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MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. ER-2007-0002

SURREBUTTAL TESTIMONY

OF

JAMES H. VANDER WEIDE, PH.D.

ON

BEHALF OF

UNION ELECTRIC COMPANY
d/b/a AMERENUE

St. Louis, Missouri
February 2007

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OF

DR. JAMES H. VANDER WEIDE

CASE NO. ER-2007-0002

I. INTRODUCTION AND SUMMARY

Q. Please state your name, title, and business address.

A. My name is James H. Vander Weide. I am Research Professor of Finance and Economics at Duke University, the Fuqua School of Business. I am also President of Financial Strategy Associates, a firm that provides strategic and financial consulting services to business clients. My business address is 3606 Stoneybrook Drive, Durham, North Carolina.

Q. Are you the same James H. Vander Weide who presented direct and rebuttal testimonies in this proceeding filed in July 2006 and January 2007, respectively?

A. Yes, I am.

Q. What is the purpose of your testimony?

A. I have been asked by Union Electric Company d/b/a AmerenUE ("AmerenUE" or "the Company") to respond to the rebuttal testimonies filed by Mr. Stephen G. Hill, Dr. J. Randall Woolridge, and Mr. Charles W. King. Mr. Hill's testimony is filed on behalf of the Missouri Public Service Commission Staff, Dr. Woolridge's testimony is filed on behalf of the State of Missouri, and Mr. King's testimony is filed on behalf of the Office of Public Counsel.

Q. How have you organized you Surrebuttal Testimony?

A. Since Mr. Hill, Dr. Woolridge, and Mr. King offer similar rebuttal testimonies, I will organize my Surrebuttal Testimony by topic rather by witness whenever possible. Specifically, I will address these witnesses' comments regarding my: (1) financial risk adjustment; (2) proxy group of companies; (3) DCF analysis; (4) risk premium analyses; and (5) CAPM analyses.

Q. Please summarize your Surrebuttal Testimony.

A. My Surrebuttal Testimony can be briefly summarized as follows:

<u>Financial Risk Adjustment</u>. I estimate AmerenUE's cost of equity by first estimating the average cost of equity for a large proxy group of comparable risk companies, and then adjusting the proxy group's estimated cost of equity to reflect the difference between the proxy group's average financial risk and the financial risk implicit in AmerenUE's recommended ratemaking capital structure. I recommend this financial risk adjustment because it is consistent with the economic definition of the cost of capital. The other parties' inappropriate criticisms of my procedure stem from their: (1) illogical analysis of the consequences of using a market value capital structure to estimate AmerenUE's ratemaking overall cost of capital; and (2) misapprehension that I am recommending that a market value capital structure be used to calculate AmerenUE's overall cost of capital in this proceeding. I demonstrate that my financial risk adjustment is consistent with financial theory and my prior testimony. I also demonstrate that my financial risk adjustment does not produce "illogical" results and that some regulators use market value capital structures either to adjust the cost of equity for differences in financial risk or to estimate the overall cost of capital.

<u>Proxy Companies</u>. I recommend using a large proxy group of comparable risk companies because use of such a group increases the reliability of my cost of equity estimates and is consistent with the U.S. Supreme Court mandate in the *Hope* and *Bluefield* cases that utility investors should be allowed to earn a return commensurate with returns they could achieve if they invested in other companies of comparable risk. I demonstrate that the other parties' claims that my proxy group is more risky than AmerenUE is unfounded; indeed, my comparable company group has the same average bond rating as AmerenUE.

<u>DCF Analysis</u>. The other parties' claim that the results of DCF analyses should be given the primary weight in this proceeding because their DCF analyses produce more "reliable" cost of equity estimates than other cost of equity estimates. I rebut the other parties' specious arguments regarding the reliability of their cost of equity estimates, demonstrating that the other parties' errors in their applications of the DCF model, most notably their use of arbitrary growth rates, call into question their DCF model results. For example, Mr. Hill obtains growth rates for Public Service of New Mexico in the range from *negative* 8.76 percent to *positive* 11.45 percent, but arbitrarily chooses a growth estimate of 5.75 percent, a growth rate that others would be unable to predict from the data he presents. Clearly, an analysis in which the analyst can choose *any* number in the range *negative* 8.76 percent to *positive* 11.45 percent, and in which the analyst chooses a number that is unrelated in any mathematical way to the data presented, cannot be termed to be "reliable."

<u>Risk Premium Analyses</u>. I refute the other parties' claims that there has been a downward "trend" in risk premiums and confirm that reliable information regarding the cost of equity can be obtained from considering both the average return and the average risk premium over a long period of time. I also corroborate the consistency of my ex post and ex ante risk premium studies and confirm the validity of my use of utility bond yields to estimate the interest rate component in my risk premium studies.

CAPM Analyses. Contrary to other parties' claims, I demonstrate the CAPM provides a reasonable estimate of the cost of equity for companies like the electric companies with betas close to 1.0 and that the market risk premium can be estimated using either ex post or ex ante market risk premium data.

Q. Is there anything in the testimonies of Mr. Hill, Dr. Woolridge, and Mr. King that causes you to change your recommended cost of equity for AmerenUE?

A. No.

II. FINANCIAL RISK ADJUSTMENT

Q. How do you estimate AmerenUE's cost of equity in this proceeding?

A. I estimate AmerenUE's cost of equity by: (1) estimating the average cost of equity for a large proxy group of comparable risk companies, and (2) adjusting the proxy group's estimated cost of equity to reflect the difference between the proxy group's average financial risk and the financial risk implicit in AmerenUE's recommended capital structure.

Q. How do financial economists measure the risk of investing in a company's stock?

A. Financial economists measure the risk of investing in a company's stock by calculating the forward-looking variability in the rate of return on an investment in the company's stock.[1]

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[1] This statement assumes that the probability distribution of future rates of return on an investment in a company's stock is symmetric. When returns are distributed symmetrically, risk can be measured either by the variance or the standard deviation of return on an investment in the company's stock.

Q. What is the difference between a company's business risk and its financial risk?

A. As noted above, risk is measured by the forward-looking variability in the rate of return on an investment in a company's stock. Total risk is the sum of business risk and financial risk, where business risk is the forward-looking variability in the rate of return on an investment in the company's stock when the company is all-equity financed, and financial risk is the additional variability in the rate of return on an investment in the company's stock that arises as a result of debt financing.

Q. How do you measure your proxy group's average financial risk?

A. I measure my proxy group's average financial risk using data on the percentages of debt and equity in my proxy group's composite capital structure, where these percentages are calculated using market values of debt and equity.[2]

Q. What is the difference between the market value of debt and equity and book value of debt and equity?

A. The market value of debt and equity reflects the values of these quantities in the marketplace, whereas the book value of debt and equity reflects the values shown on a company's accounting records. The values shown on the company's accounting records are based on historical cost rather than economic or market value.

2 In measuring the debt component of the market value capital structure, I used the book value of debt as a surrogate for the market value of debt. Use of book debt values as surrogates for market debt values is common in the financial community because the book value of debt is generally approximately equal to the market value of debt.

Q. Why do you measure your proxy group's average financial risk using market value capital structure data rather than book value capital structure data?

A. I measure my proxy group's average financial risk using market value capital structure data because the forward-looking variability in the rate of return on a company's stock depends on the company's market value capital structure, not its book value capital structure.

Q. Can you illustrate how the forward-looking variability in the rate of return on the equity investment in a company increases with debt financing?

A. Yes. Consider a company whose only asset is an investment in a real estate development project that is currently worth $200 million. Suppose that the project is financed entirely with equity, and that the investor in the project believes that, over the next year, the project will either increase in value by $20 million, or decrease in value by $20 million. Then the rate of return on both the value of the project and the value of the equity in the project will be either $20/$200 million = 10 percent, or -$20/$200 million = -10 percent); and the range of rates of return on equity will be from positive 10 percent to negative 10 percent.

Now suppose that the same project is financed with $100 million in debt and $100 in equity, both measured in terms of market value. In this case, the rate of return on the equity in the project would be either plus 20 percent or minus 20 percent (20/100 or -20/100),[3] and the range of rates of returns on equity will be twice as large as in the previous case from positive 20 percent to negative 20 percent. Thus, the variability in the market rate

[3] For simplicity, I have assumed that there is no interest on the debt. If one assumes interest on the debt, the variability in the rate of return on the equity in the project financed with both debt and equity would be even greater.

of return on the equity in the project (that is, on the company's stock) has increased as a result of the partial use of debt financing.

Q. Can you explain why the financial risk of this project depends on the market values of debt and equity, and not the book values of debt and equity?

A. Yes. Recall that financial risk is the additional variability in the market rate of return on equity resulting from the use of debt financing. Since the market rate of return on equity depends on the market value of the equity in the project, not the book value, the financial risk of the project also depends on the market value of the equity in the project, not the book value.

Q. Is there any meaningful relationship between a company's book value capital structure and the variability of return to shareholders in the marketplace?

A. No. The variability of the market return to shareholders depends only on the company's market value capital structure, not its book value capital structure. In my illustration, the fact that an investor might have purchased a project ten years ago at a price of $50 million is entirely irrelevant to the calculation of the variability in the market rate of return today.

Q. Does Mr. Hill recognize that financial economists measure financial risk in terms of a company's market value capital structure?

A. Yes. Mr. Hill states, "The Company's testimony regarding the existence of market-value capital structure theory is correct." (Hill Rebuttal at 13.) Mr. Hill also states,

> ***The other instance in which market-value capital structures are used is in the quantification of financial risk***, i.e., when comparing one market-value capital structure to another market-value capital structure. The econometric analyses used to estimate the impact of financial risk differences on the cost of equity rely on the original capital structure theory work of Miller and

> Modigliani. That theoretical work is based solely on market-value capital structures. ***<u>Therefore, the equity cost adjustment formulas extracted from that work are applied using only market-value capitalization</u>***. (Hill Rebuttal at 24. Emphasis added.)

Q. Since Mr. Hill recognizes that financial risk depends on the company's market value capital structure, what is the basis for Mr. Hill's disagreement with your use of a financial risk adjustment based on the market value capital structures of your proxy companies?

