BEFORE THE CORPORATION COMMISSION OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF OKLAHOMA NATURAL GAS COMPANY, A DIVISION OF ONE GAS, INC., FOR A REVIEW AND CHANGE OR MODIFICATION IN ITS RATES, CHARGES, TARIFFS, AND TERMS AND CONDITIONS OF SERVICE	CAUSE NO. PUD 201500213

RESPONSIVE TESTIMONY
OF
DAVID J. GARRETT

COST OF CAPITAL

THE PUBLIC UTILITY DIVISION

OCTOBER 19, 2015

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INTRODUCTION

Q. State your name and occupation.

A. My name is David Garrett. I am employed as a public utility regulatory analyst at the Public Utility Division ("PUD") of the Oklahoma Corporation Commission (the "Commission").

Q. Summarize your educational background and professional experience.

A. I received a B.B.A. degree with a major in Finance, an M.B.A. degree, and a Juris Doctor degree from the University of Oklahoma. I worked in private legal practice representing clients in various litigation and transactional matters before joining the Commission in 2011. At the Commission, I worked in the Office of General Counsel representing PUD in regulatory proceedings before joining PUD as a regulatory analyst in 2012. I have attended numerous training courses and seminars covering a variety of regulatory issues. I am a Certified Depreciation Professional through the Society of Depreciation Professionals. I am also a Certified Rate of Return Analyst through the Society of Utility and Regulatory Financial Analysts. I have testified in many regulatory proceedings and the Commission has accepted my credentials. A more complete description of my qualifications and regulatory experience is included in my curriculum vitae.[1]

Q. Describe the general organization of your testimony.

A. In this cause, I am testifying on the two primary capital recovery mechanisms in the rate base rate of return model: cost of capital and depreciation. Because these are two separate issues, and the testimonies are voluminous, I have filed two separate responsive

[1] Exhibit DG-C-1.

testimony documents. The exhibits attached to both testimonies each have a different number. The cost of capital exhibits are labeled "DG-C," and the depreciation exhibits are labeled "DG-D." In this testimony, I will address the cost of capital, capital structure, and other related issues.

EXECUTIVE SUMMARY

Q. Summarize the key points of your testimony.

A. According to the U.S. Supreme Court, ONG's allowed rate of return in this case should be based on the Company's risk, and should be sufficient enough for ONG to remain financially sound under efficient and economical management. In addition, the Company has no right to profits anticipated in highly profitable enterprises. The allowed rate of return should be based on the utility's cost of capital. A utility's cost of capital is comprised of two components: debt and equity. While the cost of debt is determined by fixed, contractual interest payments, the cost of equity must be estimated through financial models. I have employed three widely-used financial models on a group of proxy companies to arrive at a fair, reasonable and accurate estimate of the Company's cost of equity in this case, including: 1) the Discounted Cash Flow Model; 2) the Capital Asset Pricing Model; and 3) the Comparable Earnings Model. Finally, I conducted an objective analysis to determine the Company's optimal capital structure. I will summarize each of these issues in turn.

Discounted Cash Flow Model ("DCF" Model)

The most important component of the DCF Model is the growth rate. I considered historical dividend growth, projected earnings growth, and the fundamental growth rate

in estimating a reasonable, sustainable growth rate for each proxy company. Out of the several variations of the DCF Model, I used the model that results in the highest cost of equity estimate, all else held constant.

Capital Asset Pricing Model ("CAPM")

Out of the three models I used to estimate the cost of equity in this case, the CAPM is the only model that specifically measures the risk of the utility, as instructed by the Supreme Court. In fact, all three of the inputs to the CAPM model relate to risk: 1) risk-free rate; 2) beta; and 3) equity risk premium. The risk-free rate and equity risk premium are single figures that apply to every company. Beta, on the other hand, is a term used to measure the risk of each individual company. There are two primary types of risk: firm-specific risk and market risk. Since firm-specific risk can be eliminated through diversification, it is not rewarded by the market. Beta measures market risk – the type of risk that is rewarded by the market. I conducted regression analyses to determine the beta for each company in the proxy group. Finally, I conducted extensive analyses to estimate the equity risk premium. The equity risk premium is the amount of return on the market above the risk-free rate that equity investors expect. I incorporated three widely-accepted methods of estimating the equity risk premium, including: 1) a historical study; 2) a survey of experts; and 3) the implied equity risk premium calculation.

Comparable Earnings Model ("CEM")

The CEM simply compares the actual returns on equity earned by a group of companies with comparable risk to the target utility. The CEM should be conducted on a group of

competitive, non-regulated firms with risk profiles and operations similar to those of public utilities. Unfortunately, such a group of competitive firms does not exist in the market. As a result, expert witnesses in utility rate cases usually conduct the CEM on the same group of proxy utility companies used to conduct the other two models. When the CEM is conducted this way, it is clearly the weakest of the three models for these reasons: 1) the earned returns of other utilities are heavily influenced by commission-awarded returns in the past, which may not be appropriate under current economic conditions, if they ever were at all; 2) the CEM, unlike the other two models, has no way of measuring risk and does not consider any forward-looking projections; and 3) the returns of other utilities were not earned under the restraints of competition. I have only included the CEM in this case because regulators are familiar with seeing it, but for the reasons stated above, the Commission should give much less consideration to the CEM than the other two superior models.

Capital Structure

A firm's capital structure refers to the ratios of debt and equity used to finance the firm's operations. For competitive firms, the value of the firm is maximized when the cost of capital is minimized. This means that firms must determine the fractions of debt and equity to use in order to minimize their overall capital cost. While competitive firms have a natural financial incentive to minimize capital costs, regulated utilities do not. This is because a higher cost of capital increases a utility's revenue. The Commission has the authority to stand in the place of competition and impute a proper capital structure

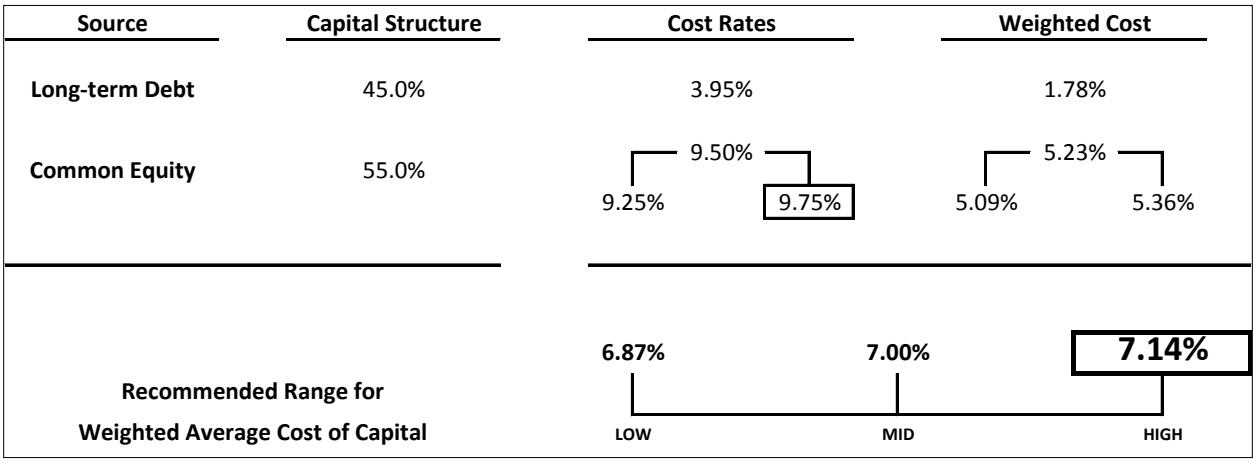
if necessary. I conducted an extensive, objective analysis to estimate the Company's optimal capital structure.

Q. Summarize PUD's recommendation to the Commission.

A. Considering an average of the three models used to estimate the cost of equity, as well as the expected return on the market portfolio, ONG's true cost of equity is very likely below 9.0 percent. PUD, however, is recommending a higher cost of equity of 9.75 percent, which is the highest point within a range of reasonableness of 9.25 to 9.75 percent. This recommendation is well above the true required rate of return of the Company's equity investors. While the rate of return awarded by this Commission should arguably equal the true required rate of return, PUD is recommending an awarded return on equity above the true required return in the interest of gradualism and fairness to the Company. PUD is also recommending a cost of debt of 3.95 percent as proposed by ONG. With regard to capital structure, PUD is recommending that the Commission impute a capital structure consisting of 45 percent debt and 55 percent equity. ONG's optimal, competitive capital structure actually consists of a much higher debt ratio – approximately 70 percent. PUD, however, is recommending a much lower debt ratio in the interest of gradualism and fairness to the Company, as imputing the optimal capital structure at this time would represent an abrupt adjustment rather than a gradual one. Based on these recommendations for the capital structure, cost of equity, and cost of debt, PUD is recommending an overall weighted average cost of capital of 7.14 percent, which

is the midpoint within a range of reasonableness of 6.87 to 7.14 percent. PUD's recommendations are presented in the figure below.[2]

Figure 1:
Recommended Weighted Average Cost of Capital



PUD's recommendation was developed through extensive, objective analysis, and it is fair, just, and reasonable for both ratepayers and the Company.

LEGAL STANDARD

Q. Discuss the legal standard governing the allowed rate of return on capital investments for regulated utilities.

A. In *Wilcox v. Consolidated Gas Co. of New York*, the U.S. Supreme Court first addressed the meaning of a fair rate of return for public utilities.[3] The Court found that "the amount of risk in the business is a most important factor" in determining the appropriate allowed rate of return.[4] Later in two landmark cases, the U.S. Supreme Court set forth the standards by which public utilities are allowed to earn a return on capital investments. In

[2] Exhibit DG-C-2.

[3] *Wilcox v. Consolidated Gas Co. of New York*, 212 U.S. 19 (1909).

[4] *Id*. at 48.

Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia, the Court held:

> 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. . . but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. 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.[5]

In *Federal Power Commission v. Hope Natural Gas Company*, the Court expanded on the guidelines set forth in *Bluefield* and stated:

> From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock. By that standard the 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.[6]

In summation, the *Hope* and *Bluefield* decisions set fort the following primary standards to be considered when determining a fair rate of return for public utilities:

1. Corresponding Risk – risk is the most important factor when assessing the required return on equity. A utility's return should be less than the return of riskier enterprises.

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[5] *Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679, 692-93 (1923).

[6] *Federal Power Commission v. Hope Natural Gas Co*., 320 U.S. 591, 603 (1944).

2. Financial Soundness – a utility is entitled to a return sufficient to maintain its credit, attract capital, and remain financially sound under efficient and economical management.

The cost of capital models I have employed in this case are in accord with these standards, and have been widely accepted by regulatory commissions around the country for many years.

Q. The allowed rate of return should equal the return required by the Company's investors.

A. Yes. The Supreme Court standards indicate that the allowed return set by the Commission in this case should equal the true required rate of return of the Company's equity investors. Scholars agree:

> Since by definition the cost of capital of a regulated firm represents precisely the expected return that investors could anticipate from other investments while bearing no more or less risk, and since investors will not provide capital unless the investment is expected to yield its opportunity cost of capital, the correspondence of the definition of the cost of capital with the court's definition of legally required earnings appears clear.[7]

The models I have employed in this case indicate the true required rate of return for the Company. If the Commission sets the allowed return equal to the true required return, it will allow the company to maintain its financial integrity and satisfy the claims of its investors. On the other hand, if the Commission sets the allowed rate of return higher than the true required return, it arguably results in an inappropriate transfer of wealth from ratepayers to shareholders. According to Dr. Morin:

[7] A. Lawrence Kolbe, James A. Read, Jr. & George R. Hall, *The Cost of Capital: Estimating the Rate of Return for Public Utilities* 21 (The MIT Press 1984).

> [I]f the allowed rate of return is greater than the cost of capital, capital investments are undertaken and investors' opportunity costs are more than achieved. Any excess earnings over and above those required to service debt capital accrue to the equity holders, and the stock price increases. In this case, the wealth transfer occurs from ratepayers to shareholders.[8]

While it is true that setting the allowed return above the true required return would result in an excess transfer of wealth from ratepayers to shareholders, the Supreme Court does not specifically dictate that the allowed return be set equal to the true required return. Instead, the law allows the Commission to establish a rate of return within a range of reasonableness – one that balances the interests of ratepayers and shareholders.[9] The best starting point for assessing a reasonable range for the allowed return, however, is assessing the true required return on equity, which is what the models I have employed in this case are designed to do.

GENERAL CONCEPTS AND METHODOLOGY

Q. Discuss the general concept of the cost of capital.

A. The cost of capital for a firm refers to the weighted average cost of all types of securities issued by the firm, including debt and equity. Determining the cost of debt is relatively straight-forward. Interest payments on bonds are contractual, "embedded costs" that are basically calculated by dividing total interest payments by the book value of outstanding debt. Determining the cost of equity, on the other hand, is more complex. Unlike the known, contractual cost for fixed debt securities, there is no explicit "cost" of common equity. The "return" on equity is *ex post* – it is not known until after the prior claims of

[8] Roger A. Morin, *New Regulatory Finance* 23-24 (Public Utilities Reports, Inc. 2006) (1994).

[9] *See* Kolbe *supra* n. 7, at 21.

bondholders have been satisfied. While the "return" on equity is *ex post*, the "cost" of equity, or the required return of stockholders, is *ex ante* – it must be estimated before a firm commences a capital project so it can be sure the project will generate enough cash flow to satisfy the required return of its investors.[10] In order to determine the appropriate cost of equity capital, firms estimate the return their equity investors will demand in exchange for giving up their opportunity to invest in other securities, or postponing their own consumption, all while assuming some level of risk that they will realize a negative return on their investment. Once firms estimate the required return on equity, they can calculate their overall weighted average cost of capital ("WACC"), which includes the cost of debt. Competitive firms use their WACC as the discount rate to determine the value of capital projects. The basic WACC equation used in regulatory proceedings is presented below:[11]

Equation 1:
Weighted Average Cost of Capital

$$WACC = \left(\frac{D}{D+E}\right) C_D + \left(\frac{E}{D+E}\right) C_E$$

where: $WACC$ = *weighted average cost of capital*
D = *book value of debt*
C_D = *embedded cost of debt capital*
E = *book value of equity*
C_E = *market-based cost of equity capital*

[10] *See* David C. Parcell, *The Cost of Capital – A Practitioner's Guide* 9-10 (Society of Utility and Regulatory Financial Analysts 2010);

[11] *See* Morin *supra* n. 8, at 449-450. The traditional practice uses current market returns and market values of the company's outstanding securities to compute the WACC, but in the ratemaking context, analysts usually employ a hybrid computation consisting of embedded costs of debt from the utilities books, and a market-based cost of equity. Additionally, the traditional WACC equation usually accounts for the tax shield provided by debt, but taxes are accounted for separately in the ratemaking revenue requirement.

As discussed above, the cost of equity (C_E) is one of the primary contentious issues in rate cases, and will be the subject of most of my remaining testimony. In addition, the Commission must also determine the appropriate capital structure, which is comprised of the debt ratio (D / (D+E)), and the equity ratio (E / (D+E)). Throughout my testimony, the phrase "cost of capital" means the weighted average cost of capital, which includes both debt and equity.

Q. Discuss your general approach in estimating the cost of equity in this case.

A. While a competitive firm must estimate its own cost of capital to assess the profitability capital projects, regulators must estimate a utility's cost of capital to determine a fair rate of return. The legal standards set forth above do not include specific guidelines regarding the models that must be used to estimate the cost of equity. Over the years, however, regulatory commissions have consistently relied on several models. The models I have employed in this case have been widely used and accepted in regulatory proceedings for many years. These models include: 1) Discounted Cash Flow Model; 2) Capital Asset Pricing Model; and 3) Comparable Earnings Model. The specific inputs and calculations for these models are described in more detail in their respective sections of the testimony.

Q. Explain why you used multiple models to estimate the cost of equity.

A. The models used to estimate the cost of equity attempt to measure the required return of equity investors by estimating a number of different inputs. It is preferable to use multiple models because the results of any one model may contain a degree of inconsistency, especially depending on the reliability of the inputs used at the time of conducting the model. By using multiple models, the analyst can compare the results of the models and look for outlying results and inconsistencies. Likewise, if multiple

models produce a similar result, it may indicate a more narrow range for the allowed rate of return.[12]

THE PROXY GROUP

Q. Explain the benefits of choosing a proxy group of companies in conducting cost of capital analyses.

A. The cost of equity models in this case can be used to estimate the cost of capital of any individual, publicly-traded company. There are advantages, however, to conducting cost of capital analysis on a "proxy group" of companies that are comparable to the target company. First, it is better to assess the financial soundness of a utility by comparing it a group of other financially sound utilities. Second, using a proxy group provides more reliability and confidence in the overall results because there is a larger sample size. Finally, the use of a proxy group is often a pure necessity when the target company is a subsidiary that is not publicly traded, as is the case with ONG. This is because the financial models used in this case require information from publicly-traded firms, such as stock prices and dividends.

Q. Describe your criteria for the proxy group selection

A. For the proxy group, I chose 22 publicly traded companies identified by Value Line Investment Survey as electric utilities. Additional criteria for the proxy group are as follows:

1. Investment grade long-term bond rating by Moody's;
2. A Value Line safety rank of "3" or better;[13]

[12] *See* Morin *supra* n. 8, at 28.

3. A Value Line financial strength grade of "B" or better.[14]

The Value Line safety ranks and financial strength grades, along with the Moody's bond rating, provide good indications of a company's financial strength. If the target utility is financially healthy as is the case here, it is important to compare it to a group of other financially healthy utilities.

RISK AND RETURN CONCEPTS

Q. Discuss the general relationship between risk and return.

A. According to the Supreme Court, risk is among the most important factors for the Commission to consider when determining the allowed return. In order to comply with this standard, it is necessary to understand the relationship between risk and return. There is a direct relationship between risk and return: the more (less) risk an investor assumes, the larger (smaller) return the investor will demand. There are two primary types of risk that affect equity investors: firm-specific risk and market risk. Firm-specific risk affects individual firms, while market risk affects all companies in the market to varying degrees.

Q. Discuss the differences between firm-specific risk and market risk.

A. Firm-specific risk affects individual companies, rather than the entire market. For example, a competitive firm might overestimate customer demand for a new product,

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[13] The Value Line Safety Rank is a measurement of relative potential risk associated with individual common stocks. The safety rank is computed by averaging two other value line indexes the price stability index and the financial strength rating. Safety ranks range from 1 (highest) to 5 (lowest). *See* Value Line Glossary at http://www.valueline.com/Glossary/Glossary.aspx (accessed August 31, 2015).

[14] Value Line Investment Survey's Financial Strength grade is a measure of a company's financial condition, and is reported on a scale of A++ (highest) to C (lowest). The largest companies with the strongest balance sheets get the highest scores. See "How to Read a Value Line Report, p. 4, http://www3.valueline.com/pdf/The_In-Depth_Guide_to_Reading_a_Value_Line_Research_Report.pdf (accessed August 31, 2015).

resulting in reduced sales revenue. This is an example of project risk.[15] There are several other types of firm-specific risks, including: 1) financial risk – the risk that equity investors of leveraged firms face as residual claimants on earnings; 2) default risk – the risk that a firm will default on its debt securities; and 3) business risk – which encompasses all other operating and managerial factors that may result in investors realizing less than their expected return in that particular company. While firm-specific risk affects individual companies, market risk affects all companies in the market to varying degrees. Examples of market risk include interest rate risk, inflation risk, and the risk of major socio-economic events. When there are changes in these risk factors, it affects all firms in the market.[16]

Q. Firm-specific risk is diversifiable.

A. Yes. One of the fundamental concepts in finance is the fact that firm-specific risk can be eliminated through diversification.[17] If someone irrationally invested their entire funds in one firm, they would be exposed to all of the firm-specific risk and the market risk inherent in that single firm. Rational investors, however, are risk-averse and seek to eliminate risk they can control. Investors can eliminate firm-specific risk by simply adding more stocks to their portfolio through a process called "diversification." There are two reasons why diversification eliminates firm-specific risk. First, each stock in a diversified portfolio represents a much smaller percentage of the overall portfolio than it

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[15] Aswath Damodaran, *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset* 62-63 (3rd ed., John Wiley & Sons, Inc. 2012).

[16] *See* Zvi Bodie, Alex Kane & Alan J. Marcus, *Essentials of Investments* 149 (9th ed., McGraw-Hill/Irwin 2013).

[17] *See* John R. Graham, Scott B. Smart & William L. Megginson, *Corporate Finance: Linking Theory to What Companies Do* 179-80 (3rd ed., South Western Cengage Learning 2010).

would in a portfolio of just one or a few stocks. Thus, any firm-specific action that changes the stock price of one stock in the diversified portfolio will have only a small impact on the entire portfolio.[18] For example, an investor who had their entire portfolio invested in Enron stock at the beginning of 2001 would have lost their entire investment by the end of the year. That investor would have irrationally exposed themselves to the entire, firm-specific risk of Enron's imprudent management. On the other hand, a rational, diversified investor who owned every stock in the S&P 500 would have actually earned a positive return over the same period of time. The second reason why diversification eliminates firm-specific risk is that the effects of firm-specific actions on stock prices can be either positive or negative for each stock. Thus, in large portfolios, the net effect of these positive and negative firm-specific risk factors will be essentially zero and will not affect the value of the overall portfolio.[19] Firm-specific risk is also called "diversifiable risk" due to the fact that it can be easily eliminated through diversification.

Q. Because firm-specific risk can be easily eliminated through diversification, it is not rewarded by the market through higher returns.

A. Yes. Because investors eliminate firm-specific risk through diversification, they know they cannot expect a higher return for assuming the firm-specific risk in any one company. Thus, the risks associated with an individual firm's operations, as well as managerial risk and default risk, are not rewarded by the market. In fact, firm-specific risk is also called "unrewarded" risk for this reason. Market risk, on the other hand,

[18] *See* Damodaran *supra* n. 15, at 64.

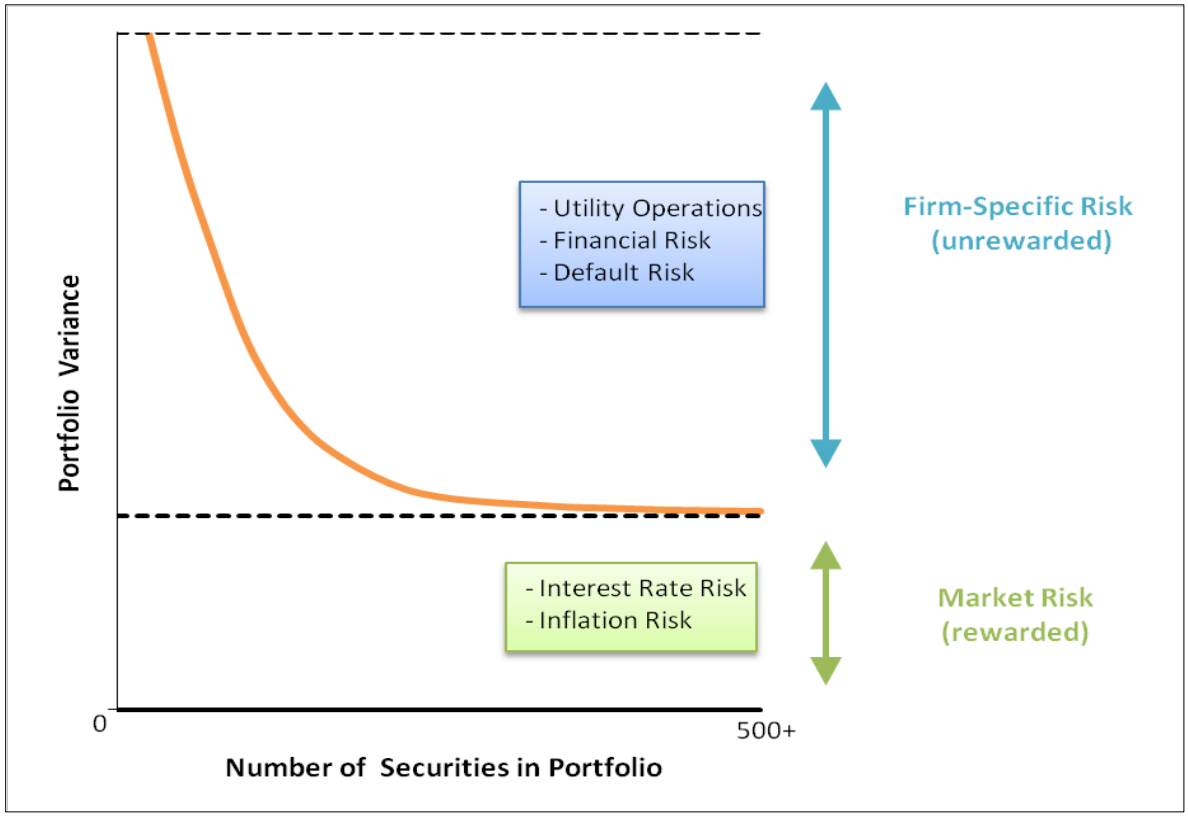
[19] *Id*.

cannot be eliminated through diversification. Market risks, such as interest rate risk and inflation risk, affect all stocks in the market to different degrees. Because market risk cannot be eliminated through diversification, investors who assume higher levels of market risk also expect higher returns. Market risk is also called "systematic risk." Scholars agree:

> If investors can cheaply eliminate some risks through diversification, then we should not expect a security to earn higher returns for risks that can be eliminated through diversification. Investors can expect compensation only for bearing systematic risk (i.e., risk that cannot be diversified away).[20]

These important concepts are illustrated in the figure below.

Figure 2:
Effects of Portfolio Diversification



[20] *See* Graham, Smart & Megginson *supra* n. 17, at 180 (emphasis added).

This figure shows that as stocks are added to a portfolio, the amount of firm-specific risk is reduced until it is essentially eliminated. No matter how many stocks are added, however, there remains a certain level of fixed market risk. The level of market risk will vary from firm to firm. Market risk is the only type of risk that is rewarded by the market, and is thus the primary type of risk the Commission should consider when determining the allowed return.

Q. Since only market risk is considered when estimating the cost of equity, describe how market risk is measured.

A. Investors who want to eliminate firm-specific risk must hold a fully diversified portfolio. To determine the amount of risk that a single stock adds to the overall market portfolio, investors measure the covariance between a single stock and the market portfolio. The result of this calculation is called "beta."[21] Beta represents the sensitivity of a given security to the market as a whole. The market portfolio of all stocks has a beta equal to one. Stocks with betas greater than one are relatively more sensitive to market risk than the average stock. For example, if the market increases (decreases) by 1.0 percent, a stock with a beta of 1.5 will, on average, increase (decrease) by 1.5 percent. In contrast, stocks with betas of less than one are less sensitive to market risk. For example, if the market increases (decreases) by 1.0 percent, a stock with a beta of 0.5 will, on average, only increase (decrease) by 0.5 percent. Thus, stocks with low betas are relatively insulated from market conditions. The beta term is used in the Capital Asset Pricing Model to estimate the required return on equity, which is discussed in more detail later.

[21] *Id*. at 180-81.

Q. Public utilities are defensive firms that have low betas, low market risk, and are relatively insulated from overall market conditions.

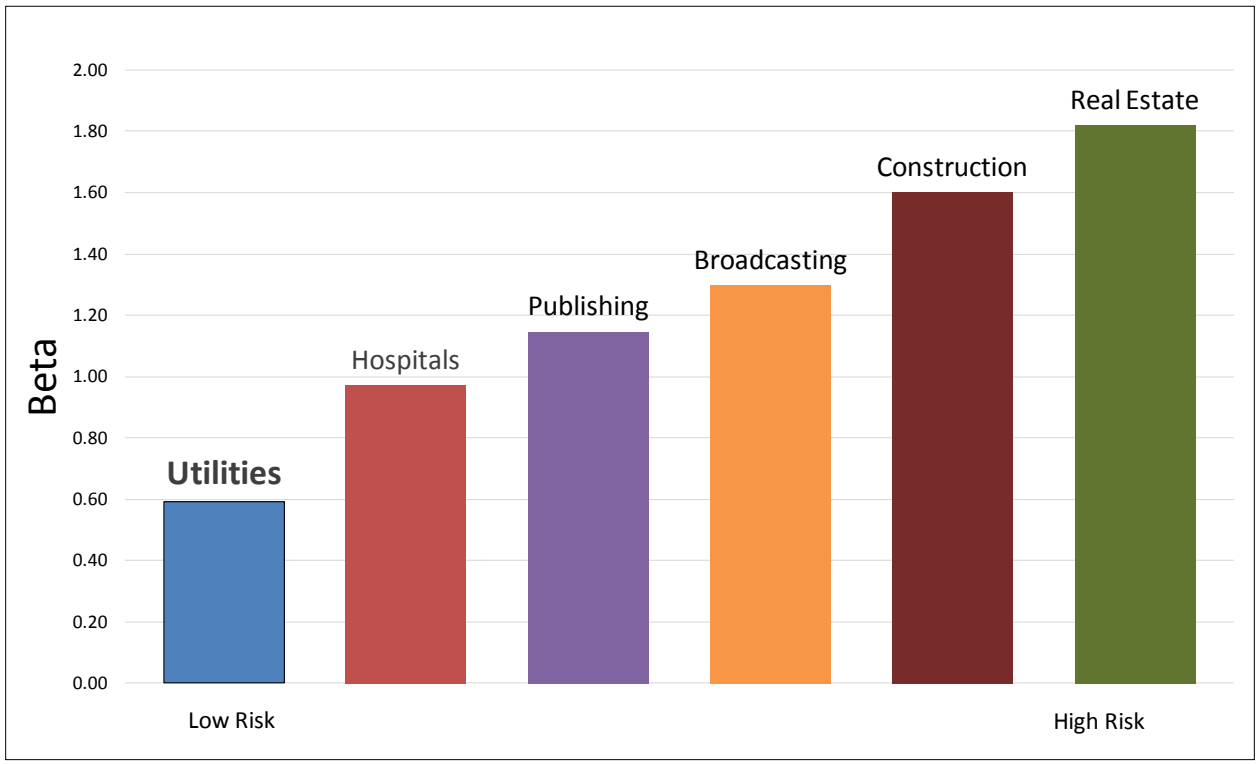
A. Yes. Recall that although market risk affects all firms in the market, it affects firms to varying degrees. Firms with high betas are affected more than firms with low betas, which is why firms with high betas are more risky. Stocks with betas greater than one are generally known as "cyclical stocks." Firms in cyclical industries are sensitive to recurring patterns of recession and recovery known as the "business cycle."[22] Thus, cyclical firms are exposed to a greater level of market risk. Securities with betas less than one, other the other hand, are known as "defensive stocks." Companies in defensive industries, such as public utility companies, "will have low betas and performance that is comparatively unaffected by overall market conditions."[23] The figure below compares the betas of several industries and illustrates that the utility industry is one of the least risky industries in the U.S. market.[24]

[22] *See* Bodie, Kane & Marcus *supra* n. 16, at 382.

[23] *Id*. at 383.

[24] *See* Betas by Sector (US) at http://pages.stern.nyu.edu/~adamodar/. The exact beta calculations are not as important as illustrating the well-known fact that utilities are very low-risk companies.

