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Witness:	*Stephen G. Hill*
Sponsoring Party:	*MoPSC Staff*
Type of Exhibit:	*Rebuttal Testimony*
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REBUTTAL TESTIMONY

OF

STEPHEN G. HILL

ON BEHALF OF

THE MISSOURI PUBLIC SERVICE COMMISSION

UNION ELECTRIC COMPANY
d/b/a AmerenUE

CASE NO. ER-2008-0318

Jefferson City, Missouri
October 2008

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REBUTTAL TESTIMONY OF

STEPHEN G. HILL

UNION ELECTRIC COMPANY
d/b/a AmerenUE

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REBUTTAL TESTIMONY OF

STEPHEN G. HILL

UNION ELECTRIC COMPANY
d/b/a AmerenUE

CASE NO. ER-2008-0318

Q. PLEASE STATE YOUR NAME, OCCUPATION AND ADDRESS.

A. My name is Stephen G. Hill. I am self-employed as a financial consultant, and principal of Hill Associates, a consulting firm specializing in financial and economic issues in regulated industries. My business address is P.O. Box 587, Hurricane, West Virginia, 25526 (e-mail: hillassociates@gmail.com).

Q. ARE YOU THE SAME STEPHEN G. HILL THAT TESTIFIED PREVIOUSLY IN THIS PROCEEDING ON BEHALF OF THE MISSOURI PUBLIC SERVICE COMMISSION STAFF REGARDING RATE OF RETURN ISSUES?

A. Yes, I am.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY AT THIS TIME?

A. I will respond to the Direct Testimony of Union Electric Company d/b/a AmerenUE (AmerenUE, or the Company) witness, Dr. Roger Morin, regarding his estimate of the cost of common equity capital for the Company.

EXECUTIVE SUMMARY

Q. PLEASE SUMMARIZE YOUR REBUTTAL TESTIMONY.

A. In his Direct Testimony submitted in this proceeding, Dr. Morin has relied on the results of risk premium analyses (CAPM and Risk Premium), which are less reliable as primary indicators of the cost of equity capital, as well as DCF analyses. The results of

Dr. Morin's historical risk premium analyses are overstated due not only to the fact that long-term historical results do not replicate investors' current expectations, but also due to the general inaccuracy of those methods.

Dr. Morin's DCF results are overstated for three reasons. First, Dr. Morin has relied on only one growth rate measure, ignoring other data available to investors that indicate lower expected long-term growth. Second, Dr. Morin has unnecessarily added approximately 30 basis points to his recommendations in this case for flotation costs associated with common equity issuances that are already accounted for in the stock price investors are willing to provide. In so doing, Dr. Morin incorporates a market price for utility stock that is different from the actual, current market price. Third, Dr. Morin has increased dividend yields for one year's projected dividend growth when that growth is already included in the published yield.

TECHNICAL ISSUES

Q. PRIOR TO ADDRESSING THE DETAILS OF EACH OF DR. MORIN'S EQUITY COST ESTIMATION METHODS, ARE THERE TECHNICAL ASPECTS OF HIS ANALYSES THAT CAUSE ALL OF HIS RESULTS TO BE OVERSTATED?

A. Yes. There are technical aspects of each of Dr. Morin's equity cost analyses which cause the results to be overstated to varying degrees and which I will discuss below when I address each of those methods in detail. However, there are two unnecessary adjustments applied by Dr. Morin to each equity cost estimate that cause his average ROE results to be overstated by approximately 37 basis points (0.37%). Those adjustments are a dividend yield adjustment and a flotation cost adjustment.

Dr. Morin's Direct Testimony and Exhibits indicate that he has added flotation costs to the equity cost estimates he presents. His flotation cost increases his recommended

return on equity by 25 basis points, on average. As I explained at pages 45 through 47 of my Direct Testimony, an explicit adjustment for flotation costs is unnecessary. Removing that unnecessary 25 basis point adjustment from Dr. Morin's average equity cost estimate for AmerenUE indicates an average equity cost estimate of 10.65 percent, not the 10.9 percent reported at page 65 of Dr. Morin's Direct Testimony [10.65% = 10.90% - 0.25%].

Q. IN ADDITION TO THE FLOTATION COST ADJUSTMENT, WHAT IS THE SECOND UNNECESSARY ADJUSTMENT IN DR. MORIN'S EQUITY COST ESTIMATES?

A. Dr. Morin's DCF analysis relies on dividend yields published in Value Line. I have no concerns with the use of Value Line as a source of information. In calculating his DCF dividend yields, however, Dr. Morin increases the current dividend yield by one plus the DCF growth rate. As Value Line explains to its subscribers in "A Subscribers' Guide," the dividend yield published by Value Line, is based on the "cash dividends *estimated to be declared in the next 12 months* divided by the recent [stock] price." Therefore, in adjusting the dividend yield published by Value Line for one year's expected growth, Dr. Morin is double-counting that growth.

As shown on Dr. Morin's Schedules RAM-E5-2, RAM-E6-2. RAM-E7-2, and RAM-E8-2 attached to Dr. Morin's Testimony, his dividend growth adjustment (1+g) increases the DCF cost of equity capital from 20 to 30 basis points. Because the reported Value Line dividend is already adjusted for expected growth, this represents an overstatement of the overall cost of equity of approximately 12 basis points because DCF analyses represent 4 of Dr. Morin's 8 equity estimation methods [25 basis points x 4 ÷ 8 = 12.5].

That 12 basis point overstatement caused by double-counting the dividend increase, combined with the inclusion of an unnecessary 25 basis point flotation cost

adjustment causes Dr. Morin's equity cost estimates to be overstated by approximately 37 basis points. Therefore Dr. Morin's equity cost analyses, without the unnecessary upward adjustments indicate an average cost of equity capital for AmerenUE of 10.53 percent, not the 10.9 percent he reports [10.53% = 10.90% - 0.37%].