A. Mr. Hill's disagreement with my financial risk adjustment is based on his incorrect claims that: (1) I am recommending that a market value capital structure be used in this proceeding to calculate AmerenUE's overall cost of capital (Hill Rebuttal at 2); (2) my use of a market value capital structure is circular (Hill Rebuttal at 6); (3) my use of a market value capital structure would allow AmerenUE to earn a return in excess of its cost of capital (Hill Rebuttal at 8); (4) my financial risk adjustment is inconsistent with financial theory (Hill Rebuttal at 11 – 13); (5) there is support in the finance literature for use of a book value capital structure (Hill Rebuttal at 13 – 15); (6) stock prices incorporate book value capital structures because investors only get information on book value capital structures, and markets are efficient (Hill Rebuttal at 14); (7) book value capital structures do not have to be justified because regulators have always used book value capital structures to set allowed rates of return (Hill Rebuttal at 14); and (8) my testimony is not credible because I have recently changed my position on the appropriate capital structure for use in calculating the company's overall cost of capital (Hill Rebuttal at 15 – 25).

Q. Does Dr. Woolridge raise any concerns with your financial risk adjustment that differ from the concerns raised by Mr. Hill?

A. Yes. Dr. Woolridge disagrees with my financial risk adjustment because, in his opinion: (1) a market-to-book ratio greater than 1.0 indicates that companies are earning more than their cost of capital; and (2) my financial risk adjustment produces illogical results.

A. I am not testifying in this proceeding on the appropriate capital structure for use in calculating AmerenUE's overall cost of capital.

Q. Are you testifying in this proceeding on the appropriate capital structure for use in calculating AmerenUE's overall cost of capital?

A. No. However, I am recommending that: (1) the financial risk of my comparable companies be measured based on their market value capital structures; and (2) the average cost of equity for my comparable companies be adjusted to reflect the difference between the financial risk of my proxy group and the financial risk implied by AmerenUE's recommended capital structure for ratemaking purposes.

Q. Does Mr. Hill also make a financial risk adjustment to the cost of equity results he obtains for his proxy group?

A. Yes. Mr. Hill states,

> I have estimated the equity capital cost of the Company's electric utility and gas distribution operations to fall in a range of 9.00% to 9.75%. Within that range, I estimate the equity cost of the Company's utility operations to be near the lower end of a reasonable range of equity costs ***due to AmerenUE's lower financial risk***—9.25%. [Hill Rebuttal at 4. Emphasis added.]

B. My financial risk adjustment is not circular.

Q. Mr. Hill asserts that your use of a market value capital structure is circular. (Hill Rebuttal at 6.) Do you agree with Mr. Hill's assertion?

A. No. Mr. Hill's assertion that my recommendation is circular is based on his further incorrect assertion that I am recommending that a market value capital structure be used to calculate AmerenUE's overall cost of capital. Since I am not offering testimony on the appropriate capital structure for use in calculating the overall cost of capital, Mr. Hill's assertion that my recommendation is circular is incorrect.

Q. Would Mr. Hill's assertion regarding the circularity of your recommendation be true if you were recommending that AmerenUE's overall cost of capital be calculated using a market value capital structure?

A. No. Mr. Hill's assertion regarding circularity is also based on his incorrect assumptions that: (1) use of a market value capital structure would lead to a higher rate of return on equity; (2) a higher rate of return on equity would lead to a higher market value for the company's stock; and (3) a higher market value for the company's stock would produce an even higher rate of return on equity.

Q. You have previously explained that your financial risk adjustment is not the same as recommending a market value capital structure to calculate the overall cost of capital. Can you explain why Mr. Hill's three further assumptions listed in the previous response are incorrect?

A. Yes. If regulators were to announce that they were going to use market value capital structures to set rates, investors would assume that use when investors determined their required returns; and the use of a market value capital structure to set rates would have no impact on the market price of a company's stock after the original announcement. Furthermore, if the use of a market value capital structure were to cause the market price of the company's stock to increase, this increase would reduce the company's financial risk, and hence its cost of equity. Thus, the higher market value would reduce the company's required rate of return on equity, not increase it, as Mr. Hill asserts.

Q. Even if Mr. Hill's assertion—that use of a company's market value capital structure in rate setting is circular—were true, does his conclusion apply to your recommended financial risk adjustment?

A. No. As noted above, I am not testifying in this proceeding on the appropriate capital structure for use in calculating AmerenUE's overall cost of capital. My recommended financial risk adjustment to my estimated cost of equity for my proxy companies is based on the market value capital structure of my proxy group, not a market value capital structure of AmerenUE (indeed, AmerenUE does not even have a market value capital structure). Since the market prices of my proxy companies' stocks do not depend on AmerenUE's allowed rate of return on equity, the circular link that Mr. Hill posits simply does not exist.

C. Adoption of my financial risk adjustment would not cause AmerenUE to have an allowed return on equity that exceeds its cost of equity.

Q. Would adoption of your financial risk adjustment cause AmerenUE's allowed rate of return to exceed its cost of equity?

A. No. My estimate of AmerenUE's required rate of return on equity is based on my estimate of the average cost of equity of my proxy companies. Since the financial risk of my proxy companies is less than the financial risk implied by AmerenUE's recommended capital structure, my cost of equity cannot logically be applied to AmerenUE's recommended capital structure without adjusting for the lower financial risk of my proxy companies. In making his assertion, Mr. Hill fails to recognize that the cost of equity of my proxy companies depends on their financial risk, and the financial risk of my proxy companies is less than the financial risk implied by AmerenUE's recommended capital structure.

D. My financial risk adjustment is consistent with financial theory.

Q. Why does Mr. Hill believe that your financial risk adjustment is inconsistent with financial theory?

A. Mr. Hill claims that my financial risk adjustment is inconsistent with financial theory because: (1) financial risk reflects the impact of fixed charges on the variability of the company's net income; and (2) the amount of fixed charges does not depend on whether the company's capital structure is measured in terms of market or book values. (Hill Rebuttal at 11.)

Q. Do you agree with Mr. Hill's argument that financial risk reflects the impact of fixed charges on the variability of the company's net income?

A. No. Financial economists define financial risk as the impact of debt financing on the variability of market returns to shareholders. The variability of market returns to shareholders increases when a company employs more debt, because the variability in returns falls entirely on the equity investors. Mr. Hill's definition of financial risk is inconsistent with the definition used by financial economists.

Q. Do you agree with Mr. Hill's assertion that the amount of fixed charges does not depend on whether a company's capital structure is measured in terms of market values or book values?

A. Yes. However, I have not claimed that the amount of fixed charges does depend on whether a company's capital structure is measured in terms of market or book values. Rather, my financial risk adjustment is based on the facts that: (1) the financial risk of my proxy companies depends on their market value capital structures, not their book value capital structures; and (2) one cannot logically apply a cost of equity estimated from a sample of companies that have one level of financial risk to a capital structure that implies a different level of financial risk.

E. The financial literature overwhelmingly supports the use of market value capital structures to measure the cost of capital.

Q. Do you agree with Mr. Hill's statement that "there is also support for the use of book value capital structures in the literature of corporate finance"? (Hill Rebuttal at 14.)

A. No. The finance literature overwhelmingly supports the use of market value capital structures to estimate a company's overall cost of capital.[4]

Q. Mr. Hill cites articles by Elliot and Beranak as examples of financial literature that support the use of a book value capital structure to estimate a company's

[4] See, for example, Brealey, Myers, and Allen, *Principles of Corporate Finance*, 8th ed., 2006, Chapter 19.1, pp. 503 – 507, provided in response to MPSC 0544.

overall cost of capital. Do these articles actually support the use of a book value capital structure to estimate a company's overall cost of capital?

A. No. Neither the Elliot nor the Beranak article support the use of a book value capital structure to estimate a company's cost of capital. Indeed, the Elliot article does not even address the issue of whether market or book values should be used to measure a company's capital structure. Instead, it presents an elementary discussion of the cost of capital aimed at readers of an accounting magazine. Given the intended audience, the article merely describes how the cost of capital might be calculated based on information commonly available to accountants. The article makes no attempt to consider the differences between economic and accounting definitions of "equity" or the economic and accounting definitions of the rate of return on equity.

Further, the Beranak article presents an analysis of a simple situation where a company issues debt and equity at the beginning of a period to finance an investment with a one-period life. Beranak defines the term "book value" as the amount of debt and equity issued at the beginning of the period, and he defines "market value" as the present value of the company's income at the end of the one-period life of the investment. In short, Beranak's analysis considers a simple, one-period world in which the accounting issues associated with book values do not arise. Thus, the Beranak analysis does not address the reasons why the use of real world book value capital structures to estimate a company's overall cost of capital is inconsistent with financial theory.

Q. Mr. Hill also cites a book by Brigham and Gapenski as support for the use of book value weights to determine the overall cost of capital (Hill Rebuttal at 14).

Do Brigham and Gapenski recommend the use of book value capital structure weights to estimate the overall cost of capital?

A. No. Brigham and Gapenski clearly state their strong support for the use of market value capital structures to estimate the weighted average cost of capital:

> What can we conclude from all this? We are absolutely convinced that the procedures we recommend are correct—namely, ***firms should focus on market value capital structures and base their cost of capital calculations on market value weights***. Because market values do change, it would be impossible to keep the actual capital structure on target at all times, but this fact in no way detracts from the validity of market value targets. (Eugene F. Brigham, Louis C. Gapenski, Intermediate Financial Management, 5th edition, 1996, Chapter 12, "Capital Structure Decisions," p. 427. Emphasis added.)

F. Stock prices reflect financial risk as measured by market value capital structures not book value capital structures.

Q. Do stock prices reflect financial risk?

A. Yes. Stock prices reflect all the risks investors perceive when they purchase a company's stock, including financial risk.

Q. Is financial risk properly measured using market value capital structures or book value capital structures?

A. Financial risk is the increase in the variability in the market rate of return on equity caused by the use of debt financing. As my example described above illustrates, the increase in the variability of the market rate of return on equity caused by a higher level of debt financing undoubtedly depends on a company's market value capital structure, not its book value capital structure.

