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
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5   **I.   INTRODUCTION AND SUMMARY**

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

7   A.   My name is James H. Vander Weide. I am Research Professor of Finance and

8   Economics at Duke University, the Fuqua School of Business. I am also President of

9   Financial Strategy Associates, a firm that provides strategic and financial consulting services

10 to business clients. My business address is 3606 Stoneybrook Drive, Durham, North

11 Carolina.

12   **Q.   Are you the same James H. Vander Weide who presented direct and**

13 **rebuttal testimonies in this proceeding filed in July 2006 and January 2007,**

14 **respectively?**

15   A.   Yes, I am.

16   **Q.   What is the purpose of your testimony?**

17   A.   I have been asked by Union Electric Company d/b/a AmerenUE

18 ("AmerenUE" or "the Company") to respond to the rebuttal testimonies filed by Mr. Stephen

19 G. Hill, Dr. J. Randall Woolridge, and Mr. Charles W. King. Mr. Hill's testimony is filed on

20 behalf of the Missouri Public Service Commission Staff, Dr. Woolridge's testimony is filed

21 on behalf of the State of Missouri, and Mr. King's testimony is filed on behalf of the Office

22 of Public Counsel.

1   **Q.   How have you organized you Surrebuttal Testimony?**

2   A.   Since Mr. Hill, Dr. Woolridge, and Mr. King offer similar rebuttal

3   testimonies, I will organize my Surrebuttal Testimony by topic rather by witness whenever

4   possible. Specifically, I will address these witnesses' comments regarding my: (1) financial

5   risk adjustment; (2) proxy group of companies; (3) DCF analysis; (4) risk premium analyses;

6   and (5) CAPM analyses.

7   **Q.   Please summarize your Surrebuttal Testimony.**

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

9   **Financial Risk Adjustment.** I estimate AmerenUE's cost of equity by first

10   estimating the average cost of equity for a large proxy group of comparable risk companies,

11   and then adjusting the proxy group's estimated cost of equity to reflect the difference

12   between the proxy group's average financial risk and the financial risk implicit in

13   AmerenUE's recommended ratemaking capital structure. I recommend this financial risk

14   adjustment because it is consistent with the economic definition of the cost of capital. The

15   other parties' inappropriate criticisms of my procedure stem from their: (1) illogical analysis

16   of the consequences of using a market value capital structure to estimate AmerenUE's

17   ratemaking overall cost of capital; and (2) misapprehension that I am recommending that a

18   market value capital structure be used to calculate AmerenUE's overall cost of capital in this

19   proceeding. I demonstrate that my financial risk adjustment is consistent with financial

20   theory and my prior testimony. I also demonstrate that my financial risk adjustment does not

21   produce "illogical" results and that some regulators use market value capital structures either

22   to adjust the cost of equity for differences in financial risk or to estimate the overall cost of

23   capital.

1   **Proxy Companies**. I recommend using a large proxy group of comparable

2   risk companies because use of such a group increases the reliability of my cost of equity

3   estimates and is consistent with the U.S. Supreme Court mandate in the *Hope* and *Bluefield*

4   cases that utility investors should be allowed to earn a return commensurate with returns they

5   could achieve if they invested in other companies of comparable risk. I demonstrate that the

6   other parties' claims that my proxy group is more risky than AmerenUE is unfounded;

7   indeed, my comparable company group has the same average bond rating as AmerenUE.

8   **DCF Analysis**. The other parties' claim that the results of DCF analyses

9   should be given the primary weight in this proceeding because their DCF analyses produce

10   more "reliable" cost of equity estimates than other cost of equity estimates. I rebut the other

11   parties' specious arguments regarding the reliability of their cost of equity estimates,

12   demonstrating that the other parties' errors in their applications of the DCF model, most

13   notably their use of arbitrary growth rates, call into question their DCF model results. For

14   example, Mr. Hill obtains growth rates for Public Service of New Mexico in the range from

15   *negative* 8.76 percent to *positive* 11.45 percent, but arbitrarily chooses a growth estimate of

16   5.75 percent, a growth rate that others would be unable to predict from the data he presents.

17   Clearly, an analysis in which the analyst can choose *any* number in the range *negative*

18   8.76 percent to *positive* 11.45 percent, and in which the analyst chooses a number that is

19   unrelated in any mathematical way to the data presented, cannot be termed to be "reliable."

20   **Risk Premium Analyses**. I refute the other parties' claims that there has been

21   a downward "trend" in risk premiums and confirm that reliable information regarding the

22   cost of equity can be obtained from considering both the average return and the average risk

23   premium over a long period of time. I also corroborate the consistency of my ex post and ex

1 ante risk premium studies and confirm the validity of my use of utility bond yields to

2 estimate the interest rate component in my risk premium studies.

3   **CAPM Analyses**. Contrary to other parties' claims, I demonstrate the CAPM

4 provides a reasonable estimate of the cost of equity for companies like the electric companies

5 with betas close to 1.0 and that the market risk premium can be estimated using either ex post

6 or ex ante market risk premium data.

7   **Q.**   **Is there anything in the testimonies of Mr. Hill, Dr. Woolridge, and Mr.**

8 **King that causes you to change your recommended cost of equity for AmerenUE?**

9   A.   No.

10   **II.   FINANCIAL RISK ADJUSTMENT**

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

12   A.   I estimate AmerenUE's cost of equity by: (1) estimating the average cost of

13 equity for a large proxy group of comparable risk companies, and (2) adjusting the proxy

14 group's estimated cost of equity to reflect the difference between the proxy group's average

15 financial risk and the financial risk implicit in AmerenUE's recommended capital structure.

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

17 **stock?**

18   A.   Financial economists measure the risk of investing in a company's stock by

19 calculating the forward-looking variability in the rate of return on an investment in the

20 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.

1   **Q.   What is the difference between a company's business risk and its**

2   **financial risk?**

3   A.   As noted above, risk is measured by the forward-looking variability in the rate

4   of return on an investment in a company's stock. Total risk is the sum of business risk and

5   financial risk, where business risk is the forward-looking variability in the rate of return on

6   an investment in the company's stock when the company is all-equity financed, and financial

7   risk is the additional variability in the rate of return on an investment in the company's stock

8   that arises as a result of debt financing.

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

10   A.   I measure my proxy group's average financial risk using data on the

11   percentages of debt and equity in my proxy group's composite capital structure, where these

12   percentages are calculated using market values of debt and equity.[2]

13   **Q.   What is the difference between the market value of debt and equity and**

14   **book value of debt and equity?**

15   A.   The market value of debt and equity reflects the values of these quantities in

16   the marketplace, whereas the book value of debt and equity reflects the values shown on a

17   company's accounting records. The values shown on the company's accounting records are

18   based on historical cost rather than economic or market value.

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[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.

1   **Q.   Why do you measure your proxy group's average financial risk using**

2   **market value capital structure data rather than book value capital structure data?**

3   A.   I measure my proxy group's average financial risk using market value capital

4   structure data because the forward-looking variability in the rate of return on a company's

5   stock depends on the company's market value capital structure, not its book value capital

6   structure.

7   **Q.   Can you illustrate how the forward-looking variability in the rate of**

8   **return on the equity investment in a company increases with debt financing?**

9   A.   Yes. Consider a company whose only asset is an investment in a real estate

10   development project that is currently worth $200 million. Suppose that the project is

11   financed entirely with equity, and that the investor in the project believes that, over the next

12   year, the project will either increase in value by $20 million, or decrease in value by

13    $20 million. Then the rate of return on both the value of the project and the value of the

14   equity in the project will be either $20/$200 million = 10 percent, or -$20/$200 million = -

15   10 percent); and the range of rates of return on equity will be from positive 10 percent to

16   negative 10 percent.

17   Now suppose that the same project is financed with $100 million in debt and

18    $100 in equity, both measured in terms of market value. In this case, the rate of return on the

19   equity in the project would be either plus 20 percent or minus 20 percent (20/100 or -

20   20/100),[3] and the range of rates of returns on equity will be twice as large as in the previous

21   case from positive 20 percent to negative 20 percent. Thus, the variability in the market rate

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[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.

6

1   of return on the equity in the project (that is, on the company's stock) has increased as a

2   result of the partial use of debt financing.

3   **Q.   Can you explain why the financial risk of this project depends on the**

4   **market values of debt and equity, and not the book values of debt and equity?**

5   A.   Yes. Recall that financial risk is the additional variability in the market rate of

6   return on equity resulting from the use of debt financing. Since the market rate of return on

7   equity depends on the market value of the equity in the project, not the book value, the

8   financial risk of the project also depends on the market value of the equity in the project, not

9   the book value.

10   **Q.   Is there any meaningful relationship between a company's book value**

11   **capital structure and the variability of return to shareholders in the marketplace?**

12   A.   No. The variability of the market return to shareholders depends only on the

13   company's market value capital structure, not its book value capital structure. In my

14   illustration, the fact that an investor might have purchased a project ten years ago at a price of

15    $50 million is entirely irrelevant to the calculation of the variability in the market rate of

16   return today.