Q. IN ADDITION TO THE ISSUES YOU HAVE DESCRIBED, ARE THERE PROBLEMS WITH DR. MORIN'S SAMPLE GROUP OF ELECTRIC UTILITY COMPANIES?

A. Yes. In estimating the cost of equity for AmerenUE, both Dr. Morin and I have used similar risk sample groups of publicly traded electric utilities because 1) AmerenUE does not have publicly-traded common equity and 2) the use of a sample group of several companies offers a more statistically reliable estimate of the cost of equity capital. Dr. Morin has used two electric utility sample groups. While that fact alone is not troubling, there are other aspects of his sample group selection process that indicate Dr. Morin's reliance on the second group—Moody's electric utility sample group—does not provide a reliable estimate of the cost of equity capital of AmerenUE.

In selecting his primary sample group for the purpose of determining the cost of equity of AmerenUE, Dr. Morin selected a group from companies that had "integrated" electric operations, like the Company (i.e., generation assets as well as transmission and distribution). He applied further screening to eliminate firms that were dissimilar to AmerenUE (i.e., those with below investment-grade bond ratings, foreign companies, privately-held companies, companies that do not pay dividends, those with market capitalization below $0.5 Billion, those that derive less than 50 percent of revenues from electric operations, and those that were not followed by Value Line). That sample selection process is designed to create a group of companies with risks similar to AmerenUE and appears to be reasonable.

However, Dr. Morin elects also to analyze the equity capital cost of another group of utilities (the Moody's electric utility group) that are, in the main, not similar in risk to AmerenUE. First, eleven of the companies included in Dr. Morin's second (Moody's) sample group were specifically excluded from consideration in constructing his primary electric utility sample. Seven of the companies were excluded because they did not have integrated electric utility operations and the other four were excluded because they did not have at least 50 percent of revenues from electric operations. (For example, Constellation Energy and NiSource Inc., both included in Dr. Morin's second (Moody's) group of companies, had 13 percent and 16 percent of revenues from electric operations, respectively, according to AUS Utility Reports (August 2008). Dr. Morin excluded those companies from his primary sample group because they had characteristics that made them dissimilar in risk to AmerenUE. It is unreasonable, therefore, to re-include those companies in a separate sample group used to estimate the Company's cost of equity.

Second, the nine companies remaining in Dr. Morin's Moody's electric sample group are also in his first AmerenUE-similar, integrated electric group and the analysis of their cost of equity is redundant. There is no need to apply the cost of equity methods to those companies twice.

Third, Moody's ceased publication of its electric utility index in 2002.[1] Therefore, the "Moody's group" is not based on any current publication and it is reasonable to believe that that group of electric utilities is not representative of investors' current

[1] In his Direct Testimony before the Washington Utilities and Transportation Commission in Puget Energy's most recent rate proceeding (Docket Nos. UE-072300/UG-072301; Exhibit No. RAM-1T, p. 39) Dr. Morin noted that "data for [Moody's] index was unavailable beyond 2002." He elects not to provide that information in his Direct Testimony in this proceeding.

expectations with regard to the utility industry.[2] In referring to Dr. Morin's similar-risk sample group, therefore, I will refer only to his Standard & Poor's (S&P) integrated electric utility group and not to his "Moody's electric" sample group, which does not provide a reliable indication of the cost of equity of AmerenUE.

DR. MORIN'S EQUITY COST METHODS

A. CAPITAL ASSET PRICING MODEL (CAPM)

Q. WHAT ARE YOUR COMMENTS ON DR. MORIN'S CAPM ANALYSIS?

A. There are three factors in any CAPM cost of equity estimate: the risk-free rate, the market risk premium and the beta coefficient. According to CAPM theory, the cost of equity equals the risk-free rate plus beta times the market risk premium. Each of those elements in Dr. Morin's CAPM analysis serves to overstate the cost of equity capital.

With regard to the risk-free rate, Dr. Morin uses a 4.5 percent long-term Treasury yield as the risk-free rate. Interest rates have fallen since he performed his cost of equity analysis. Currently, long-term T-Bonds are yielding about 4.35 percent.[3] Therefore, Dr. Morin's CAPM estimate is 15 basis points too high due to the decline in interest rates, which is not captured in this analysis.

Q. WHAT ARE YOUR COMMENTS REGARDING THE BETA COEFFICIENT IN DR. MORIN'S STANDARD CAPM ANALYSIS?

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[2] Interestingly, even though Moody's ceased publication of its utility index years ago, the companies included in that list by Dr. Morin have recently changed. In his testimony on behalf of Puget Energy earlier this year (Washington Utility & Transportation Commission. Docket No. UE-072300/UG-072301, Morin Direct, Exhibit__(RAM-17), p. 1), he used a "Moody's Electric Utilities" sample that did not include CH Energy Group. However, Dr. Morin includes that company in his Moody's Electric Utilities sample group in his testimony in this proceeding.

[3] Federal Reserve Statistical Release H.15, weekly 30-year T-Bond yields, 8/15/08 through 9/19/08 (six-week average).

A. Dr. Morin's integrated electric utility sample group has a current average beta coefficient of 0.804, according to Value Line.[4] In his analysis in this proceeding, Dr. Morin used a Value Line beta of 0.87. Using a more current 0.804 beta, rather than the 0.87 beta used by Dr. Morin, along with the 7.4 percent market risk premium used in his analysis, causes a reduction of 49 basis points in Dr. Morin's CAPM results [0.87 – 0.804 = 0.066 x 7.4% = 0.49%].

As shown on page 40 of his Direct Testimony, Dr. Morin's original CAPM cost of equity estimate is 10.9 percent (without flotation costs). Substituting the current risk-free rate and the current Value Line beta for his similar-risk sample group indicates a CAPM result more than 60 basis point lower—10.30 percent [4.35% (risk-free rate) + 0.804 (beta) x 7.4% (Morin's selected market risk premium) = 10.30%].

