BEFORE THE CORPORATION COMMISSION OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF OKLAHOMA GAS AND ELECTRIC COMPANY FOR AN ORDER OF THE COMMISSION AUTHORIZING APPLICANT TO MODIFY ITS RATES, CHARGES, AND TARIFFS FOR RETAIL ELECTRIC SERVICE IN OKLAHOMA	CAUSE NO. PUD 201500273

RESPONSIVE TESTIMONY
OF
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PART I

THE PUBLIC UTILITY DIVISION

MARCH 21, 2016

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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 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]

[1] Exhibit DG-1-1.

Q. Describe the scope and organization of your testimony.

A. In this case I am testifying on the two primary capital recovery mechanisms in the rate base rate of return model – cost of capital and depreciation – in response to the application of Oklahoma Gas and Electric Company ("OG&E" or the "Company"). Together these issues are voluminous, so I have filed two separate responsive testimony documents – Part I and Part II. Part I of my responsive testimony (this document) includes cost of capital and related issues, and Part II of my responsive testimony includes depreciation expense and related issues. The exhibits attached to Part I of my responsive testimony have a prefix of "DG 1," and the exhibits attached to Part II of my responsive testimony have a prefix of "DG 2."

EXECUTIVE SUMMARY

Q. Summarize the key points of your testimony.

A. The key points of my testimony are summarized as follows:

1. Basing the awarded rate of return for OG&E on orders and settlements from other jurisdictions fails to comply with the Supreme Court's standards governing this issue; instead, the awarded rate of return should be based on the Company's cost of capital.

As with other issues in a rate case, the Commission has a duty to act as a surrogate for competition and ensure that the utility's costs are reasonable; this standard also applies to the cost of capital. According to the U.S. Supreme Court, OG&E's awarded rate of return in this case should be commensurate with the Company's very low level of risk. The well-established financial models I have employed in this case provide a close estimate of the Company's cost of capital and comply with the legal standards governing this issue. Utility

witnesses often argue that the awarded return should be influenced by an average or trend in other awarded returns around the country. A reliance on this method, however, fails to satisfy the legal standards set forth by the Supreme Court. Instead, the awarded return should be based on the Company's cost of capital.

2. When the awarded rate of return exceeds the cost of capital, it results in an inappropriate transfer of excess wealth from customers to shareholders.

If the awarded rate of return is greater than the Company's cost of capital, the excess earnings above those required to service the true cost of capital accrue to shareholders. In this case, OG&E is asking the Commission for an awarded return that grossly exceeds its cost of capital. If the Commission adopts the Company's position in this case, it would be permitting an excess transfer of wealth from customers to shareholders of more than $80 million per year; in addition, it would be permitting an excess transfer of wealth from Oklahoma citizens to the Internal Revenue Service of more than $40 million per year.

3. The Company's cost of equity must lie between a "floor" and a "ceiling," where the floor is the risk-free rate and the ceiling is the required return on the market portfolio; currently, the floor is about three percent and the ceiling is about eight percent.

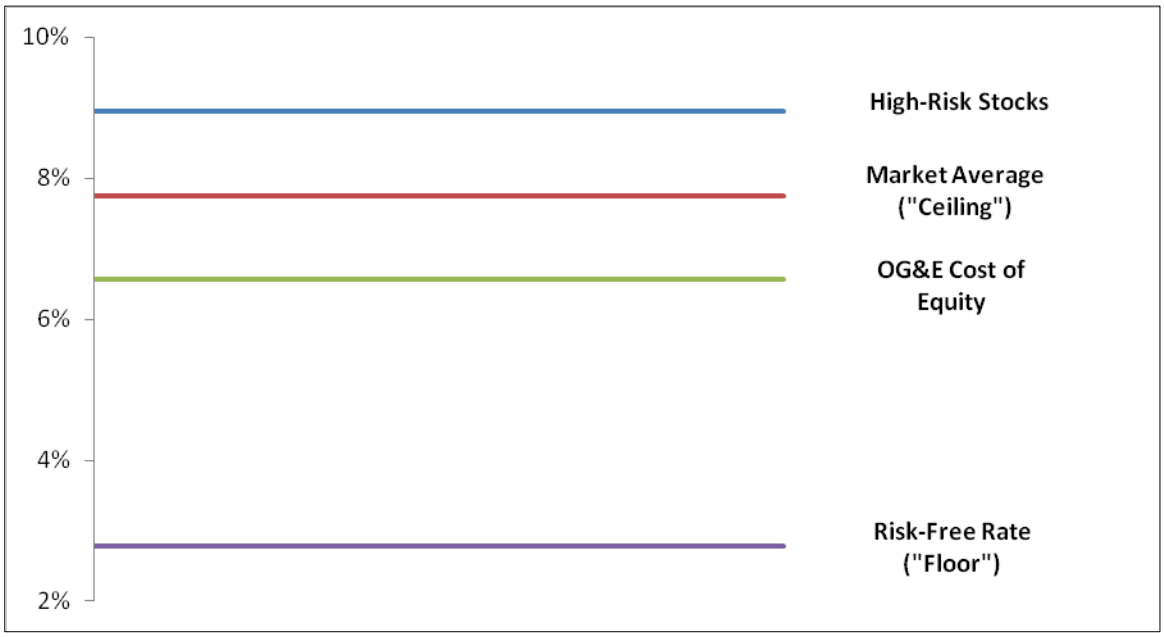
Analysts can use a variety of financial models to closely estimate a utility's cost of equity. Before any such analysis begins however, the analyst can be sure that the result must fall between two numbers, which act as a "floor" and a "ceiling" for a utility's cost of equity. The floor is the "risk-free rate," which is based on the yields of U.S. Treasury securities. When investors buy U.S. Treasury securities, they expect a small return without assuming any risk. Therefore, when investors buy stocks, they require a return above the risk-free rate to compensate them for the risk they have assumed. Thus, the risk-free rate is the floor

above which a utility's cost of equity must lie. The ceiling is the "required return on the market portfolio." Since it is undisputed that utility stocks are consistently and decisively less risky than the average stock in the market, the required return on a utility's stock must be less than the required return on the average stock. The average required return on all stocks is called the required return on the market portfolio, which can be closely estimated through a variety of methods. Thus, the required return on the market portfolio is the ceiling below which a utility's cost of equity must lie. Currently, the floor is about 3.0 percent and the ceiling is about 8.0 percent, which means that OG&E's cost of equity must lie between these two numbers.

4. The models I used in this case indicate the Company's cost of equity is about 6.2 percent.

To estimate OG&E's cost of equity, I used two well-established, widely-accepted models: The Discounted Cash Flow Model and the Capital Asset Pricing Model. Companies around the world have relied on these models for decades to estimate their cost of equity. The results of these models indicate that OG&E's cost of equity is about 6.2 percent. Predictably, this result falls between the floor and ceiling discussed above, and is illustrated below.

Figure 1:
Required Return Comparison



As shown in this figure, high-risk stocks have required returns above the market average, but it is indisputable that utility stocks are consistently and decisively less risky than the average stock in the market. Thus, the cost of equity for a utility stock must be less than the market average.

5. When assessing the proper capital structure, it is not appropriate to merely consider the capital structures of other regulated utilities or the Company's test-year capital structure; OG&E's optimal capital structure consists of about 60 percent debt and 40 percent equity.

In addition to cost of equity, capital structure is a major component of a company's cost of capital. Capital structure refers to the proportions of debt and equity a firm uses to finance its operations. Competitive firms have an incentive to increase their debt ratio to an optimal level that minimizes their weighted average cost of capital and maximizes profits. Unlike competitive firms, utility companies do not have a financial incentive to minimize their

cost of capital. In fact, they have a financial incentive to maximize their cost of capital. This results in utilities operating with insufficient amounts of debt in their capital structures. Therefore, a commission standing in the place of competition cannot assess the capital structure that would occur in a competitive environment by simply considering the capital structures of other regulated utilities. When the test-year capital structure is not proper, the Commission has the authority and the duty to impute a prudent capital structure in order to minimize capital costs. In this case, OG&E's proposed capital structure contains only 47 percent debt, which is grossly insufficient. An objective analysis reveals that OG&E's optimal capital structure consists of about 60 percent debt and 40 percent equity. If OG&E were in a pure competitive environment, where firms try to minimize their cost of capital, the Company would likely have a debt ratio of about 60 percent.

LEGAL STANDARDS

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.[2] The Court found that "the amount of risk in the business is a most important factor" in determining the appropriate allowed rate of return.[3] Later in two landmark cases, the Court set forth the standards by which

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

[3] *Id*. at 48.

public utilities are allowed to earn a return on capital investments. In *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.[4]

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.[5]

In addition, the Oklahoma Supreme Court echoed the standards discussed above while providing further clarification on determining a fair rate of return. In *Southwestern Public Service Company v. State of Oklahoma*, the Court held that a fair rate of return "cannot be developed by a rule of thumb calculation, but must be determined in the exercise of a fair, enlightened and independent judgment in light of all relevant facts."[6] The cost of capital

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

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

[6] *Southwestern Public Service Company v. State of Oklahoma*, 637 P.2d 92, 96 (1981).

models I have employed in this case are in accord with all of the foregoing legal standards and have been widely accepted by regulatory commissions around the country.

Q. The allowed rate of return should be based on the Company's cost of capital.

A. Yes. The Supreme Court standards discussed above indicate that the allowed return set by the Commission in this case should be based on the Company's cost of capital. This standard is clearly set forth in *Hope*: "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." Here, the *Hope* Court is simply recognizing the fundamental purpose of the rate base rate of return model. The utility should be allowed to recover all of its reasonable expenses, recover its capital investments through depreciation, and recover a return on its capital investments sufficient to satisfy the required return of its investors. The "required return" from the investors' perspective is synonymous with the "cost of capital" from the utility's perspective. Scholars agree that the allowed rate of return should be based on the cost of capital:

> 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 closely estimate the Company's true cost of equity, and the return on equity awarded by the Commission should be based on this cost of equity.

Q. If the Commission sets the allowed return greater than the cost of capital, it will be permitting an excess transfer of wealth from Oklahoma ratepayers to Company shareholders and the federal government.

A. Yes. The Supreme Court's standards are clear that the awarded return should be based on the cost of capital. If the Commission sets the awarded return equal to the Company's cost of capital, it will comply with the Supreme Court's standards, 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 cost of capital, 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]

Specifically, if the Commission adopts the Company's position in this case, it would be permitting an excess transfer of wealth from Oklahoma customers to Company shareholders of more than $80 million per year; in addition, it would be permitting an excess transfer of wealth from Oklahoma citizens to the Internal Revenue Service of more than $40 million per year.[9]

Q. Simply basing the awarded return on a trend or average of other awarded returns and settlements is fundamentally flawed.

A. Yes. Utility companies often rely on other commission-awarded returns and returns arising from settlements to support their excessive awarded return recommendations. As discussed further below, this approach fails to satisfy even one of the legal standards governing this issue. This is because according to the legal standards, the awarded return should be based on the cost of capital. In addition, this approach is fundamentally flawed for several reasons. First, awarded and settled returns from other jurisdictions have no material connection with the Company's cost of capital. While the awarded return from a particular jurisdiction should be based on the cost of capital of its regulated utility, it is

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

[9] These figures were estimated by considering the difference between the Company's proposal regarding cost of equity and capital structure and conservative estimates of the Company's actual cost of equity and optimal debt ratio – 7.0% and 55% respectively.

abundantly clear that this is not the case. As discussed in more detail later in this testimony, awarded returns generally far exceed utilities' cost of capital. In fact, awarded returns and cost of capital, while remotely related, are actually two separate concepts. Awarded returns are decided in court by elected and appointed officials. Awarded returns may be influenced by local politics, settlements, and misconceptions about fundamental concepts in financial theory. The cost of capital, on the other hand, is not influenced by any of these things, but instead it is driven by the market; it is driven by stock prices, dividends, growth rates, and most importantly – it is driven by risk. The cost of capital can be closely estimated through the use of several financial models that have been used by firms, investors, and academics around the world for decades. Thus, even if there were no legal standards governing this issue, basing the awarded return on anything other than the cost of capital would make no sense. Under the rate base rate of return model, a utility is allowed an opportunity to earn a return sufficient to satisfy the return required by its investors. Why then, would we base the awarded return on anything other than the return required by the Company's investors? This "required return" from the investors' standpoint is synonymous with the "cost of capital" from the Company's standpoint. Thus, the rate of return awarded by this Commission should be based on the Company's cost of capital. To base the awarded return on the awarded and settled returns from other jurisdictions would not only lead to unsubstantiated, fundamentally-flawed, and dubious results (and it does), it would also defeat the entire purpose of utilizing any fundamental financial analysis to arrive at a well-supported recommendation. In fact, if we were to ignore the Supreme Court's mandates, and simply rely on the awarded returns from other jurisdictions, the entire body of analysis,

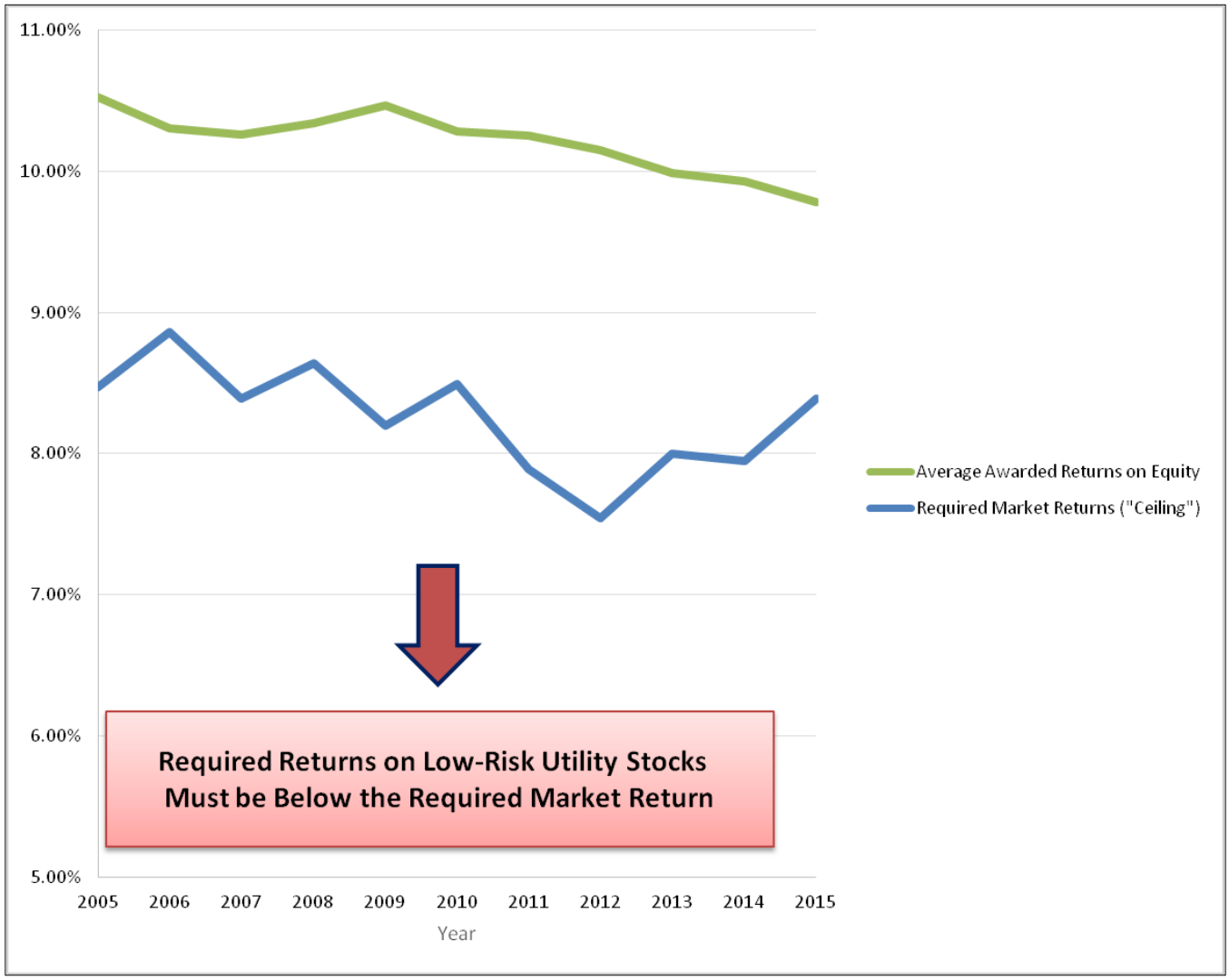
testimony, and recommendations from all of the cost of capital witness in this case could be boiled down to one single sentence:

> The recently awarded returns from other jurisdictions, which were apparently based on previous awarded returns from other jurisdictions, which were apparently based on previous awarded returns from other jurisdictions, on average, are about 9.3 percent.

Under this naïve approach, no further analysis is required, and the awarded return in any particular case would amount to nothing more than a copy of a copy of a copy – a distorted figure that at one time may have resembled something real. Furthermore, basing the awarded return on other cloned awarded returns effectively prevents the awarded returns from changing along with economic conditions. As shown in the figure below, awarded returns for public utilities have been well above the average market return (the "ceiling" discussed above) for at least ten years. This is likely due in part to the fact that many years ago, utilities' cost of equity may have actually been close to nine percent. In fact, during the early 1990s, the average required market return (the "ceiling") was around 12 percent, so the cost of equity for low-risk utility stocks could have been about nine percent. Since the early 1990s however, interest rates have dramatically declined among other economic changes, and it is clear that awarded returns have failed to keep pace with decreasing equity costs. It is not hard to see why this is the case. If every awarded return is based merely on an average of other awarded returns, the average awarded returns will effectively fail to adapt. Recall that the cost of equity for utility companies must be <u>below</u> the required market return (the "ceiling"). This is because of the following indisputable fact: Utility stocks are less risky than the average stock in the market, and thus the required returns (or

cost of equity) on utility stocks must be less than the required returns on the market. Thus, awarded returns should generally be below the required market return as well.

Figure 2:
Awarded Returns on Equity vs. Required Market Returns (2005 – 2015)



The massive gap between the average awarded returns and utility cost of equity (somewhere below the ceiling), has resulted in immense, excess amounts of ratepayer wealth being transferred to shareholders and the IRS for at least 10 years. While it would

be arguably unfair to OG&E for this problem to be abruptly remedied in this case, the Commission has an opportunity to move in the right direction. Regardless of the Commission's final decision on the awarded return in this case, the Commission should, at the very least, recognize that the awarded return should be based on the Company's cost of capital, even if the awarded return is markedly higher than the cost of capital.

Q. Simply basing the awarded return on a trend or average of other awarded returns fails to comply with every legal standard governing this issue.

A. Yes. Not only is it fundamentally flawed to rely on the awarded returns of other jurisdictions, but it also fails to comply with every legal standard governing this issue. As discussed above, the rate of return should be based on the Company's cost of capital, which is the same as the return required by its investors. Under the rate base rate of return model, basing the awarded return on anything else is nonsensical. It is no surprise then, that in the hundreds of pages of legal opinions discussing this issue, there is not so much as a sentence saying that regulators should base their awarded returns on the awarded returns from other jurisdictions. In stark contrast to this "cloned return" approach, the cost of capital approach satisfies every single legal standard governing this issue. The following figure summarizes the key standards set forth by the U.S. and Oklahoma Supreme Courts:

Figure 3:
Compliance with Governing Legal Standards

Governing Legal Standards	Method	
	Basing the awarded return on other awarded returns	Basing the awarded return on the cost of capital
Risk is the most important factor when determining the allowed rate of return (*Wilcox*)	✗	✓
No constitutional right to earnings realized in highly profitable enterprises (*Bluefield*)	✗	✓
Return should be sufficient to assure financial soundness under efficient management (*Bluefield*)	✗	✓
Return should be commensurate with those on investments of corresponding risk (*Hope*)	✗	✓
Return cannot be developed by a rule of thumb calculation (*Southwestern*)	✗	✓
Return must be determined by independent judgment (*Southwestern*)	✗	✓

Each standard is briefly discussed in more detail as follows:

1. Risk is the most important factor when determining the awarded return.

This standard demonstrates that the Court understands one of the most basic, fundamental concepts in financial theory: the more (less) risk an investor assumes, the more (less) return the investor expects. Since utility stocks are very low risk, the return to equity investors should be relatively low. I have used the CAPM in this case to estimate the Company's cost of equity, and this financial model thoroughly considers risk. On the other hand, the

cloned return approach does not take risk into account – a fact made painfully clear in the figure above showing that awarded returns have grossly exceeded true required equity returns on utility stocks for at least the past 10 years.

2. There is no constitutional right to earnings realized in highly profitable enterprises.

The public utility industry is one of the least risky industries in the entire country. Relatively speaking, nearly every other industry could be considered "highly profitable" compared to the utility industry. This does not mean that these riskier industries always realize higher profits – that would defeat the entire concept of risk. Instead, it means that the required returns on stocks in these riskier industries must be higher than the required returns on utility stocks. In the long run, the profits realized in these riskier industries should be higher than the profits realized in the utility industry. The cloned return approach, however, has led to artificially inflated profits in the utility industry for many years. While returns on equity in the electric utility industry have recently been about 9.0 percent, there are more than 3,500 companies in over 35 different industries around the country with an average return on equity of only 1.3 percent.[10] More importantly, every single one of these industries is riskier than the electric utility industry. In this case, OG&E is asking for an awarded return that is greater than the actual returns of more than 3,500 highly profitable enterprises.

[10] Exhibit DG 1-17.

3. The awarded return should be sufficient to assure financial soundness under efficient management.

Indeed, since the cloned return approach has resulted excessive awarded returns for many years, utility companies have been able to remain more than financially sound. In fact, the transfer of wealth from ratepayers to shareholders has been so excessive that even under relatively inefficient management a utility could remain financially sound. This concession, however, distracts from the salient point. Suppose the cloned return approach resulted in returns that were less than utility cost of capital. In this case the cloned return approach would be just as baseless as it is now, but would not allow utilities to remain financially sound, even under the most efficient management. Therefore, regardless of the result, the cloned return approach cannot truly satisfy this important legal standard. If the awarded return is based on the cost of capital, however, it mathematically must allow the utility to earn a return that is sufficient to assure financial soundness under prudent and efficient management. An awarded return set equal to the cost of capital under the rate base rate of return model allows the utility to cover all of its reasonable expenses, pay its corporate taxes, recover its capital investments through depreciation expense, and satisfy the required returns of its debt and equity investors.

4. The awarded return should be commensurate with those on investments of corresponding risk.

With this standard, the *Hope* Court is reaffirming the importance of risk in determining the cost of equity and awarded rate of return. The CAPM analysis set forth in this testimony shows how risk is thoroughly incorporated into this financial model. Thus, the cost of equity results produced by the CAPM are reflective of the very low risk inherent in the

Company's stock. Relying on the cloned return approach fails to comply with this legal standard. Utilities may argue that other regulated utilities have corresponding risk, so it is appropriate to consider their earned and awarded returns. This reasoning is severely flawed for three reasons. First, the historical book return on equity for regulated firms is not determined by competitive forces. Thus, a commission standing in the place of competition should not rely upon the earned returns of other utilities. Second, the earned and awarded returns of other utilities occurred in the past, and are thus not reflective of current economic conditions. This point is made painfully clear in the figure above, which shows that the awarded returns today are still apparently influenced by economic conditions nearly 30 years old. Third, when the *Hope* Court states that the return on equity should be commensurate with the returns on investments, it is still recognizing that those returns are based on the cost of capital. In fact, in the sentence immediately preceding the one giving us the "corresponding risk" standard, the Court states: "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."[11] Thus, the Court again properly recognizes that the awarded return should be based on the cost of capital, and in turn, the cost of capital should be based on the capital costs of companies with similar risk profiles.