17   **Q.   Does Mr. Hill recognize that financial economists measure financial risk**

18   **in terms of a company's market value capital structure?**

19   A.   Yes. Mr. Hill states, "The Company's testimony regarding the existence of

20   market-value capital structure theory is correct." (Hill Rebuttal at 13.) Mr. Hill also states,

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

7

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

6   **Q.   Since Mr. Hill recognizes that financial risk depends on the company's**

7   **market value capital structure, what is the basis for Mr. Hill's disagreement with your**

8   **use of a financial risk adjustment based on the market value capital structures of your**

9   **proxy companies?**

10   A.   Mr. Hill's disagreement with my financial risk adjustment is based on his

11   incorrect claims that: (1) I am recommending that a market value capital structure be used in

12   this proceeding to calculate AmerenUE's overall cost of capital (Hill Rebuttal at 2); (2) my

13   use of a market value capital structure is circular (Hill Rebuttal at 6); (3) my use of a market

14   value capital structure would allow AmerenUE to earn a return in excess of its cost of capital

15   (Hill Rebuttal at 8); (4) my financial risk adjustment is inconsistent with financial theory

16   (Hill Rebuttal at 11 – 13); (5) there is support in the finance literature for use of a book value

17   capital structure (Hill Rebuttal at 13 – 15); (6) stock prices incorporate book value capital

18   structures because investors only get information on book value capital structures, and

19   markets are efficient (Hill Rebuttal at 14); (7) book value capital structures do not have to be

20   justified because regulators have always used book value capital structures to set allowed

21   rates of return (Hill Rebuttal at 14); and (8) my testimony is not credible because I have

22   recently changed my position on the appropriate capital structure for use in calculating the

23   company's overall cost of capital (Hill Rebuttal at 15 – 25).

1   **Q.   Does Dr. Woolridge raise any concerns with your financial risk**

2   **adjustment that differ from the concerns raised by Mr. Hill?**

3   A.   Yes. Dr. Woolridge disagrees with my financial risk adjustment because, in

4   his opinion: (1) a market-to-book ratio greater than 1.0 indicates that companies are earning

5   more than their cost of capital; and (2) my financial risk adjustment produces illogical

6   results.

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

9   **Q.   Are you testifying in this proceeding on the appropriate capital structure**

10   **for use in calculating AmerenUE's overall cost of capital?**

11   A.   No. However, I am recommending that: (1) the financial risk of my

12   comparable companies be measured based on their market value capital structures; and

13   (2) the average cost of equity for my comparable companies be adjusted to reflect the

14   difference between the financial risk of my proxy group and the financial risk implied by

15   AmerenUE's recommended capital structure for ratemaking purposes.

16   **Q.   Does Mr. Hill also make a financial risk adjustment to the cost of equity**

17   **results he obtains for his proxy group?**

18   A.   Yes. Mr. Hill states,

19   I have estimated the equity capital cost of the Company's electric
20   utility and gas distribution operations to fall in a range of 9.00% to
21   9.75%. Within that range, I estimate the equity cost of the
22   Company's utility operations to be near the lower end of a
23   reasonable range of equity costs *due to AmerenUE's lower*
24   *financial risk*—9.25%. [Hill Rebuttal at 4. Emphasis added.]

1   **B.   My financial risk adjustment is not circular.**

2   **Q.   Mr. Hill asserts that your use of a market value capital structure is**

3   **circular. (Hill Rebuttal at 6.) Do you agree with Mr. Hill's assertion?**

4   A.   No. Mr. Hill's assertion that my recommendation is circular is based on his

5   further incorrect assertion that I am recommending that a market value capital structure be

6   used to calculate AmerenUE's overall cost of capital. Since I am not offering testimony on

7   the appropriate capital structure for use in calculating the overall cost of capital, Mr. Hill's

8   assertion that my recommendation is circular is incorrect.

9   **Q.   Would Mr. Hill's assertion regarding the circularity of your**

10   **recommendation be true if you were recommending that AmerenUE's overall cost of**

11   **capital be calculated using a market value capital structure?**

12   A.   No. Mr. Hill's assertion regarding circularity is also based on his incorrect

13   assumptions that: (1) use of a market value capital structure would lead to a higher rate of

14   return on equity; (2) a higher rate of return on equity would lead to a higher market value for

15   the company's stock; and (3) a higher market value for the company's stock would produce

16   an even higher rate of return on equity.

17   **Q.   You have previously explained that your financial risk adjustment is not**

18   **the same as recommending a market value capital structure to calculate the overall cost**

19   **of capital. Can you explain why Mr. Hill's three further assumptions listed in the**

20   **previous response are incorrect?**

21   A.   Yes. If regulators were to announce that they were going to use market value

22   capital structures to set rates, investors would assume that use when investors determined

23   their required returns; and the use of a market value capital structure to set rates would have

1   no impact on the market price of a company's stock after the original announcement.

2   Furthermore, if the use of a market value capital structure were to cause the market price of

3   the company's stock to increase, this increase would reduce the company's financial risk, and

4   hence its cost of equity. Thus, the higher market value would reduce the company's required

5   rate of return on equity, not increase it, as Mr. Hill asserts.

6   **Q.   Even if Mr. Hill's assertion—that use of a company's market value**

7   **capital structure in rate setting is circular—were true, does his conclusion apply to your**

8   **recommended financial risk adjustment?**

9   A.   No. As noted above, I am not testifying in this proceeding on the appropriate

10   capital structure for use in calculating AmerenUE's overall cost of capital. My

11   recommended financial risk adjustment to my estimated cost of equity for my proxy

12   companies is based on the market value capital structure of my proxy group, not a market

13   value capital structure of AmerenUE (indeed, AmerenUE does not even have a market value

14   capital structure). Since the market prices of my proxy companies' stocks do not depend on

15   AmerenUE's allowed rate of return on equity, the circular link that Mr. Hill posits simply

16   does not exist.

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

20   **Q.   Would adoption of your financial risk adjustment cause AmerenUE's**

21   **allowed rate of return to exceed its cost of equity?**

22   A.   No. My estimate of AmerenUE's required rate of return on equity is based on

23   my estimate of the average cost of equity of my proxy companies. Since the financial risk of

24   my proxy companies is less than the financial risk implied by AmerenUE's recommended

1   capital structure, my cost of equity cannot logically be applied to AmerenUE's recommended

2   capital structure without adjusting for the lower financial risk of my proxy companies. In

3   making his assertion, Mr. Hill fails to recognize that the cost of equity of my proxy

4   companies depends on their financial risk, and the financial risk of my proxy companies is

5   less than the financial risk implied by AmerenUE's recommended capital structure.

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

7   **Q.   Why does Mr. Hill believe that your financial risk adjustment is**

8   **inconsistent with financial theory?**

9   A.   Mr. Hill claims that my financial risk adjustment is inconsistent with financial

10   theory because: (1) financial risk reflects the impact of fixed charges on the variability of the

11   company's net income; and (2) the amount of fixed charges does not depend on whether the

12   company's capital structure is measured in terms of market or book values. (Hill Rebuttal

13   at 11.)

14   **Q.   Do you agree with Mr. Hill's argument that financial risk reflects the**

15   **impact of fixed charges on the variability of the company's net income?**

16   A.   No. Financial economists define financial risk as the impact of debt financing

17   on the variability of market returns to shareholders. The variability of market returns to

18   shareholders increases when a company employs more debt, because the variability in returns

19   falls entirely on the equity investors. Mr. Hill's definition of financial risk is inconsistent

20   with the definition used by financial economists.

1   Q.   Do you agree with Mr. Hill's assertion that the amount of fixed charges

2   does not depend on whether a company's capital structure is measured in terms of

3   market values or book values?

4   A.   Yes. However, I have not claimed that the amount of fixed charges does

5   depend on whether a company's capital structure is measured in terms of market or book

6   values. Rather, my financial risk adjustment is based on the facts that: (1) the financial risk

7   of my proxy companies depends on their market value capital structures, not their book value

8   capital structures; and (2) one cannot logically apply a cost of equity estimated from a sample

9   of companies that have one level of financial risk to a capital structure that implies a different

10   level of financial risk.

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

13   Q.   Do you agree with Mr. Hill's statement that "there is also support for the

14   use of book value capital structures in the literature of corporate finance"? (Hill

15   Rebuttal at 14.)

16   A.   No. The finance literature overwhelmingly supports the use of market value

17   capital structures to estimate a company's overall cost of capital.[4]

18   Q.   Mr. Hill cites articles by Elliot and Beranak as examples of financial

19   literature that support the use of a book value capital structure to estimate a company's

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[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.

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1   **overall cost of capital. Do these articles actually support the use of a book value capital**

2   **structure to estimate a company's overall cost of capital?**

3   A.   No. Neither the Elliot nor the Beranak article support the use of a book value

4   capital structure to estimate a company's cost of capital. Indeed, the Elliot article does not

5   even address the issue of whether market or book values should be used to measure a

6   company's capital structure. Instead, it presents an elementary discussion of the cost of

7   capital aimed at readers of an accounting magazine. Given the intended audience, the article

8   merely describes how the cost of capital might be calculated based on information commonly

9   available to accountants. The article makes no attempt to consider the differences between

10   economic and accounting definitions of "equity" or the economic and accounting definitions

11   of the rate of return on equity.

12   Further, the Beranak article presents an analysis of a simple situation where a

13   company issues debt and equity at the beginning of a period to finance an investment with a

14   one-period life. Beranak defines the term "book value" as the amount of debt and equity

15   issued at the beginning of the period, and he defines "market value" as the present value of

16   the company's income at the end of the one-period life of the investment. In short, Beranak's

17   analysis considers a simple, one-period world in which the accounting issues associated with

18   book values do not arise. Thus, the Beranak analysis does not address the reasons why the

19   use of real world book value capital structures to estimate a company's overall cost of capital

20   is inconsistent with financial theory.

21   **Q.   Mr. Hill also cites a book by Brigham and Gapenski as support for the**

22   **use of book value weights to determine the overall cost of capital (Hill Rebuttal at 14).**

1 **Do Brigham and Gapenski recommend the use of book value capital structure weights**

2 **to estimate the overall cost of capital?**

3   A.   No. Brigham and Gapenski clearly state their strong support for the use of

4 market value capital structures to estimate the weighted average cost of capital:

5   What can we conclude from all this? We are absolutely
6   convinced that the procedures we recommend are correct—
7   namely, *firms should focus on market value capital structures*
8   *and base their cost of capital calculations on market value*
9   *weights*. Because market values do change, it would be
10   impossible to keep the actual capital structure on target at all
11   times, but this fact in no way detracts from the validity of market
12   value targets. (Eugene F. Brigham, Louis C. Gapenski,
13   Intermediate Financial Management, 5th edition, 1996, Chapter
14   12, "Capital Structure Decisions," p. 427. Emphasis added.)