Q. WHAT ARE YOUR COMMENTS REGARDING DR. MORIN'S CALCULATION OF THE MARKET RISK PREMIUM IN HIS CAPM ANALYSIS?

A. Dr. Morin averages a long-term historical market premium provided by Ibbotson Associates (now Morningstar) and a forward-looking market premium calculated by applying a DCF analysis to a group of stocks followed by Value Line. With regard to Dr. Morin's market risk premium, there are two points at issue.

First, when using the historical Ibbotson data, Dr. Morin elects to rely only on the difference between the earned return of stock and the yields of bonds. The rationale supporting that method is that there have been unanticipated gains with bond investments, and the historical yields (which are lower that the earned returns) better represent investor

[4] The Value Line Investment Survey, Summary & Index, September 26, 2008. By definition the beta of "the market" is 1.0, and the beta of a firm with higher-than-average risk will be above one. For companies like utilities that have lower-than-average investment risk, their betas are usually below 1.0.

expectations. However, there is no "yield" analogue for stocks and the metric used by Morningstar is the earned return on either the S&P 500 or the NYSE index. Therefore, the return series are better balanced and have more meaning for determining expectations if earned returns are used for both series.

As Dr. Morin notes at page 36 of his Direct Testimony, the difference between the historical earned return of stocks and bonds is 6.5 percent (i.e., the average historical return on stocks has been 6.5% higher than the average historical return on bonds). Dr. Morin has elected to use 7.1 percent based on the difference between historical earned returns of stocks and historical bond yields, because, as he notes in his Direct Testimony at page 36, "Ibbotson Associates recommend" its use.

However, a 2003 paper published by Ibbotson in the *Financial Analysts' Journal* indicates that the maximum expected market risk premium (the return equity investors expect in the future over bond yields) is 5.9 percent, not the 7.1 percent used by Dr. Morin in his testimony.[5] In that paper, Dr. Ibbotson discusses the current theoretical debate over the market risk premium, which I summarized in my Direct Testimony at pages 28 through 34. As Ibbotson noted in his 2003 paper, research indicates that the market risk premium going forward ranges from 0 percent to a maximum of about 5 percent.[6] Ibbotson disagreed with that research and provided his analysis of the issue, which showed a prospective market risk premium to range from 3.97 percent (based on a geometric average), to 5.90 percent (based on an arithmetic average).

[5] Ibbotson, R., Peng, C., "Long-Run Stock Returns: Participating in the Real Economy," *Financial Analysts' Journal*, January/February 2003, pp. 88-98.
[6] *Id.*, pp. 88, 89.

Dr. Morin has selected a particular historical market risk premium for his CAPM because Ibbotson recommended it, but in a different publication, Dr. Ibbotson indicates the prospective market risk premium is 5.9 percent (at the upper end), not the 7.1 percent Dr. Morin ultimately uses in his CAPM analysis. The use of a 7.1 percent risk premium instead of Ibbotson's forward-looking 5.9 percent maximum, given the use of a 0.87 beta coefficient, would cause an overstatement in Dr. Morin's CAPM of 104 basis points [0.87 (beta) x (7.1% Morin's MRP – 5.9% Ibbotson MRP) = 1.04%]. That would reduce Dr. Morin's updated CAPM from 10.3 percent to approximately 9.3 percent.

Second, Dr. Morin also constructed a forward-based market risk premium based on a DCF analysis of the universe of stocks followed by Value Line. Dr. Morin advises the Commission to be cautious about relying on DCF estimates, yet, he bases his preferred risk premium methodology, in part, on a DCF analysis. If the DCF provides a reasonable estimate of the expected return for the entire Value Line universe of stocks, it is reasonable to believe it would provide an accurate estimate of the cost of equity for utilities.

Q. ARE THERE OTHER CONSIDERATIONS REGARDING THE MARKET RISK PREMIUM OF WHICH THIS COMMISSION SHOULD BE AWARE?

A. Yes. Historical return data can be averaged in two different ways—arithmetic averaging and geometric averaging. The arithmetic average takes the sum of the returns and divides by the number of periods. The geometric average measures the rate of return from the beginning of the period to the end of the period. When returns are volatile the arithmetic average is higher than the geometric average. The higher arithmetic average is the only one that Dr. Morin has considered.

However, research has shown that there is negative autocorrelation in the historical return data, which means that periods of high returns are followed by periods of low

returns and vice versa. Given that fact, the arithmetic average, which assumes strict independence of the periodic returns, provides a misleading indication of the historical average. Therefore, consideration of only the higher arithmetic mean is improper.

Also, there has been considerable research regarding the market risk premium and whether or not long-term historical data such as that published by Morningstar (on which Dr. Morin relies) is representative of forward-looking investor opinion. Dr. Morin discusses that research in his 2006 text[7] but fails to mention it in his testimony in this proceeding, again electing to use only the highest end of a reasonable range of market risk premium indications.

Q. CAN YOU PROVIDE A MORE DETAILED DESCRIPTION OF THE DIFFERENCES BETWEEN ARITHMETIC AND GEOMETRIC AVERAGES AND THE ADVANTAGES OF BOTH?

A. Yes. An arithmetic average of historical return data is the sum of all the periodic returns (the "period" is usually assumed to be one year), divided by the number of historical periods. A geometric average is a compound return—it is the rate of constant growth that would cause the security price at the beginning of the period to grow to the value realized at the end of the period.

