0	3.3	3.4	3.6	na	na	na	5.0	na	1 6	na	2 3
Nat'l Assn. of Realtors	2 2	5.2 L	na	2.2	2 3	2.4	2.6	2 8	3.1	3 3	3.5	4.4	5 2	na	4.8	na	2.7	2.3	3.1
Fannie Mae	2 2	5.3	na	na	2 6	2.7	2.7	2 9	3.1	3.1	3.2	na	na	na	4.8	na	2 9	2.5	0.7 L
Georgia State University	2 2	5.3	na	na	2.1	2 5	2.7	3 0	3.4	3.7	4.0	4 8	5 6	na	5.2	na	2 2	2.2	1.4
Moody's Capital Markets Group	2 2	5.3	2 8	2.4	2 2	2.4	2.5	2 5	2.7	2 9	3.0	4 0 L	4.7 L	3 5 L	4.6	89.7	2.1	1.9	1 8
Comerica Bank	2 2	5.3	2 6	na	2.1	2 3	2.5	2.7	3.0	3 2	3.4	na	na	na	4.8	na	2 6	2.0	2 3
PNC Financial Services Corp.	2 2	5.3	2 8	na	2.4	2 5	2.7	2 9	3.2	3 3	3.7	na	5 3	4 2	4.9	86.7	3 0	2.0	2 2
Stone Harbor Investment Partners	2.1	5.3	2 5	2.3	2 0 L	2 2 L	2.3	2.7	3.1	3 5	3.7	4.7	5 5	na	5.1	83 0	2 6	2.6	2.4
Cycledata Corp.	2.1 L	5.2 L	2 5	2.0 L	2.1	2 3	2.5	2.7	3.0	3 2	3.4	4 3	5.1	4.1	4.8	87 0	2.7	2.2	2.1
June Consensus	**2.4**	**5.4**	**2.8**	**2.5**	**2.4**	**2.6**	**2.7**	**2.9**	**3.1**	**3.3**	**3.5**	**4.6**	**5.3**	**4.2**	**4.9**	**87.0**	**2.4**	**2.2**	**2.2**
Top 10 Avg.	2.6	5.6	3.0	2.6	2.6	2.8	2.9	3.1	3.4	3.6	3.9	4.9	5.7	4.5	5.2	89.8	2.9	2.6	2.8
Bottom 10 Avg.	2.2	5.3	2.6	2.3	2.2	2.3	2.5	2.6	2.8	2.9	3.2	4.2	5.0	3.9	4.7	84.0	1.8	1.9	1.5
May Consensus	2.4	5.4	2 8	2.5	2.4	2 6	2.7	2 9	3.1	3 3	3.6	4 6	5 3	4.1	4.9	86.7	2 5	2.2	2 2
Number of Forecasts Changed From A Month Ago:																			
Down	4	5	4	5	6	9	6	6	6	6	14	10	4	7	8	5	9	11	14
Same	34	28	21	15	20	10	13	22	22	24	21	11	16	7	14	8	30	23	22
Up	6	6	9	6	13	16	16	16	15	14	7	6	8	6	13	13	5	8	8
Diffusion Index	52 %	51 %	57 %	52 %	59 %	60 %	64 %	61 %	60 %	59 %	42 %	43 %	57 %	48 %	57 %	65 %	45 %	46 %	43 %

Second Quarter 2019

Interest Rate Forecasts

Key Assumptions

Blue Chip Financial Forecasts Panel Members	Percent Per Annum -- Average For Quarter															Avg. For	(Q-Q % Change) (SAAR)		
	Short-Term							Intermediate-Term				Long-Term				Qtr.			
	1 Federal Funds Rate	2 Prime Bank Rate	3 LIBOR Rate 3-Mo.	4 Com. Paper 1-Mo.	5 Treas. Bills 3-Mo.	6 Treas. Bills 6-Mo.	7 Treas. Bills 1-Yr.	8 Treas. Notes 2-Yr.	9 Treas. Notes 5-Yr.	10 Treas. Notes 10-Yr.	11 Treas. Bond 30-Yr.	12 Aaa Corp. Bond	13 Baa Corp. Bond	14 State & Local Bonds	15 Home Mtg. Rate	A. Fed's Major Currency $ Index	B. Real GDP	C. GDP Price Index	D. Cons. Price Index
Moody's Analytics	3.4 H	6.5 H	3.7 H	3.4	3.1 H	3.2 H	3.4 H	3.5 H	3.7	3.9	4.6 H	5.5 H	6.4 H	4.3	5.3	na	2.3	2.9 H	2.7
J.P. Morgan Chase	2.9	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	2.0	2.2	2.3
RBC Capital Markets	2.9	na	na	na	na	na	na	3.3	3.5	3.6	3.8	na	na	na	na	na	3.4 H	2.2	2.4
Barclays Capital	2.9	6.0	na	na	na	na	na	na	na	na	na	na	na	na	na	na	2.5	2.1	1.8
Goldman Sachs & Co.	2.8	na	3.1	na	2.7	na	na	3.0	3.3	3.4	3.5	na	na	na	4.8	na	1.9	2.2	2.2
NatWest Markets	2.7	5.8	3.1	2.8	2.8	3.0	3.2	3.2	3.3	3.3	3.5	4.7	5.4	4.1	5.2	88.0	2.7	1.7 L	0.7
Naroff Economic Advisors	2.7	5.8	3.0	3.7 H	2.9	3.1	3.3	3.3	3.5	3.7	4.1	5.2	5.9	4.9 H	5.5 H	82.0 L	2.6	2.5	2.7
BMO Capital Markets	2.7	5.8	3.0	na	2.6	2.7	2.8	3.0	3.3	3.4	3.5	na	na	na	5.0	83.9	2.2	1.8	1.8
S&P Global	2.7	5.5	3.0	na	2.6	2.9	2.9	3.0	3.1	3.3	3.6	na	na	na	4.9	83.9	2.0	2.1	2.0
Amherst Pierpont Securities	2.7	5.8	3.2	2.8	2.8	2.9	3.1	3.3	3.6	3.9	4.3	5.2	6.1	4.7	5.5	91.5	2.8	2.5	3.3 H
MacroFin Analytics	2.7	5.8	3.3	2.8	2.9	3.0	3.3	3.5 H	3.9 H	4.0 H	4.2	5.0	5.9	4.8	5.5 H	90.2	2.6	2.3	2.2
RDQ Economics	2.7	5.8	3.1	2.8	2.8	3.0	3.1	3.1	3.4	3.6	3.8	5.2	5.8	4.6	5.3	90.8	2.2	2.3	2.3
DePrince & Associates	2.7	5.7	3.2	2.9	2.8	2.9	3.1	3.3	3.4	3.5	3.7	4.8	5.8	4.5	5.2	89.9	2.7	2.3	2.4
Daiwa Capital Markets America	2.7	5.8	3.2	2.9	2.8	2.9	3.1	3.4	3.6	3.7	3.9	4.8	5.6	na	5.4	90.0	2.4	2.3	2.4
MUFG Union Bank	2.7	5.8	3.0	2.7	2.7	2.8	3.2	3.0	3.2	3.3	3.5	4.3	5.1	4.2	4.9	82.0 L	2.9	2.1	3.0
High Frequency Economics	2.7	5.8	na	na	2.7	2.9	3.0	3.0	3.2	3.4	3.6	na	na	na	na	na	2.5	2.7	2.7
Chmura Economics & Analytics	2.7	5.8	3.3	2.8	2.7	2.9	3.1	3.3	3.5	3.6	3.9	4.7	na	na	5.1	86.8	3.3	1.9	2.3
Oxford Economics	2.7	5.5	3.1	na	2.6	2.8	2.8	3.0	3.1	3.3	3.6	na	na	na	5.0	84.7	2.2	2.3	2.1
Swiss Re	2.6	5.6	2.8	2.6	2.5	2.6	2.7	2.9	2.8	2.9	3.6	4.7	5.6	na	4.8	na	1.8	1.8	0.5 L
The Northern Trust Company	2.6	5.8	3.1	2.7	2.8	2.9	3.0	3.2	3.5	3.8	4.0	5.3	6.1	4.8	5.4	84.7	2.3	2.0	2.0
Bank of America Merrill Lynch	2.6	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	1.9	1.9	2.2
BNP Paribas Americas	2.6	na	2.7	na	na	na	na	2.8	3.1	3.3	na	na	na	na	na	na	2.0	na	1.5
Chase Wealth Management	2.6	5.8	3.0	3.0	2.7	2.9	3.0	3.1	3.3	3.5	3.8	4.6	5.4	4.4	5.1	88.8	2.3	2.0	2.3
Regions Financial Corporation	2.5	5.6	2.8	2.4	2.4	2.6	2.7	2.9	3.3	3.4	3.7	4.7	5.4	4.5	5.0	87.7	2.2	2.0	2.1
Grant Thornton/Diane Swonk	2.5	5.5	3.0	2.8	2.4	2.8	3.0	3.2	3.4	3.5	3.8	4.2	5.3	3.6	5.1	92.7 H	2.5	2.5	2.2
Nomura Securities, Inc.	2.5	5.5	na	na	na	na	na	3.0	3.0	3.1	na	4.2	4.7 L	na	na	na	2.1	2.0	1.4
AIG	2.5	5.6	na	na	2.4	2.7	2.9	2.9	3.1	3.3	3.7	na	5.1	na	4.8	na	2.3	2.5	1.5
Societe Generale	2.5	5.8	na	na	2.6	na	na	3.1	na	2.8	2.9	na	na	na	na	na	1.1 L	1.8	2.0
Via Nova Investment Mgt.	2.5	5.5	3.0	2.4	2.4	2.6	2.8	3.0	3.5	3.8	4.0	4.9	5.4	4.9 H	5.4	88.0	2.5	2.2	2.3
Economist Intelligence Unit	2.5	5.5	2.6	2.6	2.6	2.7	2.8	3.2	3.4	3.6	3.8	na	na	na	5.2	na	3.2	na	2.3
Wells Fargo	2.5	5.5	2.8	2.4	2.7	2.8	2.8	3.1	3.3	3.5	3.6	4.6	5.4	4.1	5.0	84.3	2.9	2.3	2.4
Scotiabank Group	2.5	5.5	na	na	2.6	na	na	3.0	3.0	3.1	3.3	na	na	na	na	na	2.3	2.5	2.4
Nat'l Assn. of Realtors	2.5	5.5	na	2.6	2.7	2.8	2.9	3.1	3.3	3.5	3.7	4.6	5.4	na	5.0	na	2.7	2.2	3.0
GLC Financial Economics	2.5	5.5	2.8	2.5	2.5	2.7	2.7	2.9	3.4	3.7	3.8	5.1	5.8	4.4	5.4	86.8	3.2	1.8	2.4
Action Economics	2.5	5.6	2.6	2.6	2.6	2.7	2.8	2.9	3.1	3.3	3.4	4.3	5.1	3.8	4.9	87.0	3.2	2.6	2.5
Georgia State University	2.4	5.5	na	na	2.3	2.7	2.8	3.1	3.5	3.8	4.2	5.0	5.9	na	5.3	na	2.1	2.3	2.0
Comerica Bank	2.4	5.5	2.8	na	2.3	2.5	2.7	2.9	3.2	3.3	3.6	na	na	na	5.0	na	2.5	2.0	2.1
PNC Financial Services Corp.	2.4	5.5	2.9	na	2.5	2.7	2.8	3.0	3.3	3.4	3.7	na	5.4	4.2	5.0	86.7	2.6	2.1	2.2
Loomis, Sayles & Company	2.4	5.5	2.9	2.5	2.4	2.5	2.6	2.8	3.0	3.3	3.5	4.3	5.0	4.0	4.8	87.4	2.7	2.4	2.2
Moody's Capital Markets Group	2.4	5.5	3.1	2.5	2.4	2.5	2.5	2.5	2.7	2.9	3.0	4.0	4.7 L	3.5 L	4.6	89.8	2.2	1.9	1.6
Fannie Mae	2.4	5.5	na	na	2.7	2.7	2.8	2.9	3.1	3.2	3.3	na	na	na	4.8	na	2.3	2.8	2.3
Stone Harbor Investment Partners	2.4	5.5	2.7	2.5	2.2	2.4	2.5	2.9	3.3	3.6	3.8	4.8	5.6	na	5.2	85.0	2.5	2.9	2.7
Cycledata Corp.	2.1	5.2	2.5 L	2.0 L	2.1	2.3	2.5	2.7	3.0	3.2	3.4	4.3	5.1	4.1	4.8	87.0	2.6	2.2	2.1
ACIMA Private Wealth	2.0 L	5.0 L	2.5 L	2.5	1.8 L	2.0 L	1.9 L	2.0 L	2.0 L	2.0 L	2.6 L	3.9 L	5.0	3.7	4.2 L	83.0	1.8	2.2	2.1
June Consensus	**2.6**	**5.6**	**3.0**	**2.7**	**2.6**	**2.7**	**2.9**	**3.0**	**3.2**	**3.4**	**3.7**	**4.7**	**5.5**	**4.3**	**5.1**	**87.0**	**2.4**	**2.2**	**2.2**
Top 10 Avg.	2.8	5.9	3.2	3.0	2.8	3.0	3.2	3.3	3.6	3.8	4.1	5.1	5.9	4.6	5.4	90.0	3.0	2.6	2.7
Bottom 10 Avg.	2.3	5.4	2.7	2.4	2.3	2.5	2.6	2.7	2.9	3.0	3.2	4.2	5.0	3.9	4.7	84.0	1.9	1.9	1.5
May Consensus	2.6	5.6	2.9	2.7	2.6	2.7	2.9	3.0	3.2	3.4	3.7	4.7	5.4	4.3	5.0	86.5	2.4	2.2	2.2
Number of Forecasts Changed From A Month Ago:																			
Down	4	4	5	5	6	8	8	6	5	6	12	8	7	6	8	5	10	8	7
Same	35	31	20	17	20	14	15	21	15	21	18	9	9	11	10	9	23	27	31
Up	5	4	7	4	12	13	12	14	20	14	9	10	12	6	17	11	11	7	6
Diffusion Index	51 %	50 %	53 %	48 %	58 %	57 %	56 %	60 %	69 %	60 %	46 %	54 %	59 %	50 %	63 %	62 %	51 %	49 %	49 %