Figure 3:
Beta by Industry



The fact that utilities are defensive firms that are exposed to little market risk is beneficial to society. When the business cycle enters a recession, consumers can be assured that their utility companies will be able to maintain normal business operations, and utility investors can be confident that utility stock prices will not widely fluctuate. So while it is preferable that utilities are defensive firms that experience little market risk and are relatively insulated from market conditions, this fact should also be appropriately reflected in the Commission's allowed return.

Q. Investors in firms with low betas require a smaller return than the average required return on the market.

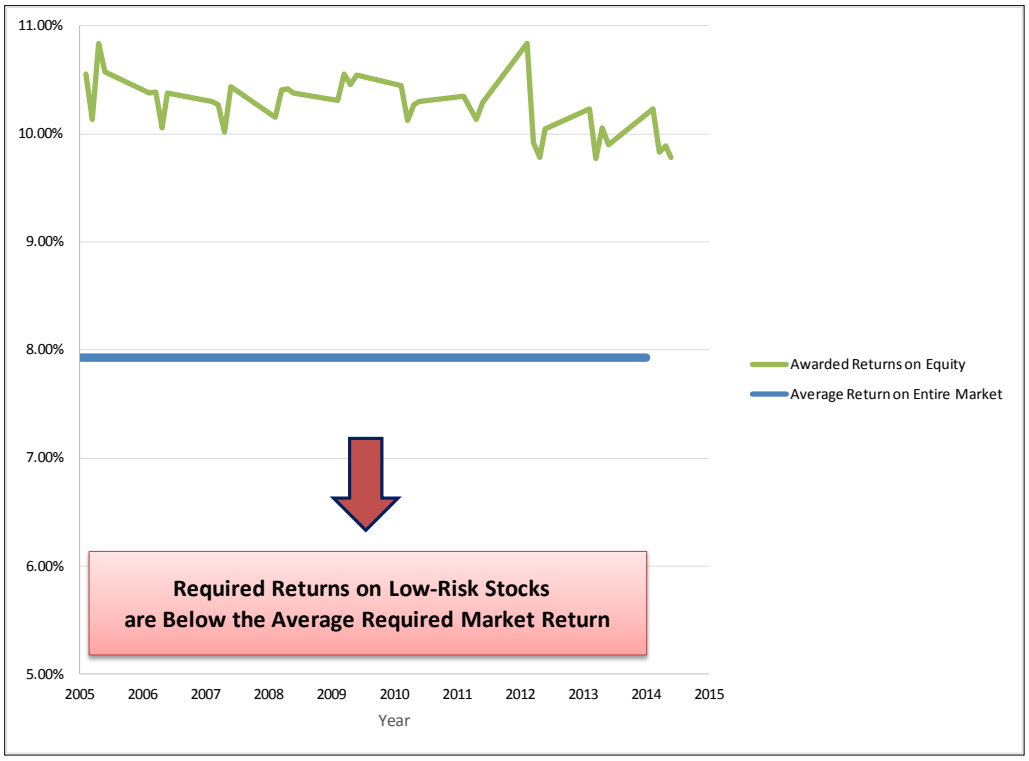
A. Yes. This is the basic concept of the risk and return doctrine: The more (less) risk an investor assumes, the larger (smaller) return the investor will demand. So, if a particular

stock is less risky than the market average, then an investor in that stock will require a smaller return than the average return on the market. Since utilities are low-risk companies with low betas, the required return for utilities is lower than the required return on the overall market.

Q. Commission-awarded returns on equity have exceeded the average return on the market over the last ten years.

A. Yes. Although it is indisputable that the true required return on utility stocks must generally be less than the required return on the overall market, the commission-awarded returns on equity have actually exceeded the overall market return over the past ten years. The following figure illustrates these results.[25]

Figure 4:
Allowed Returns on Equity vs. Average Market Return (2005 – 2014)



[25] *See* Exhibit DG-C-16.

As shown in this figure, the average return on the entire market, which includes very high-risk stocks, has been only eight percent over the past ten years. Although the required return on low risk stocks such as utility stocks has been generally less than eight percent over the same time period, commission-awarded returns on equity have been around 10 percent – much higher than utilities' true required return. There are several potential explanations why awarded returns have exceeded true required returns over the past ten years. First, many "awarded" returns arise from settlements. Settled returns are generally higher than true required returns because utilities are likely to make other concessions in exchange for reporting a higher return to their shareholders. Second, utilities' expert witnesses have apparently done an effective job advocating for their clients. While this Commission has the opportunity to hear from several other highly qualified witnesses in this proceeding, this may not be the case in every proceeding. Third, many years ago utilities' required returns may have actually been close to ten percent. In 2000, the Treasury bond rate was more than twice the rate it is today.[26] As interest rates have declined over the years, perhaps regulators have been slow to adapt to the economic realities that result in lower required returns. Finally, it is possible that regulators tend to take a conservative approach when determining the allowed rate of return and rely too heavily on the recent returns awarded by other commissions around the country. Simply taking an average of awarded returns around the country is not an appropriate way to assess a fair rate of return for a regulated utility as it arguably does not comply with the Supreme Court's standards and generally prevents awarded returns from

[26] U.S. Department of Treasury Resource Center. http://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yield.

changing to reflect current economic and financial conditions. Regardless of the reason, however, it is abundantly clear that awarded returns have exceeded required returns. When awarded returns exceed required returns, it arguably results in an inappropriate transfer of wealth from ratepayers to shareholders. Moving the allowed return closer to the required return in this case will comply with the Supreme Court's standards, allow the Company to remain financially healthy, and reduce the inappropriate transfer of excess wealth to shareholders.

DISCOUNTED CASH FLOW ANALYSIS

Q. Generally describe the Discounted Cash Flow model.

A. The Discounted Cash Flow ("DCF") Model is based on a fundamental financial model called the "dividend discount model," which maintains that the value of a security is equal to the present value of the future cash flows it generates.[27] Cash flows from common stock are paid to investors in the form of dividends. There are several variations of the DCF Model. In its most general form, the DCF Model is expressed as follows:[28]

Equation 2:
General Discounted Cash Flow

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \cdots + \frac{D_n}{(1+k)^n}$$

where: P_0 = *current stock price*
$D_1 \ldots D_n$ = *expected future dividends*
k = *discount rate / required return*

[27] *See* Parcell *supra* n. 10, at 134.

[28] *See* Bodie, Kane & Marcus *supra* n. 16, at 410.

The General DCF Model would require an estimation of an infinite stream of dividends. Since this would be impractical, analysts use more feasible variations of the General DCF Model, which are discussed further below.

Q. All DCF Models rely on several underlying assumptions.

A. Yes. The DCF Models rely on the following four assumptions:[29]

1. Investors evaluate common stocks in the classical valuation framework; that is, they trade securities rationally at prices reflecting their perceptions of value;

2. Investors discount the expected cash flows at the same rate (K) in every future period;

3. The K obtained from the DCF equation corresponds to that specific stream of future cash flows alone; and

4. Dividends, rather than earnings, constitute the source of value.

Q. Describe the Constant Growth DCF Model.

A. The General DCF can be rearranged to make it practical for estimating the cost of equity. Regulators typically rely on some variation of the Constant Growth DCF Model, which is expressed as follows:[30]

Equation 3:
Constant Growth Discounted Cash Flow

$$K = \frac{D_1}{P_0} + g$$

where: K = *discount rate / required return on equity*
D_1 = *expected dividend per share one year from now*
P_0 = *current stock price*
g = *expected growth rate of future dividends*

[29] *See* Morin *supra* n. 8, at 252.

[30] *See* Parcell *supra* n. 10, at 124-26.

Unlike the General DCF Model, the Constant Growth DCF Model solves directly for the required return (K). In addition, by assuming that dividends grow at a constant rate, the dividend stream from the General DCF Model may be essentially substituted with a term representing the expected constant growth rate of future dividends (g). The Constant Growth DCF Model may be considered in two parts. The first part is the dividend yield (D_1/P_0), and the second part is the growth rate (g). In other words, the required return in the DCF Model is equivalent to the dividend yield plus the growth rate.

Q. Utilization of the Constant Growth DCF Model requires additional assumptions.

A. Yes. In addition to the four assumptions listed above, the Constant Growth DCF Model relies on five additional assumptions as follows:[31]

1. The discount rate (K) must exceed the growth rate (g);
2. The dividend growth rate (g) is constant in every year to infinity;
3. Investors require the same return (K) in every year; and
4. There is no external financing; that is, growth is provided only by the retention of earnings.

Since the growth rate is assumed to be constant, it is important not to use growth rates that are unreasonably high.

Q. Describe the Quarterly Approximation DCF Model.

A. The basic form of the Constant Growth DCF Model described above is sometimes referred to as the "Annual" DCF Model. This is because the model assumes an annual dividend payment to be paid at the end of every year, as well as an increase in dividends

[31] *See* Morin *supra* n. 8, at 254-56.

once each year. In reality, however, most utilities pay dividends on a quarterly basis. The Constant Growth DCF equation may be modified to reflect the assumption that investors receive successive quarterly dividends and reinvest them throughout the year at the discount rate. This variation is called the Quarterly Approximation DCF Model.[32]

Equation 4:
Quarterly Approximation Discounted Cash Flow

$$K = \left[\frac{d_0(1+g)^{1/4}}{P_0} + (1+g)^{1/4}\right]^4 - 1$$

where: K = *discount rate / required return*
d_0 = *current quarterly dividend per share*
P_0 = *stock price*
g = *expected growth rate of future dividends*

The Quarterly Approximation DCF Model assumes that dividends are paid quarterly and that each dividend is constant for four consecutive quarters. All else held constant, this model actually results in the highest cost of equity estimate for the utility in comparison to other DCF Models because it accounts for the quarterly compounding of dividends. There are several other variations of the Constant Growth (or Annual) DCF Model, including a Semi-Annual DCF Model which is used by the Federal Energy Regulatory Commission ("FERC"). These models, along with the Quarterly Approximation DCF Model, have been accepted in regulatory proceedings as useful tools for estimating the cost of equity. For this case, I have chosen to use the Quarterly Approximation DCF Model described above.

[32] *See* Morin *supra* n. 8, at 348.

Q. Describe the inputs of the DCF Model.

A. There are three primary inputs in the DCF Model: stock price (P_0), current dividend (d_0), and the growth rate (g). The stock prices and dividends are known inputs based on recorded data, while the growth rate projection must be estimated. I will discuss each of these inputs in turn.

Stock Price

$$\left(K = \frac{D_1}{\boldsymbol{P_0}} + g\right)$$

Q. Describe how you determined the stock price input of the DCF Model.

A. For the stock price (P_0), I used a one-month average of stock prices for each company in the proxy group.[33] Analysts sometimes rely on average stock prices for longer periods (e.g., 60, 90, or 180 days). According to the efficient market hypothesis, however, markets reflect all relevant information available at a particular time, and prices adjust instantaneously to the arrival of new information.[34] Past stock prices, in essence, reflect outdated information. The DCF Model used in utility rate cases is a derivation of the dividend discount model, which is used to determine the current value of an asset. Thus, according to the dividend discount model and the efficient market hypothesis, the value for the "P_0" term in the DCF Model should technically be the current stock price, rather than an average.

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[33] *See* Exhibit DG-C-4.

[34] *See* Eugene F. Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, Vol. 25, No. 2 The Journal of Finance 383 (1970); *see also* Graham, Smart & Megginson *supra* n. 17, at 357. The efficient market hypothesis was formally presented by Eugene Fama in 1970, and is a cornerstone of modern financial theory and practice.

Q. Explain why you used a 30-day average for the current stock price input.

A. Yes. Using a short-term average of stock prices for the current stock price input adheres to market efficiency principles which avoiding any irregularities that may arise from using a single current stock price. In the context of a utility rate proceeding there is a significant length of time from when an application is filed and responsive testimony is due. Choosing a current stock price for one particular day during that time could raise a separate issue concerning which day was chosen to be used in the analysis. In addition, a single stock price on a particular day may be unusually high or low. It is arguably ill-advised to use a single stock price in a model that is ultimately used to set rates for several years, especially if a stock is experiencing some volatility. Thus, it is preferable to use a short-term average of stock prices, which represents a good balance between adhering to well-established concepts of market efficiency, and avoiding any irregularities that may arise from using a single stock price on a given day. The stock prices I used in my DCF analysis are one-month averages of adjusted closing stock prices for each company in the proxy group.[35]

Current Dividend

$$\left(K = \frac{\boldsymbol{D_1}}{P_0} + g\right)$$

Q. Describe how you determined the dividend input of the DCF Model.

A. The dividend term in the Quarterly Approximation DCF Model is the current quarterly dividend per share. I obtained the quarterly dividend paid in the second quarter of 2015

[35] Exhibit DG-C-4. Adjusted closing prices, rather than actual closing prices, are ideal for analyzing historical stock prices. The adjusted price provides an accurate representation of the firm's equity value beyond the mere market price because it accounts for stock splits and dividends.

for each proxy company.[36] The Quarterly Approximation DCF Model assumes that the company increases its dividend payments each quarter. Thus, the model assumes that each quarterly dividend is greater than the previous one by $(1 + g)^{0.25}$. This expression could be describe as the dividend quarterly growth rate, where the term "g" is the growth rate and the exponential term "0.25" signifies one quarter of the year.

Q. The Quarterly Approximation DCF Model results in the highest cost of equity relative to other DCF Models, all else held constant.

A. Yes. The DCF Model I employed in this case results in a higher DCF cost of equity estimate than the annual or semi-annual DCF Models due to the quarterly compounding of dividends inherent in the model. In fact, the final result of the DCF Model I used is nearly 300 basis points higher than the result produced by the annual DCF Model.[37]

Growth Rate

$$\left(K = \frac{D_1}{P_0} + \boldsymbol{g}\right)$$

Q. Describe how you determined the growth rate input of the DCF Model.

A. While the stock price and dividend inputs of the DCF Model are known figures that can be obtained, the growth rate must be estimated. For this reason, the growth rate is usually the most contested term of the DCF Model. I used three reasonable methods to estimate the growth rate for each proxy company: 1) historical dividend growth; 2) projected earnings growth; and 3) fundamental growth. I will discuss each method in turn.

[36] Nasdaq Dividend History, http://www.nasdaq.com/quotes/dividend-history.aspx (accessed July 9, 2015).

[37] *See* Exhibit DG-C-7.

1. Historical Dividend Growth

Historical growth rates in dividends, earnings, and book value can be reasonable ways to estimate future growth, especially for utility companies. This is because utilities tend to have stable earnings and pay dividends in a consistent manner. One primary advantage of using historical data is that it is known; it essentially does not need to be estimated. In my DCF Model, I obtained historical dividend growth over the last five years for each proxy company. While it would not be unreasonable to use historic earnings or book value, the "DCF theory states clearly that it is expected future cash flows in the form of dividends that constitute investment value."[38] Thus, it makes sense to consider actual dividend growth when estimating the growth rate in the DCF Model.

2. Projected Earnings Growth

In addition to considering historic dividend growth, I also considered projected earnings growth. Since the ability to pay dividends stems from a company's ability to generate earnings, we should expect earnings growth to have an influence on dividend growth.[39] One potential drawback of using earnings growth is that earnings tend to be much more volatile than dividends. Thus, analysts should be cautious when using projected earnings growth to ensure that the inputs are reasonable. In my DCF Model, I considered the projected earnings for each proxy company.[40]

3. Fundamental Growth

Young, high-growth companies tend to retain a relatively larger portion of their earnings rather than paying it back to shareholders in the form of dividends. This is because the

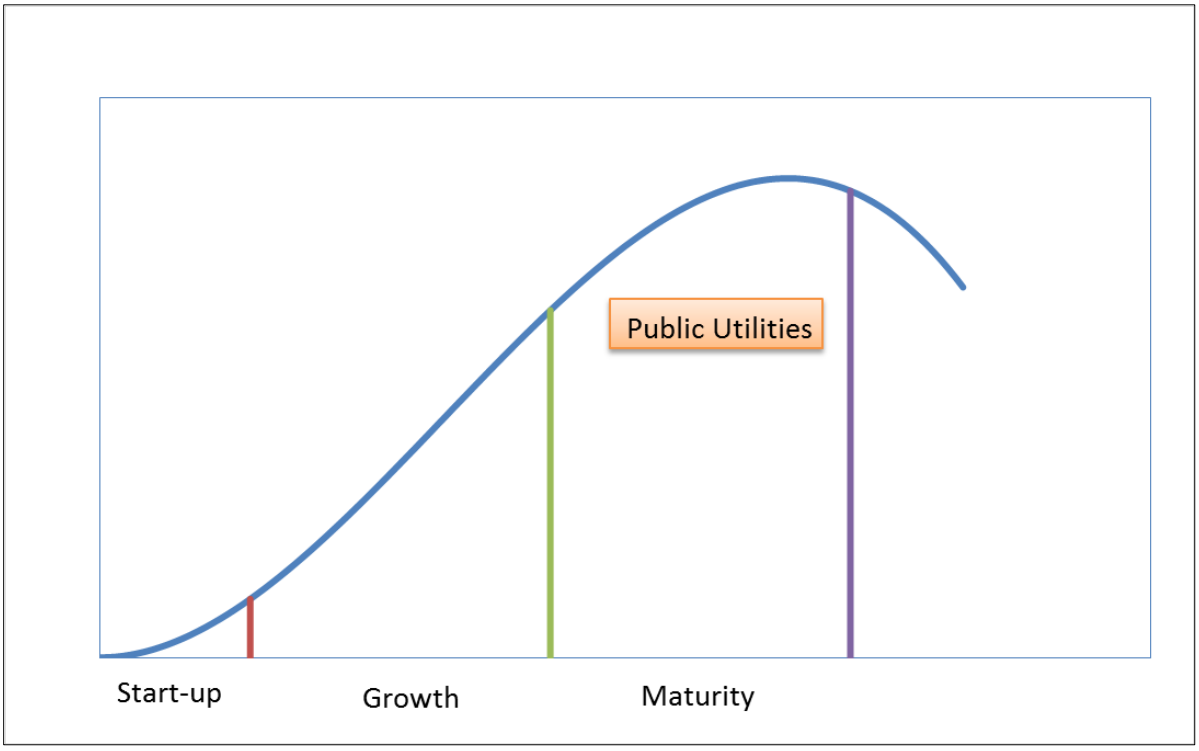
[38] Morin *supra* n. 8, at 284.

[39] *See id*.

[40] Exhibit DG-C-6.

shareholders of these high-growth firms would rather the firm reinvest their earnings in projects that have the ability to earn high returns and generate capital gains. In contrast to these high-growth firms, utilities are older, low-growth firms. In fact, the average age of the proxy group of utilities in this case is over 100 years old.[41] Utility shareholders would rather receive relatively higher dividend compensation.[42] The figure below illustrates the well-known business / industry life-cycle pattern.

Figure 5:
Industry Life Cycle



In an industry's early stages, there are ample opportunities for growth and profitable reinvestment. In the maturity stage, growth opportunities diminish, and firms choose to

[41] Exhibit DG-C-3.

[42] *See generally* Bodie, Kane & Marcus *supra* n. 16, at 416-17.

pay out a larger portion of their earnings in the form of dividends. The portion of earnings that are paid out as dividends can be measured through the payout ratio.

Equation 5:
Payout Ratio

$$Payout\ Ratio = \frac{Dividends\ per\ Share}{Earnings\ per\ Share}$$

The counterpart of the payout ratio is called the retention or "plowback" ratio. This ratio is used to measure the remaining portion of a firm's earnings that it retains.

Equation 6:
Retention Ratio

$$Retention\ Ratio = 1 - Payout\ Ratio$$

Analysts can use the retention ratio along with a firm's return on equity to get a good indication of its growth rate. In fact, the "simplest relationship determining growth is one based on the retention ratio and the return on equity on [a firm's] projects."[43] The equation for the fundamental growth rate is as follows:

Equation 7:
Fundamental Growth Rate

$$Fundamental\ Growth\ Rate = Return\ on\ Equity\ x\ Retention\ Ratio$$

It is well known that utilities have relatively low growth rates. In fact, when explaining the concept of growth, financial textbooks will sometimes use utilities as examples of low-growth firms and contrast them with high-growth firms of other industries.[44] I calculated the fundamental growth rate for each proxy company over the last five years,

[43] *See* Damodaran *supra* n. 15, at 285.

[44] *See id*. at 286 (Dr. Damodaran contrasts the low growth rate of Consolidated Edison with the higher growth rates of Proctor & Gamble and Intel; *see also* Bodie, Kane & Marcus *supra* n. 16, at 416-17 (The authors contrast a group of electric utilities with low growth rates and high payout ratios with a group of computer software firms with high growth rates and low payout ratios).

and averaged the results with the historical dividend growth and projected earnings growth discussed above.[45]

Q. Describe the final results of your DCF Model.

A. I used the Quarterly Approximation DCF Model to estimate the cost of capital for each proxy company. The inputs of the DCF Model for each proxy company included a 30-day average of stock prices for the current stock price, the dividends reported in the second quarter of 2015, and an average of three reasonable methods for determining the growth rate. The average DCF result of the proxy companies using the Quarterly Approximation DCF Model is 8.32 percent, which is the result I considered in my final cost of capital recommendation, along with the results of the other models.

CAPITAL ASSET PRICING MODEL ANALYSIS

Q. Describe the Capital Asset Pricing Model.

A. The Capital Asset Pricing Model ("CAPM") is a market-based model founded on the principle that investors demand higher returns for incurring additional risk.[46] The CAPM estimates this required return.

Q. Discuss the assumptions inherent in the CAPM.

A. The CAPM relies on the following assumptions:

1. Investors are rational, risk-adverse, and strive to maximize profit and terminal wealth;

[45] Exhibit DG-C-5.

[46] William F. Sharpe, *A Simplified Model for Portfolio Analysis* 277-93 (Management Science IX 1963); *see also* Graham, Smart & Megginson *supra* n. 17, at 208.

2. Investors make choices on the basis of risk and return. Return is measured by the mean returns expected from a portfolio of assets; risk is measured by the variance of these portfolio returns;

3. Investors have homogenous expectations of risk and return;

4. Investors have identical time horizons;

5. Information is freely and simultaneously available to investors.

6. There is a risk-free asset, and investors can borrow and lend unlimited amounts at the risk-free rate;

7. There are no taxes, transaction costs, restrictions on selling short, or other market imperfections; and,

8. Total asset quality is fixed, and all assets are marketable and divisible.[47]

While some of these assumptions may appear to be restrictive, they do not outweigh the inherent value of the model. The CAPM has been widely used by firms, analysts, and regulators for decades to estimate the cost of equity capital.

Q. The CAPM promotes the legal standards set forth by the U.S. Supreme Court.

A. Yes. The CAPM directly considers the amount of risk inherent in an individual company. According to the Supreme Court, "the amount of risk in the business is a most important factor" in determining the appropriate allowed rate of return.[48] The Court also held that "the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risk."[49] The CAPM is arguably the strongest of the three models presented in this case, because it is the only model that directly measures the most important component of a fair rate of return analysis: Risk.

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[47] *See id*.

[48] *Wilcox*, 212 U.S. at 48 (emphasis added).

[49] *Hope Natural Gas Co*., 320 U.S. at 603 (emphasis added).

Q. Describe the CAPM equation.

A. The basic CAPM equation is expressed as follows:

Equation 8:
Capital Asset Pricing Model

$$K = R_F + \beta_i(R_M - R_F)$$

where: K = *required return*
R_F = *risk-free rate*
β = *beta coefficient of asset i*
R_M = *required return on the overall market*

There are essentially three terms within the CAPM equation that are required to calculate the required return (K): 1) the risk-free rate (R_F); 2) the beta coefficient (β); and 3) the market risk premium ($R_M - R_F$), which is the required return on the overall market less the risk-free rate. Each term is discussed in more detail below, along with the inputs I used for each term.

The Risk-Free Rate

$$\left(K = \boldsymbol{R_F} + \beta_i(R_M - R_F)\right)$$

Q. Describe the risk-free rate.

A. The first term in the CAPM is the risk-free rate (R_F). The risk-free rate is simply the level of return investors can achieve without assuming any risk. The risk-free rate represents the bare minimum return that any investor would require on a risky asset. Even though no investment is technically void of risk, investors often use U.S. Treasury securities to represent the risk-free rate because they accept that those securities essentially contain no default risk. The Treasury issues securities with different

maturities, including short-term Treasury Bills, intermediate-term Treasury Notes, and long-term Treasury Bonds.

Q. It is preferable to use the yield on long-term Treasury bonds for the risk-free rate in the CAPM.

A. Yes. In valuing an asset, investors estimate cash flows over long periods of time. Common stock is viewed as a long-term investment, and the cash flows from dividends are assumed to last indefinitely. Thus, short-term Treasury bill yields are rarely used in the CAPM to represent the risk-free rate. Short-term rates are subject to greater volatility and can thus lead to unreliable estimates. Instead, long-term Treasury bonds are usually used to represent the risk-free rate in the CAPM.[50] I considered a 30-day average of daily Treasury yield curve rates on 30-year Treasury bonds in my risk-free rate estimate, which resulted in a risk-free rate of 3.09 percent.[51]

The Beta Coefficient

$$\left(K = R_F + \boldsymbol{\beta_i}(R_M - R_F)\right)$$

Q. Describe the beta coefficient.

A. As discussed above, beta represents the sensitivity of a given security to movements in the overall market (or the "market portfolio"). The CAPM states that in efficient capital markets, the expected risk premium on each investment is proportional to its beta. Recall that a security with a beta greater (less) than one is more (less) risky than the market portfolio. A stock's beta equals the covariance of the asset's returns with the returns on a

[50] *See* Morin *supra* n. 8, at 150.

[51] Exhibit DG-C-8.

market portfolio, divided by the portfolio's variance, as expressed in the following formula:[52]

Equation 9:
Beta

$$\beta_i = \frac{\sigma_{im}}{\sigma_m^2}$$

where: β_i = *beta of asset i*
σ_{im} = *covariance of asset i returns with market portfolio returns*
σ^2_m = *variance of market portfolio*

Typically, an index such as the S&P 500 Index is used as proxy for the market portfolio. The historical betas for publicly traded firms are published by several commercial sources.[53] Beta may also be calculated through a linear regression analysis, which provides additional statistical information about the relationship between a single stock and the market portfolio.

Q. Describe how you calculated the raw betas for the proxy companies and the results of your analysis.

A. To calculate the betas for each proxy company, I obtained weekly returns over a five year period for each proxy company as well as weekly returns for the S&P 500 over the same time period.[54] I then conducted a regression analysis for each proxy company, using the individual stock returns as the dependent variable and the S&P 500 returns as the independent variable. Commercial analysts calculate raw betas in a similar fashion. Value Line, for example, calculates beta from a regression analysis using weekly returns

[52] Graham, Smart & Megginson *supra* n. 17, at 180-81.

[53] E.g., Value Line, Bloomberg, and Merrill Lynch.

[54] Exhibit DG-C-9.

for the NYSE Composite Index over a five year period.[55] The slopes of the linear regression lines produced by my regression analyses are the betas for each proxy company.[56] The betas for each proxy company were positive, and less than one. This indicates that when the stock market moved up or down, the stock prices for each proxy utility also moved in the same direction, but to a lesser extent. This makes sense because public utilities are defensive firms that are relatively insulated from aggregate changes in market conditions.

Q. Describe the adjustments you made to the betas obtained through your regression analyses.

A. The betas obtained through my regression analyses are considered "raw" betas. There is considerable empirical evidence that raw betas should be adjusted to account for beta's natural tendency to revert to an underlying mean.[57] Some analysts use an adjustment method proposed by Blume, which adjusts raw betas toward the market mean of one.[58] While the Blume adjustment method is popular due to its simplicity, it is arguably arbitrary, and some would say not useful at all. According to Dr. Damodaran: "While we agree with the notion that betas move toward 1.0 over time, the [Blume adjustment] strikes us as arbitrary and not particularly useful."[59] The Blume adjustment method is especially arbitrary when applied to industries with consistently low betas, such as the utility industry. For industries with consistently low betas, it is better to employ an

[55] Value Line, Using Beta, http://www.valueline.com/Tools/Educational_Articles/Stocks/Using_Beta.aspx (accessed June 17, 2015).

[56] Exhibit DG-C-10.

[57] *See* Michael J. Gombola and Douglas R. Kahl, *Time-Series Processes of Utility Betas: Implications for Forecasting Systematic Risk* 84-92 (Financial Management Autumn 1990).

[58] See Marshall Blume, *On the Assessment of Risk*, Vol. 26, No. 1 The Journal of Finance 1 (1971).

[59] Damodaran *supra* n. 15, at 187.

adjustment method that adjusts raw betas toward an industry average, rather than the market average. Vasicek proposed such a method, which is preferable to the Blume adjustment method because it allows raw betas to be adjusted toward an industry average, and also accounts for the statistical accuracy of the raw beta calculation. In other words, "[t]he Vasicek adjustment seeks to overcome one weakness of the Blume model by not applying the same adjustment to every security; rather, a security-specific adjustment is made depending on the statistical quality of the regression."[60] The Vasicek beta adjustment equation is expressed as follows:

Equation 10:
Vasicek Beta Adjustment

$$\beta_{i1} = \frac{\sigma^2_{\beta_{i0}}}{\sigma^2_{\beta 0} + \sigma^2_{\beta_{i0}}}\beta_0 + \frac{\sigma^2_{\beta 0}}{\sigma^2_{\beta 0} + \sigma^2_{\beta_{i0}}}\beta_{i0}$$

where: β_{i1} = *Vasicek adjusted beta for security i*
β_{i0} = *historical beta for security i*
β_0 = *beta of industry or proxy group*
$\sigma^2_{\beta 0}$ = *variance of betas in the industry or proxy group*
$\sigma^2_{\beta i0}$ = *square of standard error of the historical beta for security i*

The Vasicek beta adjustment is an improvement on the Blume model because the Vasicek model does not apply the same adjustment to every security. A higher standard error produced by the regression analysis indicates a lower statistical significance of the beta estimate. Thus, a beta with a high standard error should receive a greater adjustment than a beta with a low standard error. As stated in Ibbotson:

[60] 2012 Ibbotson Stocks, Bonds, Bills, and Inflation Valuation Yearbook 77-78 (Morningstar 2012).

> While the Vasicek formula looks intimidating, it is really quite simple. The adjusted beta for a company is a weighted average of the company's historical beta and the beta of the market, industry, or peer group. How much weight is given to the company and historical beta depends on the statistical significance of the company beta statistic. If a company beta has a low standard error, then it will have a higher weighting in the Vasicek formula. If a company beta has a high standard error, then it will have lower weighting in the Vasicek formula. An advantage of this adjustment methodology is that it does not force an adjustment to the market as a whole. Instead, the adjustment can be toward an industry or some other peer group. This is most useful in looking at companies in industries that on average have high or low betas.[61]

Thus, the Vasicek adjustment method is statistically more accurate, and is the preferred method to use when analyzing companies in an industry that has inherently low betas, such as the utility industry. The Vasicek method was also confirmed by Gombola, who conducted a study specifically related to utility companies. Gombola concluded that "[t]he strong evidence of auto-regressive tendencies in utility betas lends support to the application of adjustment procedures such as the . . . adjustment procedure presented by Vasicek."[62] Gombola concluded that adjusting raw betas toward the market mean of one is too high, and that "[i]nstead, they should be adjusted toward a value that is less than one."[63] Thus, the Vasicek adjustment method is ideal for adjusting raw utility betas. Although I used the Vasicek method to adjust the raw betas I calculated for each proxy company, I also considered the arbitrarily high betas published by Value Line in my final CAPM result.[64]

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[61] *Id*. at 78 (emphasis added).