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

17   Q.   **Do stock prices reflect financial risk?**

18   A.   Yes. Stock prices reflect all the risks investors perceive when they purchase a

19 company's stock, including financial risk.

20   Q.   **Is financial risk properly measured using market value capital structures**

21 **or book value capital structures?**

22   A.   Financial risk is the increase in the variability in the market rate of return on

23 equity caused by the use of debt financing. As my example described above illustrates, the

24 increase in the variability of the market rate of return on equity caused by a higher level of

25 debt financing undoubtedly depends on a company's market value capital structure, not its

26 book value capital structure.

1   **Q.   If financial risk is based on market value capital structures rather than**

2   **book value capital structures, what is the basis of Mr. Hill's argument that stock prices**

3   **reflect book value capital structures rather than market value capital structures?**

4   A.   Mr. Hill's argument is based on his incorrect assumptions that: (1) investors

5   are only exposed to information on a company's book value capital structure when they

6   assess common stock investments; and (2) the theory of efficient markets implies that stock

7   prices must therefore reflect book value information.

8   **Q.   Do you agree with Mr. Hill's assumption that investors are only exposed**

9   **to information on a company's book value capital structure when they assess common**

10   **stock investments?**

11   A.   No. Since investors assess common stock investments by comparing the

12   company's current stock price to their estimate of the company's intrinsic value, they

13   certainly are exposed to information on market values as well as book values. Most investors

14   are also aware that the expected return and risk on an investment depends on the market

15   value of the investment, not the book value of the investment.

16   **Q.   Do you agree with Mr. Hill's assertion that the theory of efficient markets**

17   **implies that stock prices must reflect book value information?**

18   A.   No. The theory of efficient markets implies that stock prices reflect all the

19   information available to investors. As noted above, investors are certainly exposed to

20   information on the market values of a company's stock, as well as the book values of a

21   company's stock. In addition, investors realize that the expected return and risk of the stock

22   depend on the market price of the stock, not its book value. Since investors are aware that

23   market prices are a superior basis for measuring the expected return and risk on a company's

1   stock, and information on market prices is widely available to investors, the theory of

2   efficient markets suggests—contrary to Mr. Hill's argument—that stock prices reflect market

3   value capital structures, not book value capital structures.

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

6   **Q.   Mr. Hill claims that "the use of book value capital structures with**

7   **original cost rate making is a long-standing paradigm of regulation." (Hill Rebuttal**

8   **at 14.) Are you aware of examples where regulators have used market value capital**

9   **structures to estimate the overall cost of capital?**

10   A.   Yes. I'm aware of several examples where regulators have used market value

11   capital structures either to adjust the cost of equity for financial risk adjustment or to estimate

12   the overall cost of capital. First, the Pennsylvania Public Utility Commission has adopted a

13   financial risk adjustment similar to the adjustment I have recommended here to set the

14   allowed rate of return on equity for electric and water companies. Second, numerous

15   regulatory bodies, including the FCC's Wireline Competition Bureau and the public service

16   commission of Massachusetts, have used market value capital structures to estimate the cost

17   of capital in proceedings on the cost of the unbundled network elements local exchange

18   carriers are required to lease to their competitors. Third, the Surface Transportation Board

19   uses a market value capital structure to estimate the cost of capital for railroads. Fourth,

20   some state tax authorities use market value capital structures to calculate the cost of capital

21   that is used to value utilities' properties for the purpose of assessing property taxes,

22   including, for example, California, Colorado, and Utah.

1 **Q.   Even if use of book value capital structures were a "long-standing**

2 **paradigm of regulation," would the existence of such a paradigm be sufficient**

3 **justification for rejecting your financial risk adjustment?**

4 A.   No. First, the Commission should understand that I am not testifying in this

5 proceeding on the appropriate capital structure to be used to estimate the overall cost of

6 capital. Rather, I am simply recommending that the estimated cost of equity for my

7 comparable companies be adjusted to reflect the difference in financial risk between the

8 average capital structure for the comparable companies and AmerenUE's recommended

9 capital structure. Second, although the use of book value capital structures has been a long-

10 standing paradigm in some regulatory jurisdictions, it is not the current paradigm in all

11 regulatory jurisdictions. Third, even if the use of book value capital structures were a long-

12 standing paradigm of regulation, this fact would not be sufficient justification for rejecting

13 my financial risk adjustment. My financial risk adjustment is based on sound financial and

14 economic theory. The Commission should judge my recommendation based on the evidence

15 I have presented.

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

18 **Q.   Is it correct, as Mr. Hill claims, that you have recently changed your**

19 **position regarding the appropriate capital structure for use in estimating a company's**

20 **overall cost of capital (Hill Rebuttal at 2, 3, 15-25)?**

21 A.   No. As an economist, I have consistently maintained that a company's

22 weighted average cost of capital should be estimated using a market value capital structure.

1 Indeed, this position is held by virtually all financial economists because it is the only

2 position that is consistent with economic theory.

3 **Q.   Have you ever testified that use of a book value capital structure to**

4 **estimate a company's overall cost of capital is consistent with economic theory?**

5 A.   No.

6 **Q.   Are you generally asked in electric utility cases to recommend a capital**

7 **structure for use in determining a company's overall allowed rate of return for**

8 **regulatory purposes?**

9 A.   No. In the majority of the electric utility cases in which I have testified, I

10 have only been asked to recommend an appropriate allowed rate of return on equity. An

11 internal company witness generally presents the company's recommended capital structure.

12 **Q.   Are you recommending an appropriate capital structure for use in**

13 **determining AmerenUE's overall allowed rate of return in this proceeding?**

14 A.   No. The Company's recommended capital structure for use in determining its

15 overall rate of return is presented in Mr. Nickloy's testimony.

16 **Q.   In prior electric utility cases, have you recognized that your**

17 **recommended allowed rate of return on equity would typically be applied to a book**

18 **value capital structure?**

19 A.   Yes. Since I first began testifying in electric utility cases in 1982, I have

20 recognized that my recommended allowed rate of return on equity would typically be applied

21 to a book value capital structure.

22 **Q.   When did you first begin to recommend that the cost of equity estimate**

23 **for your proxy companies be adjusted to reflect the difference in the financial risk of**

19

1   **your proxy companies, measured by their market value capital structures, and the**

2   **financial risk implied by a company's recommended book value capital structure?**

3   A.   I first recommended making such a financial risk adjustment in testimony for

4   San Diego Gas & Electric filed in February 2003 with the FERC. I also made such a

5   recommendation for a Pacific Gas & Electric FERC case filed in March 2003, and the studies

6   for this case date to mid-2002 because there was a delay in filing the case.

7   **Q.   If you have always recognized that your recommended rate of return on**

8   **equity would typically be applied to a book value capital structure, why did you begin**

9   **to recommend a financial risk adjustment in electric utility cases in 2003?**

10   A.   When I first began testifying in electric utility cases in 1982, I assumed that

11   the regulatory practice of using book value capital structures to calculate a company's overall

12   cost of capital was unlikely to change; and hence, recommending a deviation from this

13   practice, even a change that is economically justified and theoretically correct, would be

14   futile. However, my experience in the telecommunications industry in the late 1990s and

15   early 2000s and my observation of the practices of other regulatory authorities caused me to

16   change my initial assumption. I therefore began to recommend a financial risk adjustment.

17   **Q.   Mr. Hill claims that your recommended financial risk adjustment in this**

18   **proceeding is inconsistent with your testimonies in prior proceedings. Do you agree**

19   **that your current testimony is inconsistent with your testimony in prior proceedings?**

20   A.   No. My current testimony is that my financial risk adjustment should be

21   adopted because it is consistent with financial and economic theory. Since I have not

22   testified that the use of a book value capital structure to calculate a company's overall cost of

23   capital was consistent with financial theory, my current testimony is consistent with my prior

1 testimony. For most of my years as an expert witness, I did not explicitly argue that market

2 value capital structures should be used to estimate a utility company's overall cost of capital

3 because I assumed that regulators were not likely to change their prior practice of using book

4 value capital structures to estimate a company's overall cost of capital. As noted above, my

5 experience in the telecommunications industry in the late 1990s and early 2000s and my

6 observation of regulation in other industries has caused me to change my initial assumption.

7 **Q. Mr. Hill argues that your recommendation to make a financial risk**

8 **adjustment at a time when market-to-book ratios are above 1.0 is opportunistic because**

9 **you failed to make such a recommendation in a 1982 Carolina Power & Light case**

10 **when market-to-book ratios were below 1.0. Do you agree with his assessment of your**

11 **reasons for recommending such an adjustment in this proceeding?**

12 A. No. I recommend a financial risk adjustment because such an adjustment is

13 consistent with financial and economic theory and properly adjusts the cost of equity for the

14 difference in the financial risk embedded in my cost of equity estimate and the financial risk

15 implied by AmerenUE's recommended capital structure. In addition, my financial risk

16 adjustment can hardly be called "opportunistic," since I did not recommend a financial risk

17 adjustment in all my electric cases from 1984 to 2003 when market prices were above book

18 values. Thus, I did not suddenly begin to recommend a financial risk adjustment when

19 market prices rose above book values, as Mr. Hill suggests.

1   Q.   On a purely logical basis, does it make sense to argue that because you

2   did not recommend a financial risk adjustment 25 years ago, you should not

3   recommend a financial risk adjustment now?