Third Quarter 2019

Interest Rate Forecasts

Key Assumptions

Blue Chip Financial Forecasts Panel Members	Percent Per Annum -- Average For Quarter															Avg. For	(Q-Q % Change) (SAAR)		
	Short-Term							Intermediate-Term				Long-Term							
	1 Federal Funds Rate	2 Prime Bank Rate	3 LIBOR Rate 3-Mo.	4 Com. Paper 1-Mo.	5 Treas. Bills 3-Mo.	6 Treas. Bills 6-Mo.	7 Treas. Bills 1-Yr.	8 Treas. Notes 2-Yr.	9 Treas. Notes 5-Yr.	10 Treas. Notes 10-Yr.	11 Treas. Bond 30-Yr.	12 Aaa Corp. Bond	13 Baa Corp. Bond	14 State & Local Bonds	15 Home Mtg. Rate	A. Fed's Major Currency $ Index	B. Real GDP	C. GDP Price Index	D. Cons. Price Index
Moody's Analytics	3.7 H	6 9 H	4.0 H	3.7	3.4 H	3 5 H	3.7 H	3 8 H	3 9	4.0	4.7 H	5 5 H	6.5 H	4.4	5.4	na	1 9	2 8	2.6
J.P. Morgan Chase	3.1	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	1 8	2 3	2.4
RBC Capital Markets	3.1	na	na	na	na	na	na	3 5	3 6	3.7	3 8	na	na	na	na	na	3.4	1.4 L	3.0
Barclays Capital	3.1	6 3	na	na	na	na	na	na	na	na	na	na	na	na	na	na	2 0	2 3	2.2
Goldman Sachs & Co.	3 0	na	3.3	na	2 9	na	na	3 2	3.4	3.5	3 6	na	na	na	4 9	na	1.7	2 0	2.0
MUFG Union Bank	3 0	6 0	3.2	2.9	3 0	3.1	3.4	3 2	3 3	3.4	3 6	4.4	5.2	4 3	5 0	81.0 L	2 8	2.1	2.8
Amherst Pierpont Securities	3 0	6.1	3.4	3.0	3 0	3 2	3.3	3.4	3 8	4.0	4.4	5 3	6.2	4 8	5.7	92.0	2 6	2 6	3.3
High Frequency Economics	2 9	6 0	na	na	3 0	3.1	3.2	3.1	3 3	3.5	3.7	na	na	na	na	na	2.1	2 8	2.8
Chmura Economics & Analytics	2 9	6 0	3.5	3.1	3 0	3 2	3.3	3 5	3.7	3.7	4.1	4 8	na	na	5 2	86.2	3.7 H	2 2	2.4
Oxford Economics	2 9	5.7	3.2	na	2 8	3 0	3.0	3.1	3 2	3.3	3.7	na	na	na	5.1	84.9	1 9	2 5	2.0
Naroff Economic Advisors	2 9	6 0	3.2	4.0 H	3 2	3 3	3.4	3 6	3.7	4.0	4 3	5 5 H	6.1	5 0	5.7 H	83.5	2 2	2 3	2.3
RDQ Economics	2 9	6 0	3.3	3.0	3 0	3.1	3.2	3 3	3 6	3.8	4 0	5 5 H	6.1	4 9	5 5	91.3	2 3	2.4	2.4
Daiwa Capital Markets America	2 9	6 0	3.3	3.1	3 0	3.1	3.3	3 5	3.7	3.8	4 0	4 9	5.7	na	5 6	90.0	2 2	2.4	2.5
MacroFin Analytics	2 9	6 0	3.5	3.0	3.1	3 2	3.5	3.7	4.1 H	4.2 H	4.4	5 2	6.0	5.0	5.7 H	90.5	2 3	2.1	2.1
NatWest Markets	2 9	6 0	3.2	2.9	2 9	3.1	3.2	3 3	3 3	3.4	3 6	4 8	5.5	4.1	5 2	88.0	2 6	2 0	1.3 L
S&P Global	2 9	5 6	3.1	na	2.7	2 9	3.0	3 0	3 2	3.4	3.7	na	na	na	5 0	83.7	2 3	2.1	1.9
BMO Capital Markets	2 9	6 0	3.1	na	2 6	2 8	2.9	3.1	3 3	3.4	3 6	na	na	na	5.1	83.5	2 0	1 9	2.0
Bank of America Merrill Lynch	2 9	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	1 9	1 9	2.4
Swiss Re	2 9	5 9	3.0	2.8	2.7	2 9	3.0	3.1	2 9	3.0	3.7	4.7	5.6	na	4 8	na	1.7	3.4 H	3.4 H
DePrince & Associates	2 9	5 9	3.3	3.1	3 0	3.1	3.2	3.4	3 5	3.6	3 8	5.1	5.9	4.7	5.4	90.1	2.7	2 2	2.4
Chase Wealth Management	2 8	6 0	3.2	3 2	2 9	3.1	3.2	3 3	3 5	3.7	4 0	4 8	5.6	4.6	5 3	88.7	2.1	2.1	2.2
Via Nova Investment Mgt.	2 8	5 8	3.2	2.7	2.7	2 8	3.1	3 3	3 8	4.0	4 3	5 2	5.6	5.2 H	5 6	88.0	2.4	2 2	2.3
Nomura Securities, Inc.	2 8	5 8	na	na	na	na	na	3 0	3 0	3.0	na	4 0	4.6	na	na	na	2.1	2 0	2.5
Action Economics	2.7	5 8	2.9	2 8	2 9	2 9	3.0	3.1	3 2	3.3	3.4	4 3	5.1	3.8	4 9	86.8	3.1	2 3	2.5
Societe Generale	2.7	5 8	na	na	2.7	na	na	3 0	na	2.5	2 9	na	na	na	na	na	0 0 L	1.7	1.7
Wells Fargo	2.7	5.7	2.9	2 6	2 8	2 9	2.9	3 2	3 3	3.6	3.7	4 6	5.5	4.2	5.1	82.8	2.7	2.4	2.9
The Northern Trust Company	2.7	5 8	3.1	2 8	2 8	2 9	3.0	3 2	3 6	3.9	4 2	5.4	6.2	4.9	5 5	84.9	1 9	2 0	2.0
Economist Intelligence Unit	2.7	5.7	2.7	2 8	2 8	2 8	3.0	3 3	3 6	3.7	4 0	na	na	na	5 3	na	2 2	na	2.3
Grant Thornton/Diane Swonk	2.7	5.7	3.2	3 0	2 5	2 9	3.1	3 3	3.4	3.6	4 0	4 3	5.4	3.7	5.1	93.1 H	2 3	2 6	2.4
AIG	2.7	5.7	na	na	2 5	2 8	3.0	3 0	3.1	3.4	3 8	na	5.3	na	4 9	na	2 2	2 5	1.5
Comerica Bank	2.7	5 8	3.1	na	2 6	2.7	2.9	3.1	3.4	3.5	3 8	na	na	na	5 2	na	2.4	2 0	2.0
Georgia State University	2 6	5 8	na	na	2.4	2 9	3.0	3 3	3 6	3.9	4 3	5 2	6.0	na	5.4	na	2 2	2 2	2.0
Loomis, Sayles & Company	2 6	5.7	3.1	2.7	2 6	2.7	2.7	2 8	3 0	3.3	3 5	4 3	5.0	4.0	4 8	87.5	2 6	2.4	2.2
Stone Harbor Investment Partners	2 6	5 8	3.0	2 8	2 5	2 6	2.8	3.1	3.4	3.7	3 8	4 9	5.7	na	5 3	86.0	2 3	3 0	3.0
BNP Paribas Americas	2 6	na	2.7	na	na	na	na	2.7	3 0	3.2	na	na	na	na	na	na	1 2	na	2.4
Nat l Assn. of Realtors	2 6	5 6	na	2.7	2 8	2 9	3.0	3 2	3.4	3.6	3 8	4.7	5.6	na	5.1	na	2 6	2.1	2.8
Regions Financial Corporation	2 6	5 6	2.9	2 5	2 5	2 6	2.7	2 9	3 3	3.4	3 8	4.7	5.5	4.5	5 0	87.3	1 9	2.1	2.1
GLC Financial Economics	2 6	5 6	2.8	2 6	2 6	2.7	2.7	2 9	3 5	3.8	4 0	5.4	6.1	4.6	5 5	86.9	2 6	2.1	2.5
PNC Financial Services Corp.	2 5	5 5	3.0	na	2.7	2 8	2.9	3 0	3 3	3.4	3.7	na	5.4	4.1	5 0	86.7	2 3	2.1	2.2
Scotiabank Group	2 5	5 5	na	na	2 6	na	na	3 0	3.1	3.2	3.4	na	na	na	na	na	2 2	2 0	2.5
Moody's Capital Markets Group	2.4	5 5	3.1	2 5	2.4	2.4	2.4	2.4	2 6	2.8	2 9	4.1	4.6 L	3.4 L	4 5	89.6	2.1	2 0	1.8
Fannie Mae	2.4	5 5	na	na	2 8	2 8	2.9	3 0	3.1	3.2	3 3	na	na	na	4 8	na	2 2	2 5	2.9
Cycledata Corp.	2.1	5 2	2.5 L	2 0 L	2.1	2 3	2.5	2.7	3 0	3.2	3.4	4 3	5.1	4.1	4 8	87.0	2 6	2 2	2.1
ACIMA Private Wealth	1 9 L	4 9 L	2.5 L	2 5	1.7 L	1 9 L	1.9 L	2 0 L	2 0 L	1.9 L	2 5 L	3 9 L	5.0	3.7	3 3 L	84.0	1 8	2.0	1.9
June Consensus	**2.8**	**5.8**	**3.1**	**2.9**	**2.7**	**2.9**	**3.0**	**3.1**	**3.3**	**3.5**	**3.8**	**4.8**	**5.6**	**4.4**	**5.1**	**87.1**	**2.2**	**2.2**	**2.3**
Top 10 Avg.	3.1	6.1	3.4	3.2	3.0	3 2	3.4	3.5	3.7	3.9	4.2	5 3	6.1	4 8	5.6	90.1	2.9	2.7	3.0
Bottom 10 Avg.	2.4	5.4	2.8	2.5	2.4	2 5	2.6	2.7	2.9	2.9	3.2	4 3	5.1	3 9	4.7	84.0	1.6	1 9	1.8
May Consensus	2.8	5.8	3.1	2.9	2.7	2 9	3.0	3.1	3.3	3.5	3.8	4 8	5.5	4.4	5.1	86.6	2.2	2 3	2.3
Number of Forecasts Changed From A Month Ago:																			
Down	4	4	6	5	7	8	7	7	5	8	13	9	4	5	7	6	11	11	9
Same	35	29	18	16	19	14	14	18	18	23	18	13	13	8	14	10	22	25	28
Up	5	6	8	5	12	13	14	16	17	10	8	5	11	8	14	10	11	6	7
Diffusion Index	51 %	53 %	53 %	50 %	57 %	57 %	60 %	61 %	65 %	52 %	44 %	43 %	63 %	57 %	60 %	58 %	50 %	44 %	48 %

International Interest Rate And Foreign Exchange Rate Forecasts

United States

Blue Chip Forecasters	3 Mo. Interest Rate %			10 Yr. Gov't Bond Yield %			Fed's Major Currency $ Index		
	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo.
Barclays	na	na	na	2.75	2.75	na	na	na	na
BMO Capital Markets	na	na	na	3.16	3.23	3.39	86.7	85.2	83.9
IHSMarkit	na	na	na	3.19	3.32	3.51	na	na	na
ING Financial Markets	2.65	2.85	3.05	3.40	3.30	3.20	94.4	96.9	97.2
Mizuho Research Institute	2.35	2.35	2.35	3.20	3.20	3.20	87.0	86.0	86.0
Moody's Analytics	na	na	na	3.29	3.60	3.89	na	na	na
Moody's Capital Markets	na	na	na	3.00	2.93	2.88	88.0	88.5	89.0
Nomura Securities	na	na	na	na	na	na	na	na	na
Oxford Economics	na	na	na	3.14	3.20	3.00	86.8	85.1	84.7
Scotiabank	na	na	na	2.97	3.03	3.30	na	na	na
Wells Fargo	2.50	2.65	2.90	3.05	3.20	3.37	na	na	na
June Consensus	**2.50**	**2.62**	**2.77**	**3.12**	**3.18**	**3.30**	**88.6**	**88.3**	**88.2**
High	2.65	2.85	3.05	3.40	3.60	3.89	94.4	96.9	97.2
Low	2.35	2.35	2.35	2.75	2.75	2.88	86.7	85.1	83.9
Last Months Avg.	2.09	2.21	2.36	3.01	3.13	3.27	87.5	87.5	87.3

Japan

Blue Chip Forecasters	3 Mo. Interest Rate %			10 Yr. Gov't Bond Yield %			USD/YEN		
	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo.
Barclays	na	na	na	0.05	0.05	na	103.0	101.0	na
BMO Capital Markets	na	na	na	0.07	0.09	0.11	108.0	106.0	104.0
IHSMarkit	na	na	na	na	na	na	109.4	109.9	112.2
ING Financial Markets	0.05	0.05	0.10	0.10	0.10	0.10	105.0	105.0	102.0
Mizuho Research Institute	0.09	0.09	0.09	0.05	0.05	0.05	110.0	108.0	108.0
Moody's Analytics	na	na	na	0.06	0.06	0.04	110.8	111.9	111.1
Moody's Capital Markets	na	na	na	0.05	0.08	0.13	112.0	113.0	114.0
Nomura Securities	na	na	na	na	na	na	108.0	110.0	110.0
Oxford Economics	na	na	na	0.08	0.08	0.08	109.5	110.6	113.4
Scotiabank	na	na	na	na	na	na	109.0	110.0	110.0
Wells Fargo	-0.02	-0.01	0.00	0.07	0.08	0.10	na	na	na
June Consensus	**0.04**	**0.04**	**0.06**	**0.07**	**0.07**	**0.09**	**108.5**	**108.5**	**109.4**
High	0.09	0.09	0.10	0.10	0.10	0.13	112.0	113.0	114.0
Low	-0.02	-0.01	0.00	0.05	0.05	0.04	103.0	101.0	102.0
Last Months Avg.	0.02	0.02	0.03	0.06	0.07	0.08	107.5	107.9	108.8

United Kingdom

Blue Chip Forecasters	3 Mo. Interest Rate %			10 Yr. Gilt Yields %			GBP/USD		
	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo.
Barclays	na	na	na	1.70	1.75	na	1.42	1.44	na
BMO Capital Markets	na	na	na	1.72	1.93	2.21	1.39	1.42	1.45
IHSMarkit	na	na	na	na	na	na	1.39	1.38	1.39
ING Financial Markets	0.80	0.80	1.05	1.75	1.85	1.90	1.40	1.53	1.61
Mizuho Research Institute	0.85	0.85	1.10	1.60	1.65	1.80	na	na	na
Moody's Analytics	na	na	na	1.70	1.69	1.91	1.33	1.28	1.29
Moody's Capital Markets	na	na	na	1.50	1.55	1.60	1.33	1.32	1.31
Nomura Securities	na	na	na	na	na	na	1.43	1.48	1.48
Oxford Economics	na	na	na	1.94	2.20	2.45	1.42	1.47	1.48
Scotiabank	na	na	na	na	na	na	1.41	1.45	1.48
Wells Fargo	0.80	0.90	1.15	1.70	1.85	2.10	na	na	na
June Consensus	**0.82**	**0.85**	**1.10**	**1.70**	**1.81**	**2.00**	**1.39**	**1.42**	**1.44**
High	0.85	0.90	1.15	1.94	2.20	2.45	1.43	1.53	1.61
Low	0.80	0.80	1.05	1.50	1.55	1.60	1.33	1.28	1.29
Last Months Avg.	0.83	0.83	0.96	1.64	1.75	1.98	1.40	1.41	1.45

Switzerland

Blue Chip Forecasters	3 Mo. Interest Rate %			10 Yr. Gov't Bond Yield %			USD/CHF		
	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo.
Barclays	na	na	na	na	na	na	0.97	0.97	na
BMO Capital Markets	na	na	na	na	na	na	0.98	0.97	0.97
IHSMarkit	na	na	na	na	na	na	1.00	1.00	1.01
ING Financial Markets	-0.65	-0.65	-0.65	0.20	0.25	0.45	1.00	0.96	0.96
Mizuho Research Institute	na	na	na	na	na	na	na	na	na
Moody's Analytics	na	na	na	0.24	0.30	0.46	1.00	1.04	1.04
Moody's Capital Markets	na	na	na	0.05	0.08	0.10	1.00	1.00	1.00
Nomura Securities	na	na	na	na	na	na	0.98	0.94	0.94
Oxford Economics	na	na	na	0.23	0.34	0.64	0.94	0.91	0.91
Scotiabank	na	na	na	na	na	na	na	na	na
Wells Fargo	na	na	na	na	na	na	na	na	na
June Consensus	**-0.65**	**-0.65**	**-0.65**	**0.18**	**0.24**	**0.41**	**0.98**	**0.97**	**0.98**
High	-0.65	-0.65	-0.65	0.24	0.34	0.64	1.00	1.04	1.04
Low	-0.65	-0.65	-0.65	0.05	0.08	0.10	0.94	0.91	0.91
Last Months Avg.	-0.75	-0.75	-0.75	0.14	0.23	0.40	0.97	0.97	0.96

Canada

Blue Chip Forecasters	3 Mo. Interest Rate %			10 Yr. Gov't Bond Yield %			USD/CAD		
	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo.
Barclays	na	na	na	na	na	na	1.29	1.28	na
BMO Capital Markets	na	na	na	2.60	2.70	2.97	1.27	1.26	1.24
IHSMarkit	na	na	na	na	na	na	1.24	1.23	1.27
ING Financial Markets	2.00	2.00	2.30	2.60	2.70	2.90	1.25	1.23	1.20
Mizuho Research Institute	na	na	na	na	na	na	na	na	na
Moody's Analytics	na	na	na	3.10	3.53	3.91	1.27	1.26	1.23
Moody's Capital Markets	na	na	na	2.48	2.45	2.40	1.29	1.29	1.29
Nomura Securities	na	na	na	na	na	na	1.30	1.28	1.26
Oxford Economics	na	na	na	2.67	2.79	3.04	1.28	1.28	1.27
Scotiabank	na	na	na	2.48	2.53	2.63	1.26	1.25	1.23
Wells Fargo	1.90	2.00	2.25	2.50	2.50	2.65	na	na	na
June Consensus	**1.95**	**2.00**	**2.28**	**2.63**	**2.74**	**2.93**	**1.27**	**1.26**	**1.25**
High	2.00	2.00	2.30	3.10	3.53	3.91	1.30	1.29	1.29
Low	1.90	2.00	2.25	2.48	2.45	2.40	1.24	1.23	1.20
Last Months Avg.	1.78	1.95	2.08	2.49	2.68	2.87	1.27	1.26	1.24

International Interest Rate And Foreign Exchange Rate Forecasts

Australia

	3 Mo. Interest Rate %			10 Yr. Gov't Bond Yield %			AUD/AUD		
Blue Chip Forecasters	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo.
Barclays	na	na	na	na	na	na	0.77	0.77	na
BMO Capital Markets	na	na	na	na	na	na	0.77	0.78	0.79
IHSMarkit	na	na	na	na	na	na	0.73	0.73	0.72
ING Financial Markets	1.90	2.05	2.40	3.00	3.20	3.30	0.78	0.80	0.85
Mizuho Research Institute	na	na	na	na	na	na	na	na	na
Moody's Analytics	na	na	na	2.67	2.67	2.74	0.76	0.74	0.72
Moody's Capital Markets	na	na	na	2.90	2.93	2.90	0.76	0.75	0.75
Nomura Securities	na	na	na	na	na	na	0.73	0.75	0.77
Oxford Economics	na	na	na	3.00	3.14	3.27	0.76	0.76	0.76
Scotiabank	na	na	na	na	na	na	0.79	0.80	0.81
Wells Fargo	na	na	na	na	na	na	na	na	na
June Consensus	**1.90**	**2.05**	**2.40**	**2.89**	**2.98**	**3.05**	**0.76**	**0.76**	**0.77**
High	1.90	2.05	2.40	3.00	3.20	3.30	0.79	0.80	0.85
Low	1.90	2.05	2.40	2.67	2.67	2.74	0.73	0.73	0.72
Last Months Avg.	1.80	1.90	2.20	2.83	2.93	3.06	0.76	0.77	0.78

Eurozone

	3 Mo. Interest Rate %			USD/EUR		
Blue Chip Forecasters	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo.
Barclays	na	na	na	1.22	1.22	na
BMO Capital Markets	na	na	na	1.22	1.24	1.26
IHSMarkit	na	na	na	1.20	1.20	1.19
ING Financial Markets	-0.33	-0.33	-0.20	1.23	1.30	1.32
Mizuho Research Institute	-0.30	-0.30	-0.20	1.22	1.24	1.25
Moody's Analytics	na	na	na	1.18	1.14	1.13
Moody's Capital Markets	na	na	na	1.17	1.17	1.17
Nomura Securities	na	na	na	1.23	1.27	1.30
Oxford Economics	na	na	na	1.25	1.30	1.30
Scotiabank	na	na	na	1.27	1.29	1.32
Wells Fargo	-0.30	-0.20	0.05	na	na	na
June Consensus	**-0.31**	**-0.28**	**-0.12**	**1.22**	**1.24**	**1.25**
High	-0.30	-0.20	0.05	1.27	1.30	1.32
Low	-0.33	-0.33	-0.20	1.17	1.14	1.13
Last Months Avg.	-0.33	-0.32	-0.23	1.23	1.23	1.26

	10 Yr. Gov't Bond Yields %											
	Germany			France			Italy			Spain		
Blue Chip Forecasters	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo.	In 3 Mo.	In 6 Mo.	In 12 Mo.
Barclays	0.75	0.85	na	na	na	na	na	na	na	na	na	na
BMO Capital Markets	0.85	1.07	1.30	na	na	na	na	na	na	na	na	na
ING Financial Markets	0.70	0.75	0.90	1.00	1.05	1.20	2.20	2.15	2.30	1.50	1.55	1.70
Mizuho Research Institute	0.65	0.70	0.75	na	na	na	na	na	na	na	na	na
Moody's Analytics	0.72	0.93	1.22	0.97	1.07	1.25	2.02	2.19	2.37	1.82	2.03	2.25
Moody's Capital Markets	0.65	0.70	0.75	0.93	1.00	1.05	2.45	2.46	1.45	1.57	1.65	1.73
Nomura Securities	na	na	na	na	na	na	na	na	na	na	na	na
Oxford Economics	0.80	0.95	1.18	1.15	1.32	1.57	2.10	2.30	2.63	1.50	1.72	2.14
Wells Fargo	0.75	0.90	1.20	na	na	na	na	na	na	na	na	na
June Consensus	**0.73**	**0.86**	**1.04**	**1.01**	**1.11**	**1.27**	**2.19**	**2.27**	**2.19**	**1.60**	**1.74**	**1.96**
High	0.85	1.07	1.30	1.15	1.32	1.57	2.45	2.46	2.63	1.82	2.03	2.25
Low	0.65	0.70	0.75	0.93	1.00	1.05	2.02	2.15	1.45	1.50	1.55	1.70
Last Months Avg.	0.70	0.81	1.03	0.93	1.06	1.29	1.98	2.09	2.33	1.47	1.61	1.86

Consensus Forecasts
10-year Bond Yields vs U.S. Yield

	Current	In 3 Mo.	In 6 Mo.	In 12 Mo.
Japan	-2.98	-3.05	-3.10	-3.22
United Kingdom	-1.45	-1.41	-1.37	-1.31
Switzerland	-2.87	-2.94	-2.93	-2.89
Canada	-0.51	-0.48	-0.43	-0.38
Australia	-0.18	-0.22	-0.19	-0.25
Germany	-2.39	-2.38	-2.32	-2.26
France	-2.17	-2.10	-2.07	-2.04
Italy	-0.88	-0.92	-0.90	-1.12
Spain	-1.76	-1.52	-1.44	-1.35

Consensus Forecasts
3 Mo. Deposit Rates vs U.S. Rate

	Current	In 3 Mo.	In 6 Mo.	In 12 Mo.
Japan	-2.35	-2.46	-2.66	-2.70
United Kingdom	-1.68	-1.68	-1.77	-1.67
Switzerland	-3.04	-3.15	-3.27	-3.42
Canada	-0.62	-0.55	-0.62	-0.49
Australia	-0.29	-0.60	-0.57	-0.37
Eurozone	-2.65	-2.81	-2.89	-2.88

Viewpoints:

A Sampling of Views on the Economy, Financial Markets and Government Policy Excerpted from Recent Reports Issued by our Blue Chip Panel Members and Others

3:10 To Luna

To begin, let me apologize to the Oscar-nominated Western, 3:10 to Yuma, for title tainting. But, the sight of 10-year Treasury yields closing above 3.10% during this week—for the first time in nearly 7 years—was too tempting. The 3.10% mark happened to be our forecast for the average level this December, and we've hit it some seven months early. With a slight upward revision to our oil price projection as a backdrop, we're changing our year-end forecast to 3.25% (and lifting our Canada 10-year forecast to 2.70% from 2.55%)—a modest "moonward" adjustment (okay… I apologize for the cheesy "Luna" rhyme too). Importantly, we still expect longer-term yields to exhibit a ratcheting pattern, posting temporary rallies (perhaps even back below 3% in the weeks ahead) as yield-starved investors take advantage of the multiyear highs. This will continue to restrain the net rising trend, despite it having perked up in the past couple of weeks. Several factors have contributed to the perking.