Q. If financial risk is based on market value capital structures rather than book value capital structures, what is the basis of Mr. Hill's argument that stock prices reflect book value capital structures rather than market value capital structures?

A. Mr. Hill's argument is based on his incorrect assumptions that: (1) investors are only exposed to information on a company's book value capital structure when they assess common stock investments; and (2) the theory of efficient markets implies that stock prices must therefore reflect book value information.

Q. Do you agree with Mr. Hill's assumption that investors are only exposed to information on a company's book value capital structure when they assess common stock investments?

A. No. Since investors assess common stock investments by comparing the company's current stock price to their estimate of the company's intrinsic value, they certainly are exposed to information on market values as well as book values. Most investors are also aware that the expected return and risk on an investment depends on the market value of the investment, not the book value of the investment.

Q. Do you agree with Mr. Hill's assertion that the theory of efficient markets implies that stock prices must reflect book value information?

A. No. The theory of efficient markets implies that stock prices reflect all the information available to investors. As noted above, investors are certainly exposed to information on the market values of a company's stock, as well as the book values of a company's stock. In addition, investors realize that the expected return and risk of the stock depend on the market price of the stock, not its book value. Since investors are aware that market prices are a superior basis for measuring the expected return and risk on a company's stock, and information on market prices is widely available to investors, the theory of efficient markets suggests—contrary to Mr. Hill's argument—that stock prices reflect market value capital structures, not book value capital structures.

G. Some regulators have used market value capital structures to estimate the cost of capital.

Q. Mr. Hill claims that "the use of book value capital structures with original cost rate making is a long-standing paradigm of regulation." (Hill Rebuttal at 14.) Are you aware of examples where regulators have used market value capital structures to estimate the overall cost of capital?

A. Yes. I'm aware of several examples where regulators have used market value capital structures either to adjust the cost of equity for financial risk adjustment or to estimate the overall cost of capital. First, the Pennsylvania Public Utility Commission has adopted a financial risk adjustment similar to the adjustment I have recommended here to set the allowed rate of return on equity for electric and water companies. Second, numerous regulatory bodies, including the FCC's Wireline Competition Bureau and the public service commission of Massachusetts, have used market value capital structures to estimate the cost of capital in proceedings on the cost of the unbundled network elements local exchange carriers are required to lease to their competitors. Third, the Surface Transportation Board uses a market value capital structure to estimate the cost of capital for railroads. Fourth, some state tax authorities use market value capital structures to calculate the cost of capital that is used to value utilities' properties for the purpose of assessing property taxes, including, for example, California, Colorado, and Utah.

Q. Even if use of book value capital structures were a "long-standing paradigm of regulation," would the existence of such a paradigm be sufficient justification for rejecting your financial risk adjustment?

A. No. First, the Commission should understand that I am not testifying in this proceeding on the appropriate capital structure to be used to estimate the overall cost of capital. Rather, I am simply recommending that the estimated cost of equity for my comparable companies be adjusted to reflect the difference in financial risk between the average capital structure for the comparable companies and AmerenUE's recommended capital structure. Second, although the use of book value capital structures has been a long-standing paradigm in some regulatory jurisdictions, it is not the current paradigm in all regulatory jurisdictions. Third, even if the use of book value capital structures were a long-standing paradigm of regulation, this fact would not be sufficient justification for rejecting my financial risk adjustment. My financial risk adjustment is based on sound financial and economic theory. The Commission should judge my recommendation based on the evidence I have presented.

H. I have not changed my position regarding the appropriate capital structure for use in estimating the overall cost of capital.

Q. Is it correct, as Mr. Hill claims, that you have recently changed your position regarding the appropriate capital structure for use in estimating a company's overall cost of capital (Hill Rebuttal at 2, 3, 15-25)?

A. No. As an economist, I have consistently maintained that a company's weighted average cost of capital should be estimated using a market value capital structure.

Indeed, this position is held by virtually all financial economists because it is the only position that is consistent with economic theory.

Q. Have you ever testified that use of a book value capital structure to estimate a company's overall cost of capital is consistent with economic theory?

A. No.

Q. Are you generally asked in electric utility cases to recommend a capital structure for use in determining a company's overall allowed rate of return for regulatory purposes?

A. No. In the majority of the electric utility cases in which I have testified, I have only been asked to recommend an appropriate allowed rate of return on equity. An internal company witness generally presents the company's recommended capital structure.

Q. Are you recommending an appropriate capital structure for use in determining AmerenUE's overall allowed rate of return in this proceeding?

A. No. The Company's recommended capital structure for use in determining its overall rate of return is presented in Mr. Nickloy's testimony.

Q. In prior electric utility cases, have you recognized that your recommended allowed rate of return on equity would typically be applied to a book value capital structure?

A. Yes. Since I first began testifying in electric utility cases in 1982, I have recognized that my recommended allowed rate of return on equity would typically be applied to a book value capital structure.

Q. When did you first begin to recommend that the cost of equity estimate for your proxy companies be adjusted to reflect the difference in the financial risk of

your proxy companies, measured by their market value capital structures, and the financial risk implied by a company's recommended book value capital structure?

A. I first recommended making such a financial risk adjustment in testimony for San Diego Gas & Electric filed in February 2003 with the FERC. I also made such a recommendation for a Pacific Gas & Electric FERC case filed in March 2003, and the studies for this case date to mid-2002 because there was a delay in filing the case.

Q. If you have always recognized that your recommended rate of return on equity would typically be applied to a book value capital structure, why did you begin to recommend a financial risk adjustment in electric utility cases in 2003?

A. When I first began testifying in electric utility cases in 1982, I assumed that the regulatory practice of using book value capital structures to calculate a company's overall cost of capital was unlikely to change; and hence, recommending a deviation from this practice, even a change that is economically justified and theoretically correct, would be futile. However, my experience in the telecommunications industry in the late 1990s and early 2000s and my observation of the practices of other regulatory authorities caused me to change my initial assumption. I therefore began to recommend a financial risk adjustment.

Q. Mr. Hill claims that your recommended financial risk adjustment in this proceeding is inconsistent with your testimonies in prior proceedings. Do you agree that your current testimony is inconsistent with your testimony in prior proceedings?

A. No. My current testimony is that my financial risk adjustment should be adopted because it is consistent with financial and economic theory. Since I have not testified that the use of a book value capital structure to calculate a company's overall cost of capital was consistent with financial theory, my current testimony is consistent with my prior testimony. For most of my years as an expert witness, I did not explicitly argue that market value capital structures should be used to estimate a utility company's overall cost of capital because I assumed that regulators were not likely to change their prior practice of using book value capital structures to estimate a company's overall cost of capital. As noted above, my experience in the telecommunications industry in the late 1990s and early 2000s and my observation of regulation in other industries has caused me to change my initial assumption.

Q. Mr. Hill argues that your recommendation to make a financial risk adjustment at a time when market-to-book ratios are above 1.0 is opportunistic because you failed to make such a recommendation in a 1982 Carolina Power & Light case when market-to-book ratios were below 1.0. Do you agree with his assessment of your reasons for recommending such an adjustment in this proceeding?

A. No. I recommend a financial risk adjustment because such an adjustment is consistent with financial and economic theory and properly adjusts the cost of equity for the difference in the financial risk embedded in my cost of equity estimate and the financial risk implied by AmerenUE's recommended capital structure. In addition, my financial risk adjustment can hardly be called "opportunistic," since I did not recommend a financial risk adjustment in all my electric cases from 1984 to 2003 when market prices were above book values. Thus, I did not suddenly begin to recommend a financial risk adjustment when market prices rose above book values, as Mr. Hill suggests.

Q. On a purely logical basis, does it make sense to argue that because you did not recommend a financial risk adjustment 25 years ago, you should not recommend a financial risk adjustment now?

A. No. My recommendation here must be judged on its merits. I have shown that financial and economic theory requires the adjustment I have proposed, whereas Mr. Hill has failed to provide any reasonable basis for rejecting the fundamental economic reasoning and correctness of my financial risk adjustment. At best, Mr. Hill's argument only suggests from the benefit of hindsight that perhaps I should have considered a financial risk adjustment in earlier testimonies. Mr. Hill's argument certainly does not suggest that my recommended financial risk adjustment in this proceeding is inappropriate. If I had recommended a financial risk adjustment in prior cases, my recommended costs of equity would have been higher. In this sense, my failure to explicitly recommend a financial risk adjustment in cases prior to 2003 simply produced conservative estimates of the cost of equity.

I. Mr. Hill has changed his position on the use of a financial risk adjustment based on a market-value capital structure.

Q. Mr. Hill argues against your use of a financial risk adjustment based on market value capital structures in this proceeding. Has Mr. Hill recommended a financial risk adjustment based on market value capital structures in prior electric utility cases?

A. Yes. Mr. Hill filed testimony in a 2006 PacifiCorp case in which he recommended a financial risk adjustment based on market value capital structure information. (See Supplemental Testimony of Mr. Hill in Docket Nos. UE-050684 and UE-

050412 before the Washington Utilities and Transportation Commission filed January 27, 2006.) In that case, Mr. Hill's use of a financial risk adjustment based on market value capital structure information, if it had been accepted, would have produced a lower overall cost of capital for PacifiCorp. Mr. Hill's testimony in that proceeding is clearly inconsistent with his testimony in this proceeding.

J. A market-to-book ratio greater than 1.0 does not indicate that a company is earning more than its cost of equity.

Q. Dr. Woolridge criticizes your financial risk adjustment because, in his opinion, a market-to-book ratio greater than 1.0 indicates that a company is earning more than its cost of equity. Did you refute Dr. Woolridge's opinion in your Rebuttal Testimony?

A. Yes. In my Rebuttal Testimony at pp. 61 - 67, I demonstrated that Dr. Woolridge's view is soundly refuted by evidence from the capital markets that there are many companies with market-to-book ratios greater than 1.0 that are earning either negative rates of return on equity, or rates of return on equity that are significantly lower than Dr. Woolridge's 9.0 percent recommended return on equity in this proceeding.