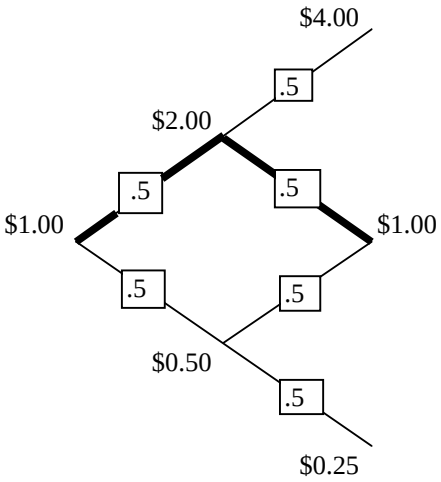
The support for the use of an arithmetic mean of historical data rests in "decision tree" logic, which is demonstrated by the following example. Assume that an investor buys a stock for $1, and that stock has a 50% chance of doubling in price (increasing 100%) and a 50% chance of dropping by half (a loss of 50% of its value). Also assume that in the first year the stock price doubles from $1 to $2, but in the second year the stock price declines by 50%, resulting in a $1 price. The arithmetic average return is 25% [(100% + (-50%))/2 = 25%]. Because the investor winds up with $1 at

the end of the second year after beginning with $1 at the outset, the geometric return is 0% [(1+100%)(1-50%) – 1 = 0%].

While it is counter-intuitive to state that the historical return in our example is 25% (the arithmetic average) when the investor winds up with the same amount of money at the end of two years as he or she began with, the rationale for the use of the arithmetic mean lies in the probabilities that existed for the investor at the outset. Those probabilities are best represented by the "decision tree" shown below, which displays all the possible outcomes for the investor (with the actual outcome designated by a bold line).

Chart I

Decision Tree Example



In this example, the investors' expected return, which is calculated as the sum of all the possible outcomes, is $1.5625 [Expected Return = $(0.5)^2(\$4.00) + 2(0.5)^2(\$1.00) + (0.5)^2(\$0.25) = \$1.5625$]. The only way to calculate the $1.5625 value using historical average data is through the use of the arithmetic mean return [$1.5625 = $1.00(1.25)(1.25)].

[7] Morin, R., New Regulatory Finance, Public Utilities Reports, Vienna, VA, 2006, pp. 155-162.

This example provides support for the use of arithmetic averages of historical returns in estimating the cost of capital.

However, underlying the example cited above are some very strict assumptions about the relationship between year-to-year returns that are not representative of the actual nature of those returns. The "decision tree" assumes that the periodic returns are strictly independent results—each having no affect on the other. However, research indicates that such is not the case, and that period-to-period returns are inter-dependent to some degree.[8]

Therefore, the very strict "decision tree" logic used to support sole reliance on an arithmetic market risk premium does not apply to actual historical returns because those returns are inter-related and not strictly independent. Even academics that use arithmetic means of historical data recognize that if historical returns are not strictly independent (i.e., they are "serially correlated," or are "mean reverting"), then the arithmetic mean does not provide a valid representation of the historical average return:

> If, however, the objective is to obtain the *median* future value of the investment, then the initial investment should be compounded at the geometric sample average. When returns are serially correlated, then the arithmetic average [footnote] can lead to misleading estimates and thus the geometric average may be the more appropriate statistic to use.
>
> [footnote] The point is well illustrated by the textbook example where an initial investment of $100 is worth $200 after one year and $100 after two years. The arithmetic average return is 25% whereas the geometric average return is 0%. The latter coincides with the true return.[9]

[8] E. Fama and K. French, "Dividend Yields and Expected Stock Returns," *Journal of Financial Economics* (October 1988), pp. 3-26.

[9] (Mehra, R., Prescott, E., "The Equity Premium in Retrospect," Handbook of the Economics of Finance, Constantinides, Harris, Stultz, Editors, 2003.

Also, in a white paper presented to the Social Security Administration in 2001 regarding expected equity returns in the 21st Century, Professor John Campbell of Harvard provided the following comments regarding geometric means:

> When returns are negatively serially correlated, however, the arithmetic average is not necessarily superior as a forecast of long-term future returns. To understand this, consider an extreme example in which prices alternate deterministically between 100 and 150. The return is 50% when prices rise, and –33% when prices fall. Over any even number of periods, the geometric average return is zero, but the arithmetic average return is 8.5%. In this case the arithmetic average return is misleading because it fails to take account of the fact that high returns always multiply a low initial price of 100, while low returns always multiply a high initial price of 150. The geometric average is a better indication of long-term future prospects in this example. [footnote omitted]
>
> The point here is not just a theoretical curiosity, because in the historical data summarized by Siegel, there is strong evidence that the stock market is mean-reverting. That is, periods of high returns tend to be followed by periods of lower returns. This suggests that the arithmetic average return probably overstates expected future returns over long periods.[10]

Finally, there are data anomalies associated with arithmetic risk premiums. The arithmetic market risk premium is period-specific. That is, the longer the assumed holding period, the lower the arithmetic risk premium. It is commonly assumed that the holding periods (the amount of time between buying and selling the market portfolio) is one year. However, there is no magic to that particular time-span; it is simply a common assumption in the calculation. If, for example, we assume that the holding period is two years instead of one, the arithmetic average market risk premium reported by Morningstar declines by 100 basis points. If that holding period increases to three years, the market risk premium declines

[10] (Estimating the Real Rate of Return on Stocks Over the Long Term, Papers by Campbell, Diamond, Shoven, Presented to the Social Security Advisory Board, August 2001; Cambell, J., "Forecasting U.S. Equity Returns in the 21st Century", pp. 3, 4).

again.[11] Therefore, the arithmetic mean changes with a change in the length of the holding period. The geometric mean does not vary with the holding period chosen, since the beginning and ending points determine the rate of growth.

In sum, both arithmetic and geometric averages have academic support in analyzing historical return data, and both should be considered in determining the cost of equity capital.

Q. DOESN'T DR. MORIN POINT TO A 2003 PAPER BY HARRIS, MARSTON, MISHRA AND O'BRIEN TO SUPPORT HIS 7.4 PERCENT MARKET RISK PREMIUM ESTIMATE?

A. Yes, he does. However, one of the authors of that article now has a different opinion regarding a reasonable forward-looking market risk premium.

Q. CAN YOU PLEASE EXPLAIN THAT STATEMENT?

A. Yes. Dr. Morin, Professor Felicia Marston (one of the authors of the market risk premium study referenced by Dr. Morin) and I made presentations at the 39th Annual Financial Forum of the Society of Utility and Regulatory Financial Analysts in April of 2007 in Washington, DC. Dr. Morin made his presentation on the first day of the conference, while Professor Marston and I were on a panel during the second day of the conference, where the topic of the discussion was the market risk premium.

