BEFORE THE CORPORATION COMMISSION OF OKLAHOMA

APPLICATION OF THE EMPIRE DISTRICT ELECTRIC COMPANY, A KANSAS CORPORATION, FOR AN ADJUSTMENT IN ITS RATES AND CHARGES FOR ELECTRIC SERVICE IN THE STATE OF OKLAHOMA	CASE NO. PUD 201600468

DIRECT TESTIMONY OF

DAVID J. GARRETT

PART I – COST OF CAPITAL

ON BEHALF OF

OKLAHOMA INDUSTRIAL ENERGY CONSUMERS

MARCH 13, 2017

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I. INTRODUCTION

Q. State your name and occupation.

A. My name is David J. Garrett. I am a consultant specializing in public utility regulation. I am the managing member of Resolve Utility Consulting, PLLC. I focus my practice on the primary capital recovery mechanisms for public utility companies: cost of capital and depreciation.

Q. Summarize your educational background and professional experience.

A. I received a B.B.A. with a major in Finance, an M.B.A. and a Juris Doctor from the University of Oklahoma. I worked in private legal practice for several years before accepting a position as assistant general counsel at the Oklahoma Corporation Commission in 2011. At the Oklahoma Commission, I worked in the Office of General Counsel in regulatory proceedings. In 2012, I began working for the Public Utility Division as a regulatory analyst providing testimony in regulatory proceedings. After leaving the Oklahoma Commission, I formed Resolve Utility Consulting, PLLC, where I have represented various consumer groups, state agencies, and municipalities in utility regulatory proceedings, primarily in the areas of cost of capital and depreciation. I am a Certified Depreciation Professional with the Society of Depreciation Professionals. I am also a Certified Rate of Return Analyst with the Society of Utility and Regulatory Financial Analysts. A more complete description of my qualifications and regulatory experience is included in my curriculum vitae.[1]

[1] Exhibit DG 1-1.

Q. On whose behalf are you testifying in this proceeding?

A. I am testifying on behalf of the Oklahoma Industrial Energy Consumers ("OIEC"). OIEC is an unincorporated association of companies with facilities in Oklahoma that require significant energy usage.

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 Empire District Electric Company ("Empire" or the "Company"). Together these issues are voluminous, so I have filed two separate responsive testimony documents. Part I of my responsive testimony (this document) includes cost of capital and related issues. Part II of my responsive testimony includes depreciation expense and related issues. In this testimony, I am responding to the direct testimony of Company witness Dr. James H. Vander Weide.

II. OVERVIEW OF COST OF CAPITAL RECOMMENDATIONS

Q. What is the purpose of your Cost of Capital Testimony?

A. The purpose of my testimony is to present evidence and provide the Commission with recommendations regarding: (1) Empire's awarded return on equity ("ROE"), and (2) the appropriate capital structure that the Commission should impute for ratemaking purposes to arrive at an appropriate cost of capital for Empire.

Q. Explain the Weighted Average Cost of Capital, and how the Company's ROE and its capital structure affect this equation.

A. The term "cost of capital" refers to the weighted average cost of all types of securities within a company's capital structure, including debt and equity. Determining the cost of debt is relatively straight-forward. Interest payments on bonds are contractual, "embedded costs" that are generally 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 of debt, there is no explicit "cost" of equity; the cost of equity must be estimated through various financial models. Thus, the overall weighted average cost of capital ("WACC"), includes the cost of debt and the estimated cost of equity. It is a "weighted average," because it is based upon the Company's relative levels of debt and equity, or "capital structure." Companies in the competitive market often use their WACC as the discount rate to determine the value of capital projects, so it is important that this figure be closely estimated. The basic WACC equation used in regulatory proceedings is presented as follows:[2]

[2] *See* Roger A. Morin, *New Regulatory Finance* 449-450 (Public Utilities Reports, Inc. 2006) (1994). 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.

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*

Thus, the three components of the weighted average cost of capital include the following:

1. Cost of Equity
2. Cost of Debt
3. Capital Structure

The term "cost of capital" is necessarily synonymous with the "weighted average cost of capital," and the terms are used interchangeably throughout this testimony.

Q. Describe the relationship between the cost of equity, required return on equity, earned return on equity, and awarded return on equity.

A. While "cost of equity," "required return on equity," "earned return on equity," and "awarded return on equity" are interrelated factors and concepts, they are all technically different. The financial models presented in this case were created as tools for estimating the "cost" of equity, which is synonymous to the "required return" that investors expect in exchange for giving up their opportunity to invest in other securities, or postponing their own consumption, given the level of risk inherent in the equity investment. In other words, the *cost* of equity from the company's perspective equals the *required return* from the investor's perspective.

The "earned" ROE is a historical return that is measured from a company's accounting statements, and it is used to measure how much shareholders earned for investing in a company. A company's earned ROE is not the same as the company's cost of equity, or an investor's required return. For example, an investor who invests in a risky firm may *require* a return on investment of 10%. If the company has used the same estimates as the investor, then the company will estimate that its *cost* of equity is also 10%. If the company performs poorly and the investor *earns* a return only 3%, this does not mean that the investor required only 3%, or that the investor will not still require a 10% return the following period. Thus, the cost of equity is not the same as the earned ROE. If by chance the company in this example achieves a 10% return on equity, then it will have exactly satisfied the return required by its shareholders.

Finally, the "awarded" return on equity is unique to the regulatory environment; it is the return authorized by a regulatory commission pursuant to legal guidelines. As discussed later in this testimony, the awarded ROE should be based on the utility's cost of equity. The relationship between the terms and concepts discussed thus far could be summarized in the following sentence: If the awarded ROE reflects a utility's cost of equity it should allow the utility to achieve an earned ROE that is sufficient to satisfy the required return of its equity investors; in addition, the regulator must consider the cost of debt and determine a prudent capital structure in order to ensure the utility's weighted average cost of capital is fair and reasonable.

Q. Describe Empire's position regarding the cost of capital in this case.

A. In this Application, the Company has proposed a cost of equity of 9.9%, a cost of debt of 5.30%, and a pro forma debt ratio of 50.32%, which equate to an overall proposed weighted average return of 7.59%.[3] In the sections below, I discuss why the Company's proposed ROE is overstated, as well as the specific flaws and errors upon which the Company's requested cost of capital is based.

Q. Summarize your analyses and conclusions regarding Empire's cost of equity.

A. In formulating my recommendation, I performed thorough, independent analyses to calculate Empire's cost of equity. To do this, I selected a proxy group of companies that represents a relevant sample with asset and risk profiles similar to Empire's. Based on this proxy group, I evaluated the results of the two most widely-used and widely-accepted financial models for calculating cost of equity in utility rate case proceedings: (1) the Discounted Cash Flow ("DCF") model; and (2) the Capital Asset Pricing Model ("CAPM"). Applying reasonable inputs and assumptions to these models reveals that Empire's estimated cost of equity is 7.5%.

Q. Summarize your analyses and conclusions regarding Empire's capital structure.

A. The Company's requested capital structure includes about 50%% long-term debt and 50% common equity (exclusive of other capital items). In this testimony, I present evidence showing that although utility debt ratios should usually be higher than their actual debt ratios, Empire's requested capital structure is reasonable under the circumstances.

[3] Company schedule F-1.

Q. Summarize your awarded return recommendation.

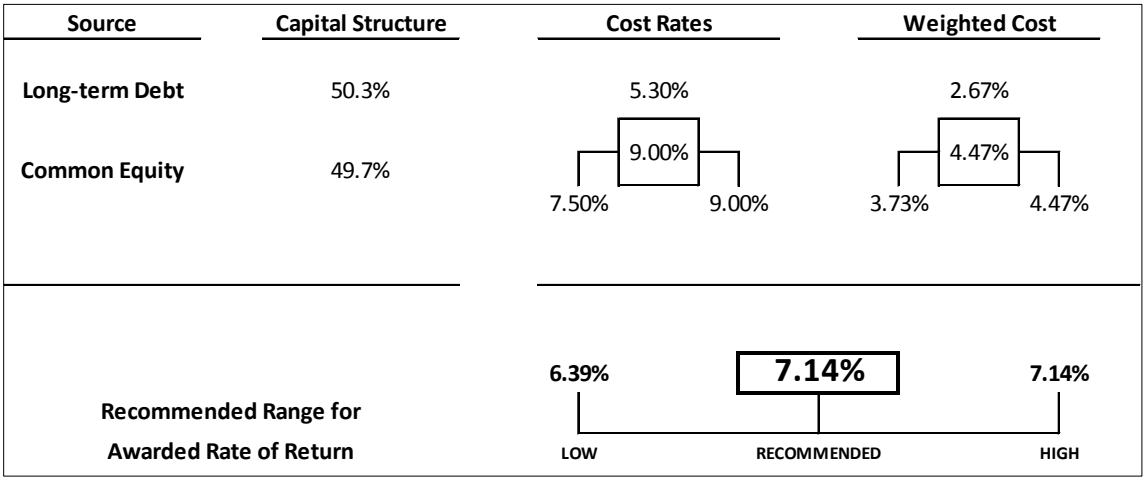
A. Pursuant to the legal and technical standards guiding this issue, the awarded rate of return should be based on, or reflective of the weighted average cost of the utility's cost of equity and cost of debt. As discussed above, Empire's estimated cost of equity is 7.5%. The legal standards governing this issue indicate that the awarded return should reflect the actual cost of equity. However, these legal standards also provide that the "end result" be fair and reasonable under the circumstances. Specifically, in *Federal Power Commission v. Hope Natural Gas Co.*, the Supreme Court found that although the awarded return should be based on a utility's cost of capital, it is also indicated that the "end result" should be just and reasonable.[4] If the Commission were to award a return on equity reflective of Empire's actual cost of equity of 7.5% it would be technically correct under the rate base rate of return model, and it would not violate any legal standards. However, if the Commission were to set the awarded return at 7.5%, it would represent an abrupt change in Empire's awarded return, which is currently 9.9%.[5] One of the primary reasons Empire's cost of equity is low is because it is a very low-risk asset. In general, utility stocks are low-risk investments because movements in their prices are not volatile. If the Commission were to make a significant, sudden change in the awarded ROE, however, it could conflict with the *Hope* Court's "end result" doctrine. For this reason, I recommend an awarded return on equity that is higher than Empire's actual cost of equity.

[4] *See Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591, 603 (1944). Here, the Court states that it is not mandating the various permissible ways in which the rate of return may be determined, but instead indicates that the end result should be just and reasonable. This is sometimes called the "end result" doctrine.

[5] Company schedule F-1.

Specifically, I recommend that the Commission award a return on equity of 9.0%, which is the highest point in a reasonable range of 7.5% - 9.0%. Adopting an awarded ROE at the lower end of the range would represent a stricter adherence to the principles set forth by the Supreme Court – that the awarded return should reflect the utility's actual cost of capital, which in this case is approximately 7.5%. On the other hand, adopting an awarded ROE at the higher end of the range would be consistent with the *Hope* Court's "end result" doctrine by recognizing that it is reasonable under the circumstances to gradually move the awarded return closer to the true cost of equity in the interest of minimizing the Company's market risk. In addition, I recommend the Commission adopt Empire's proposed capital structure consisting of 50.32% debt and 49.68% equity. My recommendations regarding the awarded rate of return are illustrated in the following figure:

Figure 1:
OIEC Awarded Return Recommendation



Thus, in this case, if the Commission were to award a return on equity of 9.0%, it will allow Empire's shareholders to earn a return that is much higher than the one they require for

investing in a low-risk utility company. OIEC's overall weighted average cost of capital recommendation is 7.14%.

Q. Please provide an overview of the problems you have identified with the Company's cost of capital estimate.

A. As set forth above, Dr. Vander Weide proposes a return on equity of 9.9%. Dr. Vander Weide's recommendations are based on the CAPM, DCF Model, and other risk premium models. However, several of his key assumptions and inputs to these models violate fundamental, widely-accepted tenants in finance and valuation, while other assumptions and inputs are simply unrealistic. In the sections below, I will discuss my concerns regarding the Company's requested cost of capital in further detail. However, the key areas of concern are summarized as follows:

1. In his DCF Model, Dr. Vander Weide's long-term growth rate applied to Empire exceeds the long-term growth rate for the entire U.S. economy. It is a fundamental concept in finance that, in the long run, a company cannot grow at a faster rate than the aggregate economy in which it operates; this is especially true for a regulated utility with a defined service territory. Thus, the results of Dr. Vander Weide's DCF Model are based on unrealistic assumptions and are not reflective of market conditions.[6]

2. Dr. Vander Weide's estimate for the equity risk premium ("ERP"), the single most important factor in estimating the cost of equity, is significantly higher than the estimates reported by thousands of experts across the country. This is because Dr. Vander Weide has inappropriately considered the arithmetic mean total market returns dating as far back as 1926. It is widely-accepted in the finance community that the current and forward-looking equity risk premium is lower than the historical risk premium (especially when calculated through the arithmetic mean).[7]

[6] EDE Schedule JVW-1 (many of Dr. Vander Weide's estimated growth rates exceed projected nominal GDP growth of 4%, as does the average growth rate in this schedule.

[7] Direct Testimony of Dr. Vander Weide, p. 41, lines 8-12.

3. Dr. Vander Weide's estimates for beta for the proxy companies in the CAPM are significantly higher than the betas reported by institutional financial analysts, and are overstated due to faulty assumptions.

4. Dr. Vander Weide's own risk premium is also unrealistic, as it produces cost of equity results for a utility that exceeds any reasonable estimate of the required return on the market portfolio.

In short, the assumptions employed by Dr. Vander Weide skew the results of his financial models such that they do not reflect the economic realities of the market upon which cost of equity recommendation should be based. In the testimony below, I demonstrate how correcting the various erroneous assumptions in the DCF and CAPM financial models results in appropriate ROE recommendations which better align with current market conditions and Empire's risk profile.

Q. Describe the harmful impact to the state's economy and to large consumers of energy, such as OIEC member companies, if the Commission were to adopt Empire's inflated ROE recommendation.

A. When the awarded return is set significantly above the true cost of equity, it results in an inappropriate and excess transfer of wealth from ratepayers to shareholders beyond that which is required by law. This outflow of funds from Oklahoma's economy would not benefit its businesses or citizens. Instead, Oklahoma businesses, such as OIEC member companies, would be less competitive with businesses in surrounding states, and individual ratepayers will receive inflated costs for basic goods and services, along with higher utility bills.

III. LEGAL STANDARDS AND THE AWARDED RETURN

Q. Discuss the legal standards governing the awarded 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.[8] The Court found that "the amount of risk in the business is a most important factor" in determining the appropriate allowed rate of return.[9] Later in two landmark cases, the Court set forth the standards by which 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.[10]

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

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

[9] *Id*. at 48.

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

> 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.[11]

The cost of capital models I have employed in this case are in accord with all of the foregoing legal standards.

Q. Is it important that the awarded rate of return be based on the Company's actual cost of capital?

A. Yes. The Supreme Court in *Hope* makes it clear that the allowed return should be based on the actual cost of capital. Under the rate base rate of return model, a utility should be allowed to recover all of its reasonable expenses, its capital investments through depreciation, and 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 actual cost of capital:

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

> 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.[12]

The models I have employed in this case closely estimate the Company's true cost of equity. If the Commission sets the awarded return based on my lower, and more reasonable rate of return, 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 much *higher* than the true cost of capital, it arguably results in an inappropriate transfer of wealth from ratepayers to shareholders.