4   A.   No. My recommendation here must be judged on its merits. I have shown

5   that financial and economic theory requires the adjustment I have proposed, whereas Mr. Hill

6   has failed to provide any reasonable basis for rejecting the fundamental economic reasoning

7   and correctness of my financial risk adjustment. At best, Mr. Hill's argument only suggests

8   from the benefit of hindsight that perhaps I should have considered a financial risk

9   adjustment in earlier testimonies. Mr. Hill's argument certainly does not suggest that my

10   recommended financial risk adjustment in this proceeding is inappropriate. If I had

11   recommended a financial risk adjustment in prior cases, my recommended costs of equity

12   would have been higher. In this sense, my failure to explicitly recommend a financial risk

13   adjustment in cases prior to 2003 simply produced conservative estimates of the cost of

14   equity.

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

17   Q.   Mr. Hill argues against your use of a financial risk adjustment based on

18   market value capital structures in this proceeding. Has Mr. Hill recommended a

19   financial risk adjustment based on market value capital structures in prior electric

20   utility cases?

21   A.   Yes. Mr. Hill filed testimony in a 2006 PacifiCorp case in which he

22   recommended a financial risk adjustment based on market value capital structure

23   information. (See Supplemental Testimony of Mr. Hill in Docket Nos. UE-050684 and UE-

1   050412 before the Washington Utilities and Transportation Commission filed January

2   27, 2006.) In that case, Mr. Hill's use of a financial risk adjustment based on market value

3   capital structure information, if it had been accepted, would have produced a lower overall

4   cost of capital for PacifiCorp. Mr. Hill's testimony in that proceeding is clearly inconsistent

5   with his testimony in this proceeding.

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

8   **Q.   Dr. Woolridge criticizes your financial risk adjustment because, in his**

9   **opinion, a market-to-book ratio greater than 1.0 indicates that a company is earning**

10   **more than its cost of equity. Did you refute Dr. Woolridge's opinion in your Rebuttal**

11   **Testimony?**

12   A.   Yes. In my Rebuttal Testimony at pp. 61 - 67, I demonstrated that Dr.

13   Woolridge's view is soundly refuted by evidence from the capital markets that there are

14   many companies with market-to-book ratios greater than 1.0 that are earning either negative

15   rates of return on equity, or rates of return on equity that are significantly lower than Dr.

16   Woolridge's 9.0 percent recommended return on equity in this proceeding.

17   **Q.   Even if Dr. Woolridge's view regarding the implications of market-to-**

18   **book ratios greater than 1.0 were correct, would it have any relevance to the legitimacy**

19   **of your recommended financial risk adjustment?**

20   A.   No. Dr. Woolridge's view is based on his incorrect assumption that I am

21   recommending that AmerenUE's market value capital structure be used to calculate its

22   overall cost of capital. As I have noted above, my financial risk adjustment is not based on

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

2   market value capital structure.

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

4   **Q.   Dr. Woolridge argues that your financial risk adjustment produces the**

5   **illogical result that it increases the cost of equity for companies with high market-to-**

6   **book ratios, and decreases the cost of equity for companies with low market-to-book**

7   **ratios (Woolridge Rebuttal at 37). Is he correct?**

8   A.   No. Dr. Woolridge again fails to recognize that my financial risk adjustment

9   is not based on AmerenUE's market-to-book ratio. Rather, my financial risk adjustment is

10   based on the average market value capital structure percentages of my proxy group. Thus, a

11   link between AmerenUE's market-to-book ratio (which it does not have) and my

12   recommended cost of equity does not exist.

13   **III.   PROXY COMPANIES**

14   **Q.   What proxy companies do you recommend for the purpose of estimating**

15   **AmerenUE's cost of equity?**

16   A.   I recommend the large groups of proxy companies shown on Schedules JVW-

17   1 and JVW-2 of my Direct Testimony, and Rebuttal Schedule JVW-1 in my Rebuttal

18   Testimony.

19   **Q.   Why do you recommend using a large group of comparable risk**

20   **companies to estimate AmerenUE's cost of equity?**

21   A.   As explained in my earlier testimonies, I recommend using a large proxy

22   group of comparable risk companies because use of such a group increases the reliability of

23   my cost of equity estimates and is consistent with the U.S. Supreme Court mandate in the

1 *Hope* and *Bluefield* cases that utility investors should be allowed to earn a return

2 commensurate with returns they could achieve if they invested in other companies of

3 comparable risk.[5]

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

5   **Q.   Did you provide evidence in your testimony that your proxy companies**

6 **are reasonable proxies for the risk of investing in AmerenUE?**

7   A.   Yes. On pages 25-29 and Schedules JVW-1 and JVW-2 of my Direct

8 Testimony and pages 33-35 and Rebuttal Schedule JVW-2 of my Rebuttal Testimony, I

9 provided evidence that my proxy companies are reasonable proxies for the risk of investing

10 in AmerenUE.

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

12   A.   Yes. Mr. Hill claims that I should have screened my "sample group to

13 determine how much of the firm's revenue was derived through utility operations" (Hill

14 Rebuttal at 41).

15   **Q.   Did Mr. Hill screen his proxy companies to determine the percentage of**

16 **revenues they received from utility operations?**

17   A.   Yes. Mr. Hill chose to eliminate all companies with less than 70 percent

18 revenue from electric operations (Hill Direct at 27 – 28).

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

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

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[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.

1   Q.   How does the risk of Mr. Hill's proxy group of 15 companies compare to

2   the risk of the proxy groups of 34 and 32 electric companies you presented in your

3   direct and rebuttal testimonies?

4   A.   Mr. Hill's proxy electric group is somewhat more risky than my electric proxy

5   companies, having an average S&P bond rating in the range BBB to BBB- (see Vander

6   Weide Rebuttal at 33). In addition, three of Mr. Hill's proxy companies are below

7   investment grade, while each of my companies has an investment grade bond rating.

8   Q.   You have testified that your proxy companies are comparable in risk to

9   AmerenUE based on S&P bond ratings. Has Mr. Hill also testified that S&P bond

10   ratings verify that the risk of his recommended proxy group is similar to the risk of the

11   company whose cost of equity he is estimating?

12   A.   Yes. For example, in his Direct Testimony in New Hampshire, Mr. Hill used

13   S&P bond ratings to verify that his proxy group was comparable in risk to Public Service of

14   New Hampshire:

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

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

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1   **B.**   **It is preferable to use a large group of comparable risk companies**

2   **to estimate the cost of equity.**

3   **Q.**   **Since Mr. Hill's proxy group is somewhat more risky than your proxy**

4 **group and contains significantly fewer companies, are there any reasons why the**

5 **Commission should prefer your proxy group over Mr. Hill's?**

6   A.   Yes. It is preferable to use a larger proxy group of similar risk companies to

7 estimate the cost of equity because the cost of equity results for a single company or a small

8 group of companies is uncertain. However, the uncertainty in cost of equity results for a

9 small group of companies can be reduced by using a larger group of companies of

10 comparable risk. Since my proxy group is comparable in risk to AmerenUE and contains

11 more than twice as many companies as Mr. Hill's proxy group, my cost of equity results are

12 significantly more reliable than Mr. Hill's. Thus, the Commission should prefer my proxy

13 group to Mr. Hills.

14   **IV.**   **DCF ANALYSES**

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

16   A.   Yes. My original DCF analysis is described in my Direct Testimony on pp.

17 17 – 27, and my updated DCF analysis is described in my Rebuttal Testimony on p. 34.

18   **Q.**   **What cost of equity results did you obtain from your original and**

19 **updated DCF analyses?**

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

21 my updated DCF analysis produced a cost of equity result of 11.75 percent.

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

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

24 including my DCF results.

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

2   A.   The other parties criticize my DCF analysis because, in their opinions: (1) I

3   should have given greater weight to my DCF results because DCF cost of equity estimates

4   are more reliable than other cost of equity estimates; (2) I should not have relied on analysts'

5   growth forecasts; (3) sustainable growth rates better reflect investors' expectations than

6   analysts' growth forecasts; (4) I incorrectly used a quarterly DCF model; and (5) I should

7   have used equal weights to average my cost of equity results rather than market value

8   weights.

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

12   **Q.   Mr. Hill claims that "the more reliable DCF equity cost estimates before**

13   **the Commission in this proceeding uniformly indicate a cost of equity capital well below**

14   **10%." (Hill Rebuttal at 30.) Do you agree with his claim?**

15   A.   No. As noted above, my original DCF analysis produced a cost of equity

16   result of 10.7 percent, and my updated electric company DCF analysis produced a cost of

17   equity result of 11.75 percent. Neither of these results indicates a cost of equity below

18   10 percent.

19   **Q.   Is Mr. Hill's DCF estimate of AmerenUE's cost of equity "more reliable"**

20   **than other cost of equity estimates presented in this proceeding?**

21   A.   No. The DCF model requires an estimate of investors' expected growth for

22   each company in the analysis. To estimate this component of his DCF model, Mr. Hill

23   examines various growth rate data, including historical and forecasted retention growth,

24   historical and forecasted growth in earnings, dividends, and book value per share, and

1   analysts' earnings growth estimates. For Public Service of New Mexico ("PNM"), these

2   growth rate data range from *negative* 8.76 percent to *positive* 11.45 percent. After reviewing

3   these data, Mr. Hill simply observes that "investors can reasonably expect a sustainable

4   growth rate in the future of 5.75 percent for PNM" (Hill Direct Appendix C-5 – C-6). As

5   shown below in Table 1, Mr. Hill obtains a similarly wide range of growth rates for each of

6   his proxy companies, and, in each case, arbitrarily chooses a final growth rate that others

7   would be unable to predict from the data presented. Clearly, an analysis in which Mr. Hill

8   could have chosen *any* number in the range *negative* 8.76 percent to *positive* 11.45 percent,

9   and in which he chose a number that is unrelated in any mathematical way to the data

10   presented, cannot be termed to be "reliable."