Q. Even if Dr. Woolridge's view regarding the implications of market-to-book ratios greater than 1.0 were correct, would it have any relevance to the legitimacy of your recommended financial risk adjustment?

A. No. Dr. Woolridge's view is based on his incorrect assumption that I am recommending that AmerenUE's market value capital structure be used to calculate its overall cost of capital. As I have noted above, my financial risk adjustment is not based on

AmerenUE's market value capital structure—indeed, AmerenUE does not even have a market value capital structure.

K. My financial risk adjustment does not produce illogical results.

Q. Dr. Woolridge argues that your financial risk adjustment produces the illogical result that it increases the cost of equity for companies with high market-to-book ratios, and decreases the cost of equity for companies with low market-to-book ratios (Woolridge Rebuttal at 37). Is he correct?

A. No. Dr. Woolridge again fails to recognize that my financial risk adjustment is not based on AmerenUE's market-to-book ratio. Rather, my financial risk adjustment is based on the average market value capital structure percentages of my proxy group. Thus, a link between AmerenUE's market-to-book ratio (which it does not have) and my recommended cost of equity does not exist.

III. PROXY COMPANIES

Q. What proxy companies do you recommend for the purpose of estimating AmerenUE's cost of equity?

A. I recommend the large groups of proxy companies shown on Schedules JVW-1 and JVW-2 of my Direct Testimony, and Rebuttal Schedule JVW-1 in my Rebuttal Testimony.

Q. Why do you recommend using a large group of comparable risk companies to estimate AmerenUE's cost of equity?

A. As explained in my earlier testimonies, I recommend using a large proxy group of comparable risk companies because use of such a group increases the reliability of my cost of equity estimates and is consistent with the U.S. Supreme Court mandate in the

Hope and *Bluefield* cases that utility investors should be allowed to earn a return commensurate with returns they could achieve if they invested in other companies of comparable risk.[5]

A. My proxy companies are comparable in risk to AmerenUE.

Q. Did you provide evidence in your testimony that your proxy companies are reasonable proxies for the risk of investing in AmerenUE?

A. Yes. On pages 25-29 and Schedules JVW-1 and JVW-2 of my Direct Testimony and pages 33-35 and Rebuttal Schedule JVW-2 of my Rebuttal Testimony, I provided evidence that my proxy companies are reasonable proxies for the risk of investing in AmerenUE.

Q. Does Mr. Hill have any objections to your choice of proxy companies?

A. Yes. Mr. Hill claims that I should have screened my "sample group to determine how much of the firm's revenue was derived through utility operations" (Hill Rebuttal at 41).

Q. Did Mr. Hill screen his proxy companies to determine the percentage of revenues they received from utility operations?

A. Yes. Mr. Hill chose to eliminate all companies with less than 70 percent revenue from electric operations (Hill Direct at 27 – 28).

Q. How many companies are in Mr. Hill's final proxy group?

A. Mr. Hill's proxy electric group contains 15 companies.

[5] *See Bluefield Water Works and Improvement Co. v. Public Service Comm'n.* 262 U.S. 679, 692 (1923) and *Hope Natural Gas Co*., 320 U.S. at 603.

Q. How does the risk of Mr. Hill's proxy group of 15 companies compare to the risk of the proxy groups of 34 and 32 electric companies you presented in your direct and rebuttal testimonies?

A. Mr. Hill's proxy electric group is somewhat more risky than my electric proxy companies, having an average S&P bond rating in the range BBB to BBB- (see Vander Weide Rebuttal at 33). In addition, three of Mr. Hill's proxy companies are below investment grade, while each of my companies has an investment grade bond rating.

Q. You have testified that your proxy companies are comparable in risk to AmerenUE based on S&P bond ratings. Has Mr. Hill also testified that S&P bond ratings verify that the risk of his recommended proxy group is similar to the risk of the company whose cost of equity he is estimating?

A. Yes. For example, in his Direct Testimony in New Hampshire, Mr. Hill used S&P bond ratings to verify that his proxy group was comparable in risk to Public Service of New Hampshire:

> Public Service Company of New Hampshire's corporate bond rating is "BBB"" by Standard & Poor's, which is higher than the average S&P bond rating of the sample group, which falls between "BBB" and "BBB+." In sum, objective indicators imply that the investment risk of the sample group is similar to but somewhat higher than that of Public Service Company of New Hampshire.[6]

[6] Hill Direct Testimony at 27, Docket No. DE 04-177.

B. It is preferable to use a large group of comparable risk companies to estimate the cost of equity.

Q. Since Mr. Hill's proxy group is somewhat more risky than your proxy group and contains significantly fewer companies, are there any reasons why the Commission should prefer your proxy group over Mr. Hill's?

A. Yes. It is preferable to use a larger proxy group of similar risk companies to estimate the cost of equity because the cost of equity results for a single company or a small group of companies is uncertain. However, the uncertainty in cost of equity results for a small group of companies can be reduced by using a larger group of companies of comparable risk. Since my proxy group is comparable in risk to AmerenUE and contains more than twice as many companies as Mr. Hill's proxy group, my cost of equity results are significantly more reliable than Mr. Hill's. Thus, the Commission should prefer my proxy group to Mr. Hills.

IV. DCF ANALYSES

Q. Did you perform a DCF analysis of AmerenUE's cost of equity?

A. Yes. My original DCF analysis is described in my Direct Testimony on pp. 17 – 27, and my updated DCF analysis is described in my Rebuttal Testimony on p. 34.

Q. What cost of equity results did you obtain from your original and updated DCF analyses?

A. My original DCF analysis produced a cost of equity result of 10.7 percent, and my updated DCF analysis produced a cost of equity result of 11.75 percent.

Q. What weight did you give to your DCF results in this proceeding?

A. I gave the same weight to the results of each of my cost of equity methods, including my DCF results.

Q. What are the other parties' criticisms of your DCF analysis?

A. The other parties criticize my DCF analysis because, in their opinions: (1) I should have given greater weight to my DCF results because DCF cost of equity estimates are more reliable than other cost of equity estimates; (2) I should not have relied on analysts' growth forecasts; (3) sustainable growth rates better reflect investors' expectations than analysts' growth forecasts; (4) I incorrectly used a quarterly DCF model; and (5) I should have used equal weights to average my cost of equity results rather than market value weights.

A. The other parties' DCF cost of equity estimates are not more reliable than other cost of equity estimates presented in this proceeding.

Q. Mr. Hill claims that "the more reliable DCF equity cost estimates before the Commission in this proceeding uniformly indicate a cost of equity capital well below 10%." (Hill Rebuttal at 30.) Do you agree with his claim?

A. No. As noted above, my original DCF analysis produced a cost of equity result of 10.7 percent, and my updated electric company DCF analysis produced a cost of equity result of 11.75 percent. Neither of these results indicates a cost of equity below 10 percent.

Q. Is Mr. Hill's DCF estimate of AmerenUE's cost of equity "more reliable" than other cost of equity estimates presented in this proceeding?

A. No. The DCF model requires an estimate of investors' expected growth for each company in the analysis. To estimate this component of his DCF model, Mr. Hill examines various growth rate data, including historical and forecasted retention growth, historical and forecasted growth in earnings, dividends, and book value per share, and analysts' earnings growth estimates. For Public Service of New Mexico ("PNM"), these growth rate data range from *negative* 8.76 percent to *positive* 11.45 percent. After reviewing these data, Mr. Hill simply observes that "investors can reasonably expect a sustainable growth rate in the future of 5.75 percent for PNM" (Hill Direct Appendix C-5 – C-6). As shown below in Table 1, Mr. Hill obtains a similarly wide range of growth rates for each of his proxy companies, and, in each case, arbitrarily chooses a final growth rate that others would be unable to predict from the data presented. Clearly, an analysis in which Mr. Hill could have chosen *any* number in the range *negative* 8.76 percent to *positive* 11.45 percent, and in which he chose a number that is unrelated in any mathematical way to the data presented, cannot be termed to be "reliable."

TABLE 1
MR. HILL'S ARBITRARY DCF GROWTH RATES
FOR HIS PROXY ELECTRIC COMPANIES[7]

Company	*Ticker*	*Range of Results*		*Mr. Hill's Final DCF Growth Estimate*
Central Vermont P. S.	CV	**-1.00%**	9.50%	4.22%
FirstEnergy Corp.	FE	0.00%	11.50%	5.75%
Northeast Utilities	NU	**-3.44%**	10.16%	6.48%
Progress Energy	PGN	**-5.76%**	6.50%	3.43%
Alliant Energy	LNT	**-12.50%**	6.00%	5.78%
Ameren Corp.	AEE	**-2.53%**	8.00%	5.01%
American Electric Power	AEP	**-9.22%**	6.00%	5.12%
Cleco Corporation	CNL	**-2.95%**	8.50%	6.40%
DPL, Inc.	DPL	**-3.58%**	5.50%	5.80%
Empire District Electric	EDE	**-5.00%**	15.26%	4.57%
Entergy Corp.	ETR	3.36%	11.03%	6.00%
Hawaiian Electric	HE	**-1.28%**	4.08%	3.95%
PNM Resources	PNM	**-8.76%**	11.45%	6.36%
Pinnacle West Capital	PNW	**-4.50%**	6.50%	5.23%
Unisource Energy	UNS	0.00%	16.00%	6.20%

[7] Data from Mr. Hill's Exhibit__(SGH-1) Schedule 5, page 2 of 4.

Q. Are Dr. Woolridge's or Mr. King's DCF estimates "more reliable" than other cost of equity estimates presented in this proceeding?

A. No. Like Mr. Hill, Dr. Woolridge's DCF estimates depend on his growth rate estimates which are highly subjective. In addition, Mr. King's DCF estimates are biased downward by his selection of proxy companies. I discussed this problem with Mr. King's analysis in my Rebuttal Testimony, Section V, A.