[62] Gombola *supra* n. 57, at 92 (emphasis added).

[63] *Id*. at 91-92.

[64] *See* Exhibit DG-C-14.

The Equity Risk Premium

$$\left(K = R_F + \beta_i(\boldsymbol{R_M} - \boldsymbol{R_F})\right)$$

Q. Describe the equity risk premium.

A. The final term of the CAPM is the equity risk premium ("ERP"), which is the required return on the market portfolio less the risk-free rate ($R_M - R_F$). In other words, the ERP is the level of return investors expect above the risk-free rate in exchange for investing in risky securities. Many experts would agree that "the single most important variable for making investment decisions is the equity risk premium."[65] Not only is the ERP the most important and influential factor in the CAPM equation, it is arguably one of the most important factors in estimating the cost of capital in this proceeding. There are three well-known, reasonable, and widely-recognized ways to estimate the ERP: 1) calculating a historical average; 2) taking a survey of experts; and 3) calculating the implied equity risk premium. I incorporated each one of these methods in determining the ERP used in my CAPM analysis. I will discuss each method in turn.

1. HISTORICAL AVERAGE

Q. Describe the historical equity risk premium.

A. The historical ERP may be calculated by simply taking the difference between returns on stocks and returns on government bonds over a certain period of time. Ibbotson, the most widely cited source for the ERP in the U.S.,[66] reports both the geometric mean and arithmetic mean for the returns of stocks and government bonds in its annual

[65] Elroy Dimson, Paul Marsh & Mike Staunton, *Triumph of the Optimists: 101 Years of Global Investment Returns* 4 (Princeton University Press 2002).

[66] *Id*. at 173.

yearbooks.[67] Many practitioners rely on the historical ERP as an estimate for the forward-looking ERP because it is easy to obtain. There are three important factors to consider when estimating the historic ERP: 1) the period of time; 2) the choice of the risk-free rate; and 3) whether to use geometric or arithmetic averages. I will discuss each of these factors in turn.

Q. It is preferable to use longer time periods when calculating the historic ERP.

A. Yes. Calculating returns over longer time periods is preferable because the results produce a smaller standard error, and are thus more reliable.[68] Using at least 50 years of data is ideal. I have considered returns from 1926 – 2014 in my historic ERP estimate.[69]

Q. The rate on long-term Treasury bonds should be used as the risk-free rate.

A. Yes. In corporate finance and valuation, the rate on long-term Treasury bonds is typically used as the risk-free rate,[70] and as discussed above, short-term Treasury bill yields are rarely used in the CAPM to represent the risk-free rate because they are subject to greater volatility and can lead to unreliable estimates. I have considered the difference between returns on stocks and returns on long-term government bonds in my historic ERP estimate.[71]

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[67] 2015 Ibbotson Stocks, Bonds, Bills, and Inflation Classic Yearbook 91 (Morningstar 2015).

[68] Damodaran *supra* n. 15, at 162.

[69] Exhibit DG-C-13.

[70] Damodaran *supra* n. 15, at 162.

[71] Exhibit DG-C-13.

Q. It is better to use the geometric average rather than the arithmetic average when looking at historical returns over time.

A. Yes. While some scholars argue for the use of arithmetic averages,[72] it is better to use the geometric average for estimating historical returns.[73] Evidence suggests that stocks are negatively correlated (i.e., good years are more likely to be followed by poor years, and vice versa), and thus the arithmetic average tends to overstate the true ERP.[74] When returns are volatile, the arithmetic average can produce dubious results. This concept is demonstrated in the following simple example. Suppose an investor made a $100 investment and had a positive return of 100 percent in the first year. Now the investor has $200 in her portfolio. During the second year, however, the investor experienced a negative 50 percent return. Now the investor has $100 in her portfolio. After two years the investor is back where she began with $100 in her portfolio – an overall return of zero percent. The arithmetic average, however, would indicate the investor experience a positive annual return of 25 percent:

$$r_A = \frac{1}{2}(100\% - 50\%) = 25\%$$

A return of 25 percent, however, is clearly not an accurate representation of what actually happened. The geometric average, on the other hand, would indicate that the investor experienced a zero percent annual return:

$$r_G = \left[\frac{\$100}{\$100}\right]^{\frac{1}{2}} - 1 = 0.0\%$$

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[72] *See e.g.*, Morin *supra* n. 8, at 116-17.

[73] *See* Damodaran *supra* n. 15, at 163.

[74] *Id*.

Since the investor experienced no gain or loss by the end of the second year, the geometric mean is a more accurate representation of the investor's actual return. Indeed, the arithmetic average is arguably more appropriate in other circumstances. The geometric average, however, is more appropriate when measuring returns over a long time horizon, which is what is done when calculating the historic ERP. Although the geometric average is arguably more appropriate when looking at the historic ERP, I have also considered the higher arithmetic average in my historic ERP calculation.[75]

Q. Describe the actual results of the historic ERP analysis.

A. According to Ibbotson, the historic ERP using the geometric average is 4.4 percent, while the historic ERP using the arithmetic average is 6.0 percent.[76] The average of these two numbers is 5.2 percent, which is the figure I used in my historic ERP estimate.[77]

Q. Describe the limitations of relying solely on a historical average to estimate the forward-looking ERP.

A. Many investors use the historic ERP because it is convenient and easy to calculate. What matters in the CAPM model, however, is not the actual risk premium from the past, but rather the expected risk premium looking forward.[78] Some investors may think that a historic ERP provides some indication of what the prospective risk premium is, but there is empirical evidence to suggest the prospective, forward-looking ERP is actually lower than the historical ERP. In a landmark publication on risk premiums around the world, *Triumph of the Optimists*, the authors suggest through extensive empirical research that

[75] Exhibit DG-C-13.

[76] Ibbotson supra n. 67, at 91.

[77] Exhibit DG-C-13.

[78] Graham, Smart & Megginson *supra* n. 17, at 330.

the prospective ERP is lower than the historical ERP.[79] This is due in large part to what is known as "survivorship bias" or "success bias" – a tendency for failed companies to be excluded from historical indices.[80] From their extensive analysis, the authors make the following conclusion regarding the prospective ERP:

> The result is a forward-looking, geometric mean risk premium for the United States . . . of around 2½ to 4 percent and an arithmetic mean risk premium . . . that falls within a range from a little below 4 to a little above 5 percent.[81]

Indeed, these results are lower than the historical returns reported in Ibbotson. Dr. Damodaran agrees:

> The historical risk premium obtained by looking at U.S. data is biased upwards because of survivor bias . . . . The true premium, it is argued, is much lower. This view is backed up by a study of large equity markets over the twentieth century (*Triumph of the Optimists*), which concluded that the historical risk premium is closer to 4%.[82]

Regardless of the variations in historic ERP estimates, many scholars and practitioners agree that simply relying on a historic ERP to estimate the risk premium going forward is not ideal. Fortunately, "a naïve reliance on long-run historical averages is not the only approach for estimating the expected risk premium."[83]

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[79] Dimson, Marsh & Staunton *supra* n. 65.

[80] *Id*. at 34.

[81] *Id*. at 194.

[82] Aswath Damodaran, *Equity Risk Premiums: Determinants, Estimation and Implications – The 2015 Edition* 17 (New York University 2015).

[83] Graham, Smart & Megginson *supra* n. 17, at 330.

2. EXPERT SURVEYS

Q. Describe the expert survey approach to estimating the ERP.

A. As its name implies, the expert survey approach to estimating the ERP involves conducting a survey of experts ranging from professors, analysts, chief financial officers (CFO) and other executives around the country and asking them what they think the expected ERP is. Graham and Harvey have performed such a survey every quarter since 1996. In their survey during the first quarter of 2015, they found that experts around the country believe that the current risk premium is only 4.51 percent.[84] The IESE Business School conducts a similar expert survey. Their expert survey reported an average ERP of only 5.5 percent.[85] Averaging the ERP results from both surveys provides a very reasonable ERP of 5.0 percent.[86]

3. IMPLIED EQUITY RISK PREMIUM

Q. Describe the implied equity risk premium.

A. The third method of estimating the ERP is arguably the best. The implied ERP relies on the stable growth model proposed by Gordon, often called the "Gordon Growth Model," which is a basic stock valuation model widely used in finance for many years:[87]

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[84] John R. Graham and Campbell R. Harvey, *The Equity Risk Premium in 2014*, at 3 (Fuqua School of Business, Duke University 2014), copy available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2611793.

[85] Pablo Fernandez, Pablo Linares & Isabel F. Acin, *Market Risk Premium used in 88 Countries in 2014: A Survey with 8,228 Answers*, at 3 (IESE Business School 2015), copy available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2598104

[86] Exhibit DG-C-13.

[87] Myron J. Gordon and Eli Shapiro, *Capital Equipment Analysis: The Required Rate of Profit* 102-10 (Management Science Vol. 3, No. 1 Oct. 1956).

Equation 11:
Gordon Growth Model

$$P_0 = \frac{D_1}{K - g}$$

where: P_0 = *current value of stock*
D_1 = *value of next year's dividend*
K = *cost of equity capital / discount rate*
g = *constant growth rate in perpetuity for dividends*

This model is similar to the Constant Growth DCF Model presented in Equation 3 above ($K=D_1/P_0+g$). In fact, the underlying concept in both models is the same: The current value of an asset is equal to the present value of its future cash flows. Instead of using this model to determine the discount rate of one company, we can use it to determine the discount rate for the entire market by substituting the inputs of the model. Specifically, instead of using the current stock price (P_0), we will use the current value of the S&P 500 (V_{500}). Instead of using the dividends of a single firm, we will consider the dividends paid by the entire market. Additionally, we should consider potential dividends. In other words, stock buybacks should be considered in addition to paid dividends, as stock buybacks represent another way for the firm to transfer free cash flow to shareholders. Focusing on dividends alone without considering stock buybacks could understate the cash flow component of the model, and ultimately understate the implied ERP. The market dividend yield plus the market buyback yield gives us the gross cash yield to use as our cash flow in the numerator of the discount model. This gross cash yield is increased each year over the next five years by the growth rate. These cash flows must be discounted in order to determine their present value. The discount rate in each denominator is the risk-free rate (R_F) plus the discount rate (K). The following formula

shows how the implied return is calculated. Since the current value of the S&P is known, we can solve for K: The implied market return.[88]

Equation 12:
Implied Market Return

$$V_{500} = \frac{CY_1(1+g)^1}{(1+R_F+K)^1} + \frac{CY_2(1+g)^2}{(1+R_F+K)^2} + \cdots + \frac{CY_5(1+g)^5 + TV}{(1+R_F+K)^5}$$

where: V_{500} = *current value of index (S&P 500)*
$CY_{1\text{-}5}$ = *average cash yield over last five years (includes dividends and buybacks)*
g = *compound growth rate in earnings over last five years*
R_F = *risk-free rate*
K = *implied market return (this is what we are solving for)*
TV = *terminal value* $= CY_5 (1+R_F) / K$

The discount rate is called the "implied" return here because based on the current value of the index as well as the value of free cash flow to investors projected over the next five years. Thus, based on these inputs, the market is "implying" the expected return. After solving for the implied market return (K), we simply subtract the risk-free rate from it to arrive at the implied ERP.

Equation 13:
Implied Equity Risk Premium

$$Implied\ Expected\ Market\ Return - R_F = Implied\ ERP$$

Q. Discuss the results of your implied ERP calculation.

A. After collecting data for the index value, operating earnings, dividends, and buybacks for the S&P 500 over the past five years, I calculated the dividend yield, buyback yield, and gross cash yield for each year.[89] I also calculated the compound annual growth rate (g) from operating earnings. I used these inputs, along with the risk-free rate and current

[88] *See* Exhibit DG-C-12 for detailed calculation.

[89] *Id*.

value of the index to calculate a current expected return on the entire market of 8.91 percent. I subtracted the risk-free rate of 3.09 percent to arrive at the implied equity risk premium of 5.82 percent. Dr. Damodaran, one of the world's leading experts on the ERP, also uses the implied ERP method discussed above. He calculates an implied ERP every year and publishes his findings. According to Dr. Damodaran, the implied ERP for 2014 was 5.78 percent.[90] Thus, my equity risk premium estimate is slightly higher than Dr. Damodaran's estimate.

Q. Discuss the results of your final ERP estimate.

A. PUD's ERP estimate is higher than Ibbotson's historical average, higher than the average results from both expert surveys, and higher than the implied ERP estimated by Dr. Damodaran. In determining the final ERP to use for the CAPM model, I took a weighted average of each of the three sources of the equity risk premium: historical, survey, and implied. I applied weights to each method in accordance with my judgment on the value of each method as follows:[91]

Figure 6:
Recommended Equity Risk Premium

Source	ERP	Weight Factor	Weighted Result
Average Historic ERP	5.20%	0.1	0.52%
Average Survey ERP	5.01%	0.3	1.50%
Average Implied ERP	5.80%	0.6	3.48%
Total		1.0	**5.50%**

[90] Damodaran *supra* n. 82, at 120.

[91] Exhibit DG-C-13.

While it would not be unreasonable to use any of these methods by themselves to estimate the ERP, it is more prudent to consider each method, and as a matter of principle, the methods are not equal in value. As shown in this figure, I gave the greatest weighting to the implied ERP method (0.6), because it is the most fundamentally sound. Incidentally, it is also the highest of the three methods. The final ERP I used in my CAPM calculation is 5.5 percent.[92]

Q. Describe the final results of your CAPM analysis.

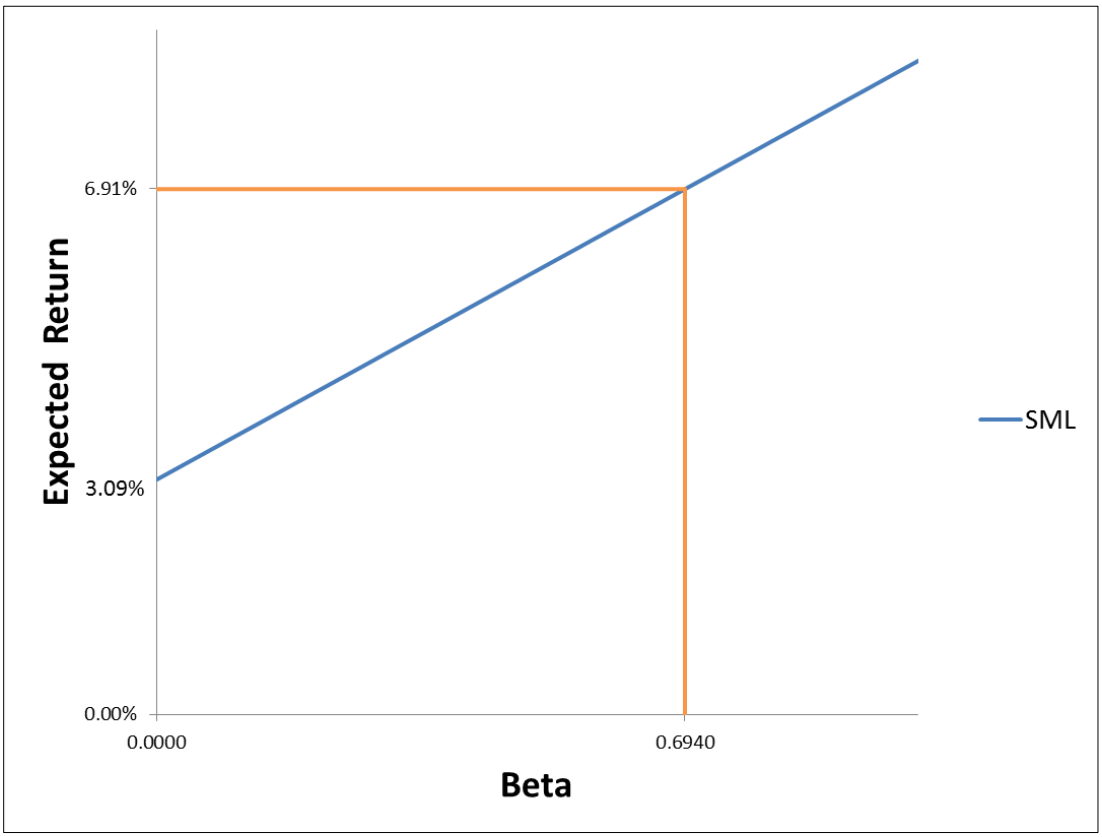
A. Using the inputs for the risk-free rate, beta coefficient, and equity risk premium discussed above, I calculated the CAPM cost of equity for each proxy company. The average CAPM cost of equity is 6.91 percent.[93] This is the rate I considered in my final cost of equity analysis.[94] The CAPM may be displayed graphically through what is known as the Security Market Line ("SML"). The following figure shows the expected return (cost of equity) on the y-axis, and the average beta for the proxy group on the x-axis. The SML intercepts the y-axis at the level of the risk-free rate. The slope of the SML is the equity risk premium.

[92] *See* Exhibit DG-C-13.

[93] *See* Exhibit DG-C-14.

[94] *See* Exhibit DG-C-19.

Figure 7:
CAPM Graph



The SML provides the required rate of return that will compensate investors for the beta risk of that investment. Thus, at a beta of 0.694, the required return for ONG is 6.91 percent.

COMPARABLE EARNINGS ANALYSIS

Q. Describe the Comparable Earnings Model.

A. In contrast to the DCF and CAPM models, which are "market-based" models, the Comparable Earnings Model ("CEM") is an "accounting-based" model. That is, the CEM relies on available accounting data, particularly the return earned on book equity. The CEM involves simply comparing the earned returns on equity of other companies

with similar market risk. The CEM stems primarily in the standards set forth in the *Hope* case, which states that "the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks."[95]

Q. It is more technically sound to conduct the Comparable Earnings Model on a group of competitive firms, rather than a group of regulated utilities.

A. Yes. In utility rate cases, analysts often perform the CEM on the same proxy group of regulated utilities used in the CAPM and DCF analyses. Technically, however, it would be much better to conduct this analysis on a group of unregulated, competitive firms with similar risk profiles and business operations. The reason analysts do not conduct the CEM on such a group of comparable competitive firms is that they arguably do not exist. In other words, there is no group of firms in the country with business operations and risk profiles comparable to public utilities.[96]

Q. Discuss the rationale behind choosing competitive firms for the CEM analysis.

A. The rationale behind choosing competitive firms for the CEM analysis is that the returns on equity of regulated utilities are based on past information, and were not earned under the restraints of competition. As aptly stated by Dr. Morin:

[95] *Hope Natural Gas Co.*, 320 U.S. at 603.

[96] *See* Figure 3 above showing utility betas are among the lowest in the country.

> The historical book return on equity for regulated firms is not determined by competitive forces but instead reflects the past actions of regulatory commissions. It would be circular to set a fair return based on the past actions of other regulators, much like observing a series of duplicate images in multiple mirrors. The rates of return earned by other regulated utilities may very well have been reasonable under historical conditions, but they are still subject to tests of reasonableness under current and prospective conditions.[97]

In other words, when regulators simply look at the earned returns of other regulated utilities, they are solely considering past information, and are also looking at returns that were not earned under the constraints of competition. Regulators have a duty to stand in the place of competition, and that duty cannot be adequately accomplished by simply awarding returns on equity based on the earned returns of other utilities. Thus, the results of any Comparable Earnings Model that compares the past returns of other utilities, including the one I have conducted in this case, should be considered with caution. Clearly, the CEM is the weakest of the three models presented in this case, as it does not account for any prospective, forward-looking factors (such as the growth rate in the DCF or the implied ERP in the CAPM), and it does not have any measure for risk (such as the beta term in the CAPM). I have only presented the CEM here because regulators have become familiar with seeing this model in rate cases. In textbooks and treatises on financial theory, corporate finance, and valuation, there are many models presented for valuing firms and estimating the required return on equity (including the DCF Model and CAPM); however, there is no mention of a "comparable earnings" method. Of course, firms are aware of their competitors' earnings, but they do not use it as a way to measure their own cost of equity. This is because there are far superior models available. Thus,

[97] Morin *supra* n. 8, at 383.

the CEM is unique to the regulatory environment, and when it is used to compare the earned returns of regulated utilities as it is here, it should be considered with caution.

Q. Describe the results of your Comparable Earnings Model.

A. In conducting my CEM analysis, I simply averaged the annual earned returns on equity for each of the proxy companies from 2005–2014. The composite average and final result of the CEM is 10.59 percent.[98]

Q. Describe some of the recent returns on equity of other competitive industries.

A. While it is infeasible to conduct the CEM on a comparable group of competitive firms because such firms are much more risky than utilities, it might nonetheless be instructive to look at some of the recent earned returns of riskier competitive firms. As discussed throughout my testimony, utilities are firms with very low levels of market risk. Therefore, the returns on equity for utility industry should generally be less than the earned returns in other industries. Currently, however, there are over 2,000 riskier firms around the country with average returns on equity that are <u>less</u> than the average returns of the proxy group.[99] The figure below illustrates a small sample of these industries:

[98] Exhibit DG-C-17.

[99] Exhibit DG-C-18.

Figure 8:
Competitive Earnings

Industry	Number of Firms	ROE
Air Transport	22	2.8%
Coal & Related Energy	42	-6.4%
Education	42	3.8%
Engineering/Construction	56	5.3%
Green & Renewable Energy	26	0.3%
Hotel/Gaming	80	5.8%
Metals & Mining	124	2.1%
Oil/Gas Production	392	6.3%
Real Estate (Development)	18	0.5%
Steel	40	-14.0%
Telecom (Wireless)	21	-4.7%

While the average return on equity for the proxy utility group is 10.95 percent, the average return on equity of over 2,000 riskier firms is less than one percent.[100]

COST OF EQUITY SUMMARY

Q. Summarize the results of the three cost of equity models presented above.

A. The following table shows the cost of equity results from each of the three models I employed in this case.

[100] Exhibit DG-C-18.

Figure 9:
Cost of Equity Summary

Model	Cost of Equity
Discounted Cash Flow	8.32%
Capital Asset Pricing Model	6.91%
Comparable Earnings	10.59%
Average	**8.60%**

The average cost of equity of these models is 8.6 percent. Taking a simple average of these three models gives far too much weight to the Comparable Earnings Model, which is not a valid model for estimating the true required return on equity. Taking an average of the results of the DCF Model and CAPM indicates a true cost of equity for ONG of only 7.6 percent.[101]

Q. The required return on equity for a utility must be lower than the required return on the overall market.

A. Yes. Regulators and other stakeholders who are familiar with cost of capital testimony in utility rate cases may have developed the impression that the true required return for utilities is around 10 percent. Indeed, a long time ago this may have actually been the case. Over the last decade, however, it is clear that commissions around the country have awarded returns on equity that are generally above utilities' true required return, as discussed above and illustrated in Figure 4. It should be reiterated that a regulated utility's required return on equity must generally be <u>below</u> the required return on the

[101] Exhibit DG-C-19.

market portfolio. This is because utilities are far less risky than the average firm in the market, as discussed throughout my testimony. Not only do regulated utilities have betas of less than one, but they have the lowest betas of nearly every industry in the county, as illustrated in Figure 3 above. Realizing that the required return on utility stocks must be less than the required return on the overall market is useful information because it allows us to test the results of the cost of equity models presented in this case to determine their reasonableness. Before we can assess the reasonableness of the models, however, we must estimate the required return on the market portfolio.

Q. Describe the required return on the overall market portfolio.

A. I used three methods to estimate the required return on the market portfolio: 1) calculating a historical average; 2) consulting a survey of experts; and 3) calculating the implied return on the market portfolio. These methods should look familiar since they are essentially the same methods used to calculate the equity risk premium ("ERP") discussed above. Recall that the ERP is simply the required return on the market less the risk-free rate ($R_M - R_F$). So in order to calculate the ERP, both of these factors must be estimated. The results of my estimate of the required market return are presented in the figure below.

Figure 10:
Required Market Return

Historic (last 10 years)	8.49%
IESE Survey	7.90%
Duke CFO Survey	6.63%
PUD Estimate	8.91%
Average	**7.98%**

For the historical calculation, I obtained the actual returns on the S&P 500 over the last 10 years and calculated the geometric average.[102] The IESE Survey and the Duke CFO Survey are the same two surveys I consulted for the equity risk premium.[103] According to thousands of analysts, professors, CFOs, and other experts around the country, the current required return on the market is only around 7.0 percent. Finally, I estimated the required return on the market portfolio using Equation 12 above.[104] My calculations resulted in a required market return of 8.91 percent, which is noticeably higher than the expert survey results. The average of these sources indicates that the required return on the overall market portfolio is only 7.98 percent.

Q. Compare, contrast and illustrate the required return on the market, the required return on low-risk stocks, and the required return on the market portfolio.

A. The concepts I have discussed above regarding the required return on the market and the required return on low-risk stocks such as utility stocks are illustrated in the chart below.

[102] Exhibit DG-C-16.

[103] *See* Fernandez *supra* n. 85, at p. 5; *see also* Graham *supra* n. 84, at p. 3.

[104] Exhibit DG-C-12 at data point [19].

Figure 11:
Required Return Comparison

As shown in this chart, the required return on low-risk stocks (i.e., defensive firms with betas of less than one such as utilities) must be greater than the risk-free rate, but less than the required return on the market portfolio. The required return on the market portfolio, as discussed above, is around 8.0 percent. Therefore, the required return on low-risk stocks must be generally less than 8.0 percent. ONG's requested return on equity, however, is 10.5 percent.

COST OF DEBT

Q. Describe ONG's position regarding long-term debt financing.

A. ONG had $1.2 billion of long-term debt capital during the test year at a cost of 3.95 percent.[105]

Q. Discuss PUD's recommendation regarding ONG's proposed cost of debt.

A. As discussed above, unlike the cost of equity, the cost of debt is based on contractual interest rates. The Company's proposed cost of debt of 3.95 percent appears to be reasonable. An efficient way to confirm the reasonableness of this cost of debt is to refer to the Bond Ratings Spreads table presented below in Figure 13. ONG's interest coverage ratio in 2014 was 4.91,[106] and according to the spread table, its "synthetic" bond rating is A2/A. (In fact, this synthetic rating is consistent with the actual ratings from Moody's and S&P which further confirms the accuracy of the Bond Ratings Spreads table used to determine the optimal capital structure). According to the same bond ratings table, ONG's synthetic interest rate is 4.09 percent, which is very close to ONG's proposed 3.95 percent cost of debt, further indicating its reasonableness. PUD recommends a pre-tax cost of debt rate of 3.95 percent as proposed by the Company.

CAPITAL STRUCTURE

Q. Generally describe the concept of capital structure.

A. "Capital structure" refers to the way a firm finances its overall operations through external financing. The primary sources of long-term, external financing are debt capital

[105] WP F-1.

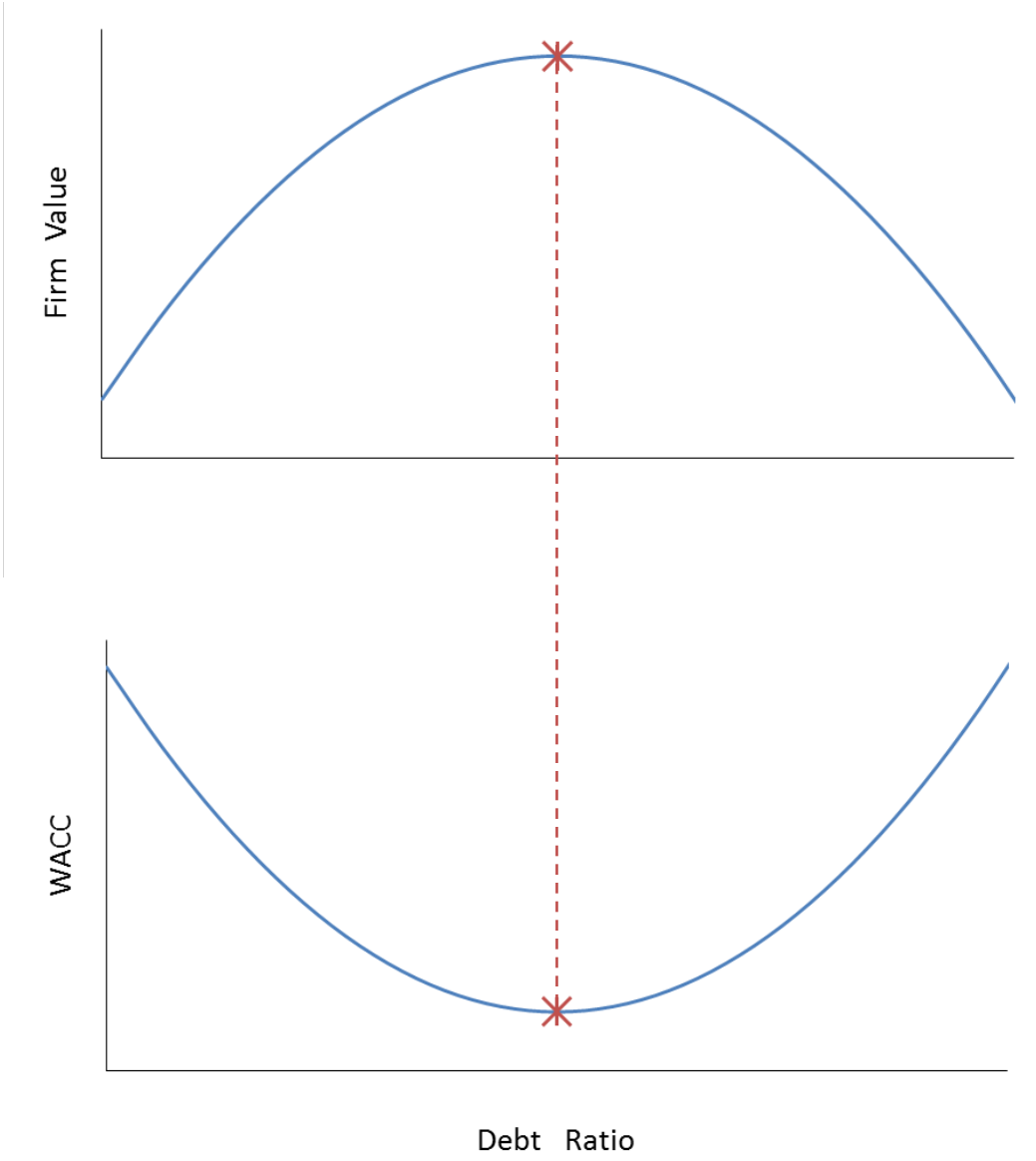
[106] Exhibit DG-C-21.

and equity capital. Debt capital usually comes in the form of contractual bond issues that require the firm make payments, while equity capital represents an ownership interest in the form of stock. Because a firm cannot pay dividends on common stock until it satisfies its debt obligations to bondholders, stockholders are referred to as "residual claimants." The fact that stockholders have a lower priority to claims on company assets is a primary factor in increasing stockholders' risk and required return. Thus, equity capital has a higher cost than debt capital. Firms can reduce their weighted average cost of capital ("WACC") by recapitalizing and increasing their debt financing. In addition, because interest expense is deductible, increasing debt also adds value to the firm by reducing the firm's tax obligation.