> [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.[13]

Thus, it is important to understand that the *awarded* return and the *cost* of capital are different but related concepts. The two concepts are related in that the legal and technical standards encompassing this issue require that the awarded return reflect the true cost of capital. On the other hand, the two concepts are different in that the legal standards do not mandate that awarded returns exactly match the cost of capital. Awarded returns are set through the regulatory process and may be influenced by a number of factors other than objective market drivers. The cost of capital, on the other hand, should be evaluated

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[12] 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).

[13] Morin *supra* n. 2, at 23-24.

objectively and be closely tied to economic realities. In other words, the cost of capital is driven by stock prices, dividends, growth rates, and most importantly – it is driven by risk. The cost of capital can be estimated through the use of financial models used by firms, investors, and academics around the world for decades. The problem is, with respect to regulated utilities, there has been a trend in which awarded returns fail to closely track with actual market-based cost of capital as further discussed below. To the extent this occurs, the results are detrimental to ratepayers and the state's economy.

Q. Describe the economic impact that occurs when the awarded return strays too far from the Supreme Court's cost of equity standard.

A. As discussed further in the sections below, Dr. Vander Weide's recommended awarded ROE is much higher than Empire's true cost of capital based on objective market data. When the awarded ROE is set far above true cost of equity, it runs the risk of violating the Supreme Court's standards directing that the awarded return should be *based on the cost of capital*. Specifically, if the Commission were to adopt the Company's position in this case, it would be permitting an excess transfer of wealth from Oklahoma customers to Company shareholders. Moreover, establishing an awarded return that far exceeds true cost of capital effectively prevents the awarded returns from changing along with economic conditions. This is especially true given the fact that regulators tend to be influenced by the awarded returns in other jurisdictions, regardless of the various unknown factors influencing those awarded returns. This is yet another reason why it is crucial for regulators to focus on the target utility's actual *cost* of equity, rather than awarded returns from other jurisdictions. Awarded returns may be influenced by settlements and other political factors not based on true market conditions. In contrast, the true cost of equity as estimated

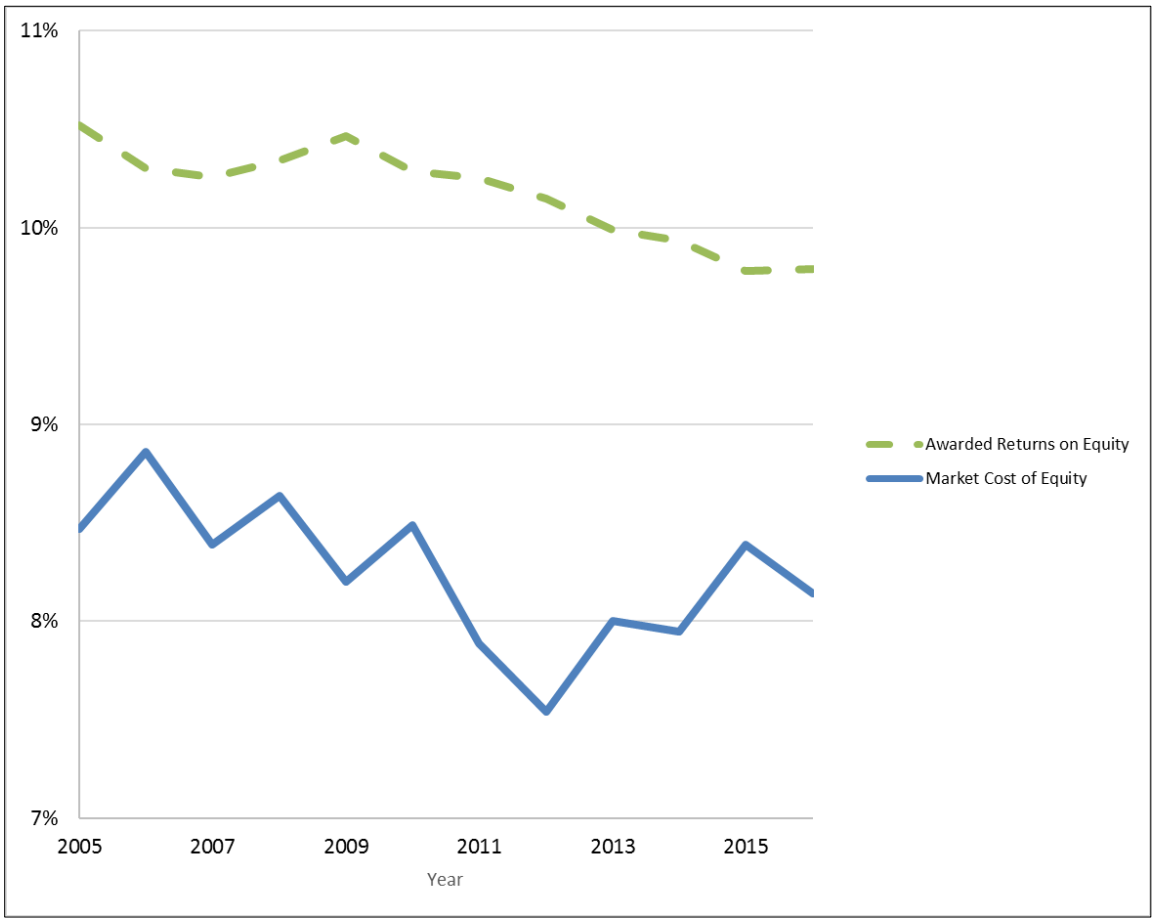
through objective models is not influenced by these factors, but is instead driven by market-based factors. If regulators rely too heavily on the awarded returns from other jurisdictions, it can create a cycle over time that bears little relation to the market-based cost of equity. In fact, this is exactly what we have observed over the past 10 years, at least. As shown in Figure 2 below, awarded returns for public utilities have been well above the average required market return for at least ten years.[14] Due to the fact that utility stocks are consistently far less risky than the average stock in the marketplace, the cost of equity for utility companies are *less* than the required return on the market.

The graph below shows two lines. The top line is the average annual awarded returns over the past 10 years. The bottom line is the required market return over the same period. As discussed in more detail later in the testimony, the required market return is essentially the return that investors would require if they invested in the entire market. In other words, the required market return is essentially the cost of equity of the entire market. Since it is undisputed (even by utility witnesses) that utility stocks are less risky than the average stock in the market, then the utilities' cost of equity must be less than the market cost of equity.[15] Thus, awarded returns should generally be below the market cost of equity, since awarded returns are supposed to be based on true cost of equity.

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

[15] This fact can be objectively measured through a term called "beta," as discussed later in the testimony. Utility betas are less than one, which means utility stocks are less risky than the "average" stock in the market. Dr. Vander Weide has also acknowledged that utility betas are less than one.

Figure 2:
Awarded Returns on Equity vs. Market Cost of Equity (2005 – 2016)



The gap between awarded returns and utility cost of equity has resulted in an excess of ratepayer wealth being transferred to utility shareholders and the IRS for at least 10 years. This is likely due, in part, to the fact that many years ago (in the 1990s) interest rates were much higher, with average required market return around 12%. In that environment, the cost of equity for low-risk utility stocks may have been about 9%. Since that time, however, interest rates have dramatically declined among other economic changes, and it is clear that awarded returns have failed to reflect decreasing equity costs.

It is not hard to see why this trend of inflating awarded returns has occurred in the past. Because awarded returns have at times been based in part on a comparison with other

awarded returns, the average awarded returns effectively fail to adapt to true market conditions. Once utility companies and regulatory commissions become accustomed to awarding rates of return higher than market conditions actually require, this trend becomes difficult to reverse. The fact is, utility stocks are *less risky* than the average stock in the market. As such, the required returns (cost of equity) on utility stocks should be less than the average required returns on the market. However, that is often not the case. What we have seen instead is a disconnect from the market-based cost of equity. For these reasons, the Commission should strive to move the awarded return to a level more closely aligned with the Company's actual, market-derived cost of capital while keeping in mind the following legal principles:

1. Risk is the most important factor when determining the awarded return. The awarded return should be commensurate with those on investments of corresponding risk.

The legal standards articulated in *Hope* and *Bluefield* demonstrate 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 requires. Since utility stocks are very low risk, the return required by equity investors should be relatively low. I have used financial models in this case to closely estimate the Company's cost of equity, and these financial models account for risk. The public utility industry is one of the least risky industries in the entire country. The cost of equity models confirm this fact in that they produce relatively low cost of equity results. In turn, the awarded ROE in this case should reflect the fact that Empire is a low-risk firm.

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

Because awarded returns in the regulatory environment have not closely tracked market-based trends and commensurate risk, utility companies have been able to remain more than financially sound, perhaps despite management inefficiencies. In fact, the transfer of wealth from ratepayers to shareholders has been so far removed from actual cost-based drivers, that even under relatively inefficient management a utility could remain financially sound. Therefore, regulatory commissions should strive to set the awarded return to a regulated utility at a level based on accurate market conditions to promote prudent and efficient management and minimize economic waste.

IV. GENERAL CONCEPTS AND METHODOLOGY

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 of competing capital projects, regulators determine a utility's cost of capital to establish 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 the two most widely used and accepted in regulatory proceedings for many years. These models are the Discounted Cash Flow Model ("DCF Model") and the Capital Asset Pricing Model ("CAPM"). The specific inputs and calculations for these models are described in more detail below.

Q. Please 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 narrower range for the cost of equity estimate.

V. THE PROXY GROUP

Q. Please 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 to 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. This is because the financial models used to estimate the cost of equity require information from publicly-traded firms, such as stock prices and dividends.

Q. Describe the proxy group you selected.

A. In this case, I started with the proxy group selected by Dr. Vander Weide, which I believe is a reasonable proxy group. However, I eliminated several companies with market capitalizations considerably higher than Empire's market capitalization. The number of companies in my proxy group is enough to provide a confident indication of Empire's cost of equity. From an analytical or statistical perspective, any marginal benefit of including additional companies in the proxy group is miniscule.

Thus, all of the companies in my proxy group are also included in Dr. Vander Weide's proxy group. These companies include a comparable group of publicly-traded, integrated electric utilities, while maintaining a large enough sample size for statistical reliability. I also ensured that each company in the proxy group has an investment grade credit rating and is not in financial distress. This is because the legal standards governing this issue require the awarded return be sufficient to maintain financial soundness. Thus, when estimating the cost of equity through a proxy group, it is important that the group consist of financially sound companies. There could be reasonable arguments made for the inclusion or exclusion of a particular company in a proxy group, however, the cost of equity results are influenced far more by the underlying assumptions and inputs to the various financial models than the composition of the proxy groups.[16]

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

Q. Did you also estimate the cost of equity using the proxy group selected by Dr. Vander Weide?

A. Yes. To show that the exact composition of the proxy group is not a significant factor in this case, I also conducted the CAPM and DCF Model using Dr. Vander Weide's proxy group while using most of Dr. Vander Weide's inputs to the models. The results of my calculations of Dr. Vander Weide's models (as corrected) closely resemble the results of the models using my selected proxy group. These results will be further discussed below.

VI. RISK AND RETURN CONCEPTS

Q. Discuss the general relationship between risk and return.

A. 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 (or less) risk an investor assumes, the larger (or smaller) return the investor will demand. There are two primary types of risk: firm-specific risk and market risk. Firm-specific risk affects individual companies, 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 a firm-specific risk called "project risk."[17] There are several other types of firm-specific risks, including: (1) "financial risk" – the risk that equity investors of leveraged firms face as residual claimants on earnings; (2) "default risk" – the risk that a firm will default on its debt securities; and (3) "business risk" – which encompasses all other operating and managerial factors that may result in investors realizing less than their expected return in that particular company. While firm-specific risk affects individual companies, market risk affects all companies in the market to varying degrees. Examples of market risk include interest rate risk, inflation risk, and the risk of major socio-economic events. When there are changes in these risk factors, they affect all firms in the market to some extent.[18]

Analysis of the U.S. market in 2001 provides a good example for contrasting firm-specific risk and market risk. During that year, Enron Corp.'s stock fell from $80 per share and the company filed bankruptcy at the end of the year. If an investor's portfolio had held only Enron stock at the beginning of 2001, this irrational investor would have lost the entire investment by the end of the year due to assuming the full exposure of Enron's firm-specific risk – in that case, imprudent management. On the other hand, a rational, diversified investor who invested the same amount of capital in a portfolio holding every stock in the S&P 500 would have had a much different result that year. The rational investor would have been relatively unaffected by the fall of Enron, because his portfolio included 499 other stocks. Each of those stocks, however, would have been affected by

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

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

various *market* risk factors that occurred that year, including the terrorist attacks on September 11th. Thus, the rational investor would have incurred a relatively minor loss due to market risk factors, while the irrational investor would have lost everything due to firm-specific risk factors.

Q. Can investors easily eliminate firm-specific risk?

A. Yes. A fundamental concept in finance is that firm-specific risk can be eliminated through diversification.[19] If someone irrationally invested all of their 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.[20]

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 diversified 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

[19] *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).

[20] *See* Damodaran *supra* n. 17, at 64.

portfolio.[21] Firm-specific risk is also called "diversifiable risk" because it can be easily eliminated through diversification.

Q. Is it well-known and accepted that 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 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. Because market risk cannot be eliminated through diversification, investors expect a return for assuming this type of risk. Market risk is also called "systematic risk." Scholars recognize the fact that market risk, which is also called "systematic risk," is the only type of risk for which investors expect a return for bearing:

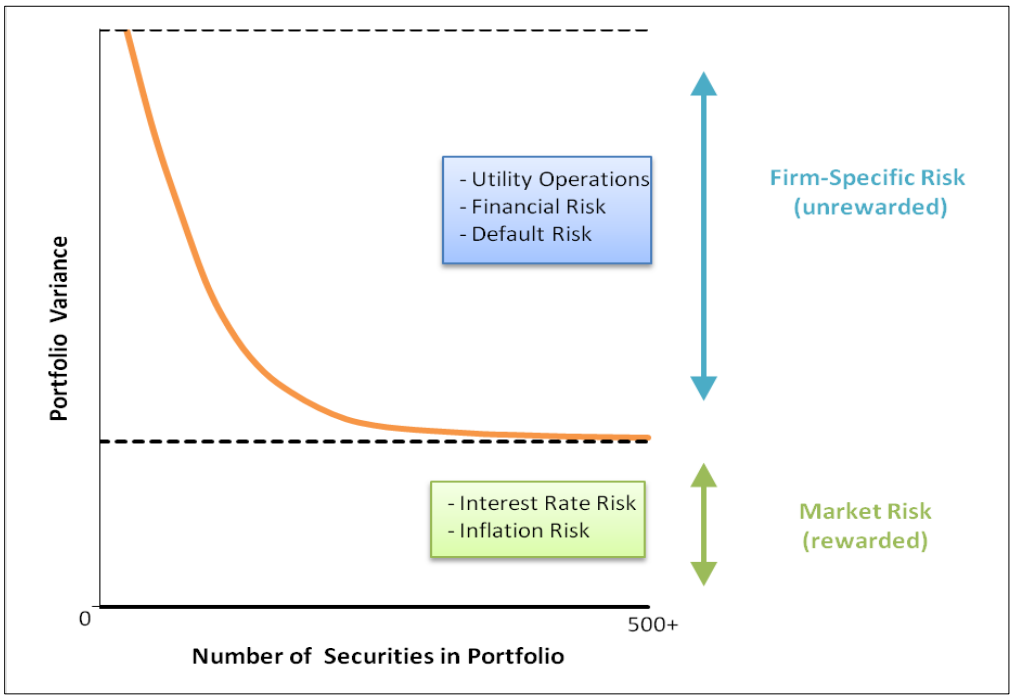
> If investors can cheaply eliminate some risks through diversification, then we should not expect a security to earn higher returns for risks that can be eliminated through diversification. Investors can expect compensation only for bearing systematic risk (i.e., risk that cannot be diversified away).[22]

These important concepts are illustrated in the figure below. Some form of this figure is found in many financial textbooks.