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

5. The awarded return cannot be developed by a rule of thumb calculation.

The cloned return approach clearly violates the "rule of thumb" standard. When an awarded return is based on nothing more than outdated copies of other awarded returns, describing it as a "rule of thumb calculation" may actually give it too much credit. Here are a few examples of inadequate rule of thumb calculations that could be used to estimate the Company's cost of equity:

1. Take the yield on treasury bonds and add four percent.
2. Take the historical equity risk premium, add the risk-free rate, and subtract one percent.
2. Take the cost of debt and add two percent.
3. Take the current dividend yield and add three percent.

Obviously, none of these methods would provide sufficient support for a decision that has a multimillion-dollar impact; and yet, each of these rule of thumb calculations could arguably be based on more substance than the cloned return approach. Regardless, the cloned return approach is, at best, a rule of thumb calculation in clear contradiction to this Supreme Court standard.

6. The awarded return must be determined by independent judgment.

Out of all the legal standards presented in this testimony, the cloned return approach most obviously violates the "independent judgment" standard. In this case the Commission has the opportunity to hear from several qualified witness presenting their opinions on well-established financial models including the CAPM, DCF, and similar models. Corporations and investors around the world have consistently relied on these models for decades to

estimate cost of equity capital. They use these models to make important decisions with massive financial and economic implications. With all of this knowledge available to the Commission, along with several qualified experts in this case costing stakeholders hundreds of thousands of dollars, as well as hundreds of pages of testimony and analysis, and countless hours of time spent on this issue, it would be both fundamentally flawed and legally problematic if the Commission's decision was based on nothing more than this:

> The recently awarded returns from other jurisdictions, which were apparently based on previous awarded returns from other jurisdictions, which were apparently based on previous awarded returns from other jurisdictions, on average, are about 9.3 percent.

Regardless of the Commission's awarded rate of return in this case, it should be based on an independent judgment of OG&E's cost of capital.

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 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.[12] 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:[13]

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*

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

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

[13] *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.

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 the Discounted Cash Flow Model and the Capital Asset Pricing 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 cost of equity estimate.[14]

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 OG&E. This is because the financial models used in this case require information from publicly-traded firms, such as stock prices and dividends.

Q. Describe the proxy group you selected.

A. In this case I used the same proxy group chosen by the Company's witness, Mr. Hevert. There could be reasonable arguments made for the inclusion or exclusion of particular companies concerning this group, but for all intents and purposes, the cost of equity

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

estimates in rate cases are influenced far more by the inputs to the various financial models we use than the composition of the proxy groups.[15]

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, resulting in reduced sales revenue. This is an example of project risk.[16] 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

[15] *See* Exhibit DG 1-3.

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

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.[17]

Q. Firm-specific risk is diversifiable.

A. Yes. One of the fundamental concepts in finance is that firm-specific risk can be eliminated through diversification.[18] 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 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.[19] For example, an investor who had their entire portfolio invested in Enron stock at the

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

[18] *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).

[19] *See* Damodaran *supra* n. 16, at 64.

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.[20] 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, 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

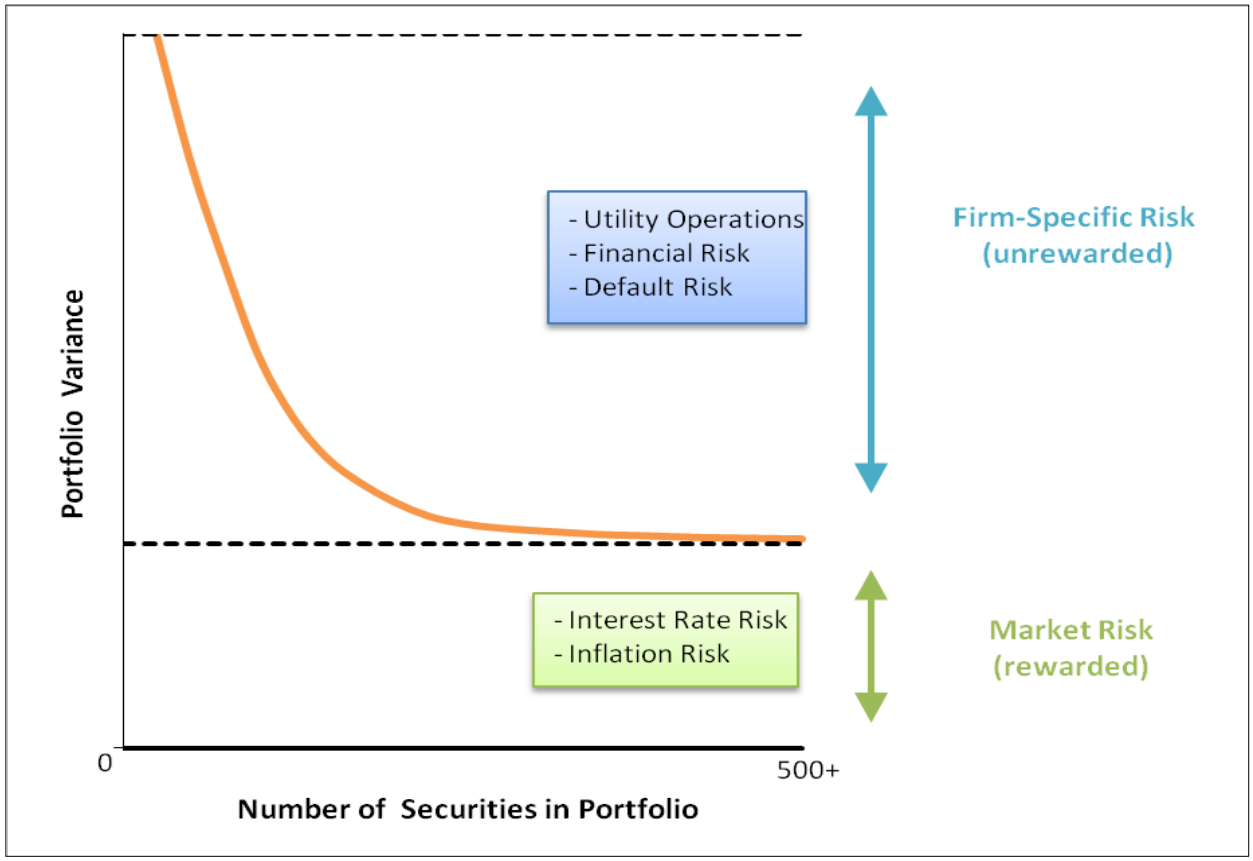
[20] *Id*.

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).[21]

These important concepts are illustrated in the figure below.

Figure 4:
Effects of Portfolio Diversification



[21] *See* Graham, Smart & Megginson *supra* n. 18, 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."[22] 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

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

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.

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."[23] 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."[24] 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.[25]

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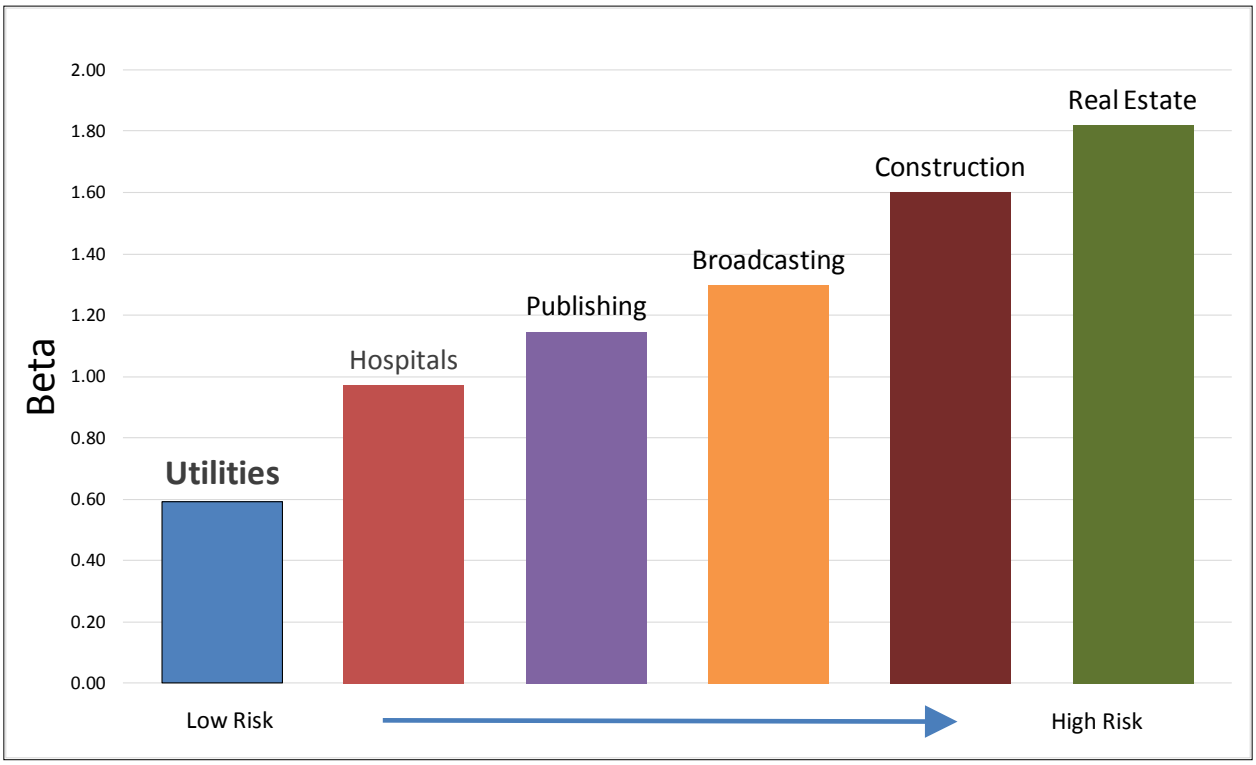
[23] *See* Bodie, Kane & Marcus *supra* n. 16, at 382.

[24] *Id*. at 383.

[25] *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. The fact that the utility industry is one of the lowest risk industries in the country should not change from year to year.

Figure 5:
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 awarded return.

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

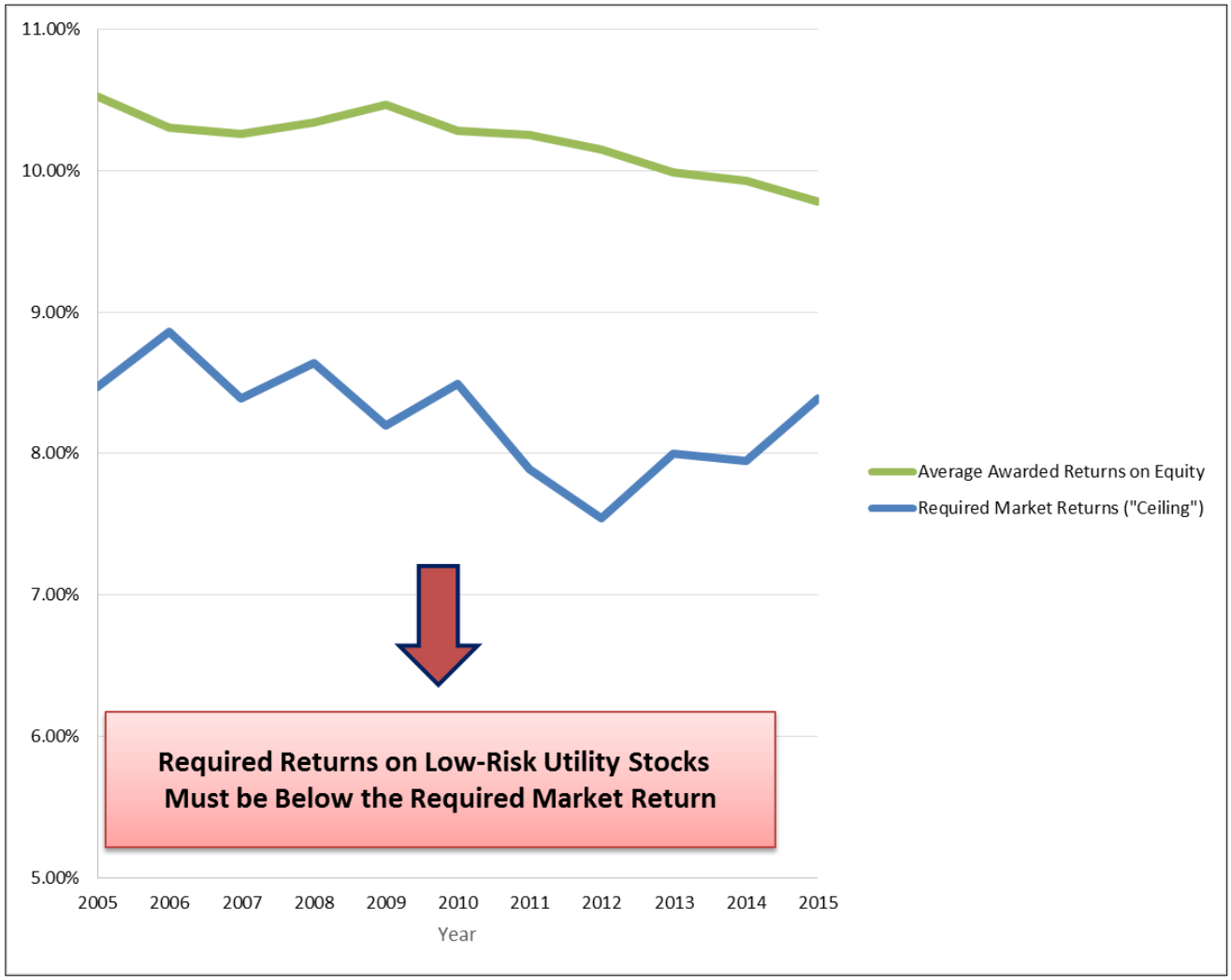
A. Yes. This is the basic concept of the risk and return doctrine: The more (less) risk an investor assumes, the larger (smaller) return the investor will demand. So, if a particular stock is less risky than the market average, then an investor in that stock will require a smaller return than the average return on the market. Since utilities are low-risk companies with low betas, the required return ("cost of capital") for utilities is lower than the required return on the overall market.

Q. Commission-awarded returns on equity have exceeded the required market returns for at least the last ten years.

A. Yes. Although it is indisputable that the true required return on utility stocks must be less than the required return on the overall market (the "ceiling), the commission-awarded returns on equity have actually exceeded the ceiling over the past ten years, as shown in the figure below.[26]

[26] *See also* Exhibit DG 1-16.

Awarded Returns on Equity vs. Average Market Return (2005 – 2014)



There are several potential explanations why awarded returns have consistently exceeded utilities' cost of capital. First, many "awarded" returns arise from settlements. Settled returns are generally much higher than the cost of capital because utilities often make concessions with other issues in a rate case in exchange for being able to report a higher awarded return to their shareholders. Second, utilities' expert witnesses have apparently done an effective job advocating for their clients and convincing regulators that it is proper

to consider the awarded returns from other jurisdictions in making their decisions. Third, many years ago utilities' cost of equity may have actually been as high as nine percent. In fact, during the early 1990s, the average required market return (the "ceiling") was around 12 percent, so the cost of equity for low-risk utility stocks could have been around 9.0 percent. Since the early 1990s, however, interest rates have dramatically declined among other economic changes, and it is clear that awarded returns have failed to keep pace with decreasing equity costs. Finally, it is clear that regulators consider the returns awarded in other jurisdictions when making their decisions. As discussed in detail above, 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 fails to comply with the Supreme Court's standards and generally prevents awarded returns from changing to reflect current economic and financial conditions. Regardless of the reason, however, it is abundantly clear that awarded returns have exceeded utility cost of equity for a long time. When awarded returns exceed the cost of equity, it results in an inappropriate transfer of wealth from ratepayers to shareholders and the federal government. Moving the allowed return closer to the Company's cost of equity in this case will comply with the Supreme Court's standards, allow the Company to remain financially healthy, and partially reduce the confiscation of excess wealth from ratepayers.

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*

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]

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[27] *See* Parcell *supra* n. 12, at 134.

[28] *See* Bodie, Kane & Marcus *supra* n. 17, at 410.

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

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 more 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*

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

[30] *See* Parcell *supra* n. 12, at 124-26.

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 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

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

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

[33] *See* Exhibit DG 1-4.

[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.

the "P_0" term in the DCF Model should technically be the current stock price, rather than an average.

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

A. 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]

[35] Exhibit DG 1-4. 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.

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 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.[37]

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

[37] *See* Exhibit DG 1-7.

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.

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.

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

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 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, many utility operating companies in the U.S. are over 100 years old. Utility shareholders would rather receive relatively higher dividend compensation.[41] The figure below illustrates the well-known business / industry life-cycle pattern.

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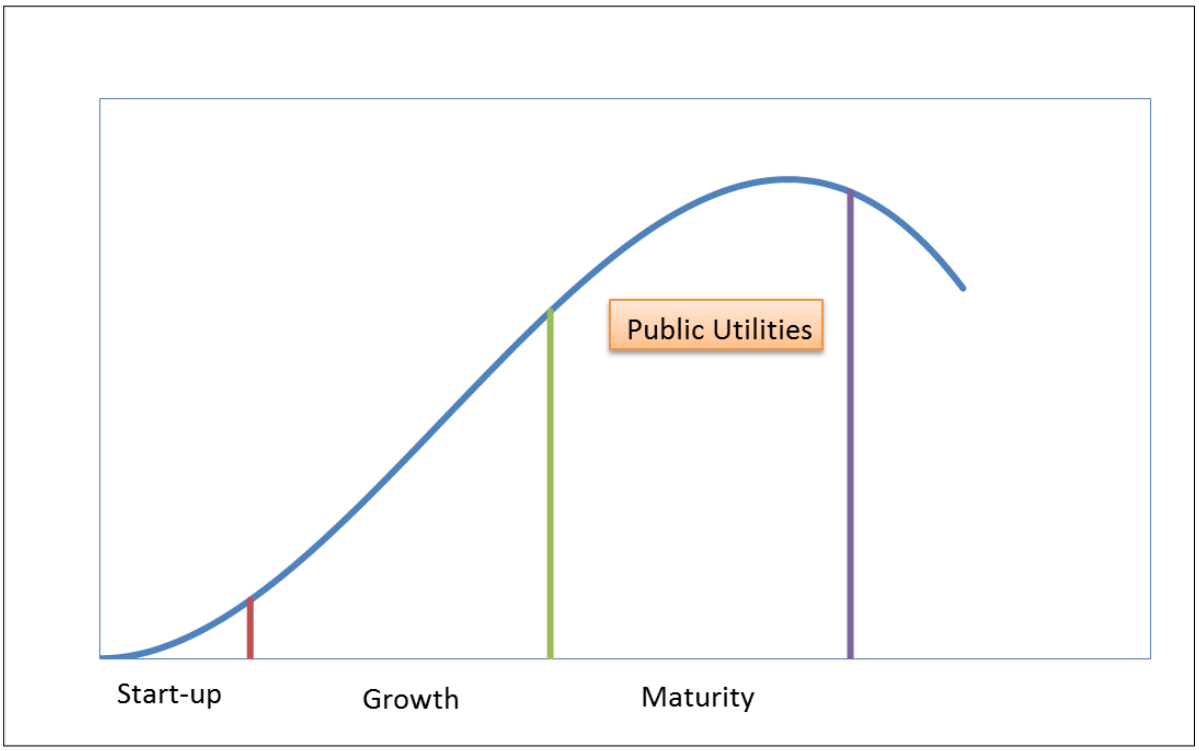
[39] *See id.*

[40] Exhibit DG 1-6.

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

Figure 6:
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 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 [the firm's] projects."[42] 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.[43] I calculated the fundamental growth rate for each proxy company over the last four years, and averaged the results with the historical dividend growth and projected earnings growth discussed above.[44]

[42] *See* Damodaran *supra* n. 16, at 285.

[43] *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).

[44] Exhibit DG 1-6.

Q. The stable growth rate cannot exceed the growth rate of the economy, especially for a regulated utility company.

A. Yes. A fundamental concept in finance is that no firm can grow forever at a rate higher than the growth rate of the economy in which it operates.[45] Thus, the constant growth rate used in the DCF Model should not exceed the aggregate economic growth rate. This is especially true when the DCF Model is conducted on public utilities because public utilities have defined service territories beyond which they cannot grow. In fact, it would not be unreasonable to assume that a regulated utility would grow at a rate that is less than the economy as a whole. Unlike competitive firms, which might grow by launching a new product line, franchising, or expanding into new and developing markets, public utilities cannot do any of these things to grow. Gross domestic product ("GDP") is one of the most widely-used measures of economies production, and is used to measure aggregate economic growth. According to the U.S. Energy Information Administration's Annual Energy Outlook 2015, U.S. economic growth is not expected to exceed 3.0 percent at any time up to 2040.[46] Thus, I capped my estimates for short-term projected growth and fundamental growth for the proxy group at 3.0 percent.[47] This ensures that the results of my DCF Model do not reflect the unrealistic assumption that a regulated utility with a defined service territory could actually grow at a rate that is greater than the entire U.S. economy.

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[45] *See* Damodaran *supra* n. 16, at 306.

[46] U.S. Energy Information Administration's Annual Energy Outlook 2015 (executive summary), ES-3.

[47] Exhibit DG 1-6.

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 first quarter of 2016, and an average of three reasonable methods for estimating the growth rate. The average DCF result of the proxy companies using the Quarterly Approximation DCF Model is 6.56 percent.[48]

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.[49] 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;

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;

[48] Exhibit DG 1-7.

[49] William F. Sharpe, *A Simplified Model for Portfolio Analysis* 277-93 (Management Science IX 1963); *see also* Graham, Smart & Megginson *supra* n. 18, at 208.

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.[50]

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 a business. According to the Supreme Court, "the amount of risk in the business is a most important factor" in determining the allowed rate of return.[51] The Court also held that "the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks."[52] The CAPM is arguably the strongest of the models usually presented in rate cases because unlike the DCF Model, the CAPM directly measures the most important component of a fair rate of return analysis: Risk.

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[50] *See id.*

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

[52] *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.[53] 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 2.77 percent.[54]

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. 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

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

[54] Exhibit DG 1-8.

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 market portfolio, divided by the portfolio's variance, as expressed in the following formula:[55]

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.[56] 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 monthly 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.[57] I then conducted a regression analysis for each proxy company using the

[55] Graham, Smart & Megginson *supra* n. 18, at 180-81.

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

[57] Exhibit DG-C-9.