First, the economy is picking up. The rote Q1 slowdown is behind us and left the economy no worse for wear. Indeed, real GDP growth actually accelerated to 2.9% y/y in Q1, up from 2.6% in Q4. And, the emerging stream of Q2 economic indicators has, so far, proved to be consistently upbeat. For example, the Atlanta Fed's GDP Nowcast began tracking Q2 three weeks ago. As was the case in the previous four quarterly trackings, the growth rate prediction first began at least at 4%. However, unlike these prior episodes, the reading has not receded but moved sideways, indicative of a consistent solid tone to the data flow.

Second, headline inflation risk is increasing, greased by higher oil prices. WTI crude has closed above $70 for the past eight days, the highest level in 3½ years. The factors fuelling this rise—the potential for reduced supply from Iran and Venezuela along with expectations for sturdy crude oil demand—led us to revise up our oil price forecast. We now see WTI closing above $65 this year versus closer to $60 before.

Third, some labour market metrics passed some key milestones, stoking wage growth expectations. The unemployment rate slipped below 4% in April (down two tenths to 3.9%), which, apart from a sole 3.8% print in April 2000, was the lowest jobless rate in more than 48 years. Also, the number of unemployed now sits below the number of job openings for the first time since the latter data commenced in 2000. Finally, the two-tenths drop in the broad U6 rate to 7.8% catapulted it to an exact 17-year low (it matched the lowest level in more than 11 years before).

Fourth, the pace of Fed redemptions is picking up, so there's increasingly less Fed demand being recycled into all maturities. In the four weeks ended May 16th, more than $26 billion was not rolled over, which is at least 75% above any other four-week period since balance sheet normalization commenced in October 2017. Meanwhile, Treasury is increasing its debt issuance across all maturities to finance the return of trillion-dollar deficits. Although this is skewed more to shorter-term maturities than longer-term tenors, a record amount of 10-year notes and 30-year bonds were still issued in May (the record dates to 1980).

On balance, while we don't expect yields to continue escalating at their present pace, a moderate net uptrend now seems to have a tighter grip on Treasuries.

Michael Gregory, BMO Capital Markets, Toronto Canada

Don't Fret About Household Debt (Yet)

It feels like every few months a major media outlet will splash a story about the return of the overleveraged US consumer. Every few months—three, to be precise—the NY Fed's quarterly report on household debt and credit arrives to provide a cross-check to these stories. Unlike many of the data sources in the news, the NY Fed report is a rigorously designed, nationally representative look at all forms of household credit. The latest such report, released Thursday and covering 1Q18—indicates there is little evidence that households are levering up, that credit quality is worsening, or that loan performance is deteriorating.

In fairness to the fourth estate, it doesn't hurt to remain vigilant, particularly in light of the aftermath of the early 2000s credit boom. While there is so far little sign of household credit becoming a problem, that could change fairly quickly and so a quarterly check-up is well-advised. And rather than continually fighting the last war we should also be vigilant to other areas of credit growth. Credit growth in the nonfinancial business sector, for example, may be exhibiting a little more froth than in the household sector.

Total household debt increased by $63 billion last quarter to $13.2 trillion, well above the $12.7 trillion peak reached at the end of the last cycle. Of course a lot of nominal variables are at all-time highs—GDP, consumption, income, etc.—and so a sense of proportion is warranted. Scaled by personal income, household debt stood at 78.2% of income in 1Q18, down slightly from 4Q17 and well off the 104.4% peak reached in 1Q09. In fact, since 4Q12 the debt-to-income ratio has hovered in a narrow 76%-80% range. Aggregates can mask demographic heterogeneity, but the separately-reported triennial Survey of Consumer Finances indicates that in 2016—the latest data point—leverage was below its peak for all income quintiles.

The performance of loans to the household sector continues to improve. Perhaps this should not be surprising given the decline in the jobless rate and steady growth in labor income. Households are now current on 95.4% of their loans; this is the highest level of the expansion.

One area of recurring focus for household loan performance is auto loans. Newly delinquent loan balances for autos stood at 7.3% of current balances in 1Q18.

Recent auto delinquencies are lower than they were during most of the last expansion, and obviously well off recession highs, though they are somewhat higher than the lows of the cycle. Those lows occurred after auto lenders tightened standards in the wake of the recession. As the recovery became more entrenched standards loosened modestly, with subsequent effects on performance. More recently, however, auto lenders have begun requiring cleaner credit, and the latest median credit score stood at 708, the highest since early 2011 (the bottom of the credit score distribution has risen in tandem). Given the recent tightening in standards, auto loan performance should remain reasonably healthy.

Auto loans represent less than 10% of household credit, while home mortgages are 67% of borrowing. It is harder to write a scary story about mortgage performance: newly delinquent mortgages stand at only 3.38% of current balances, the lowest in the history of a series going back 15 years. The low level of new or seriously delinquent loans is being felt down the pipeline, as the percent of consumers with new foreclosures remains at an all-time low of 0.03%.

The favorable news on mortgage loan performance has not encouraged mortgage lenders to loosen standards noticeably, so far. Median credit scores in 1Q18 stood at 761. While this is off the immediate post-recession highs, it remains 40 points higher than the pre-recession average.

Excessive and unaffordable debt can be a problem for the macroeconomy via two channels. First, for borrowers a a debt overhang can limit their ability to spend on other items. Second, for lenders non-performing loans can eat into capital thereby limiting the lenders' ability to extend credit to other borrowers. This second channel is not operative when it comes to student loans: the lender is increasingly the federal government. However, the first channel *(continued on next page)*

Viewpoints

A Sampling of Views on the Economy, Financial Markets and Government Policy Excerpted from Recent Reports Issued by our Blue Chip Panel Members and Others

could still be a concern, particularly if the economy heads to a nasty place. Recently there has been some rare but welcome good news concerning student lending. First, student loan growth has slowed to 4.7%oya, the first time in the series history that student loan growth has been slower than nominal GDP growth. Presumably the improving job situation has left fewer "labor market refugees" going back to school on loans. Second, newly delinquent loans recently slipped to 9.2% of current balances. This is still an extremely high number, but has fallen rapidly lately and is now at its lowest level since 2006.

Michael Feroli & Daniel Silver, JPMorgan Chase Bank, New York, NY

FOMC Minutes

We were looking for the minutes of the May FOMC meeting to provide context on the Committee's views on the trajectory of inflation, recent developments in financial conditions and implications for the path for policy, and views on balance sheet normalization in light of recent upward pressure on the effective federal funds rate. The minutes did not disappoint. Policymakers are not shaken up by the recent rise in inflation. They view this as being driven predominately by transitory factors, while measures of underlying trend inflation remain below 2%. Indeed, "a temporary period of inflation modestly above 2 percent...could be helpful". The Committee broadly recognized that financial conditions had tightened since the March meeting, but remained accommodative, and "had not materially altered their assessment of the outlook for the economy." Message received: the FOMC is intent on a June rate hike.

With time on their hands, policymakers diverted their focus to frameworks for policy implementation. Normalization of the Fed's balance sheet, in conjunction with other factors, has put upward pressure on the effective federal funds rate relative to the interest rate on excess reserves (IOER). As a quick fix, policymakers "generally agreed...to make a small technical adjustment" to policy mechanics. At a time when the FOMC raises the target range for the federal funds rate by 25bp, they would raise IOER by only 20bp in order to keep the effective federal funds rate well within the target range.

Excitement over fiscal stimulus has dimmed. Policymakers expressed uncertainty about the timing and size of the impacts from recent changes in fiscal policy. This seems like a shift from the more unambiguous stress on fiscal tailwinds expressed earlier this year. Moreover, policymakers expressed outright worry about trade policy uncertainty and its impact on the outlook. Beyond the next several years, "several participants...saw the trajectory of fiscal policy...as difficult to forecast."

The overall tone of the minutes carried a dovish tinge with respect to medium-term policy. Nothing in the minutes suggests that anything other than the gradual pace of policy tightening will continue. But there's more uncertainty about how much is needed over the medium-term, particularly as "some participants" believed that the forward guidance in the statement that policy remains accommodative and rates would likely remain below longer-run normal levels for some time is on the chopping block. That's just a change in the *description* of policy not a change in *actual* policy, and needs to be removed as they get closer to neutral. In our view, the fact that "some" are already arguing that this language is removed, means that "some" view the Fed is not far from the end of its tightening cycle.

Ellen Zenter, Morgan Stanley, New York, NY

May FOMC Minutes Show Increased Confidence in a Broadly Unchanged Outlook

The minutes of the May FOMC meeting indicated a continued upbeat view on the growth outlook among the Committee and the staff. Participants continued to describe growth as "moderate" and job gains as "strong," but they also acknowledged some softness in consumer spending—which was expected to "prove temporary." Both the staff and participants described risks to the economic outlook as roughly balanced but pointed to fiscal and trade policy as sources of uncertainty. Participants noted the difficulty involved in assessing the timing and magnitude of the effects of recent fiscal policy changes on the labor market and investment. Participants also noted that the outcomes from potential changes to trade policy are "particularly wide," and some noted that this uncertainty may lead to postponed or dampened capital spending. Despite these risks, participants noted "a number" of tailwinds supporting "continued above-trend" growth.

While the staff lowered its medium-term inflation forecast "a bit," this reflected "a touch" higher unemployment forecasts that are now arguably stale, given the 0.2pp subsequent drop in the jobless rate. Echoing the statement, the minutes noted that inflation had moved "close to 2 percent," which "most" participants found reassuring—though "several" noted the possible role of "transitory price changes" in healthcare and financial services. More generally, "participants" commented that the incoming data had "increased their confidence" in a sustained return of inflation to "near" 2 percent. Participants also viewed the Q1 employment cost index as an indication that the strong labor market was "showing through" to wage growth (despite the lack of uniformity across wage measures). The minutes also referenced a broadening in worker shortages—from "a few" to "a number" of districts.

In light of the recent move in the effective federal funds rate toward the top of the target range, the Committee discussed "a small technical realignment" of the interest rate on excess reserves (IOER) in order to keep the effective fed funds rate within the range. The deputy manager suggested this could be implemented by either (1) lowering IOER by 5 basis points at a meeting in which the FOMC decided to leave the target rate for the fed funds rate unchanged or (2) raising IOER by a smaller 20bp at a time when raising the target range for the fed funds rate by 25bp. Participants generally agreed that such a change would be appropriate "sooner rather than later," and we believe implementation is indeed likely at the June meeting (this would be consistent with the post-minutes rally in near-term Fed Funds futures). Making the adjustment at a meeting when the FOMC decided to hike rates was viewed as a simpler alternative to communicate, adding that IOER "does not, in itself, convey the stance of policy." Additionally, "a number of participants" raised that the Committee may want to discuss how to policy "most effectively and efficiently when the quantity of reserve balances reaches a level appreciably below that seen in recent years."

The incremental information in the minutes on the medium-term outlook for monetary policy was mixed to slightly dovish, in our view. "Participants" continued to view further gradual tightening as appropriate "if the economy evolves about as expected." However, "it was also noted" that a modest inflation overshoot could be "helpful" from the perspective of the Committee's objectives. "Some" members also noted the potential staleness of the forward guidance section of the statement—which currently suggests interest rates will "remain, for some time, below" longer-run levels and holds that "the stance of monetary policy remains accommodative." At the same time, given the increased confidence expressed in the inflation outlook and the risk assessed by "some" participants that supply constraints could "intensify" price and wage pressures, the net implications for the policy outlook were somewhat ambiguous.

Given the increased confidence in the inflation outlook but more dovish commentary on forward guidance and the potential desirability of a modest inflation overshoot, we left our subjective odds of a June hike unchanged at 95%.

Jan Hatizus, Goldman Sachs, New York, NY

Long-Range Survey:

The table below contains the results of our twice-annual long-range CONSENSUS survey. There are also Top 10 and Bottom 10 averages for each variable. Shown are consensus estimates for the years 2020 through 2024 and averages for the five-year periods 2020-2024 and 2025-2029. Apply these projections cautiously. Few if any economic, demographic and political forces can be evaluated accurately over such long time spans.

		----------Average For The Year----------					Five-Year Averages	
Interest Rates		**2020**	**2021**	**2022**	**2023**	**2024**	**2020-2024**	**2025-2029**
1. Federal Funds Rate	**CONSENSUS**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**
	Top 10 Average	3.5	3.6	3.6	3.5	3.5	3.5	3.5
	Bottom 10 Average	2.6	2.5	2.4	2.4	2.6	2.5	2.6
2. Prime Rate	**CONSENSUS**	**6.1**	**6.0**	**6.0**	**6.0**	**6.1**	**6.0**	**6.0**
	Top 10 Average	6.5	6.6	6.6	6.5	6.5	6.6	6.5
	Bottom 10 Average	5.6	5.5	5.4	5.5	5.6	5.5	5.6
3. LIBOR, 3-Mo.	**CONSENSUS**	**3.3**	**3.3**	**3.3**	**3.3**	**3.4**	**3.3**	**3.3**
	Top 10 Average	3.7	3.9	4.0	3.9	3.9	3.9	3.8
	Bottom 10 Average	2.9	2.8	2.7	2.7	2.9	2.8	2.9
4. Commercial Paper, 1-Mo.	**CONSENSUS**	**3.1**	**3.2**	**3.1**	**3.1**	**3.2**	**3.1**	**3.2**
	Top 10 Average	3.5	3.7	3.7	3.7	3.7	3.6	3.6
	Bottom 10 Average	2.7	2.6	2.6	2.6	2.7	2.6	2.7
5. Treasury Bill Yield, 3-Mo.	**CONSENSUS**	**3.0**	**3.0**	**2.9**	**2.9**	**3.0**	**3.0**	**3.0**
	Top 10 Average	3.5	3.6	3.6	3.5	3.6	3.5	3.5
	Bottom 10 Average	2.5	2.4	2.4	2.4	2.5	2.4	2.5
6. Treasury Bill Yield, 6-Mo.	**CONSENSUS**	**3.1**	**3.1**	**3.1**	**3.1**	**3.2**	**3.1**	**3.2**
	Top 10 Average	3.6	3.7	3.7	3.7	3.7	3.7	3.7
	Bottom 10 Average	2.7	2.6	2.5	2.5	2.7	2.6	2.7
7. Treasury Bill Yield, 1-Yr.	**CONSENSUS**	**3.2**	**3.3**	**3.2**	**3.2**	**3.3**	**3.2**	**3.3**
	Top 10 Average	3.7	3.8	3.8	3.8	3.8	3.8	3.9
	Bottom 10 Average	2.8	2.7	2.6	2.7	2.8	2.7	2.8
8. Treasury Note Yield, 2-Yr.	**CONSENSUS**	**3.4**	**3.4**	**3.4**	**3.4**	**3.4**	**3.4**	**3.5**
	Top 10 Average	3.9	4.0	4.0	3.8	4.0	3.9	4.1
	Bottom 10 Average	2.9	2.9	2.8	2.8	2.9	2.8	2.9
10. Treasury Note Yield, 5-Yr.	**CONSENSUS**	**3.6**	**3.6**	**3.6**	**3.6**	**3.7**	**3.6**	**3.8**
	Top 10 Average	4.0	4.1	4.1	4.1	4.2	4.1	4.4
	Bottom 10 Average	3.2	3.2	3.0	3.1	3.2	3.1	3.2
11. Treasury Note Yield, 10-Yr.	**CONSENSUS**	**3.8**	**3.8**	**3.8**	**3.8**	**3.8**	**3.8**	**3.9**
	Top 10 Average	4.3	4.3	4.4	4.3	4.4	4.3	4.5
	Bottom 10 Average	3.3	3.3	3.2	3.2	3.3	3.2	3.4
12. Treasury Bond Yield, 30-Yr.	**CONSENSUS**	**4.1**	**4.2**	**4.2**	**4.2**	**4.2**	**4.2**	**4.4**
	Top 10 Average	4.7	4.7	4.7	4.8	4.8	4.7	5.0
	Bottom 10 Average	3.6	3.6	3.6	3.6	3.7	3.6	3.7
13. Corporate Aaa Bond Yield	**CONSENSUS**	**5.2**	**5.2**	**5.2**	**5.3**	**5.4**	**5.3**	**5.4**
	Top 10 Average	5.7	5.8	5.9	6.0	6.0	5.9	6.0
	Bottom 10 Average	4.7	4.7	4.6	4.6	4.7	4.6	4.7
13. Corporate Baa Bond Yield	**CONSENSUS**	**6.0**	**6.0**	**6.0**	**6.1**	**6.2**	**6.1**	**6.3**
	Top 10 Average	6.6	6.8	6.9	7.0	7.0	6.9	7.0
	Bottom 10 Average	5.3	5.3	5.3	5.3	5.4	5.3	5.4
14. State & Local Bonds Yield	**CONSENSUS**	**4.6**	**4.5**	**4.5**	**4.5**	**4.6**	**4.5**	**4.6**
	Top 10 Average	5.1	5.1	5.1	5.1	5.1	5.1	5.2
	Bottom 10 Average	4.0	3.9	3.9	4.0	4.1	4.0	4.1
15. Home Mortgage Rate	**CONSENSUS**	**5.4**	**5.4**	**5.4**	**5.4**	**5.5**	**5.4**	**5.6**
	Top 10 Average	5.8	5.9	6.0	6.0	6.0	6.0	6.1
	Bottom 10 Average	4.9	4.9	4.8	4.8	4.9	4.9	5.0
A. FRB - Major Currency Index	**CONSENSUS**	**89.6**	**89.4**	**89.6**	**90.0**	**90.1**	**89.7**	**90.4**
	Top 10 Average	94.3	94.6	94.5	94.5	94.5	94.5	94.8
	Bottom 10 Average	84.6	84.0	84.3	85.4	85.6	84.8	85.9
		----------Year-Over-Year, % Change----------					Five-Year Averages	
		2020	**2021**	**2022**	**2023**	**2024**	**2020-2024**	**2025-2029**
B. Real GDP	**CONSENSUS**	**1.9**	**1.9**	**2.0**	**2.1**	**2.1**	**2.0**	**2.1**
	Top 10 Average	2.4	2.4	2.4	2.4	2.5	2.4	2.4
	Bottom 10 Average	1.5	1.3	1.5	1.8	1.8	1.6	1.8
C. GDP Chained Price Index	**CONSENSUS**	**2.2**	**2.2**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
	Top 10 Average	2.4	2.4	2.3	2.2	2.3	2.3	2.2
	Bottom 10 Average	2.0	2.0	2.0	1.9	2.0	2.0	2.0
D. Consumer Price Index	**CONSENSUS**	**2.3**	**2.3**	**2.3**	**2.2**	**2.2**	**2.3**	**2.2**
	Top 10 Average	2.7	2.6	2.5	2.4	2.5	2.5	2.4
	Bottom 10 Average	1.9	2.0	2.1	2.0	2.0	2.0	2.1