[21] *Id*.

[22] *See* Graham, Smart & Megginson *supra* n. 19, at 180 (emphasis added).

Figure 3:
Effects of Portfolio Diversification



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. 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."[23] 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%, a stock with a beta of 1.5 will, on average, increase (decrease) by 1.5%. In contrast, stocks with betas of less than one are less sensitive to market risk, such that if the market increases (decreases) by 1.0%, a stock with a beta of 0.5 will, on average, only increase (decrease) by 0.5%. Thus, stocks with low betas are relatively insulated from market conditions. The beta term is used in the Capital Asset Pricing Model to estimate the cost of equity, which is discussed in more detail later.[24]

Q. Are public utilities characterized as defensive firms that have low betas, low market risk, and are relatively insulated from overall market conditions?

A. Yes. Although market risk affects all firms in the market, it affects different firms to varying degrees. Firms with high betas are affected more than firms with low betas, which is why firms with high betas are riskier. 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."[25] 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

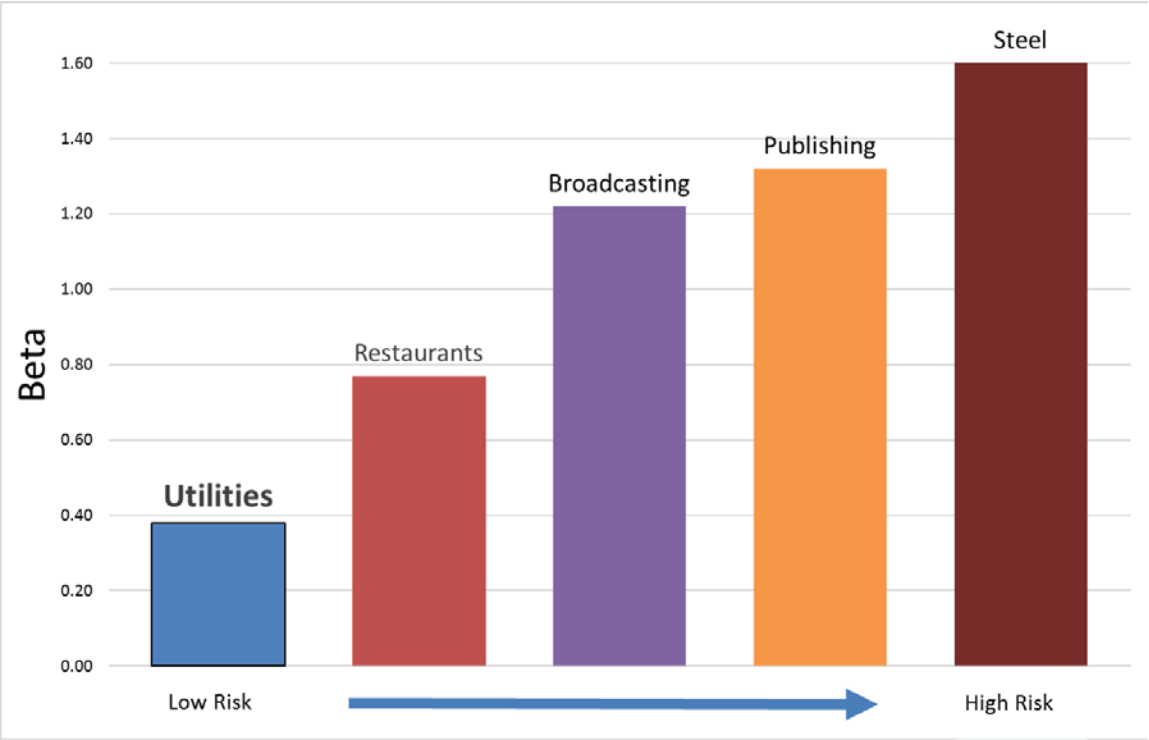
[23] *Id*. at 180-81.

[24] Though it will be discussed in more detail later, Exhibit DG 1-9 shows that the average beta of the proxy group was only 0.74. This confirms the well-known concept that utilities are relatively low-risk firms.

[25] *See* Bodie, Kane & Marcus *supra* n. 18, at 382.

public utility companies, "will have low betas and performance that is comparatively unaffected by overall market conditions."[26] In fact, financial textbooks often use utility companies as prime examples of low-risk, defensive firms. 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.[27]

Figure 4:
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

[26] *Id*. at 383.

[27] *See* Betas by Sector (US) at http://pages.stern.nyu.edu/~adamodar/. (updated January 2017). 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.

that their utility companies will be able to maintain normal business operations and provide safe and reliable service under prudent management. Likewise, 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.

VII. DISCOUNTED CASH FLOW ANALYSIS

Q. Describe the Discounted Cash Flow ("DCF") 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. 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 Model

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

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

[28] *See* Bodie, Kane & Marcus *supra* n. 18, at 410.

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

Q. Please describe the assumptions underlying all DCF Models.

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

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

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

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

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

Q. Describe the Constant Growth DCF Model.

A. The General DCF can be rearranged to make it 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:

Equation 3:
Constant Growth Discounted Cash Flow Model

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

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

[29] *See* Morin *supra* n. 2, at 252.

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

Q. Does utilization of the Constant Growth DCF Model require additional assumptions?

A. Yes. In addition to the four assumptions listed above, the Constant Growth DCF Model relies on four additional assumptions as follows:[30]

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 in this model is assumed to be constant, it is important not to use growth rates that are unreasonably high. In fact, the constant growth rate estimate for a regulated utility with a defined service territory should not exceed the growth rate for the economy in which it operates.

[30] *See* Morin *supra* n. 2, at 254-56.

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 successive quarterly dividends and reinvest them throughout the year at the discount rate. This variation is called the Quarterly Approximation DCF Model.[31]

Equation 4:
Quarterly Approximation Discounted Cash Flow Model

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

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

[31] *See* Morin *supra* n. 2, at 348.

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.

Q. Describe the inputs to the DCF Model.

A. There are three primary inputs in the DCF Model: (1) stock price (P_0); (2) dividend (d_0); and (3) 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.

A. Stock Price

$$\left[K = \frac{D_1}{\boldsymbol{P_0}} + g\right]$$

Q. How did you determine the stock price input of the DCF Model?

A. For the stock price (P_0), I used a 30-day average of stock prices for each company in the proxy group.[32] 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.[33] Past stock prices, in essence, reflect outdated information. The DCF Model used in utility rate cases is a derivation of the

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

[33] *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. 20, at 357. The efficient market hypothesis was formally presented by Eugene Fama in 1970, and is a cornerstone of modern financial theory and practice.

dividend discount model, which is used to determine the current value of an asset. Thus, according to the dividend discount model and the efficient market hypothesis, the value for the "P_0" term in the DCF Model should technically be the current stock price, rather than an average.

Q. Why did you use 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 while 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 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 principles of market efficiency while avoiding any unnecessary contentions that may arise from using a single stock price on a given day. The stock prices I used in my DCF analysis are based on 30-day averages of adjusted closing stock prices for each company in the proxy group.[34]

[34] 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.

Q. Is it fair to say that the stock price input is not a significant issue in this case?

A. Yes. The differences between my DCF Model and Dr. Vander Weide's DCF Model are primarily driven by differences in our growth rate estimates, which are further discussed below.

B. Dividend

$$\left[K = \frac{\mathbf{D_1}}{P_0} + g\right]$$

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 fourth quarter of 2016 for each proxy company.[35] 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 described 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. Does the Quarterly Approximation DCF Model result 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.

[35] Nasdaq Dividend History, http://www.nasdaq.com/quotes/dividend-history.aspx.

Q. Is it fair to say that the dividend input is not a significant issue in this case?

A. Yes. The differences between my DCF Model and Dr. Vander Weide's DCF Model are primarily driven by differences in our growth rate estimates, which are further discussed below.

C. Growth Rate

$$\left[K = \frac{D_1}{P_0} + \boldsymbol{g}\right]$$

Q. Summarize the growth rate input in the DCF Model.

A. The most critical input in the DCF Model is the growth rate. Unlike the stock price and dividend inputs, the growth rate must be estimated. As a result, the growth rate is often the most contentious DCF input in utility rate cases. The DCF model used in this case is based on the constant growth valuation model. Under this model, a stock is valued by the present value of its future cash flows in the form of dividends. Before future cash flows are discounted by the cost of equity, however, they must be "grown" into the future by a long-term growth rate. As stated above, one of the inherent assumptions of this model is that these cash flows in the form of dividends grow at a constant rate forever. Thus, the growth rate term in the constant growth DCF model is often called the "constant," "stable," or "terminal" growth rate. For young, high-growth firms, estimating the growth rate to be used in the model can be especially difficult, and may require the use of multi-stage growth models. For mature, low-growth firms such as utilities, however, estimating the terminal growth rate is more transparent. The growth term of the DCF Model is one of the most important, yet apparently most misunderstood aspects of cost of equity estimations in

utility regulatory proceedings. Therefore, I have devoted a more detailed explanation of this issue in the following sections, which are organized as follows:

(1) The Various Determinants of Growth

(2) Reasonable Estimates for Long-Term Growth

(3) Quantitative vs. Qualitative Determinants of Utility Growth: Circular References, "Flatworm" Growth, and the Problem with Analysts' Growth Rates

(4) Growth Rate Recommendation

1. The Various Determinants of Growth

Q. Describe the various determinants of growth.

A. Although the DCF Model directly considers the growth of dividends, there are a variety of growth determinants that should be considered when estimating growth rates. It should be noted that these various growth determinants are used primarily to determine the short-term growth rates in multi-stage DCF models. For utility companies, it is necessary to focus primarily on long-term growth rates, which are discussed in the following section. That is not to say that these growth determinants cannot be considered when estimating long-term growth, however, as discussed below, long-term growth must be constrained much more than short-term growth, especially for young firms with high growth opportunities. Additionally, I briefly discuss these growth determinants here because it may reveal some of the source of confusion in this area.

1. Historical Growth

Looking at a firm's actual experience over the past may provide a good starting point for estimating short-term growth. However, past growth is not always a good indicator of future growth. Some metrics that might be considered here are a historical

growth in revenues, operating income, and net income. Since dividends are paid from earnings, estimating historical earnings growth may provide an indication of future earnings and dividend growth. In general, however, revenue growth tends to be more consistent and predictable than earnings growth because it is less likely to be influenced by accounting adjustments.[36]

2. Analyst Growth Rates

Analyst growth rates refer short-term projections of earnings growth published by institutional research analysts such as Value Line and Bloomberg. A more detailed discussion of analyst growth rates, including the problems with using them in the DCF Model to estimate utility cost of equity, is provided in a later section.

3. Fundamental Determinants of Growth

Fundamental growth determinants refer to firm-specific financial metrics that arguably provide better indications of near-term sustainable growth. One such metric for fundamental growth considers the return on equity and the retention ratio. The idea behind this metric is that firms with high ROEs and retention ratios should have higher opportunities for growth.[37]

Q. Did you consider any of these determinants of growth in your DCF Model?

A. No. Primarily, the growth determinants discussed in this section will provide better indications of short to mid-term growth for firms with average to high growth opportunities. Utilities, however, are mature, low-growth firms. While it may not be

[36] *See generally* Damodaran *supra* n. 17, at 271-303.

[37] *See id.*

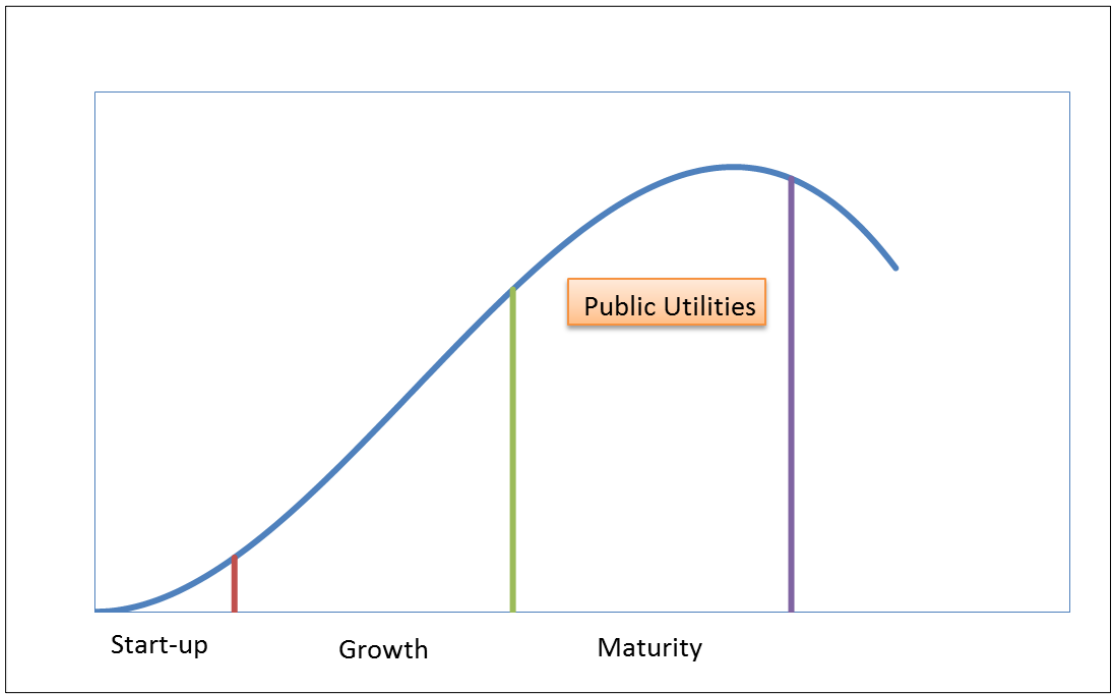
unreasonable on its face to use any of these growth determinants for the growth input in the DCF Model, we must keep in mind that the stable growth DCF Model considers only long-term growth rates, which are constrained by certain economic factors, as discussed further below.

2. Reasonable Estimates for Long-Term Growth

Q. Describe what is meant by long-term growth.

A. Recall that in order to make the DCF a viable, practical model, an infinite stream of future cash flows must be estimated and then discounted back to the present. Otherwise, each annual cash flow would have to be estimated separately. Some analysts use "multi-stage" DCF Models to estimate the value of high-growth firms through two or more stages of growth, with the final stage of growth being constant. However, it is not necessary to use multi-stage DCF Models to analyze the cost of equity of regulated utility companies. This is because regulated utilities are already in their "terminal," low growth stage. Unlike most competitive firms, the growth of regulated utilities is constrained by physical service territories, and limited primarily by the customer and load growth within those territories. The figure below illustrates the well-known business / industry life-cycle pattern.