11
12
13

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%

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

1   **Q.   Are Dr. Woolridge's or Mr. King's DCF estimates "more reliable" than**

2   **other cost of equity estimates presented in this proceeding?**

3   A.   No. Like Mr. Hill, Dr. Woolridge's DCF estimates depend on his growth rate

4   estimates which are highly subjective. In addition, Mr. King's DCF estimates are biased

5   downward by his selection of proxy companies. I discussed this problem with Mr. King's

6   analysis in my Rebuttal Testimony, Section V, A.

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

9   **Q.   Why do you rely on analysts' earnings growth forecasts when you apply**

10   **the DCF model?**

11   A.   I rely on analysts' earnings growth forecasts because my studies indicate that

12   analysts' growth forecasts are more highly correlated with stock prices than other growth

13   forecasts such as historical growth rates and sustainable growth rates. Furthermore, the

14   analysts' growth forecasts are objective indicators of investors' growth expectations for each

15   company rather than subjective estimates of each company's growth. In contrast, investors

16   have no means of knowing Mr. Hill's or Dr. Woolridge's opinions about each company's

17   growth prospects.

18   **Q.   Does Dr. Woolridge agree with your statistical studies of the relationship**

19   **between analysts' growth rates and stock prices?**

20   A.   No. Dr. Woolridge has four criticisms of my statistical study of the

21   relationship between analysts' growth rates and stock prices. First, he argues that my

22   statistical study is outdated and includes analysis of only 65 companies. Second, he argues

23   that my study is misspecified because I used a "linear approximation" to the DCF model

1   rather than a modified version of the DCF model. Third, he argues that I did not use both

2   historical and analysts' forecasted growth rates in the same regression. Fourth, he argues that

3   I did not perform any tests to determine if the difference between historic and projected

4   growth measures is statistically significant. (Woolridge Rebuttal at 17 – 18.)

5   **Q.   Have you updated your statistical analysis of the relationship between**

6   **analysts' growth rates and stock prices since the time of your original study?**

7   A.   Yes. As I reported in my Direct Testimony, my statistical study was updated

8   in August 2004. The updated results indicate that the analysts' growth rates continue to be

9   more highly correlated with stock prices than historical measures such as those employed by

10   Dr. Woolridge. The updated study included a final study group of 411 U.S. companies,

11   including 59 utilities, and incorporated data over the years 1991 – 2003.

12   **Q.   What is the significance of your result that the correlation between**

13   **analysts' forecasts and stock prices is significantly stronger than the correlation**

14   **between either historical growth measures and stock prices, or "sustainable" growth**

15   **measures and stock prices?**

16   A.   This result provides strong support for the conclusion that investors use

17   analysts' growth forecasts, rather than historical or "sustainable" growth forecasts, in making

18   stock buy and sell decisions. Since the DCF model requires the use of investors' growth

19   rates, it also provides strong support for the conclusion that analysts' growth forecasts should

20   be used to estimate the growth component of the DCF model.

1 **Q.   Do you agree with Dr. Woolridge's criticism that your DCF model is**

2 **misspecified because you used a "linear approximation" to the DCF model rather than**

3 **a modified version of the DCF model?**

4 A.   No. Most regression analyses are based on the assumption that the

5 relationship between the variables being studied is linear. As part of my studies, I tested

6 whether the linear assumption was sufficiently close to provide reliable estimates of the

7 model parameters. Applying a first order Taylor-series approximation to the DCF equation, I

8 found that the first order, or linear, approximation was sufficiently close to the true equation

9 to justify using linear regression analysis to study the relationship between price/earnings

10 ratios and growth rates.

11 **Q.   Why did you not use a combination of historical and analysts' growth**

12 **rates in the same regression?**

13 A.   I did not use a combination of historical and analysts' growth rates in the same

14 regression because there are an infinite number of such combinations which could be tested.

15 My studies indicate that the relationship between analysts' forecasts and stock prices is so

16 strong compared to the relationship between historical growth rates and stock prices that

17 there would be little advantage to combining historical growth rates with analysts' forecasts

18 to predict stock prices.

19 **Q.   Is there a statistically significant difference between historical and**

20 **projected growth measures in explaining stock prices in your statistical study?**

21 A.   Yes. The difference in performance of historical and projected growth rates is

22 both statistically significant and dramatic.

32

1   **Q.   On pages 10 – 13 of his Rebuttal Testimony,[8] Dr. Woolridge discusses his**

2   **study of the relationship between analysts' forecasted growth rates and subsequently**

3   **achieved growth rates. Did Dr. Woolridge provide the underlying data and work**

4   **papers for this study along with his testimony?**

5   A.   No, he did not.[9]

6   **Q.   Although you have had no opportunity to examine Dr. Woolridge's data,**

7   **do you have any concerns with his study based on the description he provided in his**

8   **testimony?**

9   A.   Yes. First, Dr. Woolridge's study only covers the period from 1984 to 1999

10   and hence does not reflect the many regulatory changes in financial markets that have

11   occurred since the market collapse of 2000. Second, although it is impossible to know

12   without being able to examine Dr. Woolridge's data, Dr. Woolridge apparently makes no

13   attempt to screen his data for companies that have only one or two analysts' growth forecasts

14   or for companies that have outlier growth forecasts. Although my studies indicate that

15   analysts' growth forecasts are highly correlated with stock prices for large publicly-traded

16   companies that are followed by at least three analysts, they may not be highly correlated for

17   many of the small companies contained in the I/B/E/S data base that have fewer than three

18   analysts' growth estimates and that have outlier growth forecasts. Third, Dr. Woolridge's

19   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.

1   and subsequent realized earnings in the period up to and beyond his study period.[10] Fourth,

2   Dr. Woolridge fails to recognize that his findings may be the result of companies taking

3   unexpected accruals, or asymmetries in the distribution of forecast errors, rather than from

4   problems in the analysts' forecasts.[11]

5   **Q.   Dr. Woolridge also discusses the results of his study of the relationship**

6   **between analysts' forecasts for utilities and the utilities' subsequent achieved earnings**

7   **growth rates. Do you have any comments on his study?**

8   A.   Yes. First, Dr. Woolridge has misspecified the time frame of his analysts'

9   earnings growth forecasts. In his study, Dr. Woolridge compares an analysts' forecast made

10   in a particular quarter to the company's realized earnings growth rate in the same quarter four

11   years hence. In making this comparison, Dr. Woolridge fails to recognize that the time frame

12   of the analysts' growth forecast is an indefinite, long-run period that may differ from one

13   analyst to another. Dr. Woolridge has provided no evidence that analysts' growth estimates

14   were intended to forecast actual results for a period exactly four years hence. Second, Dr.

15   Woolridge has not distinguished between normalized and non-normalized earnings. The

16   analysts' forecasts are generally intended to be normalized earnings growth forecasts,

17   meaning that they are forecasts of earnings in the absence of extraordinary events and one-

18   time write-offs. It is likely that a good deal of the forecast deviations in Dr. Woolridge's

19   sample are due to extraordinary events and one-time write-offs rather than to problems with

20   the analysts' forecasts of normalized earnings.

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[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.

1   **Q.   Even if there were no problems with Dr. Woolridge's studies of**

2   **forecasted growth rates and subsequent actual growth rates, do his studies provide any**

3   **support for his conclusion that analysts' growth rates should not be used to estimate the**

4   **growth component of the DCF model?**

5   A.   No. The DCF model requires the growth rates of investors, whether or not

6   these growth rates subsequently turn out to be correct. My studies indicate that analysts'

7   growth rates are the best surrogate for investors' growth rates because they are more highly

8   correlated with stock prices than other growth rates.

9   **C.   Sustainable growth rates do not reflect investors' growth**
10   **expectations.**

11   **Q.   Is Mr. Hill correct when he alleges that an article by Dr. Gordon supports**

12   **Mr. Hill's sustainable growth rate analysis? (Hill Rebuttal at 40.)**

13   A.   No. The Gordon article specifically compares analysts' growth rate forecasts

14   and sustainable growth rate forecasts in terms of their ability to predict stock prices. The

15   article concludes that the analysts' growth rate forecasts are superior to the sustainable

16   growth rate forecasts.

17   **Q.   Would it be possible to test Mr. Hill's growth rate forecasts to determine**

18   **whether they are related to stock prices?**

19   A.   No. As discussed above, Mr. Hill's growth rate forecasts can not be tested

20   because it is impossible to reproduce Mr. Hill's growth rates—only he knows at any point

21   time what growth rate forecast he will assign to a company.

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

3   **Q.   Has Mr. Hill changed his position on measuring sustainable growth**

4   **rates?**

5   A.   Yes. Mr. Hill measures sustainable growth as the sum of his estimate of

6   internal growth and his estimate of external growth. Mr. Hill's formula for estimating

7   external growth is shown on Exhibit__(SGH-1), Schedule 5, page 1 of 4, and it is different

8   from the formula he has used in prior testimony.[12]

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

12   **Q.   Why did you use a quarterly DCF model to estimate the DCF cost of**

13   **equity?**

14   A.   I used a quarterly DCF model to estimate the DCF cost of equity because the

15   companies in my proxy groups pay dividends quarterly, and as explained in my Direct

16   Testimony and Appendix 1 to my Direct Testimony, the quarterly DCF model is the only

17   DCF model that can be derived from the assumption that dividends are paid quarterly.

18   **Q.   Why does Dr. Woolridge disagree with your application of the quarterly**

19   **DCF model?**

20   A.   Dr. Woolridge argues first that an early proponent of the DCF model,

21   Dr. Myron Gordon, has testified before the FCC that "the appropriate dividend yield

22   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).