Q. By increasing debt, competitive firms can add value and reduce their WACC.

A. Yes. A competitive firm can add value by increasing debt. After a certain point, however, the marginal cost of additional debt outweighs its marginal benefit. This is because the more debt the firm uses, the higher interest expense it must pay, and the likelihood of loss increases. This increases the risk of recovery for both bondholders and shareholders, causing both groups of investors to demand a greater return on their investment. Thus, if debt financing is too high, the firm's WACC will increase instead of decrease. The following charts illustrate these concepts.

Figure 12:
Optimal Debt Ratio



As shown in this figure, a competitive firm's value is maximized when the WACC is minimized. In both of these graphs, the debt ratio [D / (D+E)] is shown on the x-axis. By increasing its debt ratio, a competitive firm can minimize its WACC and maximize its value. At a certain point, however, the benefits of increasing debt do not outweigh the

costs of the additional risks to both bondholders and shareholders, as each type of investor will demand a higher return for the additional risk they have assumed.[107]

Q. The rate base rate of return model does not incentivize utilities to operate at the optimal capital structure.

A. Yes. While it is true that competitive firms can maximize their value by minimizing their WACC, this is not the case for regulated utilities. Under the rate base rate of return model, a higher WACC results in a higher rates, all else held constant. The basic revenue requirement equation is as follows:

Equation 14:
Revenue Requirement for Regulated Utilities

$$RR = O + d + T + \boldsymbol{r}(A - D)$$

where:	RR	=	*revenue requirement*
	O	=	*operating expenses*
	d	=	*depreciation expense*
	T	=	*corporate tax*
	$\boldsymbol{r}$	=	***weighted average cost of capital (WACC)***
	A	=	*plant investments*
	D	=	*accumulated depreciation*

As shown in this equation, utilities can increase their revenue requirement by increasing their WACC, not by minimizing it.

Q. Generally, utilities can afford to have higher debt levels than other industries.

A. Yes. Because regulated utilities have large amounts of fixed assets, stable earnings, and low risk relative to other industries, they can afford to have higher debt ratios (or "leverage"). As aptly stated by Dr. Damodaran:

[107] *See* Graham, Smart & Megginson *supra* n. 17, at 440-41.

> Since financial leverage multiplies the underlying business risk, it stands to reason that firms that have high business risk should be reluctant to take on financial leverage. It also stands to reason that firms that operate in stable businesses should be much more willing to take on financial leverage. Utilities, for instance, have historically had high debt ratios but have not had high betas, mostly because their underlying businesses have been stable and fairly predictable.[108]

Notice how Dr. Damodaran contrasts utilities with firms that have high underlying business risk. Because utilities have low levels risk and operate a stable business, they should generally operate with relatively high levels of debt to achieve their optimal capital structure. There are objective, technical methods available to estimate the optimal capital structure, which are discussed further below.

Q. Discuss the capital structure of the proxy companies.

A. I examined the capital structure for each proxy company and averaged their debt and equity ratios.[109] The average debt ratio of the proxy group is only 49 percent. Regulators will sometimes simply look at the average debt ratio of the proxy group as a measure to determine the appropriate debt ratio of the target company. This type of analysis is oversimplified and insufficient for three important reasons:

1. Utilities do not have a financial incentive to operate at the optimal capital structure.

Under the rate base rate of return model, utilities do not have a natural financial incentive to minimize their cost of capital. Competitive firms, in contrast, can maximize their value by minimizing their cost of capital. Simply comparing the debt ratios of other regulated utilities will not indicate an appropriate capital structure. Rather, it will

[108] Damodaran *supra* n. 15, at 196 (emphasis added).

[109] Exhibit DG-C-20.

indicate debt ratios that are too low. It is the Commission's duty to stand in the place of competition and ensure that the Company's capital structure is similar to one that the Company would have in a competitive environment. This duty cannot be accomplished by simply looking at the current debt ratios of the proxy group or target company.

2. The optimal capital structure is unique to each firm.

As discussed further below, the optimal capital structure for a firm is dependant on several unique financial metrics for that firm. The other companies in the proxy group have different financial metrics than the target company, and thus have different optimal capital structures. An objective analysis should be performed using the financial metrics of the target utility to estimate its unique optimal capital structure.

3. The capital structures of the proxy group may not have been approved by their regulatory commissions.

The actual capital structure of any utility falls within the realm of managerial discretion. Regulatory commissions, however, have a duty to impute a proper capital structure if the company's actual capital structure is inappropriate. Thus, the actual capital structures of other utilities may have been deemed inappropriate by their own commission. For all of the foregoing reasons, simply comparing the capital structures of other regulated utilities has no place in a proper capital structure analysis. Instead, PUD conducted a thorough, objective, and reasonable capital structure analysis which is discussed further below.

Q. Describe an objective approach to estimating a firm's optimal capital structure.

A. My analysis of the optimal capital structure includes objective methods to measure the effects of increasing debt on both the cost of debt and cost of equity. I will discuss the affects of increasing the debt ratio on each type of security separately.

Cost of Debt

As discussed above, increasing the debt ratio will increase the cost of debt. To objectively measure how much the cost of debt increases, I considered the spreads above the risk-free rate for various levels of bond ratings and interest coverage ratios. The following table shows increasing interest rates for debt based on different bond rating levels.

Figure 13:
Bond Rating Spread

Coverage Ratio	Bond Rating	Spread	Interest Rate
> 8.5	Aaa/AAA	0.40%	3.49%
6.5 - 8.5	Aa2/AA	0.70%	3.79%
5.5 - 6.5	A1/A+	0.90%	3.99%
4.3 - 5.5	A2/A	1.00%	4.09%
3.0 - 4.3	A3/A-	1.20%	4.29%
2.5 - 3.0	Baa2/BBB	1.75%	4.84%
2.3 - 2.5	Ba1/BB+	2.75%	5.84%
2.0 - 2.3	Ba2/BB	3.25%	6.34%
1.8 - 2.0	B1/B+	4.00%	7.09%
1.5 - 1.8	B2/B	5.00%	8.09%
1.3 - 1.5	B3/B-	6.00%	9.09%
0.8 - 1.3	Caa/CCC	7.00%	10.09%

As shown in this table, the spreads over the risk-free rate gradually increase as bond ratings fall.[110] The spread is added to the risk-free rate to obtain the interest rates shown in the far right column. This concept is somewhat comparable to the interest rate a mortgage lender would charge a borrower. The mortgage lender's advertised rate is usually the lowest rate, or "prime" rate, which is available to borrowers with stellar credit scores. As credit scores decrease, however, the offered interest rate will increase. The

[110] The link between interest coverage ratios and ratings was developed by looking at all rated companies in the U.S. The default spreads are obtained from traded bonds. The spreads are added to the risk-free rate to obtain the interest rates in the table. http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ratings.htm.

bond ratings in this figure are based on various levels of interest coverage ratios shown in the far left column. The interest coverage ratio, as its name implies, is a metric used by financial analysts to gauge a firm's ability to pay its interest expense from its available earnings before interest and taxes ("EBIT"). (Likewise, the mortgage lender would consider the borrower's personal income-debt ratio). The formula for the interest coverage ratio is simply:

Equation 15:
Interest Coverage Ratio

$$\frac{Earnings\ before\ Interest\ and\ Taxes}{Interest\ Expense}$$

As the debt ratio rises, the interest coverage ratio falls, the bond ratings increase, and the cost of debt increases. Now that we have an objective way of measuring how increasing the debt ratio affects the cost of debt, we need to measure how increasing the debt ratio affects the cost of equity.

Cost of Equity

As with the cost of debt, increasing the debt ratio also increases the cost of equity. To objectively measure how much the cost of equity increases, I first calculated the Company's unlevered beta. The unlevered beta is determined by the assets owned by the firm, and removes the effects of financial leverage. As leverage increases, equity investors bear increasing amounts of risk, leading to higher betas. Before the effects of financial leverage can be accounted for, however, the effects of leverage must first be removed, which is accomplished through the unlevered beta equation:[111]

[111] Damodaran *supra* n. 15, at 197. This formula was originally developed by Hamada in 1972.

Equation 16:
Unlevered Beta

$$\beta_U = \frac{\beta_L}{\left[1 + (1 - T_c)\left(\frac{D}{E}\right)\right]}$$

where: β_U = *unlevered beta (or "asset" beta)*
β_L = *average levered beta of proxy group*
T_C = *corporate tax rate*
D = *book value of debt*
E = *book value of equity*

Using this equation, the beta for the firm can be unlevered, and then "re-levered" based on various debt ratios (by rearranging this equation to solve for β_L). So, by using the Bond Rating Spreads table and the unlevered beta equation, the costs of both debt and equity can be increased in correspondence with increasing the debt ratio, until the ideal capital structure is found: where the weighted average cost of capital is minimized.

Q. Describe ONG's optimal capital structure.

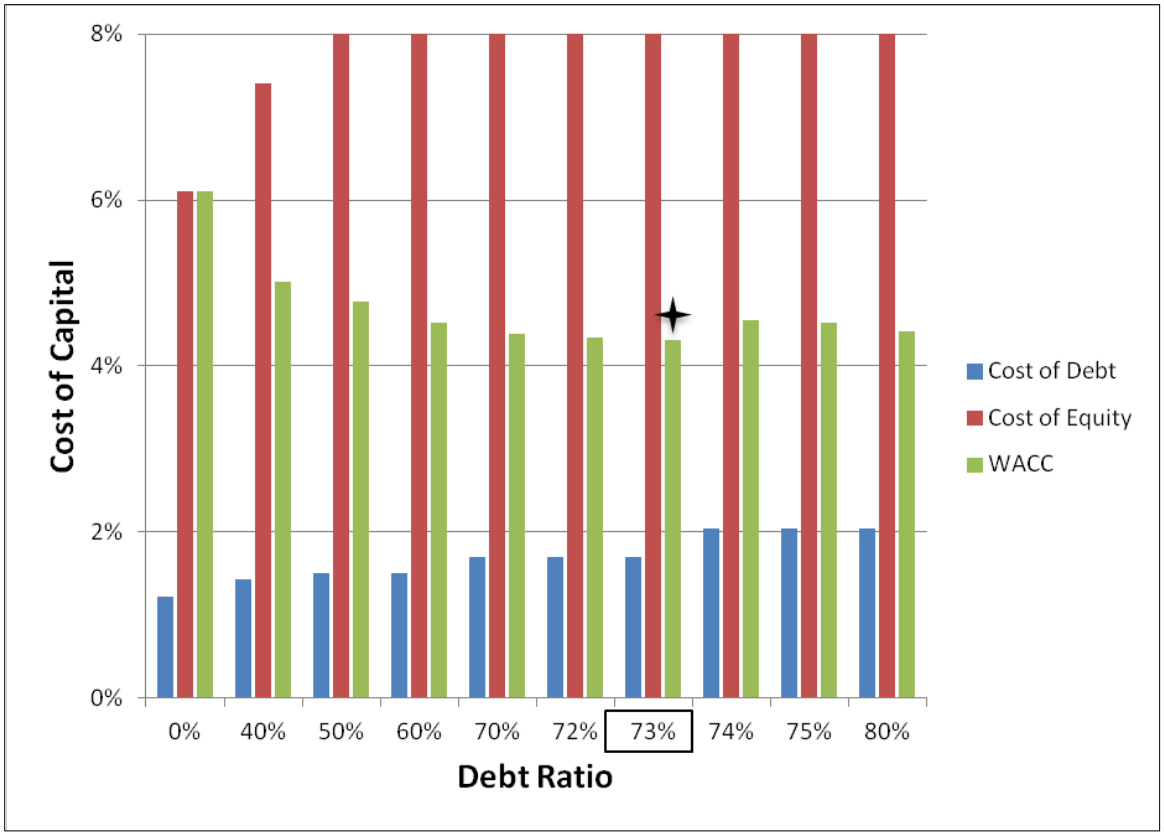
A. I analyzed the Company's optimal capital structure based on the approach discussed above. The following table presents different levels of ONG's weighted average cost of capital ("WACC") based on increasing debt ratios.

Figure 14:
ONG's WACC at Various Debt Ratios

Debt Ratio	D/E Ratio	Levered Beta	Cost of Equity	Debt Level	Interest Expense	Coverage Ratio	Pre-tax Debt Cost	After-tax Debt Cost	WACC
0%	0%	0.548	6.10%	0	0	∞	3.49%	1.22%	6.10%
40%	67%	0.785	7.41%	1,216,393	48,048	4.7	4.09%	1.43%	5.02%
50%	100%	0.904	8.06%	1,520,491	60,059	3.8	4.29%	1.50%	4.78%
60%	150%	1.081	9.04%	1,824,589	72,071	3.1	4.29%	1.50%	4.52%
70%	233%	1.378	10.67%	2,128,687	84,083	2.7	4.84%	1.69%	4.39%
72%	257%	1.463	11.13%	2,189,507	86,486	2.6	4.84%	1.69%	4.34%
73%	270%	1.510	11.39%	2,219,916	87,687	2.6	4.84%	1.69%	**4.31%**
74%	285%	1.561	11.67%	2,250,326	88,888	2.5	5.84%	2.04%	4.55%
75%	300%	1.615	11.97%	2,280,736	90,089	2.5	5.84%	2.04%	4.53%
80%	400%	1.971	13.93%	2,432,785	96,095	2.3	5.84%	2.04%	4.42%

As shown in this table, ONG's WACC decreases as debt is added until the debt ratio reaches 73 percent, after which the WACC generally increases with additional leverage. This analysis indicates that ONG's optimal capital structure consists of about 70 percent debt and 30 percent equity.[112] The following chart illustrates these findings:

Figure 15:
ONG's Optimal Capital Structure



These results further confirm the well-known concept that firms with stable earnings and low risk can minimize their cost of capital by utilizing higher amounts of debt relative to other firms. In fact, many other competitive firms in a variety of industries utilize high debt ratios to maximize value for their shareholders, as shown in the following figure:[113]

[112] Exhibit DG-C-21.

[113] *See* NYU data, http://people.stern.nyu.edu/adamodar/New_Home_Page/datacurrent.html.

Figure 16:
Other Industries with High Debt Ratios

Industry	Number of Firms	Debt Ratio
Paper/Forest Products	22	60.2%
Telecom (Wireless)	21	61.8%
Packaging & Container	26	62.0%
Broadcasting	28	62.3%
Hotel/Gaming	80	63.4%
R.E.I.T	213	63.9%
Telecom Services	77	64.2%
Hospitals	56	65.6%
Rubber & Tires	4	66.0%
Advertising	52	66.1%
Office Equipment	25	66.4%
Auto & Truck	22	69.1%
Retail (Automotive)	30	69.2%
Cable TV	18	71.1%
Trucking	30	72.4%
Total / Average	**704**	**65.6%**

As shown in this figure, there are currently over 700 companies in the U.S. operating with debt ratios around 65 percent.[114] Moreover, there are more than 4,700 firms in a variety of industries with higher debt ratios on average than ONG's current debt ratio.[115] Like public utilities, the industries shown in this figure are generally well-established firms with large amounts of capital assets. This figure, along with my technical analysis on the optimal capital structure presented above, further confirms that a debt ratio for ONG of 65 to 70 percent is reasonable and well-supported.

[114] Exhibit DG-C-22.

[115] Exhibit DG-C-22.

Q. Discuss PUD's recommended capital structure for ONG.

A. ONG's proposed capital structure consists of only 40 percent debt, which is clearly far too low given the analysis presented above.[116] If ONG were a competitive firm, it would minimize its cost of equity by operating at a capital structure consisting of about 65 to 70 percent debt. Because it is the Commission's duty to stand in the place of competition, the Commission should impute a capital structure that would exist in a competitive environment. The objective analysis I presented above indicates that the Company's optimal capital structure in a competitive environment would be about 65 to 70 percent. Notwithstanding this analysis, PUD recommends a debt ratio of only 45 percent in the interest of gradualism and fairness to the Company.

SPECIFIC RESPONSES TO ONG'S TESTIMONY

Q. Describe ONG's position regarding the cost of capital and capital structure.

A. Dr. Fairchild recommended a return on equity in the range of 10.25 percent to 10.75 percent, with a cost of debt of 3.95 percent and a capital structure consisting of 39.5 percent debt and 60.5 percent equity.[117]

Q. Discuss your specific responses to Dr. Fairchild's testimony concerning the return on equity.

A. I have organized my specific responses to Dr. Fairchild's testimony by topic, including Capital Structure, Discounted Cash Flow Model, Capital Asset Pricing Model, Risk Premium Method, and other issues.

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[116] *Id.*

[117] Direct Testimony of Bruce Fairchild p. 46.

Capital Structure

Q. ONG's proposed capital structure is far from optimal.

A. Yes. As discussed in detail above, a firm's optimal capital structure is one in which the weighted average cost of capital is minimized. In this case, PUD conducted an extensive, technical, and objective analysis to determine that ONG's optimal capital structure consists of about 65 to 70 percent debt. ONG has provided no such analysis.[118] Instead, Dr. Fairchild proposes the Commission adopt ONG's current capital structure, which consists of only 40 percent debt.[119]

Q. A capital structure recommendation simply based on the capital structures of other utilities or the target utility's current capital structure is not appropriate.

A. Yes. One of the considerations for ONG's proposed capital structure is the capital structure of its peer group.[120] In the Capital Structure section of my testimony above, I discussed in detail three important reasons why it is not appropriate to consider the capital structures of other utilities when conducting a proper capital structure analysis. These reasons are summarized as follows:

1. Utilities do not have a financial incentive to operate at the optimal capital structure, and thus the observed capital structures of other utilities are not reflective of competitive conditions;
2. The optimal capital structure is unique to each firm; and
3. The capital structure of other utilities may not have been approved by their regulatory commissions.

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[118] *See generally* Direct Testimony of Bruce Fairchild pp. 14-16.

[119] *Id*. at 16.

[120] *Id*. at 15 (citing Registration Form 10 filed with the Security and Exchange Commission).

For these reasons, the Commission should rely on PUD's objective analysis rather than merely looking at the capital structures of the proxy group or simply accepting the Company's current capital structure, as Dr. Fairchild did.

Q. The credit rating is not the primary factor to consider when determining a prudent capital structure for a utility.

A. Yes. Dr. Fairchild focuses on ONG's credit rating in support of the Company's maintaining a debt ratio that is for below the optimal level.[121] This narrative is routinely offered by utility witnesses, and it incorrectly suggests that the primary concern when assessing the optimal capital structure is achieving the highest credit rating possible. If this were true, every company would strive to issue as little debt as possible and to have interest coverage ratios above 8.0. Prudent, competitive firms, however, do not operate in this manner. Instead, they generally issue as much debt as necessary to minimize their weighted average cost of capital. In other words, competitive firms are primarily concerned with maximizing their shareholders' wealth rather than maximizing their credit rating. This is why we observe firms with high debt ratios in the market. Again, there are more than 4,700 firms across the country in a variety of industries with higher debt ratios, on average, than ONG's current debt ratio.[122] This is not surprising. These competitive firms have a financial incentive to issue as much debt as prudently possible to reduce their cost of capital. ONG, on the other hand, has a financial incentive to issue less than optimal amounts of debt to increase its cost of capital and maximize the wealth

[121] *See Id*. at 15.

[122] Exhibit DG-C-22.

of its shareholders. It is the Commission's duty to stand in the place of competition and impute a capital structure that would exist in a competitive environment.

Discounted Cash Flow Model

Q. The results of Dr. Fairchild's DCF Model are unreasonably high due to his high growth rate estimates.

A. Yes. The growth rate is the most important factor of the DCF Model, and it is well-known that utilities are mature, low-growth companies. PUD proposed a reasonable average growth rate for the proxy group of 4.7 percent.[123] Dr. Fairchild, on the other hand, proposed an average sustainable growth rate of 6.7 percent.[124] This included a 16.1 percent growth rate for Chesapeake Utilities. A sustainable growth rate of 16.1 percent for this company is essentially impossible, and Dr. Fairchild should have disregarded this result accordingly. Again, the growth rates used in any form of the DCF Model are supposed to represent long-term future growth of dividends. Recall two of basic assumptions of the DCF Model: 1) the cost of equity must exceed the growth rate; and 2) the growth rate is constant every year to infinity. So in other words, Dr. Fairchild is saying that Chesapeake Utilities is going to grow at 16.1 percent, per year, every year, forever. He is also saying that Chesapeake Utilities' cost of equity capital is greater than 16.1 percent. Clearly this is an impossible scenario. In reality, Chesapeake Utilities' cost of equity is only 6.83 percent according to the DCF Model, and only 6.39 percent according to the CAPM – not even half of 16.1 percent. No reasonable estimate would result in a cost of equity of 16.1 percent for any company in the proxy group.

[123] Exhibit DG-C-6.

[124] Direct Testimony of Bruce Fairchild, Schedule 5.

Q. Dr. Fairchild's DCF Model produced a cost of equity estimate that exceeds the required return on the overall market, further indicating its unreasonableness.

A. Yes. It is important to check the results of any model for reasonableness, and when it comes to estimating the cost of equity of very low-risk firms such as utilities, the required return on the market portfolio serves as a "ceiling" for the cost of equity estimate. The results of Dr. Fairchild's DCF Model are as high as 10.8 percent.[125] A utility's required return on equity capital must be below the required return on the market portfolio. As stated above, a reasonable estimate of the current required return on the market portfolio is, at most, 8.91 percent.[126] That means the lowest result of Dr. Fairchild's DCF Model is still above the highest estimate for the required return on the market portfolio. In fact, the true required return for ONG should be well below the required return on the market portfolio.

Capital Asset Pricing Model

Q. Dr. Fairchild's estimate for the equity risk premium is unreasonably high.

A. Yes. Recall that the ERP is one of three inputs in the CAPM equation [$R_F + \beta$ (ERP)]. The ERP is one of the most single important factors for estimating the cost of equity in this case. In his direct testimony, Dr. Fairchild states that the historical ERP 7.0 percent, and the prospective risk premium is 8.53 percent.[127] Both of these estimates are unreasonably high. I will discuss each estimate separately.

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[125] *Id*. at 34.

[126] *See* Exhibit DG-C-15.

[127] Direct Testimony of Bruce Fairchild p. 36-38.

Historical Equity Risk Premium

First, Dr. Fairchild miscalculated the arithmetic historical risk premium. Dr. Fairchild stated that according to Ibbotson, the return on stocks minus the return on Treasury bonds from 1926 – 2014 was 12.10 percent minus 5.10 percent respectively, equaling an arithmetic historical ERP of 7.00 percent.[128] In fact, the return on Treasury bonds over that period according to Ibbotson was 6.10 percent (not 5.10 percent), which means the historical, arithmetic ERP is only 6.00 percent, not 7.00 percent.[129] A miscalculation of 100 basis points when estimating the ERP is significant. Regardless of this mistake, it is more appropriate to consider the geometric mean when looking at the historical ERP.[130] Evidence suggests that stocks are negatively correlated (i.e., good years are more likely to be followed by poor years, and vice versa), and thus the arithmetic average tends to overstate the true ERP.[131] The geometric historical ERP is only 4.40 percent.[132]

Prospective Equity Risk Premium

Dr. Fairchild's prospective ERP estimate of 8.53 percent is especially unreasonable. There is extensive evidence that the prospective ERP is actually lower than the historical ERP, not higher. In a landmark publication on risk premiums around the world, *Triumph of the Optimists*, the authors show through extensive empirical research that the prospective ERP is lower than the historical ERP.[133] This is due in large part to what is known as "survivorship bias" or "success bias" – a tendency for failed companies to be

[128] *Id*. at 36-37.

[129] *See* Ibbotson, *supra* n. 67 at 91; *see also* Exhibit DG-C-13.

[130] *See* Damodaran *supra* n. 15, at 163.

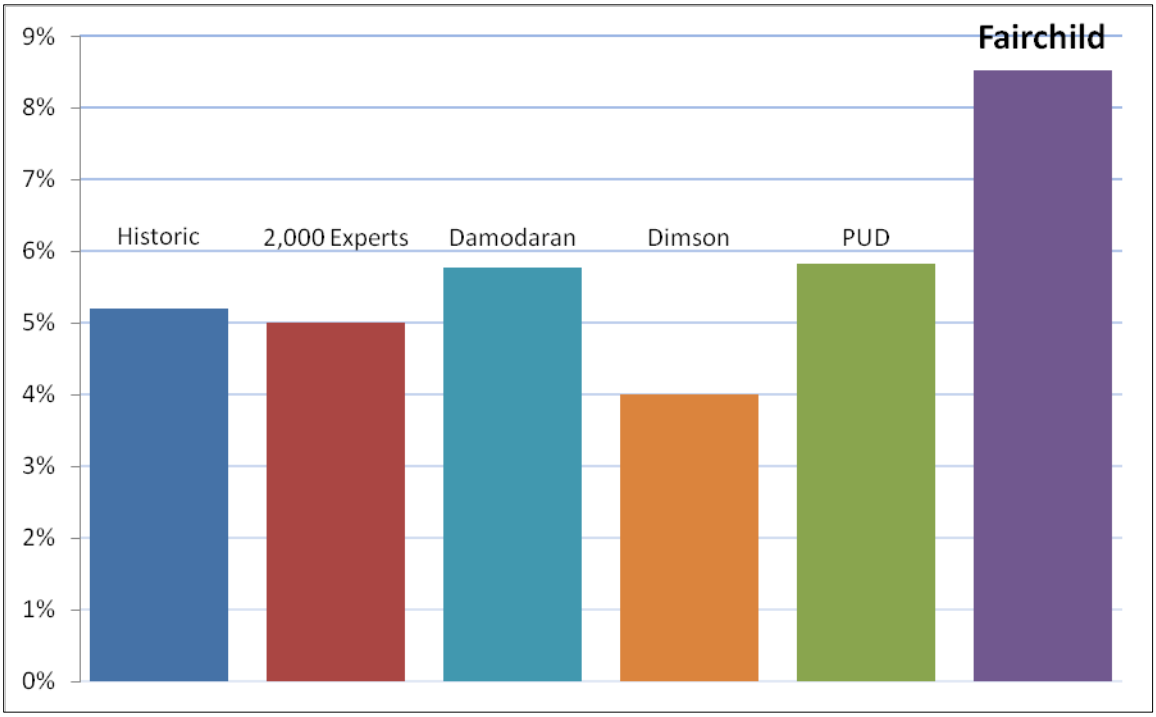
[131] *Id*.

[132] Exhibit DG-C-13.

[133] Dimson, Marsh & Staunton *supra* n. 65.

excluded from historical indices.[134] The results of the current expert surveys indicate that the authors were correct. According to thousands of experts across the country, the current ERP is about 5.0 percent, which is lower than the arithmetic historical average of 6.0 percent. Despite this extensive empirical research and the opinions of thousands of experts across the country, Dr. Fairchild is proposing a prospective ERP of 8.53 percent. The following chart contrasts these ERP estimates.

Figure 17:
Equity Risk Premium Comparison



The weight of authority and analysis contrasting Dr. Fairchild's estimate cannot be overstated:

[134] *Id*. at 34.

IBBOTSON

Ibbotson is the most widely-used and respected source for annual reporting on the historical ERP in the U.S. It is consistently relied upon and cited by analysts in utility rate cases.

EXPERT SURVEYS

The surveys cited in this case are two respected surveys of experts around the U.S., including analysts, academics, CFOs, and other executives.

DAMODARAN

Dr. Aswath Damodaran is one of the leading experts in the country on corporate finance, valuation, and especially the ERP. Many other academics, analysts, and firms rely on his ERP estimate, which is published on his website monthly, and in his annual ERP report.

DIMSON

Triumph of the Optimists, by Dimson, Marsh, and Staunton, is the single most influential study of equity risk premiums around the world, and is cited in many financial texts. One of the ultimate conclusions in *Triumph* is that the forward-looking ERP is lower than the historical ERP.

PUD

In this cause, PUD conducted a thorough, robust calculation of the implied ERP. While PUD's estimate is likely high given the results of the expert surveys, it is also the most current.

Q. The Commission should disregard Dr. Fairchild's CAPM results due to his excessively high estimate for the equity risk premium.

A. Yes. Dr. Fairchild's prospective ERP estimate is nearly 300 basis points higher than PUD's proposed ERP and over 300 basis points higher than the ERP estimate of thousands of experts across the country. In regulatory proceedings, we think of the proper cost of capital estimation in terms of a "range of reasonableness." This concept applies not only to the final result, but also to each model and input presented in the case. The equity risk premium is one of the single most important factors in estimating the cost of equity, and the most influential factor of the CAPM. Given the extensive evidence

presented in PUD's testimony, it is clear that Dr. Fairchild's proposed equity risk premium is outside the range of reasonableness. For these reasons, the Commission should disregard Dr. Fairchild's CAPM result.

Q. It is inappropriate to add a size premium to the cost of equity estimate in this case.

A. Yes. Dr. Fairchild also suggested that a size premium should be added to the CAPM cost of equity. The size premium refers to the idea that the additional risk associated with smaller firms is not fully accounted for in their betas. The "size effect" phenomenon arose from a 1981 study conducted by Banz, which found that "in the 1936 – 1975 period, the common stock of small firms had, on average, higher risk-adjusted returns than the common stock of large firms."[135] According to Ibbotson, Banz's size effect study was "[o]ne of the most remarkable discoveries of modern finance."[136] Indeed, perhaps it was, but the size effect phenomenon was short lived. Banz's 1981 publication generated much interest in the size effect, and spurred the launch of significant new small cap investment funds. However, this "honeymoon period lasted for approximately two years. . . ."[137] After 1983, U.S. small-cap stocks actually underperformed relative to large cap stocks. In other words, the size effect essentially reversed. In *Triumph of the Optimists*, the authors conducted an extensive empirical study of the size effect phenomenon around the world. They found that after the size effect phenomenon was discovered in 1981, it disappeared within a few years:

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[135] Rolf W. Banz, *The Relationship Between Return and Market Value of Common Stocks* 3-18 (Journal of Financial Economics 9 (1981)).

[136] Ibbotson *supra* n. 67, at 99. It is also interesting to note that Roger Ibbotson, the former chairman and founder of Ibbotson Associates, was on Rolf Banz's dissertation committee.

[137] Dimson, Marsh & Staunton *supra* n. 65, at 131.

> It is clear . . . that there was a global reversal of the size effect in virtually every country, with the size premium not just disappearing but going into reverse. Researchers around the world universally fell victim to Murphy's Law, with the very effect they were documenting – and inventing explanations for – promptly reversing itself shortly after their studies were published.[138]

In other words, the authors are basically saying that the very discovery of the size effect phenomenon likely caused its own demise. The authors ultimately concluded that it is "inappropriate to use the term 'size effect' to imply that we should automatically expect there to be a small-cap premium," yet this is exactly what utilities do in attempting to artificially raise the CAPM cost of equity with a size premium. Dr. Fairchild relied on Ibbotson in support for the size premium, but he failed to mention that even Ibbotson acknowledges that the size effect has not existed for at least 20 years:

> The unpredictability of small-cap returns has given rise to another argument against the existence of a size premium: that markets have changed so that the size premium no longer exists. As evidence, one might observe the last 20 years of market data to see that the performance of large-cap stocks was basically equal to that of small cap stocks. In fact, large-cap stocks have <u>outperformed</u> small-cap stocks in five of the last 10 years.[139]

In addition to the study in *Triumph* discussed above, other scholars have concluded similar results. According to Kalesnik and Beck:

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[138] *Id*. at 133.