Figure 5:
Industry Life Cycle



In an industry's early stages, there are ample opportunities for growth and profitable reinvestment. In the maturity stage, growth opportunities diminish, and firms choose to pay out a larger portion of their earnings in the form of dividends instead of reinvesting them in operations to pursue further growth opportunities. Once a firm is in the maturity stage, it is not necessary to consider higher short-term growth metrics in multi-stage DCF Models; rather, it is sufficient to analyze the cost of equity using a stable growth DCF Model with one terminal, long-term growth rate.

Q. Is it widely accepted that the terminal 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.[38] Thus, the terminal 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 these firms have defined service territories. As stated by Dr. Damodaran:

> "If a firm is a purely domestic company, either because of internal constraints . . . or external constraints (such as those imposed by a government), the growth rate in the domestic economy will be the limiting value."[39]

In fact, it is reasonable to assume that a regulated utility would grow at a rate that is less than the U.S. economic growth rate. Unlike competitive firms, which might increase their growth 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 economic production, and is used to measure aggregate economic growth. According to the Congressional Budget Office's Budget Outlook, the long-term forecast for nominal U.S. GDP growth is 4%, which includes an inflation rate of 2%.[40] For mature companies in mature industries, such as utility companies, the terminal growth rate will likely fall between the expected rate of inflation and the expected rate of nominal GDP growth. Thus, Empire's terminal growth rate is between 2% and 4%.

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[38] Damodaran *supra* n. 17, at 306.

[39] *Id*.

[40] Congressional Budget Office Long-Term Budget Outlook, https://www.cbo.gov/publication/51580.

Q. Is it reasonable to assume that the terminal growth rate will not exceed the risk-free rate?

A. Yes. In the long term, the risk-free rate will converge on the growth rate of the economy. For this reason, financial analysts often use the risk-free rate for the terminal growth rate value in the DCF model.[41] I discuss the risk-free rate in further detail later in this testimony. My risk-free rate estimate is 3.04%.

Q. Please summarize the various long-term growth rate estimates that can be used as the terminal growth rate in the DCF Model.

A. The reasonable long-term growth rate determinants are summarized as follows:

1. Inflation
2. Real GDP Growth
3. Current Risk-Free Rate
4. Nominal GDP Growth

Any of the foregoing growth determinants would provide a reasonable input for the terminal growth rate in the DCF Model for any company. In general, we should expect that utilities will, at the very least, grow at the rate of projected inflation. However, the long-term growth of any U.S. company, including utilities, will be constrained by nominal U.S. GDP growth.

[41] Damodaran *supra* n. 17, at 307.

3. Qualitative Growth: The Problem with Analysts' Growth Rates

Q. Describe the differences between "quantitative" and "qualitative" growth determinants.

A. Assessing "quantitative" growth simply involves mathematically calculating a historic metric for growth (such as revenues or earnings), or calculating various fundamental growth determinants using various figures from a firm's financial statements (such as ROE and the retention ratio). However, any thorough assessment of company growth should be based upon a "qualitative" analysis. Such an analysis would consider the question of what specific strategies that company management will implement in order to achieve a sustainable growth in earnings. Therefore, it is important to begin the analysis of Empire's growth rate with this simple, qualitative question: How is this regulated utility going to achieve a sustained growth in earnings? If this question were asked of a competitive firm, there could be a number of answers depending on the type of business model, such as launching a new product line, franchising, rebranding to target a new demographic, or expanding into a developing market. Regulated utilities, however, cannot engage in these potential growth opportunities. This is why it is not surprising to see very low load growth, customer growth, and related projections in utilities' integrated resource plans.

Q. Why is it especially important to emphasize real, qualitative growth determinants when analyzing the growth rates of regulated utilities?

A. While qualitative growth analysis is important regardless of the entity being analyzed, it is especially important in the context of utility ratemaking. This is because the rate base rate of return model inherently possesses two factors that can contribute to distorted views of utility growth when considered exclusively from a quantitative perspective. These two

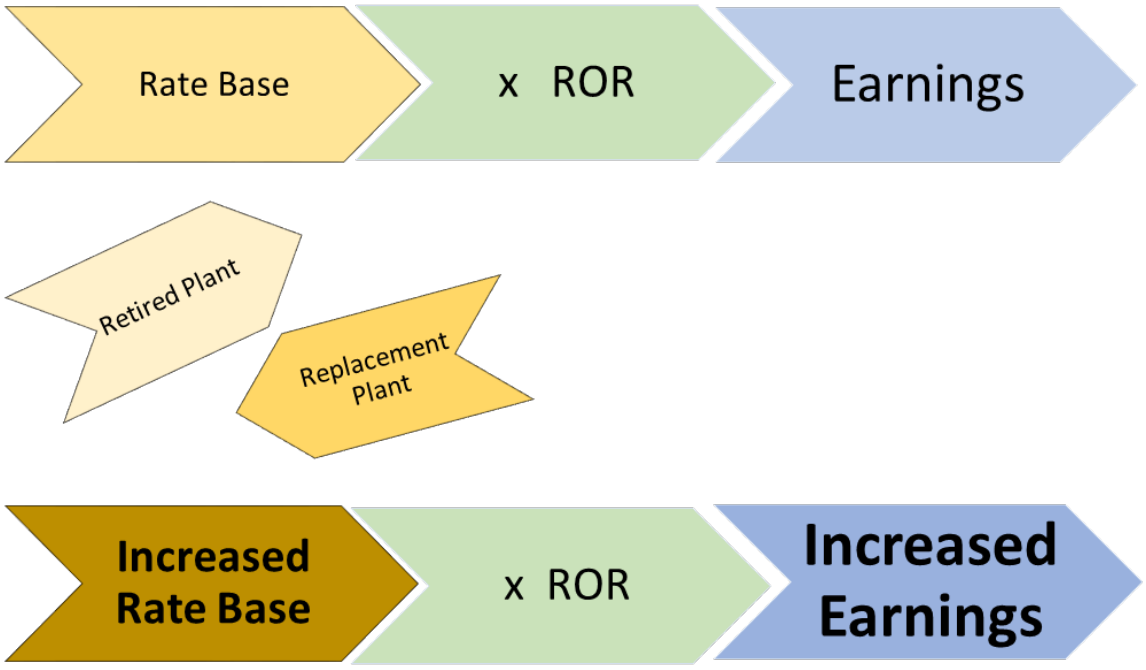
factors are (1) rate base and (2) the awarded ROE. I will discuss each factor further below. It is important to keep in mind that the ultimate objective of all of this analysis is to provide a foundation upon which to base the fair rate of return for the utility. Thus, we should strive to ensure that each individual component of the financial models used to estimate the cost of equity are also "fair." If we consider only quantitative growth determinants, it may lead to projected growth rates that are overstated and ultimately unfair, because they result in inflated cost of equity estimates.

Q. How does rate base relate to growth determinants for utilities?

A. Under the rate base rate of return model, a utility's rate base is multiplied by its awarded rate of return to produce the required level of operating income. Therefore, increases to ratebase generally result in increased earnings. Thus, utilities have a natural financial incentive to increase rate base. This concept is also discussed in Part II of my responsive testimony as it relates to accelerated depreciation and the misleading narrative of "intergenerational inequity." In short, utilities have a financial incentive to increase ratebase whether or not such increases are driven by a corresponding increase in demand. A good, relevant example of this is seen in the early retirement of old, but otherwise functional coal plants in response to environmental regulations. Under these circumstances, utilities have been able to increase their rate bases by a far greater extent than what any concurrent increase in demand would have required. In other words, utilities "grew" their earnings by simply retiring old assets and replacing them with new assets. If the tail of a flatworm is removed and regenerated, it does not mean the flatworm actually grew. Likewise, if a competitive, unregulated firm announced plans to close production

plants and replace them with new plants, it would not be considered a real determinant of growth unless analysts believed this decision would directly result in increased market share for the company and a real opportunity for sustained increases in revenues and earnings. In the case of utilities, the mere replacement of old plant with new plant does not increase market share, attract new customers, create franchising opportunities, or allow utilities to penetrate developing markets, but will result in short-term, quantitative earnings growth. However, this "flatworm growth" in earnings was merely the quantitative byproduct of the rate base rate of return model, and not an indication of real, fair, or qualitative growth. The following diagram illustrates this concept.

Figure 6:
Analysts' Earnings Growth Projections: The "Flatworm Growth" Problem



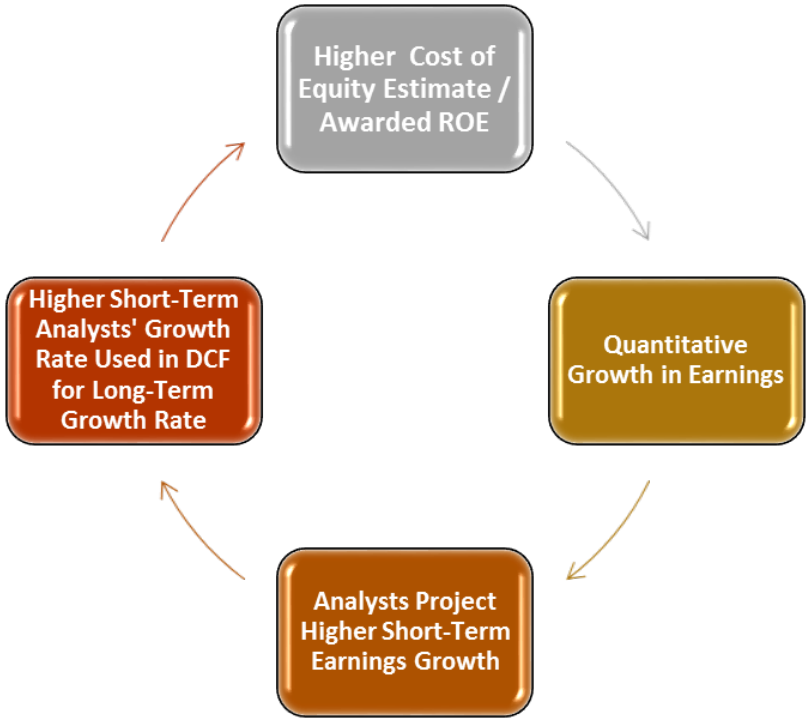
Of course, utilities must sometimes add new plant to meet the slow growth in customer demand. However, as the foregoing discussion demonstrates, it would be more appropriate

to consider load growth than increases to rate base or earnings, in order to assess real, qualitative growth.

Q. Please discuss the other way in which analysts' earnings growth projections do not provide indications of fair, qualitative growth for regulated utilities.

A. If we give undue weight to analysts' projections for utilities' earnings growth, it will not provide an accurate reflection of real, qualitative growth because a utility's earnings are heavily influenced by the ultimate figure that all of this analysis is supposed to help us estimate: the awarded return on equity. This creates a circular reference problem. In other words, if a regulator awards an ROE that is above market-based cost of capital (which is often the case, as discussed above), this could lead to higher growth rate projections from analysts. If these same inflated growth estimates are used in the DCF Model (and they often are by utility witnesses), it could lead to a higher awarded ROEs; and the cycle continues, as illustrated in the following figure:

Figure 7:
Analysts' Earnings Growth Projections: The "Circular Reference" Problem



Therefore, it is not advisable to simply consider a quantitative historical or projected growth rate in utility earnings, as this practice will not provide a reliable or accurate indication of real utility growth.

Q. Are there any other problems with relying on analysts' growth projections?

A. Yes. While the foregoing discussion shows two reasons why we cannot rely on analysts' growth rate projections to provide fair, qualitative indicators of utility growth in a stable growth DCF Model, the third reason is perhaps the most obvious and undisputable. Various institutional analysts, such as Zacks, Value Line, and Bloomberg, publish estimated projections of earnings growth for utilities. These estimates, however, are short-

term growth rate projections, ranging from 3 – 10 years.[42] Many analysts, however, inappropriately insert these short-term growth projections into the DCF Model as *long-term* growth rate projections. For example, assume that an analyst at Bloomberg estimates that a utility's earnings will grow by 7% per year over the next 3 years. When a utility witness uses this figure in a DCF Model, however, it is the *witness*, not the Bloomberg analyst, that is testifying to the regulator that the utility's earnings will grow by 7% per year over the *long-term*, which is an assumption not based in reality.

4. Long-Term Growth Rate Recommendation

Q. Describe the growth rate input used in your DCF Model.

A. I considered various qualitative determinants of growth for Empire, along with the maximum allowed growth rate under basic principles of finance and economics. The following chart shows three of the long-term growth determinants discussed in this section.

Figure 8:
Terminal Growth Rate Determinants

Determinant	Rate
Nominal GDP	4.10%
Inflation	2.00%
Risk Free Rate	3.04%
Average	**3.05%**

[42] Note that these analysts might also provide long-term growth estimates, but the growth estimates cited in the testimonies of utility witnesses are typically short-term growth estimates.

For the long-term growth rate in my DCF model I selected the maximum long-term growth rate of 4.1%, which means my model assumes that Empire's qualitative growth in earnings will match the nominal growth rate of the entire U.S. economy. In other words, the final result of my DCF Model is likely at the higher end of the reasonable range.

Q. Please describe the final results of your DCF Model.

A. I used the Quarterly Approximation DCF Model discussed above to estimate Empire's cost of equity capital. I obtained an average of reported dividends and stock prices from the proxy group, and I used a reasonable terminal growth rate estimate for Empire. My DCF cost of equity estimate for Empire is 7.6%, as expressed in the following equation:[43]

Equation 5:
DCF Results

$$\mathbf{7.6}\% = \left[\frac{\$0.39(1+4.1\%)^{1/4}}{\$47.78} + (1+4.1\%)^{1/4}\right]^{4} - 1$$

As noted above, this estimate is likely at the higher end of the appropriate range due to the high estimate for the long-term growth rate.

Q. Dr. Vander Weide's DCF Model yielded much higher results. Did you find any errors in his analysis?

A. Yes. Dr. Vander Weide's DCF Model produced cost of equity results as high as 9.3%.[44] The results of Dr. Vander Weide's DCF Model are overstated because of a crucial mistake regarding his growth rate inputs. Specifically, Dr. Vander Weide used long-term growth

[43] *See also* Exhibit DG 1-7.

[44] Direct Testimony of James H. Vander Weide, p. 48, Table 1.

rates in his proxy group as high as 9% (with an average of 5.6%), which exceeds projected U.S. GDP growth. This means Dr. Vander Weide's growth rate assumption violates the basic principle that no company can grow at a greater rate than the economy in which it operates over the long-term, especially a regulated utility company with a defined service territory. Furthermore, Dr. Vander Weide used short-term, quantitative growth estimates published by analysts. As discussed above, these analysts' estimates are inappropriate to use in the DCF Model as long-term growth rates because they are estimates of short-term growth, they do not consider qualitative aspects of growth; thus, they result in DCF cost of equity estimates that are artificially inflated above market levels.

Q. Have you corrected the errors in Dr. Vander Weide's DCF Model by limiting the growth rate in his model to the maximum reasonable long-term growth rate?