Databank:

2018 Historical Data

Monthly Indicator	Jan	Feb	Mar	Apr	May	Jun	Jly	Aug	Sep	Oct	Nov	Dec
Retail and Food Service Sales (a)	-0.2	0.0	0.8	0.3								
Auto & Light Truck Sales (b)	17.08	16.97	17.37	17.07								
Personal Income (a, current $)	0.4	0.3	0.3									
Personal Consumption (a, current $)	0.2	0.0	0.4									
Consumer Credit (e)	4.7	4.3	3.6									
Consumer Sentiment (U. of Mich.)	95.7	99.7	101.4	98.8								
Household Employment (c)	409	785	-37	3								
Non-farm Payroll Employment (c)	176	324	135	164								
Unemployment Rate (%)	4.1	4.1	4.1	3.9								
Average Hourly Earnings (All, cur. $)	26.71	26.74	26.80	26.84								
Average Workweek (All, hrs.)	34.4	34.5	34.5	34.5								
Industrial Production (d)	2.7	3.4	3.7	3.5								
Capacity Utilization (%)	76.9	77.1	77.6	78.0								
ISM Manufacturing Index (g)	59.1	60.8	59.3	57.3								
ISM Non-Manufacturing Index (g)	59.9	59.5	58.8	56.8								
Housing Starts (b)	1.339	1.290	1.336	1.287								
Housing Permits (b)	1.377	1.323	1.377	1.352								
New Home Sales (1-family, c)	633	659	672	662								
Construction Expenditures (a)	1.7	1.0	-1.7									
Consumer Price Index (nsa., d)	2.1	2.2	2.4	2.5								
CPI ex. Food and Energy (nsa., d)	1.8	1.8	2.1	2.1								
Producer Price Index (n.s.a., d)	2.7	2.8	3.0	2.6								
Durable Goods Orders (a)	-3.6	3.5	2.6									
Leading Economic Indicators (g)	0.8	0.7	0.4	0.4								
Balance of Trade & Services (f)	-56.7	-57.7	-49.0									
Federal Funds Rate (%)	1.29	1.42	1.49	1.69								
3-Mo. Treasury Bill Rate (%)	1.43	1.57	1.73	1.79								
10-Year Treasury Note Yield (%)	2.56	2.86	2.84	2.86								

2017 Historical Data

Monthly Indicator	Jan	Feb	Mar	Apr	May	Jun	Jly	Aug	Sep	Oct	Nov	Dec
Retail and Food Service Sales (a)	0.5	-0.2	0.1	0.3	0.0	-0.1	0.5	-0.1	2.0	0.7	0.8	-0.1
Auto & Light Truck Sales (b)	17.34	17.33	16.72	16.97	16.70	16.61	16.69	16.02	18.49	18.00	17.42	17.75
Personal Income (a, current $)	0.4	0.5	0.3	0.1	0.3	0.0	0.4	0.3	0.5	0.4	0.3	0.4
Personal Consumption (a, current $)	0.2	0.1	0.5	0.3	0.2	0.1	0.3	0.2	1.0	0.3	0.7	0.5
Consumer Credit (e)	3.1	5.2	4.7	3.9	5.8	3.7	5.7	3.7	5.7	5.8	9.8	6.0
Consumer Sentiment (U. of Mich.)	98.5	96.3	96.9	97.0	97.1	95.1	93.4	96.8	95.1	100.7	98.5	95.9
Household Employment (c)	-157	435	553	97	-269	358	261	-40	853	-478	71	104
Non-Farm Payroll Employment (c)	259	200	73	175	155	239	190	221	14	271	216	175
Unemployment Rate (%)	4.8	4.7	4.5	4.4	4.3	4.3	4.3	4.4	4.2	4.1	4.1	4.1
Average Hourly Earnings (All, cur. $)	25.99	26.07	26.11	26.17	26.21	26.26	26.34	26.39	26.51	26.47	26.54	26.64
Average Workweek (All, hrs.)	34.4	34.4	34.3	34.4	34.4	34.4	34.4	34.4	34.3	34.4	34.5	34.5
Industrial Production (d)	-0.5	-0.1	1.2	2.0	2.1	1.9	1.5	1.1	1.3	2.6	3.4	2.8
Capacity Utilization (%)	75.4	75.1	75.5	76.2	76.2	76.2	76.1	75.7	75.7	76.8	77.1	77.3
ISM Manufacturing Index (g)	56.0	57.6	56.6	55.3	55.5	56.7	56.5	59.3	60.2	58.5	58.2	59.3
ISM Non-Manufacturing Index (g)	56.5	57.4	55.6	57.3	57.1	57.2	54.3	55.2	59.4	59.8	57.3	56.0
Housing Starts (b)	1.236	1.288	1.189	1.154	1.129	1.217	1.185	1.172	1.159	1.261	1.299	1.207
Housing Permits (b)	1.300	1.219	1.260	1.228	1.168	1.275	1.230	1.272	1.225	1.316	1.303	1.300
New Home Sales (1-family, c)	599	615	638	593	604	616	556	558	637	618	712	636
Construction Expenditures (a)	0.8	1.9	0.3	-1.8	1.6	-0.8	-0.9	0.5	1.3	0.1	1.2	0.8
Consumer Price Index (s.a., d)	2.5	2.7	2.4	2.2	1.9	1.6	1.7	1.9	2.2	2.0	2.2	2.1
CPI ex. Food and Energy (s.a., d)	2.3	2.2	2.0	1.9	1.7	1.7	1.7	1.7	1.7	1.8	1.7	1.8
Producer Price Index (n.s.a., d)	1.7	2.0	2.2	2.5	2.3	1.9	2.0	2.4	2.6	2.8	3.0	2.5
Durable Goods Orders (a)	2.4	1.4	2.4	-0.8	0.0	6.4	-6.8	2.1	2.4	-0.4	1.7	2.7
Leading Economic Indicators (g)	0.6	0.5	0.4	0.2	0.3	0.6	0.3	0.4	0.1	1.3	0.4	1.6
Balance of Trade & Services (f)	-48.7	-44.4	-44.7	-48.1	-47.8	-45.6	-45.4	-44.6	-45.3	-49.1	-50.9	-53.9
Federal Funds Rate (%)	0.65	0.66	0.76	0.90	0.90	1.03	1.15	1.15	1.16	1.15	1.15	1.29
3-Mo. Treasury Bill Rate (%)	0.51	0.53	0.73	0.80	0.90	1.02	1.09	1.04	1.06	1.09	1.23	1.33
10-Year Treasury Note Yield (%)	2.43	2.43	2.47	2.30	2.31	2.19	2.32	2.33	2.28	2.36	2.36	2.40

(a) month-over-month % change; (b) millions, saar; (c) month-over-month change, thousands; (d) year-over-year % change; (e) annualized % change; (f) $ billions; (g) level. Most series are subject to frequent government revisions. Use with care.

Calendar Of Upcoming Economic Data Releases

Monday	Tuesday	Wednesday	Thursday	Friday
May 28 **Memorial Day** **U.S. Markets Closed**	**29** Dallas Fed Manufacturing (May) Consumer Confidence (May, Conference Board)	**30** ADP Employment (May) Real GDP (Q1, Second) Advance Economic Indicators (Apr) Dallas Fed Services (May) Beige Book EIA Crude Oil Stocks Mortgage Applications	**31** Personal Income and Consumption (Apr) Chicago PMI (May) Pending Home Sales (Apr) Weekly Jobless Claims Weekly Money Supply	**June 1** Employment (May) Manufacturing PMI (May, Final) ISM Manufacturing (May) Light Vehicle Sales (May) Construction Expenditures (Apr)
4 Factory Orders (Apr)	**5** Services PMI (May, Final) ISM Non-Manufacturing (May) JOLTS (Apr)	**6** International Trade (Apr) Productivity and Costs (Q1, Revised) EIA Crude Oil Stocks Mortgage Applications	**7** Consumer Credit (Apr) Quarterly Services Survey (Q1) Weekly Jobless Claims Weekly Money Supply	**8** Wholesale Trade (Apr)
11	**12** **FOMC Meeting** Consumer Price Index (May) NFIB Survey (May) Federal Budget (May)	**13** **FOMC Meeting** **Statement and Projections (2:00 pm)** **Press Conference (2:30 pm)** Producer Price Index (May) EIA Crude Oil Stocks Mortgage Applications	**14** Retail Sales (May) Import Prices (May) Business Inventories (Apr) Weekly Jobless Claims Weekly Money Supply	**15** Industrial Production (May) Empire State Manufacturing (Jun) Consumer Sentiment (Jun, Preliminary, Univ. of Michigan) TIC Data (Jun)
18 Business Leaders Survey (Jun) NAHB survey (Jun)	**19** Housing Starts (May)	**20** Existing Home Sales (May) Current Account (Q1) EIA Crude Oil Stocks Mortgage Applications	**21** Philadelphia Fed Manufacturing Survey (Jun) FHFA Home Price Index (Apr) Weekly Jobless Claims Weekly Money Supply	**22** IHSMarkit Manufacturing PMI (Jun, Flashl) IHSMarkit Services PMI (Jun, Flash))
25 New Home Sales (May) Dallas Fed Manufacturing (Jun)	**26** Philadelphia Fed Nonmanufacturing (Jun) S&P/Case-Shiller Home Price Index (Apr) Consumer Confidence (Jun, Conference Board Richmond Fed Survey (Jun) Dallas Fed Services (Jun) Consumer Confidence (May, Conference Board)	**27** Durable Goods (May) Advance Economic Indicators (May) Pending Home Sales (May) EIA Crude Oil Stocks Mortgage Applications	**28** Real GDP (Q1, 3rd estimate) Kansas City Fed Survey (Jun) Weekly Jobless Claims Weekly Money Supply	**29** Personal Income and Consumption (May) Chicago PMI (Jun) Consumer Sentiment ((Jun, Final, Univ. of Michigan)
July 2 ISM Manufacturing (Jun) IHSMarkit Manufacturing (Jun) Construction Spending (May)	**3** Factory Orders ((May) Light Vehicle Sales (Jun)	**4** **Independence Day** **Markets Closed**	**5** **FOMC Minutes** ADP Employment (Jun) IHSMarkit Services PMI (Jun, Final) ISM Nonmanufacturing (Jun) EIA Crude Oil Stocks Mortgage Applications Weekly Jobless Claims Weekly Money Supply	**6** Employment (Jun) International Trade (May)

BLUE CHIP FORECASTERS

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Exhibit TJB-3

Tables 1 through Table 11

Liberty Utilities (Calpeco Electric) Corp.
Summary of Results

Exhibit
Table 1
Witness: Bourassa

Line No.		Indicated Cost of Equity for Sample Group		Indicated Cost of Equity for Company[1]
1	DCF Constant Growth - Table 6	8.8%		9.5%
2	Risk Premium (Historical Returns)- Table 8	10.3%		11.0%
3	Risk Premium (Authorized ROEs) - Table 9	10.2%		10.9%
4	CAPM - Table 11	9.3%		10.0%
5	Mid-point	9.6%		10.3%
6	Cost of Equity Recommendation		10.3%	

Notes:
[1]Estimates include an equity risk premium of 70 basis points
and a financial risk adjustment of 0 basis points. See Testimony.

Liberty Utilities (Calpeco Electric) Corp.
Selected Characteristics of Sample Group of Water Utilities

Exhibit
Table 2
Witness: Bourassa

Line No.	Company	Symbol	Operating Revenues (millions)[1]	Net Plant (millions)[1]	Number of Customers (thousands)	Value Line Beta[1]	Market Capitalization (millions)[1]	Size Category[2]
1	ALLETE	ALE	1,419	3,822	149	0.70	3,905	Mid-Cap
2	Alliant Energy	LNT	3,382	10,798	1,400	0.65	10,127	Mid-Cap
3	Amer. Elec. Power	AEP	15,425	50,262	5,400	0.60	35,333	Large-Cap
4	Ameren Corp.	AEE	6,177	21,466	3,350	0.60	15,845	Large-Cap
5	Black Hills	BKH	1,680	4,541	1,209	0.80	3,288	Mid-Cap
6	CMS Energy Corp.	CMS	6,583	16,761	3,600	0.55	14,103	Large-Cap
7	Consol. Edison	ED	12,033	37,600	4,900	0.45	23,748	Large-Cap
8	Dominion Energy	D	12,586	53,758	5,200	0.60	47,238	Large-Cap
9	DTE Energy	DTE	12,607	20,721	3,400	0.60	20,206	Large-Cap
10	Duke Energy	DUK	23,565	86,391	8,900	0.55	57,857	Large-Cap
11	Edison Int'l	EIX	12,320	39,050	5,100	0.60	22,657	Large-Cap
12	El Paso Electric	EE	917	2,928	417	0.70	2,397	Mid-Cap
13	Hawaiian Elec.	HE	2,556	5,026	462	0.60	3,908	Mid-Cap
14	IDACORP Inc.	IDA	1,350	4,284	454	0.60	4,885	Mid-Cap
15	MGE Energy	MGEE	563	1,341	309	0.65	2,164	Low-Cap
16	NorthWestern Corp.	NWE	1,306	4,358	719	0.60	3,236	Mid-Cap
17	OGE Energy	OGE	2,261	8,340	842	0.90	7,434	Mid-Cap
18	PG&E Corp.	PCG	17,135	53,789	9,900	0.65	24,945	Large-Cap
19	Pinnacle West Capital	PNW	3,565	13,445	1,200	0.60	9,348	Mid-Cap
20	PNM Resources	PNM	1,445	4,980	774	0.65	3,152	Mid-Cap
21	Portland General	POR	2,009	6,741	877	0.60	4,159	Mid-Cap
22	Public Serv. Enterprise	PEG	9,161	31,797	4,000	0.65	27,130	Large-Cap
23	WEC Energy Group	WEC	7,649	21,347	4,500	0.55	21,857	Large-Cap
24	Xcel Energy Inc.	XEL	11,404	34,329	5,500	0.55	24,600	Large-Cap
25	Average		$ 7,045.7	$ 22,411.5	3,023	0.63	$ 16,396.8	
26	Liberty Utilities (Calpeco Electric) Corp.		$ 85.2	$ 357.0	49		N/A	

Notes:
[1] Value Line Analyzer Data (Weekly as of October 18, 2018)

Liberty Utilities (Calpeco Electric) Corp.
Capital Structures

Exhibit
Table 3
Witness: Bourassa

Line No.	Company	Symbol	Book Value[1] Long-Term Debt	Book Value[1] Common Equity	Market Value[1] Long-Term Debt	Market Value[1] Common Equity
1	ALLETE	ALE	41.0%	59.0%	26.9%	73.1%
2	Alliant Energy	LNT	50.2%	49.8%	28.4%	71.6%
3	Amer. Elec. Power	AEP	51.5%	48.5%	35.5%	64.5%
4	Ameren Corp.	AEE	49.7%	50.3%	30.9%	69.1%
5	Black Hills	BKH	64.5%	35.5%	48.6%	51.4%
6	CMS Energy Corp.	CMS	67.5%	32.5%	39.5%	60.5%
7	Consol. Edison	ED	48.9%	51.1%	38.3%	61.7%
8	Dominion Energy	D	64.4%	35.6%	39.6%	60.4%
9	DTE Energy	DTE	56.2%	43.8%	37.6%	62.4%
10	Duke Energy	DUK	54.0%	46.0%	45.9%	54.1%
11	Edison Int'l	EIX	49.9%	50.1%	33.9%	66.1%
12	El Paso Electric	EE	51.1%	48.9%	33.3%	66.7%
13	Hawaiian Elec.	HE	43.8%	56.2%	29.5%	70.5%
14	IDACORP Inc.	IDA	43.7%	56.3%	26.3%	73.7%
15	MGE Energy	MGEE	33.8%	66.2%	15.5%	84.5%
16	Nor hWestern Corp.	NWE	50.2%	49.8%	35.9%	64.1%
17	OGE Energy	OGE	41.7%	58.3%	27.0%	73.0%
18	PG&E Corp.	PCG	48.0%	52.0%	41.6%	58.4%
19	Pinnacle West Capital	PNW	48.9%	51.1%	33.9%	66.1%
20	PNM Resources	PNM	56.3%	43.7%	40.9%	59.1%
21	Portland General	POR	50.1%	49.9%	36.8%	63.2%
22	Public Serv. Enterprise	PEG	46.6%	53.4%	30.8%	69.2%
23	WEC Energy Group	WEC	48.0%	52.0%	28.6%	71.4%
24	Xcel Energy Inc.	XEL	55.9%	44.1%	37.1%	62.9%
25	Average		50.7%	49.3%	34.3%	65.7%
26	Max		67.5%	66.2%	48.6%	84.5%
27	Min		33.8%	32.5%	15.5%	51.4%
28	Median		50.0%	50.0%	34.7%	65.3%
29	Liberty Utilities (Calpeco Electric) Corp.	Proforma	47.5%	52.5%	N/A	N/A

[1] Value Line Analyzer Data (Weekly as of October 18, 2018)

Liberty Utilities (Calpeco Electric) Corp.
Comparisons of Past and Future Estimates of Growth

Exhibit
Table 4
Witness: Bourassa

Line No.	Company	Symbol	[1] Stock Price[1]	[2] Book Value[2]	[3] EPS[2]	[4] DPS[2]	[5] Historical Average Growth Col. 1-4	[6] Value Line Projected Growth[2]	[7] Zack's Projected Growth[3]	[8] Yahoo Finance Growth[4]	[9] Average Projected Growth
				Five-year historical annual changes							
1	ALLETE	ALE	12.66%	6.00%	5.50%	3.00%	6.79%	5.00%	6.00%	6.00%	5.67%
2	Alliant Energy	LNT	14.18%	4.50%	4.50%	7.00%	7.54%	6.50%	5.50%	5.20%	5.73%
3	Amer. Elec. Power	AEP	11.51%	4.00%	5.50%	4.50%	6.38%	4.50%	5.60%	5.73%	5.28%
4	Ameren Corp.	AEE	13.94%	-1.00%	0.50%	2.00%	3.86%	7.50%	6.50%	6.90%	6.97%
5	Black Hills	BKH	10.59%	1.50%	14.00%	3.00%	7.27%	6.50%	4.50%	4.34%	5.11%
6	CMS Energy Corp.	CMS	14.17%	5.00%	7.00%	8.50%	8.67%	7.00%	6.20%	6.97%	6.72%
7	Consol. Edison	ED	8.87%	3.50%	2.00%	2.00%	4.09%	3.00%	3.00%	3.07%	3.02%
8	Dominion Energy	D	9.37%	4.00%	4.00%	7.50%	6.22%	6.50%	6.00%	6.55%	6.35%
9	DTE Energy	DTE	12.76%	4.00%	6.00%	6.00%	7.19%	7.50%	5.30%	5.49%	6.10%
10	Duke Energy	DUK	5.68%	2.00%	0.50%	2.50%	2.67%	5.50%	5.00%	4.40%	4.97%
11	Edison Int'l	EIX	6.95%	3.00%	2.50%	9.00%	5.36%	4.50%	5.90%	3.50%	4.63%
12	El Paso Electric	EE	11.64%	6.50%	NM	18.00%	12.05%	4.50%	4.70%	4.70%	4.63%
13	Hawaiian Elec.	HE	7.53%	3.50%	4.50%	0.00%	3.88%	3.50%	6.70%	8.10%	6.10%
14	IDACORP Inc.	IDA	16.08%	5.50%	4.50%	10.50%	9.14%	3.00%	2.80%	2.80%	2.87%
15	MGE Energy	MGEE	13.18%	6.00%	4.00%	3.50%	6.67%	7.50%	ND	4.00%	5.75%
16	NorthWestern Corp.	NWE	5.30%	8.00%	7.00%	7.00%	6.83%	3.50%	2.30%	2.45%	2.75%
17	OGE Energy	OGE	3.17%	6.50%	1.00%	8.50%	4.79%	6.00%	5.20%	5.30%	5.50%
18	PG&E Corp.	PCG	2.21%	4.00%	1.50%	Neg	2.57%	7.50%	3.50%	3.30%	4.77%
19	Pinnacle West Capital	PNW	10.81%	4.00%	5.00%	2.50%	5.58%	5.00%	4.50%	3.75%	4.42%
20	PNM Resources	PNM	8.89%	2.00%	8.50%	11.50%	7.72%	7.50%	4.60%	4.95%	5.68%
21	Portland General	POR	10.75%	3.50%	3.50%	3.50%	5.31%	4.00%	3.10%	4.95%	4.02%
22	Public Serv. Enterprise	PEG	7.45%	5.50%	NEG	3.50%	5.48%	4.00%	6.00%	6.74%	5.58%
23	WEC Energy Group	WEC	12.51%	10.50%	5.50%	14.00%	10.63%	7.00%	4.40%	4.74%	5.38%
24	Xcel Energy Inc.	XEL	12.49%	4.50%	5.00%	5.50%	6.87%	5.50%	5.80%	5.95%	5.75%
25	GROUP AVERAGE		10.11%	4.44%	4.64%	6.22%	6.40%	5.52%	4.92%	5.00%	5.16%

Notes:
[1] Compound annual growth in stock prices ending December 31 through 2017. Data from Yahoo Finance website.
[2] Value Line Analyzer, weekly as of October 18, 2018.
[3] Zack's Investment Research website October 22, 2018.
[4] Yahoo Finance website October 22, 2018.