In her presentation, Professor Marston discussed the mechanics of her ex-ante market risk premium studies (she did a study in 2001 as well as the 2003 paper cited by Dr. Morin). She noted that the 2003 study finds a 7.1 percent market risk premium and a 4.15 percent risk premium for utilities. She also noted that the 7.1 percent market risk premium

[11] Copeland, Koller, and Murrin, Valuation: Measuring and Managing the Value of Companies, 3rd Ed., McKinsey & Co., New York, 2006, pp. 218-221.

should be considered an upper bound due to the data anomalies contained in the study and concluded that a reasonable estimate of the current market risk premium is 5 percent to 6 percent. The final slide in Professor Marston's power-point presentation from the April 2007 financial conference is shown below:

Table I

Marston Presentation Slide

2007 Annual Financial Forum

Society of Utility and Regulatory Financial Analysts

- I view 7.1% as a comparison to historical-based estimates and as an upper bound
- Given this, and historical evidence, my opinion currently of market risk premium is 5%-6 %. Using Stephen's .85 beta estimate➔

(1) E(R) utilities = 5% + .85 (6%)=10.1%

(2) E(R) utilities = 5% + .85 (5%) = 9.25 %

- Ex ante risk premium on ***utilities*** (using dividend growth model) was estimated at 4.15 %➔

E(R) utilities = 5% (rf) + 4.15 % = 9.15%

As the slide displayed in Table I shows, when Professor Marston's current risk premium is used, the cost of equity for the general market (shown as E(R) here), ranges from 9.25 percent to 10.1 percent. When Professor Marston's risk premium for utilities (4.15%) is used, the estimated utility cost of equity is 9.15 percent. Moreover, those estimates are based on risk-free rates of 5%, which are higher than the current risk-free rate of 4.35%. In sum,

Professor Marston's current opinions do not support Dr. Morin's choice of market risk premium or CAPM cost of equity estimates.

Q. WHAT ARE YOUR COMMENTS ON DR. MORIN'S USE OF THE EMPIRICAL CAPM—THE ECAPM?

A. As Dr. Morin notes at page 34 of his Direct Testimony, the "empirical" CAPM (ECAPM) is designed to account for the fact that the Capital Market Line is believed to have a lower slope than postulated theoretically. A lower slope for the Capital Market Line implies that the CAPM understates the equity cost rate for low beta stocks like utilities and over-estimates the equity cost rate for high beta stocks like "dot-com" companies. The flaw in Dr. Morin's "empirical" CAPM analysis and the reason (in addition to the other reasons outlined above for the standard CAPM) that his ECAPM equity cost estimate overstates the actual cost of capital is that he uses "adjusted" betas in his ECAPM analysis while the research on which the "low slope" theory is predicated uses betas that are not adjusted.

Beta estimates published by Value Line are adjusted for the theoretical tendency for beta coefficients to migrate toward the market average of 1.0. "Adjusted" betas are higher for low-beta stocks like utilities and lower for high-beta stocks like "dot-com" companies. In other words, when low betas are adjusted upward and high betas are adjusted downward, that has the same effect as lowering the slope of the Capital Market Line. Using "adjusted" betas along with an ECAPM analysis double-counts the effect of changing the slope of the Capital Market Line. All of the theoretical research Dr. Morin cites regarding the support for the ECAPM (except his own) is based on studies using "raw" or "unadjusted" betas.

Q. DOESN'T DR. MORIN INDICATE THAT THE ECAPM "SLOPE" ADJUSTMENT IS DIFFERENT FROM THE VALUE LINE BETA ADJUSTMENT, AND DOES NOT CONFLICT?

A. That is his position. It is correct that the ECAPM "slope" adjustment and the Value Line beta adjustment originate from different theoretical concepts; however, they have the same effect. Raising low betas and lowering high betas (the result of Value Line's "adjustment"), works to lower the slope of the Capital Market Line, which is also the result of the ECAPM. Therefore, Dr. Morin is incorrect to assume that using adjusted betas in an ECAPM calculation does not double-count the slope-lowering effect. Using adjusted betas in an ECAPM calculation results in an overstated cost of equity estimate.

Q. CAN YOU DEMONSTRATE HOW THE USE OF ADJUSTED BETAS AND LOWERING THE SLOPE OF THE CAPITAL MARKET LINE (ECAPM) BOTH RAISE THE COST OF EQUITY ESTIMATE AND ARE, THEREFORE, DUPLICATIVE?

A. The Capital Market Line is a straight line that is plotted on a graph with beta (the CAPM risk measure) on the "x" or horizontal axis and the yield (or cost of capital) on the "y" or vertical axis. In theory, the Capital Market Line is a straight line that slopes upward and to the right. The Capital Market Line based on the original CAPM has a steeper slope than that based on the ECAPM. Both are shown in the graph below.

By definition, the beta of the market, generally, equals 1.0 and the betas of stocks with lower than average risk, like utilities, have betas below 1.0. It can be seen from reference to the graph below that for companies like utilities with betas below 1.0, the result of the ECAPM, which produces a Capital Market Line with a lower slope, would be to raise cost of equity estimates. For example, at a beta of 0.5 the CAPM line in the graph below indicates a cost of equity of about 7.5%. However, based on that same beta, the ECAPM (represented by the bold line in the graph below) would indicate a cost of equity of about 9%. So, for utilities, the use of the ECAPM raises the resulting cost of equity.