A. Yes. Since Empire's growth rate cannot exceed GDP growth, I corrected this error in Dr. Vander Weide's DCF Model. Specifically, I recalculated Dr. Vander Weide's DCF Model using his proxy group, his dividends, and his stock prices, but with the maximum allowed growth rate of 4.1%. In other words, I used the highest growth rate available. The results of Dr. Vander Weide's corrected DCF Model indicate a much more reasonable cost of equity estimate of 7.7%, which nearly equals the result of my DCF Model (7.6%). This cost of equity estimate is likely high given the fact that GDP growth is viewed as a limiting factor on long-term growth rates for domestic companies, especially regulated utilities. The results of Dr. Vander Weide's revised DCF Model are presented in the following figure.[45]

[45] *See also* Exhibit DG 1-17.

Figure 9:
Dr. Vander Weide's DCF Inputs Using Corrected Growth Rates

Vander Weide Proxy Group	Vander Weide Stock Price	Vander Weide Dividend	GDP "Maximum" Growth Estimate	DCF Results
ALLETE	60.32	2.21	4.1%	7.8%
Alliant Energy	38.43	1.26	4.1%	7.4%
Ameren Corp.	49.75	1.82	4.1%	7.8%
Avista Corp.	41.48	1.45	4.1%	7.6%
Black Hills	60.11	1.78	4.1%	7.1%
CenterPoint Energy	22.95	1.10	4.1%	8.9%
CMS Energy Corp.	42.50	1.30	4.1%	7.2%
Dominion Resources	74.80	2.94	4.1%	8.0%
DTE Energy	94.36	3.17	4.1%	7.5%
Duke Energy	81.18	3.57	4.1%	8.5%
El Paso Electric	45.83	1.29	4.1%	6.9%
Eversource Energy	55.01	1.87	4.1%	7.5%
G't Plains Energy	27.66	1.13	4.1%	8.2%
Hawaiian Elec.	29.90	1.33	4.1%	8.6%
NextEra Energy	124.08	3.61	4.1%	7.0%
NorthWestern Corp.	57.82	2.12	4.1%	7.8%
OGE Energy	31.20	1.21	4.1%	8.0%
Otter Tail Corp.	34.72	1.34	4.1%	7.9%
PG&E Corp.	62.10	2.02	4.1%	7.4%
Pinnacle West Capital	76.10	2.71	4.1%	7.7%
PNM Resources	32.73	0.94	4.1%	7.0%
Portland General	42.73	1.32	4.1%	7.2%
PPL Corp.	34.70	1.63	4.1%	8.8%
SCANA Corp.	72.05	2.43	4.1%	7.5%
Sempra Energy	106.71	3.17	4.1%	7.1%
Southern Co.	51.61	2.37	4.1%	8.7%
Vectren Corp.	49.71	1.71	4.1%	7.5%
WEC Energy Group	60.59	2.08	4.1%	7.5%
Xcel Energy Inc.	41.65	1.43	4.1%	7.5%
Average				**7.7%**

As shown in this figure, if we use a realistic growth rate in Dr. Vander Weide's DCF Model, we see a realistic cost of equity estimation. While the actual long-term growth rates for

each of the proxy companies may be slightly different, there is one thing we can be sure of: none of them will exceed U.S. nominal GDP growth.

Q. Were the results of your DCF Model consistent with the results of your CAPM?

A. Yes, although the financial models are based on different inputs, the results were consistent. The DCF Model yielded a cost of equity of 7.6%. The CAPM yielded a cost of equity of 7.4%, as discussed in the following section. This further highlights the validity and accuracy of the models, especially when they are conducted on utility companies.

VIII. CAPITAL ASSET PRICING MODEL ANALYSIS

Q. Describe the Capital Asset Pricing Model.

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

Q. What assumptions are 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;
3. Investors have homogenous expectations of risk and return;

[46] William F. Sharpe, *A Simplified Model for Portfolio Analysis* 277-93 (Management Science IX 1963); *see also* Graham, Smart & Megginson *supra* n. 20, at 208.

4. Investors have identical time horizons;

5. Information is freely and simultaneously available to investors.

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

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

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

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

Q. Is the CAPM approach consistent with the legal standards set forth by the U.S. Supreme Court?

A. Yes. Our courts have recognized that "the amount of risk in the business is a most important factor" in determining the allowed rate of return,[48] and that "the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks."[49] The CAPM is a useful model because it directly considers the amount of risk inherent in a business. It 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.

[47] *See id.*

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

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

Q. Describe the CAPM equation.

A. The basic CAPM equation is expressed as follows:

Equation 6:
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 equity 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.

A. The Risk-Free Rate

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

Q. Explain 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. Is it preferable to use the yield on long-term Treasury bonds for the risk-free rate in the CAPM?

A. Yes. In valuing an asset, investors estimate cash flows over long periods of time. Common stock is viewed as a long-term investment, and the cash flows from dividends are assumed to last indefinitely. Thus, short-term Treasury bill yields are rarely used in the CAPM to represent the risk-free rate. Short-term rates are subject to greater volatility and can thus lead to unreliable estimates. Instead, long-term Treasury bonds are usually used to represent the risk-free rate in the CAPM.[50] I considered a 30-day average of daily Treasury yield curve rates on 30-year Treasury bonds in my risk-free rate estimate, which resulted in a risk-free rate of 3.04%.[51]

B. The Beta Coefficient

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

Q. How is the beta coefficient used in this model?

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 greater (less) than one is more (less) risky than the market portfolio. A stock's beta equals

[50] *See* Morin *supra* n. 2, at 150.

[51] Exhibit DG 1-8.

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:[52]

Equation 7:
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 various institutional analysts. 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. Also as discussed above, 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%, a stock with a beta of 1.5 will, on average, increase (decrease) by 1.5%. 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%, a stock with a beta of 0.5 will, on average, only increase (decrease) by 0.5%.

[52] Graham, Smart & Megginson *supra* n. 19, at 180-81.

Q. Describe the source for the betas you used in your CAPM analysis.

A. I used betas recently published by Value Line Investment Survey. The beta for each proxy company is less than 1.0. Thus, we have an objective measure to prove the well-known concept that utility stocks are less risky than the average stock in the market.

Q. Did Dr. Vander Weide also consider betas published by Value Line?

A. Yes. Although we relied on different proxy groups, Dr. Vander Weide and I both considered betas published by Value Line. As with my proxy group, the beta for each company in Dr. Vander Weide's proxy group is less than 1.0.

C. The Equity Risk Premium

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

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."[53] Likewise, the ERP is arguably the single most important factor in estimating the cost of capital in this matter. There are three basic methods that can be used to estimate the ERP: (1) calculating a historical

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

average; (2) taking a survey of experts; and (3) calculating the implied ERP. I will discuss each method in turn, noting advantages and disadvantages of these methods.

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. Many practitioners rely on the historical ERP as an estimate for the forward-looking ERP because it is easy to obtain. However, there are disadvantages to relying on the historical ERP.

Q. What are the limitations of relying solely on a historical average to estimate the current or 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 current and forward-looking risk premium.[54] 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.[55] This is due in large part to what is known as "survivorship bias" or "success bias" – a tendency for failed companies to be

[54] Graham, Smart & Megginson *supra* n. 19, at 330.

[55] Dimson, Marsh & Staunton *supra* n. 53, at 194.

excluded from historical indices.[56] From their extensive analysis, the authors make the following conclusion regarding the prospective ERP:

> The result is a forward-looking, geometric mean risk premium for the United States . . . of around 2½ to 4 percent and an arithmetic mean risk premium . . . that falls within a range from a little below 4 to a little above 5 percent.[57]

Indeed, these results are lower than many reported historical risk premiums. Other noted experts agree:

> 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%.[58]

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."[59]

Q. Did you rely on the historical ERP as part of your CAPM analysis in this case?

A. No. Due to the limitations of this approach, I relied on the ERP reported in expert surveys and the implied ERP method discussed below.

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[56] *Id*. at 34.

[57] *Id*. at 194.

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

[59] Graham, Smart & Megginson *supra* n. 19, at 330.

2. EXPERT SURVEYS

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

A. As its name implies, the expert survey approach to estimating the ERP involves conducting a survey of experts including professors, analysts, chief financial officers and other executives around the country and asking them what they think the ERP is. Graham and Harvey have performed such a survey every year since 1996. In their 2016 survey, they found that experts around the country believe that the current risk premium is only 4.0%.[60] The IESE Business School conducts a similar expert survey. Their expert survey reported an average ERP of only 5.3%.[61]

3. IMPLIED EQUITY RISK PREMIUM

Q. Describe the implied equity risk premium approach.

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:[62]

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[60] John R. Graham and Campbell R. Harvey, *The Equity Risk Premium in 2016*, at 3 (Fuqua School of Business, Duke University 2014), copy available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2611793.

[61] Pablo Fernandez, Pablo Linares & Isabel F. Acin, *Market Risk Premium used in 171 Countries in 2016: A Survey with 6,932 Answers*, at 3 (IESE Business School 2015), copy available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2598104. IESE Business School is the graduate business school of the University of Navarra. IESE offers Master of Business Administration (MBA), Executive MBA and Executive Education programs. IESE is consistently ranked among the leading business schools in the world.

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

Equation 8:
Gordon Growth Model

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

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

This model is similar to the Constant Growth DCF Model presented in Equation 3 above ($K=D_1/P_0+g$). In fact, the underlying concept in both models is the same: The current value of an asset is equal to the present value of its future cash flows. Instead of using this model to determine the discount rate of one company, we can use it to determine the discount rate for the entire market by substituting the inputs of the model. Specifically, instead of using the current stock price (P_0), we will use the current value of the S&P 500 (V_{500}). Instead of using the dividends of a single firm, we will consider the dividends paid by the entire market. Additionally, we should consider potential dividends. In other words, stock buybacks should be considered in addition to paid dividends, as stock buybacks represent another way for the firm to transfer free cash flow to shareholders. Focusing on dividends alone without considering stock buybacks could understate the cash flow component of the model, and ultimately understate the implied ERP. The market dividend yield plus the market buyback yield gives us the gross cash yield to use as our cash flow in the numerator of the discount model. This gross cash yield is increased each year over the next five years by the growth rate. These cash flows must be discounted 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.[63]

Equation 9:
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 10:
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 six years, I calculated the dividend yield, buyback yield, and gross cash yield for each year. I also calculated the compound annual growth rate (g) from

[63] *See* Exhibit DG 1-10 for detailed calculation.

operating earnings. I used these inputs, along with the risk-free rate and current value of the index to calculate a current expected return on the entire market of 8.29%. I subtracted the risk-free rate to arrive at the implied equity risk premium of 5.25%. 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. Dr. Damodaran's highest ERP estimate for March 2017 was only 5.84%.[64]

Q. What are the results of your final ERP estimate?

A. For the final ERP estimate I used in my CAPM analysis, I averaged the results of the ERP surveys along with the implied ERP calculations and the ERP reported by Duff & Phelps.[65] The results are presented in the following figure:

Figure 10:
Equity Risk Premium Results

IESE Business School Survey	5.3%
Graham & Harvey Survey	4.0%
Duff & Phelps Report	5.5%
Damodaran	5.8%
Garrett	5.3%
Average	**5.2%**

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

[65] *See also* Exhibit DG 1-11.

While it would be reasonable to select any one of these ERP estimates, or the average of these estimates, I selected the highest ERP estimate of 5.8% to use in my CAPM in the interest of conservatism. However, this means that the final results of my CAPM are at the higher end of a reasonable range.

Q. Please explain 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. Using the same CAPM equation presented above, the results of my CAPM analysis are expressed as follows:[66]

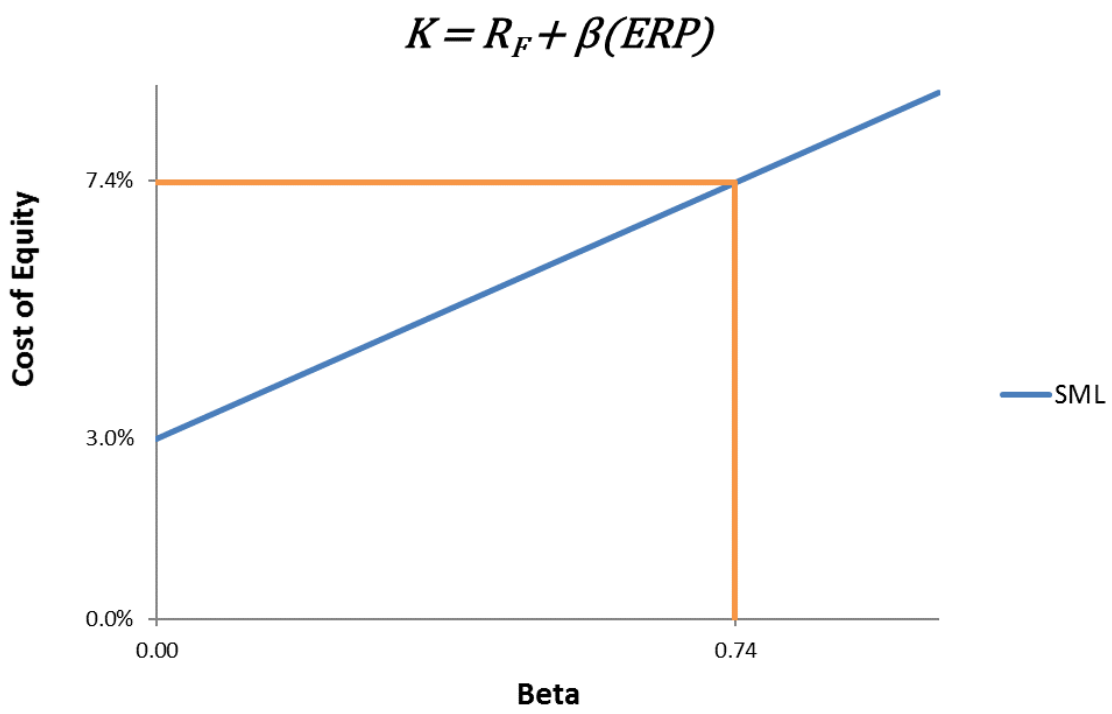
Equation 11:
CAPM Results

$$\mathbf{7.4}\% = 3.04\% + 0.74(5.84\%)$$

The CAPM suggests that Empire's cost of equity capital is about 7.4%. The CAPM may be displayed graphically through what is known as the Security Market Line ("SML"). The following figure shows the expected return (cost of equity) on the y-axis, and the average beta for the proxy group on the x-axis. The SML intercepts the y-axis at the level of the risk-free rate. The slope of the SML is the equity risk premium.

[66] Exhibit DG 1-12.

Figure 11:
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 0.74 for the proxy group, the estimated cost of equity for Empire is 7.4%.

Q. Dr. Vander Weide's CAPM analysis yields considerably higher results. Did you find specific problems with Dr. Vander Weide's CAPM assumptions and inputs?

A. Yes. Dr. Vander Weide's CAPM cost of equity results are as high as 10.5%. There are two main problems with Dr. Vander Weide's CAPM analysis, including his input for the equity risk premium and his beta adjustment.