Liberty Utilities (Calpeco Electric) Corp.
Current Dividend Yields for Water Utility Sample Group

Exhibit
Table 5
Witness: Bourassa

Line No.	Company	Symbol	[1] Stock Price (P_0)[1]	[2] Current Dividend (D_0)[1]	[3] Current Dividend Yield (D_0/P_0)	[4] Average Annual Dividend Yield (D_0/P_0)[1,2]
1	ALLETE	ALE	76.66	2.14	2.79%	2.97%
2	Alliant Energy	LNT	43.67	1.26	2.89%	3.07%
3	Amer. Elec. Power	AEP	73.15	2.39	3.27%	3.42%
4	Ameren Corp.	AEE	65.65	1.78	2.71%	3.12%
5	Black Hills	BKH	61.82	1.81	2.93%	2.75%
6	CMS Energy Corp.	CMS	50.48	1.33	2.63%	2.88%
7	Consol. Edison	ED	76.82	2.76	3.59%	3.40%
8	Dominion Energy	D	73.27	3.04	4.15%	3.88%
9	DTE Energy	DTE	112.30	3.36	2.99%	3.15%
10	Duke Energy	DUK	82.64	3.49	4.22%	4.15%
11	Edison Int'l	EIX	69.86	2.23	3.19%	2.87%
12	El Paso Electric	EE	59.50	1.32	2.22%	2.49%
13	Hawaiian Elec.	HE	35.83	1.24	3.46%	3.65%
14	IDACORP Inc.	IDA	98.59	2.24	2.27%	2.58%
15	MGE Energy	MGEE	63.68	1.26	1.98%	1.95%
16	NorthWestern Corp.	NWE	60.25	2.10	3.49%	3.52%
17	OGE Energy	OGE	37.32	1.27	3.40%	3.61%
18	PG&E Corp.	PCG	47.78	1.55	3.24%	2.42%
19	Pinnacle West Capita	PNW	84.91	2.70	3.18%	3.16%
20	PNM Resources	PNM	39.86	0.99	2.48%	2.53%
21	Portland General	POR	46.34	1.34	2.89%	2.92%
22	Public Serv. Enterpris	PEG	54.68	1.72	3.15%	3.74%
23	WEC Energy Group	WEC	70.19	2.08	2.96%	3.31%
24	Xcel Energy Inc.	XEL	48.87	1.44	2.95%	3.10%
25	GROUP AVERAGE				3.04%	3.11%

Notes:
[1] Stock prices as of October 22, 2018. Indicated Dividend from Value Line Analyzer weekly as of October 18, 2018.
[2] Average Annual Dividend is dividends declared per share for a year divided by the average annual price of the stock in the same year, expressed as a percentage. As report by Value Line Analyzer software. For comparison purposes only.

Liberty Utilities (Calpeco Electric) Corp.
Discounted Cash Flow Analysis
DCF Constant Growth

Exhibit
Table 6
Witness: Bourassa

Line No.	Company	Symbol	[1] Dividend Yield (D_0/P_0)[1]	[2] Expected Dividend Yield (D_1/P_0)[2]		[3] Average Projected Growth (g)[3]		[4] Indicated Cost of Equity (COE) k=Div Yld + g (Cols 2+3)	[5] Adjusted Indicated Cost of Equity (COE)[4]
1	ALLETE	ALE	2.79%	2.87%	+	5.67%	=	9.0%	9.0%
2	Alliant Energy	LNT	2.89%	2.97%	+	5.73%	=	8.7%	8.7%
3	Amer. Elec. Power	AEP	3.27%	3.35%	+	5.28%	=	8.6%	8.6%
4	Ameren Corp.	AEE	2.71%	2.81%	+	6.97%	=	9.8%	9.8%
5	Black Hills	BKH	2.93%	3.00%	+	5.11%	=	8.1%	8.1%
6	CMS Energy Corp.	CMS	2.63%	2.72%	+	6.72%	=	9.4%	9.4%
7	Consol. Edison	ED	3.59%	3.65%	+	3.02%	=	6.7%	
8	Dominion Energy	D	4.15%	4.28%	+	6.35%	=	10.6%	10.6%
9	DTE Energy	DTE	2.99%	3.08%	+	6.10%	=	9.2%	9.2%
10	Duke Energy	DUK	4.22%	4.33%	+	4.97%	=	9.3%	9.3%
11	Edison Int'l	EIX	3.19%	3.27%	+	4.63%	=	7.9%	7.9%
12	El Paso Electric	EE	2.22%	2.27%	+	4.63%	=	6.9%	
13	Hawaiian Elec.	HE	3.46%	3.57%	+	6.10%	=	9.7%	9.7%
14	IDACORP Inc.	IDA	2.27%	2.30%	+	2.87%	=	5.2%	
15	MGE Energy	MGEE	1.98%	2.04%	+	5.75%	=	7.8%	7.8%
16	NorthWestern Corp.	NWE	3.49%	3.53%	+	2.75%	=	6.3%	
17	OGE Energy	OGE	3.40%	3.50%	+	5.50%	=	9.0%	9.0%
18	PG&E Corp.	PCG	3.24%	3.32%	+	4.77%	=	8.1%	8.1%
19	Pinnacle West Capital	PNW	3.18%	3.25%	+	4.42%	=	7.7%	7.7%
20	PNM Resources	PNM	2.48%	2.55%	+	5.68%	=	8.2%	8.2%
21	Portland General	POR	2.89%	2.95%	+	4.02%	=	7.0%	
22	Public Serv. Enterprise	PEG	3.15%	3.23%	+	5.58%	=	8.8%	8.8%
23	WEC Energy Group	WEC	2.96%	3.04%	+	5.38%	=	8.4%	8.4%
24	Xcel Energy Inc.	XEL	2.95%	3.03%	+	5.75%	=	8.8%	8.8%
25	Average		3.04%	3.12%	+	5.16%	=	8.3%	8.8%

[1] Spot Dividend Yield = D_0/P_0. Source Table 6.

[2] Expected Dividend Yield = $D_1/P_0 = D_0/P_0 * (1+g/2)$.

[3] Growth (g). Source Table 4.

[4] Excludes results less than he forecast yield on Baa bonds plus 100 basis points. See testimony.

Liberty Utilities (Calpeco Electric) Corp.
Forecasts of Long-Term Interest Rates

Exhibit
Table 7
Witness: Bourassa

Line No.		2019	2020	2021	Average	Recommended Risk-free Rate for CAPM and MRP
1	Long-term Treasury Rates					
2	Blue Chip Consensus Forecasts[1]	3.7%	4.1%	4.2%		
3	Value Line[2]	3.3%	3.5%	3.6%		
4	Average	3.5%	3.8%	3.9%	3.7%	3.7%
5	Aaa Corporate Bonds					
6	Blue Chip Consensus Forecasts[1]	4.5%	5.2%	5.2%		
7	Value Line[2]	3.6%	3.6%	3.7%		
8	Average	4.1%	4.4%	4.5%	4.3%	
9	Baa Corporate Bonds					
10	Blue Chip Consensus Forecasts[1]	6.0%	6.0%	6.0%		
11	Value Line[2]					
12	Average	6.0%	6.0%	6.0%	6.0%	

Notes:
[1] Blue Chip Financial Forecast (June 2018).
[2] Value Line Quarterly Forecasts (August 31, 2018).

Liberty Utilities (Calpeco Electric) Corp.
Risk Premium Analysis Based on Total Returns

Exhibit
Table 8
Witness: Bourassa

Line No.		S&P Utility Index Return[1]	LT Treasury Bond Yield[2]	Risk Premium
1	1963	12.36%	4.17%	8.41%
2	1964	15.91%	4.23%	11.74%
3	1965	4.67%	4.50%	0.44%
4	1966	-4.48%	4.55%	-8.98%
5	1967	-0.63%	5.56%	-5.18%
6	1968	10.32%	5.98%	4.76%
7	1969	-15.42%	6.87%	-21.40%
8	1970	16.56%	6.48%	9.69%
9	1971	2.41%	5.97%	-4.07%
10	1972	8.15%	5.99%	2.18%
11	1973	-18.07%	7.26%	-24.06%
12	1974	-21.55%	7.60%	-28.81%
13	1975	44.49%	8.05%	36.89%
14	1976	31.81%	7.21%	23.76%
15	1977	8.64%	8.03%	1.43%
16	1978	-3.71%	8.98%	-11.74%
17	1979	13.58%	10.12%	4.60%
18	1980	15.08%	11.99%	4.96%
19	1981	11.74%	13.34%	-0.25%
20	1982	26.52%	10.95%	13.18%
21	1983	20.01%	11.97%	9.06%
22	1984	26.04%	11.70%	14.07%
23	1985	33.05%	9.56%	21.35%
24	1986	28.53%	7.89%	18.97%
25	1987	-2.92%	9.20%	-10.81%
26	1988	18.27%	9.18%	9.07%
27	1989	47.80%	8.16%	38.62%
28	1990	-2.57%	8.44%	-10.73%
29	1991	14.61%	7.30%	6.17%
30	1992	8.10%	7.26%	0.80%
31	1993	14.41%	6.54%	7.15%
32	1994	-7.94%	7.99%	-14.48%
33	1995	42.15%	6.03%	34.16%
34	1996	3.14%	6.73%	-2.89%
35	1997	24.69%	6.02%	17.96%
36	1998	14.82%	5.42%	8.80%
37	1999	-8.85%	6.82%	-14.27%
38	2000	59.70%	5.58%	52.88%
39	2001	-30.41%	5.75%	-35.99%
40	2002	-30.04%	4.84%	-35.79%
41	2003	26.11%	5.11%	21.27%
42	2004	24.22%	4.84%	19.11%
43	2005	16.79%	4.61%	11.95%
44	2006	20.95%	4.91%	16.34%
45	2007	19.36%	4.50%	14.45%
46	2008	-28.99%	3.03%	-33.49%
47	2009	11.94%	4.58%	8.91%
48	2010	5.49%	4.14%	0.91%
49	2011	19.88%	3.91%	15.74%
50	2012	1.55%	2.92%	-2.36%
51	2013	16.05%	3.45%	13.13%
52	2014	39.85%	3.34%	36.40%
53	2015	-8.59%	2.84%	-11.93%
54	2016	27.48%	2.59%	24.64%
55	2017	23.76%	2.90%	21.17%
56	Average 1963 to 2017	11 8%	6.5%	5.2%
57		Expected Long-term Treasury Bond Rate[3]		3.7%
58		Estimate of Current Risk Premium[4]		6.6%
59		Projected Returns on Equity for Sample		10.3%

Notes:
[1] Computed Composite Proxy Group Total Returns.
[2] Average annual 30 Yr. U.S. Treasury Bond yields as reported by the Federal Reserve.
Proxy for yields from 2003-2005 are based upon 20-year U.S. Treasury yield.
[3] Forecast LT U.S. Treasury Rate. Source Table 7.
[4] As explained in testimony, adjustment assumes equity costs change by 50% as much as interest rates.

Liberty Utilities (Calpeco Electric) Corp.
Risk Premiums Determined by Relationship Between
Authorized ROEs and Long-term Treasury Bond Rates[1]
During the Period 2001-2017

Exhibit
Table 9
Witness: Bourassa

Formula: Risk Premium = A_0 + (A_1 x Treasury bond Rate)[2]

No. of Litigated Decisions	324
Std Err of Y Est	0.0062
R Squared	56.2%
Estimate of intercept (A_0)	0.09332
Estimate of slope (A_1)	-0.7645
Std Err of Coef.	0.0376
t-statistic for slope	-20.34

Equity Cost Estimate for Typical Electric Utility		Predicted Risk Premium		Expected Treasury Bond Rate[3]
10.2%	=	6.50%	+	3.70%

Notes:
[1] Source of ROE Data: Public Utility Reports annual ROE survey by Phillip Cross printed in various issues plus data from AUS Utility Reports various years (2001 - 2017).
[2] 6-month lag between order dates and Treasury bond rates.
[3] Forecast Treasury Bond rate. Source Table 7.

Liberty Utilities (Calpeco Electric) Corp.
Estimation of Current Market Risk Premium
Using DCF Analysis

Exhibit
Table 10
Witness: Bourassa

Line No.	Month	Dividend Yield (D_0/P_0)[1]	Expected Dividend Yield (D_1/P_0)[2]	+	Expected Growth (g)[3]	=	Expected Market Return (k)	-	Monthly Average 30 Year Treasury Rate[4]	=	Expected Market Risk Premium (MRP)
1	Jan 2017	2.43%	2.62%	+	8.17%	=	10.79%		3.02%	=	7.77%
2	Feb	2.42%	2.62%	+	8.00%	=	10.62%		3.03%	=	7.59%
3	Mar	2.47%	2.66%	+	7.83%	=	10.50%		3.08%	=	7.42%
4	Apr	2.46%	2.65%	+	7.83%	=	10.48%		2.94%	=	7.54%
5	May	2.50%	2.69%	+	7.83%	=	10.52%		2.96%	=	7.56%
6	June	2.51%	2.71%	+	8.00%	=	10.71%		2.80%	=	7.91%
7	July	2.49%	2.69%	+	8.00%	=	10.69%		2.88%	=	7.81%
8	Aug	2.62%	2.83%	+	8.00%	=	10.83%		2.80%	=	8.03%
9	Sep	2.46%	2.66%	+	8.17%	=	10.83%		2.78%	=	8.05%
10	Oct	2.46%	2.67%	+	8.17%	=	10.83%		2.88%	=	7.95%
11	Nov	2.42%	2.62%	+	8.17%	=	10.78%		2.80%	=	7.98%
12	Dec	2.40%	2.60%	+	8.17%	=	10.76%		2.77%	=	7.99%
13	Jan 2018	2.68%	2.91%	+	8.50%	=	11.41%		2.88%	=	8.53%
14	Feb	2.57%	2.79%	+	8.67%	=	11.46%		3.13%	=	8.33%
15	Mar	2.59%	2.82%	+	9.00%	=	11.82%		3.09%	=	8.73%
16	Apr	2.56%	2.78%	+	8.67%	=	11.44%		3.07%	=	8.37%
17	May	2.55%	2.77%	+	8.83%	=	11.61%		3.13%	=	8.48%
18	June	2.54%	2.77%	+	9.00%	=	11.77%		3.05%	=	8.72%
19	July	2.52%	2.75%	+	9.17%	=	11.91%		3.01%	=	8.90%
20	Aug	2.52%	2.76%	+	9.33%	=	12.09%		3.04%	=	9.05%
21	Sep	2.56%	2.80%	+	9.33%	=	12.13%		3.15%	=	8.98%
19	Recommended	2.53%	2.75%	+	8.75%	=	11.50%	-	3.00%	=	8.50%
20	Short-term Trends										
21	Recent Twelve Months Avg	2.53%	2.75%	+	8.75%	=	11.50%	-	3.00%	=	8.50%
22	Recent Nine Months Avg	2.56%	2.79%	+	8.94%	=	11.74%	-	3.06%	=	8.68%
23	Recent Six Months Avg	2.54%	2.77%	+	9.06%	=	11.83%	-	3.08%	=	8.75%
24	Recent Three Months Avg	2.53%	2.77%	+	9.28%	=	12.04%	-	3.07%	=	8.98%

Notes:
[1] Average Dividend Yield (D_0/P_0) of dividend paying stocks. Data from Value Line Investment Analyzer Software Data - Value Line 1700 Stocks
[2] Expected Dividend Yield (D_1/P_0) equals current average dividend yield (D_0/P_0) times one plus growth rate(g).
[3] Median of Projected EPS and Projected DPS Growth for VL 1700 stocks. Data from Value Line Investment Analyzer Software.
[4] Monthly average 30 year U.S. Treasury as reported by Federal Reserve.

Liberty Utilities (Calpeco Electric) Corp.
Capital Asset Pricing Model (CAPM)

Exhibit
Table 11
Witness: Bourassa

Line No.		R_f[1]	+ (	(beta[2]	x	RP_M[4])			=	k
1	Traditional CAPM	3.7%	+ (	0.63	x	7.80%)			=	8.6%
2										
3		R_f[1]		RP_M[3] x .25	+ (	(beta[2]	x	RP_M[3]) x .75		
4	Empirical CAPM	3.7%	+	7.80%	x .25 + (	0.63	x	7.80%) x .75	=	9.3%
5										
6		R_f[1]	+ (	beta[3]	x	RP_M[4]) +	RP_s[5]			
7	Modified CAPM	3.7%	+ (	0.63	x	6.90%) +	2.07%		=	10.1%
8										
9										
10	Average									9.3%

Notes:

[1] Forecasts of long-term treasury yields. Source Table 7.

[2] Average VL Beta of Water Proxy Group. Source is Table 2.