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 for the NYSE Composite Index over a five year period.[58] The slopes of the linear regression lines produced by my regression analyses are the betas for each proxy company.[59] 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.[60] Some analysts use an adjustment method proposed by Blume, which adjusts raw betas toward the market mean of one.[61] 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

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[58] Value Line, Using Beta, http://www.valueline.com/Tools/Educational_Articles/Stocks/Using_Beta.aspx.

[59] Exhibit DG 1-10.

[60] *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).

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

the notion that betas move toward 1.0 over time, the [Blume adjustment] strikes us as arbitrary and not particularly useful."[62] 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 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.[63] 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."[64] The Vasicek beta adjustment equation expressed is 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*

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

[63] Oldrich A. Vasicek, *A Note on Using Cross-Sectional Information in Bayesian Estimation of Security Betas* 1233-1239 (Journal of Finance, Vol. 28, No. 5, December 1973).

[64] 2012 Ibbotson Stocks, Bonds, Bills, and Inflation Valuation Yearbook 77-78 (Morningstar 2012).

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:

> 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.[65]

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."[66] 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

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

[66] Gombola *supra* n. 60, at 92 (emphasis added).

one."[67] 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.[68]

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."[69] 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

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

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

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

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.,[70] reports both the geometric mean and arithmetic mean for the returns of stocks and government bonds in its annual yearbooks.[71] 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.[72] Using at least 50 years of data is ideal. I have considered returns from 1926 – 2014 in my historic ERP estimate.[73]

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[70] *Id*. at 173.

[71] 2015 Ibbotson Stocks, Bonds, Bills, and Inflation Classic Yearbook 91 (Morningstar 2015).

[72] Damodaran *supra* n. 16, at 162.

[73] Exhibit DG 1-13.

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,[74] 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.[75]

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,[76] it is better to use the geometric average for estimating historical returns.[77] In fact, Ibbotson recognizes that the "equity risk premium is the geometric difference between large-cap stock total returns and U.S. Treasury bill total returns."[78] 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.[79] 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

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[74] Damodaran *supra* n. 16, at 162.

[75] Exhibit DG 1-13.

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

[77] *See* Damodaran *supra* n. 16, at 163.

[78] Ibbotson *supra* n. 71, at 68.

[79] *Id*.

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 25 percent return, 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:

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

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 may be 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.[80]

[80] Exhibit DG 1-13.

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.[81] The average of these two numbers is 5.2 percent, which is the figure I used in my historic ERP estimate.[82]

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.[83] 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 the prospective ERP is lower than the historical ERP.[84] 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.[85] From their extensive analysis, the authors make the following conclusion regarding the prospective ERP:

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[81] Ibbotson *supra* n. 71, at 91.

[82] Exhibit DG 1-13.

[83] Graham, Smart & Megginson *supra* n. 18, at 330.

[84] Dimson, Marsh & Staunton *supra* n. 69.

[85] *Id*. at 34.

> 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.[86]

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%.[87]

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."[88]

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 2015

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[86] *Id*. at 194.

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

[88] Graham, Smart & Megginson *supra* n. 18, at 330.

survey, they found that experts around the country believe that the current risk premium is only 4.51 percent.[89] The IESE Business School conducts a similar expert survey. Their expert survey reported an average ERP of only 5.50 percent.[90] Averaging the ERP results from both surveys provides a very reasonable ERP estimate of 5.0 percent.[91]

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:[92]

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*

[89] 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.

[90] 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

[91] Exhibit DG 1-13.

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

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 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.[93]

[93] *See* Exhibit DG 1-12 for detailed calculation.

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 it is 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.[94] I also calculated the compound annual growth rate (g) from operating earnings. I used these inputs, along with the risk-free rate and current value

[94] *Id*.

of the index to calculate a current expected return on the entire market of 9.03 percent. I subtracted the risk-free rate of 2.77 percent to arrive at the implied equity risk premium of 6.26 percent. Dr. Damodaran, one of the world's leading experts on the ERP, promotes the implied ERP method discussed above. He calculates monthly and annual implied ERPs with this method and publishes his results. According to Dr. Damodaran, the implied ERP for March 2016 was 5.72 percent.[95] Thus, my ERP 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:[96]

[95] http://pages.stern.nyu.edu/~adamodar/

[96] Exhibit DG 1-13.

Figure 7:
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	5.99%	0.6	3.59%
Total		1.0	**5.62%**

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. The ERP I used in my final CAPM calculation is 5.62 percent.[97]

Q. Describe the final results of your CAPM analysis.

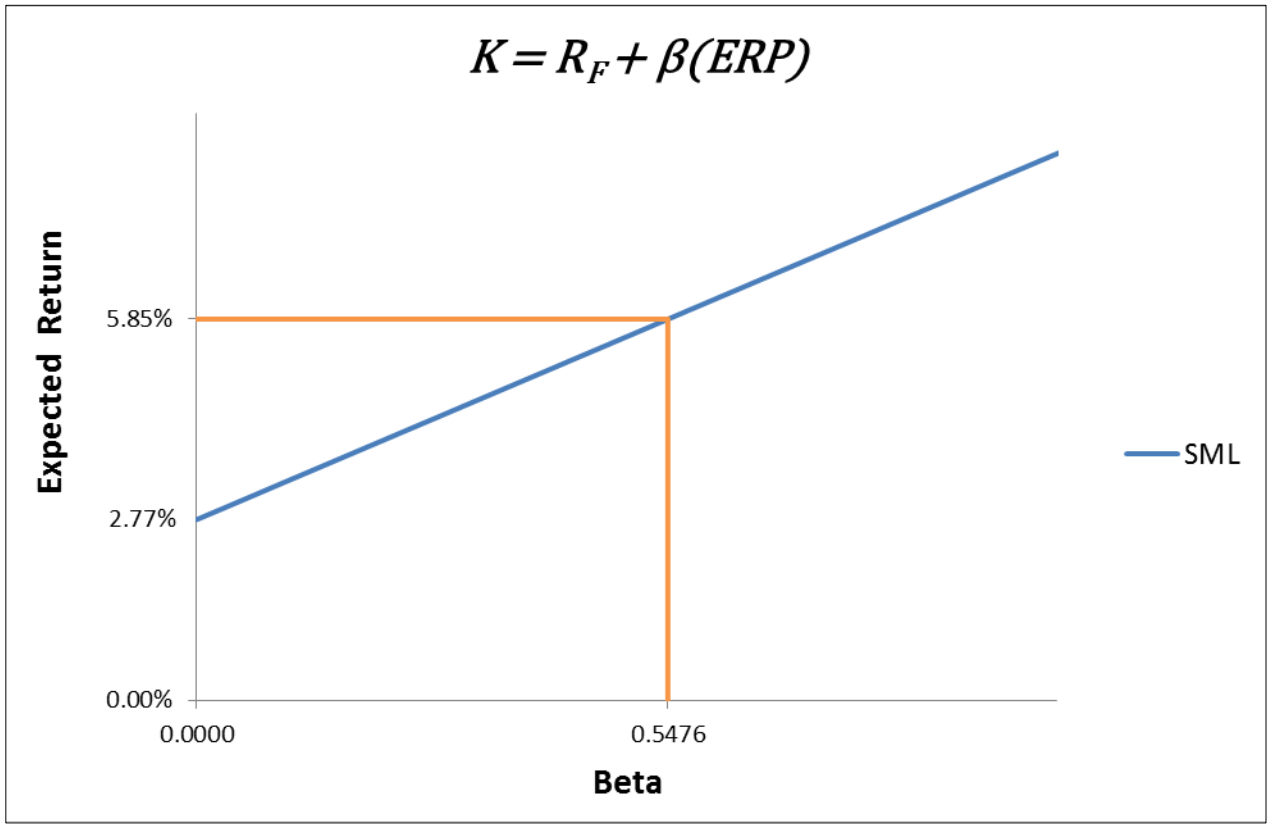
A. Using the inputs for the risk-free rate, beta coefficient, and equity risk premium discussed above, I calculated the CAPM cost of equity for each proxy company. The average CAPM cost of equity is 5.85 percent.[98] The CAPM may be displayed graphically through what is known as the Security Market Line ("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.

[97] Exhibit DG 1-13.

[98] Exhibit DG 1-14.

The SML intercepts the y-axis at the level of the risk-free rate. The slope of the SML is the equity risk premium.

Figure 8:
CAPM Graph



The SML provides the required rate of return that will compensate investors for the beta risk of that investment. Thus, at an average beta of 0.548 for the proxy group, the estimated cost of equity for OG&E is 5.85 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 averaging the earned returns on equity of other comparable companies. The CEM stems from the *Hope* standard that says the return to the equity owner should be commensurate with returns on investments in companies with similar risk.[99]

Q. The only proper way to conduct the Comparable Earnings Model is to consider a group of competitive firms with similar risk profiles and business operations, 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. The only fundamentally sound way to conduct the CEM, however, would be to consider the actual returns of a group comparable unregulated 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. This is because

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

there is no other comparable industry with the extremely low risk profile of the utility industry.

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:

> 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.[100]

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 should be disregarded. In addition, any CEM conducted on a utility proxy group fails to 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

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

term in the CAPM). Furthermore, 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 firms do not use their competitors' earnings as a basis for calculating their own cost of equity. This is because there are far superior models available, such as the CAPM and DCF Model. Thus, the CEM is apparently 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. In summation, there are six important reasons why any CEM conducted on a proxy group of utilities should be disregarded: 1) the returns of regulated utilities are based on past information; 2) the returns of other utilities were not earned under the restraints of competition; 3) the CEM fails to account for any forward-looking measures; 4) the CEM fails to directly account for market risk; 5) the competitive financial community does not use the CEM to estimate the cost of equity; and 6) the CAPM and DCF are far superior to the CEM, comply with the Supreme Court's standards, and provide a good estimate of the cost of equity.

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 somewhat 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 more than 3,600 riskier firms around the country with an average return on equity of less than 2.0 percent.[101] The figure below illustrates a small sample of these industries:

Figure 9:
Competitive Earnings

Industry	No. of Firms	Average Beta	Return on Equity
R.E.I.T.	221	0.76	7%
Reinsurance	3	1.03	7%
Paper/Forest Products	20	1.52	6%
Semiconductor Equip	46	1.40	6%
Oil/Gas (Integrated)	7	1.54	6%
Diversified	26	1.01	6%
Insurance (General)	20	1.04	5%
Publshing & Newspapers	39	1.45	4%
Engineering/Construction	51	1.32	2%
Real Estate (General/Diversified)	12	1.22	2%
Education	40	1.05	1%
Rubber& Tires	4	1.66	0%
Financial Svcs. (Non-bank & Insurance)	272	0.65	-1%
Real Estate (Development)	21	1.41	-1%
Telecom (Wireless)	19	1.48	-3%
Green & Renewable Energy	28	1.62	-4%
Precious Metals	113	1.29	-4%
Chemical (Basic)	42	1.17	-6%
Steel	36	1.43	-14%
Tobacco	20	1.91	-17%
Metals & Mining	114	1.55	-23%
Oil/Gas (Production and Exploration)	351	1.63	-28%
Coal & Related Energy	38	1.49	-31%
Total / Aveage	**1543**	**1.33**	**-4%**

[101] Exhibit DG 1-17.

As shown in this figure, there are more than 1,500 firms across the country with an average earned return on equity of negative 4.0 percent. This is not to suggest that a regulated utility should ever be awarded a negative return on equity, because it is impossible for the cost of equity to ever be negative, or even below the risk-free rate. This figure shows, however, that the shareholders of these firms have assumed more risk than the Company's shareholders, but have nonetheless received smaller returns. This further demonstrates that regulated utilities are highly insulated from the risks that competitive firms face.

COST OF EQUITY SUMMARY

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

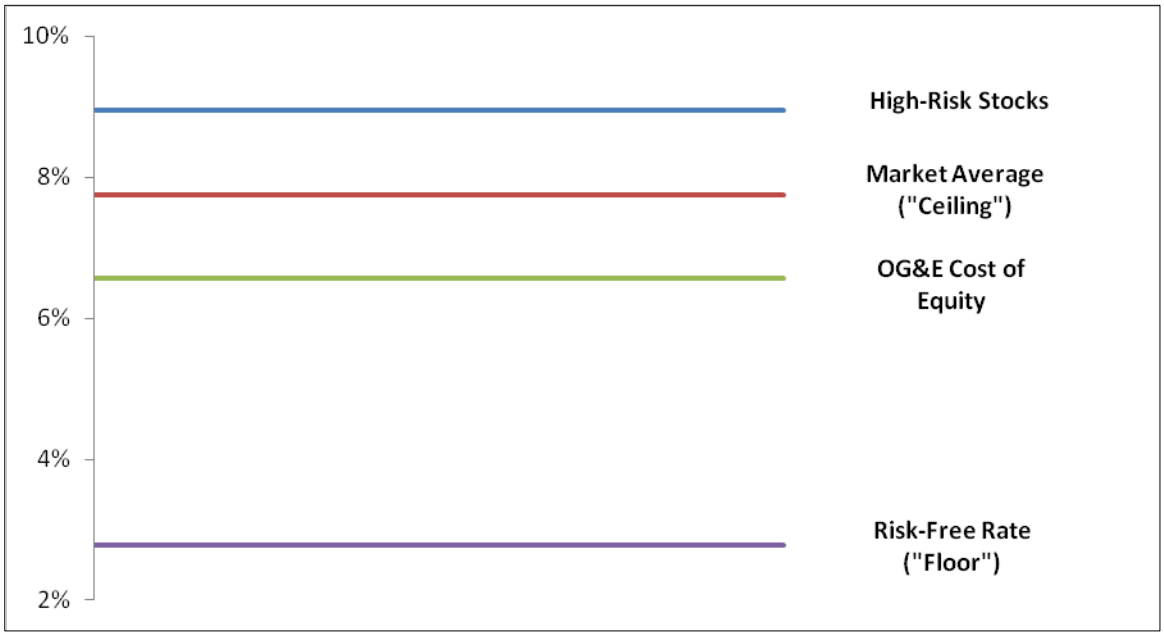
A. The following table shows the cost of equity results from each of the two models I employed in this case.

Figure 10:
Cost of Equity Summary

Model	Cost of Equity
Discounted Cash Flow Model	6.56%
Capital Asset Pricing Model	5.85%
Average	**6.20%**

The average cost of equity of these models is 6.20 percent. This result is not surprising given the fact that the Company's cost of equity must lie above the risk-free rate (the "floor") and below the required return on the market portfolio (the "ceiling"). Currently,

the floor is about 3.0 percent and the ceiling is about 8.0 percent. Thus, it is no surprise that OG&E's cost of equity estimate falls between these two numbers, as shown again in the chart below.



As shown in this figure, high-risk stocks have required returns above the market average, but it is indisputable that utility stocks are consistently and decisively less risky than the average stock in the market.

Q. Describe how you estimated the required return on the market portfolio (the "ceiling").

A. I used two methods to estimate the required return on the market portfolio: 1) consulting a survey of experts; 2) calculating the implied return on the market portfolio. These methods should look familiar since they are two of 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 11:
Required Market Return

IESE Survey	7.90%
Duke CFO Survey	6.63%
PUD Estimate	9.03%
Average	**7.85%**

The IESE Survey and the Duke CFO Survey are the same two surveys I consulted for the equity risk premium.[102] 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.[103] My calculations resulted in a required market return of 9.03 percent, which is noticeably higher than the expert survey results. The average of these sources indicates that the "ceiling" is only 7.85 percent. Again, this means that OG&E's cost of equity must be below 7.85 percent.

[102] *See* Fernandez *supra* n. 90, at p. 5; *see also* Graham *supra* n. 89, at p. 3.

[103] Exhibit DG 1-12 at data point [19].

Q. Describe whether regulatory lag affected the results of your cost of equity analysis.

A. Regulatory lag refers to the time between rate cases when fixed base rates cannot be adjusted to account for changes in costs, including the cost of capital. Regulatory lag often benefits utility companies. As discussed above, required returns on equity have been declining for many years, yet regulators have been generally slow to adapt to this economic reality. During this period of declining required returns, utilities have generally benefited from regulatory lag with regard to commission-awarded returns. When costs increase during the period between rate cases, however, regulatory lag could potentially represent a type of firm-specific business risk for utilities. Recall that firm-specific risks are unrewarded by the market and thus do not have a material impact on a utility's cost of equity. Even if regulatory lag were a type of market risk that could be rewarded, then its effects on risk would already be accounted for in the CAPM analysis. Either way, it would be inappropriate to make an additional adjustment to the cost of equity estimation to account for the effects of regulatory lag.

COST OF DEBT

Q. Describe OG&E's position regarding long-term debt financing.

A. OG&E had $2,655,459,848 of long-term debt capital during the test year at a cost of 5.62 percent. The Company's cost of debt calculation is based on the yield to maturity, and appears to have been calculated correctly.[104]

[104] WP F-3 Pro Forma.

Q. OG&E's cost of debt is markedly high given its very low debt ratio and high bond rating.

A. Yes. By comparison, PSO's cost of debt was recently calculated to be only 4.92 percent, and its Moody's bond rating was A3.[105] OG&E's current Moody's bond rating of A1 is two levels higher than PSO's rating, which means that its cost of debt should be about 75 basis points lower than PSO's rating. Instead, however, OG&E's cost of debt is about 70 basis points higher than PSO's cost of debt. Based on a recent study from the NYU Stern School of business that looked at all rated companies in the U.S., OG&E's cost of debt should be only around 3.87 percent given its Moody's bond rating.[106] This would indicate that compared to other companies around the country, OG&E's cost of debt is remarkably high.

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 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

[105] *See* Responsive Testimony of David J. Garrett filed October 14, 2015 in Cause No. PUD 201500208, p. 65-66.

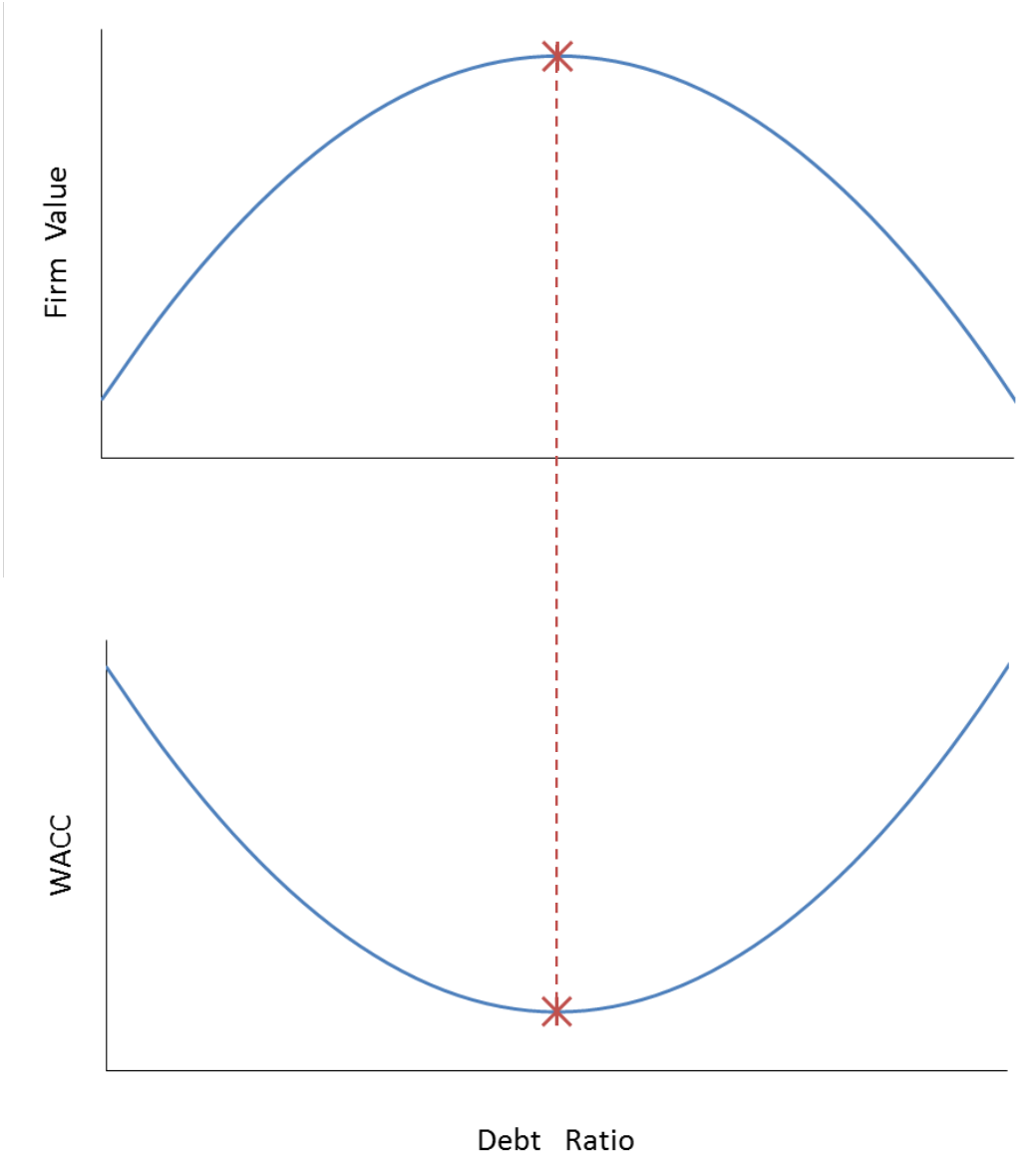
[106] *See* Exhibit DG 1-19.

that stockholders have a lower priority to claims on company assets increases their risk and required return relative to bondholders. 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 higher returns 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. Thus, a Commission standing in the place of competition must ensure that the regulated utility is operating at the lowest reasonable WACC.

[107] *See* Graham, Smart & Megginson *supra* n. 18, at 440-41.

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:

> 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. It is not appropriate to simply look at the capital structures of the proxy group in assessing a prudent capital structure.

A. Yes. Utility witness often argue that regulators should consider the capital structures of other regulated utilities in assessing the proper capital structure. This type of analysis is oversimplified and insufficient for three important reasons:

[108] Damodaran *supra* n. 16, at 196 (emphasis added).

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; in fact, they have a financial incentive to do the opposite. Competitive firms, in contrast, can maximize their value by minimizing their cost of capital. Competitive firms minimize their cost of capital by including a sufficient amount of debt in their capital structures. Simply comparing the debt ratios of other regulated utilities will not indicate an appropriate capital structure for the Company. Rather, it will indicate debt ratios that are far 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, not a regulated environment. This duty cannot be accomplished by simply looking at the capital structures of other regulated utilities or the target utility's test-year capital structure.