The graph below also shows that, because the Capital Market Line is upward-sloping, that is, it increases with increasing betas, when one moves along the x-axis from a low beta to a higher beta, the resultant cost of equity is increased. Therefore when one uses adjusted betas (which are higher than unadjusted betas for low-beta stocks like utilities), the result is to increase the cost of equity. Thus, both the use of adjusted betas and the ECAPM tend to raise the results of the equity cost estimate. Because the academic research that supports the ECAPM has been undertaken with unadjusted or raw betas it would be appropriate to estimate the cost of equity using an ECAPM only if unadjusted betas were used. However, Dr. Morin did not do that and, instead, used higher adjusted betas in his ECAPM analysis. In so doing, he overstated the equity cost estimate.

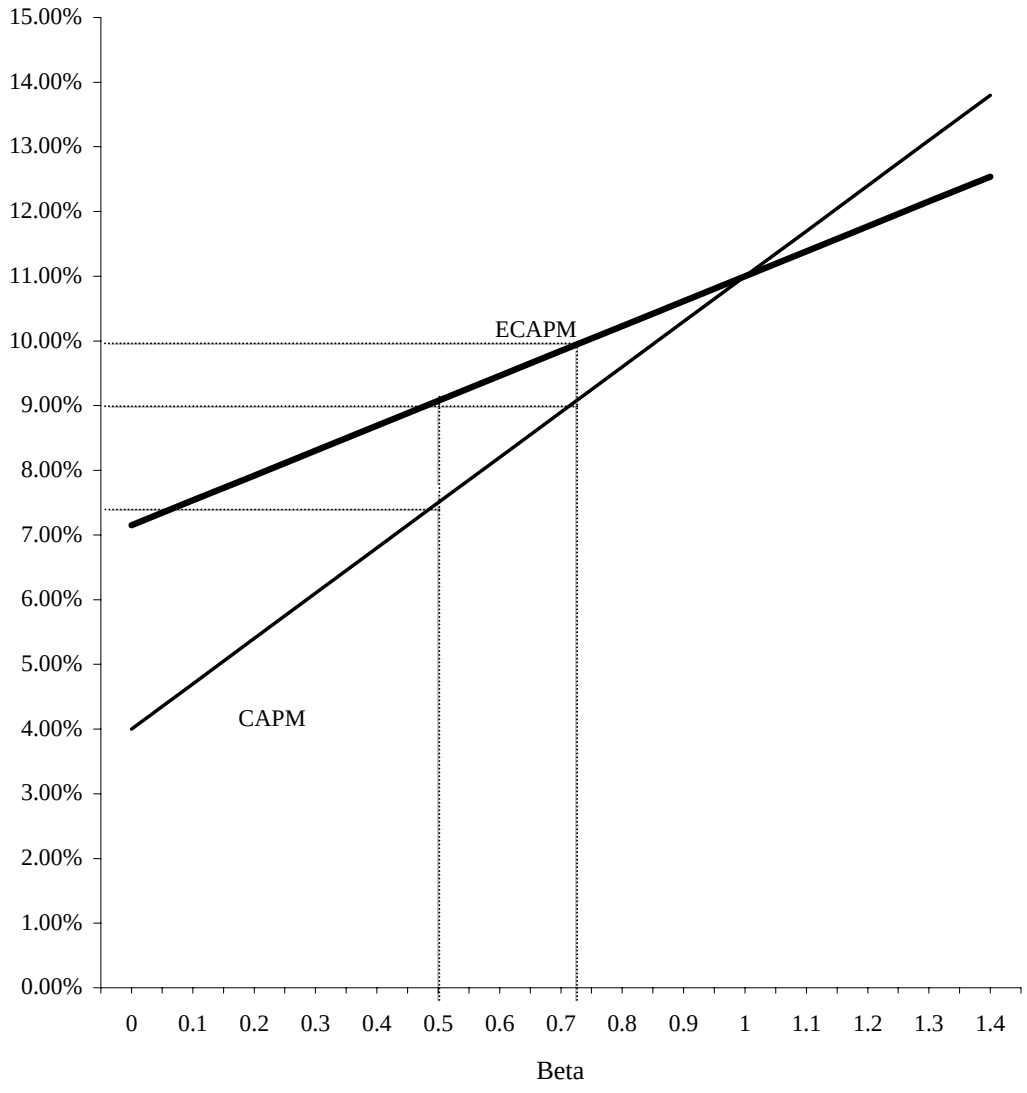
As can be seen in the graph below, for a company with an unadjusted beta of 0.5, the ECAPM would estimate a cost of equity of about 9%. Also, using the higher adjusted beta (like that published by Value Line) of 0.725 for the same company, a traditional CAPM analysis would produce the same 9% result. However, using both the adjusted beta of 0.725 and an ECAPM model (Dr. Morin's analysis) would overstate the cost of equity capital estimate. Following the 0.725 adjusted beta up to the ECAPM line in the graph below shows that the equity cost estimate using Dr. Morin's suggested method would be about 10%, overstating the cost of equity.

continued on next page

Chart II

Cost of Equity Impact of Using

Adjusted Betas With an E-CAPM Analysis



In other words, even though the use of the ECAPM and the use of adjusted rather than raw betas are based on different rationales, the result of both of those adjustments for low-beta stocks like utilities is to raise the cost of equity capital. Therefore, because both adjustments seek the same remedy and produce the same effect (increasing the CAPM result for low-beta

stocks), they are redundant. Clearly, if Dr. Morin elects to use the ECAPM he should use raw, not adjusted betas in that analysis.

Q. WHAT RESULT WOULD DR. MORIN'S ECAPM PRODUCE IF UNADJUSTED OR "RAW" BETAS WERE USED?

A. Except for the anomalies cited in the discussion above regarding risk-free rate, beta and the market risk premium, Dr. Morin's ECAPM analysis would not be problematic on theoretical grounds if he used "raw" betas rather than "adjusted" betas. Value Line has a standard formula for adjusting "raw" betas to the "adjusted" betas that are published by that investor service. It is possible, therefore, to calculate what "raw" beta supports the reported Value Line beta.