B. My studies indicate that investors use analysts' growth rates when making stock buy and sell decisions.

Q. Why do you rely on analysts' earnings growth forecasts when you apply the DCF model?

A. I rely on analysts' earnings growth forecasts because my studies indicate that analysts' growth forecasts are more highly correlated with stock prices than other growth forecasts such as historical growth rates and sustainable growth rates. Furthermore, the analysts' growth forecasts are objective indicators of investors' growth expectations for each company rather than subjective estimates of each company's growth. In contrast, investors have no means of knowing Mr. Hill's or Dr. Woolridge's opinions about each company's growth prospects.

Q. Does Dr. Woolridge agree with your statistical studies of the relationship between analysts' growth rates and stock prices?

A. No. Dr. Woolridge has four criticisms of my statistical study of the relationship between analysts' growth rates and stock prices. First, he argues that my statistical study is outdated and includes analysis of only 65 companies. Second, he argues that my study is misspecified because I used a "linear approximation" to the DCF model rather than a modified version of the DCF model. Third, he argues that I did not use both historical and analysts' forecasted growth rates in the same regression. Fourth, he argues that I did not perform any tests to determine if the difference between historic and projected growth measures is statistically significant. (Woolridge Rebuttal at 17 – 18.)

Q. Have you updated your statistical analysis of the relationship between analysts' growth rates and stock prices since the time of your original study?

A. Yes. As I reported in my Direct Testimony, my statistical study was updated in August 2004. The updated results indicate that the analysts' growth rates continue to be more highly correlated with stock prices than historical measures such as those employed by Dr. Woolridge. The updated study included a final study group of 411 U.S. companies, including 59 utilities, and incorporated data over the years 1991 – 2003.

Q. What is the significance of your result that the correlation between analysts' forecasts and stock prices is significantly stronger than the correlation between either historical growth measures and stock prices, or "sustainable" growth measures and stock prices?

A. This result provides strong support for the conclusion that investors use analysts' growth forecasts, rather than historical or "sustainable" growth forecasts, in making stock buy and sell decisions. Since the DCF model requires the use of investors' growth rates, it also provides strong support for the conclusion that analysts' growth forecasts should be used to estimate the growth component of the DCF model.

Q. Do you agree with Dr. Woolridge's criticism that your DCF model is misspecified because you used a "linear approximation" to the DCF model rather than a modified version of the DCF model?

A. No. Most regression analyses are based on the assumption that the relationship between the variables being studied is linear. As part of my studies, I tested whether the linear assumption was sufficiently close to provide reliable estimates of the model parameters. Applying a first order Taylor-series approximation to the DCF equation, I found that the first order, or linear, approximation was sufficiently close to the true equation to justify using linear regression analysis to study the relationship between price/earnings ratios and growth rates.

Q. Why did you not use a combination of historical and analysts' growth rates in the same regression?

A. I did not use a combination of historical and analysts' growth rates in the same regression because there are an infinite number of such combinations which could be tested. My studies indicate that the relationship between analysts' forecasts and stock prices is so strong compared to the relationship between historical growth rates and stock prices that there would be little advantage to combining historical growth rates with analysts' forecasts to predict stock prices.

Q. Is there a statistically significant difference between historical and projected growth measures in explaining stock prices in your statistical study?

A. Yes. The difference in performance of historical and projected growth rates is both statistically significant and dramatic.

Q. On pages 10 – 13 of his Rebuttal Testimony,[8] Dr. Woolridge discusses his study of the relationship between analysts' forecasted growth rates and subsequently achieved growth rates. Did Dr. Woolridge provide the underlying data and work papers for this study along with his testimony?

A. No, he did not.[9]

Q. Although you have had no opportunity to examine Dr. Woolridge's data, do you have any concerns with his study based on the description he provided in his testimony?

A. Yes. First, Dr. Woolridge's study only covers the period from 1984 to 1999 and hence does not reflect the many regulatory changes in financial markets that have occurred since the market collapse of 2000. Second, although it is impossible to know without being able to examine Dr. Woolridge's data, Dr. Woolridge apparently makes no attempt to screen his data for companies that have only one or two analysts' growth forecasts or for companies that have outlier growth forecasts. Although my studies indicate that analysts' growth forecasts are highly correlated with stock prices for large publicly-traded companies that are followed by at least three analysts, they may not be highly correlated for many of the small companies contained in the I/B/E/S data base that have fewer than three analysts' growth estimates and that have outlier growth forecasts. Third, Dr. Woolridge's studies are inconsistent with published results of the relationship between analysts' forecasts

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8 Dr. Woolridge's testimony filed on January 31, 2007, is mistakenly labeled as "direct testimony" but is clearly filed as rebuttal testimony.

9 Although Dr. Woolridge should have provided the data in the workpapers accompanying the filed testimony, these data were not provided; and the Company asked for the underlying data in data requests KCM-MO-016 and KCM-MO-017. As of the time of the writing of my surrebuttal testimony, Dr. Woolridge has not provided responses. If Dr. Woolridge does provide the data, I reserve the right to file supplemental testimony based on my review of the data.

and subsequent realized earnings in the period up to and beyond his study period.[10] Fourth, Dr. Woolridge fails to recognize that his findings may be the result of companies taking unexpected accruals, or asymmetries in the distribution of forecast errors, rather than from problems in the analysts' forecasts.[11]

Q. Dr. Woolridge also discusses the results of his study of the relationship between analysts' forecasts for utilities and the utilities' subsequent achieved earnings growth rates. Do you have any comments on his study?

A. Yes. First, Dr. Woolridge has misspecified the time frame of his analysts' earnings growth forecasts. In his study, Dr. Woolridge compares an analysts' forecast made in a particular quarter to the company's realized earnings growth rate in the same quarter four years hence. In making this comparison, Dr. Woolridge fails to recognize that the time frame of the analysts' growth forecast is an indefinite, long-run period that may differ from one analyst to another. Dr. Woolridge has provided no evidence that analysts' growth estimates were intended to forecast actual results for a period exactly four years hence. Second, Dr. Woolridge has not distinguished between normalized and non-normalized earnings. The analysts' forecasts are generally intended to be normalized earnings growth forecasts, meaning that they are forecasts of earnings in the absence of extraordinary events and one-time write-offs. It is likely that a good deal of the forecast deviations in Dr. Woolridge's sample are due to extraordinary events and one-time write-offs rather than to problems with the analysts' forecasts of normalized earnings.

10 Stephen J. Ciccone, "Trends in Analyst Earnings Forecast Properties," *International Review of Financial Analysis*, 14 (2005) 1 – 22.

11 Jeffery Abarbanell and Reuven Lehavy, "Biased Forecasts or Biased Earnings? The Role of Reported Earnings in Explaining Apparent Bias and Over/underreaction in Analysts' Earnings Forecasts," *Journal of Accounting and Economics*, 36 (2003) 105 – 146.

Q. Even if there were no problems with Dr. Woolridge's studies of forecasted growth rates and subsequent actual growth rates, do his studies provide any support for his conclusion that analysts' growth rates should not be used to estimate the growth component of the DCF model?

A. No. The DCF model requires the growth rates of investors, whether or not these growth rates subsequently turn out to be correct. My studies indicate that analysts' growth rates are the best surrogate for investors' growth rates because they are more highly correlated with stock prices than other growth rates.

C. Sustainable growth rates do not reflect investors' growth expectations.

Q. Is Mr. Hill correct when he alleges that an article by Dr. Gordon supports Mr. Hill's sustainable growth rate analysis? (Hill Rebuttal at 40.)

A. No. The Gordon article specifically compares analysts' growth rate forecasts and sustainable growth rate forecasts in terms of their ability to predict stock prices. The article concludes that the analysts' growth rate forecasts are superior to the sustainable growth rate forecasts.

Q. Would it be possible to test Mr. Hill's growth rate forecasts to determine whether they are related to stock prices?

A. No. As discussed above, Mr. Hill's growth rate forecasts can not be tested because it is impossible to reproduce Mr. Hill's growth rates—only he knows at any point time what growth rate forecast he will assign to a company.

D. Mr. Hill has changed his position on measuring sustainable growth rates.

Q. Has Mr. Hill changed his position on measuring sustainable growth rates?

A. Yes. Mr. Hill measures sustainable growth as the sum of his estimate of internal growth and his estimate of external growth. Mr. Hill's formula for estimating external growth is shown on Exhibit__(SGH-1), Schedule 5, page 1 of 4, and it is different from the formula he has used in prior testimony.[12]

E. The quarterly DCF model is the appropriate DCF model to estimate the cost of equity when a company pays dividends quarterly.

Q. Why did you use a quarterly DCF model to estimate the DCF cost of equity?

A. I used a quarterly DCF model to estimate the DCF cost of equity because the companies in my proxy groups pay dividends quarterly, and as explained in my Direct Testimony and Appendix 1 to my Direct Testimony, the quarterly DCF model is the only DCF model that can be derived from the assumption that dividends are paid quarterly.

Q. Why does Dr. Woolridge disagree with your application of the quarterly DCF model?

A. Dr. Woolridge argues first that an early proponent of the DCF model, Dr. Myron Gordon, has testified before the FCC that "the appropriate dividend yield adjustment for growth in the DCF model is the expected dividend for the next quarter

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12 See, for example, Mr. Hill's Direct testimony before the Washington Utilities and Transportation Commission in Docket Nos. UE-050684/UE-050412 (PacifiCorp), or Mr. Hill's Direct Testimony in Docket Nos. UG-991606, 991607 (Avista). Mr. Hill's formula in this proceeding is: "sv = g*(1-(1/(M/B)))." Mr. Hill's formula in the Washington dockets is: "sv=g*((M/B + 1)/2 – 1).

multiplied by four." (Woolridge Rebuttal at 8 - 9.) Second, Dr. Woolridge argues that Professor Bower has argued that the conventional DCF calculation produces a downwardly-biased estimate of the cost of equity, but that the annual DCF model provides the most appropriate estimate of the utility's required return when the resulting required rate of return is applied to a forward-looking rate base. (Woolridge Rebuttal at 9.)

Q. Is the fact that Dr. Gordon testified in favor of an annual DCF model a reasonable justification for use of the annual DCF model in this proceeding?