[3] Estimate of Market Risk Premium (MRP):

Historical MRP (1926-2017)	7.10%	Source is Duff & Phelps 2018 CRSP Decile Size Study - Supplementary Exhibits.
Current MRP	8.50%	Source is Table 11
Average MRP	7.80%	

[4] Estimate of Market Risk Premium (MRP):

Historical MRP (1963-2017)	5.30%	Source is Duff & Phelps 2018 CRSP Decile Size Study - Supplementary Exhibits.
Current MRP	8.50%	Source is Table 11
Average MRP	6.90%	

[5] Size Premium. Sources Exhibit TJB-COC-DT2, page 1.

Exhibit TJB-4

Liberty Utilities (CalPeco Electric's) Comparative Risk Study

Line No.	Operating Income EBIT ($ in millions) Symbol	Symbol	2017	2016	2015	2014	2013	2012	5-Year Average	Std Dev.	Co-efficient of variation of Operating Income
1	ALLETE	ALE	229.8	223.5	247.0	188.8	154.1	155.2	208.64	37.11	0.1779
2	Alliant Energy	LNT	653.4	537.0	577.0	543.6	642.5	629.8	590.70	48.45	0.0820
3	Amer. Elec. Power	AEP	3,344.1	3,474.9	3,333.5	3,232.0	3,087.0	2,956.0	3,294.30	144.47	0.0439
4	Ameren Corp.	AEE	1,458.0	1,381.0	1,259.0	1,254.0	1,184.0	1,338.0	1,307.20	110.13	0.0843
5	Black Hills	BKH	416.7	329.6	279.4	260.5	255.6	241.5	308.35	67.28	0.2182
6	CMS Energy Corp.	CMS	1,338.0	1,297.0	1,163.0	1,152.0	1,142.0	1,062.0	1,218.40	91.92	0.0754
7	Consol. Edison	ED	2,609.0	2,471.0	2,427.0	2,164.0	2,271.0	2,339.0	2,388.40	174.01	0.0729
8	Dominion Energy	D	4,130.0	3,627.0	3,536.0	3,445.0	3,316.0	3,173.0	3,610.80	179.41	0.0497
9	DTE Energy	DTE	1,646.0	1,445.0	1,350.0	1,590.0	1,203.0	1,279.0	1,446.80	179.58	0.1241
10	Duke Energy	DUK	5,753.0	5,314.0	5,420.0	5,344.0	5,350.0	3,738.0	5,436.20	181.31	0.0334
11	Edison Int'l	EIX	2,209.0	2,092.0	2,008.0	2,472.0	2,290.0	2,285.0	2,214.20	180.06	0.0813
12	El Paso Electric	EE	198.3	194.9	146.2	151.2	165.6	168.7	171.22	24.24	0.1416
13	Hawaiian Elec.	HE	338.3	348.2	322.6	328.9	315.4	324.2	330.67	12.90	0.0390
14	IDACORP Inc.	IDA	304.4	271.8	282.1	253.7	291.7	242.6	280.73	19.31	0.0688
15	MGE Energy	MGEE	148.0	148.3	144.1	157.8	146.6	112.8	148.96	5.19	0.0348
16	NorthWestern Corp.	NWE	261.4	246.0	245.0	178.0	171.0	153.3	220.29	42.35	0.1922
17	OGE Energy	OGE	510.3	503.3	481.2	536.8	553.5	676.9	517.02	28.45	0.0550
18	PG&E Corp.	PCG	2,956.0	2,201.0	1,608.0	2,450.0	1,762.0	1,799.0	2,195.40	542.27	0.2470
19	Pinnacle West Capital	PNW	934.4	856.0	854.6	811.2	846.3	851.8	860.52	45.13	0.0524
20	PNM Resources	PNM	333.5	278.0	290.1	299.7	299.1	273.7	300.07	20.66	0.0689
21	Portland General	POR	376.0	333.0	309.0	293.0	258.0	302.0	313.80	44.18	0.1408
22	Public Serv. Enterprise	PEG	2,444.0	2,382.0	2,962.0	2,623.0	2,299.0	2,318.0	2,542.00	280.45	0.1103
23	WEC Energy Group	WEC	1,785.2	1,682.1	1,250.5	1,112.1	1,080.1	1,000.3	1,382.00	329.36	0.2383
24	Xcel Energy Inc.	XEL	2,190.0	2,213.9	2,130.0	1,948.1	1,847.6	1,822.7	2,065.90	160.42	0.0777
25	Proxy Group										0.1046

		2017	2016	2015	2014	2013	2012	Average	Std Dev.	Co-efficient of variation of Operating Income
26	Company	32.38	24.29	17.15	17.97	19.10	9.10	22.18	6.34	0.2860
27	**Risk relative to the average risk of the proxy group**									**2.74**

Line No.	Sales ($ in millions) Company	Symbol	2017	2016	2015	2014	2013	2012	5-Year Average
1	ALLETE	ALE	1,419	1,340	1,486	1,137	1,018	961	1,280
2	Alliant Energy	LNT	3,382	3,320	3,254	3,350	3,277	3,095	3,317
3	Amer. Elec. Power	AEP	15,425	16,380	16,453	17,020	15,357	14,945	16,127
4	Ameren Corp.	AEE	6,177	6,076	6,098	6,053	5,838	6,828	6,048
5	Black Hills	BKH	1,680	1,573	1,305	1,394	1,276	1,174	1,445
6	CMS Energy Corp.	CMS	6,583	6,399	6,456	7,179	6,566	6,312	6,637
7	Consol. Edison	ED	12,033	12,075	12,554	12,919	12,381	12,188	12,392
8	Dominion Energy	D	12,586	11,737	11,683	12,436	13,120	13,093	12,312
9	DTE Energy	DTE	12,607	10,630	10,337	12,301	9,661	8,791	11,107
10	Duke Energy	DUK	23,565	22,743	23,459	23,925	24,598	19,624	23,658
11	Edison Int'l	EIX	12,320	11,869	11,524	13,413	12,581	11,862	12,341
12	El Paso Electric	EE	917	887	850	918	890	853	892
13	Hawaiian Elec.	HE	2,556	2,381	2,603	3,240	3,238	3,375	2,803
14	IDACORP Inc.	IDA	1,349	1,262	1,270	1,283	1,246	1,081	1,282
15	MGE Energy	MGEE	563	545	564	620	591	541	577
16	NorthWestern Corp.	NWE	1,306	1,257	1,214	1,205	1,155	1,070	1,227
17	OGE Energy	OGE	2,261	2,259	2,197	2,453	2,868	3,671	2,408
18	PG&E Corp.	PCG	17,135	17,666	16,833	17,090	15,598	15,040	16,864
19	Pinnacle West Capital	PNW	3,565	3,499	3,495	3,492	3,455	3,302	3,501
20	PNM Resources	PNM	1,445	1,363	1,439	1,436	1,388	1,342	1,414
21	Portland General	POR	2,009	1,923	1,898	1,900	1,810	1,805	1,908
22	Public Serv. Enterprise	PEG	9,161	9,198	10,415	10,886	9,968	9,781	9,926
23	WEC Energy Group	WEC	7,649	7,472	5,926	4,997	4,519	4,246	6,113
24	Xcel Energy Inc.	XEL	11,404	11,107	11,024	11,686	10,915	10,128	11,227

		2017	2016	2015	2014	2013	2012	5-Year Average
25	Company	85.23	83.74	73.89	73.23	75.48	71.95	78.31

Line No.	Operating Margin (%) Company	Symbol	2017	2016	2015	2014	2013	2012	5-Year Average	Std Dev.	Co-efficient of variation of Operating Margin
1	ALLETE	ALE	16.19%	16.68%	16.62%	16.61%	15.13%	16.15%	16.25%	0.0065	0.0402
2	Alliant Energy	LNT	19.32%	16.17%	17.73%	16.23%	19.61%	20.35%	17.81%	0.0191	0.1075
3	Amer. Elec. Power	AEP	21.68%	21.21%	20.26%	18.99%	20.10%	19.78%	20.45%	0.0105	0.0512
4	Ameren Corp.	AEE	23.60%	22.73%	20.65%	20.72%	20.28%	19.60%	21.60%	0.0148	0.0684
5	Black Hills	BKH	24.80%	20.95%	21.42%	18.70%	20.03%	20.57%	21.18%	0.0228	0.1075
6	CMS Energy Corp.	CMS	20.33%	20.27%	18.01%	16.05%	17.39%	16.83%	18.41%	0.0186	0.1013
7	Consol. Edison	ED	21.68%	20.46%	19.33%	16.75%	18.34%	19.19%	19.31%	0.0190	0.0984
8	Dominion Energy	D	32.81%	30.90%	30.27%	27.70%	25.27%	24.23%	29.39%	0.0295	0.1003
9	DTE Energy	DTE	13.06%	13.59%	13.06%	12.93%	12.45%	14.55%	13.02%	0.0041	0.0313
10	Duke Energy	DUK	24.41%	23.37%	23.10%	22.34%	21.75%	19.05%	22.99%	0.0102	0.0443
11	Edison Int'l	EIX	17.93%	17.63%	17.42%	18.43%	18.20%	19.26%	17.92%	0.0041	0.0229
12	El Paso Electric	EE	21.63%	21.97%	17.20%	16.47%	18.60%	19.78%	19.17%	0.0252	0.1312
13	Hawaiian Elec.	HE	13.24%	14.62%	12.39%	10.15%	9.74%	9.61%	12.03%	0.0207	0.1718
14	IDACORP Inc.	IDA	22.55%	21.54%	22.21%	19.78%	23.41%	22.45%	21.90%	0.0136	0.0622
15	MGE Energy	MGEE	26.29%	27.22%	25.56%	25.45%	24.81%	20.83%	25.87%	0.0092	0.0357
16	NorthWestern Corp.	NWE	20.02%	19.56%	20.18%	14.78%	14.81%	14.33%	17.87%	0.0282	0.1576
17	OGE Energy	OGE	22.57%	22.28%	21.90%	21.88%	19.30%	18.44%	21.59%	0.0131	0.0606
18	PG&E Corp.	PCG	17.25%	12.46%	9.55%	14.34%	11.30%	11.96%	12.98%	0.0296	0.2277
19	Pinnacle West Capital	PNW	26.21%	24.47%	24.45%	23.23%	24.50%	25.80%	24.57%	0.0106	0.0432
20	PNM Resources	PNM	23.08%	20.40%	20.16%	20.87%	21.55%	20.39%	21.21%	0.0117	0.0553
21	Portland General	POR	18.72%	17.32%	16.28%	15.42%	14.25%	16.73%	16.40%	0.0172	0.1047
22	Public Serv. Enterprise	PEG	26.68%	25.90%	28.44%	24.10%	23.06%	23.70%	25.63%	0.0217	0.0848
23	WEC Energy Group	WEC	23.34%	22.51%	21.10%	22.25%	23.90%	23.56%	22.62%	0.0107	0.0475
24	Xcel Energy Inc.	XEL	19.20%	19.93%	19.32%	16.67%	16.93%	18.00%	18.41%	0.0150	0.0815
25	Proxy Group		21.52%	20.59%	19.86%	18.78%	18.95%	18.96%	19.94%		0.0849

		2017	2016	2015	2014	2013	2012	Average	Std Dev.	Co-efficient of variation of Operating Margin
26	Company	37.99%	29.01%	23.21%	24.54%	25.30%	12.65%	28.01%	0.06	0.2193
27	**Risk relative to the average risk of the proxy group**									**2.58**

Line No.	Return on Equity (ROE) Company	Symbol	2017	2016	2015	2014	2013	2012	Average	Std Dev.	Co-efficient of variation of ROE
1	ALLETE	ALE	7.7%	8.2%	9.0%	7.8%	7.8%	8.1%	8.1%	0.0054	0.0664
2	Alliant Energy	LNT	11.4%	9.7%	10.2%	10.9%	11.3%	10.3%	10.7%	0.0063	0.0587
3	Amer. Elec. Power	AEP	9.8%	11.9%	9.9%	9.7%	9.6%	9.5%	10.2%	0.0098	0.0962
4	Ameren Corp.	AEE	9.4%	9.2%	8.3%	8.7%	7.8%	8.8%	8.7%	0.0065	0.0742
5	Black Hills	BKH	10.9%	8.7%	8.8%	9.4%	8.9%	7.1%	9.3%	0.0093	0.1001
6	CMS Energy Corp.	CMS	13.7%	13.0%	13.3%	13.0%	13.1%	12.9%	13.2%	0.0030	0.0228
7	Consol. Edison	ED	8.2%	8.3%	9.1%	8.5%	9.4%	9.6%	8.7%	0.0055	0.0625
8	Dominion Energy	D	13.1%	14.5%	15.0%	15.4%	15.4%	14.9%	14.7%	0.0036	0.0245
9	DTE Energy	DTE	10.8%	9.6%	9.1%	10.9%	8.3%	9.0%	9.7%	0.0110	0.1128
10	Duke Energy	DUK	7.1%	6.2%	7.2%	7.2%	6.8%	5.2%	6.9%	0.0040	0.0581
11	Edison Int'l	EIX	12.7%	10.8%	12.0%	13.0%	12.5%	15.9%	12.2%	0.0085	0.0698
12	El Paso Electric	EE	8.6%	9.0%	8.1%	9.3%	9.4%	11.0%	8.9%	0.0055	0.0615
13	Hawaiian Elec.	HE	8.5%	12.0%	8.3%	9.4%	9.4%	10.2%	9.5%	0.0148	0.1555
14	IDACORP Inc.	IDA	9.4%	9.2%	9.5%	9.9%	9.9%	9.6%	9.6%	0.0030	0.0312
15	MGE Energy	MGEE	9.8%	10.4%	10.3%	12.2%	12.1%	11.1%	11.0%	0.0111	0.1011
16	NorthWestern Corp.	NWE	9.0%	9.8%	8.6%	8.2%	9.1%	9.0%	9.0%	0.0060	0.0673
17	OGE Energy	OGE	10.0%	9.8%	10.2%	12.2%	12.8%	12.8%	11.0%	0.0139	0.1263
18	PG&E Corp.	PCG	9.3%	7.9%	5.9%	9.1%	5.7%	6.7%	7.6%	0.0174	0.2291
19	Pinnacle West Capital	PNW	9.9%	9.2%	9.5%	9.1%	9.7%	9.8%	9.5%	0.0034	0.0363
20	PNM Resources	PNM	9.1%	7.0%	7.1%	6.5%	6.8%	6.6%	7.3%	0.0102	0.1390
21	Portland General	POR	8.4%	8.2%	7.6%	9.2%	7.5%	8.2%	8.2%	0.0066	0.0810
22	Public Serv. Enterprise	PEG	10.3%	10.9%	12.9%	12.5%	10.7%	11.5%	11.5%	0.0094	0.0817
23	WEC Energy Group	WEC	10.5%	10.5%	7.4%	13.3%	13.6%	13.2%	11.1%	0.0254	0.2295
24	Xcel Energy Inc.	XEL	10.2%	10.2%	10.0%	10.0%	9.9%	10.2%	10.1%	0.0013	0.0131
25	Proxy Group		9.9%	9.8%	9.5%	10.2%	9.9%	10.0%	9.9%		0.0875

		2017	2016	2015	2014	2013	2012	5-Year Average	Std Dev.	Co-efficient of variation of ROE
26	Company	9.90%	12.90%	6.31%	7.54%	8.61%	1.51%	9.05%	0.04	0.4542
27	**Risk relative to the average risk of the proxy group**									**5.19**

Operating Leverage = Percent Change in Operating Income/Percent Change in Sales
(also a measure of business risk)

Line No.	Company	Symbol	2017	2016	2015	2014	2013	5-Year Average
1	ALLETE	ALE	0.47	0.96	1.00	1.94	0.12	1.09
2	Alliant Energy	LNT	11.57	3.40	2.13	6.86	0.34	3.18
3	Amer. Elec. Power	AEP	0.65	9.55	0.94	0.43	1.61	2.89
4	Ameren Corp.	AEE	3.35	26.86	0.54	1.61	0.79	8.09
5	Black Hills	BKH	3.88	0.87	1.14	0.21	0.67	1.52
6	CMS Energy Corp.	CMS	1.10	13.05	0.09	0.09	1.87	3.58
7	Consol. Edison	ED	16.06	0.48	4.30	1.08	1.84	5.48
8	Dominion Energy	D	1.92	5.57	0.44	0.75	21.85	7.15
9	DTE Energy	DTE	0.75	2.48	0.95	1.18	0.60	1.34
10	Duke Energy	DUK	2.29	0.64	0.73	0.04	1.70	0.92
11	Edison Int'l	EIX	1.47	1.40	1.33	1.20	0.04	1.35
12	El Paso Electric	EE	0.52	7.63	0.45	2.86	0.41	2.87
13	Hawaiian Elec.	HE	0.39	0.93	0.10	129.30	0.67	32.68
14	IDACORP Inc.	IDA	1.73	5.62	11.74	4.48	1.32	5.89
15	MGE Energy	MGEE	0.05	0.84	0.96	1.55	3.28	0.85
16	NorthWestern Corp.	NWE	1.63	0.11	48.06	0.94	1.47	12.68
17	OGE Energy	OGE	16.54	1.62	0.99	0.21	0.83	4.84
18	PG&E Corp.	PCG	11.41	7.45	22.85	4.08	0.55	11.45
19	Pinnacle West Capital	PNW	4.81	1.74	48.98	3.87	0.14	14.85
20	PNM Resources	PNM	3.32	0.79	14.26	0.06	2.73	4.61
21	Portland General	POR	2.89	5.90	51.88	2.73	52.60	15.85
22	Public Serv. Enterprise	PEG	6.47	1.68	2.99	1.53	0.43	1.66
23	WEC Energy Group	WEC	2.60	1.32	0.67	0.28	1.24	1.22
24	Xcel Energy Inc.	XEL	0.40	5.27	1.65	0.77	0.18	2.02
25	Average		4.01	4.42	9.13	7.00	4.05	6.17

		2017	2016	2015	2014	2013	Average
26	Liberty Utilities (Calpeco Electric) Corp.	18.82	3.12	5.10	1.97	Not Available	7.25
27	**Risk relative to the average risk of the proxy group**						**1.18**

Liberty Utilities (Calpeco Electric) Corp.
Comparative Risk Study
Beta Estimate Using Duff and Phelps Risk Study Portfolio Information

A. Beta Estimates for Proxy Group and Company`

Line No.		Portfolio	Operating Margin[1]	Portfolio	CV (Operating Margin)[1]	Portfolio	CV (ROE)[1]	
1	Company	2	28.01%	9	21.93%	11	45.42%	
2	Proxy Group	4	19.94%	18	8.49%	23	8.75%	
			Portfolio Sum Beta[2]		Portfolio Sum Beta[3]		Portfolio Sum Beta[4]	Average
3	Company		0.84		1.18		1.18	
4	Proxy Group		0.95		1.01		0.85	
5	Percentage Difference		-11.6%		16.8%		38.8%	**14.7%**

B. Assume percentage difference is the same for electric utilities as companies in general

		Value Line Beta
6	Proxy Group[5]	0.63
7	Implied Beta for Company[6]	0.72

Notes:
[1] CV stands for Coefficient of Variation,
[2] Source is Duff & Phelps 2018 Valuation Handbook, Risk Study, Exhibit D-1, Companies Ranked by Operating Margin.
[3] Source is Duff & Phelps 2018 Valuation Handbook, Risk Study, Exhibit D-2, Companies Ranked by CV (Operating Margin).
[4] Source is Duff & Phelps 2018 Valuation Handbook, Risk Study, Exhibit D-3, Companies Ranked by CV (Operating Margin).
[5] Source is Table 2.
[6] Calculated by multiplying (1+ percentage difference in risk study betas) times average beta for the proxy group.