[139] Ibbotson *supra* n. 67, at 112 (emphasis added).

> Today, more than 30 years after the initial publication of Banz's paper, the empirical evidence is extremely weak even before adjusting for possible biases. . . . The U.S. long-term size premium is driven by the extreme outliers, which occurred three-quarters of a century ago. . . . Finally, adjusting for biases . . . makes the size premium vanish. If the size premium were discovered today, rather than in the 1980s, it would be challenging to even publish a paper documenting that small stocks outperform large ones.[140]

Utility companies often argue that the CAPM cost of equity should be increased to account for the size effect, but the size effect has been dead for over 20 years. Indeed, for extremely small companies with excess risk that cannot be adequately measured by beta, some size premium may be appropriate.[141] This is not the case here, however, and the Commission should reject any size premium adjustment to the cost of equity estimates in this case.

Risk Premium Method

Q. Dr. Fairchild's Risk Premium Method is completely inappropriate.

A. Yes. Dr. Fairchild testified that he estimated the cost of equity using a risk premium method based on commission-awarded returns.[142] This approach is not a proper way to estimate the cost of equity. Commission-awarded returns have no meaningful connection to the equity risk premium ("ERP"). I will reiterate what the ERP actually is: it is the level of return investors expect above the risk-free rate in exchange for investing in risky securities. Specifically, the ERP is the expected return on the market less the risk-free

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[140] Vitali Kalesnik and Noah Beck, *Busting the Myth About Size* (Research Affiliates 2014), available at https://www.researchaffiliates.com/Our%20Ideas/Insights/Fundamentals/Pages/284_Busting_the_Myth_About_Size.aspx (accessed September 4, 2015) (emphasis added).

[141] *See generally e.g.* Responsive Testimony of David Garrett in Cause No. PUD 201500123 (analyzing the cost of capital of Oak Hills Water Company – an extremely small water company with about 40 customers and about $40,000 of net plant).

[142] *See* Direct Testimony of Bruce Fairchild, p. 40-44.

rate [ERP=R_M–R_F]. In other words, the ERP is a function of market-driven forces. It cannot be influenced by the decision of a regulatory body. For that matter, it cannot be materially influenced by the decision of any single company. Thus, the ERP has no material connection with the returns awarded to public utility companies in rate cases. This point is furthered by the expert surveys. Recall that the expert surveys ask thousands of experts across the country about the current ERP. When these experts are asked about the sources they relied on in giving their ERP estimate, it is not surprising that they make no mention of commission-awarded returns.[143] Moreover, many awarded returns arise out of settlements, which means that in complete contrast to the ERP, they are not reflective of market-driven forces. For all of these reasons, it is completely inappropriate to consider commission-awarded returns in any ERP analysis. Thus, the Commission should disregard Dr. Fairchild's Risk Premium Method analysis.

Firm-Specific Business Risks

Q. In addition to having low levels of market risk, ONG also has low levels of firm-specific business risk.

A. Yes. Dr. Fairchild suggested that ONG faces substantial risk factors. For example, he stated that the "financial results of LDCs are heavily dependent on general economic conditions."[144] This statement is misleading, as it is well-known that utilities are defensive firms that are relatively insulated from market conditions.[145] Thus, their

[143] In fact, in the IESE Business School's 2014 survey, some of the respondents indicated which books, papers, and other sources they used as a reference to justify the equity risk premium that they used. The most cited references were Dr. Damodaran, Ibbotson, Duff & Phelps, Graham-Harvey, Bloomberg, Grabowski, Siegel, and other sources. Of course, there was no mention of commission-awarded returns.

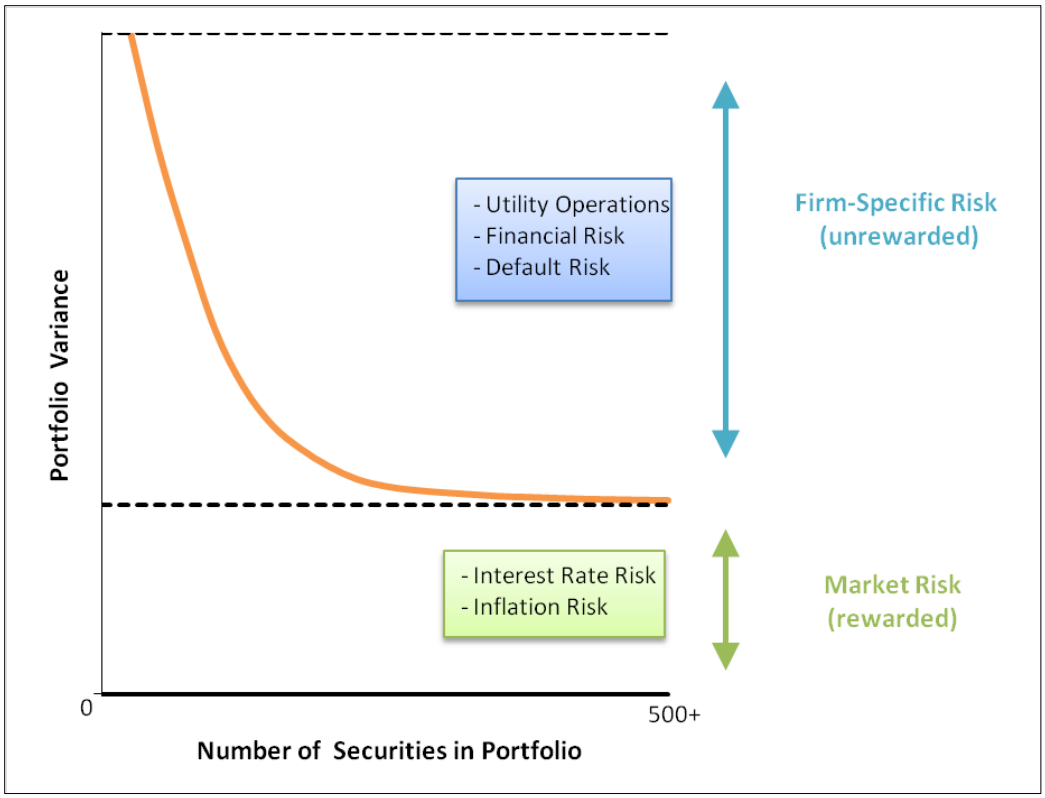
[144] Direct Testimony of Bruce Fairchild p. 9.

[145] *See* Bodie *supra* n. 16, at 382-83.

performance is relatively unaffected by aggregate changes economic conditions. Even the Company has acknowledged that one of the benefits from it separating from ONEOK is that it "insulates the utility operations from the risks related to the operations of ONEOK's non-utility business."[146] Recall that there are two primary types of risk: market risk, which affects all firms to varying degrees, and firm-specific risk, which affects individual firms. Dr. Fairchild suggested that certain risk factors should generally increase the cost of equity, including operational risks, general legal claims, and even credit collection issues.[147] These are all types of firm-specific risks. As discussed above, it is a well-known concept in finance that firm-specific risks are unrewarded by the market. This is because investors can easily eliminate firm-specific risks through portfolio diversification. Thus, investors do not expect a return for assuming firm-specific risk. This concept was also illustrated in Figure 2 above.

[146] Direct Testimony of Caron Lawhorn p. 6-7.

[147] *See generally* Direct Testimony of Bruce Fairchild pp. 8-10.



Therefore, any discussion of the Company's firm-specific risks in the cause, while perhaps relevant to other issues in the rate case, should have no material effect on the cost of equity estimate. Rather, it is market risk that is rewarded by the market. I have thoroughly considered market risk in my CAPM analysis discussed above. Dr. Fairchild even suggested that investors would demand a higher awarded return to compensate them for the potential risk of "terrorist activities."[148] This type of rhetoric should be ignored. Rather, the Commission should focus on the reasonable, empirical evidence presented in PUD's testimony with regard to market risk.

[148] *See* Direct Testimony of Bruce Fairchild p. 9.

Q. Notwithstanding the fact that firm-specific risk is unrewarded by the market, ONG does not possess a great amount of firm-specific risk.

A. Yes. Even though one of the most well-established principals in finance is that firm-specific risk is unrewarded by the market, ONG nonetheless does not possess a relatively large amount of firm-specific risk. Dr. Fairchild suggested that various amounts of "regulatory risk," including infrastructure improvements, construction of new facilities, environmental regulation, and other factors, increase the Company's risk. All firms in the market are subject to various regulations, and investors in those firms do not expect any additional compensation for assuming those types of firm-specific risks. Furthermore, Dr. Fairchild does not explain how the need to make infrastructure improvements adds to the Company's risk. Under the rate base rate of return model, when the company makes capital investments it will recover all of its investment through depreciation, and it will earn a return on the investments as well. This is not a good example of risk. In contrast to this arrangement, there are many examples of actual firm-specific risk, such as operational risk. For example, RIM, the maker of BlackBerry, was on top of the smartphone industry in 2008 with a stock price of $138 and a 19.5 percent share of the global smartphone market.[149] As competitors like Apple and Samsung entered and gained ground in the market, RIM failed to adjust. By 2012, RIM's stock price fell to about $10 per share, and by 2014, RIM's market share had dropped to less than one percent.[150] There are many other examples of firms who were dominant at one time and were eventually overcome by competitive forces and other business risks (e.g.,

[149] Brad Moon, *A Brief History of Research in Motion* (InvestorPlace 2013).

[150] Global smartphone OS market share held by RIM (BlackBerry) from 2007 to 2015, by quarter, available at http://www.statista.com/statistics/263439/global-market-share-held-by-rim-smartphones/.

Compaq, Arthur Andersen, Montgomery Ward, RCA, PaineWebber, TWA, Enron, etc.). Likewise, there are countless of examples of companies who lost massive amounts of shareholder wealth due to failed products (e.g., Crystal Pepsi, Sony Betamax, Colgate Kitchen Entrees, Coors Rocky Mountain Spring Water, Bic Underwear, Harley Davidson Perfume, Life Savers Soda, the DeLorean car, etc.). Unlike public utilities, competitive firms must constantly face the crushing weight of competition, which increases their risk. Among these competitive forces are the threat of new entrants to the market and the threat of substitute products.[151] Public utilities, however, are relatively unthreatened by these competitive forces due to their monopoly status, captive customer base, and lack of substitutes for the services they provide. While society benefits from the fact that utilities are very low-risk firms, this fact should be appropriately reflected in the awarded rate of return.

CONCLUSION AND RECOMMENDATION

Q. Summarize the key points of your testimony.

A. According to the Supreme Court, risk is one of the most important factors to consider when estimating the cost of equity. ONG, like any utility, is a firm with very low levels of risk – far below the market average. Thus, ONG's true required return on equity must be less than the required return on the overall market. PUD used three widely-accepted methods for estimating ONG's required return on equity: 1) Discounted Cash Flow; 2) Capital Asset Pricing Model; and 3) Comparable Earnings. According to these models, as well as the required return on the overall market, ONG's true required return on equity

[151] *See* Bodie, Kane & Marcus *supra* n. 16, at 395 (discussing Michael Porter's five determinants of competition).

is likely less than eight percent. Although setting the allowed return equal to the required return would allow ONG to remain financially healthy and attract capital under efficient and economical management, PUD is recommending a return on equity well above ONG's true required return in the interest of promoting a gradual, rather than abrupt move toward the true required return. In addition, PUD analyzed the Company's optimal capital structure. ONG's proposed capital structure is far from optimal, as its proposed debt ratio is far less than one that would exist in a competitive environment. Even though ONG's optimal debt ratio is around 70 percent, PUD is recommending the Commission impute a debt ratio of only 45 percent, as imputing the optimal debt ratio at this time would result in an abrupt change rather than a gradual one.

Q. The inputs you used in your models and other factors you considered in making your recommendation are very fair and reasonable to ONG.

A. Yes. Each of the models discussed in this case uses various inputs and estimates. I made many decisions using reasonable, professional judgment with regard to these inputs. There were many decisions made in conducting these models that went in the Company's favor. In other words, all else held constant, each of the following decisions would result in a higher revenue requirement for the Company:

1. I used a Quarterly Approximation DCF Model, which produces the highest result of all other variations of the DCF Model.

Many other analysts use the Annual DCF Model or Semi-Annual DCF Model, but the Quarterly Approximation DCF Model (all else held constant) produces the highest cost of

equity result. In fact, my DCF Model produced a result nearly 300 basis points higher than the Annual DCF Model.[152]

2. The implied equity risk premium that I calculated was higher than the historical average and expert survey results.

To determine the overall equity risk premium ("ERP"), I took a weighted average of the three different sources for the ERP, including the historical results, the expert survey results, and the implied ERP calculation. The ERP I calculated was the highest. Moreover, I took a weighted average of the three sources for the ERP and gave the implied ERP the greatest weight.[153] This means that the highest ERP received the greatest weighting (60 percent) of the three ERP estimates. This resulted in a higher CAPM cost of equity for the Company.

3. I incorporated an historical, arithmetic average equity risk premium in my overall equity risk premium estimate.

The historical, arithmetic average ERP is arguably not as accurate as the historical, geometric average ERP. Moreover, there is evidence that the current and prospective ERP is smaller than the historical, arithmetic average ERP, as also discussed above. This is further confirmed by the fact that the survey results and the implied ERP calculation are both lower than the historical, arithmetic ERP. Despite all of these facts, I incorporated the higher historical, arithmetic ERP in my overall ERP estimate.

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[152] Exhibit DG-C-7. My DCF Model produced a cost of equity of 7.96% while the Annual DCF Model produced a cost of equity of only 4.80%. The Semi-Annual DCF Model would have produced a cost of equity somewhere in between. I only factored my DCF result into the final analysis.

[153] *See* Exhibit DG-C-13.

4. In my CAPM analysis, I incorporated published betas that have been arbitrarily adjusted too high.

As discussed above, it is more accurate to adjust raw betas using the Vasicek method. Betas published by Value Line are adjusted toward the market mean of one rather than the utility industry average, which means they are too high. The adjustment method I used is more appropriate when analyzing an industry with betas that are consistently low, such as the utility industry. Despite the fact that the higher Value Line betas are not as accurate, I incorporated them into my CAPM model, resulting in a higher cost of equity estimate.

5. PUD is recommending a capital structure that contains much less debt than the optimal capital structure.

PUD's technical analysis revealed that ONG's optimal capital structure consists of about 65 to 70 percent debt. This is not surprising considering that there are hundreds of firms around the country that operate with similar debt levels.[154] Utilities typically have capital structures with insufficient amounts of debt because they have no natural financial incentive to minimize their overall cost of capital by issuing more debt. Although it would be proper for the Commission, who stands in the place of competition, to impute the optimal capital structure, PUD is recommending that the Commission impute a capital structure consisting of only 45 percent debt in the interest of gradualism and fairness to the Company.

6. Finally, PUD's overall recommendation is well above the Company's true required return on equity.

As discussed above, the legal standards governing the allowed rate of return arguably require that the allowed rate of return be set equal to the true required rate of return. In

[154] Exhibit DG-C-22.

addition, however, the legal standards also allow for the overall end result to be fair under the circumstances, even if it means the allowed return is set above the required return. As discussed above, ONG's true required return must be below the required return on the overall market, which means that ONG's true required rate of return is very likely below eight percent. This estimate is further confirmed by the average results of the CAPM and DCF Model (7.61 percent).[155] PUD, however, is recommending a return on equity that is well above the true required return on equity. In the interest of fairness and reasonableness to the Company, PUD's recommendation represents a gradual move toward the true required return, rather than an abrupt adjustment.[156]

Q. State PUD's recommendation to the Commission.

A. PUD respectfully requests the Commission adopt the following recommendations:

1. A cost of equity of 9.75 percent, which is the highest point in a range of reasonableness of 9.25 to 9.75 percent;
2. A cost of debt of 3.95 percent, as proposed by the Company;
3. A capital structure consisting of 45 percent debt and 55 percent equity;
4. An overall weighted average cost of capital of 6.56 percent, which is the highest point in a range of reasonableness of 6.34 percent to 6.56 percent

These recommendations are fair, just, and reasonable to both ratepayers and the Company.

[155] Exhibit DG-C-19.

[156] The Company's current awarded return on equity is 10.5%, which was reset in ONG's last PBRC review (Cause No. PUD 201400069).

I state under penalty of perjury under the laws of Oklahoma that the foregoing is true and correct to the best of my knowledge.

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EDUCATION

University of Oklahoma — Norman, OK
Master of Business Administration — 2014
Areas of Concentration: Finance, Energy

University of Oklahoma College of Law — Norman, OK
Juris Doctor — 2007
Member, American Indian Law Review

University of Oklahoma — Norman, OK
Bachelor of Business Administration — 2003
Major: Finance

PROFESSIONAL DESIGNATIONS

Society of Depreciation Professionals
Certified Depreciation Professional (CDP)

Society of Utility and Regulatory Financial Analysts
Certified Rate of Return Analyst (CRRA)

The Mediation Institute
Certified Civil / Commercial & Employment Mediator

WORK EXPERIENCE

Oklahoma Corporation Commission — Oklahoma City, OK
Public Utility Regulatory Analyst — 02/2012 – Present
Assistant General Counsel — 02/2011 – 01/2012

Perebus Counsel, PLLC — Oklahoma City, OK
Managing Member — 09/2009 – 01/2011
Represented clients in the areas of family law, estate planning, debt negotiations, business organization, and utility regulation.

Moricoli & Schovanec, P.C. — Oklahoma City, OK
Associate Attorney — 08/2007 – 08/2009
Represented clients in the areas of contracts, oil and gas, business structures and estate administration.

TEACHING EXPERIENCE

University of Oklahoma — Norman, OK
Adjunct Instructor – "Conflict Resolution" — 2014
Adjunct Instructor – "Ethics in Leadership"

Rose State College — Midwest City, OK
Adjunct Instructor – "Legal Research" — 2013 – 2014
Adjunct Instructor – "Oil & Gas Law"

PUBLICATIONS

American Indian Law Review — Norman, OK
"Vine of the Dead: Reviving Equal Protection Rites for Religious Drug Use" — 2006
(31 Am. Indian L. Rev. 143)

VOLUNTEER EXPERIENCE

Calm Waters — Oklahoma City, OK
Board Member — 2015 – Present
Participate in management of operations, attend meetings, review performance, compensation, and financial records. Assist in fundraising events.

Group Facilitator & Fundraiser — 2014 – Present
Facilitate group meetings designed to help children and families cope with divorce and tragic events. Assist in fundraising events.

St. Jude Children's Research Hospital — Oklahoma City, OK
Oklahoma Fundraising Committee — 2008 – 2010
Raised money for charity by organizing local fundraising events.

PROFESSIONAL ASSOCIATIONS

Oklahoma Bar Association — 2007 – Present

Society of Depreciation Professionals — 2014 – Present
Board Member – Vice President — 2015 – 2016
Participate in management of operations, attend meetings, review performance, organize presentation agenda.

Society of Utility Regulatory Financial Analysts — 2014 – Present

CONTINUING PROFESSIONAL EDUCATION

Society of Depreciation Professionals — New Orleans, LA
"Introduction to Depreciation" and "Extended Training" — 2014
Week-long training seminar with extensive instruction on utility depreciation, including average lives and net salvage.

Society of Utility and Regulatory Financial Analysts — Indianapolis, IN
46th Financial Forum. "The Regulatory Compact: Is it Still Relevant?" — 2014
Forum discussions on current issues.

Energy Management Institute — Houston, TX
"Fundamentals of Power Trading" — 2013
Instruction and practical examples on the power market complex, as well as comprehensive training on power trading.

New Mexico State University, Center for Public Utilities — Santa Fe, NM
Current Issues 2012, "The Santa Fe Conference" — 2012
Forum discussions on various current issues in utility regulation.

Energy Management Institute — Houston, TX
"Introduction to Energy Trading and Hedging" — 2012
Instruction in energy trading and hedging, including examination of various trading instruments and techniques.

Michigan State University, Institute of Public Utilities — Clearwater, FL
"39th Eastern NARUC Utility Rate School" — 2011
One-week, hands-on training emphasizing the fundamentals of the utility ratemaking process.

New Mexico State University, Center for Public Utilities — Albuquerque, NM
"The Basics: Practical Regulatory Training for the Changing Electric Industries" — 2010
One-week, hands-on training designed to provide a solid foundation in core areas of utility ratemaking.

The Mediation Institute — Oklahoma City, OK
"Civil / Commercial & Employment Mediation Training" — 2009
Extensive instruction and mock mediations designed to build foundations in conducting mediations in civil matters.

EXPERIENCE IN REGULATORY PROCEEDINGS

1. **Oak Hills Water System, Inc.** (Cause No. PUD 15-123) – Testified on cost of capital, capital structure, and depreciation.

2. **CenterPoint Energy Oklahoma Gas, 2014** (Cause No. PUD 14-227) – Testified on prudence of fuel-related costs and process in annual fuel audit and prudence review.

3. **Public Service Company of Oklahoma, 2014** (Cause No. PUD 14-233) – Testified on PSO's application for a certificate of authority to issue new debt securities.

4. **Empire District Electric Company, 2014** (Cause No. PUD 14-226) – Testified on prudence of fuel-related costs and process in annual fuel audit and prudence review.

5. **Fort Cobb Fuel Authority, 2014** (Cause No. PUD 14-219) – Testified on prudence of fuel-related costs and process in annual fuel audit and prudence review.

6. **Fort Cobb Fuel Authority, 2014** (Cause No. PUD 14-140) – Testified in FCFA's application for a rate increase on outside services, legislative advocacy, miscellaneous taxes, payroll expense and taxes, employee insurance expense, and insurance expense.

7. **Public Service Company of Oklahoma, 2013** (Cause No. PUD 13-217) – Lead auditor of PSO's application for a rate increase. Provided additional research support for cost of capital issue. Assisted in coordination of PUD staff analysts and issues.

8. **Public Service Company of Oklahoma, 2013** (Cause No. PUD 13-201) – Testified in PSO's application for authorization of a standby and supplemental service tariff.

9. **Fort Cobb Fuel Authority, 2013** (Cause No. PUD 13-134) – Testified on prudence of fuel-related costs and process in annual fuel audit and prudence review.

10. **Empire District Electric Company, 2013** (Cause No. PUD 13-131) – Testified on prudence of fuel-related costs and process in annual fuel audit and prudence review.

11. **CenterPoint Energy Oklahoma Gas, 2013** (Cause No. PUD 13-127) – Testified on prudence of fuel-related costs and process in annual fuel audit and prudence review.

12. **Oklahoma Gas & Electric Company, 2012** (Cause No. PUD 12-185) – Testified in OG&E's application for extension of a gas transportation contract.

13. **Empire District Electric Company, 2012** (Cause No. PUD 12-170) – Testified on prudence of fuel-related costs and process in annual fuel audit and prudence review.

14. **Oklahoma Gas & Electric Company, 2012** (Cause No. PUD 12-169) – Testified on prudence of fuel-related costs and process in annual fuel audit and prudence review.

Weighted Average Cost of Capital
(PUD Recommendation)

Exhibit DG-C-2

	[1]	[2]	[3]
Source	**Capital Structure**	**Cost Rates**	**Weighted Cost**
Long-term Debt	45.0%	3.95%	1.78%
Common Equity	55.0%	9.50% 9.25% 9.75%	5.23% 5.09% 5.36%

[4]

Recommended Range for Weighted Average Cost of Capital

LOW	**MID**	**HIGH**
6.87%	**7.00%**	**7.14%**

[1] PUD proposed capital structure based on objective capital structure analysis

[2] ONG proposed debt cost; cost of equity is based on return on equity analysis + / - .25% for zone of reasonableness

[3] = [1] x [2]

[4] = Weighted long-term debt plus weighted common equity

Proxy Group Summary

Company	Ticker	[1] Market Cap. ($ millions)	[2] Market Category	[3] Common Equity Ratio	[4] Moody's Bond Rating	[5] Value Line Safety Rank	[6] Financial Strength	[7] Year Founded
AGL Resources	GAS	5,900	Mid Cap	51.2%	NR	1	A	1856
Atmos Energy	ATO	5,400	Mid Cap	55.7%	A2	1	A	1906
Chesapeake Utilities	CPK	800	Small Cap	65.5%	NR	2	B++	1859
Laclede Group	LG	2,300	Mid Cap	44.9%	Baa2	2	B++	1857
New Jersey Resources	NJR	2,600	Mid Cap	61.8%	Aa2	1	A+	1922
Northwest Natural Gas	NWN	1,200	Small Cap	55.2%	A3	1	A	1859
Piedmont Natural Gas	PNY	2,900	Mid Cap	47.9%	A2	2	B++	1949
South Jersey Industries	SJI	1,800	Small Cap	52.0%	A2	2	A	1910
Southwest Gas	SWX	2,500	Mid Cap	47.6%	A3	3	B++	1931
WGL Holdings	WGL	2,800	Mid Cap	63.8%	A3	1	A	1848

[1], [3], [5], [6] Value Line Investment Survey (all 2014 data); Zack's

[2] Large Cap > $10 billion market capitalization; Mid Cap > $2 billion market capitalization.

[4] Moody's long-term credit rating; https://www.moodys.com/page/lookuparating.aspx (accessed 10-18-15)

[7] Yahoo! Finance company profile pages; some companies are technically newer but only due to mergers and name changes

Stock and Index Prices

Ticker	^GSPC	GAS	ATO	CPK	LG	NJR	NWN	PNY	SJI	SWX	WGL
30-day Average	2096	48.08	52.37	53.85	52.32	28.36	43.29	36.26	25.35	53.74	55.06
Standard Deviation	20.7	1.05	0.92	0.89	0.73	0.76	0.72	0.54	0.44	0.97	0.97
07/08/15	2047	48.30	53.83	55.34	54.04	28.88	44.04	37.15	25.41	54.98	55.50
07/07/15	2081	48.75	53.83	55.45	53.95	28.88	44.18	36.84	25.40	55.58	55.17
07/06/15	2069	47.35	52.43	54.45	52.89	28.01	43.30	36.12	24.98	55.01	53.97
07/02/15	2077	47.37	52.17	54.14	52.23	27.84	42.92	35.78	24.91	54.15	53.86
07/01/15	2077	46.67	51.48	54.06	51.66	27.58	42.23	35.28	24.72	53.43	53.55
06/30/15	2063	46.56	51.28	53.85	52.06	27.55	42.18	35.31	24.73	53.21	53.84
06/29/15	2058	46.96	51.43	53.94	51.95	27.70	42.71	35.59	25.01	53.32	54.07
06/26/15	2102	47.47	51.75	54.39	51.87	27.82	43.00	35.73	25.28	53.66	54.77
06/25/15	2102	46.88	51.67	54.05	51.44	27.87	42.80	35.56	25.12	53.24	54.27
06/24/15	2109	47.13	51.95	53.90	52.55	28.18	43.14	36.04	25.39	53.08	54.71
06/23/15	2124	47.70	52.52	54.23	52.77	28.50	43.30	36.31	25.54	53.46	55.43
06/22/15	2123	48.20	52.75	53.75	52.79	28.46	43.58	36.63	25.69	54.21	55.84
06/19/15	2110	48.19	52.70	53.39	52.86	28.46	43.42	36.79	25.62	54.44	55.58
06/18/15	2121	48.61	52.89	54.06	52.92	28.41	43.28	36.94	25.51	54.91	55.68
06/17/15	2100	48.21	52.12	53.41	52.30	27.63	42.60	36.65	24.73	54.23	54.55
06/16/15	2096	47.68	51.94	53.29	52.26	27.66	42.84	36.47	24.76	53.33	54.89
06/15/15	2084	47.43	51.44	52.62	51.75	27.49	42.88	36.14	24.80	52.43	53.85
06/12/15	2094	47.84	51.48	55.07	51.66	27.66	42.75	36.02	25.04	52.96	54.76
06/11/15	2109	47.98	51.95	55.59	51.91	28.09	43.28	36.18	25.37	53.40	55.34
06/10/15	2105	47.59	51.55	54.63	51.46	27.99	43.08	36.20	25.28	53.37	54.36
06/09/15	2080	47.44	51.37	53.36	51.12	27.62	42.70	35.69	25.03	51.72	54.21
06/08/15	2079	47.45	51.40	53.31	51.31	27.95	42.83	35.86	25.22	52.22	54.57
06/05/15	2093	47.55	51.44	53.37	51.54	28.15	42.77	35.72	25.39	52.18	54.70
06/04/15	2096	48.42	52.35	53.49	52.26	28.56	43.05	36.05	25.62	52.94	55.44
06/03/15	2114	48.64	52.67	54.13	52.11	29.16	43.21	36.49	25.86	54.02	55.86
06/02/15	2110	49.25	53.20	54.11	52.30	29.29	43.91	36.71	25.83	54.58	56.12
06/01/15	2112	50.36	54.09	53.78	53.35	29.73	44.52	37.04	26.07	55.21	57.22
05/29/15	2107	50.37	54.02	52.35	53.03	29.83	44.70	36.96	26.13	54.46	57.06
05/28/15	2121	50.32	53.99	52.32	52.87	29.95	44.91	37.01	26.17	54.78	56.68
05/27/15	2123	49.60	53.41	51.79	52.35	29.80	44.58	36.70	26.01	53.69	56.02

All prices are adjusted closing prices reported by Yahoo! Finance, http://finance.yahoo.com (accessed 7-9-15 for all securities)

Fundamental Growth Rates

		[1]	[2]	[3]	[4]	[1]	[2]	[3]	[4]	[1]	[2]	[3]	[4]	[1]	[2]	[3]	[4]	[1]	[2]	[3]	[4]	[5]
			2010				2011				2012				2013				2014			Fundamental
Company	Ticker	ROE	DPS	EPS	FGR	ROE	DPS	EPS	FGR	ROE	DPS	EPS	FGR	ROE	DPS	EPS	FGR	ROE	DPS	EPS	FGR	Growth Rate
AGL Resources	GAS	0.13	1.76	3.00	0.05	0.05	1.90	2.12	0.01	0.08	1.74	2.31	0.02	0.09	1.88	2.64	0.02	0.15	1.96	4.71	0.09	3.80%
Atmos Energy	ATO	0.09	1.34	2.16	0.03	0.09	1.36	2.26	0.04	0.08	1.38	2.10	0.03	0.09	1.40	2.50	0.04	0.09	1.48	2.96	0.05	3.68%
Chesapeake Utilities	CPK	0.12	0.87	1.82	0.06	0.12	0.91	1.91	0.06	0.11	0.96	1.99	0.06	0.12	1.01	2.26	0.07	0.12	1.07	2.47	0.07	6.23%
Laclede Group	LG	0.10	1.57	2.43	0.04	0.11	1.61	2.86	0.05	0.10	1.66	2.79	0.04	0.05	1.70	2.02	0.01	0.06	1.76	2.35	0.01	2.97%
New Jersey Resources	NJR	0.14	0.68	1.23	0.06	0.14	0.72	1.29	0.06	0.14	0.77	1.36	0.06	0.13	0.81	1.37	0.05	0.18	0.86	2.10	0.11	6.87%
Northwest Natural Gas	NWN	0.11	1.68	2.73	0.04	0.09	1.75	2.39	0.02	0.08	1.79	2.22	0.02	0.08	1.83	2.24	0.01	0.08	1.85	2.16	0.01	2.12%
Piedmont Natural Gas	PNY	0.12	1.11	1.55	0.03	0.11	1.15	1.57	0.03	0.12	1.19	1.66	0.03	0.11	1.23	1.78	0.03	0.11	1.27	1.84	0.03	3.31%
South Jersey Industries	SJI	0.14	0.68	1.35	0.07	0.14	0.75	1.45	0.07	0.13	0.83	1.52	0.06	0.12	0.90	1.52	0.05	0.11	0.96	1.57	0.04	5.73%
Southwest Gas	SWX	0.09	1.00	2.27	0.05	0.09	1.06	2.43	0.05	0.10	1.18	2.86	0.06	0.10	1.32	3.11	0.06	0.10	1.46	3.01	0.05	5.40%
WGL Holdings	WGL	0.10	1.50	2.27	0.03	0.10	1.55	2.25	0.03	0.11	1.59	2.68	0.04	0.09	1.66	2.31	0.03	0.11	1.72	2.68	0.04	3.45%
Average																						**4.35%**

[1], [2], [3] Value Line Investment Survey - 2014 data

[4] = [1] * (1 - [2] / [3]) = Fundamental Growth Rate for that year

[5] = Average of [4] for each year

Average Growth Rates

Company	Ticker	[1] Historic Growth	[2] Projected Growth	[3] Fundamental Growth	[4] Mean Growth
AGL Resources	GAS	2.0%	NR	3.80%	2.90%
Atmos Energy	ATO	2.0%	7.00%	3.68%	4.23%
Chesapeake Utilities	CPK	4.5%	3.00%	6.23%	4.58%
Laclede Group	LG	3.0%	4.40%	2.97%	3.46%
New Jersey Resources	NJR	8.5%	6.00%	6.87%	7.12%
Northwest Natural Gas	NWN	3.5%	4.00%	2.12%	3.21%
Piedmont Natural Gas	PNY	3.5%	5.00%	3.31%	3.94%
South Jersey Industries	SJI	10.0%	6.00%	5.73%	7.24%
Southwest Gas	SWX	8.0%	4.00%	5.40%	5.80%
WGL Holdings	WGL	3.0%	6.50%	3.45%	4.32%
Average		4.8%	5.1%	4.4%	4.7%

[1] Value Line Invstment Survey; dividend growth rate over past five years

[2] Yahoo! Finance projected earnings growth over next five years

[3] Fundamental growth rates from Exhibit DG-C-5

[4] = Average ([1],[2],[3])

DCF Final Results

Company	Ticker	[1] Dividend (d_0)	[2] Stock Price (P_0)	[3] Growth (g)	[4] Annual DCF Results	[5] Quarterly DCF Results
AGL Resources	GAS	0.510	48.08	0.029	3.99%	7.34%
Atmos Energy	ATO	0.390	52.37	0.042	5.00%	7.37%
Chesapeake Utilities	CPK	0.288	53.85	0.046	5.13%	6.83%
Laclede Group	LG	0.460	52.32	0.035	4.37%	7.14%
New Jersey Resources	NJR	0.225	28.36	0.071	7.97%	10.56%
Northwest Natural Gas	NWN	0.465	43.29	0.032	4.31%	7.71%
Piedmont Natural Gas	PNY	0.330	36.26	0.039	4.88%	7.77%
South Jersey Industries	SJI	0.251	25.35	0.072	8.31%	11.56%
Southwest Gas	SWX	0.405	53.74	0.058	6.60%	9.02%
WGL Holdings	WGL	0.463	55.06	0.043	5.19%	7.87%
Average					5.58%	**8.32%**

[1] Second quarter 2015 reported dividends per share - Nasdaq.com.