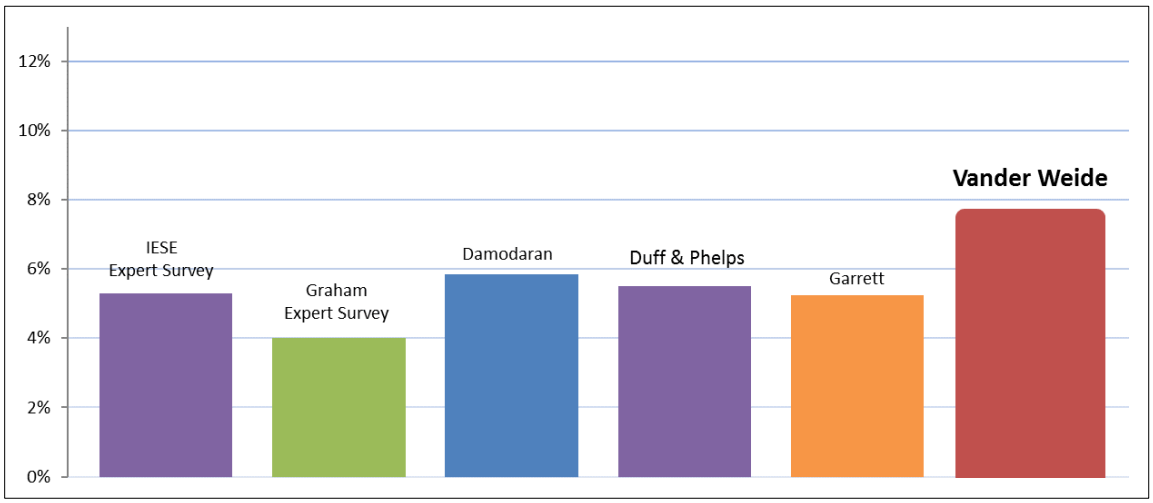
Q. Did Dr. Vander Weide rely on a reasonable measure for the equity risk premium?

A. No. Dr. Vander Weide's used an input as high as 7.5% for the equity risk premium ("ERP").[67] The ERP is one of three inputs in the CAPM equation, and it is one of the most single important factors for estimating the cost of equity in this case. As discussed above, I used two widely-accepted methods for estimating the ERP, including consulting expert surveys and calculating the implied ERP based on aggregate market data. The highest reasonable ERP produced from this analysis is 5.8%. This means that Dr. Vander Weide's overestimated ERP is considerably higher than the range of ERPs utilized by firms and analysts across the country. Because the ERP is not firm-specific, there are fairly standardized ERP levels that are widely recognized by several prominent national expert surveys. For example, as discussed above, Graham and Harvey's 2016 expert survey reports an average ERP of 4.0%. The IESE Business School expert survey reports an average ERP of 5.3%. Similarly, Duff & Phelps estimates an ERP of 5.5% for 2016. The following chart illustrates that Dr. Vander Weide's ERP estimate is far out of line with industry norms:[68]

[67] Direct Testimony of Janes H. Vander Weide, p. 47, line 12.

[68] The ERP estimated by Dr. Damodaran is the highest of his several ERP estimates under various assumptions.

Figure 12:
Equity Risk Premium Comparison



When compared with these well-established ERP benchmarks, it is clear that Dr. Vander Weide's ERP estimate is not within the range of reasonableness. As a result, his CAPM cost of equity estimates are overstated.

Q. Did Dr. Vander Weide use a reasonable measure for his beta input?

A. No. According to Dr. Vander Weide, the utility betas published by analysts such as Value Line are understated because betas that are less than 1.0 are less reliable.[69] In fact however, there is evidence to the contrary.

Q. Discuss the evidence that suggests published utility betas may actually be too high, rather than too low.

A. Published betas are calculated through a regression analysis that considers the movements in price of an individual stock and movements in the price of the overall market portfolio.

[69] Direct Testimony of Dr. Vander Weide, p. 43, lines 1-3.

The betas produced by this regression analysis are considered "raw" betas. There is empirical evidence that raw betas should be adjusted to account for beta's natural tendency to revert to an underlying mean.[70] Some analysts use an adjustment method proposed by Blume, which adjusts raw betas toward the market mean of one.[71] While the Blume adjustment method is popular due to its simplicity, it is arguably arbitrary, and some would say not useful at all. According to Dr. Damodaran: "While we agree with the notion that betas move toward 1.0 over time, the [Blume adjustment] strikes us as arbitrary and not particularly useful."[72] 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.[73] 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."[74] The Vasicek beta adjustment equation expressed is as follows:

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[70] *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).

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

[72] Damodaran *supra* n. 17, at 187.

[73] 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).

[74] 2012 Ibbotson Stocks, Bonds, Bills, and Inflation Valuation Yearbook 77-78 (Morningstar 2012).

Equation 12:
Vasicek Beta Adjustment

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

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

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

> 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.[75]

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

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

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."[76] Gombola also concluded that adjusting raw betas toward the market mean of 1.0 is too high, and that "[i]nstead, they should be adjusted toward a value that is less than one."[77] In conducting the Vasicek adjustment on betas in previous cases, it reveals that utility betas are even lower than those published by Value Line.[78] Gombola's findings are particular important here, because his study was conducted on utility companies. Despite the strong evidence presented by Vasicek and Gombola that utility betas published by Value line are too high, I used the Value Line published betas in the interest of reasonableness. Regardless, it is clear that adjusting betas to a level that is higher than Value Line's betas is not reasonable, and would produce CAPM cost of equity results that are too high.

Q. Despite the technical differences between the betas estimated by Dr. Vander Weide and the Value Line betas you relied on, is there evidence that Dr. Vander Weide's CAPM cost of equity estimate is unrealistically high?

A. Yes. Although there are various schools of thought regarding beta calculations and adjustments, we have a more straight-forward approach to assessing whether the ultimate results of the CAPM and DCF Model are reasonable. This reasonableness check involves estimating the "ceiling" on utility cost of equity. I discuss this in more detail below, but in

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

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

[78] *See e.g.* Responsive Testimony of David J. Garrett, filed March 21, 2016 in Cause No. PUD 201500273 (OG&E's 2015 rate case), at pp. 56 – 59.

short, since it is undisputed that utility stocks are less risky than the average stock (with a beta of 1.0), then in fact, utility cost of equity must be less than the market cost of equity. Currently, the market cost of equity is only about 8.1%.[79] Therefore, since 8.1% is the "ceiling" for Empire's true cost of equity, we know that cost of equity estimates as high as 10.2% are not realistic, and thus must be based on unrealistic inputs, such as Dr. Vander Weide's beta assumptions.

Q. Did you also review Dr. Vander Weide's other risk premium analyses?

A. Yes. Before I discuss Dr. Vander Weide's risk premium model, I will reiterate that the CAPM itself is a "risk premium" model. In short, it takes the bare minimum return any investor would require for buying a stock (the risk-free rate), then adds a *premium* to compensate the investor for the extra risk he or she assumes by buying a stock rather than a riskless U.S. Treasury security. The CAPM has been utilized by companies around the world for decades for the same purpose we are using it in this case – to estimate cost of equity. When reasonable inputs are used in the CAPM, this model tends to produce cost of equity results for utility companies that are much lower than the excessive awarded returns requested by utility executives. Thus, utility witnesses often downplay or completely distort the Nobel-Prize-winning CAPM and instead promote their own various risk premium models.

In this case, Dr. Vander Weide's risk premium model suffers from the same errors as his DCF Model: growth rate estimates for individual companies that exceed the growth

[79] *See* Exhibit DG 1-14.

rate of the entire U.S. economy. Specifically, Dr. Vander Weide used long-term growth rates as high as 12.97% in conducting his risk premium model, which means we cannot view his results as realistic. To reiterate, Dr. Vander Weide is suggesting that a company's earnings can grow at a rate more than four times projected U.S. GDP growth over the long-term, which is simply not realistic. Moreover, the results of his risk premium model were as high as 10.5%,[80] which is over 200 basis points above the utility cost of equity "ceiling" discussed above (about 8.1%).[81]

IX. OTHER COST OF EQUITY ISSUES

Q. Are there any other issues raised in Dr. Vander Weide's testimony to which you would like to respond?

A. Yes. In his testimony, Dr. Vander Weide suggests that certain firm-specific risks and other factors should have an increasing effect on the cost of equity, apparently beyond that which is indicated by the CAPM and DCF Models. These issues include demand uncertainty, operating expense uncertainty, and regulatory uncertainty, among others.[82] As discussed and illustrated above however, it is a well-known concept in finance that firm-specific risks are unrewarded by the market. Therefore, the Company's firm-specific business risks, while perhaps relevant to other issues in the rate case, have no meaningful effect on the cost of equity estimate. Rather, it is market risk that is rewarded by the market, and this concept is thoroughly addressed in my CAPM analysis discussed above. I would also add

[80] Direct Testimony of Dr. James H. Vander Weide, p. 34, line 5.

[81] *See* Exhibit DG 1-14.

[82] *See* Direct Testimony of Dr. James H. Vander Weide p 13, lines 7-12.

a comment about the term "regulatory uncertainty" used by Dr. Vander Weide. Terms like this, along with terms like "regulatory risk," are often used by utility witnesses as part of a narrative suggesting that the regulatory process somehow adds risk to regulated utility companies; this could not be more misleading. In reality, the utility industry is one of the lowest risk industries in the country because of regulation, not in spite of it. The fact that utility companies possess very little risk is beneficial to society, and this low level of risk should be appropriately reflected in low awarded return on equity.

X. COST OF EQUITY SUMMARY

Q. Please summarize the results of the CAPM and DCF Model discussed above.

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

Figure 13:
Cost of Equity Summary

Model	Cost of Equity
Discounted Cash Flow Model	7.6%
Capital Asset Pricing Model	7.4%
Average	**7.5%**

The average cost of equity result of the DCF Model and the CAPM is 7.5%. Furthermore, it is noteworthy that these two models produced nearly identical results, especially considering the fact that the inputs for the two models are completely different. Again, the DCF Model considers stock price, dividends, and a long-term growth rate. The CAPM

considers the risk-free rate, beta, and the equity risk premium. These inputs are relatively unrelated to each other, and yet the models produced similar results. This fact further highlights the validity of these two models, which have been relied upon by executives, analysts, academics, and regulators for decades to value companies and estimate cost of equity.

Q. Is there a market indicator that you can use to test the reasonableness of your cost of equity estimate?

A. Yes. The CAPM is a risk premium model based on the fact that all investors will require, at a minimum, a return equal to the risk-free rate when investing in equity securities. Of course, the investors will also require a premium on top of the risk-free rate to compensate them for the risk they have assumed. If an investor bought every stock in the market portfolio, he would require the risk-free rate, plus the equity risk premium ("ERP") discussed above. Recall that the risk-free rate plus the equity risk premium is called the required return on the market portfolio. This could also be called the market cost of equity. It is undisputed that the cost of equity of utility stocks must be less than the total market cost of equity. This is because utility stocks are less risky than the average stock in the market. (We proved this above by showing that utility betas were less than one). Therefore, once we determine the market cost of equity, it gives us a "ceiling" below which Empire's actual cost of equity must lie.

Q. Describe how you estimated the market cost of equity.

A. The methods used to estimate the market cost of equity are necessarily related to the methods used to estimate the ERP discussed above. In fact, the ERP is calculated by taking

the market cost of equity less the risk-free rate. Therefore, in estimating the market cost of equity, I relied on the same methods discussed above to estimate the ERP: (1) consulting expert surveys; and (2) calculating the implied ERP. The results of my market cost of equity analysis are presented in the following table:[83]

Figure 14:
Market Cost of Equity Summary

Source	Estimate
IESE Survey	8.3%
Graham Harvey Survey	7.1%
Damodaran	8.9%
Garrett	8.3%
Average	8.1%

As shown in this table, the average market cost of equity from these sources is only 8.1%. Therefore, it is not surprising that the CAPM and DCF Model indicate a cost of equity for Empire of only 7.5%. In other words, any cost of equity estimate for Empire (or any regulated utility) that is above the market cost of equity should be viewed as unreasonable, at best. In this case, Dr. Vander Weide suggests a cost of equity nearly 200 basis points above the market cost of equity.

[83] *See also* Exhibit DG 1-14 for details. Note these estimates are based on reported ERPs plus the risk-free rate used in my analysis.

Q. What do you recommend for the awarded return on equity?

A. The Commission should strive to award a return on equity that reflects, or is based upon the market-based cost of equity. However, the awarded return must also consider broader ratemaking principles and be reasonable under the circumstances. The results of the financial models presented in this case indicate a cost of equity estimate of approximately 7.5%. In the interest of avoiding a volatile move in the awarded return, I recommend the Commission adopt an awarded return on equity of 9.0%, which is the highest point in a reasonable range of 7.5% - 9.0%. This recommendation not only complies with the *Hope* Court's recognition that the awarded return be based on the actual cost of equity, but it also complies with the Court's acknowledgment that the "end result" be just and reasonable under the circumstances.

XI. COST OF DEBT

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

A. Empire had $818 million of long-term debt in its test year capital structure, at a cost of 5.3%, which is the cost of debt proposed by the Company as part of its weighted average cost of capital proposal.[84] I do not recommend any adjustments to the Company's proposed cost of debt.

[84] Company schedule F-1.

XII. CAPITAL STRUCTURE

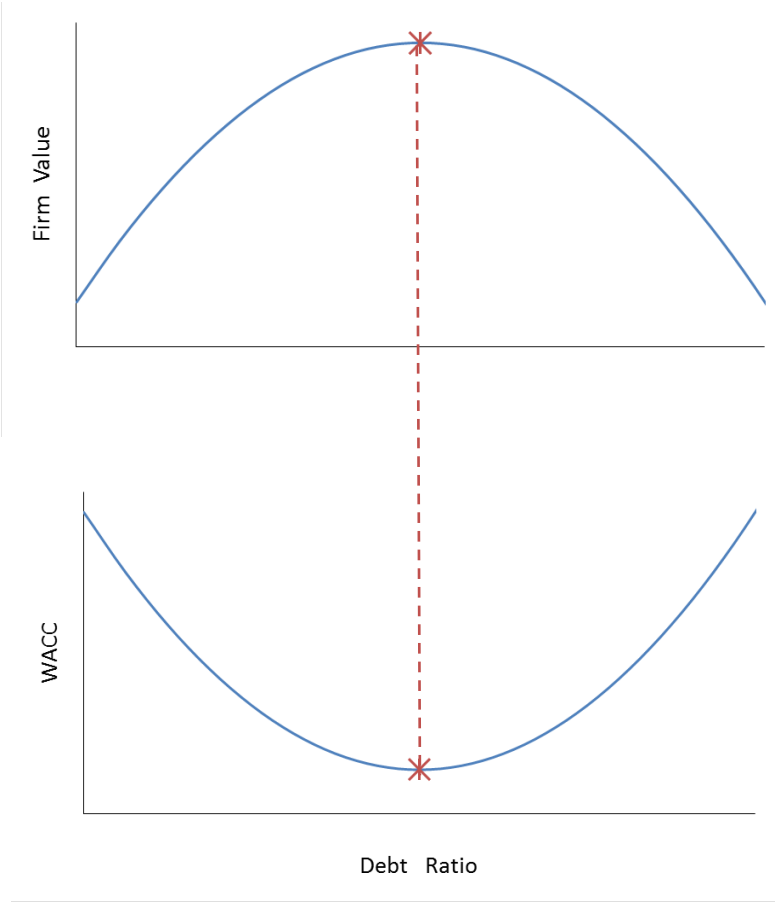
Q. Describe in general the concept of a company's "capital structure."