1   multiplied by four." (Woolridge Rebuttal at 8 - 9.) Second, Dr. Woolridge argues that

2   Professor Bower has argued that the conventional DCF calculation produces a downwardly-

3   biased estimate of the cost of equity, but that the annual DCF model provides the most

4   appropriate estimate of the utility's required return when the resulting required rate of return

5   is applied to a forward-looking rate base. (Woolridge Rebuttal at 9.)

6   **Q.   Is the fact that Dr. Gordon testified in favor of an annual DCF model a**

7   **reasonable justification for use of the annual DCF model in this proceeding?**

8   A.   No. Although Dr. Gordon was certainly a major early proponent of the DCF

9   model, this does not imply that Dr. Gordon is correct in his arguments regarding the quarterly

10   DCF model. As shown in my Appendix 1 (filed with my Direct Testimony), there can be no

11   doubt that when dividends are paid quarterly, the quarterly DCF model must be used to

12   estimate the cost of equity.

13   **Q.   Do you agree with Dr. Bower's statement that the annual DCF**

14   **calculation is a downwardly-biased estimate of the market cost of equity when**

15   **companies pay dividends quarterly?**

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

17   in this proceeding.

18   **Q.   Do you agree with Dr. Bower's argument that it is appropriate to apply**

19   **the annual DCF model to a utility whose rate base is measured over a forward-looking**

20   **period?**

21   A.   No. I believe that it is important to measure the cost of equity correctly, as I

22   have done in this proceeding. Once the cost of equity is estimated correctly, the Commission

1 should ask the second question, "Will the company be able to earn its allowed rate of return

2 when this cost of equity is applied to a forward-looking rate base?"

3 **Q. Mr. Hill also criticizes your DCF model on the grounds that your DCF**

4 **model incorrectly assumes that dividends increase each quarter rather than annually.**

5 **Has Mr. Hill correctly characterized the assumptions of your DCF model?**

6 A. No. As described in Appendix 1 in my Direct Testimony, my quarterly DCF

7 model can only be derived from the assumptions that dividends are paid quarterly but

8 increase just once each year. The quarterly DCF model I present in my testimony cannot be

9 derived under the assumption that dividends increase each quarter.

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

12 **Q. Why did you use market value weights to calculate the average DCF**

13 **result for your proxy companies?**

14 A. I used market value weights to calculate the average DCF result for my proxy

15 companies because the purpose of my cost of equity analyses is to measure investors'

16 expected rate of return on a portfolio of electric utility stocks. The expected rate of return on

17 a portfolio of stocks is best calculated using market value weights for the companies in the

18 portfolio.

19 **Q. Dr. Woolridge asserts that your use of market value weights increases the**

20 **impact of non-comparable companies on your overall result (Woolridge Rebuttal at 7).**

21 **Do you agree with his assertion?**

22 A. No. The evidence I presented in my direct and rebuttal testimonies indicates

23 that a utility's percentage of revenues from regulated electric service has no impact on its risk

1   as measured by bond ratings. Thus, the companies Dr. Woolridge is concerned about are, in

2   fact, comparable in risk to the other companies in the proxy group.

3   V.   **RISK PREMIUM ANALYSES**

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

5   A.   The risk premium approach is based on the principle that investors expect to

6   earn a return on an equity investment in AmerenUE that reflects a "premium" over and above

7   the return they expect to earn on an investment in a portfolio of long-term bonds. This equity

8   risk premium compensates equity investors for the additional risk they bear in making equity

9   investments versus bond investments. Using the risk premium approach, the cost of equity is

10   given by the following equation: *cost of equity = interest rate plus risk premium.*

11   **Q.   How did you measure the required risk premium on an equity investment**

12   **in AmerenUE?**

13   A.   I used two methods to estimate the required risk premium, the ex post risk

14   premium method and the ex ante risk premium method. My ex post risk premium method

15   measures the required risk premium on an equity investment in AmerenUE from historical

16   data on the experienced returns on stock and bond investments from 1937 to the present. My

17   ex ante risk premium method measures the required return from studies of the DCF-expected

18   return on comparable groups of utilities over the last seven or eight years compared to

19   interest rates on A-rated utility bonds.

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

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

22   A.   Yes. Mr. Hill has three criticisms of my ex post risk premium analysis. First

23   he claims that risk premiums have trended downward over time. Second, he claims that my

1   ex post risk premiums are so volatile that they cannot be reliably used to forecast future rates

2   of return. Third, he claims that I should have used current interest rates rather than

3   forecasted interest rates to measure the interest rate component of the risk premium method.

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

6   **Q.   Is Mr. Hill correct when he argues that there has been a significant**

7   **downward trend in risk premiums over time?**

8   A.   No. As discussed in my Direct Testimony at page 35, I tested whether there

9   were a significant downward trend in the equity risk premium over my study period by

10   regressing my ex post risk premium data against time. As I show in my testimony, my

11   statistical analysis reveals that there is no significant downward trend in risk premiums over

12   the period of my study.

13   **Q.   Do you have any other evidence that there has been no significant**

14   **downward trend in risk premiums over time?**

15   A.   Yes. Ibbotson Associates also tests whether there are significant trends in risk

16   premium results over time, concluding that there are no trends in risk premiums over time

17   (see Vander Weide Direct at 35).

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

20   **Q.   Do you agree with Mr. Hill's criticism that historical risk premia are too**

21   **volatile to provide reliable information regarding the cost of equity?**

22   A.   No. Although there is high variability in year-to-year historical returns, the

23   average variability is significantly reduced by using the longest period of time for which

24   reliable data are available. According to statistical theory, the variability in the average ex

1   post return over a long period of time is equal to the variability in the annual return divided

2   by the square root of *n*, where *n* is the number of years in the study. Thus, reliable

3   information regarding the cost of equity can be obtained from considering both the average

4   return and the average risk premium over a long period of time rather than considering the

5   returns and risk premiums in each year.

6   **Q.   Do you agree with Mr. Hill's claim that you should have used current**

7   **interest rates rather than forecasted interest rates to measure the expected ex post risk**

8   **premium?**

9   A.   No. It is reasonable to use the forecasted 2007 interest rate in my ex post risk

10   premium method because the rates determined in this proceeding will not become permanent

11   until mid-2007.

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

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

14   A.   Mr. Hill claims that: (1) cost of equity estimates from the 1999 – 2006 period

15   do not represent investors' current expectations; (2) my ex ante regression results are

16   inconsistent with my ex post regression results; and (3) I should have used a simple

17   regression of the risk premium on interest rates rather than an adjusted regression (Hill

18   Rebuttal at 53 - 54).

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

3   Q.   Does Mr. Hill's criticism that cost of equity estimates from the period

4   1999 – 2006 cannot be used to represent investors' current expectations correctly

5   characterize your ex ante risk premium studies?

6   A.   No. I am not using cost of equity estimates from the period 1999 – 2006 to

7   represent investors' current expectations. Rather, I am using the relationship between the

8   risk premium and interest rates over this period of time to forecast the future risk premium.[13]

9   Q.   Why do you believe that your ex ante risk premia over that period of time

10 can be used to forecast the future required risk premium?

11 A.   I believe that my ex ante risk premium over this period of time can be used in

12 conjunction with interest rates to forecast the future risk premium because the ex ante risk

13 premium generally increases when interest rates decline; and this relationship can be used to

14 forecast the future risk premium.

15
16

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

17 Q.   Do you agree with Mr. Hill's argument that your ex ante risk premium

18 regression results are inconsistent with your ex post regression results?

19 A.   No. Mr. Hill fails to recognize that my ex ante risk premium regression

20 results are not comparable to my ex post risk premium regression results because my ex ante

21 risk premium regressions relate the ex ante risk premium to interest rates, whereas the ex post

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[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.

1   regression relates the ex post risk premium to time. It is not inconsistent for there to be no

2   relationship between the risk premium and time, while there is a relationship between the risk

3   premium and interest rates.

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

6   Q.   **Why did you use an adjusted regression equation to forecast the future**

7   **risk premium rather than the simple regression analysis you also report in your work**

8   **papers?**

9   A.   I used the adjusted regression analysis to forecast the future risk premium

10   because my simple regression results are characterized by the presence of auto correlation in

11   the residuals. In the presence of auto correlation in the residuals, the estimated regression

12   coefficients are highly unreliable estimates of the actual relationship between the risk

13   premium and interest rates. My adjusted regression equation is based on a commonly used

14   procedure for eliminating the residual auto correlation. Thus, my adjusted regression results

15   are significantly more reliable than my simple regression results.

16   Q.   **Mr. Hill expresses concern with the relatively low "r-squared" values**

17   **from your adjusted regression. Is his concern justified?**

18   A.   No. The important statistical variable for measuring the relationship between

19   the risk premium and interest rates is the t-statistic, not the r-squared statistic. The high

20   values of the t-statistic shown in my work papers demonstrate that the relationship between

21   the risk premium and interest rates is significant.

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

2   **Q.   What are Dr. Woolridge's basic criticisms of your risk premium**

3   **analyses?**

4   A.   Dr. Woolridge argues that: (1) my use of the yield to maturity on A-rated

5   utility bonds inflates the required return on equity; and (2) there are a number of flaws in

6   using historical returns to estimate expected equity risk premiums.

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

10   **Q.   Does Dr. Woolridge have any criticisms of your use of the yield to**

11   **maturity on A-rated utility bonds to estimate the interest rate component of the risk**

12   **premium approach?**

13   A.   Yes. Dr. Woolridge argues that my use of the yield to maturity on A-rated

14   utility bonds inflates the required return on equity because long-term utility bonds are not

15   risk free, that is, they are subject to both interest rate risk and credit risk (Woolridge Rebuttal

16   at 33).