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

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

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 effects 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 Spreads

Ratings Table			
Coverage Ratio	Bond Rating	Spread	Interest Rate
> 8.5	Aaa/AAA	0.75%	3.52%
6.5 - 8.49	Aa2/AA	1.00%	3.77%
5.5 - 6.49	A1/A+	1.10%	3.87%
4.25 - 5.49	A2/A	1.25%	4.02%
3.0 - 4.24	A3/A-	1.75%	4.52%
2.5 - 2.99	Baa2/BBB	2.25%	5.02%
2.25 - 2.49	Ba1/BB+	3.25%	6.02%
2.0 - 2.249	Ba2/BB	4.25%	7.02%
1.75 - 1.99	B1/B+	5.50%	8.27%
1.5 - 1.74	B2/B	6.50%	9.27%
1.25 - 1.49	B3/B-	7.50%	10.27%
0.8 - 1.249	Caa/CCC	9.00%	11.77%

As shown in this table, the spreads over the risk-free rate gradually increase as bond ratings fall.[109] 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 the "prime" rate, which is available to borrowers with stellar credit scores. As credit scores decrease, however, the offered interest rate will increase. The 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

[109] 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.

and taxes ("EBIT"). (Likewise, the mortgage lender would consider the borrower's personal income-debt ratio). The formula for the interest coverage ratio is as follows:

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:[110]

[110] Damodaran *supra* n. 16, 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 OG&E'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 OG&E's weighted average cost of capital ("WACC") based on increasing debt ratios. Utilities will often suggest the following misleading narrative to regulators: "If we issue more debt, our risk will increase which will raise our cost of debt and also raise our cost of equity." While there is some truth to this narrative, it is very misleading for one important reason: It fails to acknowledge that the only cost that matters here is the weighted average cost of capital, not the individual components of capital.

Figure 14:
OG&E'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%	0.496	5.56%	0	0	∞	3.52%	2.16%	5.56%
40%	67%	0.699	6.70%	2,278,903	128,074	3.91	4.52%	2.77%	5.12%
50%	100%	0.800	7.26%	2,848,629	160,093	3.13	4.52%	2.77%	5.02%
52%	108%	0.825	7.41%	2,962,574	166,497	3.01	4.52%	2.77%	4.99%
55%	122%	0.867	7.64%	3,133,492	176,102	2.84	5.02%	3.07%	5.13%
60%	150%	0.952	8.12%	3,418,355	192,112	2.60	5.02%	3.07%	5.09%
62%	163%	0.992	8.34%	3,532,300	198,515	2.52	5.02%	3.07%	5.08%
63%	170%	1.013	8.46%	3,589,272	201,717	2.48	6.02%	3.69%	5.45%
69%	217%	1.157	9.27%	3,902,621	219,327	2.28	7.02%	4.30%	5.86%
90%	900%	3.230	20.91%	5,127,532	288,167	1.74	8.27%	5.07%	6.65%

As shown in this figures, the misleading narrative offered by utilities is indeed partially correct. The column on the far left shows increasing levels of debt ratios. At zero percent debt, the utility's beta is completely unlevered, its cost of equity is only 5.56 percent, and its cost of debt (pre-tax) is only 3.52 percent. As the debt ratio is increased to 40 percent, notice that both the cost of equity and the cost of debt increase (6.70 percent and 4.52 percent respectively). However, notice that the weighted average cost of capital in the far right column actually decreases from 5.56 percent to 5.12 percent. How could this happen? Recall the basic weighted average cost of capital formula:

Weighted Average Cost of Capital = (Debt Ratio x Cost of Debt) + (Equity Ratio x Cost of Equity)

As the debt ratio increases, both the cost of debt and the cost of equity rise, however, the equity ratio also falls. This means the firm is replacing the higher-cost equity with the lower-cost debt as it increases the debt ratio. As shown in the figure above, at a debt ratio of 52 percent, OG&E's weighted average cost of capital is minimized at 4.99 percent. This is the number upon which the Commission should base its awarded return. At first glance, it would appear that OG&E's optimal debt ratio is around 52 percent. However, this

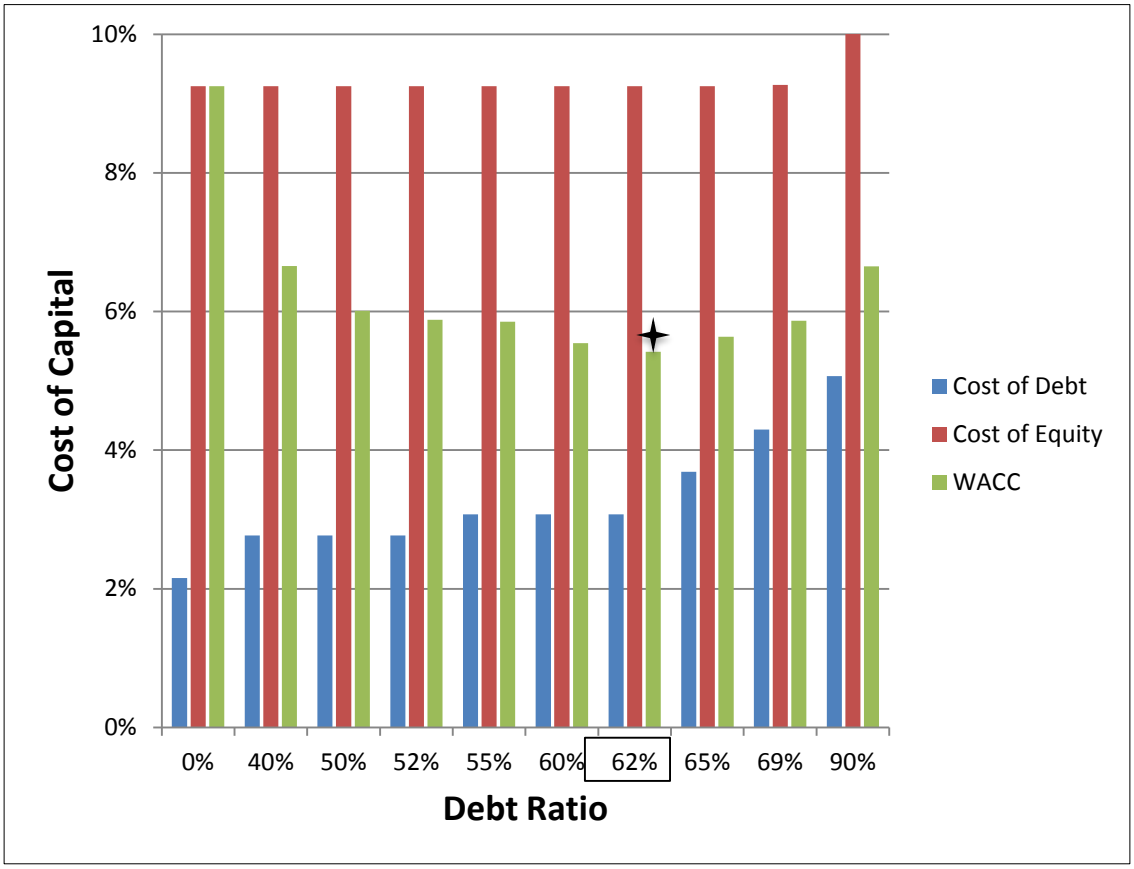
estimate assumes that OG&E's cost of equity is properly estimated at 7.41 percent (see the cost of equity column in the figure). In fact, OG&E's awarded return on equity (regardless of which recommendation the Commission chooses in this case) will be much higher than its actual cost of equity. If, for example, the Commission adopts PUD's high recommended awarded return on equity of 9.25 percent, OG&E's weighted average cost of capital would be minimized at a debt ratio of about 62 percent, not 52 percent, as shown in the following table.

Figure 15:
OG&E's WACC at a 9.25 Percent Inflated Cost of Equity

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%		9.25%	0	0	∞	3.52%	2.16%	9.25%
40%	67%		9.25%	2,278,903	128,074	3.91	4.52%	2.77%	6.66%
50%	100%		9.25%	2,848,629	160,093	3.13	4.52%	2.77%	6.01%
52%	108%		9.25%	2,962,574	166,497	3.01	4.52%	2.77%	5.88%
55%	122%		9.25%	3,133,492	176,102	2.84	5.02%	3.07%	5.85%
60%	150%		9.25%	3,418,355	192,112	2.60	5.02%	3.07%	5.54%
62%	163%		9.25%	3,532,300	198,515	2.52	5.02%	3.07%	5.42%
65%	186%		9.25%	3,703,217	208,121	2.40	6.02%	3.69%	5.63%
69%	217%		9.27%	3,902,621	219,327	2.28	7.02%	4.30%	5.86%
90%	900%		20.91%	5,127,532	288,167	1.74	8.27%	5.07%	6.65%

Contrast this figure with the one before it. Notice in this figure that the cost of equity does not increase as the debt ratio moves to 40 percent, to 50 percent, and even as high as 65 percent. This is because OG&E's actual cost of equity does not increase above 9.25 percent until its debt ratio rises as high as 69 percent. Thus, at an awarded return on equity of 9.25 percent, OG&E's debt ratio should be about 60 percent, as illustrated in the figure below.

Figure 16:
OG&E's Optimal Capital Structure



All of 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.

Q. Hundreds of competitive firms around the country utilize high debt ratios in order to maximize profits.

A. Yes. In fact, there are currently more than 1,000 firms across the country with debt ratios of 60 percent or greater, with an average debt ratio of 68 percent, as shown in the following figure:[111]

Figure 17:
Industries with Debt Ratios of 60 Percent or Greater

Industry	Number of Fimrs	Debt Ratio
Advertising	44	73%
Auto & Truck	19	74%
Bank (Money Center)	9	67%
Beverage (Soft)	43	64%
Broadcasting	29	68%
Brokerage & Investment Banking	42	77%
Cable TV	19	69%
Coal & Related Energy	38	69%
Farming/Agriculture	37	55%
Hospitals/Healthcare Facilities	58	66%
Hotel/Gaming	73	61%
Office Equipment & Services	24	67%
Packaging & Container	25	63%
Paper/Forest Products	20	74%
R.E.I.T.	221	64%
Restaurant/Dining	83	61%
Retail (Automotive)	26	70%
Retail (Building Supply)	5	67%
Retail (Distributors)	83	60%
Telecom (Wireless)	19	61%
Telecom. Services	65	65%
Tobacco	20	85%
Trucking	26	74%
Total / Average	**1028**	**68%**

[111] *See* Exhibit DG-C-22.

Many of the industries shown here, like public utilities, are generally well-established industries with large amounts of capital assets. There are several notable industries that are relatively comparable to public utilities in some ways. For example, the Cable TV industry has an average debt ratio of about 69 percent. Likewise, the telecommunication services industry has a debt ratio of 65 percent. In PSO's recent rate case, its test-year debt ratio was about 56 percent. Even though PSO's debt test-year debt level was less than optimal in that case, PUD recommended a 56 percent debt ratio for PSO.[112]

Q. OG&E's debt limit is 65 percent.

A. Yes. As stated in OGE Energy Corp.'s annual report: "Pursuant to the [debt] restriction in OG&E's revolving credit agreement, OG&E must also maintain a percentage of debt to total capitalization at a level that does not exceed 65 percent."[113] While OG&E may be bound by the terms of its revolving credit agreement with regard to its debt ratio, this Commission is not. In other words, the Commission has the authority, and the duty, to impute a proper capital structure when the Company's capital structure is not reflective of one that would exist in competitive environment. Regardless, this provision demonstrates that OG&E's own lenders are willing to let the Company have a debt ratio of up to 65 percent.[114] Nonetheless, we are generally led to believe that the Company will suffer significant, negative financial impact if it were to increase its debt ratio even slightly. If

[112] See Responsive Testimony of David J. Garrett re Cost of Capital, filed October 14, 2015 in Cause No. PUD 201500208, p. 105.

[113] OGE Energy Corp. 2014 10-K, p. 44.

[114] While accounting for the dividend restriction.

this were the case, would the Company's own lenders not enforce a much lower debt restriction? In addition, in the prospectus for the most recent public offering of long term debt, the Company specifically states that "there is no limit on the amount of debt that we may issue."[115]

Q. Summarize your conclusions with regard to capital structure.

A. All of the evidence presented here with regard to capital structure clearly indicates that OG&E's debt ratio is far below one that could be considered reasonable – one that would exist in a competitive environment. The following figure summarizes the various debt ratios discussed in this section:

[115] OG&E Supplement to Prospectus Dated May 3, 2013 regarding $250,000,000 Senior Notes due December 15, 2044, S-6, as provided in the response to Data Request OIEC-7-4(e).

Figure 18:
Debt Ratio Comparison Summary

Description	Debt Ratio
Cable TV Industry	69%
Coal Industry	69%
Wireless Telecom Industry	61%
Telecom Services Industry	65%
Power Industry	56%
PSO's Recent Test Year Level	56%
Over 1,000 other Firms	65%
OG&E's Stated Limit	65%
PUD's Calculation	62%
OG&E's Actual Level	47%

When a utility's debt ratio is far below a reasonable level, a Commission standing in the place of competition should impute a debt ratio that would exist in a competitive environment, and at least partially limit the inappropriate transfer of excess wealth from Oklahoma ratepayers to shareholders and the IRS.

SPECIFIC RESPONSES TO OG&E'S COST OF CAPITAL TESTIMONY

Q. Describe OG&E's position regarding the cost of capital and capital structure.

A. Mr. Hevert recommended a return on equity in the range of 10.25 percent to 10.75 percent, along with a cost of debt of the Company's proposed cost of debt and capital structure consisting of 53.31 percent debt and 46.69 percent equity.[116]

Q. Discuss your specific responses to Mr. Hevert's testimony concerning the return on equity.

A. I have organized my specific responses to Mr. Hevert's testimony by topic, including DCF Analysis, CAPM Analysis, Bond Yield Plus Risk Premium Analysis, flotation costs, and capital structure.

Discounted Cash Flow Analysis

Q. Describe Mr. Hevert's position regarding the DCF Model.

A. Mr. Hevert used two forms of the DCF Model in his analysis, including the Constant Growth DCF Model and the Multi-Stage DCF Model.

Q. The results of Mr. Hevert's Constant Growth DCF Model are unreasonably high due to his high growth rate estimates.

A. Yes. As discussed above, the long-term, constant growth rate for any regulated utility company cannot exceed the growth rate of the entire economy, and in fact may be less than the growth rate of the entire economy. According to the EIA (and many other sources),

[116] Direct Testimony of Robert B. Hevert p. 65.

U.S. GDP growth is not expected to rise above 3.0 percent, as discussed above. Thus, the long-term growth rates used for every proxy company in Mr. Hevert's Constant Growth DCF Model should all be below 3.0 percent. However, Mr. Hevert's growth rate estimate for every company in the proxy group all exceed the growth rate of the entire U.S. economy. For example, Mr. Hevert expects that PNM Resources Inc. will grow at a rate of more than twice the rate of the entire U.S. economy, despite the fact that PNM Resources, like all regulated utilities, has a defined service territory.[117]

Q. Mr. Hevert has proposed extremely high growth rate estimates in the past.

A. Yes. One aspect of growth rate projections is that they may be tested for accuracy in the future. In OG&E's 2011 rate case, Mr. Hevert used projected growth rate estimates in his DCF analysis and equity risk premium analysis. A review of Mr. Hevert's prior growth rate estimates reveals some alarming figures. The table below shows a sample of Mr. Hevert's projected growth rate estimates in OG&E's 2011 rate case, and contrasts them to the actual growth rates observed over the same time period.[118]

[117] Exhibit RBH-1, p. 3

[118] Exhibit DG 1-22.

Figure 19:
Illustration of Earnings Growth Volatility

Company	Ticker	Hevert's Prior Growth Rate Estimate	Actual Growth in Earnings	Amount Overestimated
Amazon	AMZN	29%	-40%	69%
Consol Energy	CNX	47%	-6%	53%
EOG Resources Inc.	EOG	44%	10%	34%
Netflix Inc.	NFLX	30%	8%	23%
NRG Energy	NRG	25%	-32%	57%
Range Resources	RRC	29%	-3%	32%
Southwestern Energy	SWN	23%	9%	14%
Starwood Hotels & Resorts	HOT	25%	10%	15%
Textron Inc.	TXT	45%	-12%	57%
Wynn Resorts LTD	WYNN	50%	28%	23%
Average		35%	-3%	37%

I will reiterate the basic Constant Growth DCF Model, which is essentially the model that both Mr. Hevert and I used in this case:[119]

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

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 discount rate (K) must exceed the growth rate (g); and 2) the growth rate is constant every year to infinity. Even Mr. Hevert acknowledges these same assumptions in his

[119] Mr. Hevert and I both used slight variations of this model, but the underlying concepts and assumptions are the same.

responsive testimony.[120] In other words (using the table above as an example), in 2011 Mr. Hevert projected that Wynn Resorts' dividends would grow at a rate of 50 percent, per year, every year, forever. He is also saying that the required return of Wynn Resorts' equity investors exceeds 50 percent. This is, quite literally, an impossible scenario. It is impossible for any company to sustain a 50 percent growth rate, especially for a long period of time, and there is no way that Wynn Resort's cost of equity is even close to 50 percent. In fact, a quick CAPM analysis reveals that Wynn Resort's current cost of equity is only about 10 percent.[121] Not surprisingly, over the past five years Wynn Resort's actual growth rate was about 28 percent – about half the rate Mr. Hevert projected. We see another striking example of Mr. Hevert's overestimated growth rate projections in Amazon. Mr. Hevert projected that Amazon's dividends would grow at 29 percent, per year, every year, forever. Instead, Amazon experience a negative earnings growth of 40 percent, which means that Mr. Hevert overestimated the growth rate by nearly 70 percent.

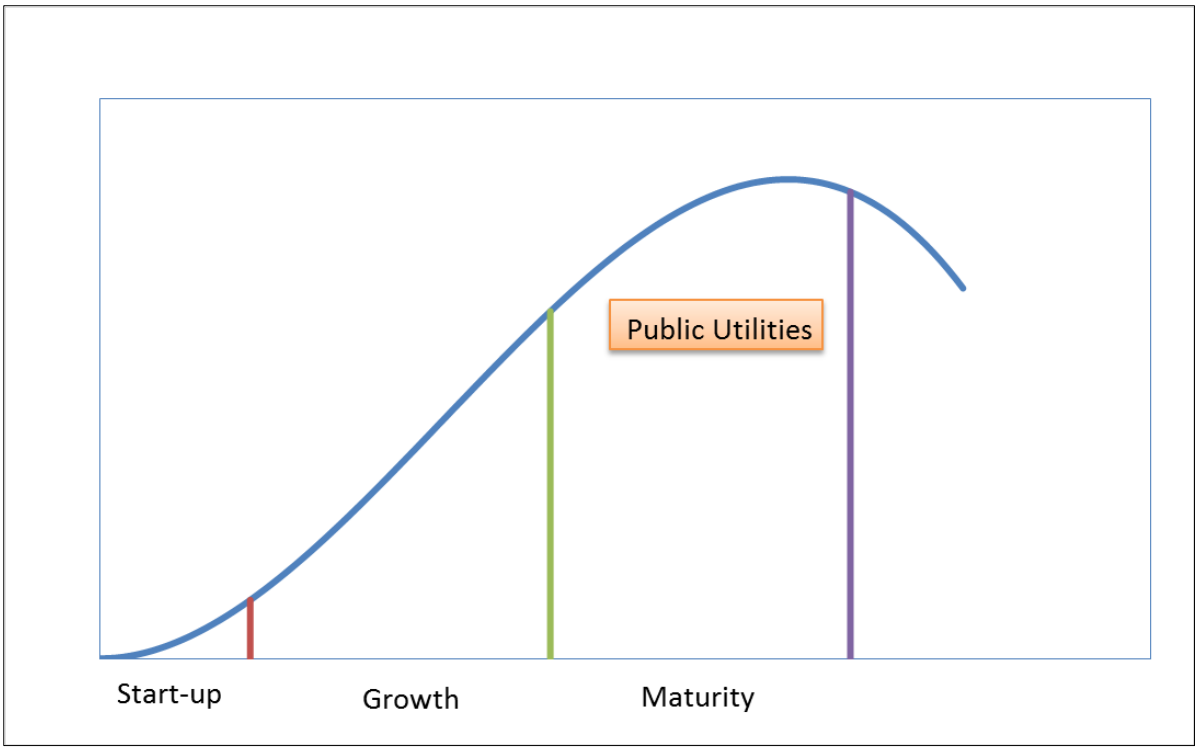
Q. It is not necessary to use a multistage DCF growth model for public utilities.

A. Yes. In addition to employing a constant growth DCF Model, Mr. Hevert also employed a Multi-Stage DCF Model. Multi-Stage DCF Models are generally used for young firms with high growth opportunities. These firms are typically in the earlier stages of the

[120] Responsive Testimony of Robert B. Hevert p. 18:9-13.

[121] The CAPM equation is: cost of equity = risk-free rate + beta x equity risk premium. For Wynn Resorts, I used the beta published by Value Line of 1.35, as well as the risk-free rate of 2.77% and the equity risk premium of 5.62%. The final result is 2.77% + 1.35 x 5.62% = 11.05%.

business cycle. In contrast, utilities are mature, well-established firms with low growth rates. Recall the industry life cycle figure displayed above.



In an industry's early stages, there are ample opportunities for growth and profitable reinvestment in the company. Thus, the shareholders of these young, high-growth companies generally prefer that the company reinvest its earnings into projects with high potential returns to increase the shareholders' capital gains. In contrast, the shareholders of utilities and other mature, low-growth firms prefer to receive compensation in the form of dividends. In fact, when explaining this concept, financial textbooks will sometimes use utilities as the example of mature, low-growth firms and contrast them with high-growth

firms for which the Multi-Stage DCF Model is applicable.[122] In one prominent financial text, the authors contrast a group of electric utilities with a group of computer software companies.[123] After contrasting the payout ratios and growth rates of these two groups of firms, the authors correctly conclude with this well-known concept: "electric utilities are more representative of mature firms. Their median return on capital is lower . . . ; dividend payout is higher. . . ; and average growth is lower. . . . We conclude that the higher payouts of the electric utilities reflect their more limited opportunities to reinvest earnings . . . ."[124] The authors contrasted the group of low-growth utilities with the group of high-growth software companies to make the following point: multi-stage DCF Models are more appropriate for younger firms with high-growth in their early years, not for low-growth firms such as public utilities.

Q. The results of Mr. Hevert's Multi-Stage DCF Model are unreasonably high.

A. Yes. Although it is unnecessary to use Multi-Stage DCF Model to estimate the cost of capital for public utilities, the results of Mr. Hevert's Multi-Stage DCF Model are unreasonably high. The results of Mr. Hevert's Multi-Stage DCF Model are as high as 9.96 percent.[125] A utility's cost of equity must be below the required return on the market portfolio. As stated above, a reasonable estimate of the current required return on the

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

[123] *Id*.

[124] *Id*. at 417.

[125] Exhibit RBH-1.

market portfolio is about 7.85 percent.[126] That means that Mr. Hevert's Multi-Stage DCF produces results that are over 200 basis points higher than the "ceiling" of a utility's cost of equity.

Capital Asset Pricing Model

Q. Mr. Hevert's estimate for the equity risk premium is extremely high.

A. Yes. In his direct testimony, Mr. Hevert testified that the equity risk premium ("ERP") is as high as 10.32 percent.[127] 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. As discussed above, PUD conducted a thorough, robust analysis of the ERP using three reasonable, widely-accepted methods, including: 1) calculating the historical average; 2) consulting expert surveys; and 3) calculating the implied ERP based on aggregate market data. Mr. Hevert used none of these methods. Instead, Mr. Hevert essentially conducted a DCF analysis on every single company in the S&P 500. This approach is inferior to any of the methods PUD employed. This is because Mr. Hevert had to make 1,500 separate inputs for his model: 500 separate inputs for the current stock price, 500 separate inputs for the current dividend, and most importantly, 500 separate estimates for the growth rate. This means that Mr. Hevert's approach requires much more subjectivity and has a much greater potential for error, as indicated by his

[126] *See* Exhibit DG 1-16.