For a reported weighted-average Value Line beta coefficient of 0.804 for the utility groups studied by Dr. Morin, the average "raw" beta would have been 0.707.[12] Using that "raw" beta in Dr. Morin's ECAPM formula shown on page 42 of his Direct Testimony, a current long-term T-bond risk-free rate (4.35%) and Ibbotson's projected maximum market risk premium (5.9%), the equity cost estimate would be 8.95% [k = 4.35% + 0.25(5.9%) + 0.75(0.707)(5.9%) = 8.95%].

B. RISK PREMIUM

Q. PLEASE DESCRIBE THE RISK PREMIUM ANALYSES UNDERTAKEN BY DR. MORIN IN HIS DIRECT TESTIMONY IN THIS PROCEEDING.

A. Dr. Morin has performed two separate risk premium analyses based on historical data. The risk premium analyses Dr. Morin utilizes include an examination of the historical return difference between earned returns of electric and gas companies and the yield on long-term treasury bonds. Company witness Morin performs this analysis over a period beginning

in 1931 through 2005 for electric utilities. In the final risk premium analysis, Dr. Morin compares the allowed returns for electric utilities with then-current U.S. Treasury Bond (T-Bond) yields from 1996 through 2005. Each of those risk premium analyses is calculated using current bond yields.

Q. PRIOR TO DISCUSSING THE DETAILS OF EACH OF THOSE RISK PREMIUM ANALYSES, DO YOU HAVE ANY COMMENTS OF A GENERAL NATURE REGARDING RISK PREMIUM-TYPE ANALYSES?

A. Yes. A fundamental precept on which the risk premium methodology is based holds that the higher risk of stocks over bonds requires an incrementally higher return for those stocks in order for investors to be compensated for assuming the higher risk. Although that is generally true, it is most important to realize that, given a current bond yield of about 6 percent for BBB-rated utilities, an equity return of 8 percent, 10 percent, 13 percent or even 50 percent would fulfill the requirement of providing a "premium" over debt costs. The real issue with a risk premium analysis is determining that premium with any precision. It is not a directly observable phenomenon.

There are two other fundamental tenets, upon which risk premium-type analyses are grounded which, when examined, indicate that this equity cost estimation methodology should not be given primary consideration in setting allowed rates of return. First, since risk premium analyses look backward in time, they assume "past is prologue."

In other words, the investors' expectations for the future are assumed to mirror the average results they have experienced in the past. As I have noted, current research indicates that such is not the case. Second, implicit in the use of an average historical return

[12] Beta (raw) = (Beta (adjusted) - 0.33) / 0.67.

premium of equities over debt is the assumption that the risk premium is constant over time. Neither of these assumptions upon which the risk premium analysis rests is true.

That the risk premium varies significantly from period to period is revealed most clearly in Dr. Morin's Exhibit No. RAM-E3, which shows the data on which his risk premium results are based. The common stock annual returns on which Company witness Morin relied have ranged from +77 percent to -37 percent, while bond annual returns have ranged from +33 percent to –10 percent.

Moreover, the risk premiums that result from these widely-varying data series also, unsurprisingly, show very wide variation. The earned return difference between electric utility stocks and T-Bonds shown in Exhibit No. RAM-E3 averages 5.7 percent, but ranges from +77.54 percent to –37.69 percent, with a standard deviation of 21.66 percent. Adding two standard deviation units to the average risk premium creates a statistical confidence interval in which we can be 95 percent confident that the "real" risk premium exists. That calculation produces a risk premium range of –37.62 percent to +49.02 percent [5.7% ± 2 x 21.66%]. This sort of extreme volatility is evidence that the risk premium is not a reliable equity cost estimation methodology.

The practical impact of the volatility of historical risk premium data is that, with the selection of any particular period over which to average the historical data, virtually any risk premium result can be produced. In addition, the use of historical earned-return data to estimate current equity capital costs has been questioned in the financial literature, by authorities on whom Dr. Morin has elected to rely:

> There are both conceptual and measurement problems with using I&S [Ibbotson and Sinquefield] data for purposes of estimating the cost of capital. Conceptually, there is no compelling reason to think that investors expect the same relative returns that were earned in the past. Indeed, evidence presented in the following

> sections indicates that relative expected returns should, and do, vary significantly over time. Empirically, the measured historic premium is sensitive both to the choice of estimation horizon and to the end points. These choices are essentially arbitrary, yet they can result in significant differences in the final outcome.[13]
>
> **Other Methods**. Several other approaches have been used to estimate the cost of common equity. Two of these should be noted. First there is the risk premium method, which is based upon the premise that common equity carries a higher risk than debt. This approach is relatively straightforward: (1) determine the historic spread between the return on debt and the return on common equity, and (2) add this risk premium to the current debt yield to derive an approximation of current equity return requirements….
>
> Like other methods, however, there are a number of specific problems. Over what historic period of time should the spread be established? Does the spread between the return on debt and the return on equity remain constant over time and at all interest levels? Should the spread be expressed on a before- or after-tax basis to the investor? What debt instruments should be used (e.g., government securities versus corporate or utility bonds)? What equity securities should be used? How should the resulting return requirement be adjusted for the risk that corresponds to a given utility? In light of these problems, many use the risk premium approach as a subsidiary method to test the results of other approaches."[14]

The type of data described in the quote above as both conceptually and empirically problematic forms the basis of Dr. Morin's Risk Premium methodology.

Q. WHAT ARE YOUR COMMENTS REGARDING DR. MORIN'S HISTORICAL RISK PREMIUM ANALYSIS?

A. This form of the risk premium analysis measures the earned return on common stocks and subtracts from that the yield on long-term T-Bonds to produce a risk premium.

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[13] "The Risk Premium Approach to Measuring a Utility's Cost of Equity," Brigham, Shome and Vinson, Financial Management, (Spring 1985), p. 34.

[14] Phillips, C. F., The Regulation of Public Utilities, Public Utilities Reports, Arlington, VA, (1993), p. 399.