Liberty Utilities (Calpeco Electric) Corp.
Capital Asset Pricing Model (CAPM)

Line No.												CAPM Results From Table 11	Difference
		Rf^{1}	+ (	$(beta^{2}$	x	RP_M^{4}	)			=	k		
1	Traditional CAPM	3.7%	+ (	0.72	x	7.80%	)			=	9.3%	8.6%	0.7%
2													
3		Rf^{1}		RP_M^{4} x .25	+ (	$(beta^{2}$	x	RP_M^{3}	) x .75				
4	Empirical CAPM	3.7%	+	7.80%	x .25 + (	0.72	x	7.80%	) x .75	=	9.9%	9.3%	0.6%
5													
6		Rf^{1}	+ (	$beta^{3}$	x	RP_M^{4}	) +	RP_s^{5}					
7	Modified CAPM	3.7%	+ (	0.72	x	6.90%	) +	2.07%		=	10.8%	10.1%	0.6%
8													
9													
10	Average										10.0%	9.3%	0.7%
11	High												0.7%
12	Low												0.6%

Notes:

[1] Forecasts of long-term treasury yields. Source Table 7.

[2] Average VL Beta of Water Proxy Group. Source is Table 2.

[3] Estimate of Market Risk Premium (MRP):

Historical MRP (1926-2017)	7.10%	Source is Duff & Phelps 2018 CRSP Decile Size Study - Supplementary Exhibits.
Current MRP	8.50%	Source is Table 11
Average MRP	7.80%	

[4] Estimate of Market Risk Premium (MRP):

Historical MRP (1963-2017)	5.30%	Source is Duff & Phelps 2018 CRSP Decile Size Study - Supplementary Exhibits.
Current MRP	8.50%	Source is Table 11
Average MRP	6.90%	

[5] Size Premium. Sources Exhibit TJB-COC-DT2, page 1.

Exhibit TJB-5

Liberty Utilities (CalPeco Electric's) Size Study

Liberty Utilities (Calpeco Electric) Corp.
Risk Premium- Size (RP_s) Estimates **Size Premium**
Based on *Duff and Phelps* 2018 Valuation Handbook (Risk Premium Study Data)

			Measures of size (Millions)						
Line No.	Company	Symbol	MV Equity[1]	Book Equity[1]	MVIC[1]	5 Yr Avg. Net Income[1]	Total Assets[1]	5 Yr Avg. EBITDA[1]	Sales
1	ALLETE	ALE	$ 3,905	$ 2,068	$ 5,345	$ 97	$ 5,080	$ 255	$ 1,340
2	Alliant Energy	LNT	$ 10,127	$ 3,981	$ 14,138	$ 338	$ 14,188	$ 962	$ 3,320
3	Amer. Elec. Power	AEP	$ 35,333	$ 18,288	$ 54,753	$ 1,443	$ 64,729	$ 4,874	$ 16,380
4	Ameren Corp.	AEE	$ 15,845	$ 7,183	$ 22,939	$ 589	$ 25,945	$ 2,180	$ 6,076
5	Black Hills	BKH	$ 3,288	$ 1,708	$ 6,398	$ 87	$ 6,659	$ 402	$ 1,573
6	CMS Energy Corp.	CMS	$ 14,103	$ 4,441	$ 23,317	$ 413	$ 23,050	$ 1,660	$ 6,399
7	Consol. Edison	ED	$ 23,748	$ 15,419	$ 38,479	$ 1,141	$ 48,111	$ 3,294	$ 12,075
8	Dominion Energy	D	$ 47,238	$ 17,140	$ 78,186	$ 1,594	$ 76,585	$ 4,616	$ 11,737
9	DTE Energy	DTE	$ 20,206	$ 9,514	$ 32,391	$ 666	$ 33,767	$ 2,297	$ 10,630
10	Duke Energy	DUK	$ 57,857	$ 41,741	$ 106,892	$ 2,136	$ 137,914	$ 6,390	$ 22,743
11	Edison Int'l	EIX	$ 22,657	$ 11,670	$ 34,299	$ 1,594	$ 52,580	$ 3,919	$ 11,869
12	El Paso Electric	EE	$ 2,397	$ 1,142	$ 3,593	$ 91	$ 3,484	$ 305	$ 887
13	Hawaiian Elec.	HE	$ 3,908	$ 2,098	$ 5,542	$ 165	$ 13,100	$ 483	$ 2,381
14	DACORP Inc.	IDA	$ 4,885	$ 2,250	$ 6,631	$ 169	$ 6,045	$ 371	$ 1,262
15	MGE Energy	MGEE	$ 2,164	$ 779	$ 2,563	$ 64	$ 1,855	$ 151	$ 545
16	NorthWestern Corp.	NWE	$ 3,236	$ 1,800	$ 5,051	$ 84	$ 5,421	$ 263	$ 1,257
17	OGE Energy	OGE	$ 7,434	$ 3,850	$ 10,184	$ 355	$ 10,413	$ 1,052	$ 2,259
18	PG&E Corp.	PCG	$ 24,945	$ 19,223	$ 42,698	$ 893	$ 68,012	$ 4,071	$ 17,666
19	Pinnacle West Capital	PNW	$ 9,348	$ 5,009	$ 14,137	$ 387	$ 17,019	$ 1,333	$ 3,499
20	PNM Resources	PNM	$ 3,152	$ 1,696	$ 5,333	$ 106	$ 6,646	$ 438	$ 1,363
21	Portland General	POR	$ 4,159	$ 2,416	$ 6,585	$ 141	$ 7,838	$ 550	$ 1,923
22									
23	Public Serv. Enterprise	PEG	$ 27,130	$ 13,847	$ 39,198	$ 1,239	$ 42,716	$ 3,545	$ 9,198
24	WEC Energy Group	WEC	$ 21,857	$ 9,462	$ 30,604	$ 548	$ 31,591	$ 1,372	$ 7,472
25	Xcel Energy Inc.	XEL	$ 24,600	$ 11,456	$ 39,120	$ 905	$ 43,030	$ 2,870	$ 11,107
26	Liberty Utilities (Calpeco Electric) Corp.		N/A	$ 115.4	N/A	$ 9.6	$ 302 0	$ 9.1	$ 83.7

[1] From Yahoo Finance, 10K, or Value Line Analyzer

Line No.	Net Income Data ($ millions) Company	Symbol	2017	2016	2015	2014	2013	2012	5-Year Average
1	ALLETE	ALE	$ 159.2	$ 155 3	$ 163.4	$ 124.8	$ 104.7	$ 97.1	$ 141.5
2	Alliant Energy	LNT	$ 455.9	$ 373 8	$ 380.7	$ 385.5	$ 382.1	$ 337.8	$ 395.6
3	Amer. Elec. Power	AEP	$ 1,783.2	$ 2,073 6	$ 1,763.4	$ 1,634.0	$ 1,549 0	$ 1,443.0	$ 1,760.6
4	Ameren Corp.	AEE	$ 683.0	$ 659 0	$ 585.0	$ 593.0	$ 518 0	$ 589.0	$ 607.6
5	Avista Corp.	AVA	$ 126.1	$ 137 2	$ 118.1	$ 114.2	$ 111.1	$ 78.2	$ 121.3
6	Black Hills	BKH	$ 186.5	$ 140 3	$ 128.3	$ 128.8	$ 115 9	$ 86.9	$ 139.9
7	CMS Energy Corp.	CMS	$ 610.0	$ 553 0	$ 525.0	$ 479.0	$ 454 0	$ 413.0	$ 524.2
8	Consol. Edison	ED	$ 1,266.0	$ 1,189 0	$ 1,193.0	$ 1,066.0	$ 1,157 0	$ 1,141.0	$ 1,174.2
9	Dominion Energy	D	$ 2,244.0	$ 2,123 0	$ 1,899.0	$ 1,793.0	$ 1,806 0	$ 1,594.0	$ 1,973.0
10	DTE Energy	DTE	$ 1,029.0	$ 868 0	$ 796.0	$ 905.0	$ 661 0	$ 666.0	$ 851.8
11	Duke Energy	DUK	$ 2,963.0	$ 2,560 0	$ 2,854.0	$ 2,934.0	$ 2,813 0	$ 2,136.0	$ 2,824.8
12	Edison Int'l	EIX	$ 1,603.0	$ 1,422 0	$ 1,480.0	$ 1,539.0	$ 1,344 0	$ 1,594.0	$ 1,477.6
13	El Paso Electric	EE	$ 98.3	$ 96 8	$ 81.9	$ 91.4	$ 88 6	$ 90.9	$ 91.4
14	Hawaiian Elec.	HE	$ 180.6	$ 250 2	$ 161.8	$ 170.2	$ 163.4	$ 165.0	$ 185.2
15	DACORP Inc.	IDA	$ 212.4	$ 198 3	$ 194.7	$ 193.5	$ 182.4	$ 168.9	$ 196.3
16	MGE Energy	MGEE	$ 76.1	$ 75 6	$ 71.3	$ 80.3	$ 74 9	$ 64.5	$ 75.6
17	NorthWestern Corp.	NWE	$ 162.7	$ 164 2	$ 138.4	$ 120.7	$ 94 0	$ 83.7	$ 136.0
18	OGE Energy	OGE	$ 384.3	$ 338 2	$ 337.6	$ 395.8	$ 387 6	$ 355.0	$ 368.7
19	PG&E Corp.	PCG	$ 1,807.0	$ 1,431 0	$ 988.0	$ 1,450.0	$ 828 0	$ 893.0	$ 1,300.8
20	Pinnacle West Capital	PNW	$ 497.8	$ 442 0	$ 437.3	$ 397.6	$ 406.1	$ 387.4	$ 436.1
21	PNM Resources	PNM	$ 154.4	$ 117.4	$ 118.8	$ 116.8	$ 114 0	$ 106.2	$ 124.3
22	Portland General	POR	$ 204.0	$ 193 0	$ 172.0	$ 175.0	$ 137 0	$ 141.0	$ 176.2
23									
24	Public Serv. Enterprise	PEG	$ 1,431.0	$ 1,436 0	$ 1,679.0	$ 1,518.0	$ 1,243 0	$ 1,239.0	$ 1,461.4
25	WEC Energy Group	WEC	$ 998.2	$ 940 2	$ 640.3	$ 589.5	$ 578 6	$ 547.5	$ 749.4
26	Xcel Energy Inc.	XEL	$ 1,171.0	$ 1,123.4	$ 1,063.6	$ 1,021.3	$ 948 2	$ 905.2	$ 1,065.5
27	Liberty Utilities (Calpeco Electric) Corp.		$ 15.4	$ 9 0	$ 10.5	$ 11.3	$ 1.7	$ 9.6	$ 9.6

Net Income data for publicly traded water utilities from Value Line, Zacks Investment Research, 10K, and/or Yahoo Finance

Line No.	EBITDA Data ($ millions) Company	Symbol	2017	2016	2015	2014	2013	2012	5-Year Average
1	ALLETE	ALE	$ 407	$ 419	$ 417	$ 325	$ 271	$ 255	$ 368
2	Alliant Energy	LNT	$ 1,115	$ 949	$ 978	$ 932	$ 1,013	$ 962	$ 997
3	Amer. Elec. Power	AEP	$ 5,470	$ 5,566	$ 5,488	$ 5,305	$ 4,961	$ 4,874	$ 5,358
4	Ameren Corp.	AEE	$ 2,432	$ 2,326	$ 2,155	$ 2,067	$ 1,945	$ 2,180	$ 2,185
5	Avista Corp.	AVA	$ 478	$ 492	$ 442	$ 401	$ 395	$ 333	$ 442
6	Black Hills	BKH	$ 613	$ 525	$ 441	$ 411	$ 404	$ 402	$ 479
7	CMS Energy Corp.	CMS	$ 2,219	$ 2,108	$ 1,913	$ 1,837	$ 1,770	$ 1,660	$ 1,969
8	Consol. Edison	ED	$ 3,950	$ 3,687	$ 3,557	$ 3,235	$ 3,295	$ 3,294	$ 3,545
9	Dominion Energy	D	$ 6,332	$ 5,476	$ 5,205	$ 5,005	$ 4,706	$ 4,616	$ 5,345
10	DTE Energy	DTE	$ 2,729	$ 2,479	$ 2,248	$ 2,783	$ 2,335	$ 2,297	$ 2,515
11	Duke Energy	DUK	$ 9,799	$ 9,194	$ 9,033	$ 8,851	$ 8,579	$ 6,390	$ 9,091
12	Edison Int'l	EIX	$ 4,324	$ 4,190	$ 4,013	$ 4,287	$ 3,912	$ 3,919	$ 4,145
13	El Paso Electric	EE	$ 351	$ 340	$ 297	$ 297	$ 304	$ 305	$ 318
14	Hawaiian Elec.	HE	$ 560	$ 553	$ 518	$ 510	$ 480	$ 483	$ 524
15	DACORP Inc.	IDA	$ 470	$ 419	$ 425	$ 391	$ 426	$ 371	$ 426
16	MGE Energy	MGEE	$ 201	$ 193	$ 188	$ 198	$ 185	$ 151	$ 193
17	NorthWestern Corp.	NWE	$ 432	$ 407	$ 392	$ 310	$ 288	$ 263	$ 366
18	OGE Energy	OGE	$ 794	$ 826	$ 789	$ 818	$ 852	$ 1,052	$ 816
19	PG&E Corp.	PCG	$ 5,810	$ 4,956	$ 4,220	$ 4,883	$ 3,839	$ 4,071	$ 4,742
20	Pinnacle West Capital	PNW	$ 1,530	$ 1,459	$ 1,426	$ 1,308	$ 1,339	$ 1,333	$ 1,412
21	PNM Resources	PNM	$ 602	$ 520	$ 513	$ 510	$ 466	$ 438	$ 522
22	Portland General	POR	$ 721	$ 654	$ 614	$ 594	$ 506	$ 550	$ 618
23									
24	Public Serv. Enterprise	PEG	$ 3,691	$ 3,506	$ 4,389	$ 4,050	$ 3,669	$ 3,545	$ 3,861
25	WEC Energy Group	WEC	$ 2,584	$ 2,445	$ 1,834	$ 1,532	$ 1,480	$ 1,372	$ 1,975
26	Xcel Energy Inc.	XEL	$ 3,794	$ 3,648	$ 3,379	$ 3,094	$ 2,942	$ 2,870	$ 3,371
27	Liberty Utilities (Calpeco Electric) Corp.		$ 24.3	$ 24 3	$ 16.9	$ 18.0	$ 18 9	$ 9.1	$ 18.6

Earnings before Interest, Taxes, Depreciation and Amortization (EBITDA). From Value Line, Yahoo Finance, 10K, or Zacks Investment Research.

Risk Premium- Size (RP_s) Estimates
Data Smoothing with Regression Analysis
Smoothed Premium (RP_s) = Constant + X Coefficients * Log(Relevent Metric)

Size Premium
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Witness: Bourassa

Line No.			MV Equity (Table B-1)[1]	Book Equity (Table B-2)[1]	MVIC (Table B-4)[1]	5 Yr Avg. Net Income (Table B-3)[1]	Total Assets (Table B-5)[1]	5 Yr Avg. EBITDA (Table B-6)[1]	Sales (Table B-7)	
1										
2	Constant		8 978%	6.260%	8 358%	5.279%	6.754%	5.722%	9 045%	
3	X Coefficient(s)		-1.733%	-1.029%	-1 514%	-0.954%	-1 051%	-0.962%	-1.483%	
4										
5						**RP_s (levered)**				
6			MV	Book		5 Yr Avg.	Total	5 Yr Avg.		
7	Company	Symbol	Equity	Equity	MVIC	Net Income	Assets	EBITDA	Sales	Average
8	ALLETE	ALE	2.75%	2 85%	2.71%	3.38%	2.86%	3.41%	4.41%	3 20%
9	Alliant Energy	LNT	2.04%	2 56%	2.07%	2.87%	2.39%	2 85%	3.82%	2 66%
10	Amer. Elec. Power	AEP	1.10%	1 87%	1.18%	2.27%	1.70%	2.17%	2.80%	1 87%
11	Ameren Corp.	AEE	1.70%	2 29%	1.76%	2.64%	2.11%	2 51%	3.43%	2 35%
12	Black Hills	BKH	2.88%	2 93%	2.60%	3.43%	2.74%	3 22%	4.30%	3.16%
13	CMS Energy Corp.	CMS	1.79%	2 51%	1.75%	2.78%	2.17%	2 62%	3.40%	2.43%
14	Consol. Edison	ED	1.40%	1 95%	1.42%	2.36%	1.83%	2 34%	2.99%	2 04%
15	Dominion Energy	D	0.88%	1 90%	0.95%	2.22%	1.62%	2 20%	3.01%	1 83%
16	DTE Energy	DTE	1.52%	2.17%	1.53%	2.59%	1.99%	2.49%	3.07%	2.19%
17	Duke Energy	DUK	0.72%	1 51%	0.74%	2.10%	1.35%	2 06%	2.58%	1 58%
18	Edison Int'l	EIX	1.43%	2 07%	1.49%	2.22%	1.79%	2 27%	3.00%	2 04%
19	El Paso Electric	EE	3.12%	3.11%	2.98%	3.41%	3.03%	3 33%	4.67%	3 38%
20	Hawaiian Elec.	HE	2.75%	2 84%	2.69%	3.16%	2.43%	3.14%	4.04%	3 01%
21	DACORP Inc.	IDA	2.59%	2 81%	2.57%	3.15%	2.78%	3 25%	4.45%	3 09%
22	MGE Energy	MGEE	3.20%	3 28%	3.20%	3.55%	3.32%	3 62%	4.99%	3 59%
23	NorthWestern Corp.	NWE	2.90%	2 91%	2.75%	3.44%	2.83%	3 39%	4.45%	3 24%
24	OGE Energy	OGE	2.27%	2 57%	2.29%	2.85%	2.53%	2 81%	4.07%	2.77%
25	PG&E Corp.	PCG	1.36%	1 85%	1.35%	2.46%	1.67%	2 25%	2.75%	1 96%
26	Pinnacle West Capital	PNW	2.10%	2.45%	2.07%	2.81%	2.31%	2.72%	3.79%	2 61%
27	PNM Resources	PNM	2.91%	2 94%	2.72%	3.35%	2.74%	3.18%	4.40%	3.18%
28	Portland General	POR	2.71%	2.78%	2.58%	3.23%	2.66%	3 09%	4.17%	3 03%
29										
30	Public Serv. Enterprise	PEG	1.29%	2 00%	1.40%	2.33%	1.89%	2 31%	3.17%	2 06%
31	WEC Energy Group	WEC	1.46%	2.17%	1.57%	2.67%	2.02%	2.70%	3.30%	2 27%
32	Xcel Energy Inc.	XEL	1.37%	2 08%	1.41%	2.46%	1.88%	2.40%	3.05%	2 09%
32	Average		2.01%	2.43%	1.99%	2.82%	2.28%	2.76%	3.67%	2 57%
33	Comparative Risk Study Risk Premium Adjustment (see Comparative Risk Study Adjustment to Size Premium)									-0 50%
34	Proxy Group Adjusted Risk Premium - Size (RP_S).									2 07%
35	Liberty Utilities (Calpeco Electric) Corp.		N/A	4.14%	N/A	4.34%	4.15%	4 80%	6.19%	4.72%
36	Comparative Risk Study Risk Premium Adjustment (see Comparative Risk Study Adjustment to Size Premium)									-0 29%
37	Adjusted Risk Premium - Size (RP_S)									4.43%
38	Difference in Adjusted Risk Premium Between Proxy Group and Company									2 36%

[1] Source: Duff & Phelps 2018 Valuation Handbook Supplementary Data Exhibits (Regression Equations)

Liberty Utilities (Calpeco Electric) Corp.
Comparative Risk Study - Adjustment to Size Premium
Based on *Duff and Phelps* 2018 Size Study Data
Step 1 - Identify the equivalent C exhibit for the B exhibits used to compute the size premium.
Step 2 - Indentify the fundamental risk characteristics of the companies of the equivalent portfolio in the C- exhibit.
Step 3 - Indentify the guideline portfolio in the D exhibit which has the most simliar fundamental risk characteristic found in Step 2 and find the smoothed average risk premium.
Step 4 - Indentify the guideline portfolio in the D exhibit which has the most simliar fundamental risk characteristic to the Company and find the smoothed average risk premium.
Step 5 - The diffence in smoothed average risk premiums is the maxmium indicated risk adjustment. The range of adjustments may be 0 or at the maximum depending on the circumstances.