[2] Thirty-day average stock price from DG-C-4

[3] Growth rate from DG-C-6

[4] Annual DCF = $d_0(1 + g) / P_0 + g$ (not considered in final recommendation)

[5] Quarterly DCF Approximation = $[d_0(1 + g)^{0.25}/P_0 + (1 + g)^{0.25}]^4 - 1$

Risk-Free Rate
(Daily Curve Yield on 30-Year Treasury Bonds)

Date	Rate
05/27/15	2.88
05/28/15	2.89
05/29/15	2.88
06/01/15	2.94
06/02/15	3.02
06/03/15	3.11
06/04/15	3.03
06/05/15	3.11
06/08/15	3.11
06/09/15	3.15
06/10/15	3.22
06/11/15	3.11
06/12/15	3.10
06/15/15	3.09
06/16/15	3.06
06/17/15	3.09
06/18/15	3.14
06/19/15	3.05
06/22/15	3.16
06/23/15	3.20
06/24/15	3.16
06/25/15	3.16
06/26/15	3.25
06/29/15	3.09
06/30/15	3.11
07/01/15	3.20
07/02/15	3.19
07/06/15	3.08
07/07/15	3.04
07/08/15	2.99
Average	**3.09%**

*Daily Treasury Yield Curve Rates on 30-year T-bonds, http://www.treasury.gov/resources-center/data-chart-center/interest-rates/. Accessed 7-10-15

Index and Proxy Group Returns

	S&P 500		GAS		ATO		CPK		LG		NJR		NWN		PNY		SJI		SWX		WGL	
Date	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return
07/06/15	2,069	-0.004	47.35	0.000	52.43	0.005	54.45	0.006	52.89	0.013	28.01	0.006	43.30	0.009	36.12	0.010	24.98	0.003	55.01	0.016	53.97	0.002
06/29/15	2,077	-0.012	47.37	-0.002	52.17	0.008	54.14	-0.005	52.23	0.007	27.84	0.001	42.92	-0.002	35.78	0.001	24.91	-0.015	54.15	0.009	53.86	-0.017
06/22/15	2,102	-0.004	47.47	-0.015	51.75	-0.018	54.39	0.019	51.87	-0.019	27.82	-0.022	43.00	-0.010	35.73	-0.029	25.28	-0.013	53.66	-0.014	54.77	-0.015
06/15/15	2,110	0.008	48.19	0.007	52.70	0.024	53.39	-0.031	52.86	0.023	28.46	0.029	43.42	0.016	36.79	0.021	25.62	0.023	54.44	0.028	55.58	0.015
06/08/15	2,094	0.001	47.84	0.006	51.48	0.001	55.07	0.032	51.66	0.002	27.66	-0.018	42.75	0.000	36.02	0.008	25.04	-0.014	52.96	0.015	54.76	0.001
06/01/15	2,093	-0.007	47.55	-0.056	51.44	-0.048	53.37	0.019	51.54	-0.028	28.15	-0.056	42.77	-0.043	35.72	-0.034	25.39	-0.028	52.18	-0.042	54.70	-0.041
05/26/15	2,107	-0.009	50.37	0.008	54.02	0.010	52.35	0.016	53.03	0.012	29.83	-0.006	44.70	0.000	36.96	0.008	26.13	0.001	54.46	0.012	57.06	0.017
05/18/15	2,126	0.002	49.98	-0.006	53.50	0.001	51.55	0.024	52.40	-0.001	30.00	-0.025	44.68	-0.007	36.68	-0.004	26.11	-0.013	53.83	0.008	56.12	-0.006
05/11/15	2,123	0.003	50.28	0.026	53.45	-0.001	50.34	-0.007	52.45	0.019	30.77	0.047	45.01	0.012	36.81	0.018	26.45	0.030	53.40	0.009	56.46	0.031
05/04/15	2,116	0.004	49.00	-0.021	53.52	-0.007	50.69	0.073	51.45	0.002	29.38	-0.028	44.47	-0.044	36.18	-0.012	25.67	-0.010	52.90	-0.030	54.74	-0.002
04/27/15	2,108	-0.004	50.03	-0.018	53.92	-0.025	47.24	-0.055	51.34	-0.015	30.22	-0.042	46.53	-0.035	36.61	-0.031	25.94	-0.024	54.53	-0.057	54.85	-0.036
04/20/15	2,118	0.018	50.93	0.036	55.28	0.031	50.01	0.021	52.14	0.030	31.53	0.033	48.23	0.025	37.77	0.052	26.59	0.022	57.81	0.033	56.92	0.043
04/13/15	2,081	-0.010	49.18	-0.020	53.64	-0.024	48.98	-0.034	50.64	-0.019	30.52	-0.014	47.04	-0.015	35.92	-0.028	26.00	-0.024	55.97	-0.022	54.59	-0.021
04/06/15	2,102	0.017	50.19	0.011	54.97	-0.010	50.68	-0.011	51.64	0.003	30.96	-0.004	47.74	-0.016	36.97	-0.002	26.65	-0.016	57.25	-0.019	55.74	0.003
03/30/15	2,067	0.003	49.66	0.026	55.55	0.025	51.26	0.038	51.49	0.021	31.10	0.021	48.50	0.030	37.05	0.022	27.08	0.009	58.37	0.023	55.56	0.015
03/23/15	2,061	-0.022	48.38	-0.025	54.22	-0.022	49.37	0.005	50.45	-0.016	30.47	-0.013	47.10	-0.008	36.24	-0.013	26.83	-0.025	57.08	-0.011	54.76	-0.009
03/16/15	2,108	0.027	49.63	0.059	55.45	0.052	49.14	0.032	51.29	0.036	30.89	0.046	47.48	0.064	36.72	0.039	27.52	0.038	57.70	0.036	55.24	0.054
03/09/15	2,053	-0.009	46.88	0.006	52.71	0.017	47.63	0.057	49.53	0.010	29.53	0.030	44.63	0.001	35.35	0.022	26.51	0.023	55.69	0.043	52.39	0.039
03/02/15	2,071	-0.016	46.62	-0.041	51.83	-0.016	45.08	-0.035	49.03	-0.035	28.67	-0.069	44.60	-0.047	34.57	-0.057	25.92	-0.068	53.42	-0.060	50.44	-0.039
02/23/15	2,105	-0.003	48.60	-0.020	52.66	0.002	46.69	-0.018	50.83	-0.007	30.80	-0.014	46.79	-0.014	36.64	-0.014	27.80	0.000	56.82	0.000	52.47	-0.013
02/17/15	2,110	0.006	49.57	0.000	52.55	0.015	47.56	0.007	51.16	0.010	31.25	-0.001	47.48	0.007	37.16	0.003	27.80	-0.005	56.81	-0.006	53.15	0.016
02/09/15	2,097	0.020	49.55	-0.077	51.76	-0.047	47.25	-0.039	50.66	-0.026	31.27	-0.033	47.14	-0.025	37.05	-0.028	27.94	-0.021	57.16	-0.033	52.30	-0.024
02/02/15	2,055	0.030	53.69	-0.029	54.30	-0.032	49.17	0.019	52.04	-0.014	32.34	0.028	48.33	-0.022	38.13	-0.027	28.55	-0.001	59.13	-0.024	53.56	-0.036
01/26/15	1,995	-0.028	55.27	-0.020	56.09	-0.030	48.24	-0.043	52.79	-0.031	31.44	-0.034	49.43	-0.030	39.19	-0.020	28.58	-0.034	60.61	-0.022	55.57	-0.032
01/20/15	2,052	0.016	56.38	0.031	57.81	0.003	50.38	-0.004	54.46	0.018	32.54	0.021	50.95	0.013	39.97	0.006	29.58	-0.001	61.97	0.003	57.41	0.017
01/12/15	2,019	-0.012	54.66	0.043	57.63	0.058	50.61	0.038	53.51	0.028	31.87	0.039	50.30	0.038	39.74	0.021	29.61	0.024	61.79	0.014	56.45	0.036
01/05/15	2,045	-0.007	52.41	-0.021	54.45	-0.012	48.76	-0.012	52.05	-0.006	30.67	0.017	48.47	-0.007	38.91	0.004	28.92	-0.001	60.92	0.004	54.47	0.023
12/29/14	2,058	-0.015	53.56	-0.006	55.09	-0.002	49.35	-0.019	52.35	-0.008	30.15	0.000	48.81	-0.021	38.74	-0.004	28.95	-0.002	60.67	-0.007	53.26	-0.001
12/22/14	2,089	0.009	53.87	0.053	55.20	0.030	50.33	0.062	52.78	0.036	30.15	0.047	49.86	0.034	38.88	0.035	28.99	0.026	61.08	0.063	53.29	0.037
12/15/14	2,071	0.034	51.16	0.020	53.60	0.024	47.38	0.023	50.93	0.021	28.78	-0.004	48.25	0.046	37.56	0.017	28.25	0.002	57.44	0.019	51.39	0.001
12/08/14	2,002	-0.035	50.17	-0.041	52.36	-0.023	46.32	0.030	49.86	-0.013	28.90	-0.006	46.11	-0.004	36.91	-0.003	28.19	0.002	56.40	-0.023	51.36	0.016
12/01/14	2,075	0.004	52.31	0.020	53.58	0.012	44.97	0.018	50.50	0.023	29.07	0.028	46.30	0.014	37.01	0.014	28.12	0.013	57.70	0.011	50.53	0.060
11/24/14	2,068	0.002	51.28	0.008	52.93	0.001	44.19	-0.008	49.37	-0.014	28.28	0.003	45.64	-0.002	36.51	-0.001	27.76	-0.012	57.09	0.002	47.67	0.012
11/17/14	2,064	0.012	50.89	0.009	52.88	0.014	44.53	-0.005	50.09	0.027	28.20	0.006	45.72	0.010	36.54	0.020	28.10	0.021	56.97	0.014	47.09	0.005
11/10/14	2,040	0.004	50.44	-0.055	52.14	-0.021	44.73	-0.035	48.78	-0.023	28.03	-0.034	45.27	-0.021	35.82	-0.025	27.53	-0.032	56.21	-0.029	46.87	0.004
11/03/14	2,032	0.007	53.35	0.019	53.25	0.027	46.38	-0.026	49.93	0.010	29.00	0.015	46.26	0.004	36.76	-0.007	28.43	-0.003	57.89	0.017	46.67	0.018
10/27/14	2,018	0.027	52.36	0.002	51.85	0.027	47.63	0.057	49.41	0.038	28.57	0.063	46.06	0.036	37.03	0.040	28.52	0.024	56.93	0.038	45.85	0.026
10/20/14	1,965	0.041	52.28	0.033	50.50	0.028	45.06	0.039	47.61	0.025	26.86	0.042	44.46	0.030	35.61	0.031	27.86	0.036	54.83	0.051	44.69	0.037
10/13/14	1,887	-0.010	50.60	0.005	49.12	0.046	43.39	0.044	46.45	0.003	25.79	0.046	43.16	0.017	34.55	0.022	26.90	0.006	52.20	0.036	43.09	0.015
10/06/14	1,906	-0.031	50.33	0.011	46.94	0.006	41.57	0.003	46.34	0.019	24.66	0.004	42.45	0.022	33.80	0.019	26.75	0.023	50.39	0.052	42.43	0.030
09/29/14	1,968	-0.008	49.79	0.003	46.66	0.014	41.44	-0.005	45.47	0.008	24.57	-0.005	41.53	0.004	33.17	0.007	26.15	0.015	47.88	-0.004	41.19	0.015
09/22/14	1,983	-0.014	49.64	-0.025	45.99	-0.045	41.65	-0.008	45.11	-0.030	24.70	0.001	41.37	-0.017	32.96	-0.032	25.78	-0.027	48.07	-0.029	40.60	-0.020
09/15/14	2,010	0.013	50.93	-0.001	48.17	-0.007	41.99	-0.024	46.52	0.002	24.67	0.005	42.10	-0.011	34.04	-0.006	26.50	-0.012	49.48	-0.025	41.45	-0.009
09/08/14	1,986	-0.011	50.98	-0.033	48.54	-0.033	43.04	-0.049	46.43	-0.029	24.55	-0.040	42.58	-0.036	34.25	-0.045	26.83	-0.037	50.73	-0.020	41.82	-0.031
09/02/14	2,008	0.002	52.71	0.018	50.20	0.015	45.27	0.007	47.80	0.002	25.59	0.012	44.17	0.000	35.85	-0.007	27.87	-0.003	51.78	0.012	43.15	0.028
08/25/14	2,003	0.008	51.78	0.019	49.47	0.010	44.95	0.000	47.70	0.011	25.29	-0.003	44.17	0.017	36.10	0.009	27.95	0.003	51.17	0.001	41.99	0.017
08/18/14	1,988	0.017	50.82	0.011	48.96	0.013	44.97	-0.005	47.19	0.010	25.38	0.007	43.44	0.007	35.77	0.014	27.86	0.010	51.11	0.015	41.30	0.022
08/11/14	1,955	0.012	50.25	0.019	48.34	0.027	45.19	0.050	46.73	0.023	25.19	0.023	43.16	0.021	35.27	0.034	27.58	0.024	50.35	0.055	40.42	0.019
08/04/14	1,932	0.003	49.32	-0.007	47.07	0.006	43.05	0.013	45.67	0.013	24.62	0.002	42.27	0.010	34.12	0.022	26.93	0.042	47.72	-0.007	39.67	0.059
07/28/14	1,925	-0.027	49.65	-0.036	46.77	-0.041	42.49	-0.031	45.10	-0.029	24.58	-0.046	41.85	-0.036	33.39	-0.020	25.83	-0.023	48.07	-0.030	37.44	-0.028
07/21/14	1,978	0.000	51.51	-0.022	48.75	-0.022	43.86	-0.034	46.43	-0.004	25.77	-0.049	43.40	-0.026	34.09	-0.024	26.45	-0.044	49.54	-0.024	38.52	-0.038
07/14/14	1,978	0.005	52.69	0.010	49.87	0.003	45.39	-0.014	46.64	0.014	27.10	0.000	44.57	-0.005	34.94	-0.007	27.68	-0.011	50.74	0.003	40.02	0.000
07/07/14	1,968	-0.009	52.19	0.011	49.73	-0.005	46.03	-0.011	45.98	0.000	27.09	0.010	44.78	0.012	35.17	-0.007	27.98	-0.012	50.58	0.013	40.01	-0.001
06/30/14	1,985	0.012	51.62	-0.018	49.97	-0.024	46.56	0.006	45.99	-0.015	26.83	-0.033	44.27	-0.021	35.41	-0.012	28.32	-0.023	49.93	-0.027	40.07	-0.017
06/23/14	1,961	-0.001	52.55	0.003	51.19	0.001	46.27	0.014	46.70	0.009	27.75	0.025	45.23	0.018	35.83	0.010	29.00	0.017	51.31	0.013	40.78	-0.002
06/16/14	1,963	0.014	52.37	0.029	51.15	0.031	45.63	0.026	46.26	0.012	27.06	0.023	44.42	0.024	35.49	0.021	28.51	0.026	50.65	0.008	40.84	0.039
06/09/14	1,936	-0.007	50.92	-0.012	49.60	-0.002	44.49	-0.001	45.71	0.019	26.45	-0.005	43.37	-0.018	34.74	-0.005	27.77	-0.009	50.24	-0.025	39.32	-0.004
06/02/14	1,949	0.013	51.54	0.004	49.70	0.021	44.53	0.051	44.84	0.005	26.58	0.006	44.17	0.015	34.92	0.020	28.04	0.019	51.51	0.011	39.47	0.019
05/27/14	1,924	0.012	51.35	0.008	48.66	-0.005	42.38	0.006	44.60	0.024	26.43	0.031	43.54	0.017	34.25	0.017	27.52	0.013	50.94	0.005	38.74	0.019
05/19/14	1,901	0.012	50.97	0.003	48.88	0.002	42.14	0.007	43.57	-0.010	25.64	0.017	42.82	-0.001	33.67	0.001	27.17	0.000	50.70	-0.016	38.02	-0.008
05/12/14	1,878	0.000	50.79	0.017	48.76	0.003	41.83	0.011	44.03	-0.011	25.22	0.062	42.88	0.013	33.64	0.015	27.16	0.003	51.50	-0.006	38.32	0.036
05/05/14	1,878	-0.001	49.93	-0.009	48.60	-0.003	41.37	0.044	44.51	0.003	23.75	0.016	42.34	0.021	33.15	-0.009	27.08	0.005	51.84	-0.011	36.99	0.000
04/28/14	1,881	0.010	50.36	0.007	48.74	-0.014	39.63	-0.044	44.39	0.000	23.38	-0.008	41.48	-0.024	33.44	-0.025	26.96	-0.004	52.44	-0.009	37.00	-0.025
04/21/14	1,863	-0.001	50.00	0.014	49.43	0.027	41.47	0.050	44.38	-0.009	23.58	0.007	42.52	0.003	34.30	0.001	27.07	0.010	52.93	0.012	37.96	0.008
04/14/14	1,865	0.027	49.32	0.036	48.11	0.028	39.51	0.017	44.78	0.011	23.40	0.015	42.39	0.012	34.25	0.013	26.81	0.026	52.32	0.032	37.65	0.023
04/07/14	1,816	-0.026	47.58	0.016	46.78	0.018	38.85	-0.032	44.30	0.003	23.05	-0.022	41.88	0.002	33.81	-0.007	26.13	-0.019	50.69	-0.013	36.81	-0.015
03/31/14	1,865	0.004	46.82	0.017	45.94	0.034	40.14	-0.014	44.17	-0.005	23.58	-0.003	41.79	0.005	34.06	0.022	26.64	0.008	51.34	0.005	37.37	0.008
03/24/14	1,858	-0.005	46.06	0.012	44.41	-0.001	40.73	-0.008	44.38	-0.002	23.66	0.032	41.58	0.018	33.34	0.004	26.42	0.009	51.09	-0.003	37.08	0.001
03/17/14	1,867	0.014	45.50	-0.025	44.46	-0.004	41.06	0.023	44.46	-0.003	22.93	-0.018	40.84	-0.006	33.20	0.002	26.17	-0.018	51.22	-0.013	37.04	-0.011
03/10/14	1,841	-0.020	46.65	0.041	44.64	0.018	40.12	0.055	44.58	0.023	23.36	0.097	41.10	0.026	33.15	0.020	26.66	0.022	51.91	0.006	37.46	0.011
03/03/14	1,878	0.010	44.83	0.000	43.84	-0.014	38.02	-0.003	43.55	0.004	21.30	-0.006	40.07	-0.018	32.48	0.013	26.08	-0.038	51.59	-0.012	37.03	-0.025
02/24/14	1,859	0.013	44.83	0.005	44.44	0.012	38.14	-0.015	43.39	0.012	21.42	-0.008	40.81	0.022	32.07	0.007	27.12	0.031	52.20	-0.008	37.97	0.040
02/18/14	1,836	-0.001	44.59	0.009	43.92	0.009	38.73	0.017	42.88	0.007	21.60	0.007	39.92	-0.011	31.86	0.007	26.30	0.002	52.64	0.006	36.52	0.034
02/10/14	1,839	0.023	44.17	0.018	43.53	-0.035	38.09	0.032	42.57	0.016	21.45	0.009	40.35	0.046	31.63	0.024	26.25	0.047	52.30	0.050	35.32	0.022
02/03/14	1,797	0.008	43.38	-0.037	45.12	-0.017	36.92	-0.025	41.91	-0.035	21.25	-0.021	38.59	-0.025	30.90	-0.013	25.08	-0.009	49.83	-0.034	34.54	-0.032
01/27/14	1,783	-0.004	45.05	0.014	45.90	0.024	37.89	-0.009	43.43	0.019	21.70	-0.009	39.56	-0.007	31.31	0.003	25.30	-0.020	51.59	-0.003	35.69	-0.017
01/21/14	1,790	-0.026	44.45	0.006	44.83	0.014	38.24	-0.014	42.62	0.009	21.90	0.003	39.86	0.005	31.21	0.014	25.83	-0.011	51.73	-0.008	36.32	0.002
01/13/14	1,839	-0.002	44.19	-0.004	44.20	0.009	38.76	0.009	42.24	-0.020	21.82	-0.003	39.65	0.000	30.79	-0.002	26.13	-0.005	52.17	-0.011	36.24	-0.014