[127] *See* Exhibit RBH-5. Mr. Hevert described the equity risk premium as the "market risk premium." These terms are synonymous.

unreasonably high result. In fact, as shown in Figure 17 above, we have seen that Mr. Hevert's growth rate projections are susceptible to extreme inaccuracy:

Company	Ticker	Hevert's Prior Growth Rate Estimate	Actual Growth in Earnings	Amount Overestimated
Amazon	AMZN	29%	-40%	69%
Consol Energy	CNX	47%	-6%	53%
EOG Resources Inc.	EOG	44%	10%	34%
Netflix Inc.	NFLX	30%	8%	23%
NRG Energy	NRG	25%	-32%	57%
Range Resources	RRC	29%	-3%	32%
Southwestern Energy	SWN	23%	9%	14%
Starwood Hotels & Resorts	HOT	25%	10%	15%
Textron Inc.	TXT	45%	-12%	57%
Wynn Resorts LTD	WYNN	50%	28%	23%
Average		35%	-3%	37%

If the growth rate estimate in a DCF Model misses the mark, it should only be by a few percentage points at most, not by 69 percent (as with Amazon). Furthermore, as discussed above, long-term growth rates this high are literally impossible to achieve. No company can grow at 50 percent, per year, every year, forever (as Mr. Hevert projected with Wynn Resorts). In his estimation of the ERP in this case, Mr. Hevert has once again made 500 growth rate estimates – one for every single firm in the S&P 500. Indeed, some of his projected growth rates in this case may turn out to be lower than estimated, but such a concession misses the broader point: It is not necessary to project 500 different growth rates to arrive at a reasonable estimate of the equity risk premium. In stark contrast to Mr. Hevert's approach to estimating the ERP, PUD relied on three reasonable, widely-accepted and recognized methods. I provided detailed discussion on each of these methods above

in the ERP section of my testimony. I will briefly reiterate these methods, and discuss why each is more reasonable than Mr. Hevert's method.

1. Historical Risk Premium

There is one particular aspect to the historical risk premium that is attractive from an analytical perspective: it relies on reliable, recorded data and does not require projections of the future. While the ERP does not change much over time, there is ample evidence that the forward-looking, *ex ante*, ERP is actually lower than the historical ERP, as discussed in detail in the ERP section above. Mr. Hevert's forward-looking ERP, however, is about twice as high as the historical ERP.

2. Expert Survey Risk Premium

The ERP is not firm-specific. Thus, there is essentially only one ERP that applies to all firms. This aspect of the ERP allows this Commission to consider the opinions of thousands of experts across the country with regard to this specific issue. Fortunately, there are several prominent expert surveys available. The average result of the surveys PUD used in this case indicate an ERP of about five percent.[128] Again, Mr. Hevert's ERP estimate is more than twice as high as what thousands of other experts across the country think.

3. Implied Risk Premium

The implied ERP approach considers the gross cash yields from the S&P 500 and a reasonable growth rate in aggregate earnings. Unlike Mr. Hevert's approach, which

[128] Exhibit DG 1-13.

considers 500 separate stock prices, 500 separate dividends, and 500 separate potentially volatile and overestimated growth rates, PUD's implied ERP considers the actual, aggregate information reported by the S&P 500. In other words, it is not necessary to make 1,500 individual estimates when the S&P simply provides the requisite data in consolidated form.[129] To determine the growth rate, PUD considered the operating earnings reported by the S&P over the past five years. Whereas we've seen that Mr. Hevert's past growth rate projections have been wrong by as much as 69 percent, the reported earnings PUD used to determine the growth rate are accurate, reliable, and reasonable. The result of PUD's implied ERP calculation is 6.26 percent, which is higher than the estimated ERP of thousands of experts across the country. Regardless, Mr. Hevert's proposed ERP is significantly higher than PUD's estimate.

Q. Contrast and illustrate Mr. Hevert's ERP estimate with the results from these other sources.

A. Mr. Hevert's ERP estimate is about twice as high as the other, reasonable estimates that I presented in this case. The following chart illustrates how unreasonable Mr. Hevert's ERP estimate actually is:

[129] *See* Exhibit DG 1-12.

Figure 20:
Equity Risk Premium Comparison

The weight of authority and analysis contrasting Mr. Hevert's result cannot be overstated:

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 in his annual ERP report.

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 Mr. Hevert's CAPM results due to his inappropriately high estimate for the equity risk premium.

A. Yes. In cost of capital testimony, experts often speak 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 overwhelming evidence presented in PUD's testimony, it is clear that Mr. Hevert's proposed equity risk premium is far outside the range of reasonableness. For these reasons, the Commission should disregard Mr. Hevert's CAPM result.

Bond Yield Plus Risk Premium Analysis

Q. Mr. Hevert's Bond Yield Plus Risk Premium analysis is inappropriate.

A. Yes. Mr. Hevert testified that an alternative approach to estimating the ERP is to consider commission-awarded returns to utilities. This is not a valid method for estimating the ERP because commission-awarded returns do not affect the ERP. In fact, as discussed thoroughly in the Legal Standards section of this testimony, commission-awarded returns should not even be considered in a cost of equity estimate. 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 rate [$ERP=R_M–R_F$]. In other words, the ERP is a function of market-

driven forces. It cannot be influenced by the decisions of a utility commission. For that matter, it cannot be materially influenced by the decisions 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.[130] 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 Mr. Hevert's Bond Yield Plus Risk Premium analysis.

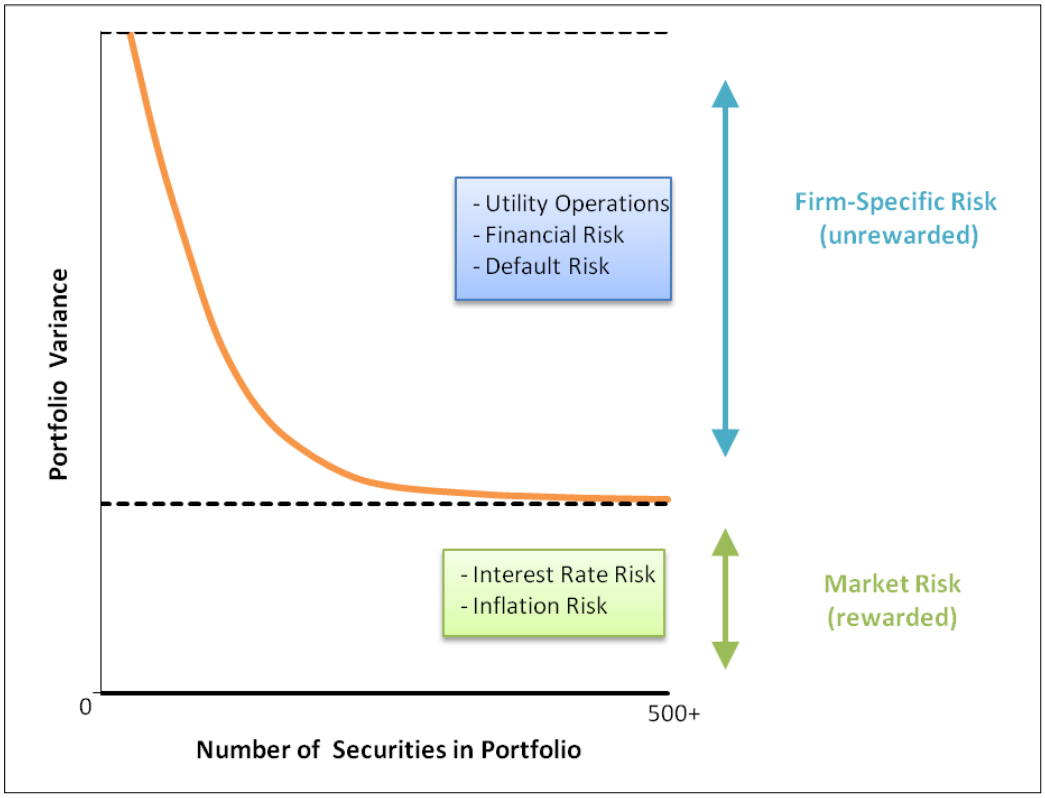
Business Risks

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

A. Yes. 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. Mr. Hevert suggested that certain firm-specific factors should have an increasing effect on the cost of equity, including environmental regulations, capital expenditures, and other rate

[130] 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.

mechanisms.[131] As discussed above, it is a well-known concept in corporate 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.



Therefore, any discussion of the Company's firm-specific business risks in the cause, while perhaps relevant to other issues in the rate case, should have no meaningful 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.

[131] *See generally* Direct Testimony of Robert B. Hevert pp. 34-42.

Q. OG&E does not possess a great amount of firm-specific risk.

A. Yes. Even though firm-specific risk is unrewarded by the market and has no material impact on the cost of capital estimation, OG&E nonetheless does not possess a great amount of firm-specific business risk. Mr. Hevert's testimony regarding business risks primarily centered around the fact that OG&E is going to be spending money on plant investments over the next few years.[132] Yet Mr. Hevert failed to explain how this adds risk to the Company. Rather, by making significant additions to its rate base, OG&E is adding to its overall revenue requirement. Under the rate base rate of return model, the Company will be allowed to recover all of its useful plant investments through depreciation, and in addition, the company will recover a return on those investments that is well above its actual cost of capital. An arrangement this favorable to a company could only exist in a regulated environment. 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.[133] 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.[134] There are numerous examples of firms who were dominant at one time and

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[132] *See id.*

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

[134] 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/.

were eventually overcome by competitive forces and other business risks (see Compaq, Arthur Andersen, Montgomery Ward, Lehman Brothers, RCA, PaineWebber, TWA, Enron, etc.). Likewise, there are numerous examples of companies who lost massive amounts of shareholder wealth due to failed products (see 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 endure 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.[135] Public utilities, however, are not threatened by these competitive forces due to their monopoly status, captive customer base, and the fact that there are minimal substitutes for their services. 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.

Q. OG&E's riders further contribute to its low levels of firm-specific business risk.

A. Yes. In his direct testimony, Mr. Hevert said that regulatory recovery mechanisms such as riders do not reduce the Company's cost of equity.[136] I would generally agree with this statement, but perhaps for different reasons than Mr. Hevert suggested. Mr. Hevert suggested the effect of riders on the cost of equity is dependent upon the amount of riders among the proxy group. This suggestion could be true in part if there were a drastic

[135] *See* Bodie, Kane & Marcus *supra* n. 17, at 395 (discussing Michael Porter's five determinants of competition).

[136] See Direct Testimony of Robert B. Hevert p. 46:16-19.

difference between the level of riders in the proxy companies and the target company. Riders, however, primarily affect firm-specific risk. Again, firm-specific risk is unrewarded by the market. Investors only expect a return for assuming market risk, which I have considered in this case through the CAPM. It is conceivable that if a utility had a sudden and significant increase in its level of riders it could not only reduce its business risk but perhaps its market risk as well. Utilities are already defensive firms that are relatively insulated from market conditions. This fact is directly observed in utilities' very low betas. To the extent that a significant increase in riders further insulated a utility from aggregate market conditions, it could arguably have some effect on the cost of equity. For all intents and purposes, however, it is fair to say that OG&E's riders do not have a material effect on the cost of equity from a technical standpoint, particularly if there has not been a recent, significant change in the level of riders. Thus, in determining the cost of equity, it is more important for this Commission to focus on market risks rather than firm-specific risks, such as riders. In other words, the models PUD has presented in this case give a very good estimate of the Company's true required return without considering and attempting to quantify the effect of riders.

Flotation Costs

Q. The Commission should not allow recovery of equity flotation costs.

A. Yes. When companies issue equity securities, they typically hire at least one investment bank as an underwriter for the securities. "Flotation costs" generally refer to the underwriter's compensation for the services it provides in connection with the securities

offering. Mr. Hevert testified that he modified his DCF calculation to derive a dividend yield that would reimburse investors for flotation costs.[137] Regardless of whether Mr. Hevert considered the explicitly considered the effect of flotation costs in his final recommendation, the Commission should not allow recovery of flotation costs in this case for the following three reasons:

1. Flotation costs are not actual "out-of-pocket" costs.

Mr. Hevert stated that flotation costs "include out-of-pocket expenditures for preparation, filing, underwriting and other issuance costs of common stock."[138] This statement is misleading. Describing a cost as "out-of-pocket" suggests that the Company actually expended funds to pay for it. Underwriters, however, are not compensated in this fashion. Instead, underwriters are compensated through an "underwriting spread." An underwriting spread is the difference between the price at which the underwriter purchases the shares from the firm, and the price at which the underwriter sells the shares to investors.[139] Another reason it is misleading for Mr. Hevert to suggest that OG&E experienced out-of-pocket flotation costs is that OG&E is a wholly-owned subsidiary of AEP, which means it does not issue securities to the public and would thus would have no need to retain an underwriter. Thus, OG&E has not experienced any out-of-pocket flotation costs, and if it has, those costs should be included in the Company's expense schedules.

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[137] *See* Direct Testimony of Robert B. Hevert p. 45:14-18.

[138] *Id*. at 43:6.

[139] *See* Graham, Smart & Megginson *supra* n. 18, at 509.

2. The market already accounts for flotation costs.

When an underwriter markets a firm's securities to investors, the investors are well aware of the underwriter's fees. In other words, the investors know that a portion of the price they are paying for the shares does not go directly to the company, but instead goes to compensate the underwriter for its services. In fact, federal law requires that the underwriter's compensation be disclosed on the front page of the prospectus.[140] Thus, investors have already considered and accounted for flotation costs when making their decision to purchase shares at the quoted price. There is no need for the Company's shareholders to receive additional compensation to account for costs they have already considered and agreed to. We see similar compensation structures in other kinds of business transactions. For example, a homeowner may hire a realtor and sell a home for $100,000. After the realtor takes a six percent commission, the seller nets $94,000. The buyer and seller agreed to the transaction notwithstanding the realtor's commission. Obviously, it would be unreasonable for the buyer or seller to demand additional funds from anyone after the deal is done to reimburse them for the realtor's fees. Likewise, investors of competitive firms do not expect additional compensation for flotation costs. Thus, it would not be appropriate for a commission standing in the place of competition to award a utility's investors with this additional compensation.

[140] *See* Regulation S-K, 17 C.F.R. § 229.501(b)(3) (requiring that the underwriter's discounts and commissions be disclosed on the outside cover page of the prospectus). A prospectus is a legal document that provides details about an investment offering.

3. It is inappropriate to add any additional basis points to a cost of equity proposal that is already far above the true required return.

For the reasons discussed above, flotation costs should be disallowed from a technical standpoint; they should also be disallowed from a practical standpoint. OG&E is asking this Commission to award it a cost of equity that is well over 300 basis points above its true cost of equity. Under these circumstances, it is especially inappropriate to suggest that the effect of flotation costs should be considered in any way.

Capital Structure

Q. OG&E's proposed capital structure is not 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 OG&E's optimal capital structure consists of about 60 percent debt. OG&E has provided no such analysis, but instead has simply noted the capital structures of other regulated utilities around the country.[141]

Q. A capital structure recommendation simply based on the capital structures of other utilities is not appropriate.

A. Yes. In the Capital Structure section of my testimony above, I discussed in detail three important reasons why it is not appropriate to rely on the capital structures of other utilities when conducting a proper capital structure analysis. Each reason is summarized as follows:

[141] *See* Direct Testimony of Robert B. Hevert p. 54.

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;

3. The capital structure of other utilities may not have been approved by their regulatory commissions.

For these reasons, the Commission should rely on PUD's objective analysis rather than simply looking at the capital structures of the proxy group, as Mr. Hevert did.

CONCLUSION AND RECOMMENDATION

Q. Summarize the key points of your testimony.

A. The key points of my testimony are summarized as follows:

1. Basing the awarded rate of return for OG&E on orders and settlements from other jurisdictions fails to comply with the Supreme Court's standards governing this issue; instead, the awarded rate of return should be based on the Company's cost of capital.

2. When the awarded rate of return exceeds the cost of capital, it results in an inappropriate transfer of excess wealth from customers to shareholders.

3. The Company's cost of capital must lie between a "floor" and a "ceiling," where the floor is the risk-free rate and the ceiling is the required return on the market portfolio; currently, the floor is about three percent and the ceiling is about eight percent.

4. The models I used in this case indicate the Company's cost of equity is about 6.2 percent.

5. When assessing the proper capital structure, it is not appropriate to merely consider the capital structures of other regulated utilities or the Company's test-year capital structure; OG&E's optimal capital structure consists of about 60 percent debt and 40 percent equity.

Q. State PUD's recommendation to the Commission.

A. PUD respectfully requests the Commission make the following findings with regard to the issues presented in this testimony:

Cost of Equity

1. The Commission finds that, pursuant to the Supreme Court's standards, the return on equity awarded in any case should be based on the utility's cost of equity as estimated through various financial models, and should not be based on the returns awarded in other jurisdictions;

2 The Commission finds that PUD's recommended awarded return on equity of 9.25 percent should be adopted, and that although this awarded return on equity is significantly higher than OG&E's cost of equity, it is nonetheless based on the Company's cost of equity, and is fair under the circumstances as it represents a gradual move towards true cost of equity rather than an abrupt one;

Cost of Debt

3. The Commission finds that OG&E's cost of debt of 5.62 should be adopted;

Capital Structure

4. The Commission finds that as a surrogate for competition, it has the authority to impute a proper capital structure for any regulated utility when the utility's capital structure is not reflective of one that would exist in a competitive environment;

5. The Commission finds that regulated utilities do not have a financial incentive to operate at a capital structure that would exist in a competitive environment, and thus the capital structures of other regulated utilities do not necessarily indicate capital structures that would exist in a competitive environment;

6. The Commission finds that just as competitive firms seek to minimize their weighted average cost of capital, the utility has the obligation to seek the lowest reasonable weighted average cost of capital;

7. The Commission finds that OG&E's current debt ratio of 46.69 percent is significantly less than a debt ratio that would exist for the Company in a

competitive environment, and that this low debt ratio increases OG&E's cost of capital beyond its lowest reasonable level;

8. The Commission finds that although OG&E's actual capital structure is within the discretion of company management, the Commission will impute a capital structure in future rate cases that seeks to minimize the Company's weighted average cost of capital to a more reasonable level;

9. The Commission finds that OG&E's proposed capital structure is adopted;

Awarded Rate of Return

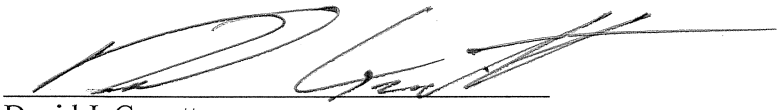
10. The Commission finds that, pursuant to the Supreme Court's standards, the rate of return awarded in any case should be based on the utility's actual weighted average cost of capital as calculated through its cost of equity, cost of debt, and optimal capital structure, and should not be based on the returns awarded in other jurisdictions;

11 The Commission finds that PUD's recommended awarded rate of return of 7.56 percent should be adopted, and that although this awarded rate of return is significantly higher than OG&E's weighted average cost of capital, it is nonetheless based on the Company's weighted average cost of capital, and is fair under the circumstances as it represents a gradual move towards true cost of capital rather than an abrupt one;

Q. This concludes your testimony.

A. Yes, including any exhibits, appendices, and other items attached hereto. I reserve the right to supplement this testimony as needed with any additional information that has been requested from the Company but not yet provided.

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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Master of Business Administration — 2014
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University of Oklahoma College of Law — Norman, OK
Juris Doctor — 2007
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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.

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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 — 2016 – 2017
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. **Public Service Company of Oklahoma, 2015** (Cause No. PUD 15-208) – Testified on cost of capital, capital structure, and depreciation rates.

2. **Oklahoma Natural Gas Company, 2015** (Cause No. PUD 09-110) – Testified on cost of capital, capital structure, and depreciation rates.

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

4. **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.

5. **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.

6. **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.

7. **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.

8. **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.

9. **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.

10. **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.

11. **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.

12. **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.

13. **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.

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

15. **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.