A. No. Although Dr. Gordon was certainly a major early proponent of the DCF model, this does not imply that Dr. Gordon is correct in his arguments regarding the quarterly DCF model. As shown in my Appendix 1 (filed with my Direct Testimony), there can be no doubt that when dividends are paid quarterly, the quarterly DCF model must be used to estimate the cost of equity.

Q. Do you agree with Dr. Bower's statement that the annual DCF calculation is a downwardly-biased estimate of the market cost of equity when companies pay dividends quarterly?

A. Yes. That is why I use the quarterly DCF model to estimate the cost of equity in this proceeding.

Q. Do you agree with Dr. Bower's argument that it is appropriate to apply the annual DCF model to a utility whose rate base is measured over a forward-looking period?

A. No. I believe that it is important to measure the cost of equity correctly, as I have done in this proceeding. Once the cost of equity is estimated correctly, the Commission should ask the second question, "Will the company be able to earn its allowed rate of return when this cost of equity is applied to a forward-looking rate base?"

Q. Mr. Hill also criticizes your DCF model on the grounds that your DCF model incorrectly assumes that dividends increase each quarter rather than annually. Has Mr. Hill correctly characterized the assumptions of your DCF model?

A. No. As described in Appendix 1 in my Direct Testimony, my quarterly DCF model can only be derived from the assumptions that dividends are paid quarterly but increase just once each year. The quarterly DCF model I present in my testimony cannot be derived under the assumption that dividends increase each quarter.

F. Market weights should be used to calculate the average DCF result for my proxy companies.

Q. Why did you use market value weights to calculate the average DCF result for your proxy companies?

A. I used market value weights to calculate the average DCF result for my proxy companies because the purpose of my cost of equity analyses is to measure investors' expected rate of return on a portfolio of electric utility stocks. The expected rate of return on a portfolio of stocks is best calculated using market value weights for the companies in the portfolio.

Q. Dr. Woolridge asserts that your use of market value weights increases the impact of non-comparable companies on your overall result (Woolridge Rebuttal at 7). Do you agree with his assertion?

A. No. The evidence I presented in my direct and rebuttal testimonies indicates that a utility's percentage of revenues from regulated electric service has no impact on its risk as measured by bond ratings. Thus, the companies Dr. Woolridge is concerned about are, in fact, comparable in risk to the other companies in the proxy group.

V. RISK PREMIUM ANALYSES

Q. What is the risk premium approach to estimating the cost of equity?

A. The risk premium approach is based on the principle that investors expect to earn a return on an equity investment in AmerenUE that reflects a "premium" over and above the return they expect to earn on an investment in a portfolio of long-term bonds. This equity risk premium compensates equity investors for the additional risk they bear in making equity investments versus bond investments. Using the risk premium approach, the cost of equity is given by the following equation: *cost of equity = interest rate plus risk premium*.

Q. How did you measure the required risk premium on an equity investment in AmerenUE?

A. I used two methods to estimate the required risk premium, the ex post risk premium method and the ex ante risk premium method. My ex post risk premium method measures the required risk premium on an equity investment in AmerenUE from historical data on the experienced returns on stock and bond investments from 1937 to the present. My ex ante risk premium method measures the required return from studies of the DCF-expected return on comparable groups of utilities over the last seven or eight years compared to interest rates on A-rated utility bonds.

A. Surrebuttal of Mr. Hill's Ex Post Risk Premium Comments

Q. Does Mr. Hill have any criticisms of your ex post risk premium analysis?

A. Yes. Mr. Hill has three criticisms of my ex post risk premium analysis. First he claims that risk premiums have trended downward over time. Second, he claims that my ex post risk premiums are so volatile that they cannot be reliably used to forecast future rates of return. Third, he claims that I should have used current interest rates rather than forecasted interest rates to measure the interest rate component of the risk premium method.

1. There has been no significant downward trend in risk premiums.

Q. Is Mr. Hill correct when he argues that there has been a significant downward trend in risk premiums over time?

A. No. As discussed in my Direct Testimony at page 35, I tested whether there were a significant downward trend in the equity risk premium over my study period by regressing my ex post risk premium data against time. As I show in my testimony, my statistical analysis reveals that there is no significant downward trend in risk premiums over the period of my study.

Q. Do you have any other evidence that there has been no significant downward trend in risk premiums over time?

A. Yes. Ibbotson Associates also tests whether there are significant trends in risk premium results over time, concluding that there are no trends in risk premiums over time (see Vander Weide Direct at 35).

2. An historical risk premium provides reliable information regarding the cost of equity.

Q. Do you agree with Mr. Hill's criticism that historical risk premia are too volatile to provide reliable information regarding the cost of equity?

A. No. Although there is high variability in year-to-year historical returns, the average variability is significantly reduced by using the longest period of time for which reliable data are available. According to statistical theory, the variability in the average ex post return over a long period of time is equal to the variability in the annual return divided by the square root of *n*, where *n* is the number of years in the study. Thus, reliable information regarding the cost of equity can be obtained from considering both the average return and the average risk premium over a long period of time rather than considering the returns and risk premiums in each year.

Q. Do you agree with Mr. Hill's claim that you should have used current interest rates rather than forecasted interest rates to measure the expected ex post risk premium?

A. No. It is reasonable to use the forecasted 2007 interest rate in my ex post risk premium method because the rates determined in this proceeding will not become permanent until mid-2007.

B. Surrebuttal of Mr. Hill's Ex Ante Risk Premium Comments

Q. What are Mr. Hill's criticisms of your ex ante risk premium studies?

A. Mr. Hill claims that: (1) cost of equity estimates from the 1999 – 2006 period do not represent investors' current expectations; (2) my ex ante regression results are inconsistent with my ex post regression results; and (3) I should have used a simple regression of the risk premium on interest rates rather than an adjusted regression (Hill Rebuttal at 53 - 54).

1. The time period of my ex ante risk premium studies is appropriate.

Q. Does Mr. Hill's criticism that cost of equity estimates from the period 1999 – 2006 cannot be used to represent investors' current expectations correctly characterize your ex ante risk premium studies?

A. No. I am not using cost of equity estimates from the period 1999 – 2006 to represent investors' current expectations. Rather, I am using the relationship between the risk premium and interest rates over this period of time to forecast the future risk premium.[13]

Q. Why do you believe that your ex ante risk premia over that period of time can be used to forecast the future required risk premium?

A. I believe that my ex ante risk premium over this period of time can be used in conjunction with interest rates to forecast the future risk premium because the ex ante risk premium generally increases when interest rates decline; and this relationship can be used to forecast the future risk premium.

2. My ex ante risk premium regressions are not inconsistent with my ex post risk premium regressions.

Q. Do you agree with Mr. Hill's argument that your ex ante risk premium regression results are inconsistent with your ex post regression results?

A. No. Mr. Hill fails to recognize that my ex ante risk premium regression results are not comparable to my ex post risk premium regression results because my ex ante risk premium regressions relate the ex ante risk premium to interest rates, whereas the ex post

[13] As discussed in my direct and rebuttal testimonies, my electric ex ante studies cover the time period included simply because that is when I began performing the study, and I have continued updating the study to the present. I also note that my two ex ante risk premium studies cover slightly different time periods, with the natural gas company risk premium study extending over a longer period of time, because I began doing an ex ante study using natural gas companies before I began performing a similar study for the electric companies.

regression relates the ex post risk premium to time. It is not inconsistent for there to be no relationship between the risk premium and time, while there is a relationship between the risk premium and interest rates.

3. The adjusted ex ante regression equation should be used to forecast the expected future risk premium.

Q. Why did you use an adjusted regression equation to forecast the future risk premium rather than the simple regression analysis you also report in your work papers?

A. I used the adjusted regression analysis to forecast the future risk premium because my simple regression results are characterized by the presence of auto correlation in the residuals. In the presence of auto correlation in the residuals, the estimated regression coefficients are highly unreliable estimates of the actual relationship between the risk premium and interest rates. My adjusted regression equation is based on a commonly used procedure for eliminating the residual auto correlation. Thus, my adjusted regression results are significantly more reliable than my simple regression results.

Q. Mr. Hill expresses concern with the relatively low "r-squared" values from your adjusted regression. Is his concern justified?

A. No. The important statistical variable for measuring the relationship between the risk premium and interest rates is the t-statistic, not the r-squared statistic. The high values of the t-statistic shown in my work papers demonstrate that the relationship between the risk premium and interest rates is significant.

C. Surrebuttal of Dr. Woolridge's Risk Premium Comments

Q. What are Dr. Woolridge's basic criticisms of your risk premium analyses?

A. Dr. Woolridge argues that: (1) my use of the yield to maturity on A-rated utility bonds inflates the required return on equity; and (2) there are a number of flaws in using historical returns to estimate expected equity risk premiums.

1. Using the yield to maturity on A-rated utility bonds to estimate the interest rate component of the risk premium approach does not inflate the required return on equity.

Q. Does Dr. Woolridge have any criticisms of your use of the yield to maturity on A-rated utility bonds to estimate the interest rate component of the risk premium approach?

A. Yes. Dr. Woolridge argues that my use of the yield to maturity on A-rated utility bonds inflates the required return on equity because long-term utility bonds are not risk free, that is, they are subject to both interest rate risk and credit risk (Woolridge Rebuttal at 33).

Q. Do you agree with Dr. Woolridge's criticism of your use of the yield to maturity on A-rated utility bonds to estimate the interest rate component of the risk premium approach?

A. No. Dr. Woolridge fails to recognize that the risk premium approach does not require that the interest rate be "risk free." Indeed, the only requirement of the risk premium approach is that the same interest rate be used to estimate the interest rate component as is used to estimate the risk premium component. Since the risk premium approach suggests that the cost of equity equals (the interest rate) plus (the required return on equity minus the interest rate), the cost of equity should be approximately the same in a risk premium analysis, no matter what interest rate is used as the benchmark interest rate. Thus, use of the interest rate on A-rated utility bonds in a risk premium analysis will produce a higher interest rate component than use of a government bond interest rate, but this difference will be offset by the correspondingly lower risk premium.