Index and Proxy Group Returns

	S&P 500		GAS		ATO		CPK		LG		NJR		NWN		PNY		SJI		SWX		WGL	
Date	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return
01/06/14	1,842	0.006	44.36	0.030	43.80	0.024	38.44	0.001	43.11	0.022	21.88	0.019	39.63	-0.002	30.84	0.004	26.26	0.016	52.77	0.002	36.74	-0.007
12/30/13	1,831	-0.005	43.08	-0.033	42.78	-0.010	38.42	-0.012	42.17	-0.022	21.46	-0.031	39.70	-0.019	30.71	-0.015	25.86	-0.017	52.68	-0.018	36.99	0.003
12/23/13	1,841	0.013	44.53	0.003	43.19	-0.001	38.90	-0.005	43.14	-0.007	22.15	0.014	40.46	-0.009	31.18	-0.014	26.32	0.006	53.64	0.008	36.88	0.002
12/16/13	1,818	0.024	44.39	0.033	43.23	0.026	39.09	0.046	43.43	0.024	21.85	0.050	40.84	0.021	31.63	0.043	26.17	0.003	53.20	0.057	36.79	0.015
12/09/13	1,775	-0.016	42.98	-0.005	42.12	-0.024	37.37	0.009	42.43	-0.005	20.81	-0.031	40.01	0.017	30.31	-0.015	26.09	-0.021	50.34	-0.014	36.26	-0.026
12/02/13	1,805	0.000	43.22	-0.015	43.15	0.015	37.05	-0.004	42.63	-0.014	21.48	-0.003	39.33	-0.018	30.77	-0.012	26.65	0.000	51.04	0.002	37.22	-0.001
11/25/13	1,806	0.001	43.88	-0.016	42.50	-0.013	37.21	0.021	43.22	-0.017	21.54	0.006	40.03	-0.004	31.14	-0.006	26.67	0.010	50.95	0.003	37.25	-0.009
11/18/13	1,805	0.004	44.59	-0.004	43.06	-0.030	36.44	0.019	43.95	0.001	21.40	-0.001	40.18	0.009	31.32	0.004	26.40	-0.009	50.81	-0.007	37.60	0.018
11/11/13	1,798	0.016	44.77	0.008	44.38	0.029	35.77	0.034	43.92	0.000	21.42	0.000	39.81	-0.009	31.20	-0.002	26.64	-0.042	51.17	-0.009	36.92	-0.119
11/04/13	1,771	0.005	44.42	-0.007	43.13	0.020	34.58	-0.006	43.92	-0.003	21.41	-0.012	40.16	-0.013	31.25	-0.012	27.80	-0.005	51.64	-0.004	41.91	-0.008
10/28/13	1,762	0.001	44.73	-0.002	42.27	0.005	34.78	-0.013	44.04	-0.007	21.68	-0.006	40.69	-0.010	31.62	-0.022	27.92	-0.009	51.87	0.005	42.23	-0.002
10/21/13	1,760	0.009	44.81	0.034	42.04	0.032	35.24	0.011	44.35	0.005	21.81	0.027	41.11	0.015	32.33	0.022	28.17	0.004	51.63	0.030	42.32	0.034
10/14/13	1,745	0.024	43.35	0.025	40.72	0.015	34.87	0.020	44.12	0.026	21.23	0.035	40.51	0.044	31.65	0.028	28.05	0.031	50.13	0.030	40.92	0.032
10/07/13	1,703	0.008	42.31	0.004	40.13	0.017	34.19	0.053	43.00	0.024	20.50	0.007	38.81	0.005	30.79	0.028	27.21	0.009	48.66	0.032	39.65	0.024
09/30/13	1,691	-0.001	42.12	-0.015	39.47	-0.016	32.45	-0.025	42.01	-0.005	20.36	-0.016	38.61	-0.012	29.96	-0.024	26.96	-0.008	47.13	-0.012	38.73	-0.018
09/23/13	1,692	-0.011	42.77	0.001	40.11	0.014	33.29	-0.019	42.23	0.015	20.69	-0.007	39.10	0.010	30.68	-0.010	27.18	0.000	47.70	0.027	39.42	0.023
09/16/13	1,710	0.013	42.75	0.040	39.57	0.028	33.93	0.017	41.61	0.026	20.83	0.047	38.72	0.021	30.99	0.018	27.18	0.009	46.45	0.042	38.55	0.014
09/09/13	1,688	0.020	41.10	0.004	38.51	0.028	33.35	0.025	40.56	0.008	19.90	0.010	37.93	0.012	30.43	0.024	26.94	0.009	44.58	0.007	38.02	0.019
09/03/13	1,655	0.014	40.94	-0.002	37.45	-0.021	32.53	-0.018	40.25	-0.026	19.71	-0.020	37.50	-0.019	29.73	-0.010	26.71	-0.009	44.26	-0.009	37.31	-0.034
08/26/13	1,633	-0.018	41.03	-0.030	38.26	-0.035	33.14	-0.027	41.33	0.000	20.11	-0.027	38.23	-0.029	30.02	-0.019	26.95	-0.022	44.64	-0.024	38.62	-0.039
08/19/13	1,664	0.005	42.32	0.019	39.67	0.014	34.06	-0.006	41.33	0.011	20.66	0.017	39.37	0.013	30.60	0.012	27.57	0.023	45.76	0.009	40.21	0.003
08/12/13	1,656	-0.021	41.54	-0.021	39.14	-0.059	34.25	-0.068	40.88	-0.033	20.33	-0.040	38.86	-0.032	30.23	-0.051	26.94	-0.044	45.35	-0.035	40.10	-0.049
08/05/13	1,691	-0.011	42.42	-0.002	41.59	-0.012	36.75	-0.023	42.26	-0.004	21.18	0.013	40.16	-0.021	31.86	-0.013	28.17	-0.017	47.00	0.001	42.16	-0.015
07/29/13	1,710	0.011	42.50	-0.003	42.10	0.011	37.61	0.011	42.42	-0.031	20.90	-0.007	41.02	-0.007	32.29	-0.010	28.67	-0.004	46.98	0.000	42.80	0.002
07/22/13	1,692	0.000	42.63	0.008	41.64	0.006	37.21	0.017	43.78	0.002	21.06	-0.014	41.30	0.000	32.62	-0.001	28.78	0.001	46.96	-0.022	42.70	0.011
07/15/13	1,692	0.007	42.28	0.023	41.38	0.038	36.59	0.015	43.70	0.010	21.35	0.063	41.31	0.021	32.67	0.019	28.74	0.034	48.03	0.029	42.26	0.047
07/08/13	1,680	0.030	41.32	0.049	39.87	0.045	36.04	0.070	43.27	0.028	20.09	0.026	40.47	0.039	32.04	0.031	27.81	0.042	46.66	0.046	40.38	0.032
07/01/13	1,632	0.016	39.41	-0.005	38.15	-0.012	33.68	0.030	42.07	-0.007	19.58	0.010	38.96	-0.005	31.07	-0.011	26.69	-0.004	44.60	0.005	39.14	-0.012
06/24/13	1,606	0.009	39.60	0.016	38.61	0.061	32.68	0.002	42.38	0.023	19.39	-0.010	39.17	0.016	31.40	0.021	26.79	0.020	44.36	0.014	39.60	0.030
06/17/13	1,592	-0.021	38.98	-0.018	36.38	-0.047	32.62	-0.010	41.44	-0.038	19.59	-0.056	38.54	-0.024	30.74	-0.024	26.26	-0.027	43.74	-0.039	38.46	-0.033
06/10/13	1,627	-0.010	39.71	0.011	38.16	-0.020	32.96	0.003	43.07	-0.001	20.76	-0.012	39.49	-0.007	31.50	0.007	26.99	-0.010	45.51	-0.005	39.77	0.004
06/03/13	1,643	0.008	39.30	0.005	38.95	-0.019	32.85	-0.015	43.11	-0.010	21.01	0.000	39.77	0.009	31.27	0.003	27.27	0.008	45.73	0.019	39.62	0.007
05/28/13	1,631	-0.011	39.11	-0.011	39.70	-0.011	33.36	0.003	43.53	0.028	21.00	-0.009	39.40	-0.024	31.17	-0.009	27.05	-0.011	44.89	-0.028	39.33	-0.021
05/20/13	1,650	-0.011	39.53	-0.032	40.16	-0.043	33.25	-0.024	42.36	-0.014	21.18	-0.017	40.36	-0.025	31.43	-0.022	27.35	-0.025	46.19	-0.038	40.15	-0.032
05/13/13	1,667	0.021	40.82	0.025	41.96	0.021	34.08	-0.009	42.95	0.025	21.55	0.020	41.40	-0.001	32.15	0.029	28.06	0.023	48.00	0.015	41.46	0.011
05/06/13	1,634	0.012	39.85	-0.007	41.11	-0.009	34.40	0.007	41.91	-0.018	21.12	-0.005	41.44	0.023	31.26	-0.009	27.43	-0.009	47.31	-0.003	41.02	0.004
04/29/13	1,614	0.020	40.12	0.015	41.51	0.018	34.18	0.037	42.66	0.009	21.23	-0.008	40.49	-0.009	31.54	0.011	27.69	-0.004	47.43	0.013	40.86	-0.011
04/22/13	1,582	0.017	39.53	-0.005	40.77	-0.008	32.96	0.029	42.27	0.030	21.41	-0.009	40.88	-0.008	31.20	-0.023	27.79	-0.011	46.80	0.004	41.30	0.004
04/15/13	1,555	-0.021	39.72	-0.001	41.09	0.018	32.02	0.002	41.04	0.002	21.61	0.011	41.20	0.003	31.95	0.008	28.08	0.040	46.59	0.004	41.13	0.008
04/08/13	1,589	0.023	39.76	0.043	40.38	0.028	31.95	0.015	40.96	0.032	21.37	0.023	41.08	0.017	31.70	0.030	27.01	0.057	46.39	0.027	40.81	0.026
04/01/13	1,553	-0.010	38.13	-0.006	39.29	-0.013	31.49	0.019	39.68	0.010	20.89	0.007	40.38	0.010	30.78	0.015	25.56	-0.007	45.18	0.011	39.79	-0.006
03/25/13	1,569	0.008	38.35	0.012	39.83	0.023	30.90	-0.004	39.28	0.020	20.75	0.001	40.00	-0.005	30.33	-0.003	25.74	0.010	44.70	-0.007	40.02	0.007
03/18/13	1,557	-0.002	37.91	0.008	38.94	0.011	31.02	-0.009	38.50	0.027	20.73	0.003	40.22	0.005	30.43	-0.008	25.49	-0.003	45.00	0.000	39.74	-0.004
03/11/13	1,561	0.006	37.62	0.009	38.50	0.010	31.31	0.014	37.48	-0.012	20.66	-0.005	40.03	-0.006	30.68	0.009	25.56	-0.001	44.98	0.019	39.88	0.022
03/04/13	1,551	0.022	37.27	0.015	38.11	0.051	30.87	0.017	37.92	0.013	20.76	0.004	40.28	-0.035	30.40	0.019	25.60	0.003	44.15	0.008	39.01	0.017
02/25/13	1,518	0.002	36.73	0.010	36.25	0.033	30.34	0.018	37.42	0.006	20.68	0.023	41.74	-0.003	29.84	0.005	25.52	0.005	43.79	0.028	38.38	0.001
02/19/13	1,516	-0.003	36.37	0.001	35.11	0.002	29.82	0.008	37.18	0.010	20.21	0.006	41.85	0.008	29.70	0.015	25.38	0.014	42.62	0.017	38.34	0.004
02/11/13	1,520	0.001	36.33	-0.004	35.03	0.003	29.58	0.006	36.82	0.000	20.09	0.037	41.50	0.001	29.26	-0.004	25.04	0.000	41.91	-0.003	38.18	-0.004
02/04/13	1,518	0.003	36.46	-0.046	34.94	0.004	29.42	-0.018	36.81	0.007	19.38	-0.007	41.48	-0.013	29.39	0.003	25.04	0.004	42.02	-0.008	38.32	-0.001
01/28/13	1,513	0.007	38.20	0.024	34.81	0.015	29.97	0.012	36.54	0.017	19.51	0.016	42.03	0.016	29.29	-0.021	24.95	0.009	42.35	0.020	38.37	0.016
01/22/13	1,503	0.011	37.31	0.003	34.30	0.003	29.61	-0.011	35.91	0.011	19.20	0.019	41.38	0.042	29.92	0.001	24.72	0.019	41.51	0.016	37.77	0.027
01/14/13	1,486	0.009	37.19	0.020	34.18	0.041	29.94	0.029	35.51	0.021	18.84	0.039	39.71	-0.010	29.88	0.038	24.27	0.016	40.87	0.025	36.79	0.048
01/07/13	1,472	0.004	36.45	-0.019	32.84	-0.011	29.09	-0.007	34.78	-0.009	18.13	-0.022	40.09	-0.024	28.79	-0.023	23.89	0.005	39.87	-0.022	35.12	-0.034
12/31/12	1,466	0.046	37.16	0.037	33.22	0.038	29.31	0.057	35.11	0.023	18.54	0.036	41.08	0.049	29.46	0.049	23.77	0.046	40.76	0.044	36.34	0.047
12/24/12	1,402	-0.019	35.85	-0.017	32.01	-0.039	27.74	-0.044	34.32	-0.021	17.90	-0.024	39.15	-0.043	28.07	-0.052	22.73	-0.046	39.04	-0.028	34.72	-0.029
12/17/12	1,430	0.012	36.47	0.018	33.30	0.018	29.00	0.048	35.05	-0.034	18.33	0.008	40.90	0.032	29.63	0.042	23.84	0.031	40.19	0.027	35.74	0.019
12/10/12	1,414	-0.003	35.82	0.002	32.70	-0.008	27.66	-0.032	36.29	-0.003	18.19	-0.028	39.63	0.009	28.44	0.002	23.13	0.009	39.12	-0.005	35.08	0.008
12/03/12	1,418	0.001	35.76	0.015	32.96	0.019	28.58	0.024	36.39	-0.008	18.71	0.015	39.26	-0.010	28.40	0.017	22.92	0.007	39.30	0.001	34.80	-0.008
11/26/12	1,416	0.005	35.22	0.038	32.36	0.024	27.92	0.039	36.68	0.044	18.43	0.035	39.64	0.040	27.94	0.040	22.75	0.040	39.24	0.028	35.09	0.047
11/19/12	1,409	0.036	33.93	-0.006	31.61	0.028	26.86	0.025	35.15	0.007	17.80	0.002	38.11	0.008	26.86	0.014	21.88	0.022	38.16	0.014	33.51	0.007
11/12/12	1,360	-0.014	34.14	-0.003	30.75	-0.038	26.22	-0.050	34.91	-0.007	17.77	-0.050	37.80	-0.022	26.48	-0.020	21.40	-0.027	37.62	-0.027	33.26	-0.030
11/05/12	1,380	-0.024	34.24	-0.031	31.95	-0.010	27.59	-0.016	35.16	-0.040	18.72	-0.055	38.66	-0.048	27.01	-0.043	22.00	-0.034	38.67	-0.028	34.31	-0.020
10/31/12	1,414	0.002	35.32	-0.018	32.27	-0.015	28.04	-0.041	36.62	-0.025	19.80	-0.022	40.60	-0.051	28.24	-0.012	22.77	-0.019	39.78	-0.023	35.01	-0.013
10/22/12	1,412	-0.015	35.96	-0.011	32.76	-0.004	29.25	0.004	37.56	-0.026	20.25	-0.027	42.77	-0.020	28.58	-0.021	23.21	-0.010	40.72	-0.004	35.48	-0.001
10/15/12	1,433	0.003	36.37	0.015	32.90	0.008	29.13	-0.030	38.57	-0.002	20.83	0.013	43.63	-0.007	29.20	0.031	23.45	0.000	40.88	0.006	35.53	0.012
10/08/12	1,429	-0.022	35.82	-0.028	32.65	-0.011	30.03	0.002	38.66	-0.013	20.56	-0.010	43.95	-0.022	28.32	-0.030	23.45	-0.023	40.64	-0.006	35.11	-0.015
10/01/12	1,461	0.014	36.87	0.010	33.01	0.008	29.96	0.020	39.16	0.011	20.77	0.000	44.92	0.019	29.20	-0.007	23.99	-0.005	40.87	-0.005	35.66	-0.004
09/24/12	1,441	-0.013	36.52	-0.009	32.75	0.003	29.38	0.013	38.74	0.016	20.76	-0.018	44.08	0.008	29.40	-0.015	24.10	0.007	41.06	-0.006	35.79	0.004
09/17/12	1,460	-0.004	36.85	0.002	32.67	0.010	29.00	0.014	38.15	0.011	21.15	0.018	43.74	0.002	29.86	0.023	23.94	0.002	41.30	0.014	35.66	0.003
09/10/12	1,466	0.019	36.79	0.008	32.36	0.001	28.61	-0.007	37.71	-0.008	20.77	0.029	43.67	0.004	29.18	0.013	23.90	0.020	40.73	-0.002	35.56	-0.004
09/04/12	1,438	0.022	36.48	0.031	32.31	0.011	28.80	-0.001	38.03	0.009	20.18	0.009	43.50	-0.012	28.80	0.028	23.43	0.024	40.82	0.028	35.70	0.028
08/27/12	1,407	-0.003	35.39	0.006	31.97	-0.008	28.83	0.003	37.70	0.005	20.01	-0.012	44.02	-0.003	28.01	-0.003	22.87	-0.001	39.71	-0.002	34.72	-0.018
08/20/12	1,411	-0.005	35.20	-0.010	32.24	-0.031	28.73	-0.029	37.50	-0.028	20.26	-0.015	44.14	-0.009	28.08	-0.024	22.90	-0.021	39.78	-0.021	35.37	-0.024
08/13/12	1,418	0.009	35.56	-0.006	33.27	-0.006	29.60	0.017	38.59	0.012	20.56	0.019	44.53	0.015	28.77	0.012	23.40	-0.017	40.65	0.008	36.22	0.003
08/06/12	1,406	0.011	35.76	-0.006	33.47	0.020	29.10	0.012	38.14	0.018	20.19	-0.009	43.86	0.003	28.42	-0.004	23.81	0.001	40.31	-0.020	36.12	0.009
07/30/12	1,391	0.004	35.97	0.004	32.83	0.006	28.76	-0.002	37.48	0.016	20.37	-0.016	43.72	-0.004	28.55	0.001	23.79	-0.007	41.14	-0.010	35.79	-0.022
07/23/12	1,386	0.017	35.81	0.017	32.64	-0.016	28.81	0.008	36.90	0.010	20.71	0.007	43.89	0.007	28.51	-0.016	23.95	0.003	41.58	-0.012	36.58	0.007
07/16/12	1,363	0.004	35.21	0.012	33.16	-0.008	28.57	-0.002	36.55	0.002	20.56	0.007	43.60	0.039	28.98	-0.003	23.88	-0.006	42.07	-0.003	36.34	0.022
07/09/12	1,357	0.002	34.79	0.012	33.42	0.033	28.62	0.022	36.47	0.019	20.42	0.036	41.95	0.000	29.06	-0.005	24.03	0.008	42.20	0.037	35.57	0.000

Index and Proxy Group Returns

	S&P 500		GAS		ATO		CPK		LG		NJR		NWN		PNY		SJI		SWX		WGL	
Date	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return
07/02/12	1,355	-0.005	34.37	0.005	32.35	0.018	28.00	0.040	35.78	0.007	19.71	0.012	41.93	-0.007	29.20	0.011	23.85	0.036	40.70	0.011	35.57	0.016
06/25/12	1,362	0.020	34.20	0.014	31.78	0.033	26.91	0.007	35.52	0.024	19.47	0.026	42.22	-0.010	28.87	0.002	23.03	0.011	40.27	-0.004	35.00	-0.014
06/18/12	1,335	-0.006	33.74	-0.012	30.77	-0.011	26.71	-0.013	34.68	-0.010	18.97	-0.032	42.63	0.011	28.83	0.006	22.77	-0.006	40.44	-0.008	35.51	-0.004
06/11/12	1,343	0.013	34.16	0.015	31.13	0.012	27.07	0.024	35.05	0.023	19.60	0.017	42.15	0.008	28.65	0.015	22.91	0.004	40.76	0.008	35.67	0.008
06/04/12	1,326	0.037	33.67	0.033	30.76	0.028	26.42	0.026	34.27	0.034	19.28	0.046	41.81	0.030	28.22	0.062	22.81	0.044	40.46	0.048	35.40	0.035
05/29/12	1,278	-0.030	32.60	-0.009	29.94	0.011	25.75	-0.001	33.14	-0.016	18.42	-0.022	40.57	-0.010	26.58	0.011	21.85	0.027	38.62	0.002	34.21	0.010
05/21/12	1,318	0.017	32.89	0.011	29.60	0.010	25.77	0.000	33.68	-0.010	18.84	-0.007	40.97	0.013	26.29	0.005	21.28	0.003	38.56	0.001	33.87	0.008
05/14/12	1,295	-0.043	32.52	-0.033	29.30	-0.006	25.78	-0.009	34.00	-0.008	18.99	-0.014	40.46	-0.010	26.16	-0.015	21.22	-0.011	38.51	-0.022	33.59	-0.030
05/07/12	1,353	-0.011	33.63	0.002	29.49	0.014	26.02	0.032	34.29	-0.004	19.26	0.017	40.88	0.015	26.55	0.018	21.46	-0.001	39.36	0.036	34.65	0.013
04/30/12	1,369	-0.024	33.57	-0.019	29.08	0.001	25.22	-0.027	34.43	-0.013	18.95	-0.005	40.27	-0.004	26.07	-0.031	21.49	-0.022	37.98	-0.013	34.20	-0.020
04/23/12	1,403	0.018	34.22	0.025	29.06	0.013	25.92	0.032	34.89	0.009	19.04	-0.010	40.45	0.028	26.91	0.016	21.97	0.010	38.49	0.011	34.89	0.008
04/16/12	1,379	0.006	33.40	0.012	28.69	0.034	25.11	0.021	34.59	0.015	19.23	0.029	39.35	0.017	26.47	0.015	21.75	0.019	38.08	0.010	34.61	0.015
04/09/12	1,370	-0.020	32.99	-0.024	27.75	-0.016	24.59	-0.023	34.07	-0.010	18.68	-0.035	38.70	-0.025	26.09	-0.046	21.34	-0.029	37.68	-0.033	34.08	-0.034
04/02/12	1,398	-0.007	33.80	-0.011	28.19	-0.001	25.18	0.003	34.43	0.000	19.36	-0.019	39.71	-0.004	27.36	-0.009	21.97	-0.020	38.96	-0.005	35.28	-0.006
03/26/12	1,408	0.008	34.19	0.012	28.21	0.021	25.10	-0.012	34.44	0.001	19.72	-0.001	39.88	0.004	27.61	-0.003	22.43	-0.013	39.17	0.008	35.48	0.009
03/19/12	1,397	-0.005	33.79	-0.008	27.62	0.003	25.42	-0.007	34.42	-0.019	19.74	0.001	39.70	-0.003	27.70	-0.002	22.73	-0.005	38.84	-0.012	35.16	-0.002
03/12/12	1,404	0.024	34.05	-0.008	27.54	-0.012	25.60	0.006	35.10	-0.029	19.72	-0.014	39.83	-0.013	27.76	-0.024	22.84	-0.012	39.32	-0.006	35.25	-0.018
03/05/12	1,371	0.001	34.33	-0.002	27.88	0.005	25.45	0.044	36.14	0.025	20.00	-0.010	40.38	0.013	28.45	0.019	23.12	0.018	39.55	0.015	35.88	0.023
02/27/12	1,370	0.003	34.41	-0.022	27.75	-0.023	24.37	-0.063	35.25	-0.036	20.20	-0.035	39.87	-0.059	27.92	-0.049	22.72	-0.059	38.97	-0.003	35.09	-0.035
02/21/12	1,366	0.003	35.20	-0.025	28.41	0.007	26.01	0.001	36.57	-0.004	20.94	-0.003	42.37	0.000	29.37	-0.008	24.16	-0.006	39.09	0.003	36.36	-0.006
02/13/12	1,361	0.014	36.09	0.005	28.21	0.008	25.99	0.027	36.71	0.002	20.99	0.011	42.39	0.011	29.62	0.012	24.30	0.012	38.97	0.014	36.56	0.009
02/06/12	1,343	-0.002	35.92	0.000	27.99	-0.038	25.30	-0.033	36.64	-0.021	20.76	-0.033	41.94	-0.031	29.26	-0.017	24.02	-0.034	38.44	-0.011	36.23	-0.041
01/30/12	1,345	0.022	35.91	-0.009	29.09	0.014	26.17	-0.002	37.43	0.022	21.46	0.017	43.29	0.034	29.78	0.020	24.86	0.016	38.86	0.006	37.79	0.007
01/23/12	1,316	0.001	36.22	-0.003	28.69	-0.007	26.21	0.018	36.61	0.034	21.11	0.006	41.84	0.022	29.20	0.014	24.46	0.005	38.62	0.017	37.55	-0.005
01/17/12	1,315	0.020	36.34	0.020	28.88	0.008	25.76	0.017	35.41	0.011	20.99	-0.001	40.95	0.000	28.79	-0.003	24.34	-0.009	37.98	0.024	37.72	-0.004
01/09/12	1,289	0.009	35.63	0.001	28.64	-0.011	25.32	-0.022	35.04	-0.003	21.02	-0.024	40.95	-0.008	28.89	-0.016	24.55	-0.014	37.11	-0.029	37.86	0.003
01/03/12	1,278	0.016	35.59	-0.026	28.96	-0.021	25.91	-0.013	35.16	-0.005	21.54	-0.002	41.27	-0.011	29.36	-0.018	24.91	-0.014	38.23	-0.012	37.77	-0.012
12/27/11	1,258	-0.006	36.52	0.008	29.58	0.003	26.24	0.000	35.35	-0.006	21.59	0.004	41.71	-0.006	29.91	-0.001	25.26	-0.001	38.69	-0.003	38.21	0.006
12/19/11	1,265	0.037	36.24	0.023	29.49	0.015	26.25	0.018	35.55	0.030	21.50	0.032	41.95	0.028	29.94	0.024	25.29	0.036	38.79	0.067	37.99	0.033
12/12/11	1,220	-0.028	35.44	0.041	29.05	-0.004	25.79	0.003	34.50	-0.009	20.83	0.006	40.80	0.004	29.25	0.017	24.42	0.003	36.34	0.020	36.79	0.000
12/05/11	1,255	0.009	34.03	-0.023	29.16	0.011	25.71	0.015	34.80	0.014	20.71	0.025	40.64	0.010	28.76	0.018	24.36	0.006	35.62	-0.005	36.77	0.007
11/28/11	1,244	0.074	34.84	0.041	28.85	0.001	25.34	0.038	34.32	0.031	20.20	0.038	40.26	0.033	28.25	0.082	24.21	0.046	35.81	0.062	36.52	0.049
11/21/11	1,159	-0.047	33.48	-0.053	28.81	-0.061	24.40	-0.042	33.29	-0.052	19.46	-0.058	38.97	-0.046	26.11	-0.058	23.14	-0.043	33.74	-0.051	34.83	-0.041
11/14/11	1,216	-0.038	35.35	-0.008	30.69	-0.011	25.49	0.018	35.11	0.010	20.67	-0.009	40.86	0.004	27.72	-0.008	24.18	-0.022	35.54	-0.016	36.31	-0.030
11/07/11	1,264	0.008	35.65	0.011	31.04	0.007	25.04	-0.005	34.77	0.007	20.86	0.010	40.69	0.010	27.95	0.008	24.72	-0.015	36.11	0.005	37.43	0.009
10/31/11	1,253	-0.025	35.27	-0.038	30.82	0.006	25.16	-0.022	34.52	-0.030	20.66	-0.006	40.28	-0.020	27.73	-0.045	25.09	-0.001	35.91	-0.006	37.11	-0.012
10/24/11	1,285	0.038	36.67	0.032	30.64	0.038	25.74	0.038	35.57	0.022	20.79	0.020	41.09	0.040	29.05	0.053	25.11	0.036	36.14	0.037	37.55	0.042
10/17/11	1,238	0.011	35.53	0.012	29.52	0.014	24.79	0.027	34.81	0.005	20.39	0.036	39.52	0.000	27.58	0.034	24.23	0.040	34.86	0.001	36.02	0.013
10/10/11	1,225	0.060	35.12	0.018	29.12	0.038	24.14	0.031	34.64	0.033	19.68	0.043	39.52	0.024	26.68	0.056	23.29	0.046	34.82	0.047	35.56	0.045
10/03/11	1,155	0.021	34.49	-0.007	28.04	-0.016	23.42	-0.028	33.54	0.001	18.88	0.019	38.58	0.015	25.26	0.002	22.27	0.014	33.26	0.017	34.02	0.018
09/26/11	1,131	-0.004	34.74	0.026	28.49	0.036	24.09	0.030	33.50	0.008	18.53	0.003	38.01	0.039	25.21	0.019	21.96	0.012	32.71	-0.006	33.43	0.023
09/19/11	1,136	-0.065	33.85	-0.027	27.51	-0.065	23.39	-0.021	33.23	0.002	18.47	-0.068	36.58	-0.045	24.74	-0.054	21.70	-0.045	32.92	-0.007	32.67	-0.070
09/12/11	1,216	0.054	34.81	0.024	29.41	0.013	23.90	0.032	33.17	0.026	19.82	0.028	38.32	0.009	26.16	-0.007	22.72	0.054	33.15	0.056	35.14	0.023
09/06/11	1,154	-0.017	34.00	-0.013	29.04	-0.012	23.16	-0.015	32.32	-0.032	19.28	-0.021	37.98	-0.002	26.34	0.001	21.56	-0.015	31.38	-0.033	34.34	-0.011
08/29/11	1,174	-0.002	34.44	-0.003	29.38	0.038	23.51	-0.037	33.39	0.023	19.69	-0.011	38.05	-0.004	26.32	0.017	21.89	-0.002	32.47	0.004	34.71	0.015
08/22/11	1,177	0.047	34.54	0.085	28.32	0.027	24.40	0.062	32.65	0.062	19.91	0.062	38.19	0.047	25.89	0.069	21.93	0.057	32.34	0.049	34.19	0.073
08/15/11	1,124	-0.047	31.82	-0.013	27.58	0.018	22.99	-0.014	30.73	-0.009	18.75	-0.010	36.47	-0.022	24.21	-0.023	20.74	0.023	30.84	-0.008	31.87	-0.015
08/08/11	1,179	-0.017	32.23	0.001	27.09	-0.004	23.32	-0.005	31.02	0.004	18.94	0.011	37.28	0.011	24.79	0.023	20.28	-0.037	31.07	-0.030	32.35	0.007
08/01/11	1,199	-0.072	32.21	-0.063	27.21	-0.063	23.44	0.020	30.88	-0.031	18.73	-0.006	36.89	-0.041	24.24	-0.039	21.05	-0.049	32.03	-0.043	32.11	-0.033
07/25/11	1,292	-0.039	34.40	-0.032	29.04	-0.022	22.98	-0.024	31.87	-0.023	18.83	-0.049	38.45	-0.034	25.21	-0.046	22.13	-0.055	33.46	-0.035	33.20	-0.034
07/18/11	1,345	0.022	35.53	0.019	29.68	0.009	23.54	-0.002	32.63	0.005	19.80	0.011	39.80	0.011	26.44	0.005	23.41	-0.011	34.69	-0.002	34.37	0.015
07/11/11	1,316	-0.021	34.88	-0.020	29.42	-0.002	23.58	-0.005	32.45	-0.011	19.59	-0.009	39.35	0.004	26.30	-0.011	23.67	-0.014	34.75	-0.014	33.86	0.017
07/05/11	1,344	0.003	35.60	0.018	29.49	0.003	23.70	-0.018	32.81	-0.001	19.77	0.004	39.21	0.002	26.59	-0.002	24.01	-0.003	35.25	-0.002	33.29	0.021
06/27/11	1,340	0.056	34.99	0.046	29.40	0.048	24.13	0.021	32.83	0.028	19.70	0.051	39.14	0.028	26.65	0.049	24.07	0.056	35.31	0.050	32.61	0.033
06/20/11	1,268	-0.002	33.44	0.006	28.05	0.012	23.65	0.051	31.92	0.030	18.74	0.004	38.07	0.011	25.39	0.008	22.80	0.020	33.62	0.014	31.58	0.001
06/13/11	1,272	0.000	33.25	0.011	27.72	0.010	22.50	0.003	30.98	0.003	18.67	-0.009	37.66	0.005	25.19	0.009	22.36	-0.014	33.16	-0.001	31.55	0.005
06/06/11	1,271	-0.022	32.88	-0.027	27.43	-0.010	22.43	-0.012	30.89	-0.005	18.84	-0.018	37.48	-0.001	24.97	-0.023	22.68	-0.020	33.19	-0.016	31.40	-0.005
05/31/11	1,300	-0.023	33.78	-0.013	27.72	-0.036	22.70	-0.038	31.04	-0.012	19.18	-0.017	37.53	-0.022	25.57	-0.037	23.15	-0.038	33.75	-0.028	31.55	-0.036
05/23/11	1,331	-0.002	34.22	-0.002	28.74	-0.012	23.59	-0.015	31.42	-0.015	19.51	-0.003	38.39	-0.002	26.54	-0.013	24.06	0.001	34.73	-0.014	32.72	-0.013
05/16/11	1,333	-0.003	34.29	-0.009	29.09	-0.006	23.94	-0.020	31.89	-0.013	19.56	0.013	38.48	-0.017	26.90	-0.003	24.05	-0.012	35.22	-0.026	33.15	0.014
05/09/11	1,338	-0.002	34.60	0.002	29.28	-0.004	24.43	0.014	32.32	0.000	19.31	0.028	39.16	0.028	26.99	0.014	24.34	0.006	36.16	0.047	32.70	0.021
05/02/11	1,340	-0.017	34.55	-0.002	29.41	-0.020	24.09	-0.046	32.32	-0.004	18.78	0.001	38.08	-0.035	26.60	-0.021	24.18	-0.033	34.53	-0.026	32.03	-0.034
04/25/11	1,364	0.020	34.62	0.032	30.00	0.044	25.24	0.025	32.47	0.024	18.75	0.026	39.47	0.032	27.18	0.041	25.00	0.037	35.44	0.029	33.15	0.040
04/18/11	1,337	0.013	33.56	0.016	28.74	-0.004	24.61	-0.007	31.70	-0.005	18.28	0.015	38.25	0.007	26.11	0.014	24.11	0.000	34.45	0.005	31.87	0.003
04/11/11	1,320	-0.006	33.03	0.003	28.84	-0.008	24.78	-0.002	31.84	-0.007	18.01	-0.017	37.97	-0.012	25.75	-0.001	24.10	-0.019	34.28	-0.011	31.77	-0.016
04/04/11	1,328	-0.003	32.92	-0.016	29.06	-0.023	24.82	-0.004	32.07	-0.013	18.33	-0.011	38.42	-0.016	25.76	-0.016	24.57	0.002	34.65	-0.011	32.28	-0.010
03/28/11	1,332	0.014	33.47	0.033	29.73	0.027	24.91	0.011	32.49	0.025	18.53	0.026	39.05	0.002	26.17	0.036	24.51	0.028	35.02	0.024	32.60	0.029
03/21/11	1,314	0.027	32.41	-0.001	28.95	0.013	24.65	0.020	31.68	0.016	18.07	0.014	38.95	0.000	25.28	0.027	23.83	0.020	34.20	0.016	31.67	0.010
03/14/11	1,279	-0.019	32.44	-0.003	28.57	-0.023	24.16	0.007	31.18	-0.012	17.82	0.001	38.94	-0.020	24.61	-0.019	23.35	-0.016	33.68	-0.010	31.35	-0.003
03/07/11	1,304	-0.013	32.53	0.007	29.24	-0.021	24.00	-0.005	31.57	-0.026	17.80	-0.013	39.73	-0.024	25.10	-0.018	23.75	-0.026	34.03	-0.027	31.44	-0.020
02/28/11	1,321	0.001	32.29	0.011	29.88	0.030	24.13	0.024	32.41	-0.002	18.02	0.014	40.71	0.046	25.55	0.029	24.38	0.036	34.99	0.008	32.10	0.021
02/22/11	1,320	-0.017	31.94	-0.013	29.00	-0.002	23.57	-0.001	32.47	-0.001	17.77	0.004	38.94	-0.016	24.83	0.008	23.53	0.004	34.69	0.009	31.43	-0.003
02/14/11	1,343	0.010	32.36	0.038	29.05	0.019	23.60	0.015	32.52	-0.006	17.71	0.019	39.58	0.032	24.64	0.023	23.42	0.014	34.38	0.007	31.54	0.008
02/07/11	1,329	0.014	31.17	0.011	28.52	0.013	23.26	0.014	32.72	0.011	17.38	-0.011	38.35	0.023	24.09	0.014	23.10	0.007	34.13	0.025	31.28	0.008
01/31/11	1,311	0.027	30.83	0.036	28.15	0.014	22.95	0.011	32.36	0.002	17.58	-0.017	37.51	0.008	23.76	-0.006	22.94	0.015	33.29	0.012	31.03	0.036
01/24/11	1,276	-0.005	29.75	-0.011	27.77	-0.011	22.69	-0.031	32.31	0.005	17.87	-0.018	37.22	-0.013	23.91	-0.004	22.61	-0.005	32.89	-0.004	29.94	-0.009
01/18/11	1,283	-0.008	30.09	-0.006	28.08	-0.005	23.41	-0.019	32.16	-0.029	18.20	-0.025	37.70	-0.015	24.01	-0.006	22.72	-0.021	33.02	0.000	30.20	-0.014
01/10/11	1,293	0.017	30.26	0.021	28.21	0.044	23.86	0.021	33.10	0.074	18.66	0.011	38.28	-0.022	24.16	0.018	23.20	0.019	33.02	0.017	30.62	0.022
01/03/11	1,272	0.011	29.63	0.003	27.02	0.017	23.37	-0.038	30.82	0.007	18.47	0.009	39.15	0.006	23.73	0.001	22.76	-0.003	32.48	0.001	29.95	0.019