16. **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
(Recommended Award)

Source	[1] Capital Structure	[2] Cost Rates	[3] Weighted Cost
Long-term Debt	46.7%	5.62%	2.62%
Common Equity	53.3%	9.00% (8.75% / **9.25%**)	4.80% (4.66% / **4.93%**)

	[4]			
Recommended Range for Weighted Average Cost of Capital		**7.29%** (LOW)	**7.42%** (MID)	**7.56%** (HIGH)

[1] OG&E's proposed capital structure

[2] Debt cost rate proposed by OG&E. Cost of common equity recommended by PUD + / - 0.25% 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] S&P Bond Rating	[4] Moody's Bond Rating	[5] Value Line Safety Rank	[6] Financial Strength	[7] Value Line Region
ALLETE, Inc.	ALE	2,500	Mid Cap	BBB+	A3	2	A	Central
Alliant Energy Corporation	LNT	6,900	Mid Cap	A-	A3	2	A	Central
Ameren Corporation	AEE	10,400	Large Cap	BBB+	Baa1	2	A	Central
American Electric Power Co., Inc.	AEP	27,000	Large Cap	BBB	Baa1	2	A	Central
Avista Corporation	AVA	2,200	Mid Cap	BBB	Baa1	2	A	West
CMS Energy Corporation	CMS	9,800	Mid Cap	BBB+	Baa2	2	B++	Central
Dominion Resources, Inc.	D	40,000	Large Cap	A-	Baa2	2	B++	East
DTE Energy Company	DTE	14,000	Large Cap	BBB+	A3	2	B++	Central
Empire District Electric Company	EDE	1,000	Small Cap	BBB	Baa1	2	B++	Central
Great Plains Energy Inc.	GXP	4,100	Mid Cap	BBB+	Baa2	3	B+	Central
IDACORP, Inc.	IDA	3,500	Mid Cap	BBB	Baa1	2	B++	West
NorthWestern Corporation	NWE	2,700	Mid Cap	BBB	A3	2	B+	West
Otter Tail Corporation	OTTR	1,000	Small Cap	BBB	A3	3	B	Central
Pinnacle West Capital Corporation	PNW	7,300	Mid Cap	A-	A3	1	A+	West
PNM Resources, Inc.	PNM	2,300	Mid Cap	BBB+	Baa3	3	B	West
Portland General Electric Company	POR	3,400	Mid Cap	BBB	A3	2	B++	West
SCANA Corporation	SCG	8,500	Mid Cap	BBB+	Baa3	2	B++	East
Westar Energy, Inc.	WR	5,900	Mid Cap	BBB+	Baa1	2	B++	Central
Xcel Energy Inc.	XEL	19,000	Large Cap	A-	A3	1	A	West

[1], [5], [6] Value Line Investment Survey

[2] Large Cap > $10 billion; Mid Cap > $2 billion; Small Cap > $200 million

[3] https://www.standardandpoors.com/web/guest (accessed 1-21-16)

[4] https://www.moodys.com/ (accessed 1-21-16)

[7] The Value Line figures cited in these exhibits come from Issue 1 (11-20-15), Issue 5 (12-18-15), and Issue 11 (10-30-15) for the East, Central, and West electric utilities respectively

Stock and Index Prices

Ticker	^GSPC	ALE	LNT	AEE	AEP	AVA	CMS	D	DTE	EDE	GXP	IDA	NWE	OTTR	PNW	PNM	POR	SCG	WR	XEL
30-day Average	2002	50.21	61.76	43.18	57.57	35.05	35.89	67.69	79.71	26.95	26.95	67.85	53.96	26.57	63.74	30.00	36.36	60.29	41.86	35.84
Standard Deviation	68.3	0.76	1.43	0.71	1.42	0.65	0.52	1.39	1.12	1.94	0.51	0.98	0.75	0.45	1.08	0.85	0.58	1.17	0.76	0.70
01/20/16	1859	49.80	61.76	42.33	57.92	35.07	35.96	68.73	80.19	27.53	26.41	66.50	53.20	26.90	63.62	30.09	36.83	60.13	40.71	36.62
01/19/16	1881	50.36	63.08	43.45	59.57	35.55	36.87	69.90	82.23	27.94	27.24	67.59	54.57	27.00	64.88	30.55	37.69	61.56	41.71	37.21
01/15/16	1880	49.49	62.42	43.51	58.69	35.13	36.19	68.88	80.54	27.69	26.82	66.49	53.73	26.13	64.01	30.20	36.74	60.53	41.20	36.50
01/14/16	1922	50.29	62.63	43.71	59.14	35.45	36.71	69.67	81.32	28.22	27.21	67.68	54.55	26.98	64.81	30.66	37.39	61.15	41.94	36.71
01/13/16	1890	49.88	61.70	43.14	57.95	34.76	36.13	69.02	80.25	27.50	26.60	66.81	53.69	26.39	63.87	30.05	36.55	60.23	41.58	36.11
01/12/16	1939	50.20	61.66	43.38	58.17	34.98	35.91	68.90	79.60	27.76	26.67	67.33	53.50	26.79	63.70	30.43	36.20	60.62	41.55	36.33
01/11/16	1924	50.66	62.16	43.52	58.77	35.29	36.08	69.41	79.15	27.72	27.29	67.96	53.31	26.80	64.78	30.93	36.31	60.89	42.25	36.47
01/08/16	1922	49.86	61.96	43.51	58.26	35.11	36.10	69.52	78.38	27.61	27.00	67.28	52.81	26.23	64.02	30.79	35.94	60.70	42.09	36.18
01/07/16	1943	49.68	61.98	43.85	58.35	35.47	36.16	68.51	78.72	27.62	27.24	67.52	53.50	26.42	64.47	30.75	35.91	60.95	42.24	36.58
01/06/16	1990	50.02	62.64	43.82	59.03	35.59	35.94	68.47	79.59	28.26	27.28	67.52	54.18	26.67	64.49	30.69	36.03	61.01	42.74	36.44
01/05/16	2017	49.88	62.56	43.54	58.81	35.42	35.89	68.05	79.95	27.66	27.23	67.41	53.93	26.68	64.40	30.57	35.99	61.06	42.64	36.06
01/04/16	2013	49.72	62.28	43.03	58.33	35.05	35.61	67.47	79.14	27.78	27.07	67.29	53.25	26.43	64.08	30.17	35.80	60.67	42.37	35.70
12/31/15	2044	50.83	62.45	43.23	58.27	35.37	36.08	67.64	80.19	28.07	27.31	68.00	54.25	26.63	64.48	30.57	36.37	60.49	42.41	35.91
12/30/15	2063	51.61	63.45	44.00	58.90	35.99	36.68	68.68	81.54	28.57	27.78	69.50	55.21	27.13	65.23	31.09	37.22	61.30	43.16	36.40
12/29/15	2078	51.33	63.38	44.12	58.89	36.06	36.57	68.64	81.44	28.64	27.78	69.67	55.30	27.38	65.19	31.12	37.13	61.44	43.05	36.22
12/28/15	2057	51.26	63.23	44.04	58.60	35.90	36.41	67.86	80.66	28.79	27.74	69.55	54.91	27.18	64.84	30.86	36.82	61.21	42.83	36.14
12/24/15	2061	51.15	62.69	43.68	58.40	35.41	36.01	67.77	79.88	28.37	27.44	68.81	54.52	26.95	64.29	30.67	36.43	60.94	42.71	35.74
12/23/15	2064	51.36	62.88	43.85	58.25	35.36	36.10	68.08	80.01	28.50	27.43	68.82	54.61	27.03	64.43	30.58	36.49	61.20	42.70	35.85
12/22/15	2039	51.03	62.29	43.20	57.21	35.08	35.69	67.14	79.08	28.85	27.07	68.00	54.01	26.82	63.50	29.94	35.93	60.39	41.81	35.33
12/21/15	2021	50.08	61.93	42.86	56.55	34.96	35.59	66.56	78.66	27.76	26.89	67.48	53.46	26.65	62.96	29.71	35.02	60.22	41.31	35.09
12/18/15	2006	50.23	62.46	43.20	56.28	35.03	35.61	66.90	78.88	27.18	26.93	68.45	54.23	26.54	62.85	29.54	35.84	60.34	41.45	35.28
12/17/15	2042	51.03	63.71	44.03	57.42	35.32	36.20	67.54	79.95	26.76	27.18	69.01	54.89	26.65	63.59	29.64	36.69	61.43	42.04	36.07
12/16/15	2073	50.49	60.76	43.00	57.01	35.41	36.23	67.57	80.16	26.70	27.06	68.97	54.88	26.57	63.62	29.56	36.97	61.10	42.24	36.09
12/15/15	2043	49.63	59.31	41.94	56.04	34.18	35.22	66.15	78.41	25.97	26.43	67.55	53.49	26.00	62.06	28.94	36.29	59.38	41.23	35.25
12/14/15	2022	48.73	58.79	41.80	54.54	33.85	35.03	65.40	77.76	25.68	26.16	66.83	52.80	25.52	61.45	28.48	35.81	58.51	40.60	34.97
12/11/15	2012	48.64	58.59	41.72	54.56	33.45	34.86	64.89	77.62	24.54	25.97	66.15	52.68	25.48	61.53	28.47	35.79	57.45	40.70	34.62
12/10/15	2052	49.14	58.81	41.71	54.88	33.55	34.87	65.20	78.21	22.65	25.87	66.35	52.77	25.83	61.21	28.31	35.54	56.98	40.41	34.48
12/09/15	2048	49.88	60.28	42.58	56.25	34.25	35.26	66.19	79.49	22.97	26.36	67.79	53.86	26.49	63.12	28.67	36.15	58.71	41.05	34.96
12/08/15	2064	50.15	60.69	42.74	55.88	34.70	35.38	65.91	79.89	22.81	26.56	68.58	54.02	26.56	63.55	28.97	36.35	59.01	41.40	34.89
12/07/15	2077	49.80	60.33	42.97	56.25	34.65	35.50	66.14	80.45	22.37	26.59	68.66	54.55	26.40	63.13	29.05	36.46	59.18	41.61	34.95

All prices are adjusted closing prices reported by Yahoo! Finance, http://finance.yahoo.com

Fundamental Growth Rates

Company	Ticker	[1]	[2]	[3]	[4]	[1]	[2]	[3]	[4]	[1]	[2]	[3]	[4]	[1]	[2]	[3]	[4]	[5]
		2011				2012				2013				2014				Fundamental
		ROE	DPS	EPS	FGR	ROE	DPS	EPS	FGR	ROE	DPS	EPS	FGR	ROE	DPS	EPS	FGR	Growth Rate
ALLETE, Inc.	ALE	0.09	1.78	2.65	0.03	0.08	1.84	2.58	0.02	0.08	1.90	2.63	0.02	0.08	1.96	2.90	0.03	2.47%
Alliant Energy Corporation	LNT	0.10	1.70	2.75	0.04	0.10	1.80	3.05	0.04	0.11	1.88	3.29	0.05	0.11	2.04	3.48	0.05	4.30%
Ameren Corporation	AEE	0.08	1.56	2.47	0.03	0.09	1.60	2.41	0.03	0.08	1.60	2.10	0.02	0.09	1.61	2.40	0.03	2.61%
American Electric Power Co., Inc.	AEP	0.10	1.85	3.13	0.04	0.10	1.88	2.98	0.04	0.10	1.95	3.18	0.04	0.10	2.03	3.34	0.04	3.81%
Avista Corporation	AVA	0.09	1.10	1.72	0.03	0.06	1.16	1.32	0.01	0.09	1.22	1.85	0.03	0.08	1.27	1.84	0.02	2.28%
CMS Energy Corporation	CMS	0.13	0.84	1.45	0.05	0.13	0.96	1.53	0.05	0.13	1.02	1.66	0.05	0.13	1.08	1.74	0.05	5.02%
Dominion Resources, Inc.	D	0.14	1.97	2.76	0.04	0.15	2.11	2.75	0.03	0.15	2.25	3.09	0.04	0.15	2.40	3.05	0.03	3.73%
DTE Energy Company	DTE	0.09	2.32	3.67	0.03	0.09	2.42	3.88	0.03	0.08	2.59	3.76	0.03	0.11	2.69	5.10	0.05	3.60%
Empire District Electric Company	EDE	0.08	0.64	1.31	0.04	0.08	1.00	1.32	0.02	0.09	1.01	1.48	0.03	0.09	1.03	1.55	0.03	2.88%
Great Plains Energy Inc.	GXP	0.06	0.84	1.25	0.02	0.06	0.86	1.35	0.02	0.07	0.88	1.62	0.03	0.07	0.94	1.57	0.03	2.51%
IDACORP, Inc.	IDA	0.10	1.20	3.36	0.06	0.10	1.37	3.37	0.06	0.10	1.57	3.64	0.06	0.10	1.76	3.85	0.05	5.80%
NorthWestern Corporation	NWE	0.11	1.44	2.53	0.05	0.09	1.48	2.26	0.03	0.09	1.52	2.46	0.03	0.08	1.60	2.99	0.04	3.76%
Otter Tail Corporation	OTTR	0.03	1.19	0.45	-0.04	0.07	1.19	1.05	-0.01	0.09	1.19	1.37	0.01	0.10	1.21	1.55	0.02	-0.50%
Pinnacle West Capital Corporation	PNW	0.09	2.10	2.99	0.03	0.10	2.67	3.50	0.02	0.10	2.23	3.66	0.04	0.09	2.33	3.58	0.03	2.96%
PNM Resources, Inc.	PNM	0.06	0.50	1.08	0.03	0.07	0.58	1.31	0.04	0.07	0.68	1.41	0.04	0.07	0.76	1.45	0.03	3.39%
Portland General Electric Company	POR	0.09	1.06	1.95	0.04	0.08	1.08	1.87	0.03	0.08	1.10	1.77	0.03	0.09	1.12	2.18	0.04	3.70%
SCANA Corporation	SCG	0.10	1.94	2.97	0.03	0.10	1.98	3.15	0.04	0.10	2.03	3.39	0.04	0.11	2.10	3.79	0.05	4.02%
Westar Energy, Inc.	WR	0.08	1.28	1.79	0.02	0.09	1.32	2.15	0.04	0.10	1.36	2.27	0.04	0.10	1.40	2.35	0.04	3.38%
Xcel Energy Inc.	XEL	0.10	1.03	1.72	0.04	0.10	1.07	1.85	0.04	0.10	1.11	1.91	0.04	0.10	1.20	2.03	0.04	4.13%

[1], [2], [3] Value Line Investment Survey

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

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

Growth Rate Results

		[1]	[1]	[2]	[2]	[3]	[4]
		Historic Growth		Projected Growth		Fundamental	Growth
Company	Ticker	Earnings	Dividends	Earnings	Dividends	Growth	Rate
ALLETE, Inc.	ALE	7.0%	NMF	6.5%	3.0%	2.47%	3.00%
Alliant Energy Corporation	LNT	8.0%	3.5%	6.0%	4.5%	4.30%	3.00%
Ameren Corporation	AEE	-2.0%	-4.5%	7.0%	3.5%	2.61%	1.54%
American Electric Power Co., Inc.	AEP	1.5%	0.5%	5.0%	5.0%	3.81%	3.00%
Avista Corporation	AVA	7.5%	9.5%	5.0%	4.0%	2.28%	3.00%
CMS Energy Corporation	CMS	NR	NR	5.5%	6.5%	5.02%	3.00%
Dominion Resources, Inc.	D	3.0%	5.5%	8.0%	7.5%	3.73%	3.00%
DTE Energy Company	DTE	3.5%	2.0%	5.0%	5.5%	3.60%	3.00%
Empire District Electric Company	EDE	2.5%	-2.5%	3.0%	2.0%	2.88%	1.79%
Great Plains Energy Inc.	GXP	-4.0%	-6.0%	5.0%	6.0%	2.51%	1.00%
IDACORP, Inc.	IDA	9.0%	NR	1.0%	6.0%	5.80%	3.00%
NorthWestern Corporation	NWE	NR	NR	6.5%	6.5%	3.76%	3.00%
Otter Tail Corporation	OTTR	-2.0%	1.0%	9.0%	1.5%	-0.50%	1.42%
Pinnacle West Capital Corporation	PNW	3.5%	3.5%	4.0%	3.5%	2.96%	3.00%
PNM Resources, Inc.	PNM	1.5%	1.0%	9.0%	10.0%	3.39%	3.00%
Portland General Electric Company	POR	NR	NR	6.0%	5.5%	3.70%	3.00%
SCANA Corporation	SCG	3.0%	4.0%	4.5%	3.5%	4.02%	3.00%
Westar Energy, Inc.	WR	6.5%	3.5%	6.0%	3.0%	3.38%	3.00%
Xcel Energy Inc.	XEL	7.0%	2.5%	4.5%	6.0%	4.13%	3.00%
Average							2.7%

[1] Historic compound annual growth rates in earnings and dividends over the past 10 years reported in Value Line

[2] Projected annual growth rates in earnings and dividends over the next three to five years reported in Value Line

[3] Fundamental growth rates from Exhibit DG 1-5

[4] = Weighted average of Historic Growth, Projected Growth, and Fundamental Growth, with a maximum of 3% so as not to exceed GDP growth.

* NMF = no meaningful figure; NR = not reported

DCF Final Results

Company	Ticker	[1] Dividend (d_0)	[2] Stock Price (P_0)	[3] Growth (g)	[4] DCF Results
ALLETE, Inc.	ALE	0.520	50.21	3.00%	7.33%
Alliant Energy Corporation	LNT	0.588	61.76	3.00%	6.98%
Ameren Corporation	AEE	0.425	43.18	1.54%	5.59%
American Electric Power Co., Inc.	AEP	0.560	57.57	3.00%	7.07%
Avista Corporation	AVA	0.343	35.05	3.00%	7.09%
CMS Energy Corporation	CMS	0.310	35.89	3.00%	6.60%
Dominion Resources, Inc.	D	0.700	67.69	3.00%	7.33%
DTE Energy Company	DTE	0.730	79.71	3.00%	6.83%
Empire District Electric Company	EDE	0.260	26.95	1.79%	5.78%
Great Plains Energy Inc.	GXP	0.263	26.95	1.00%	4.99%
IDACORP, Inc.	IDA	0.510	67.85	3.00%	6.13%
NorthWestern Corporation	NWE	0.500	53.96	3.00%	6.87%
Otter Tail Corporation	OTTR	0.313	26.57	1.42%	6.27%
Pinnacle West Capital Corporation	PNW	0.625	63.74	3.00%	7.10%
PNM Resources, Inc.	PNM	0.220	30.00	3.00%	6.05%
Portland General Electric Company	POR	0.300	36.36	3.00%	6.44%
SCANA Corporation	SCG	0.545	60.29	3.00%	6.77%
Westar Energy, Inc.	WR	0.360	41.86	3.00%	6.59%
Xcel Energy Inc.	XEL	0.320	35.84	3.00%	6.73%
Average					**6.56%**

[1] First quarter 2016 reported dividends per share. Nasdaq.com

[2] Thirty-day average stock price from DG 1-4

[3] Growth rate from DG 1-6

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

Risk-Free Rate

Date	Rate
01/04/16	2.98
01/05/16	3.01
01/06/16	2.94
01/07/16	2.92
01/08/16	2.91
01/11/16	2.96
01/12/16	2.89
01/13/16	2.85
01/14/16	2.90
01/15/16	2.81
01/19/16	2.82
01/20/16	2.77
01/21/16	2.79
01/22/16	2.83
01/25/16	2.80
01/26/16	2.79
01/27/16	2.80
01/28/16	2.79
01/29/16	2.75
02/01/16	2.77
02/02/16	2.67
02/03/16	2.70
02/04/16	2.70
02/05/16	2.68
02/08/16	2.56
02/09/16	2.55
02/10/16	2.53
02/11/16	2.50
02/12/16	2.60
02/16/16	2.64
Average	**2.77%**