2. Historical return data can be used to estimate expected equity risk premiums.

Q. Does Dr. Woolridge agree with your use of historical stock and bond returns to estimate the equity risk premium?

A. No. Dr. Woolridge states:

> There are a number of flaws in using historic returns over long time periods to estimate expected equity risk premiums. These issues include: (a) Biased historic bond returns; (b) The arithmetic versus the geometric mean returns; (c) Unattainable and biased historic stock returns; (d) Survivorship bias; (e) The "Peso Problem;" (f) Market conditions today are significantly different than the past; and (g) Changes in risk and return in the markets. (Woolridge Rebuttal at 22.)

Q. Why does Dr. Woolridge believe that historic bond returns are biased?

A. On page 23 of his testimony, Dr. Woolridge states:

> Historic bond returns are biased downward as a measure of expectancy because of capital losses suffered by bondholders in the past. As such, risk premiums derived from this data are biased upwards.

Q. Do you agree with Dr. Woolridge's statement that historic bond returns are biased downward because of capital losses suffered by past bond investors?

A. No. Because of capital gains and losses, historic bond returns may be higher or lower than what investors expected at the time they purchased the bonds. During the period since 1982, for example, historic bond returns have been biased upward as a measure of expectancy because of the large capital gains achieved by bondholders over this period. However, over the entire period since 1926, capital gains and losses on bonds have approximately offset each other, and consequently there is no significant bias as a result from either capital gains or losses.

Q. What is the difference between an arithmetic and a geometric mean return?

A. An arithmetic mean return is an additive return that is calculated by summing the achieved return in each time period and dividing the total by the number of periods. In contrast, the geometric mean return is a multiplicative return that is calculated in two steps. First, one calculates the product of (1 plus the return) in each period of the study. Second, one calculates the n^{th} root of this product and subtracts 1 from the result. Thus, if there are two periods, and r_1 and r_2 are the returns in periods one and two, respectively, the arithmetic mean is calculated from the equation: $a_m = (r_1 + r_2) \div 2$. The geometric mean is calculated from the equation,

$$a_g = [(1 + r_1) \text{ x } (1 + r_2)]^{.5} - 1.$$

Q. Please describe Dr. Woolridge's issue with regard to geometric versus arithmetic mean returns.

A. Dr. Woolridge believes that my study is biased because I calculated the expected risk premium using the arithmetic mean of past returns, whereas he believes I should have calculated the expected risk premium using the geometric mean of past returns.

Q. Is Dr. Woolridge's criticism valid?

A. No. As Ibbotson Associates explains in Stocks, Bonds, Bills, and Inflation Valuation Edition 2006 Yearbook, the arithmetic mean return is the best approach for calculating the return investors expect to receive in the future. As Ibbotson Associates states:

> The equity risk premium data presented in this book are arithmetic average risk premia as opposed to geometric average risk premia. The arithmetic average equity risk premium can be demonstrated to be most appropriate when discounting future cash flows. For use as the expected equity risk premium in either the CAPM or the building block approach, the arithmetic mean or the simple difference of the arithmetic means of stock market returns and riskless rates is the relevant number. This is because both the CAPM and the building block approach are additive models, in which the cost of capital is the sum of its parts. The geometric average is more appropriate for reporting past performance, since it represents the compound average return. [Ibbotson Associates, 2006 Yearbook, Valuation Edition, p. 77.]

A discussion of the importance of using arithmetic mean returns in the context of CAPM or risk premium studies was included in my Direct Testimony, Schedule JVW-7.

Q. Why does Dr. Woolridge believe your historical returns are "unattainable"? (Woolridge Rebuttal at 25.)

A. Dr. Woolridge argues that the historical results are "unattainable" because the stock indices required to calculate historical stock returns assume monthly portfolio rebalancing, and monthly rebalancing would greatly increase transaction costs.

Q. Is Dr. Woolridge's argument correct?

A. No. Dr. Woolridge's argument is based on his incorrect assumption that investors would have to constantly rebalance their portfolios to achieve the weighting of the market index. However, investors can achieve the market weighting simply by purchasing a market index, which is widely available and inexpensive.

Q. Dr. Woolridge also criticizes your ex post risk premium study because it is based on "biased estimates of stock returns." (Woolridge Rebuttal at 25.) Is he correct?

A. No. Dr. Woolridge bases his allegation on an article by Richard Roll in the *Journal of Financial Economics* that does not apply to the returns in my ex post risk premium study. The Roll paper demonstrates that there is possibly a bias associated with portfolio rebalancing when there is serial correlation in the returns over time. I have demonstrated that my ex post risk premium returns are not characterized by serial correlation. Hence, Dr. Woolridge's criticism based on a reference to the Roll paper is unfounded.

Q. Do you agree with Dr. Woolridge's criticism that your ex post risk premium study is characterized by "survivorship bias" (Woolridge Rebuttal at 26)?

A. No. Survivorship bias refers to problems that might arise when data for companies that have failed are excluded from the sample. However, with regard to the U.S. markets that I study, survivorship bias is not a major issue. First, over the period 1937 to the present, there have been very few companies in the S&P 500 and the S&P Utilities that have failed. Second, the S&P 500 includes the return on a stock until the day it is dropped from the index, and the effect of a company being dropped from the S&P 500 is generally anticipated by the market well in advance of the delisting. Thus, survivorship is not a material issue with respect to U.S. stocks.

Q. What does Dr. Woolridge mean when he refers to the "peso problem"?

A. Dr. Woolridge uses the term "peso problem" to refer to the fact that U.S. investors have generally earned higher returns on stock investments than investors in other countries because the U.S. economy has not suffered many of the same economic calamities as the economies of other countries. This criticism of the use of U.S. stock returns in risk premium studies might be appropriate if one were attempting to estimate the expected rates of return on non-U.S. stocks, especially stocks in countries that could suffer or have suffered economic calamities. However, for U.S. stocks, since there is no indication that the U.S. will suffer the economic calamities of other countries, such as hyper-inflation or military invasion, there is no reason why the returns on U.S. stocks would be biased upward. As Ibbotson Associates states with respect to "survivorship bias" and the closely-related "peso problem":

> While the survivorship bias evidence may be compelling on a worldwide basis, one can question its relevance to a purely U.S. analysis. If the entity being valued is a U.S. company, then the relevant data set should be the performance of equities in the U.S. market. [Ibbotson Associates, *op. cit.*, p. 89.]

Q. On page 27 of his testimony, Dr. Woolridge criticizes your use of historical risk premiums on the grounds that "market conditions today are significantly different than in the past." What is the basis of Dr. Woolridge's concern regarding "current market conditions"?

A. Dr. Woolridge is concerned that, since price/earnings ratios are high, and interest rates are at historic lows, stock returns in the future may be significantly less than they have been in the past. (Woolridge at 27.)

Q. Is the fact that price/earnings ratios are high, and interest rates are low, a reasonable basis on which to reject the use of historical risk premium data?

A. No. While price/earnings ratios are high in relation to their long-run historic average, there is no compelling evidence that they are unreasonably high in light of current interest rate conditions in the capital markets. Furthermore, Dr. Woolridge fails to understand that my study involves the difference between stock returns and bond returns, and bond returns are likely to be more sensitive to rising interest rates than stock returns. Thus, if anything, low interest rates, according to his logic, should imply that risk premiums would increase in the future, not decrease.

Q. Do you agree with Dr. Woolridge's assertion that bond returns have become more volatile than stock returns (Woolridge Rebuttal at 28)?

A. No. Ibbotson Associates provides ample evidence that stock returns continue to be significantly more volatile than bond returns (see Ibbotson Associates *Stocks, Bonds, Bills and Inflation, 2006 Yearbook*, at 112). In addition, Dr. Woolridge fails to acknowledge that much of the measured volatility in bond returns is due to the general decline in interest rates since 1982. This decline in interest rates has made bonds less risky, not more risky, as Dr. Woolridge suggests.

Q. Do you agree with Dr. Woolridge's claim that real interest rates have increased in recent years (Woolridge Rebuttal at 29)?

A. No. The exhibit that Dr. Woolridge himself presents in Exhibit__(JRW-9), page 4 of 4, suggests that real interest rates have declined in recent years from the highs in the 1980s.

Q. Dr. Woolridge's final criticism of your ex post risk premium study is that the equity risk premium has declined in recent years. Did you present any evidence in your Direct Testimony relating to this issue?

A. Yes. I presented evidence on pp. 35 – 36 of my Direct Testimony that there has been no significant trend in equity risk premiums over time. Since the time of my Direct

Testimony, Ibbotson Associates has published their 2006 Yearbook, in which they agree with my finding that there has been no significant trend in equity risk premiums over time:

> The estimate of the equity risk premium depends on the length of the data series studied. A proper estimate of the equity risk premium requires a data series long enough to give a reliable average without being unduly influenced by very good and very poor short-term returns. When calculated using a long data series, the historical equity risk premium is relatively stable. Furthermore, because an average of the realized equity risk premium is quite volatile when calculated using a short history, using a long series makes it less likely that the analyst can justify any number he or she wants.
>
> …The 80-year period starting with 1926 is representative of what can happen: it includes high and low returns, volatile and quiet markets, war and peace, inflation and deflation, and prosperity and depression. Restricting attention to a shorter historical period underestimates the amount of change that could occur in a long future period. Finally, because historical event-types (not specific events) tend to repeat themselves, long-run capital market return studies can reveal a great deal about the future. Investors probably expect "unusual" events to occur from time to time, and their return expectations reflect this. [*SBBI Valuation Edition 2006 Yearbook*, pp. 82—83.]

D. Surrebuttal of Mr. King's Risk Premium Comments

Q. Does Mr. King have any criticisms of your risk premium analyses?

A. Yes. Mr. King claims that my risk premium analyses should be rejected because: (1) my ex post risk premium results are too variable to provide cost of equity estimates; (2) my realized rates of return do not equate to expected rates of return; and (3) my ex ante risk premium analysis is self contradictory. However, I have addressed the first two issues in my surrebuttal to Mr. Hill's and Dr. Woolridge's risk premium comments.