Index and Proxy Group Returns

	S&P 500		GAS		ATO		CPK		LG		NJR		NWN		PNY		SJI		SWX		WGL	
Date	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return
12/27/10	1,258	0.001	29.55	-0.013	26.56	-0.002	24.30	0.006	30.60	-0.005	18.31	-0.010	38.92	-0.012	23.70	-0.019	22.83	-0.007	32.47	-0.002	29.40	-0.008
12/20/10	1,257	0.010	29.96	0.020	26.62	-0.002	24.16	0.004	30.77	-0.004	18.50	-0.002	39.40	-0.003	24.16	-0.029	23.00	-0.006	32.54	0.007	29.64	0.005
12/13/10	1,244	0.003	29.35	-0.009	26.68	0.008	24.06	0.030	30.90	0.008	18.53	0.016	39.51	0.016	24.88	0.005	23.13	0.013	32.31	0.017	29.48	0.000
12/06/10	1,240	0.013	29.62	-0.041	26.47	-0.020	23.37	0.038	30.64	0.029	18.24	0.014	38.88	-0.012	24.76	0.014	22.83	0.014	31.77	0.012	29.48	-0.003
11/29/10	1,225	0.030	30.87	0.005	27.00	0.051	22.52	0.027	29.77	0.010	17.99	-0.011	39.35	-0.042	24.41	-0.019	22.51	0.021	31.39	0.004	29.57	-0.042
11/22/10	1,189	-0.009	30.73	-0.006	25.68	0.001	21.93	-0.003	29.48	0.002	18.19	0.036	41.08	0.009	24.89	0.011	22.05	0.012	31.26	0.016	30.86	0.012
11/15/10	1,200	0.000	30.93	-0.014	25.67	0.011	22.00	-0.017	29.42	0.003	17.56	0.011	40.73	0.000	24.62	0.004	21.78	0.004	30.78	-0.003	30.51	-0.056
11/08/10	1,199	-0.022	31.38	-0.017	25.40	-0.008	22.37	0.051	29.33	-0.007	17.36	-0.008	40.72	-0.020	24.52	-0.013	21.70	-0.018	30.86	-0.021	32.31	-0.008
11/01/10	1,226	0.036	31.92	-0.002	25.60	0.033	21.28	-0.001	29.54	0.016	17.50	0.026	41.56	0.007	24.84	0.003	22.11	0.022	31.53	0.032	32.58	0.028
10/25/10	1,183	0.000	31.99	0.011	24.79	0.012	21.29	0.007	29.07	0.006	17.05	-0.003	41.28	-0.003	24.76	0.005	21.62	-0.001	30.56	0.010	31.68	-0.001
10/18/10	1,183	0.006	31.65	-0.001	24.51	-0.002	21.15	-0.037	28.89	-0.011	17.10	-0.002	41.41	-0.010	24.62	-0.006	21.65	-0.002	30.27	-0.010	31.72	0.004
10/11/10	1,176	0.009	31.70	0.001	24.56	-0.005	21.97	-0.011	29.22	0.005	17.13	0.016	41.83	0.016	24.77	0.004	21.68	-0.001	30.58	0.001	31.58	0.008
10/04/10	1,165	0.016	31.68	0.002	24.70	-0.002	22.22	0.047	29.09	0.008	16.86	0.013	41.19	0.035	24.67	0.000	21.71	0.012	30.56	0.024	31.33	0.010
09/27/10	1,146	-0.002	31.63	0.015	24.75	0.016	21.21	0.028	28.85	0.018	16.64	0.015	39.79	0.019	24.67	0.028	21.46	0.033	29.85	0.015	31.02	0.020
09/20/10	1,149	0.021	31.17	0.015	24.36	0.016	20.64	0.030	28.32	0.025	16.39	0.032	39.04	0.017	24.00	0.024	20.77	0.020	29.40	0.031	30.41	0.036
09/13/10	1,126	0.014	30.72	-0.009	23.98	-0.010	20.05	-0.005	27.63	-0.019	15.88	-0.005	38.39	0.000	23.43	0.017	20.38	0.003	28.50	0.005	29.36	-0.007
09/07/10	1,110	0.005	30.99	-0.002	24.24	-0.012	20.14	0.001	28.18	0.001	15.96	0.001	38.38	-0.010	23.04	-0.013	20.31	-0.007	28.35	0.003	29.56	-0.011
08/30/10	1,105	0.037	31.06	0.028	24.53	0.009	20.12	0.001	28.15	0.007	15.95	0.006	38.78	0.020	23.34	0.001	20.44	0.012	28.27	0.005	29.89	0.020
08/23/10	1,065	-0.007	30.21	0.016	24.31	0.018	20.09	0.045	27.95	0.035	15.86	0.034	38.01	0.029	23.32	0.055	20.20	0.043	28.14	0.039	29.32	0.017
08/16/10	1,072	-0.007	29.74	-0.019	23.88	0.001	19.24	-0.021	27.01	-0.025	15.33	-0.032	36.94	-0.029	22.09	-0.020	19.37	-0.016	27.09	-0.014	28.82	-0.005
08/09/10	1,079	-0.038	30.33	-0.034	23.86	-0.029	19.65	0.044	27.71	-0.031	15.83	-0.007	38.05	-0.031	22.53	-0.023	19.69	-0.024	27.47	-0.043	28.97	-0.023
08/02/10	1,122	0.018	31.40	0.026	24.59	0.019	18.83	-0.015	28.58	0.000	15.95	0.024	39.29	-0.002	23.06	0.042	20.17	0.013	28.70	0.023	29.67	0.010
07/26/10	1,102	-0.001	30.61	-0.022	24.13	0.001	19.11	0.033	28.59	0.004	15.58	0.004	39.36	0.017	22.13	0.001	19.92	0.000	28.06	-0.008	29.36	-0.005
07/19/10	1,103	0.035	31.31	0.037	24.11	0.034	18.50	0.047	28.48	0.042	15.52	0.049	38.69	0.069	22.11	0.051	19.92	0.058	28.28	0.070	29.50	0.040
07/12/10	1,065	-0.012	30.20	-0.002	23.31	-0.013	17.66	-0.040	27.34	-0.021	14.80	-0.032	36.19	-0.028	21.05	-0.027	18.82	-0.026	26.44	-0.029	28.36	-0.008
07/08/10	1,078		30.27		23.62		18.39		27.93		15.30		37.25		21.62		19.33		27.24		28.58	

Prices obtained from Yahoo! Finance, http://finance.yahoo.com (accessed 7-10-15)

Returns are discrete returns of price

Beta Regression Analysis

AGL Resources **GAS**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.546565717
R Square	0.298734083
Adjusted R Square	0.296026493
Standard Error	0.018546271
Observations	261

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.037950282	0.037950282	110.3320805	9.89053E-22
Residual	259	0.089086719	0.000343964		
Total	260	0.127037001			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.000272835	0.00115915	0.235374651	0.814103957	-0.002009723	0.002555392	-0.002009723	0.002555392
GAS	0.627837932	0.059771843	10.50390787	9.89053E-22	0.510137281	0.745538583	0.510137281	0.745538583

Atmos Energy **ATO**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.497645565
R Square	0.247651109
Adjusted R Square	0.244746287
Standard Error	0.01957301
Observations	261

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.032661491	0.032661491	85.25517601	9.75734E-18
Residual	259	0.099223607	0.000383103		
Total	260	0.131885098			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.001748917	0.001223322	1.42964595	0.154023766	-0.000660006	0.004157839	-0.000660006	0.004157839
ATO	0.582449195	0.06308087	9.233372949	9.75734E-18	0.458232523	0.706665866	0.458232523	0.706665866

Chesapeake Utilities **CPK**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.359181314
R Square	0.129011216
Adjusted R Square	0.125648325
Standard Error	0.024463681
Observations	261

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.022959281	0.022959281	38.36318631	2.294E-09
Residual	259	0.15500417	0.000598472		
Total	260	0.177963451			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00319549	0.001528991	2.089934314	0.037599193	0.000184654	0.006206325	0.000184654	0.006206325
CPK	0.488336506	0.078842767	6.19380225	2.294E-09	0.33308205	0.643590962	0.33308205	0.643590962

Beta Regression Analysis

Laclede Group **LG**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.505295557
R Square	0.2553236
Adjusted R Square	0.252448401
Standard Error	0.016458752
Observations	261

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.024055641	0.024055641	88.80207873	2.54919E-18
Residual	259	0.070160643	0.000270891		
Total	260	0.094216284			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.001287221	0.001028679	1.251333783	0.211941783	-0.000738418	0.00331286	-0.000738418	0.00331286
LG	0.499860147	0.053044083	9.423485487	2.54919E-18	0.395407569	0.604312725	0.395407569	0.604312725

New Jersey Resources **NJR**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.491708613
R Square	0.24177736
Adjusted R Square	0.23884986
Standard Error	0.021679962
Observations	261

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.038818225	0.038818225	82.58832297	2.70253E-17
Residual	259	0.121735374	0.000470021		
Total	260	0.160553599			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.000922446	0.001355007	0.680768425	0.496626179	-0.001745787	0.003590679	-0.001745787	0.003590679
NJR	0.634976842	0.069871258	9.087811781	2.70253E-17	0.497388771	0.772564912	0.497388771	0.772564912

Northwest Natural Gas **NWN**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.495708034
R Square	0.245726455
Adjusted R Square	0.242814202
Standard Error	0.018973449
Observations	261

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.030374937	0.030374937	84.37675192	1.36354E-17
Residual	259	0.093237871	0.000359992		
Total	260	0.123612808			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.00069452	0.001185849	-0.585673562	0.558604879	-0.003029653	0.001640612	-0.003029653	0.001640612
NWN	0.561691356	0.061148575	9.185681898	1.36354E-17	0.441279692	0.682103019	0.441279692	0.682103019

Beta Regression Analysis

Piedmont Natural Gas **PNY**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.573418212
R Square	0.328808446
Adjusted R Square	0.326216973
Standard Error	0.01908821
Observations	261

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.046230293	0.046230293	126.8808988	3.2336E-24
Residual	259	0.094369177	0.00036436		
Total	260	0.14059947			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.000376149	0.001193021	0.315290782	0.752794768	-0.001973108	0.002725405	-0.001973108	0.002725405
PNY	0.692952351	0.061518431	11.26414217	3.2336E-24	0.571812379	0.814092323	0.571812379	0.814092323

South Jersey Industries **SJI**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.584373293
R Square	0.341492146
Adjusted R Square	0.338949645
Standard Error	0.018320277
Observations	261

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.045079969	0.045079969	134.3134562	2.68332E-25
Residual	259	0.086928833	0.000335633		
Total	260	0.132008802			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.000602414	0.001145025	-0.526114433	0.599258906	-0.002857158	0.00165233	-0.002857158	0.00165233
SJI	0.684276857	0.059043499	11.58936824	2.68332E-25	0.568010435	0.80054328	0.568010435	0.80054328

Southwest Gas **SWX**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.571614548
R Square	0.326743191
Adjusted R Square	0.324143744
Standard Error	0.019160654
Observations	261

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.046147291	0.046147291	125.6971863	4.82849E-24
Residual	259	0.09508684	0.000367131		
Total	260	0.141234131			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.001106299	0.001197549	0.923802347	0.356449076	-0.001251874	0.003464471	-0.001251874	0.003464471
SWX	0.692330002	0.061751907	11.21147565	4.82849E-24	0.570730277	0.813929726	0.570730277	0.813929726

Beta Regression Analysis

WGL Holdings **WGL**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.4897691
R Square	0.239873771
Adjusted R Square	0.236938921
Standard Error	0.021079437
Observations	261

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.036317407	0.036317407	81.73288114	3.75368E-17
Residual	259	0.115084753	0.000444343		
Total	260	0.15140216			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00108085	0.001317474	0.820395913	0.412744843	-0.001513474	0.003675174	-0.001513474	0.003675174
WGL	0.614182538	0.067935857	9.040623935	3.75368E-17	0.480405592	0.747959484	0.480405592	0.747959484

Beta Calculation

		[1]	[2]	[3]	[4]
Company	Ticker	Raw Beta	Standard Error	SE^2	Adjusted Beta
AGL Resources	GAS	0.6278	0.0598	0.0036	0.6200
Atmos Energy	ATO	0.5824	0.0631	0.0040	0.5931
Chesapeake Utilities	CPK	0.4883	0.0788	0.0062	0.5514
Laclede Group	LG	0.4999	0.0530	0.0028	0.5361
New Jersey Resources	NJR	0.6350	0.0699	0.0049	0.6223
Northwest Natural Gas	NWN	0.5617	0.0611	0.0037	0.5803
Piedmont Natural Gas	PNY	0.6930	0.0615	0.0038	0.6585
South Jersey Industries	SJI	0.6843	0.0590	0.0035	0.6549
Southwest Gas	SWX	0.6923	0.0618	0.0038	0.6580
WGL Holdings	WGL	0.6142	0.0679	0.0046	0.6113
Average		0.6079	0.0636	0.0041	0.6086
Variance		0.0056	0.0001	0.0000	0.0019

[1] Raw beta calculated through linear regression from DG-1.9

[2] Standard error of the beta coefficient from DG-1.9

[3] = [2]^2

[4] Adjusted beta using Vasicek adjustment method (see testimony)

Implied Equity Risk Premium Calculation

Year	[1] Index Value	[2] Operating Earnings	[3] Dividends	[4] Buybacks	[5] Earnings Yield	[6] Dividend Yield	[7] Buyback Yield	[8] Gross Cash Yield
2010	11,430	758.71	205.82	298.82	6.64%	1.80%	2.61%	4.42%
2011	11,385	876.76	240.20	405.08	7.70%	2.11%	3.56%	5.67%
2012	12,742	870.19	280.69	398.91	6.83%	2.20%	3.13%	5.33%
2013	16,495	956.01	311.77	475.59	5.80%	1.89%	2.88%	4.77%
2014	18,245	1,004.22	350.43	553.28	5.50%	1.92%	3.03%	4.95%

Cash Yield	5.03%	[9]
Growth Rate	5.77%	[10]
Risk-free Rate	3.09%	[11]
Current Index Value	2,096	[12]

Year	[13] 1	[14] 2	[15] 3	[16] 4	[17] 5
Expected Dividends	111.49	117.92	124.72	131.91	139.52
Expected Terminal Value					2471.03
Present Value	102.37	99.42	96.55	93.77	1703.89
Intrinsic Index Value	2096	[18]			
Required Return on Market	8.91%	[19]			
Implied Equity Risk Premium	**5.82%**	[20]			

[1-4] S&P Quarterly Press Releases, data found at www.spdji.com/indices/equity/sp-500 (all dollar figures are in $ billions)

[1] Market value of S&P 500

[5] = [2] / [1]

[6] = [3] / [1]

[7] = [4] / [1]

[8] = [6] + [7]

[9] = Average of [8]

[10] = Compund annual growth rate of [2] = (end value / beginning value)$^{1/5}$-1

[11] Risk-free rate calculated in DG-1.7

[12] 30-day average of closing index prices from DG-1.3

[13-16] Expected dividends = [9]*[12]*(1+[10])^{n} ; Present value = expected dividend / (1+[11]+[19])^{n}

[17] Expected terminal value = expected dividend * (1+[11]) / [19] ; Present value = (expected dividend + expected terminal value) / (1+[11]+[19])^{n}

[18] = Sum([13-17]) present values.

[19] = [20] + [11]

[20] Internal rate of return calculation setting [18] equal to [12] and solving for the discount rate

Equity Risk Premium Result

Historic Premium		
Geometric Mean	4.40%	[1]
Arithmetic Mean	6.00%	[2]
Historic ERP Average	5.20%	[3]
Expert Survey Premium		
IESE Survey	5.50%	[4]
Duke CFO Survey	4.51%	[5]
Expert ERP Average	5.01%	[6]
Implied Premium		
Damodaran	5.78%	[7]
PUD	5.82%	[8]
Implied ERP Average	5.80%	[9]
Average Equity Risk Premium	**5.50%**	[10]

[1],[2] Geometric and arithmetic mean of total returns on large company stocks less total returns on long-term government bonds, 2015 Ibbotson Stocks, Bonds, Bills, and Iflation (SBBI) Classic Yearbook, p. 91 (data from 1926-2014).

[3] = Average ([1],[2])

[4] IESE Business School, "Discount Rate (risk-Free Rate and Market Risk Premium) used in 41 countries in 2015: a survey" p. 3.

[5] Graham and Harvey "The Equity Risk Premium in 2015" (survey of U.S. executives) p. 3

[6] = Average([4],[5])

[7] Aswath Damodaran, "Equity Risk Premiums: Determinants, Estimation and Implications - The 2015 Edition, p. 120. 2014 ERP

[8] = PUD calculated ERP from DG-C-12

[9] = Average ([7],[8])

[10] = Weighted average; Historic = 10%, Survey = 30%, Implied = 60%

CAPM Results

Company	Ticker	[1] Risk-Free Rate	[2] Calculated Beta	[3] Value Line Beta	[4] Average Beta	[5] Risk Premium	[6] CAPM Results
AGL Resources	GAS	3.09%	0.620	0.800	0.710	5.50%	6.99%
Atmos Energy	ATO	3.09%	0.593	0.850	0.722	5.50%	7.06%
Chesapeake Utilities	CPK	3.09%	0.551	0.650	0.601	5.50%	6.39%
Laclede Group	LG	3.09%	0.536	0.700	0.618	5.50%	6.49%
New Jersey Resources	NJR	3.09%	0.622	0.800	0.711	5.50%	7.00%
Northwest Natural Gas	NWN	3.09%	0.580	0.700	0.640	5.50%	6.61%
Piedmont Natural Gas	PNY	3.09%	0.659	0.800	0.729	5.50%	7.10%
South Jersey Industries	SJI	3.09%	0.655	0.850	0.752	5.50%	7.23%
Southwest Gas	SWX	3.09%	0.658	0.850	0.754	5.50%	7.24%
WGL Holdings	WGL	3.09%	0.611	0.800	0.706	5.50%	6.97%
Average			0.609	0.780	0.694		**6.91%**

[1] One-month average of current 30-year Treasury bond yield from DG-C-8
[2] Calculated beta from DG-C-11
[3] Value Line Investment Survey
[4] = Average ([2],[3])
[5] Equity risk premium from DG-C-13
[6] = [1] + [4] * [5]

Required Return on the Market

Historic (last 10 years)	8.49%	[1]
IESE Survey	7.90%	[2]
Duke CFO Survey	6.63%	[3]
PUD Estimate	8.91%	[4]
Average	**7.98%**	[5]
ONG Requested Return	**10.50%**	

Required returns on low risk stocks like utilities are generally less than 7.93% (confirmed by CAPM analysis)

[1] Average of geometric and arithmetic mean returns on S&P 500 from 2005 - 2014 from DG-C-16

[2] IESE Business School, "Discount Rate (risk-Free Rate and Market Risk Premium) used in 41 countries in 2015: a survey" p. 3.

[3] Graham and Harvey "The Equity Risk Premium in 2015" (survey of U.S. executives), p. 3.

[4] Calculated required return on market from DG-C-12

[5] = Average([1],[2],[3],[4])

Utility Awarded Returns vs. Market Returns (2005 - 2014)

Exhibit DG-C-16

Quarter	[1] Cases Filed	[2] Average Awarded ROE
2005.1	4	10.55%
2005.2	12	10.13%
2005.3	8	10.84%
2005.4	10	10.57%
2006.1	11	10.38%
2006.2	18	10.39%
2006.3	7	10.06%
2006.4	12	10.38%
2007.1	11	10.30%
2007.2	16	10.27%
2007.3	8	10.02%
2007.4	11	10.44%
2008.1	7	10.15%
2008.2	8	10.41%
2008.3	21	10.42%
2008.4	6	10.38%
2009.1	13	10.31%
2009.2	22	10.55%
2009.3	17	10.46%
2009.4	14	10.54%
2010.1	16	10.45%
2010.2	19	10.12%
2010.3	12	10.27%
2010.4	8	10.30%
2011.1	8	10.35%
2011.2	15	10.24%
2011.3	17	10.13%
2011.4	10	10.29%
2012.1	17	10.84%
2012.2	16	9.92%
2012.3	8	9.78%
2012.4	12	10.05%
2013.1	19	10.23%
2013.2	16	9.77%
2013.3	4	10.06%
2013.4	7	9.90%
2014.1	9	10.23%
2014.2	25	9.83%
2014.3	8	9.89%
2014.4	16	9.78%

Year	[3] Annual Market Return	
2005	4.83%	
2006	15.61%	
2007	5.48%	
2008	-36.55%	
2009	25.94%	
2010	14.82%	
2011	2.10%	
2012	15.89%	
2013	32.15%	
2014	13.48%	
Average		
Arithmetic	9.38%	[4]
Geometric	7.60%	[5]
Average Return on All Stocks	**8.49%**	[6]
Average Utility Awarded ROE	**10.30%**	[7]

Expected returns on defesive stocks with low betas such as utility stocks should be less than 8.5% over the past 10 years.

[1] Edison Electric Institute Q4 2014 Financial Update. Number of cases filed in each quarter.

[2] Edison Electric Institute Q4 2014 Financial Update. Average awarded utility ROE each quarter.

[3] Historical stock returns. NYU Stern School of Business. http://pages.stern.nyu.edu/~adamodar/. Click link for "Historical Returns on Stocks, Bonds and Bills - United States

[4] = Average of [3]

[5] = Geometric mean of [3]

[6] = Average ([4],[5])

[7] = Average of [2]

Comparable Earnings Analysis

Company	Ticker	[1] 2010	[1] 2011	[1] 2012	[1] 2013	[1] 2014	[2] Average
AGL Resources	GAS	12.9%	5.2%	7.9%	8.6%	14.9%	9.9%
Atmos Energy	ATO	9.2%	8.8%	8.1%	8.9%	9.4%	8.9%
Chesapeake Utilities	CPK	11.5%	11.5%	11.2%	11.8%	12.0%	11.6%
Laclede Group	LG	10.1%	11.1%	10.4%	5.0%	5.6%	8.4%
New Jersey Resources	NJR	14.0%	13.7%	13.8%	12.8%	18.3%	14.5%
Northwest Natural Gas	NWN	10.5%	8.9%	8.2%	8.1%	7.6%	8.7%
Piedmont Natural Gas	PNY	11.6%	11.4%	11.7%	11.3%	11.0%	11.4%
South Jersey Industries	SJI	14.2%	13.9%	12.7%	11.7%	11.2%	12.7%
Southwest Gas	SWX	8.9%	9.2%	10.2%	10.3%	9.5%	9.6%
WGL Holdings	WGL	9.9%	9.5%	10.8%	9.3%	11.0%	10.1%
Average							10.59%

[1] Reported ROE, Value Line Investment Survey 2010 - 2014

[2] = Average (2010 - 2014)

Competitive Company Earnings

Industry	Number of Firms	ROE
Air Transport	22	2.8%
Bank (Money Center)	13	8.2%
Coal & Related Energy	42	-6.4%
Education	42	3.8%
Electronics (General)	189	8.7%
Engineering/Construction	56	5.3%
Environmental & Waste Services	103	5.7%
Financial Svcs. (Non-bank & Insurance)	288	-2.2%
Green & Renewable Energy	26	0.3%
Hotel/Gaming	80	5.8%
Insurance (General)	24	7.4%
Metals & Mining	124	2.1%
Oil/Gas (Production and Exploration)	392	6.3%
Oil/Gas Distribution	85	9.6%
Paper/Forest Products	22	9.9%
Power	82	9.5%
Precious Metals	147	-6.9%
R.E.I.T.	213	7.7%
Real Estate (Development)	18	0.5%
Semiconductor Equip	47	5.6%
Software (Entertainment)	20	7.1%
Steel	40	-14.0%
Telecom (Wireless)	21	-4.7%
Tobacco	20	-54.1%
Total / Average	**2116**	**0.7%**

http://people.stern.nyu.edu/adamodar/New_Home_Page/datafile/pbvdata.html

Cost of Equity Summary

Model	Cost of Equity
Discounted Cash Flow	8.32%
Capital Asset Pricing Model	6.91%
Comparable Earnings	10.59%
Average	**8.60%**

Capital Structure Comparison

Exhibit DG-C-20

Company	Ticker	[1] Common Equity Ratio	[2] Long-Term Debt Ratio	[3] Debt-Equity Ratio
AGL Resources	GAS	51.2%	48.8%	95.3%
Atmos Energy	ATO	55.7%	44.3%	79.5%
Chesapeake Utilities	CPK	65.5%	34.5%	52.7%
Laclede Group	LG	44.9%	55.1%	122.7%
New Jersey Resources	NJR	61.8%	38.2%	61.8%
Northwest Natural Gas	NWN	55.2%	44.8%	81.2%
Piedmont Natural Gas	PNY	47.9%	52.1%	108.8%
South Jersey Industries	SJI	52.0%	48.0%	92.3%
Southwest Gas	SWX	47.6%	52.4%	110.1%
WGL Holdings	WGL	63.8%	34.8%	54.5%
Average		54.6%	45.3%	85.9%

[1-2] Value Line Investment Survey - 2014 data

[3] = [2] / [1]

Optimal Capital Structure

Inputs		
EBIT	225,294	[1]
Interest Expense	45,842	[2]
Book Debt	1,201,316	[3]
Book Equity	1,839,665	[4]
Debt / Capital	39.50%	[5]
Debt / Equity	65%	[6]
Debt Cost	3.95%	[7]
Tax Rate	35%	[8]
Unlevered Beta	0.548	[9]
Risk-free Rate	3.09%	[10]
Equity Risk Premium	5.50%	[11]
Coverage Ratio	4.91	[12]
Synthetic Bond Rating	A2/A	[13]

	[14]	[15]	[16]	[17]
Ratings Table				
	Coverage Ratio	Bond Rating	Spread	Interest Rate
	> 8.5	Aaa/AAA	0.40%	3.49%
	6.5 - 8.5	Aa2/AA	0.70%	3.79%
	5.5 - 6.5	A1/A+	0.90%	3.99%
	4.3 - 5.5	A2/A	1.00%	4.09%
	3.0 - 4.3	A3/A-	1.20%	4.29%
	2.5 - 3.0	Baa2/BBB	1.75%	4.84%
	2.3 - 2.5	Ba1/BB+	2.75%	5.84%
	2.0 - 2.3	Ba2/BB	3.25%	6.34%
	1.8 - 2.0	B1/B+	4.00%	7.09%
	1.5 - 1.8	B2/B	5.00%	8.09%
	1.3 - 1.5	B3/B-	6.00%	9.09%
	0.8 - 1.3	Caa/CCC	7.00%	10.09%

Optimal Capital Structure Calculation

[18] Debt Ratio	[19] D/E Ratio	[20] Levered Beta	[21] Cost of Equity	[22] Debt Level	[23] Interest Expense	[24] Coverage Ratio	[25] Pre-tax Debt Cost	[26] After-tax Debt Cost	[27] WACC
0%	0%	0.548	6.10%	0	0	∞	3.49%	1.22%	6.10%
40%	67%	0.785	7.41%	1,216,393	48,048	4.7	4.09%	1.43%	5.02%
50%	100%	0.904	8.06%	1,520,491	60,059	3.8	4.29%	1.50%	4.78%
60%	150%	1.081	9.04%	1,824,589	72,071	3.1	4.29%	1.50%	4.52%
70%	233%	1.378	10.67%	2,128,687	84,083	2.7	4.84%	1.69%	4.39%
72%	257%	1.463	11.13%	2,189,507	86,486	2.6	4.84%	1.69%	4.34%
73%	270%	1.510	11.39%	2,219,916	87,687	2.6	4.84%	1.69%	**4.31%**
74%	285%	1.561	11.67%	2,250,326	88,888	2.5	5.84%	2.04%	4.55%
75%	300%	1.615	11.97%	2,280,736	90,089	2.5	5.84%	2.04%	4.53%
80%	400%	1.971	13.93%	2,432,785	96,095	2.3	5.84%	2.04%	4.42%

[1] One Gas 2014 10-K p. 46 (000's)
[2] One Gas 2014 10-K p. 46 (000's)
[3] Schedule F-01 (000's)
[4] Schedule F-01 (000's)
[5] = [3] / ([3] + [4])
[6] = [3] / [4]
[7] Schedule F-01
[8] Schedule J-1
[9] Avg. VL beta from DG-C-14/(1+(1 - [8])*[6])
[10] From DG-C-8
[11] From DG-C-13
[12] = [1] / [2]
[13] Moody's rating for ONG
[14] Rages of coverage ratios
[15] Moody's / S&P bond ratings
[16] NYU spread over risk-free rate
[17] = [16] + [10]
[18] = debt / total capital
[19] = [18] / (1 - [18])
[20] = [9] * (1 + (1 - [8]) * [6]
[21] = [10] + [20] * [11]
[22] = [18] * ([3] + [4]); (000's)
[23] = [22] * [7]; (000's)
[24] = [1] / [23]
[25] = Debt cost given coverage ratio per Ratings Table
[26] = [25] * [8]
[27] = ([18] * [26]) + ((1 - [18]) * [21])

Other Industries With High Debt Ratios

Industry	Number of Firms	Debt Ratio
Advertising	52	66.1%
Air Transport	22	57.2%
Auto & Truck	22	69.1%
Auto Parts	75	41.4%
Bank (Money Center)	13	69.1%
Banks (Regional)	676	46.6%
Beverage (Alcoholic)	22	41.3%
Beverage (Soft)	46	56.7%
Broadcasting	28	62.3%
Brokerage & Investment Banking	46	79.4%
Building Materials	39	48.6%
Business & Consumer Services	177	46.6%
Cable TV	18	71.1%
Chemical (Diversified)	10	45.8%
Chemical (Specialty)	103	43.7%
Coal & Related Energy	42	57.8%
Computer Services	119	54.7%
Construction Supplies	55	56.7%
Diversified	23	52.1%
Drugs (Biotechnology)	400	40.3%
Entertainment	84	43.7%
Environmental & Waste Services	103	52.4%
Farming/Agriculture	37	52.2%
Financial Svcs. (Non-bank & Insur	288	95.7%
Food Processing	96	47.4%
Green & Renewable Energy	26	58.7%
Healthcare Support Services	138	40.4%
Heathcare Information and Techr	127	42.4%
Homebuilding	35	50.2%
Hospitals/Healthcare Facilities	56	65.6%
Hotel/Gaming	80	63.4%
Household Products	135	45.7%
Information Services	67	39.7%
Insurance (Life)	25	41.8%
Investments & Asset Managemer	148	46.1%
Metals & Mining	124	41.0%
Office Equipment & Services	25	66.4%
Oil/Gas Distribution	85	50.7%
Packaging & Container	26	62.0%
Paper/Forest Products	22	60.2%
Paper/Forest Products	22	60.2%
Power	82	55.6%
Publshing & Newspapers	43	41.5%
R.E.I.T.	213	63.9%
Real Estate (Development)	18	43.1%
Real Estate (Operations & Service	52	57.9%
Recreation	68	49.0%
Restaurant/Dining	79	53.4%
Retail (Automotive)	30	69.2%
Retail (Building Supply)	5	56.6%
Retail (Distributors)	90	58.7%
Retail (General)	23	43.3%
Retail (Grocery and Food)	21	54.6%
Rubber& Tires	4	66.0%
Shipbuilding & Marine	14	42.6%
Steel	40	49.3%
Telecom (Wireless)	21	61.8%
Telecom. Services	77	64.2%
Tobacco	20	99.5%
Transportation	21	42.3%
Transportation (Railroads)	10	39.8%
Trucking	30	72.4%
Utility (General)	21	55.6%
Utility (Water)	19	51.8%
Total / Average	**4738**	**55.1%**

NYU data, http://people.stern.nyu.edu/adamodar/New_Home_Page/datacurrent.htr

CERTIFICATE OF SERVICE

This is to certify that on October 19, 2015, a true and correct copy of the above and foregoing, was sent via electronic mail and/or United States Postal Service, postage fully prepaid thereon to the following interested parties:

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