17   **Q.   Do you agree with Dr. Woolridge's criticism of your use of the yield to**

18   **maturity on A-rated utility bonds to estimate the interest rate component of the risk**

19   **premium approach?**

20   A.   No. Dr. Woolridge fails to recognize that the risk premium approach does not

21   require that the interest rate be "risk free." Indeed, the only requirement of the risk premium

22   approach is that the same interest rate be used to estimate the interest rate component as is

23   used to estimate the risk premium component. Since the risk premium approach suggests

24   that the cost of equity equals (the interest rate) plus (the required return on equity minus the

1   interest rate), the cost of equity should be approximately the same in a risk premium analysis,

2   no matter what interest rate is used as the benchmark interest rate. Thus, use of the interest

3   rate on A-rated utility bonds in a risk premium analysis will produce a higher interest rate

4   component than use of a government bond interest rate, but this difference will be offset by

5   the correspondingly lower risk premium.

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

8   Q.   **Does Dr. Woolridge agree with your use of historical stock and bond**

9   **returns to estimate the equity risk premium?**

10   A.   No. Dr. Woolridge states:

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

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

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

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

25   Q.   **Do you agree with Dr. Woolridge's statement that historic bond returns**

26   **are biased downward because of capital losses suffered by past bond investors?**

27   A.   No. Because of capital gains and losses, historic bond returns may be higher

28   or lower than what investors expected at the time they purchased the bonds. During the

29   period since 1982, for example, historic bond returns have been biased upward as a measure

1   of expectancy because of the large capital gains achieved by bondholders over this period.

2   However, over the entire period since 1926, capital gains and losses on bonds have

3   approximately offset each other, and consequently there is no significant bias as a result from

4   either capital gains or losses.

5   **Q.   What is the difference between an arithmetic and a geometric mean**

6   **return?**

7   A.   An arithmetic mean return is an additive return that is calculated by summing

8   the achieved return in each time period and dividing the total by the number of periods. In

9   contrast, the geometric mean return is a multiplicative return that is calculated in two steps.

10   First, one calculates the product of (1 plus the return) in each period of the study. Second,

11   one calculates the nth root of this product and subtracts 1 from the result. Thus, if there are

12   two periods, and r_1 and r_2 are the returns in periods one and two, respectively, the arithmetic

13   mean is calculated from the equation: $a_m = (r_1 + r_2) \div 2$. The geometric mean is calculated

14   from the equation,

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

16   **Q.   Please describe Dr. Woolridge's issue with regard to geometric versus**

17   **arithmetic mean returns.**

18   A.   Dr. Woolridge believes that my study is biased because I calculated the

19   expected risk premium using the arithmetic mean of past returns, whereas he believes I

20   should have calculated the expected risk premium using the geometric mean of past returns.

1   **Q.   Is Dr. Woolridge's criticism valid?**

2   A.   No. As Ibbotson Associates explains in Stocks, Bonds, Bills, and Inflation

3   Valuation Edition 2006 Yearbook, the arithmetic mean return is the best approach for

4   calculating the return investors expect to receive in the future. As Ibbotson Associates states:

5   The equity risk premium data presented in this book are arithmetic
6   average risk premia as opposed to geometric average risk premia.
7   The arithmetic average equity risk premium can be demonstrated
8   to be most appropriate when discounting future cash flows. For
9   use as the expected equity risk premium in either the CAPM or
10   the building block approach, the arithmetic mean or the simple
11   difference of the arithmetic means of stock market returns and
12   riskless rates is the relevant number. This is because both the
13   CAPM and the building block approach are additive models, in
14   which the cost of capital is the sum of its parts. The geometric
15   average is more appropriate for reporting past performance, since
16   it represents the compound average return. [Ibbotson Associates,
17   2006 Yearbook, Valuation Edition, p. 77.]

18   A discussion of the importance of using arithmetic mean returns in the context of CAPM or

19   risk premium studies was included in my Direct Testimony, Schedule JVW-7.

20   **Q.   Why does Dr. Woolridge believe your historical returns are**

21   **"unattainable"? (Woolridge Rebuttal at 25.)**

22   A.   Dr. Woolridge argues that the historical results are "unattainable" because the

23   stock indices required to calculate historical stock returns assume monthly portfolio

24   rebalancing, and monthly rebalancing would greatly increase transaction costs.

25   **Q.   Is Dr. Woolridge's argument correct?**

26   A.   No. Dr. Woolridge's argument is based on his incorrect assumption that

27   investors would have to constantly rebalance their portfolios to achieve the weighting of the

28   market index. However, investors can achieve the market weighting simply by purchasing a

29   market index, which is widely available and inexpensive.

1   **Q.**   **Dr. Woolridge also criticizes your ex post risk premium study because it**

2   **is based on "biased estimates of stock returns." (Woolridge Rebuttal at 25.) Is he**

3   **correct?**

4   **A.**   No. Dr. Woolridge bases his allegation on an article by Richard Roll in the

5   *Journal of Financial Economics* that does not apply to the returns in my ex post risk

6   premium study. The Roll paper demonstrates that there is possibly a bias associated with

7   portfolio rebalancing when there is serial correlation in the returns over time. I have

8   demonstrated that my ex post risk premium returns are not characterized by serial correlation.

9   Hence, Dr. Woolridge's criticism based on a reference to the Roll paper is unfounded.

10   **Q.**   **Do you agree with Dr. Woolridge's criticism that your ex post risk**

11   **premium study is characterized by "survivorship bias" (Woolridge Rebuttal at 26)?**

12   **A.**   No. Survivorship bias refers to problems that might arise when data for

13   companies that have failed are excluded from the sample. However, with regard to the U.S.

14   markets that I study, survivorship bias is not a major issue. First, over the period 1937 to the

15   present, there have been very few companies in the S&P 500 and the S&P Utilities that have

16   failed. Second, the S&P 500 includes the return on a stock until the day it is dropped from

17   the index, and the effect of a company being dropped from the S&P 500 is generally

18   anticipated by the market well in advance of the delisting. Thus, survivorship is not a

19   material issue with respect to U.S. stocks.

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

21   **A.**   Dr. Woolridge uses the term "peso problem" to refer to the fact that U.S.

22   investors have generally earned higher returns on stock investments than investors in other

23   countries because the U.S. economy has not suffered many of the same economic calamities

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1   as the economies of other countries. This criticism of the use of U.S. stock returns in risk

2   premium studies might be appropriate if one were attempting to estimate the expected rates

3   of return on non-U.S. stocks, especially stocks in countries that could suffer or have suffered

4   economic calamities. However, for U.S. stocks, since there is no indication that the U.S. will

5   suffer the economic calamities of other countries, such as hyper-inflation or military

6   invasion, there is no reason why the returns on U.S. stocks would be biased upward. As

7   Ibbotson Associates states with respect to "survivorship bias" and the closely-related "peso

8   problem":

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

14   **Q.   On page 27 of his testimony, Dr. Woolridge criticizes your use of**

15   **historical risk premiums on the grounds that "market conditions today are significantly**

16   **different than in the past." What is the basis of Dr. Woolridge's concern regarding**

17   **"current market conditions"?**

18   A.   Dr. Woolridge is concerned that, since price/earnings ratios are high, and

19   interest rates are at historic lows, stock returns in the future may be significantly less than

20   they have been in the past. (Woolridge at 27.)

21   **Q.   Is the fact that price/earnings ratios are high, and interest rates are low, a**

22   **reasonable basis on which to reject the use of historical risk premium data?**

23   A.   No. While price/earnings ratios are high in relation to their long-run historic

24   average, there is no compelling evidence that they are unreasonably high in light of current

25   interest rate conditions in the capital markets. Furthermore, Dr. Woolridge fails to

1   understand that my study involves the difference between stock returns and bond returns, and

2   bond returns are likely to be more sensitive to rising interest rates than stock returns. Thus, if

3   anything, low interest rates, according to his logic, should imply that risk premiums would

4   increase in the future, not decrease.

5   **Q.   Do you agree with Dr. Woolridge's assertion that bond returns have**

6   **become more volatile than stock returns (Woolridge Rebuttal at 28)?**

7   A.   No. Ibbotson Associates provides ample evidence that stock returns continue

8   to be significantly more volatile than bond returns (see Ibbotson Associates *Stocks, Bonds,*

9   *Bills and Inflation, 2006 Yearbook*, at 112). In addition, Dr. Woolridge fails to acknowledge

10   that much of the measured volatility in bond returns is due to the general decline in interest

11   rates since 1982. This decline in interest rates has made bonds less risky, not more risky, as

12   Dr. Woolridge suggests.

13   **Q.   Do you agree with Dr. Woolridge's claim that real interest rates have**

14   **increased in recent years (Woolridge Rebuttal at 29)?**

15   A.   No. The exhibit that Dr. Woolridge himself presents in Exhibit__(JRW-9),

16   page 4 of 4, suggests that real interest rates have declined in recent years from the highs in

17   the 1980s.

18   **Q.   Dr. Woolridge's final criticism of your ex post risk premium study is that**

19   **the equity risk premium has declined in recent years. Did you present any evidence in**

20   **your Direct Testimony relating to this issue?**

21   A.   Yes. I presented evidence on pp. 35 – 36 of my Direct Testimony that there

22   has been no significant trend in equity risk premiums over time. Since the time of my Direct

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1   Testimony, Ibbotson Associates has published their 2006 Yearbook, in which they agree with

2   my finding that there has been no significant trend in equity risk premiums over time:

3   The estimate of the equity risk premium depends on the length of
4   the data series studied. A proper estimate of the equity risk
5   premium requires a data series long enough to give a reliable
6   average without being unduly influenced by very good and very
7   poor short-term returns. When calculated using a long data series,
8   the historical equity risk premium is relatively stable.
9   Furthermore, because an average of the realized equity risk
10   premium is quite volatile when calculated using a short history,
11   using a long series makes it less likely that the analyst can justify
12   any number he or she wants.