Q. Do you agree with Mr. King's criticism that your ex ante risk premium results are self-contradictory?

A. No. My ex ante risk premium is not self-contradictory. Rather than using a DCF analysis for a single month, it uses knowledge of the relationship between DCF results and interest rates over a 7-year period to forecast the expected return on equity. As reported in my Direct Testimony, the expected return on equity, based on the normal relationship between DCF results and interest rates, is 11 percent.

VI. <u>CAPM ANALYSES</u>

Q. How did you use the CAPM to estimate AmerenUE's cost of equity?

A. The CAPM requires an estimate of the risk-free rate, the company-specific risk factor or beta, and the expected return on the market portfolio. For my estimate of the risk-free rate, I used the forecasted yield to maturity on long-term Treasury bonds of 5.39 percent, using data from Blue Chip. For my estimate of the company-specific risk, or beta, I used the average 0.90 Value Line beta for my comparable electric companies and the average 0.88 Value line beta for my natural gas companies. For my estimate of the expected risk premium on the market portfolio, I used two approaches. First, I estimated the risk premium on the market portfolio from the difference between the arithmetic mean return on the S&P 500 and the income return on 20-year Treasury bonds as reported by Ibbotson Associates' *2006 Yearbook*, 7.1 percent. Second, I estimated the risk premium on the market portfolio from the difference between the DCF cost of equity for the S&P 500, 13.75 percent, and the forecasted yield to maturity on 20-year Treasury bonds, 5.39 percent. My second approach produced a risk premium equal to 8.35 percent.

Q. Have electric utility betas increased since the time of your Direct Testimony?

A. Yes. As shown in my Rebuttal Testimony, Rebuttal Schedule JVW-2, the average Value Line beta for the electric companies is 0.97. When the updated Value Line beta for the electric companies is included in the CAPM equation along with a long-term Treasury bond yield of 4.9 percent and the Ibbotson market risk premium, the CAPM produces a cost of equity equal to 11.8 percent.

Q. What are Mr. Hill's and Mr. King's objections to your CAPM analysis?

A. Mr. Hill believes that it is unreasonable for me to: (1) present a CAPM analysis in this proceeding because I only presented a CAPM analysis in three of the 17 testimonies I provided for his review; (2) use a DCF analysis to estimate the risk premium on the market portfolio in this proceeding because the DCF analysis produces a higher risk premium than my historical risk premium analysis; and (3) use Value Line betas now, when I testified in 1998 that Value Line betas failed to reflect the move to deregulation. Mr. King contends that: (1) other regulatory agencies agree with his rejection of the CAPM, and (2) I have "cherry-picked" the list of companies used in my DCF-based CAPM analysis.

A. The CAPM provides a reasonable estimate of the cost of equity for companies with betas close to 1.0.

Q. Why did you only present a CAPM analysis in several of the testimonies Mr. Hill reviewed?

A. As noted in my Direct Testimony, there is a substantial body of evidence that the CAPM only provides reasonable cost of equity estimates for companies whose estimated betas are close to 1.0. Specifically, this evidence suggests that the CAPM underestimates the cost of equity for a company whose beta is significantly less than 1.0, and overestimates the cost of equity for a company whose estimated beta is significantly greater than 1.0. Since electric utility betas were significantly less than 1.0 during the time I estimated the cost of equity in the testimonies Mr. Hill cites, it was reasonable for me to rely on other cost of equity methods in those cases. Now that electric utility betas are close to 1.0, it is reasonable to use the CAPM to estimate the cost of equity.

B. The market risk premium can be estimated by using either ex post or ex ante market risk premium data.

Q. Why did you use a DCF analysis in addition to historical data to estimate the risk premium on the market portfolio?

A. I used a DCF analysis in addition to historical risk premium data to estimate the risk premium on the market portfolio because witnesses such as Mr. Hill have previously criticized the use of historical risk premium data as not being representative of future expected risk premiums. Since the DCF model is forward looking, it provides an alternative estimate of the risk premium based on current market data rather than experienced returns. In addition, I now have access to databases that allow me to perform a DCF analysis on the market portfolio in a timely manner, whereas for many earlier years obtaining the data to perform such an analysis was far more labor intensive.

Q. Did you testify in 1998 that Value Line betas "fail to reflect the move to deregulation"?

A. In the 1998 testimony to which Mr. Hill refers, I testified as follows:

> Q. Are Value Line betas good estimates of expected future risk for the electric energy companies?
>
> A. No. The Value Line betas underestimate the expected future risk for the electric energy companies because Value Line betas are calculated from historical data that do not reflect the increased risk of investing in such companies during this period of increased competition and industry restructuring. However, since there are

> no superior methods for estimating future betas available at this time, I have used the Value Line beta as a conservative beta estimate.

Thus, although I mentioned that Value Line betas, calculated from historical data, do not reflect industry restructuring, I nonetheless used them in my CAPM analysis.

C. Mr. Hill has changed his approach for implementing the CAPM.

Q. In his Rebuttal Testimony, Mr. Hill places great emphasis on the need to be consistent in the application of cost of equity methodologies. Has Mr. Hill been consistent in his approach to estimating the CAPM cost of equity?

A. No. Mr. Hill has changed his approach to estimating the CAPM cost of equity in at least four ways. First, now that interest rates are expected to increase, Mr. Hill argues against the use of forecasted interest rates to estimate the risk-free rate component of the CAPM.[14] His current recommendation is inconsistent with his prior testimony that forecasted rates, as measured by the rate on T-bill futures contracts, should be used to estimate the risk-free rate component of the CAPM.[15] At the time Mr. Hill made the recommendation to use forecasted T-bill rates, forecasted rates were lower than current interest rates.

Second, Mr. Hill now recommends that the yield on long-term Treasury bonds ("T-bonds") be used to estimate the risk-free rate component of the CAPM, whereas in prior testimonies Mr. Hill has recommended that the yield on short-term Treasury bills ("T-bills")

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[14] See Hill Direct at 20.

[15] See, for example, Mr. Hill's Direct Testimony in Docket No. 6167 before the Vermont Public Service Board, May 27, 1999, at 41; or Mr. Hill's Direct Testimony in Docket Nos. UG-991606/UG-991607 before the Washington Utilities and Transportation Commission (document is not paginated).

be used to estimate the risk-free rate.[16] In this proceeding, Mr. Hill's use of the yield on long-term T-bonds reduces his estimate of the cost of equity. In prior testimonies, Mr. Hill's use of the yield on short-term T-bills also reduced his estimate of the cost of equity.

Third, in this proceeding, Mr. Hill recommends that the geometric mean risk premium be used to estimate the market risk premium, whereas in earlier testimonies, Mr. Hill has recommended giving equal weight to the arithmetic and geometric mean risk premiums.[17] Mr. Hill's recommendation in this proceeding to rely only on the geometric mean risk premium reduces his CAPM cost of equity estimate.

Fourth, in this proceeding Mr. Hill claims that Value Line betas for electric utilities overstate the risk of investing in electric utilities because electric utility betas are relatively high, whereas Mr. Hill did not claim that the CAPM underestimated the cost of equity when electric utility betas were relatively low.[18]

D. Other regulatory agencies use the CAPM to estimate the cost of equity.

Q. Do you agree with Mr. King's claim that other regulatory agencies have rejected use of the CAPM?

A. No. Some regulatory agencies do not rely on the CAPM to estimate the cost of equity, and others do rely on the CAPM. In addition, Mr. King fails to note that, although the Surface Transportation Board does not rely on the CAPM, its DCF model produces a cost of equity estimate for the regulated railroads equal to 15.18 percent, approximately 550 basis

[16] See Hill Direct at 41. See, for example, Hill Direct in Vermont Docket No. 6167 at 41 – 43 and Hill Direct in Washington Docket Nos. UG-991606/UG-991607.

[17] See Hill Direct at 46 - 47. See Hill Direct in Vermont Docket No. 6167 at 45 and Hill Direct in Washington Docket Nos. UG-991606/UG-991607**.**

[18] See Hill Direct at 44 - 45. See Hill Direct at 37 – 38 in Docket No. 6680-UR-112 before the Wisconsin Public Service Commission, October 16, 2002.

points higher than Mr. King's DCF estimate in this proceeding. Further, Mr. King fails to note that the Surface Transportation Board uses a market value capital structure to determine the overall cost of capital for the railroads. In addition, Mr. King fails to recognize that the FCC's Wireline Competition Bureau used only the CAPM to estimate the cost of capital, arriving at a cost of equity estimate of 13.068 percent; and the Bureau also correctly estimated the weighted average cost of capital using a market value capital structure.

Q. Did you "cherry-pick" the companies you used to estimate the market risk premium in your DCF-based CAPM analysis?

A. No. I simply used the dividend-paying companies in the S&P 500 (since one cannot apply a DCF model to a company that does not pay a dividend). The S&P 500 companies are selected by Standard & Poor's, not me; and the S&P 500 is commonly used as a proxy for the market as a whole.

Q. Does this conclude your Surrebuttal Testimony?

A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a AmerenUE d/b/a AmerenUE for Authority to File Tariffs Increasing Rates for Electric Service Provided to Customers in the Company's Missouri Service Area.	)))))	Case No. ER-2007-0002

AFFIDAVIT OF JAMES H. VANDER WEIDE

STATE OF NORTH CAROLINA)
) ss
COUNTY OF DURHAM)

James H. Vander Weide, being first duly sworn on his oath, states:

1. My name is James H. Vander Weide. I work in the City of Durham, North Carolina, and I am Research Professor of Finance and Economics at the Fuqua School of Business, Duke University.

2. Attached hereto and made a part hereof for all purposes is my Surrebuttal Testimony on behalf of Union Electric Company d/b/a AmerenUE which has been prepared in written form for introduction into evidence in the above-referenced docket.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct.

James H. Vander Weide
James H. Vander Weide, Ph.D.

Subscribed and sworn to before me this 23 day of February 2007.

Scott H. Ashworth
Scott H Ashworth Notary Public

My commission expires: 1/28/2012

SCOTT H. ASHWORTH
NOTARY PUBLIC
WAKE COUNTY, NC
My Commission Expires 1-28-2012