A. "Capital structure" refers to the way a company 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 to make payments, while equity capital represents an ownership interest in the form of stock. Because a firm cannot pay dividends on common stock until it satisfies its debt obligations to bondholders, stockholders are referred to as "residual claimants." The fact that stockholders have a lower priority to claims on company assets 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. Is it true that 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 non-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 figure illustrates these concepts.

Figure 15:
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.[85]

[85] *See* Graham, Smart & Megginson *supra* n. 19, at 440-41.

Q. Does the rate base rate of return model effectively incentivize utilities to operate at the optimal capital structure?

A. No. While it is true that competitive firms 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 higher rates, all else held constant. The basic revenue requirement equation is as follows:

Equation 13:
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 <u>increasing</u> their WACC, not by minimizing it. Thus, because there is no incentive for a regulated utility to minimize its WACC, a Commission standing in the place of competition must ensure that the regulated utility is operating at the lowest reasonable WACC.

Q. Do you believe that, generally speaking, 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 relatively 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.[86]

Note that the author explicitly contrasts utilities with firms that have high underlying business risk. Because utilities have low levels of 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 methods available to estimate the optimal capital structure, as discussed further below.

Q. Is it appropriate to solely consider the capital structures of the proxy group in assessing a prudent capital structure?

A. No. Utility witnesses often argue that regulators should primarily 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:

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 is

[86] Damodaran *supra* n. 17, at 196 (emphasis added).

likely to justify debt ratios that are far too low. It is the Commission's role to act as a surrogate for competition and thereby ensure that the capital structure of a regulated monopoly is similar to what would be appropriate in a competitive environment, not a regulated environment. This 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. That is, a utility's management has the discretion to choose the relative proportions of debt and equity used to finance the utility's operations. Regulatory commissions, however, have a duty to examine those decisions, and 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 is insufficient to determine a prudent capital structure.

Q. Describe the debt ratios of the proxy group you selected.

A. Although, as discussed above, it is not necessarily appropriate to solely consider the capital structures of other regulated utilities when assessing the proper capital structure of the target utility, I have conducted an analysis of the proxy companies' debt ratios. The average debt ratio of the proxy companies is 51%, which is close to Empire's proposed debt ratio.[87]

Q. What is your recommendation regarding Empire's capital structure?

A. I analyzed the Company's optimal capital structure based on the approach discussed above. Empire is proposing a debt ratio of 50.32% in this case.[88] For many utilities, a proposed debt ratio as low as this would not be reasonable, as it would not reflect one that would exist in a competitive environment. While it is appropriate for the Commission to impute an prudent capital structure when the capital structure proposed by a regulated utility is not reflective of market conditions, Empire's capital structure is reasonable in this case. Thus, I do not propose any adjustments to Empire's pro forma capital structure.

XIII. CONCLUSION AND RECOMMENDATION

Q. Summarize the key points of your testimony.

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

1. The legal standards governing this issue are clear that the awarded rate of return should be based on the Company's actual cost of capital.

[87] Exhibit DG 1-16.

[88] Company Schedule F-1.

2. The legal standards also indicate that the "end result" regarding the awarded ROE can be reasonable under the circumstances, such that the awarded return may exceed the cost of equity if there is good reason to do so.

3. The models I used in this case indicate the Company's cost of equity is approximately 7.5%. However, under prudent ratemaking principles, the Commission should award Empire's shareholders with a return on equity of 9.0%, which is the highest point in a reasonable range of 7.5% - 9.0%. Although we must move awarded returns toward true cost of equity, we should also ensure that we do not impose too much market risk to utilities in the process.

4. Empire's pro forma cost of debt and capital structure are reasonable in this case.

Q. What is your recommendation to the Commission?

A. OIEC respectfully requests that the Commission adopt the following recommendations with regard to the issues presented in this testimony:

1. The Commission should adopt an awarded return on equity of 9.0%, and although this awarded return on equity is higher than Empire's actual cost of equity, it is nonetheless based on the Company's cost of equity, and is fair under the circumstances.

2. The Commission should adopt Empire's proposed cost of debt;

3. The Commission should adopt Empire's proposed capital structure.

Q. Does this conclude 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.

Respectfully Submitted,

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EDUCATION

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

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

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

PROFESSIONAL DESIGNATIONS

Society of Depreciation Professionals
Certified Depreciation Professional (CDP)

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

The Mediation Institute
Certified Civil / Commercial & Employment Mediator

WORK EXPERIENCE

Resolve Utility Consulting PLLC — Oklahoma City, OK
Managing Member — 2016 – Present
Provide expert analysis and testimony specializing in depreciation and cost of capital issues for clients in utility regulatory proceedings.

Oklahoma Corporation Commission — Oklahoma City, OK
Public Utility Regulatory Analyst — 2012 – 2016
Assistant General Counsel — 2011 – 2012
Represented commission staff in utility regulatory proceedings and provided legal opinions to commissioners. Provided expert analysis and testimony in depreciation, cost of capital, incentive compensation, payroll and other issues.

Perebus Counsel, PLLC — Oklahoma City, OK
Managing Member — 2009 – 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 — 2007 – 2009
Represented clients in the areas of contracts, oil and gas, business structures and estate administration.

TEACHING EXPERIENCE

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

Rose State College — Midwest City, OK
Adjunct Instructor – "Legal Research" — 2013 – 2015
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 – President 2017
Participate in management of operations, attend meetings, review performance, organize presentation agenda.

Society of Utility Regulatory Financial Analysts 2014 – Present

SELECTED CONTINUING PROFESSIONAL EDUCATION

Society of Depreciation Professionals — Austin, TX
"Life and Net Salvage Analysis" — 2015
Extensive instruction on utility depreciation, including actuarial and simulation life analysis modes, gross salvage, cost of removal, life cycle analysis, and technology forecasting.

Society of Depreciation Professionals — New Orleans, LA
"Introduction to Depreciation" and "Extended Training" — 2014
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.

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.

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.

Utility Regulatory Proceedings

State	Regulatory Agency / Company-Applicant	Docket Number	Testimony / Analysis		
			Issues	Type	Date
TX	Railroad Commission of Texas CenterPoint Energy Texas Gas	GUD 10567	Depreciation rates, simulated and actuarial analysis	Prefiled	2/21/2017
AR	Arkansas Public Service Commission Oklahoma Gas & Electric Co.	160-159-GU	Cost of capital, depreciation rates, terminal salvage, lifespans	Prefiled	1/31/2017
FL	Florida Public Service Commission Peoples Gas	160-159-GU	Depreciation rates	Report	11/4/2016
AZ	Arizona Corporation Commission Arizona Public Service Co.	E-01345A-16-0036	Cost of capital, depreciation rates, terminal salvage, lifespans	Pre-filed	12/28/2016
NV	Nevada Public Utilities Commission Sierra Pacific Power Co.	16-06008	Depreciation rates, terminal salvage, lifespans, theoretical reserve	Pre-filed	9/23/2016
OK	Oklahoma Corporation Commission Oklahoma Gas & Electric Co.	PUD 201500273	Cost of capital, depreciation rates, terminal salvage, lifespans	Pre-filed Live	3/21/2016 5/3/2016
OK	Oklahoma Corporation Commission Public Service Co. of Oklahoma	PUD 201500208	Cost of capital, depreciation rates, terminal salvage, lifespans	Pre-filed Live	10/14/2015 12/8/2015
OK	Oklahoma Corporation Commission Oklahoma Natural Gas Co.	PUD 201500213	Cost of capital and depreciation rates	Pre-filed	10/19/2015
OK	Oklahoma Corporation Commission Oak Hills Water System	PUD 201500123	Cost of capital and depreciation rates	Pre-filed Live	7/8/2015 8/14/2015
OK	Oklahoma Corporation Commission CenterPoint Energy Oklahoma Gas	PUD 201400227	Fuel prudence review and fuel adjustment clause	Pre-filed Live	11/3/2014 2/10/2015
OK	Oklahoma Corporation Commission Public Service Co. of Oklahoma	PUD 201400233	Certificate of authority to issue new debt securities	Pre-filed Live	9/12/2014 9/25/2014

Utility Regulatory Proceedings

State	Regulatory Agency / Company-Applicant	Docket Number	Testimony / Analysis		
			Issues	Type	Date
OK	Oklahoma Corporation Commission Empire District Electric Co.	PUD 201400226	Fuel prudence review and fuel adjustment clause	Pre-filed Live	12/9/2014 1/22/2015
OK	Oklahoma Corporation Commission Fort Cobb Fuel Authority	PUD 201400219	Fuel prudence review and fuel adjustment clause	Pre-filed Live	 1/29/2015
OK	Oklahoma Corporation Commission Fort Cobb Fuel Authority	PUD 201400140	Outside services, legislative advocacy, payroll expense, and insurance expense	Pre-filed	12/16/2014
OK	Oklahoma Corporation Commission Public Service Co. of Oklahoma	PUD 201300201	Authorization of standby and supplemental tariff	Pre-filed Live	12/9/2013 12/19/2013
OK	Oklahoma Corporation Commission Fort Cobb Fuel Authority	PUD 201300134	Fuel prudence review and fuel adjustment clause	Pre-filed Live	10/23/2013 1/30/2014
OK	Oklahoma Corporation Commission Empire District Electric Co.	PUD 201300131	Fuel prudence review and fuel adjustment clause	Pre-filed Live	11/21/2013 12/19/2013
OK	Oklahoma Corporation Commission CenterPoint Energy Oklahoma Gas	PUD 201300127	Fuel prudence review and fuel adjustment clause	Pre-filed Live	10/21/2013 1/23/2014
OK	Oklahoma Corporation Commission Oklahoma Gas & Electric Co.	PUD 201200185	Gas transportation contract extension	Pre-filed Live	9/20/2012 10/9/2012
OK	Oklahoma Corporation Commission Empire District Electric Co.	PUD 201200170	Fuel prudence review and fuel adjustment clause	Pre-filed Live	10/31/2012 12/13/2012
OK	Oklahoma Corporation Commission Oklahoma Gas & Electric Co.	PUD 201200169	Fuel prudence review and fuel adjustment clause	Pre-filed Live	12/19/2012 4/4/2013

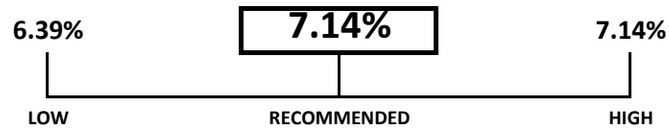
Weighted Average Awarded Return Recommendation

Exhibit DG 1-2

(Note: This is not actual cost of capital)

Source	Capital Structure	Cost Rates	Weighted Cost
Long-term Debt	50.3%	5.30%	2.67%
Common Equity	49.7%	9.00% (7.50% – 9.00%)	4.47% (3.73% – 4.47%)

Recommended Range for Awarded Rate of Return



Proxy Group Summary

Company	Ticker	[1] Market Cap. ($ millions)	[2] Market Category	[3] S&P Bond Rating	[4] Value Line Safety Rank	[5] Financial Strength	[6] Value Line Region
ALLETE	ALE	3,100	Mid Cap	BBB+	2	A	Central
Alliant Energy	LNT	8,200	Mid Cap	A-	2	A	Central
Ameren Corp.	AEE	12,000	Large Cap	BBB+	2	A	Central
Avista Corp.	AVA	2,500	Mid Cap	BBB	2	A	West
Black Hills	BKH	3,300	Mid Cap	BBB	2	A	West
CenterPoint Energy	CNP	10,000	Large Cap	A-	3	B+	Central
CMS Energy Corp.	CMS	11,000	Large Cap	BBB+	2	B++	Central
El Paso Electric	EE	1,900	Small Cap	BBB	2	B++	West
G't Plains Energy	GXP	5,700	Mid Cap	BBB+	3	B+	Central
Hawaiian Elec.	HE	3,600	Mid Cap	BBB-	2	A	West
NorthWestern Corp.	NWE	2,800	Mid Cap	BBB	3	B+	West
OGE Energy	OGE	6,400	Mid Cap	A-	2	A	Central
Otter Tail Corp.	OTTR	1,500	Small Cap	BBB	2	B++	Central
Pinnacle West Capital	PNW	8,700	Mid Cap	A-	1	A+	West
PNM Resources	PNM	2,700	Mid Cap	BBB+	3	B	West
Portland General	POR	3,900	Mid Cap	BBB	2	B++	West
SCANA Corp.	SCG	9,900	Mid Cap	BBB+	2	B++	East
Vectren Corp.	VVC	4,100	Mid Cap	A-	2	A	Central