13   ...The 80-year period starting with 1926 is representative of what
14   can happen: it includes high and low returns, volatile and quiet
15   markets, war and peace, inflation and deflation, and prosperity
16   and depression. Restricting attention to a shorter historical period
17   underestimates the amount of change that could occur in a long
18   future period. Finally, because historical event-types (not specific
19   events) tend to repeat themselves, long-run capital market return
20   studies can reveal a great deal about the future. Investors probably
21   expect "unusual" events to occur from time to time, and their
22   return expectations reflect this. [*SBBI Valuation Edition 2006*
23   *Yearbook*, pp. 82—83.]

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

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

26   A.   Yes. Mr. King claims that my risk premium analyses should be rejected

27   because: (1) my ex post risk premium results are too variable to provide cost of equity

28   estimates; (2) my realized rates of return do not equate to expected rates of return; and (3) my

29   ex ante risk premium analysis is self contradictory. However, I have addressed the first two

30   issues in my surrebuttal to Mr. Hill's and Dr. Woolridge's risk premium comments.

31   **Q.   Do you agree with Mr. King's criticism that your ex ante risk premium**

32   **results are self-contradictory?**

1   A.   No. My ex ante risk premium is not self-contradictory. Rather than using a

2   DCF analysis for a single month, it uses knowledge of the relationship between DCF results

3   and interest rates over a 7-year period to forecast the expected return on equity. As reported

4   in my Direct Testimony, the expected return on equity, based on the normal relationship

5   between DCF results and interest rates, is 11 percent.

6   **VI.   CAPM ANALYSES**

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

8   A.   The CAPM requires an estimate of the risk-free rate, the company-specific

9   risk factor or beta, and the expected return on the market portfolio. For my estimate of the

10   risk-free rate, I used the forecasted yield to maturity on long-term Treasury bonds of

11   5.39 percent, using data from Blue Chip. For my estimate of the company-specific risk, or

12   beta, I used the average 0.90 Value Line beta for my comparable electric companies and the

13   average 0.88 Value line beta for my natural gas companies. For my estimate of the expected

14   risk premium on the market portfolio, I used two approaches. First, I estimated the risk

15   premium on the market portfolio from the difference between the arithmetic mean return on

16   the S&P 500 and the income return on 20-year Treasury bonds as reported by Ibbotson

17   Associates' *2006 Yearbook,* 7.1 percent. Second, I estimated the risk premium on the market

18   portfolio from the difference between the DCF cost of equity for the S&P 500, 13.75 percent,

19   and the forecasted yield to maturity on 20-year Treasury bonds, 5.39 percent. My second

20   approach produced a risk premium equal to 8.35 percent.

21   **Q.   Have electric utility betas increased since the time of your Direct**

22   **Testimony?**

1   A.   Yes. As shown in my Rebuttal Testimony, Rebuttal Schedule JVW-2, the

2   average Value Line beta for the electric companies is 0.97. When the updated Value Line

3   beta for the electric companies is included in the CAPM equation along with a long-term

4   Treasury bond yield of 4.9 percent and the Ibbotson market risk premium, the CAPM

5   produces a cost of equity equal to 11.8 percent.

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

7   A.   Mr. Hill believes that it is unreasonable for me to: (1) present a CAPM

8   analysis in this proceeding because I only presented a CAPM analysis in three of the 17

9   testimonies I provided for his review; (2) use a DCF analysis to estimate the risk premium on

10   the market portfolio in this proceeding because the DCF analysis produces a higher risk

11   premium than my historical risk premium analysis; and (3) use Value Line betas now, when I

12   testified in 1998 that Value Line betas failed to reflect the move to deregulation. Mr. King

13   contends that: (1) other regulatory agencies agree with his rejection of the CAPM, and (2) I

14   have "cherry-picked" the list of companies used in my DCF-based CAPM analysis.

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

17   **Q.   Why did you only present a CAPM analysis in several of the testimonies**

18   **Mr. Hill reviewed?**

19   A.   As noted in my Direct Testimony, there is a substantial body of evidence that

20   the CAPM only provides reasonable cost of equity estimates for companies whose estimated

21   betas are close to 1.0. Specifically, this evidence suggests that the CAPM underestimates the

22   cost of equity for a company whose beta is significantly less than 1.0, and overestimates the

23   cost of equity for a company whose estimated beta is significantly greater than 1.0. Since

1   electric utility betas were significantly less than 1.0 during the time I estimated the cost of

2   equity in the testimonies Mr. Hill cites, it was reasonable for me to rely on other cost of

3   equity methods in those cases. Now that electric utility betas are close to 1.0, it is reasonable

4   to use the CAPM to estimate the cost of equity.

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

7   **Q.   Why did you use a DCF analysis in addition to historical data to estimate**

8   **the risk premium on the market portfolio?**

9   A.   I used a DCF analysis in addition to historical risk premium data to estimate

10   the risk premium on the market portfolio because witnesses such as Mr. Hill have previously

11   criticized the use of historical risk premium data as not being representative of future

12   expected risk premiums. Since the DCF model is forward looking, it provides an alternative

13   estimate of the risk premium based on current market data rather than experienced returns.

14   In addition, I now have access to databases that allow me to perform a DCF analysis on the

15   market portfolio in a timely manner, whereas for many earlier years obtaining the data to

16   perform such an analysis was far more labor intensive.

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

18   **deregulation"?**

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

20   Q. Are Value Line betas good estimates of expected future risk for
21   the electric energy companies?

22   A. No. The Value Line betas underestimate the expected future
23   risk for the electric energy companies because Value Line betas
24   are calculated from historical data that do not reflect the increased
25   risk of investing in such companies during this period of increased
26   competition and industry restructuring. However, since there are

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

4 Thus, although I mentioned that Value Line betas, calculated from historical data, do not

5 reflect industry restructuring, I nonetheless used them in my CAPM analysis.

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

7   **Q. In his Rebuttal Testimony, Mr. Hill places great emphasis on the need to**

8 **be consistent in the application of cost of equity methodologies. Has Mr. Hill been**

9 **consistent in his approach to estimating the CAPM cost of equity?**

10   A. No. Mr. Hill has changed his approach to estimating the CAPM cost of equity

11 in at least four ways. First, now that interest rates are expected to increase, Mr. Hill argues

12 against the use of forecasted interest rates to estimate the risk-free rate component of the

13 CAPM.[14] His current recommendation is inconsistent with his prior testimony that

14 forecasted rates, as measured by the rate on T-bill futures contracts, should be used to

15 estimate the risk-free rate component of the CAPM.[15] At the time Mr. Hill made the

16 recommendation to use forecasted T-bill rates, forecasted rates were lower than current

17 interest rates.

18   Second, Mr. Hill now recommends that the yield on long-term Treasury bonds

19 ("T-bonds") be used to estimate the risk-free rate component of the CAPM, whereas in prior

20 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).

1   be used to estimate the risk-free rate.[16] In this proceeding, Mr. Hill's use of the yield on

2   long-term T-bonds reduces his estimate of the cost of equity. In prior testimonies, Mr. Hill's

3   use of the yield on short-term T-bills also reduced his estimate of the cost of equity.

4   Third, in this proceeding, Mr. Hill recommends that the geometric mean risk

5   premium be used to estimate the market risk premium, whereas in earlier testimonies, Mr.

6   Hill has recommended giving equal weight to the arithmetic and geometric mean risk

7   premiums.[17] Mr. Hill's recommendation in this proceeding to rely only on the geometric

8   mean risk premium reduces his CAPM cost of equity estimate.

9   Fourth, in this proceeding Mr. Hill claims that Value Line betas for electric

10 utilities overstate the risk of investing in electric utilities because electric utility betas are

11 relatively high, whereas Mr. Hill did not claim that the CAPM underestimated the cost of

12 equity when electric utility betas were relatively low.[18]

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

15 **Q.   Do you agree with Mr. King's claim that other regulatory agencies have**

16 **rejected use of the CAPM?**

17 A.   No. Some regulatory agencies do not rely on the CAPM to estimate the cost

18 of equity, and others do rely on the CAPM. In addition, Mr. King fails to note that, although

19 the Surface Transportation Board does not rely on the CAPM, its DCF model produces a cost

20 of equity estimate for the regulated railroads equal to 15.18 percent, approximately 550 basis

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[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.

1   points higher than Mr. King's DCF estimate in this proceeding. Further, Mr. King fails to

2   note that the Surface Transportation Board uses a market value capital structure to determine

3   the overall cost of capital for the railroads. In addition, Mr. King fails to recognize that the

4   FCC's Wireline Competition Bureau used only the CAPM to estimate the cost of capital,

5   arriving at a cost of equity estimate of 13.068 percent; and the Bureau also correctly

6   estimated the weighted average cost of capital using a market value capital structure.

7   **Q.   Did you "cherry-pick" the companies you used to estimate the market**

8   **risk premium in your DCF-based CAPM analysis?**

9   A.   No. I simply used the dividend-paying companies in the S&P 500 (since one

10   cannot apply a DCF model to a company that does not pay a dividend). The S&P 500

11   companies are selected by Standard & Poor's, not me; and the S&P 500 is commonly used as

12   a proxy for the market as a whole.

13   **Q.   Does this conclude your Surrebuttal Testimony?**

14   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)	Case No. ER-2007-0002
for Electric Service Provided to)	
Customers in the Company's Missouri)	
Service Area.	

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, Ph.D.

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

_____
Scott H Ashworth   Notary Public

My commission expires: 1/28/2012