*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

Stock and Index Returns

	S&P 500		ALE		LNT		AEE		AEP		AVA		CMS		D		DTE		EDE		GXP		IDA		NWE		OTTR		PNW		PNM		POR		SCG		WR		XEL	
Date	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return	Price	Return
01/04/16	1,859	-0.090	49.80	-0.020	61.76	-0.011	42.33	-0.021	57.92	-0.006	35.07	-0.008	35.96	-0.003	68.73	0.016	80.19	0.000	27.53	-0.019	26.41	-0.033	66.50	-0.022	53.20	-0.019	26.90	0.010	63.62	-0.013	30.09	-0.016	36.83	0.013	60.13	-0.006	40.71	-0.040	36.62	0.020
12/01/15	2,044	-0.018	50.83	-0.002	62.45	0.038	43.23	-0.002	58.27	0.040	35.37	0.022	36.08	0.030	67.64	0.004	80.19	0.005	28.07	0.233	27.31	0.012	68.00	-0.001	54.25	0.004	26.63	0.000	64.48	0.018	30.57	0.054	36.37	-0.007	60.49	0.032	42.41	0.002	35.91	0.016
11/02/15	2,080	0.001	50.95	0.025	60.19	0.020	43.33	0.002	56.01	-0.001	34.61	0.032	35.02	-0.021	67.37	-0.048	79.76	-0.013	22.77	0.022	26.99	-0.009	68.04	0.026	54.04	0.006	26.63	-0.018	63.36	-0.002	29.00	0.031	36.61	-0.004	58.60	-0.001	42.31	0.075	35.34	0.001
10/01/15	2,079	0.083	49.72	-0.006	59.02	0.018	43.25	0.033	56.09	-0.004	33.52	0.018	35.78	0.021	70.76	0.015	80.85	0.015	22.29	0.024	27.23	0.018	66.34	0.033	53.70	0.007	27.12	0.053	63.51	0.000	28.12	0.010	36.77	0.003	58.68	0.053	39.36	0.033	35.31	0.006
09/01/15	1,920	-0.026	50.00	0.057	57.96	0.032	41.86	0.060	56.30	0.047	32.93	0.071	35.04	0.077	69.72	0.009	79.64	0.039	21.77	0.018	26.76	0.084	64.22	0.090	53.34	0.053	25.76	0.010	63.52	0.077	27.85	0.095	36.66	0.079	55.75	0.075	38.11	0.062	35.09	0.060
08/03/15	1,972	-0.063	47.32	-0.001	56.15	-0.079	39.47	-0.019	53.75	-0.031	30.76	-0.049	32.52	-0.035	69.09	-0.018	76.63	-0.030	21.40	-0.048	24.68	-0.036	58.92	-0.037	50.68	-0.041	25.51	0.007	58.95	-0.035	25.43	-0.029	33.97	-0.041	51.85	-0.035	35.87	-0.029	33.10	-0.027
07/01/15	2,104	0.020	47.35	0.041	60.95	0.075	40.24	0.090	55.49	0.068	32.36	0.077	33.70	0.076	70.37	0.072	78.98	0.078	22.47	0.056	25.60	0.081	61.17	0.106	52.84	0.104	25.34	-0.026	61.11	0.095	26.19	0.081	35.41	0.086	53.72	0.082	36.95	0.100	34.03	0.077
06/01/15	2,063	-0.021	45.49	-0.079	56.67	-0.058	36.91	-0.053	51.95	-0.059	30.04	-0.042	31.32	-0.067	65.63	-0.052	73.27	-0.049	21.29	-0.066	23.69	-0.073	55.29	-0.056	47.84	-0.054	26.00	-0.016	55.79	-0.066	24.24	-0.075	32.61	-0.043	49.65	-0.037	33.59	-0.057	31.58	-0.046
05/01/15	2,107	0.010	49.37	0.011	60.19	0.014	38.99	-0.017	55.21	-0.001	31.36	-0.009	33.58	0.015	69.21	-0.007	77.06	-0.005	22.80	0.001	25.56	0.005	58.57	-0.007	50.57	-0.001	26.41	-0.086	59.75	-0.005	26.20	-0.043	34.08	-0.006	51.55	0.003	35.62	-0.026	33.09	0.004
04/01/15	2,086	0.009	48.81	-0.047	59.37	-0.032	39.68	-0.030	55.25	0.011	31.64	-0.046	33.08	-0.028	69.71	0.011	77.45	-0.013	22.77	-0.050	25.43	-0.019	58.96	-0.040	50.64	-0.032	28.91	-0.070	60.02	-0.031	27.37	-0.042	34.27	-0.052	51.38	-0.037	36.58	-0.029	32.95	-0.026
03/02/15	2,068	-0.017	51.20	-0.038	61.31	-0.009	40.90	0.005	54.65	-0.023	33.16	0.002	34.04	-0.006	68.93	-0.017	78.48	-0.008	23.98	-0.021	25.91	0.003	61.44	0.004	52.29	0.002	31.09	-0.017	61.93	-0.005	28.57	0.023	36.15	0.002	53.32	-0.025	37.65	0.007	33.83	-0.004
02/02/15	2,105	0.055	53.22	-0.023	61.90	-0.073	40.69	-0.063	55.94	-0.075	33.08	-0.073	34.25	-0.062	70.11	-0.054	79.08	-0.085	24.49	-0.160	25.85	-0.092	61.19	-0.071	52.20	-0.062	31.62	0.069	62.25	-0.087	27.94	-0.064	36.07	-0.061	54.68	-0.107	37.39	-0.091	33.96	-0.060
01/02/15	1,995	-0.031	54.47	0.027	66.77	0.041	43.45	-0.018	60.50	0.034	35.67	0.050	36.51	0.086	74.13	0.000	86.44	0.038	29.14	0.025	28.47	0.041	65.90	0.026	55.63	0.021	29.59	-0.001	68.18	0.036	29.85	0.036	38.41	0.049	61.23	0.056	41.11	0.036	36.13	0.045
12/01/14	2,059	-0.004	53.02	0.082	64.13	0.056	44.26	0.080	58.49	0.055	33.96	0.036	33.62	0.050	74.14	0.060	83.26	0.069	28.44	0.073	27.35	0.086	64.23	0.066	54.50	0.071	29.63	0.076	65.81	0.080	28.80	0.023	36.60	0.034	58.00	0.069	39.68	0.064	34.58	0.067
11/03/14	2,068	0.025	49.01	-0.015	60.71	0.016	40.97	0.018	55.44	-0.005	32.78	-0.028	32.03	0.022	69.94	0.026	77.87	-0.009	26.50	-0.016	25.19	-0.019	60.28	-0.010	50.89	0.007	27.54	-0.062	60.91	0.029	28.15	0.004	35.41	0.013	54.26	0.039	37.28	0.034	32.40	0.014
10/01/14	2,018	0.023	49.76	0.177	59.78	0.127	40.24	0.105	55.70	0.117	33.74	0.161	31.35	0.101	68.17	0.032	78.54	0.080	26.94	0.178	25.68	0.114	60.91	0.179	50.52	0.165	29.38	0.162	59.22	0.136	28.05	0.166	34.97	0.134	52.22	0.106	36.06	0.108	31.95	0.101
09/02/14	1,972	-0.016	42.28	-0.088	53.06	-0.053	36.43	-0.032	49.85	-0.028	29.05	-0.059	28.46	-0.029	66.06	-0.016	72.73	-0.019	22.88	-0.066	23.05	-0.058	51.64	-0.055	43.36	-0.053	25.28	-0.064	52.11	-0.041	24.06	-0.050	30.85	-0.060	47.20	-0.035	32.54	-0.067	29.02	-0.042
08/01/14	2,003	0.038	46.36	0.048	56.00	0.035	37.63	0.040	51.27	0.043	30.89	0.057	29.31	0.056	67.14	0.047	74.13	0.060	24.49	0.065	24.48	0.045	54.64	0.068	45.77	0.045	27.00	0.030	54.32	0.065	25.31	0.022	32.82	0.080	48.92	0.021	34.88	0.025	30.30	0.041
07/01/14	1,931	-0.015	44.23	-0.086	54.10	-0.064	36.18	-0.059	49.15	-0.068	29.24	-0.074	27.76	-0.063	64.11	-0.054	69.94	-0.052	22.99	-0.046	23.43	-0.077	51.17	-0.074	43.82	-0.114	26.22	-0.077	51.02	-0.066	24.77	-0.119	30.40	-0.079	47.92	-0.054	34.04	-0.056	29.12	-0.044
06/02/14	1,960	0.019	48.41	0.034	57.78	0.044	38.47	0.050	52.72	0.045	31.58	0.071	29.62	0.047	67.79	0.037	73.77	0.032	24.09	0.070	25.40	0.056	55.26	0.055	49.48	0.096	28.40	0.060	54.61	0.044	28.13	0.031	33.01	0.057	50.68	0.045	36.07	0.070	30.47	0.058
05/01/14	1,924	0.021	46.83	-0.031	55.35	-0.003	36.65	-0.047	50.43	0.001	29.50	-0.016	28.29	-0.018	65.37	-0.041	71.48	-0.026	22.52	-0.002	24.05	-0.043	52.39	-0.016	45.13	-0.008	26.80	-0.014	52.32	0.001	27.30	0.028	31.23	-0.012	48.48	-0.031	33.72	0.005	28.80	-0.035
04/01/14	1,884	0.006	48.32	-0.013	55.52	0.038	38.48	0.003	50.39	0.062	29.99	0.049	28.83	0.045	68.17	0.022	73.38	0.052	22.57	0.000	25.13	-0.008	53.23	0.012	45.49	0.020	27.18	-0.048	52.29	0.024	26.55	0.031	31.61	0.035	50.05	0.046	33.57	0.020	29.84	0.050
03/03/14	1,872	0.007	48.93	0.038	53.46	0.047	38.37	0.030	47.44	0.009	28.59	0.035	27.60	0.030	66.71	0.023	69.76	0.045	22.57	0.024	25.32	0.029	52.60	-0.013	44.60	0.042	28.57	0.019	51.08	-0.018	25.75	0.034	30.54	0.026	47.85	0.048	32.89	0.038	28.43	0.012
02/03/14	1,859	0.043	47.15	0.021	51.05	0.044	37.26	0.068	47.01	0.039	27.61	0.038	26.79	0.033	65.21	0.031	66.76	0.052	22.03	0.046	24.60	0.074	53.28	0.074	42.81	0.016	28.04	0.097	52.01	0.057	24.91	0.061	29.77	0.054	45.66	0.047	31.69	0.032	28.08	0.048
01/02/14	1,783	-0.036	46.19	0.002	48.90	0.017	34.89	0.046	45.23	0.044	26.61	0.023	25.93	0.038	63.28	0.050	63.47	0.028	21.07	0.011	22.91	0.018	49.59	0.017	42.13	0.044	25.57	-0.049	49.19	0.006	23.48	0.030	28.25	-0.001	43.60	0.007	30.72	0.031	26.80	0.035
12/02/13	1,848	0.024	46.10	0.012	48.08	0.002	33.34	0.020	43.31	-0.007	26.02	0.034	24.98	0.009	60.28	0.005	61.77	0.005	20.83	0.000	22.50	0.021	48.75	0.003	40.37	-0.006	26.88	-0.010	48.91	-0.008	22.81	0.037	28.27	0.022	43.29	0.006	29.79	0.037	25.90	0.007
11/01/13	1,806	0.028	45.54	-0.015	47.98	-0.014	32.69	-0.009	43.61	0.016	25.15	-0.009	24.77	-0.034	59.96	0.018	61.48	-0.035	20.84	0.021	22.04	0.022	48.60	0.010	40.62	-0.041	27.15	0.001	49.32	-0.048	22.00	-0.020	27.65	0.039	43.05	0.012	28.73	-0.008	25.72	-0.029
10/01/13	1,757	0.045	46.25	0.046	48.65	0.063	32.99	0.038	42.94	0.081	25.37	0.053	25.62	0.053	58.88	0.020	63.69	0.048	20.42	0.038	21.55	0.056	48.12	0.066	42.34	0.020	27.12	0.081	51.79	0.034	22.46	0.057	26.62	0.017	42.55	0.013	28.96	0.031	26.49	0.045
09/03/13	1,682	0.030	44.21	0.023	45.76	-0.001	31.77	0.043	39.74	0.013	24.10	0.005	24.34	-0.008	57.71	0.081	60.78	-0.004	19.66	0.023	20.41	0.013	45.14	0.011	41.49	0.129	25.10	0.050	50.10	0.009	21.25	0.033	26.19	-0.011	42.02	-0.033	28.08	-0.004	25.34	-0.001
08/01/13	1,633	-0.031	43.21	-0.112	45.81	-0.063	30.46	-0.056	39.23	-0.067	23.98	-0.077	24.53	-0.052	53.37	-0.016	60.99	-0.054	19.22	-0.076	20.15	-0.085	44.65	-0.086	36.76	-0.048	23.90	-0.132	49.67	-0.079	20.57	-0.067	26.47	-0.091	43.43	-0.073	28.19	-0.074	25.37	-0.068
07/01/13	1,686	0.049	48.63	0.076	48.91	0.060	32.26	0.040	42.03	0.035	25.97	0.065	25.88	0.039	54.25	0.044	64.49	0.055	20.80	0.039	22.03	0.073	48.86	0.105	38.62	0.058	27.53	0.077	53.90	0.072	22.05	0.066	29.13	0.036	46.85	0.057	30.43	0.051	27.21	0.057
06/03/13	1,606	-0.015	45.21	0.053	46.15	0.024	31.03	0.023	40.61	-0.023	24.39	0.012	24.90	0.008	51.97	0.015	61.12	0.016	20.02	0.027	20.52	-0.001	44.22	0.011	36.51	-0.022	25.56	0.040	50.30	-0.018	20.69	-0.010	28.11	0.014	44.32	-0.017	28.96	0.019	25.75	-0.004
05/01/13	1,631	0.021	42.92	-0.070	45.09	-0.079	30.32	-0.061	41.55	-0.100	24.11	-0.038	24.70	-0.092	51.20	-0.083	60.16	-0.086	19.50	-0.047	20.55	-0.056	43.73	-0.033	37.32	-0.043	24.59	-0.116	51.22	-0.073	20.91	-0.066	27.71	-0.056	45.06	-0.069	28.43	-0.093	25.85	-0.097
04/01/13	1,598	0.018	46.14	0.048	48.98	0.076	32.28	0.035	46.19	0.058	25.05	0.024	27.20	0.072	55.85	0.060	65.82	0.066	20.46	0.030	21.77	0.041	45.20	0.019	39.00	0.079	27.80	0.002	55.23	0.062	22.39	0.038	29.36	0.063	48.42	0.059	31.33	0.054	28.61	0.070
03/01/13	1,569	0.036	44.05	0.043	45.52	0.052	31.19	0.049	43.68	0.039	24.47	0.046	25.39	0.050	52.68	0.039	61.72	0.033	19.87	0.046	20.92	0.062	44.34	0.034	36.14	0.033	27.75	0.078	52.02	0.035	21.56	0.037	27.61	0.031	45.71	0.058	29.73	0.081	26.73	0.045
02/01/13	1,515	0.011	42.23	0.029	43.26	0.040	29.74	0.042	42.03	0.044	23.39	0.025	24.18	0.046	50.70	0.045	59.77	0.055	18.99	0.021	19.69	0.030	42.89	0.014	35.00	0.054	25.74	0.087	50.27	0.048	20.80	0.051	26.78	0.034	43.19	0.043	27.51	0.032	25.59	0.033
01/02/13	1,498	0.050	41.04	0.126	41.58	0.055	28.55	0.056	40.25	0.061	22.83	0.073	23.12	0.054	48.50	0.045	56.65	0.054	18.59	0.041	19.11	0.054	42.28	0.071	33.21	0.065	23.69	0.075	47.97	0.058	19.78	0.049	25.91	0.050	41.39	0.026	26.66	0.051	24.77	0.040
12/03/12	1,426	0.007	36.45	0.045	39.42	-0.020	27.04	0.039	37.93	0.001	21.28	0.017	21.93	-0.002	46.43	0.014	53.73	0.002	17.87	0.019	18.14	0.003	39.50	0.015	31.18	0.012	22.04	0.032	45.35	-0.009	18.85	-0.029	24.68	0.022	40.36	-0.004	25.38	0.009	23.81	-0.003
11/01/12	1,416	0.003	34.88	-0.047	40.24	0.003	26.02	-0.089	37.91	-0.030	20.93	-0.056	21.98	0.005	45.81	-0.021	53.65	-0.024	17.53	-0.067	18.09	-0.088	38.91	-0.037	30.82	-0.031	21.36	0.018	45.77	-0.029	19.42	-0.046	24.14	-0.014	40.54	-0.056	25.15	-0.034	23.88	-0.042
10/01/12	1,412	-0.020	36.59	-0.003	40.13	0.041	28.55	0.006	39.07	0.011	22.16	-0.012	21.88	0.043	46.81	-0.003	55.00	0.036	18.79	0.007	19.83	0.008	40.40	0.034	31.82	-0.012	20.98	0.010	47.12	0.014	20.37	0.061	24.48	0.013	42.94	0.017	26.03	0.001	24.94	0.019
09/04/12	1,441	0.024	36.70	0.004	38.56	-0.016	28.37	0.011	38.63	0.022	22.44	0.013	20.98	0.021	46.95	0.009	53.08	0.037	18.66	0.021	19.67	0.044	39.09	0.044	32.19	0.000	20.77	0.054	46.48	0.028	19.21	0.022	24.15	0.018	42.23	0.030	26.00	0.030	24.46	0.003
08/01/12	1,407	0.020	36.54	0.014	39.17	-0.056	28.07	-0.044	37.79	0.029	22.15	-0.072	20.55	-0.055	46.55	-0.024	51.18	-0.048	18.27	-0.007	18.84	-0.029	37.44	-0.010	32.19	-0.009	19.71	-0.023	45.22	-0.041	18.79	-0.011	23.74	-0.014	41.01	-0.037	25.24	-0.047	24.38	-0.048
07/02/12	1,379	0.013	36.05	-0.008	41.51	0.035	29.34	0.020	36.72	0.059	23.87	0.037	21.75	0.049	47.70	0.006	53.78	0.034	18.40	0.019	19.40	0.036	37.82	0.003	32.48	0.006	20.17	0.029	47.13	0.045	19.00	0.072	24.08	0.021	42.57	0.028	26.48	0.020	25.61	0.031
06/01/12	1,362	0.040	36.34	0.070	40.11	0.043	28.77	0.051	34.69	0.036	23.02	0.051	20.73	0.009	47.43	0.037	51.99	0.054	18.05	0.052	18.73	0.075	37.71	0.071	32.28	0.044	19.61	0.080	45.11	0.048	17.72	0.048	23.58	0.071	41.42	0.030	25.96	0.059	24.83	0.023
05/01/12	1,310	-0.063	33.95	-0.041	38.46	-0.034	27.38	-0.015	33.48	0.004	21.91	-0.028	20.55	0.024	45.72	0.008	49.31	0.008	17.15	-0.011	17.42	-0.014	35.21	-0.028	30.91	0.000	18.16	-0.025	43.05	0.021	16.91	-0.006	22.02	-0.026	40.23	0.018	24.52	-0.002	24.26	0.035
04/02/12	1,398	-0.007	35.42	-0.007	39.82	0.055	27.79	0.006	33.35	0.007	22.54	0.034	20.07	0.045	45.38	0.019	48.92	0.025	17.34	0.008	17.67	0.007	36.21	-0.009	30.92	0.002	18.62	0.012	42.15	0.020	17.01	0.025	22.61	0.034	39.52	0.011	24.58	0.027	23.43	0.022
03/01/12	1,408	0.031	35.66	-0.002	37.75	0.016	27.61	0.029	33.13	0.026	21.80	0.036	19.20	0.028	44.52	0.015	47.75	0.030	17.20	0.020	17.54	0.025	36.55	0.016	30.86	0.032	18.40	0.022	41.31	0.018	16.60	0.026	21.87	0.025	39.08	0.025	23.93	0.027	22.92	0.009
02/01/12	1,366	0.041	35.74	0.014	37.16	0.006	26.84	0.014	32.30	-0.038	21.05	-0.014	18.69	-0.008	43.88	0.019	46.35	0.015	16.86	-0.030	17.12	-0.031	35.98	-0.032	29.91	-0.012	18.01	-0.025	40.56	-0.005	16.18	0.010	21.34	-0.012	38.13	0.004	23.30	-0.032	22.71	-0.004
01/03/12	1,312	0.044	35.23	-0.013	36.94	-0.029	26.48	-0.045	33.57	-0.042	21.35	-0.016	18.85	-0.011	43.06	-0.057	45.68	-0.023	17.39	-0.012	17.66	-0.053	37.17	-0.006	30.27	-0.018	18.48	0.003	40.76	-0.008	16.03	-0.016	21.60	-0.014	37.98	-0.005	24.08	-0.012	22.81	-0.038
12/01/11	1,258	0.009	35.68	0.053	38.04	0.045	27.72	-0.008	35.05	0.041	21.70	0.030	19.06	0.055	45.67	0.028	46.75	0.046	17.61	0.002	18.66	0.035	37.40	0.035	30.83	0.037	18.42	0.016	41.10	0.016	16.29	-0.046	21.90	0.020	38.18	0.045	24.36	0.054	23.70	0.061
11/01/11	1,247	-0.005	33.87	0.020	36.40	0.035	27.95	0.061	33.67	0.022	21.07	-0.006	18.06	0.015	44.42	0.010	44.69	0.010	17.58	0.054	18.02	0.025	36.15	0.023	29.72	0.012	18.13	0.133	40.44	0.040	17.07	0.063	21.47	0.021	36.55	0.032	23.11	0.013	22.33	0.017
10/03/11	1,253	0.108	33.20	0.079	35.17	0.065	26.35	0.071	32.94	0.033	21.20	0.067	17.79	0.052	43.96	0.016	44.23	0.063	16.67	0.030	17.58	0.075	35.35	0.069	29.36	0.079	16.00	0.061	38.88	0.073	16.06	0.102	21.03	0.036	35.43	0.045	22.81	0.032	21.95	0.047
09/01/11	1,131	-0.072	30.78	-0.062	33.01	-0.047	24.61	-0.003	31.88	-0.016	19.87	-0.060	16.91	0.005	43.26	0.042	41.61	-0.019	16.18	-0.066	16.35	-0.013	33.07	-0.011	27.22	-0.047	15.08	-0.110	36.22	-0.029	14.58	0.098	20.30	-0.007	33.89	0.018	22.10	0.004	20.97	0.011
08/01/11	1,219	-0.057	32.82	-0.018	34.62	0.029	24.69	0.050	32.39	0.061	21.14	0.019	16.83	0.041	41.53	0.016	42.40	0.014	17.33	0.017	16.57	-0.020	33.44	-0.018	28.57	0.059	16.95	0.004	37.32	0.045	13.28	-0.004	20.44	-0.027	33.28	0.026	22.02	0.033	20.74	0.028
07/01/11	1,292	-0.021	33.41	-0.019	33.63	-0.020	23.51	-0.001	30.52	-0.022	20.76	-0.019	16.17	-0.028	40.87	0.004	41.80	-0.004	17.04	0.060	16.90	-0.027	34.05	-0.007	26.98	-0.033	16.87	-0.015	35.72	-0.038	13.33	-0.096	21.00	-0.020	32.43	-0.005	21.32	-0.041	20.17	-0.012
06/01/11	1,321	-0.018	34.06	0.029	34.33	-0.011	23.53	-0.016	31.20	-0.014	21.15	0.030	16.64	-0.013	40.72	0.012	41.95	-0.019	16.08	0.005	17.37	-0.021	34.31	0.003	27.90	0.013	17.13	-0.037	37.15	-0.015	14.74	0.013	21.43	-0.016	32.58	-0.020	22.23	0.002	20.42	-0.007
05/02/11	1,345	-0.014	33.10	-0.004	34.73	0.040	23.92	0.014	31.63	0.060	20.53	0.035	16.85	0.018	40.25	0.039	42.78	0.022	16.00	-0.132	17.74	0.039	34.19	0.012	27.55	0.016	17.80	-0.050	37.71	0.043	14.56	0.078	21.78	0.040	33.24	-0.020	22.19	-0.001	20.57	0.017
04/01/11	1,364	0.028	33.24	0.039	33.39	0.027	23.59	0.044	29.82	0.038	19.83	0.053	16.55	0.008	38.76	0.038	41.88	0.032	18.42	0.030	17.08	0.028	33.79	0.029	27.12	0.074	18.74	0.029	36.15	0.027	13.50	0.036	20.94	0.050	33.94	0.055	22.21	0.030	20.23	0.018
03/01/11	1,326	-0.001	31.99	0.031	32.52	-0.011	22.60	0.018	28.73	-0.018	18.83	0.036	16.42	0.020	37.32	-0.010	40.57	0.052	17.89	0.007	16.61	0.043	32.84	0.010	25.24	0.032	18.22	0.009	35.22	0.013	13.03	0.121	19.94	0.026	32.18	-0.016	21.56	0.029	19.87	0.009
02/01/11	1,327	0.032	31.03	0.036	32.89	0.060	22.20	-0.014	29.25	0.016	18.17	-0.003	16.10	-0.002	37.68	0.048	38.56	0.018	17.76	0.020	15.93	-0.014	32.53	0.018	24.45	0.052	18.05	0.006	34.76	0.037	11.62	0.021	19.43	0.048	32.69	-0.042	20.96	0.020	19.70	0.016
01/21/11	1,286		29.95		31.04		22.52		28.80		18.23		16.13		35.96		37.89		17.40		16.16		31.95		23.24		17.93		33.51		11.38		18.53		34.14		20.56		19.39	

Prices obtained from Yahoo! Finance, http://finance.yahoo.com

Returns are discrete returns of price

Beta Regression Analysis

ALLETE, Inc. **ALE**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.414352243
R Square	0.171687781
Adjusted R Square	0.157406536
Standard Error	0.046482827
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.025975169	0.025975169	12.02190559	0.000997134
Residual	58	0.125317885	0.002160653		
Total	59	0.151293054			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.005797661	0.00610854	0.949107474	0.346504023	-0.00642991	0.018025232	-0.00642991	0.018025232
ALE	**0.582015792**	0.167860345	3.467261973	0.000997134	0.246006806	0.918024777	0.246006806	0.918024777

Alliant Energy Corporation **LNT**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.335540694
R Square	0.112587557
Adjusted R Square	0.097287343
Standard Error	0.042090036
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.013036214	0.013036214	7.358560686	0.008770541
Residual	58	0.102751128	0.001771571		
Total	59	0.115787342			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.00969217	0.005531261	1.752252995	0.085015534	-0.001379853	0.020764192	-0.001379853	0.020764192
LNT	**0.412317075**	0.151996953	2.712666711	0.008770541	0.108062119	0.716572031	0.108062119	0.716572031

Ameren Corporation **AEE**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.274060881
R Square	0.075109367
Adjusted R Square	0.059162976
Standard Error	0.040657464
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.007785962	0.007785962	4.710117174	0.034093454
Residual	58	0.095875702	0.001653029		
Total	59	0.103661664			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.009265259	0.005343	1.734092978	0.088214254	-0.001429918	0.019960435	-0.001429918	0.019960435
AEE	**0.318648382**	0.146823598	2.170280437	0.034093454	0.024749022	0.612547742	0.024749022	0.612547742

Beta Regression Analysis

American Electric Power Co., Inc. **AEP**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.171959783
R Square	0.029570167
Adjusted R Square	0.012838618
Standard Error	0.04152919
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.003048067	0.003048067	1.767329916	0.188918308
Residual	58	0.100031071	0.001724674		
Total	59	0.103079138			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.011217591	0.005457558	2.05542326	0.044349987	0.000293102	0.02214208	0.000293102	0.02214208
AEP	**0.199373695**	0.149971606	1.329409612	0.188918308	-0.100827089	0.499574479	-0.100827089	0.499574479

Avista Corporation **AVA**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.327130741
R Square	0.107014522
Adjusted R Square	0.091618221
Standard Error	0.044109899
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.013523791	0.013523791	6.950664291	0.010733499
Residual	58	0.112849625	0.001945683		
Total	59	0.126373416			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.009153372	0.005796702	1.579065472	0.119759911	-0.002449988	0.020756731	-0.002449988	0.020756731
AVA	**0.419956976**	0.159291149	2.636411252	0.010733499	0.101101102	0.738812851	0.101101102	0.738812851

CMS Energy Corporation **CMS**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.126807394
R Square	0.016080115
Adjusted R Square	-0.000884021
Standard Error	0.040955585
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.001589951	0.001589951	0.947888845	0.33430037
Residual	58	0.097286878	0.00167736		
Total	59	0.098876829			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.013296641	0.005382178	2.470494705	0.016453854	0.002523042	0.02407024	0.002523042	0.02407024
CMS	**0.143995004**	0.147900185	0.973595832	0.33430037	-0.15205938	0.440049388	-0.15205938	0.440049388

Beta Regression Analysis

Dominion Resources, Inc. **D**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.122018867
R Square	0.014888604
Adjusted R Square	-0.002096075
Standard Error	0.033606972
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.000990046	0.000990046	0.876590234	0.353019459
Residual	58	0.065506859	0.001129429		
Total	59	0.066496905			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.010639036	0.00441646	2.408951135	0.01919496	0.001798531	0.01947954	0.001798531	0.01947954
D	**0.113627456**	0.121362627	0.936263977	0.353019459	-0.129306235	0.356561148	-0.129306235	0.356561148