[1], [4], [5], [6] Value Line Investment Survey as of 2-9-2016

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

[3] S&P bond ratings

Stock and Index Prices

Ticker	^GSPC	ALE	LNT	AEE	AVA	BKH	CNP	CMS	EE	GXP	HE	NWE	OGE	OTTR	PNW	PNM	POR	SCG	VVC
30-day Average	2316	65.00	37.78	52.88	38.75	62.06	26.11	42.76	46.50	27.46	32.94	57.12	34.32	37.85	78.31	34.71	43.72	68.98	54.73
Standard Deviation	38.9	1.64	0.86	0.93	0.55	1.46	0.62	0.95	1.18	0.77	0.38	0.64	1.07	0.39	1.79	0.82	0.64	1.35	0.77
03/01/17	2396	67.19	39.08	54.76	39.77	65.54	27.70	44.13	49.25	28.91	33.44	58.66	37.02	38.25	82.40	36.25	45.37	68.78	56.34
02/28/17	2364	67.21	39.48	54.69	39.87	64.88	27.32	44.52	48.85	29.06	33.28	58.50	36.83	37.60	82.19	36.30	45.33	69.35	56.35
02/27/17	2370	67.14	39.05	54.29	39.74	64.82	26.79	44.30	48.70	28.88	33.25	57.98	36.27	38.25	81.18	36.05	44.82	68.54	55.97
02/24/17	2367	67.13	39.52	54.58	39.53	64.62	27.02	44.68	48.55	28.85	33.14	57.85	36.11	38.25	81.44	35.65	44.80	68.92	56.19
02/23/17	2364	66.76	39.11	54.07	39.15	64.28	26.84	44.19	48.35	28.50	32.85	57.50	35.75	37.95	80.50	35.30	44.18	68.94	55.69
02/22/17	2363	66.50	38.65	53.97	38.93	63.58	26.57	43.76	47.25	28.10	32.65	57.49	34.95	37.85	79.72	35.10	43.74	67.94	55.29
02/21/17	2365	67.06	38.43	53.89	38.99	63.24	26.61	43.54	47.25	28.09	32.49	57.94	34.95	38.15	79.77	35.35	43.72	66.96	54.85
02/17/17	2351	66.59	38.08	53.37	38.98	62.64	26.51	43.22	46.60	27.86	32.38	57.62	34.62	37.75	78.70	35.10	42.98	65.65	54.70
02/16/17	2347	66.24	37.93	52.94	39.16	62.22	26.37	43.09	46.75	27.70	32.44	57.40	34.62	38.05	78.55	35.15	43.23	67.32	54.86
02/15/17	2349	65.71	37.54	52.54	38.65	61.48	26.07	42.77	46.25	27.46	32.20	56.54	34.19	37.90	78.00	34.60	43.03	67.47	54.53
02/14/17	2338	65.12	37.67	52.65	38.52	61.43	26.05	42.78	46.40	27.75	32.79	56.46	34.31	38.15	78.09	34.90	43.32	66.86	54.78
02/13/17	2328	65.38	37.99	53.05	38.75	61.86	26.40	43.13	46.65	27.73	33.36	56.36	34.54	38.25	78.72	35.00	43.77	70.03	54.93
02/10/17	2316	65.37	37.86	52.93	38.96	61.11	26.22	42.93	46.65	27.74	33.46	56.50	34.27	38.33	78.67	35.00	43.95	69.27	55.08
02/09/17	2308	65.11	37.65	52.90	38.60	60.27	26.20	42.74	46.25	27.31	33.43	56.49	34.06	37.73	78.13	34.75	43.64	69.15	54.73
02/08/17	2295	65.28	38.15	53.12	38.77	60.67	26.15	42.90	46.25	27.22	33.37	56.75	33.90	37.78	78.57	35.15	43.83	70.25	55.02
02/07/17	2293	65.00	37.80	52.68	38.57	60.51	25.91	42.51	45.95	26.89	33.36	56.56	33.90	37.83	77.92	35.05	43.61	69.40	54.51
02/06/17	2293	65.22	37.66	52.65	38.36	60.63	25.83	42.45	45.75	26.92	33.41	56.61	33.89	37.59	77.85	34.90	43.57	69.49	54.40
02/03/17	2297	65.34	37.82	52.69	38.27	61.12	26.04	42.62	46.25	26.97	33.23	56.92	33.87	38.58	78.03	35.05	43.55	69.70	54.93
02/02/17	2281	64.72	37.51	52.59	38.07	60.94	25.93	42.76	45.90	26.90	33.02	56.57	33.52	37.59	77.79	34.75	43.46	69.17	54.19
02/01/17	2280	64.08	36.98	51.75	37.59	60.94	25.67	42.12	45.30	26.74	32.79	56.09	33.19	37.14	76.69	34.05	42.89	68.28	53.41
01/31/17	2279	64.82	37.65	52.65	38.29	62.10	25.95	42.27	45.90	27.28	33.16	57.11	33.54	37.54	77.63	34.40	43.61	68.70	54.47
01/30/17	2281	63.85	36.86	51.69	37.76	61.11	25.57	41.71	44.90	26.67	32.59	56.45	33.24	37.09	76.44	33.60	42.83	68.13	53.88
01/27/17	2295	63.94	36.89	51.82	38.14	61.63	25.80	41.45	45.00	26.76	32.41	57.12	33.42	37.83	76.11	33.85	43.07	68.50	53.97
01/26/17	2297	64.15	36.64	52.08	38.26	61.91	25.73	41.63	45.20	26.79	32.63	57.16	33.66	38.03	76.32	33.60	43.24	68.91	54.61
01/25/17	2298	63.84	36.58	51.90	38.49	61.70	25.69	41.48	45.25	26.62	32.77	57.02	33.80	38.18	76.48	33.50	43.33	69.35	54.20
01/24/17	2280	62.42	36.64	52.06	38.82	61.42	25.36	41.64	45.50	26.61	32.82	57.38	33.62	38.03	76.78	33.60	43.82	69.72	54.16
01/23/17	2265	61.68	36.71	51.98	38.80	61.26	25.18	41.96	45.65	26.66	32.71	57.09	33.38	37.09	76.54	33.65	43.73	70.30	53.82
01/20/17	2271	62.21	37.04	52.05	38.97	61.11	25.34	42.00	46.00	26.98	32.88	57.15	33.40	37.34	76.36	33.90	43.67	70.85	53.82
01/19/17	2264	62.07	36.96	51.81	38.67	61.11	25.18	41.80	45.80	26.79	32.77	56.87	33.22	37.34	76.39	33.45	43.58	70.99	53.83
01/18/17	2272	62.83	37.38	52.36	39.14	61.76	25.42	41.86	46.55	27.16	33.22	57.45	33.70	38.03	77.23	34.26	43.85	72.36	54.30

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

DCF Final Results

Company	Ticker	[1] Dividend	[2] Stock Price	[3] Dividend Yield
ALLETE	ALE	0.532	65.00	0.82%
Alliant Energy	LNT	0.315	37.78	0.83%
Ameren Corp.	AEE	0.440	52.88	0.83%
Avista Corp.	AVA	0.357	38.75	0.92%
Black Hills	BKH	0.445	62.06	0.72%
CenterPoint Energy	CNP	0.268	26.11	1.03%
CMS Energy Corp.	CMS	0.333	42.76	0.78%
El Paso Electric	EE	0.310	46.50	0.67%
G't Plains Energy	GXP	0.275	27.46	1.00%
Hawaiian Elec.	HE	0.310	32.94	0.94%
NorthWestern Corp.	NWE	0.525	57.12	0.92%
OGE Energy	OGE	0.303	34.32	0.88%
Otter Tail Corp.	OTTR	0.320	37.85	0.85%
Pinnacle West Capital	PNW	0.655	78.31	0.84%
PNM Resources	PNM	0.243	34.71	0.70%
Portland General	POR	0.320	43.72	0.73%
SCANA Corp.	SCG	0.613	68.98	0.89%
Vectren Corp.	VVC	0.420	54.73	0.77%
Average		**$0.39**	**$46.78**	**0.84%**

[1] First quarter 2017 dividends per share. Nasdaq.com

[2] Average stock price from stock price exhibit.

[3] = [1] / [2]

Terminal Growth Rate

Determinant	Rate	
Nominal GDP	4.10%	[1]
Inflation	2.00%	[2]
Risk Free Rate	3.04%	[3]
Average	**3.05%**	

[1], [2] Congressional Budget Office Long-Term Budget Outlook 2016 - 2

[3] From risk-free rate exhibit

Final DCF Result

Dividend (d_0)	Stock Price (P_0)	Growth Rate (g)	**DCF Result**
$0.39	$46.78	4.10%	**7.6%**

Risk-Free Rate

Date	Rate
01/18/17	3.00
01/19/17	3.04
01/20/17	3.05
01/23/17	2.99
01/24/17	3.05
01/25/17	3.10
01/26/17	3.08
01/27/17	3.06
01/30/17	3.08
01/31/17	3.05
02/01/17	3.08
02/02/17	3.09
02/03/17	3.11
02/06/17	3.05
02/07/17	3.02
02/08/17	2.96
02/09/17	3.02
02/10/17	3.01
02/13/17	3.03
02/14/17	3.07
02/15/17	3.09
02/16/17	3.05
02/17/17	3.03
02/21/17	3.04
02/22/17	3.04
02/23/17	3.02
02/24/17	2.95
02/27/17	2.98
02/28/17	2.97
03/01/17	3.06
Average	**3.04%**

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

Beta Results

Company	Ticker	Beta
ALLETE	ALE	0.75
Alliant Energy	LNT	0.70
Ameren Corp.	AEE	0.65
Avista Corp.	AVA	0.70
Black Hills	BKH	0.90
CenterPoint Energy	CNP	0.85
CMS Energy Corp.	CMS	0.65
El Paso Electric	EE	0.70
G't Plains Energy	GXP	0.70
Hawaiian Elec.	HE	0.70
NorthWestern Corp.	NWE	0.70
OGE Energy	OGE	0.90
Otter Tail Corp.	OTTR	0.85
Pinnacle West Capital	PNW	0.70
PNM Resources	PNM	0.75
Portland General	POR	0.70
SCANA Corp.	SCG	0.65
Vectren Corp.	VVC	0.75
Average		0.74

*Betas from Value Line Investment Survey

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	759	206	299	6.64%	1.80%	2.61%	4.42%
2011	11,385	877	240	405	7.70%	2.11%	3.56%	5.67%
2012	12,742	870	281	399	6.83%	2.20%	3.13%	5.33%
2013	16,495	956	312	476	5.80%	1.89%	2.88%	4.77%
2014	18,245	1,004	350	553	5.50%	1.92%	3.03%	4.95%
2015	17,900	885	382	572	4.95%	2.14%	3.20%	5.33%

Cash Yield	5.08%	[9]
Growth Rate	3.14%	[10]
Risk-free Rate	3.04%	[11]
Current Index Value	2,316	[12]

	[13]	[14]	[15]	[16]	[17]
Year	1	2	3	4	5
Expected Dividends	121	125	129	133	137
Expected Terminal Value					2691
Present Value	112	107	102	97	1899

Intrinsic Index Value	2316	[18]
Required Return on Market	8.29%	[19]
Implied Equity Risk Premium	**5.25%**	[20]

[1-4] S&P Quarterly Press Releases, data found at www.spdji.com/indices/equity/sp-500 (additional info tab) (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])^{n}
[18] = Sum([13-17]) present values.
[19] = [20] + [11]
[20] Internal rate of return calculation setting [18] equal to [12] and solving for the discount rate

Equity Risk Premium Results

IESE Business School Survey	5.3%	[1]
Graham & Harvey Survey	4.0%	[2]
Duff & Phelps Report	5.5%	[3]
Damodaran	5.8%	[4]
Garrett	5.3%	[5]
Average	**5.2%**	

[1] IESE Business School Survey

[2] Graham and Harvey Survey

[3] Duff & Phelps Client Alert 2016

[4] Highest ERP est., http://pages.stern.nyu.edu/~adamodar/

[5] From implied ERP exhibit

CAPM Final Results

Company	Ticker	[1] Risk-Free Rate	[2] Value Line Beta	[3] Risk Premium	[4] CAPM Results
ALLETE	ALE	3.04%	0.750	5.84%	7.4%
Alliant Energy	LNT	3.04%	0.700	5.84%	7.1%
Ameren Corp.	AEE	3.04%	0.650	5.84%	6.8%
Avista Corp.	AVA	3.04%	0.700	5.84%	7.1%
Black Hills	BKH	3.04%	0.900	5.84%	8.3%
CenterPoint Energy	CNP	3.04%	0.850	5.84%	8.0%
CMS Energy Corp.	CMS	3.04%	0.650	5.84%	6.8%
El Paso Electric	EE	3.04%	0.700	5.84%	7.1%
G't Plains Energy	GXP	3.04%	0.700	5.84%	7.1%
Hawaiian Elec.	HE	3.04%	0.700	5.84%	7.1%
NorthWestern Corp.	NWE	3.04%	0.700	5.84%	7.1%
OGE Energy	OGE	3.04%	0.900	5.84%	8.3%
Otter Tail Corp.	OTTR	3.04%	0.850	5.84%	8.0%
Pinnacle West Capital	PNW	3.04%	0.700	5.84%	7.1%
PNM Resources	PNM	3.04%	0.750	5.84%	7.4%
Portland General	POR	3.04%	0.700	5.84%	7.1%
SCANA Corp.	SCG	3.04%	0.650	5.84%	6.8%
Vectren Corp.	VVC	3.04%	0.750	5.84%	7.4%
Average			0.739		**7.4%**

[1] From risk-free rate exhibit
[2] Value Line Investment Survey
[3] From ERP exhibit
[6] = [1] + [2] * [3]

Cost of Equity Summary

Model	Cost of Equity
Discounted Cash Flow Model	7.6%
Capital Asset Pricing Model	7.4%
Average	**7.5%**

Market Cost of Equity

Source	Estimate	
IESE Survey	8.3%	[1]
Graham Harvey Survey	7.1%	[2]
Damodaran	8.9%	[3]
Garrett	8.3%	[4]
Average	8.1%	

[1] Average reported ERP + riskfree rate

[2] Average reported ERP + risk-free rate

[3] Recent highest reported ERP + risk-free rate

[4] From implied ERP exhibit herein

Awarded Returns vs. Market Cost of Equity (2005 - 2016)

	[1]	[2]
Quarter	Cases Filed	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%
2016.1	14	10.26%
2016.2	27	9.57%
2016.3	12	9.76%
2016.4	17	9.57%

	[3]	
Year	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	13.25%	
2015	1.38%	
2016	11.74%	
Average		
Arithmetic	8.89%	[4]
Geometric	7.39%	[5]
Average Return on All Stocks	**8.1%**	[6]
Average Utility Awarded ROE	**10.2%**	[7]

[8]

Year	Market Cost of Equity
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%
2016	8.14%
Average	**8.25%**

[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)

Proxy Company Debt Ratios

Company	Ticker	Debt Ratio
ALLETE	ALE	46%
Alliant Energy	LNT	50%
Ameren Corp.	AEE	49%
Avista Corp.	AVA	51%
Black Hills	BKH	58%
CenterPoint Energy	CNP	70%
CMS Energy Corp.	CMS	68%
El Paso Electric	EE	55%
G't Plains Energy	GXP	39%
Hawaiian Elec.	HE	44%
NorthWestern Corp.	NWE	54%
OGE Energy	OGE	44%
Otter Tail Corp.	OTTR	43%
Pinnacle West Capital	PNW	46%
PNM Resources	PNM	53%
Portland General	POR	48%
SCANA Corp.	SCG	54%
Vectren Corp.	VVC	50%
Average		51%

Debt ratios from Value Line Investment Survey

Dr. Vander Weide's Corrected DCF Model

Exhibit DG 1-17

	[1]	[2]	[3]	[4]
Vander Weide Proxy Group	Vander Weide Stock Price	Vander Weide Dividend	GDP "Maximum" Growth Estimate	DCF Results
ALLETE	60.32	2.21	4.1%	7.8%
Alliant Energy	38.43	1.26	4.1%	7.4%
Ameren Corp.	49.75	1.82	4.1%	7.8%
Avista Corp.	41.48	1.45	4.1%	7.6%
Black Hills	60.11	1.78	4.1%	7.1%
CenterPoint Energy	22.95	1.10	4.1%	8.9%
CMS Energy Corp.	42.50	1.30	4.1%	7.2%
Dominion Resources	74.80	2.94	4.1%	8.0%
DTE Energy	94.36	3.17	4.1%	7.5%
Duke Energy	81.18	3.57	4.1%	8.5%
El Paso Electric	45.83	1.29	4.1%	6.9%
Eversource Energy	55.01	1.87	4.1%	7.5%
G't Plains Energy	27.66	1.13	4.1%	8.2%
Hawaiian Elec.	29.90	1.33	4.1%	8.6%
NextEra Energy	124.08	3.61	4.1%	7.0%
NorthWestern Corp.	57.82	2.12	4.1%	7.8%
OGE Energy	31.20	1.21	4.1%	8.0%
Otter Tail Corp.	34.72	1.34	4.1%	7.9%
PG&E Corp.	62.10	2.02	4.1%	7.4%
Pinnacle West Capital	76.10	2.71	4.1%	7.7%
PNM Resources	32.73	0.94	4.1%	7.0%
Portland General	42.73	1.32	4.1%	7.2%
PPL Corp.	34.70	1.63	4.1%	8.8%
SCANA Corp.	72.05	2.43	4.1%	7.5%
Sempra Energy	106.71	3.17	4.1%	7.1%
Southern Co.	51.61	2.37	4.1%	8.7%
Vectren Corp.	49.71	1.71	4.1%	7.5%
WEC Energy Group	60.59	2.08	4.1%	7.5%
Xcel Energy Inc.	41.65	1.43	4.1%	7.5%
Average				**7.7%**

[1] Vander Weide's stock prices
[2] Vander Weide's dividends
[3] GDP growth estimate
[4] Vander Weide DCF formula = [2] / [1] + [3]