Line No.	Company	Symbol	Measures of size (Millions) MV Equity[1]	Book Equity[1]	MVIC[1]	5 Yr Avg. Net Income[1]	Total Assets[1]	5 Yr Avg. EBITDA[1]	Sales
1	ALLETE	ALE	$ 3,905	$ 2,068	$ 5,345	$ 97	$ 5,080	$ 368	$ 1,340
2	Alliant Energy	LNT	$ 10,127	$ 3,981	$ 14,138	$ 338	$ 14,188	$ 997	$ 3,320
3	Amer. Elec. Power	AEP	$ 35,333	$ 18,288	$ 54,753	$ 1,443	$ 64,729	$ 5,358	$ 16,380
4	Ameren Corp.	AEE	$ 15,845	$ 7,183	$ 22,939	$ 589	$ 25,945	$ 2,185	$ 6,076
5	Black Hills	BKH	$ 3,288	$ 1,708	$ 6,398	$ 87	$ 6,659	$ 479	$ 1,573
6	CMS Energy Corp.	CMS	$ 14,103	$ 4,441	$ 23,317	$ 413	$ 23,050	$ 1,969	$ 6,399
7	Consol. Edison	ED	$ 23,748	$ 15,419	$ 38,479	$ 1,141	$ 48,111	$ 3,545	$ 12,075
8	Dominion Energy	D	$ 47,238	$ 17,140	$ 78,186	$ 1,594	$ 76,585	$ 5,345	$ 11,737
9	DTE Energy	DTE	$ 20,206	$ 9,514	$ 32,391	$ 666	$ 33,767	$ 2,515	$ 10,630
10	Duke Energy	DUK	$ 57,857	$ 41,741	$ 106,892	$ 2,136	$ 137,914	$ 9,091	$ 22,743
11	Edison Int'l	EIX	$ 22,657	$ 11,670	$ 34,299	$ 1,594	$ 52,580	$ 4,145	$ 11,869
12	El Paso Electric	EE	$ 2,397	$ 1,142	$ 3,593	$ 91	$ 3,484	$ 318	$ 887
13	Hawaiian Elec.	HE	$ 3,908	$ 2,098	$ 5,542	$ 165	$ 13,100	$ 524	$ 2,381
14	IDACORP Inc.	IDA	$ 4,885	$ 2,250	$ 6,631	$ 169	$ 6,045	$ 426	$ 1,262
15	MGE Energy	MGEE	$ 2,164	$ 779	$ 2,563	$ 64	$ 1,855	$ 193	$ 545
16	NorthWestern Corp.	NWE	$ 3,236	$ 1,800	$ 5,051	$ 84	$ 5,421	$ 366	$ 1,257
17	OGE Energy	OGE	$ 7,434	$ 3,850	$ 10,184	$ 355	$ 10,413	$ 816	$ 2,259
18	PG&E Corp.	PCG	$ 24,945	$ 19,223	$ 42,698	$ 893	$ 68,012	$ 4,742	$ 17,666
19	Pinnacle West Capital	PNW	$ 9,348	$ 5,009	$ 14,137	$ 387	$ 17,019	$ 1,412	$ 3,499
20	PNM Resources	PNM	$ 3,152	$ 1,696	$ 5,333	$ 106	$ 6,646	$ 522	$ 1,363
21	Portland General	POR	$ 4,159	$ 2,416	$ 6,585	$ 141	$ 7,838	$ 618	$ 1,923
22									
23	Public Serv. Enterprise	PEG	$ 27,130	$ 13,847	$ 39,198	$ 1,239	$ 42,716	$ 3,861	$ 9,198
24	WEC Energy Group	WEC	$ 21,857	$ 9,462	$ 30,604	$ 548	$ 31,591	$ 1,975	$ 7,472
25	Xcel Energy Inc.	XEL	$ 24,600	$ 11,456	$ 39,120	$ 905	$ 43,030	$ 3,371	$ 11,107

[1] From Yahoo Finance, 10K, or Value Line Analyzer

Liberty Utilities (Calpeco Electric) Corp.
Comparative Risk Study - Adjustment to Size Premium
Based on *Duff and Phelps* 2018 Size Study Data

Line No.	Equivalent C Exhibit Portfolio Operating Margin Company	Symbol	MV Equity (Table C-1)	Book Equity (Table C-2)	MVIC (Table C-4)	5 Yr Avg. Net Income (Table C-3)	Total Assets (Table C-5)	5 Yr Avg. EBITDA (Table C-6)	Sales (Table C-7)	
1	ALLETE	ALE	11.05%	11.30%	11.17%	10.45%	11.07%	10.64%	9.33%	
2	Alliant Energy	LNT	12.55%	11.79%	12.69%	11.96%	12.37%	12.15%	9.75%	
3	Amer. Elec. Power	AEP	13.37%	13.43%	14.13%	13.07%	13.96%	13.56%	11.02%	
4	Ameren Corp.	AEE	12.81%	12.77%	12.41%	12.58%	12.22%	12.00%	9.83%	
5	Black Hills	BKH	10.81%	11.11%	11.65%	10.39%	11.60%	11.04%	9.88%	
6	CMS Energy Corp.	CMS	12.77%	11.69%	12.43%	12.41%	11.86%	12.17%	9.80%	
7	Consol. Edison	ED	12.88%	12.71%	12.96%	12.87%	13.33%	12.31%	9.74%	
8	Dominion Energy	D	13.57%	13.14%	15.17%	13.13%	14.00%	13.55%	9.78%	
9	DTE Energy	DTE	12.68%	12.22%	12.73%	12.42%	12.38%	11.87%	10.09%	
10	Duke Energy	DUK	13.70%	14.51%	15.73%	13.59%	14.23%	14.41%	10.34%	
11	Edison Int'l	EIX	12.78%	12.29%	12.79%	13.13%	13.72%	12.89%	9.68%	
12	El Paso Electric	EE	10.51%	10.48%	10.30%	10.41%	10.46%	10.23%	8.77%	
13	Hawaiian Elec.	HE	11.05%	11.30%	11.34%	11.09%	12.04%	11.20%	9.18%	
14	IDACORP Inc.	IDA	11.77%	11.38%	11.69%	11.16%	11.51%	10.67%	8.96%	
15	MGE Energy	MGEE	10.12%	9.88%	9.74%	9.61%	9.70%	9.65%	8.62%	
16	NorthWestern Corp.	NWE	10.80%	11.19%	10.91%	10.29%	11.32%	10.62%	8.83%	
17	OGE Energy	OGE	11.77%	11.82%	12.03%	12.03%	11.56%	12.13%	9.39%	
18	PG&E Corp.	PCG	12.99%	13.66%	13.28%	12.42%	13.97%	13.31%	9.72%	
19	Pinnacle West Capital	PNW	12.50%	12.12%	12.69%	12.24%	11.97%	12.25%	9.32%	
20	PNM Resources	PNM	10.77%	11.10%	11.16%	10.52%	11.60%	11.20%	9.17%	
21	Portland General	POR	11.19%	11.52%	11.68%	10.74%	11.25%	11.31%	9.32%	
22										
23	Public Serv. Enterprise	PEG	13.19%	12.35%	13.01%	12.99%	12.86%	12.61%	9.71%	
24	WEC Energy Group	WEC	12.71%	12.22%	12.68%	12.67%	12.37%	12.16%	9.81%	
25	Xcel Energy Inc.	XEL	12.96%	12.28%	13.00%	12.44%	12.89%	12.15%	9.74%	
26	Proxy Group Average		12.14%	12.01%	12.39%	11.86%	12.26%	11.92%	9.57%	11.74%
27	Smoothed Average Risk Premium based upon OM									9.49%

Liberty Utilities (Calpeco Electric) Corp.
Comparative Risk Study - Adjustment to Size Premium
Based on *Duff and Phelps* 2018 Size Study Data

Line No.	Equivalent C Exhibit Portfolio CV(Operating Margin) Company	Symbol	MV Equity (Table C-1)	Book Equity (Table C-2)	MVIC (Table C-4)	5 Yr Avg. Net Income (Table C-3)	Total Assets (Table C-5)	5 Yr Avg. EBITDA (Table C-6)	Sales (Table C-7)	
1	ALLETE	ALE	16.81%	15.22%	16.17%	18.33%	16.02%	16.31%	21.43%	
2	Alliant Energy	LNT	14.52%	15.13%	14.01%	14.49%	14.22%	14.59%	17.44%	
3	Amer. Elec. Power	AEP	12.23%	13.19%	12.16%	11.98%	13.70%	11.91%	12.46%	
4	Ameren Corp.	AEE	13.76%	13.48%	13.60%	13.09%	12.64%	13.37%	15.14%	
5	Black Hills	BKH	17.64%	15.52%	15.51%	18.34%	15.36%	16.22%	19.78%	
6	CMS Energy Corp.	CMS	13.74%	15.34%	13.54%	14.19%	12.73%	13.52%	18.30%	
7	Consol. Edison	ED	12.94%	13.61%	12.39%	12.22%	13.60%	12.18%	16.87%	
8	Dominion Energy	D	11.62%	13.35%	11.74%	11.93%	13.63%	11.90%	15.76%	
9	DTE Energy	DTE	13.11%	13.12%	12.62%	13.16%	13.10%	13.11%	17.47%	
10	Duke Energy	DUK	11.40%	12.61%	11.41%	11.49%	13.27%	12.53%	14.55%	
11	Edison Int'l	EIX	12.94%	13.45%	12.54%	11.93%	13.71%	11.74%	16.48%	
12	El Paso Electric	EE	18.59%	17.20%	18.41%	18.33%	17.50%	17.24%	31.10%	
13	Hawaiian Elec.	HE	16.80%	15.22%	15.98%	14.80%	14.52%	15.90%	25.87%	
14	IDACORP Inc.	IDA	14.90%	15.15%	15.41%	14.63%	15.58%	16.56%	27.43%	
15	MGE Energy	MGEE	19.66%	18.76%	19.21%	19.67%	18.70%	18.95%	37.62%	
16	NorthWestern Corp.	NWE	17.65%	15.39%	16.44%	18.46%	15.83%	16.35%	28.60%	
17	OGE Energy	OGE	14.88%	15.08%	14.63%	14.44%	14.70%	14.98%	22.62%	
18	PG&E Corp.	PCG	12.93%	13.05%	12.34%	12.86%	13.68%	11.62%	16.22%	
19	Pinnacle West Capital	PNW	14.52%	14.74%	14.01%	14.30%	13.47%	13.25%	21.27%	
20	PNM Resources	PNM	17.66%	15.54%	16.18%	18.07%	15.37%	15.92%	25.90%	
21	Portland General	POR	15.88%	15.03%	15.43%	15.87%	15.12%	15.47%	24.52%	
22										
23	Public Serv. Enterprise	PEG	12.92%	13.78%	12.38%	12.04%	13.48%	11.95%	16.64%	
24	WEC Energy Group	WEC	12.95%	13.12%	12.69%	13.04%	12.94%	13.52%	18.28%	
25	Xcel Energy Inc.	XEL	12.93%	13.42%	12.38%	12.83%	13.48%	12.30%	17.31%	
26	Proxy Group Average		14.71%	14.56%	14.22%	14.60%	14.43%	14.22%	20.79%	15.36%
27	Smoothed Average Risk Premium based upon CV (OM)									9.71%

Liberty Utilities (Calpeco Electric) Corp.
Comparative Risk Study - Adjustment to Size Premium
Based on *Duff and Phelps* 2018 Size Study Data

Line No.	Equivalent C Exhibit Portfolio CV(ROE) Company	Symbol	MV Equity (Table C-1)	Book Equity (Table C-2)	MVIC (Table C-4)	5 Yr Avg. Net Income (Table C-3)	Total Assets (Table C-5)	5 Yr Avg. EBITDA (Table C-6)	Sales (Table C-7)	
1	ALLETE	ALE	27.65%	27.01%	27.66%	30.34%	27.58%	27.75%	37.25%	
2	Alliant Energy	LNT	25.65%	27.19%	24.78%	25.12%	29.15%	26.76%	29.29%	
3	Amer. Elec. Power	AEP	23.19%	25.05%	23.46%	21.13%	27.16%	23.21%	23.31%	
4	Ameren Corp.	AEE	24.02%	27.23%	26.84%	23.50%	25.71%	28.04%	28.88%	
5	Black Hills	BKH	29.07%	25.93%	27.24%	30.40%	28.69%	28.70%	35.35%	
6	CMS Energy Corp.	CMS	24.41%	27.51%	26.73%	24.84%	26.61%	27.53%	31.81%	
7	Consol. Edison	ED	24.58%	25.28%	24.50%	21.82%	26.46%	24.06%	29.28%	
8	Dominion Energy	D	22.60%	25.14%	22.97%	21.31%	26.72%	23.20%	28.27%	
9	DTE Energy	DTE	24.39%	26.09%	25.01%	24.49%	24.99%	28.04%	29.04%	
10	Duke Energy	DUK	23.46%	23.93%	22.53%	21.61%	24.47%	24.64%	27.24%	
11	Edison Int'l	EIX	24.54%	25.76%	24.85%	21.31%	27.15%	22.91%	29.53%	
12	El Paso Electric	EE	30.45%	29.83%	30.73%	30.37%	30.01%	28.22%	48.03%	
13	Hawaiian Elec.	HE	27.64%	27.03%	27.65%	24.22%	30.34%	28.44%	41.61%	
14	IDACORP Inc.	IDA	25.63%	27.01%	27.08%	23.72%	28.44%	27.40%	43.96%	
15	MGE Energy	MGEE	33.05%	31.67%	33.99%	32.17%	32.49%	31.77%	54.45%	
16	NorthWestern Corp.	NWE	29.14%	26.38%	27.75%	30.49%	28.04%	27.71%	45.57%	
17	OGE Energy	OGE	27.07%	27.10%	27.71%	25.10%	29.71%	27.74%	37.48%	
18	PG&E Corp.	PCG	24.63%	24.97%	24.20%	25.58%	27.04%	22.54%	28.47%	
19	Pinnacle West Capital	PNW	25.65%	26.82%	24.78%	24.96%	28.16%	24.12%	37.68%	
20	PNM Resources	PNM	29.26%	25.87%	27.67%	30.22%	28.68%	28.48%	41.66%	
21	Portland General	POR	26.64%	26.87%	27.11%	27.24%	28.24%	26.87%	39.76%	
22										
23	Public Serv. Enterprise	PEG	24.72%	25.43%	24.45%	20.89%	25.63%	23.46%	29.41%	
24	WEC Energy Group	WEC	24.50%	26.09%	25.16%	22.97%	25.12%	27.55%	31.77%	
25	Xcel Energy Inc.	XEL	24.62%	25.79%	24.45%	25.39%	25.68%	24.40%	29.29%	
26	Proxy Group Average		26.10%	26.54%	26.22%	25.38%	27.59%	26.40%	34.93%	27.60%
27	Smoothed Average Risk Premium based upon CV (ROE)									9.52%

Liberty Utilities (Calpeco Electric) Corp.
Comparative Risk Study - Adjustment to Size Premium
Based on *Duff and Phelps* 2018 Size Study Data
Estimate of Risk Premium Adjustment

Line No.	Company	Symbol	5 -Year Historical OM	CV (OM)	CV(ROE)
1	ALLETE	ALE	16.25%	4.02%	6.64%
2	Alliant Energy	LNT	17.81%	10.75%	5.87%
3	Amer. Elec. Power	AEP	20.45%	5.12%	9.62%
4	Ameren Corp.	AEE	21.60%	6.84%	7.42%
5	Black Hills	BKH	21.18%	10.75%	10.01%
6	CMS Energy Corp.	CMS	18.41%	10.13%	2.28%
7	Consol. Edison	ED	19.31%	9.84%	6.25%
8	Dominion Energy	D	29.39%	10.03%	2.45%
9	DTE Energy	DTE	13.02%	3.13%	11.28%
10	Duke Energy	DUK	22.99%	4.43%	5.81%
11	Edison Int'l	EIX	17.92%	2.29%	6.98%
12	El Paso Electric	EE	19.17%	13.12%	6.15%
13	Hawaiian Elec.	HE	12.03%	17.18%	15.55%
14	IDACORP Inc.	IDA	21.90%	6.22%	3.12%
15	MGE Energy	MGEE	25.87%	3.57%	10.11%
16	NorthWestern Corp.	NWE	17.87%	15.76%	6.73%
17	OGE Energy	OGE	21.59%	6.06%	12.63%
18	PG&E Corp.	PCG	12.98%	22.77%	22.91%
19	Pinnacle West Capital	PNW	24.57%	4.32%	3.63%
20	PNM Resources	PNM	21.21%	5.53%	13.90%
21	Portland General	POR	16.40%	10.47%	8.10%
22					
23	Public Serv. Enterprise	PEG	25.63%	8.48%	8.17%
24	Xcel Energy Inc.	XEL	18.41%	8.15%	1.31%
25	Proxy Group Average		19.82%	8.65%	8.13%

Proxy Group Risk Differences

					Average
26	Smoothed Average Risk Premium From Equivalent D Exhibit[1]	8.01%	9.17%	8.57%	8.58%
27	Smoothed Average Risk Premium From Equivalent C Exhibit	9.49%	9.71%	9.52%	9.57%
28	**Indicated Risk Adjustment**	-1.49%	-0.53%	-0.95%	-0.99%
					Mid-point
29	Possible Adjustment to Risk Premium	0.00%	to	-0.99%	-0.50%

		5 -Year Historical OM	CV (OM)	CV(ROE)	
30	Liberty Utilities (Calpeco Electric) Corp.	28.01%	21.93%	45.42%	
					Average
31	Smoothed Average Risk Premium From Equivalent D Exhibit1	7.03%	10.04%	9.91%	8.99%
32	Smoothed Average Risk Premium From Equivalent C	9.49%	9.71%	9.52%	9.57%
33	Indicated Risk Adjustment	-2.47%	0.33%	0.39%	-0.58%
					Mid-point
34	Possible Adjustment to Risk Premium	0.00%	to	-0.58%	-0.29%

[1] Source: Duff & Phelps 2018 Valuation Handbook Supplementary Data Exhibits (Regression Equations)
[1] Source: Duff & Phelps 2018 Valuation Handbook Supplementary Data - Size Study