DTE Energy Company **DTE**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.241135924
R Square	0.058146534
Adjusted R Square	0.041907681
Standard Error	0.038195787
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.005223955	0.005223955	3.580704519	0.06344917
Residual	58	0.084617251	0.001458918		
Total	59	0.089841206			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.011549622	0.005019499	2.300951299	0.025007987	0.001502004	0.02159724	0.001502004	0.02159724
DTE	**0.261008879**	0.137933908	1.892274959	0.06344917	-0.015095833	0.537113591	-0.015095833	0.537113591

Empire District Electric Company **EDE**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.183107744
R Square	0.033528446
Adjusted R Square	0.016865143
Standard Error	0.058253149
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.006827963	0.006827963	2.012112878	0.161399058
Residual	58	0.196818901	0.003393429		
Total	59	0.203646864			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.007305823	0.007655337	0.954343843	0.343870328	-0.008017998	0.022629644	-0.008017998	0.022629644
EDE	**0.298401605**	0.210365727	1.418489647	0.161399058	-0.122691144	0.719494355	-0.122691144	0.719494355

Beta Regression Analysis

Great Plains Energy Inc. **GXP**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.325795549
R Square	0.10614274
Adjusted R Square	0.090731408
Standard Error	0.045755013
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.014418746	0.014418746	6.887317695	0.011077785
Residual	58	0.12142423	0.002093521		
Total	59	0.135842976			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.006407175	0.006012894	1.065572544	0.291032738	-0.005628941	0.018443291	-0.005628941	0.018443291
GXP	**0.43363**	0.165232039	2.624369962	0.011077785	0.102882141	0.764377859	0.102882141	0.764377859

IDACORP, Inc. **IDA**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.388017936
R Square	0.150557919
Adjusted R Square	0.135912366
Standard Error	0.044171734
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.020057958	0.020057958	10.28011147	0.002188807
Residual	58	0.113166239	0.001951142		
Total	59	0.133224197			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.009889362	0.005804828	1.703644304	0.09380052	-0.001730263	0.021508987	-0.001730263	0.021508987
IDA	**0.511445001**	0.159514448	3.206261292	0.002188807	0.192142143	0.830747858	0.192142143	0.830747858

NorthWestern Corporation **NWE**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.317210211
R Square	0.100622318
Adjusted R Square	0.085115806
Standard Error	0.047292123
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.014513021	0.014513021	6.489036324	0.013528124
Residual	58	0.129719606	0.002236545		
Total	59	0.144232627			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.012111868	0.006214894	1.948845529	0.056156341	-0.000328593	0.024552329	-0.000328593	0.024552329
NWE	**0.435045316**	0.170782904	2.547358696	0.013528124	0.093186193	0.776904438	0.093186193	0.776904438

Beta Regression Analysis

Otter Tail Corporation **OTTR**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.425551086
R Square	0.181093727
Adjusted R Square	0.166974653
Standard Error	0.053395388
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.036568293	0.036568293	12.8261762	0.000699803
Residual	58	0.165361911	0.002851067		
Total	59	0.201930204			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.003761295	0.007016954	0.536029607	0.593987938	-0.010284664	0.017807255	-0.010284664	0.017807255
OTTR	**0.690570347**	0.192823217	3.58136513	0.000699803	0.304592744	1.076547949	0.304592744	1.076547949

Pinnacle West Capital Corporation **PNW**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.262356819
R Square	0.068831101
Adjusted R Square	0.052776464
Standard Error	0.044086479
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.008332879	0.008332879	4.287303661	0.042858959
Residual	58	0.112729824	0.001943618		
Total	59	0.121062703			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.009500119	0.005793624	1.63975413	0.106469589	-0.002097079	0.021097317	-0.002097079	0.021097317
PNW	**0.329650031**	0.159206575	2.070580513	0.042858959	0.01096345	0.648336612	0.01096345	0.648336612

PNM Resources, Inc. **PNM**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.192244842
R Square	0.036958079
Adjusted R Square	0.020353908
Standard Error	0.053461875
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.006361808	0.006361808	2.225831027	0.141139142
Residual	58	0.165773981	0.002858172		
Total	59	0.172135789			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.01580151	0.007025691	2.249103889	0.028318274	0.001738061	0.029864959	0.001738061	0.029864959
PNM	**0.288035397**	0.193063318	1.491921924	0.141139142	-0.098422819	0.674493614	-0.098422819	0.674493614

Beta Regression Analysis

Portland General Electric Company **POR**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.305825481
R Square	0.093529225
Adjusted R Square	0.077900418
Standard Error	0.040498218
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.009815069	0.009815069	5.984412494	0.017486126
Residual	58	0.095126129	0.001640106		
Total	59	0.104941198			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.009944131	0.005322073	1.868469559	0.066749994	-0.000709155	0.020597417	-0.000709155	0.020597417
POR	**0.357768629**	0.146248525	2.446305887	0.017486126	0.065020401	0.650516856	0.065020401	0.650516856

SCANA Corporation **SCG**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.175566765
R Square	0.030823689
Adjusted R Square	0.014113753
Standard Error	0.042030978
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.003258733	0.003258733	1.844632329	0.17966886
Residual	58	0.10246298	0.001766603		
Total	59	0.105721713			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.008960991	0.0055235	1.622339198	0.11015459	-0.002095496	0.020017478	-0.002095496	0.020017478
SCG	**0.206148407**	0.151783679	1.358172422	0.17966886	-0.097679634	0.509976448	-0.097679634	0.509976448

Westar Energy, Inc. **WR**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.240209207
R Square	0.057700463
Adjusted R Square	0.04145392
Standard Error	0.043121642
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.006604028	0.006604028	3.551553133	0.064503913
Residual	58	0.107849606	0.001859476		
Total	59	0.114453634			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.010413122	0.00566683	1.837556784	0.071251775	-0.000930271	0.021756514	-0.000930271	0.021756514
WR	**0.293467508**	0.15572232	1.884556482	0.064503913	-0.018244581	0.605179596	-0.018244581	0.605179596

Beta Regression Analysis

Xcel Energy Inc. **XEL**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.100510575
R Square	0.010102376
Adjusted R Square	-0.006964825
Standard Error	0.039196933
Observations	60

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.000909422	0.000909422	0.591917564	0.444800542
Residual	58	0.089111176	0.0015364		
Total	59	0.090020598			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.010661219	0.005151064	2.069711913	0.042943215	0.000350244	0.020972195	0.000350244	0.020972195
XEL	**0.108902609**	0.141549282	0.76936179	0.444800542	-0.174439061	0.392244279	-0.174439061	0.392244279

Beta Results

		[1]	[2]	[3]	[4]
Company	Ticker	Raw Beta	Standard Error	SE^2	Adjusted Beta
ALLETE, Inc.	ALE	0.5820	0.1679	0.0282	0.4501
Alliant Energy Corporation	LNT	0.4123	0.1520	0.0231	0.3755
Ameren Corporation	AEE	0.3186	0.1468	0.0216	0.3273
American Electric Power Co., Inc.	AEP	0.1994	0.1500	0.0225	0.2658
Avista Corporation	AVA	0.4200	0.1593	0.0254	0.3775
CMS Energy Corporation	CMS	0.1440	0.1479	0.0219	0.2358
Dominion Resources, Inc.	D	0.1136	0.1214	0.0147	0.1983
DTE Energy Company	DTE	0.2610	0.1379	0.0190	0.2945
Empire District Electric Company	EDE	0.2984	0.2104	0.0443	0.3234
Great Plains Energy Inc.	GXP	0.4336	0.1652	0.0273	0.3824
IDACORP, Inc.	IDA	0.5114	0.1595	0.0254	0.4220
NorthWestern Corporation	NWE	0.4350	0.1708	0.0292	0.3814
Otter Tail Corporation	OTTR	0.6906	0.1928	0.0372	0.4762
Pinnacle West Capital Corporation	PNW	0.3297	0.1592	0.0253	0.3334
PNM Resources, Inc.	PNM	0.2880	0.1931	0.0373	0.3178
Portland General Electric Company	POR	0.3578	0.1462	0.0214	0.3480
SCANA Corporation	SCG	0.2061	0.1518	0.0230	0.2701
Westar Energy, Inc.	WR	0.2935	0.1557	0.0242	0.3153
Xcel Energy Inc.	XEL	0.1089	0.1415	0.0200	0.2124
Average		0.3371	0.1594	0.0258	0.3320
Variance		0.0241	0.0004	0.0001	0.0058

[1] Raw beta calculated through linear regression from DG 1-10

[2] Standard error of the beta coefficient from DG 1-10

[3] = [2]^2

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

Implied Equity Risk Premium

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Year	Index Value	Operating Earnings	Dividends	Buybacks	Earnings Yield	Dividend Yield	Buyback Yield	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	7.26%	[10]
Risk-free Rate	2.77%	[11]
Current Index Value	2,002	[12]

	[13]	[14]	[15]	[16]	[17]
Year	1	2	3	4	5
Expected Dividends	107.96	115.79	124.20	133.22	142.89
Expected Terminal Value					2346.43
Present Value	99.01	97.40	95.82	94.26	1615.50

Intrinsic Index Value	2002	[18]
Required Return on Market	9.03%	[19]
Implied Equity Risk Premium	**6.26%**	[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)$^{1/4}$-1
[11] Risk-free rate calculated in DG 1-8
[12] 30-day average of closing index prices from DG 1-4
[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])^{5}
[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 Results

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	5.72%	[7]
PUD	6.26%	[8]
Implied ERP Average	5.99%	[9]
Weighted Average ERP	**5.62%**	[10]

[1],[2] Ibbotson Stocks, Bonds, Bills, and Iflation (SBBI)
[3] = Average ([1],[2])
[4] IESE Business School Survey
[5] Graham and Harvey Survey
[6] = Average([4],[5])
[7] http://pages.stern.nyu.edu/~adamodar/
[8] = PUD calculated ERP from DG 1-12
[9] = Average ([7],[8])
[10] = Weighted average. Historic 10%, Survey 30%, Implied 60%

CAPM Final Results

Company	Ticker	[1] Risk-Free Rate	[2] Calculated Beta	[3] Value Line Beta	[4] Average Beta	[5] Risk Premium	[6] CAPM Results
ALLETE, Inc.	ALE	2.77%	0.450	0.800	0.625	5.62%	6.28%
Alliant Energy Corporation	LNT	2.77%	0.376	0.800	0.588	5.62%	6.07%
Ameren Corporation	AEE	2.77%	0.327	0.750	0.539	5.62%	5.80%
American Electric Power Co., Inc.	AEP	2.77%	0.266	0.700	0.483	5.62%	5.49%
Avista Corporation	AVA	2.77%	0.377	0.800	0.589	5.62%	6.08%
CMS Energy Corporation	CMS	2.77%	0.236	0.750	0.493	5.62%	5.54%
Dominion Resources, Inc.	D	2.77%	0.198	0.700	0.449	5.62%	5.30%
DTE Energy Company	DTE	2.77%	0.295	0.750	0.522	5.62%	5.71%
Empire District Electric Company	EDE	2.77%	0.323	0.700	0.512	5.62%	5.65%
Great Plains Energy Inc.	GXP	2.77%	0.382	0.850	0.616	5.62%	6.23%
IDACORP, Inc.	IDA	2.77%	0.422	0.800	0.611	5.62%	6.20%
NorthWestern Corporation	NWE	2.77%	0.381	0.700	0.541	5.62%	5.81%
Otter Tail Corporation	OTTR	2.77%	0.476	0.850	0.663	5.62%	6.50%
Pinnacle West Capital Corporation	PNW	2.77%	0.333	0.750	0.542	5.62%	5.82%
PNM Resources, Inc.	PNM	2.77%	0.318	0.850	0.584	5.62%	6.05%
Portland General Electric Company	POR	2.77%	0.348	0.800	0.574	5.62%	6.00%
SCANA Corporation	SCG	2.77%	0.270	0.750	0.510	5.62%	5.64%
Westar Energy, Inc.	WR	2.77%	0.315	0.750	0.533	5.62%	5.76%
Xcel Energy Inc.	XEL	2.77%	0.212	0.650	0.431	5.62%	5.19%
Average			0.332	0.763	0.548		**5.85%**

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

Required Return on the Market Portfolio

IESE Survey	7.90%
Duke CFO Survey	6.63%
PUD Estimate	9.03%
Average	**7.85%**
OG&E Requested Return	**10.25%**

Awarded Returns vs. Required Market Returns (2005 - 2015)

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%
2015.1	10	10.37%
2015.2	21	9.73%
2015.3	6	9.40%
2015.4	11	9.62%

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.

Year	[8] Required Market Return
2005	8.47%
2006	8.86%
2007	8.39%
2008	8.64%
2009	8.20%
2010	8.49%
2011	7.89%
2012	7.54%
2013	8.00%
2014	7.95%
2015	8.39%
Average	**8.26%**

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

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

[3] Historical stock returns. NYU Stern School of Business. http://pages.stern.nyu.edu/~adamodar/.

[4] = Average of [3]

[5] = Geometric mean of [3]

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

[7] = Average of [2]

[8] Annual required market returns. NYU Stern School of Business. http://pages.stern.nyu.edu/~adamodar/ (adding risk-free rate to implied ERP)

Competitive Earnings

Industry	No. of Firms	Average Beta	Return on Equity
Farming/Agriculture	37	1.25	10%
Electronics (General)	167	1.03	10%
Healthcare Products	254	1.03	10%
Business & Consumer Services	159	1.19	10%
Hospitals/Healthcare Facilities	58	0.82	10%
Bank (Money Center)	9	1.11	10%
Banks (Regional)	644	0.51	9%
Software (Internet)	308	1.34	9%
Insurance (Life)	25	1.28	9%
Power	73	0.80	9%
Oilfield Svcs/Equip.	143	1.74	8%
Environmental & Waste Services	97	1.10	8%
Brokerage & Investment Banking	42	1.35	8%
Oil/Gas Distribution	79	1.22	8%
R.E.I.T.	221	0.76	7%
Reinsurance	3	1.03	7%
Paper/Forest Products	20	1.52	6%
Semiconductor Equip	46	1.40	6%
Oil/Gas (Integrated)	7	1.54	6%
Diversified	26	1.01	6%
Insurance (General)	20	1.04	5%
Publshing & Newspapers	39	1.45	4%
Engineering/Construction	51	1.32	2%
Real Estate (General/Diversified)	12	1.22	2%
Education	40	1.05	1%
Rubber& Tires	4	1.66	0%
Financial Svcs. (Non-bank & Insurance)	272	0.65	-1%
Real Estate (Development)	21	1.41	-1%
Telecom (Wireless)	19	1.48	-3%
Green & Renewable Energy	28	1.62	-4%
Precious Metals	113	1.29	-4%
Chemical (Basic)	42	1.17	-6%
Steel	36	1.43	-14%
Tobacco	20	1.91	-17%
Metals & Mining	114	1.55	-23%
Oil/Gas (Production and Exploration)	351	1.63	-28%
Coal & Related Energy	38	1.49	-31%
Total / Aveage	**3,638**	**1.25**	**1.3%**

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

Cost of Equity Summary

Model	Cost of Equity
Discounted Cash Flow Model	6.56%
Capital Asset Pricing Model	5.85%
Average	**6.20%**

Optimal Capital Structure

Inputs		
EBIT	500,400	[1]
Interest Expense	146,700	[2]
Book Debt	2,665,460	[3]
Book Equity	3,031,798	[4]
Debt / Capital	46.78%	[5]
Debt / Equity	88%	[6]
Debt Cost	5.62%	[7]
Tax Rate	38.77%	[8]
Unlevered Beta	0.496	[9]
Risk-free Rate	2.77%	[10]
Equity Risk Premium	5.62%	[11]
Coverage Ratio	3.41	[12]
Bond Rating	A-	[13]

Ratings Table

[14] Coverage Ratio	[15] Bond Rating	[16] Spread	[17] Interest Rate
> 8.5	Aaa/AAA	0.75%	3.52%
6.5 - 8.49	Aa2/AA	1.00%	3.77%
5.5 - 6.49	A1/A+	1.10%	3.87%
4.25 - 5.49	A2/A	1.25%	4.02%
3.0 - 4.24	A3/A-	1.75%	4.52%
2.5 - 2.99	Baa2/BBB	2.25%	5.02%
2.25 - 2.49	Ba1/BB+	3.25%	6.02%
2.0 - 2.249	Ba2/BB	4.25%	7.02%
1.75 - 1.99	B1/B+	5.50%	8.27%
1.5 - 1.74	B2/B	6.50%	9.27%
1.25 - 1.49	B3/B-	7.50%	10.27%
0.8 - 1.249	Caa/CCC	9.00%	11.77%

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%	0.496	5.56%	0	0	∞	3.52%	2.16%	5.56%
40%	67%	0.699	6.70%	2,278,903	128,074	3.91	4.52%	2.77%	5.12%
50%	100%	0.800	7.26%	2,848,629	160,093	3.13	4.52%	2.77%	5.02%
52%	108%	0.825	7.41%	2,962,574	166,497	3.01	4.52%	2.77%	4.99%
55%	122%	0.867	7.64%	3,133,492	176,102	2.84	5.02%	3.07%	5.13%
60%	150%	0.952	8.12%	3,418,355	192,112	2.60	5.02%	3.07%	5.09%
62%	163%	0.992	8.34%	3,532,300	198,515	2.52	5.02%	3.07%	5.08%
63%	170%	1.013	8.46%	3,589,272	201,717	2.48	6.02%	3.69%	5.45%
69%	217%	1.157	9.27%	3,902,621	219,327	2.28	7.02%	4.30%	5.86%
90%	900%	3.230	20.91%	5,127,532	288,167	1.74	8.27%	5.07%	6.65%

[1] OG&E 2015 10-K (000's)
[2] OG&E 2015 10-K (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
[9] VL beta from DG 1-11/(1+(1 - [8])*[6])
[10] From DG 1-8
[11] From DG 1-13
[12] = [1] / [2]
[13] S&P rating for OG&E (2015 10-K)
[14] Ranges 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] * (1 - [8])
[27] = ([18] * [26]) + ((1 - [18]) * [21])

WACC at 9.25 Percent Awarded Return

Inputs		
EBIT	500,400	[1]
Interest Expense	146,700	[2]
Book Debt	2,665,460	[3]
Book Equity	3,031,798	[4]
Debt / Capital	46.78%	[5]
Debt / Equity	88%	[6]
Debt Cost	5.62%	[7]
Tax Rate	38.77%	[8]
Unlevered Beta	0.496	[9]
Risk-free Rate	2.77%	[10]
Equity Risk Premium	5.62%	[11]
Coverage Ratio	3.41	[12]
Bond Rating	A-	[13]

Ratings Table

Coverage Ratio	Bond Rating	Spread	Interest Rate
> 8.5	Aaa/AAA	0.75%	3.52%
6.5 - 8.49	Aa2/AA	1.00%	3.77%
5.5 - 6.49	A1/A+	1.10%	3.87%
4.25 - 5.49	A2/A	1.25%	4.02%
3.0 - 4.24	A3/A-	1.75%	4.52%
2.5 - 2.99	Baa2/BBB	2.25%	5.02%
2.25 - 2.49	Ba1/BB+	3.25%	6.02%
2.0 - 2.249	Ba2/BB	4.25%	7.02%
1.75 - 1.99	B1/B+	5.50%	8.27%
1.5 - 1.74	B2/B	6.50%	9.27%
1.25 - 1.49	B3/B-	7.50%	10.27%
0.8 - 1.249	Caa/CCC	9.00%	11.77%

Optimal Capital Structure Calculation

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%		9.25%	0	0	∞	3.52%	2.16%	9.25%
40%	67%		9.25%	2,278,903	128,074	3.91	4.52%	2.77%	6.66%
50%	100%		9.25%	2,848,629	160,093	3.13	4.52%	2.77%	6.01%
52%	108%		9.25%	2,962,574	166,497	3.01	4.52%	2.77%	5.88%
55%	122%		9.25%	3,133,492	176,102	2.84	5.02%	3.07%	5.85%
60%	150%		9.25%	3,418,355	192,112	2.60	5.02%	3.07%	5.54%
62%	163%		9.25%	3,532,300	198,515	2.52	5.02%	3.07%	5.42%
65%	186%		9.25%	3,703,217	208,121	2.40	6.02%	3.69%	5.63%
69%	217%		9.27%	3,902,621	219,327	2.28	7.02%	4.30%	5.86%
90%	900%		20.91%	5,127,532	288,167	1.74	8.27%	5.07%	6.65%

Competitive Industry Debt Ratios

Industry	Number of Fimrs	Debt Ratio
Advertising	44	73%
Air Transport	20	57%
Auto & Truck	19	74%
Bank (Money Center)	9	67%
Beverage (Soft)	43	64%
Broadcasting	29	68%
Brokerage & Investment Banking	42	77%
Building Materials	39	55%
Cable TV	19	69%
Coal & Related Energy	38	69%
Construction Supplies	52	58%
Farming/Agriculture	37	55%
Hospitals/Healthcare Facilities	58	66%
Hotel/Gaming	73	61%
Office Equipment & Services	24	67%
Packaging & Container	25	63%
Paper/Forest Products	20	74%
Power	73	56%
R.E.I.T.	221	64%
Real Estate (Operations & Services)	55	56%
Restaurant/Dining	83	61%
Retail (Automotive)	26	70%
Retail (Building Supply)	5	67%
Retail (Distributors)	83	60%
Retail (Grocery and Food)	17	55%
Telecom (Wireless)	19	61%
Telecom. Services	65	65%
Tobacco	20	85%
Trucking	26	74%
Total / Average	**1284**	**65%**

http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/dbtfund.htm

Illustration of Earnings Growth Volatility

Exhibit DG 1-22

Company	Ticker	[1] Hevert's Prior Growth Rate Estimate	[2] Actual Growth in Earnings	[3] Amount Overestimated
Amazon	AMZN	29%	-40%	69%
Consol Energy	CNX	47%	-6%	53%
EOG Resources Inc.	EOG	44%	10%	34%
Netflix Inc.	NFLX	30%	8%	23%
NRG Energy	NRG	25%	-32%	57%
Range Resources	RRC	29%	-3%	32%
Southwestern Energy	SWN	23%	9%	14%
Starwood Hotels & Resorts	HOT	25%	10%	15%
Textron Inc.	TXT	45%	-12%	57%
Wynn Resorts LTD	WYNN	50%	28%	23%
Average		35%	-3%	37%

[1] See Direct Testimony of Robert B. Hevert, Exhibit RBH-4 in Cause No. PUD 2011-087, long-term growth estimates

[2] Value Line Investment Survey showing actual growth in earnings over the past five years.

[3] = [1] - [2]

CERTIFICATE OF ELECTRONIC SERVICE

I, the undersigned, do hereby certify that on the 21st day of March 2016, a true and correct copy of the above and foregoing was sent electronically, addressed to the following:

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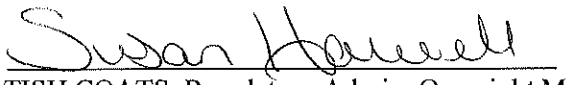

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