There have been fundamental changes in the nature of the relationship between stock returns and bond returns over the past sixty or seventy years. The data in Dr. Morin's Exhibit No. RAM-E3 indicate that from about 1930 through 1960, stock returns were quite volatile showing very wide swings while bond returns were less volatile. However, in more recent years (since 1960), stocks have actually become less volatile while bonds have become more volatile, showing much wider swings in returns. Those data indicate that the current relationship between the returns of bonds and stock is different than it has been over the longer time frame.

Q. WHAT ARE YOUR COMMENTS REGARDING DR. MORIN'S OTHER RISK PREMIUM ANALYSIS—THE "ALLOWED RETURN" RISK PREMIUM?

A. Dr. Morin's other risk premium analysis is one that compares historical allowed equity returns to annual average bond yields. That study indicates that the average risk premium between allowed returns for electric utilities and bond yields over the past 10 years is 5.6 percent. In prior testimony,[15] Dr. Morin concluded that a negative correlation existed between current bond yields and risk premiums; in this proceeding he does not do so.

It is important to understand at the outset that the annual cost rate differences between the allowed returns and utility bond yields are not necessarily reliable indicators of investor-required risk premiums. First, the allowed returns are simply averaged over all the available rate case decisions during a calendar year. That means that the capital market data that the regulatory body considered was drawn from a time prior to the decision rendered and the allowed return might not correlate with decision time-specific macro-economic events. In some cases, that period of time between the hearing and the decision can be substantial.

[15] *Washington Utility & Transportation Commission v. Puget Sound Energy*, Docket Nos. UE-060266/UG-060267, Exhibit No. 301, Morin Direct, pp. 45, 46.

Second, the relative risk of the utility for which the equity return was determined is not a factor in Dr. Morin's analysis. For example, the allowed return on equity for a "BB-" rated firm would simply be averaged in with the other returns allowed during a calendar year.

Third, while the inclusion of an outlier may not be problematic in years in which there are many rate case decisions, that would not be the case in years in which the number of decisions is small. Moreover, regulatory rate case decision data with which I am familiar shows that the number of regulatory decisions has decreased in recent years (e.g., 7 decisions in 2004).[16] That source of regulatory return data also notes that "[a]s the number of equity return determinations has declined, the average authorized return now has less of a relationship to the return than the typical electric, gas, or telecommunications company has an opportunity to earn."

Fourth, Dr. Morin emphasizes the need, in a risk premium analysis, to use as long a data series as possible: "a risk premium study should consider the longest possible period for which data are available."[17] However, Dr. Morin's allowed return Risk Premium considers only 10 years of data.

Finally, even if we assume Dr. Morin's 5.6 percent allowed return risk premium is accurate, with a current T-Bond yield of 4.35 percent, that risk premium would indicate a cost of equity for AmerenUE of 9.95 percent—significantly lower than his recommendation of 11.15 percent for AmerenUE.[18]

[16] Regulatory Research Associates, "Major Rate Case Decisions, Regulatory Focus" (Jan. 30, 2007).
[17] Morin Direct, p. 37, ll. 1, 2.
[18] Morin Direct, p. 70.

C. DISCOUNTED CASH FLOW

Q. WHAT ARE YOUR COMMENTS REGARDING DR. MORIN'S DCF ANALYSIS?

A. Dr. Morin's standard DCF analysis relies on dividend yields published in Value Line. I have no concerns with the use of that source of information. As I have noted previously, Dr. Morin increases the current dividend by one plus the DCF growth rate, which tends to overstate the dividend yield if applied to all companies in the sample group. Also, as Value Line explains to its subscribers in, "*A Subscribers' Guide*," the dividend yield published by Value Line in its *Ratings and Reports*, is based on the "cash dividends *estimated to be declared in the next 12 months* divided by the recent [stock] price." Therefore, in adjusting the dividend yield published by Value Line for one year's expected growth, Dr. Morin is double counting that growth. His dividend yields are overstated for that reason.

The growth rate portion of Dr. Morin's DCF analysis is also problematic. First, Dr. Morin's growth rate analysis is mechanistic in that it simply plugs selected projected data into a formula to produce a growth rate with no underlying analysis of either the historical or projected growth rate fundamentals. Dr. Morin, in his own published work, warns against this type of analysis.[19]

Second, Dr. Morin's growth rate analysis relies exclusively on earnings growth rate projections. As I discussed in detail in Appendix B attached to my Direct Testimony, exclusive reliance on earnings growth, absent any examination of the underlying fundamentals of long-run growth, can lead to inaccurate equity cost estimates. For example, reliance on projected earnings growth in a situation in which projected earnings were expected to recover from reduced levels would include (in any DCF estimate) the assumption that equity returns

will increase at the same exaggerated rate every five years into the indefinite future. Of course, this would not be a reasonable expectation, and any DCF analysis based on a mechanistic analysis that automatically includes such data would not produce a reasonable result. Therefore, while I have no problem with the consideration of earnings growth rate projections in determining DCF growth, they should not be afforded the exclusive weighting allowed by Dr. Morin, especially absent consideration of the underlying factors.

Third, Brealey and Meyers' latest textbook, which is a source on which Dr. Morin relies for authority, notes that analysts' earnings growth estimates have been shown to be overly-optimistic (i.e., too high), in comparison to actual results. Therefore, any DCF result obtained using those growth rates should be considered an upper bound of the cost of equity:

> Estimates of this kind [DCF] are only as good as the long-term forecasts on which they are based. For example, several studies have observed that security analysts are subject to behavioral biases and their forecasts tend to be over-optimistic [footnote omitted]. If so, such DCF estimates of the cost of equity should be regarded as upper estimates of the true figure. [footnote omitted]. *See, for example,* A. Dugar and S. Nathan, "The Effect of Investment Banking Relationships on Financial Analysts' Earnings Investment Recommendations." [20]

Fourth, as I noted above, Dr. Morin uses both Zack's and Value Line earnings projections in determining his standard DCF growth rate. Earnings growth projections are the only growth rate that Zack's publishes, so the use of that parameter is reasonable, although there are other providers of analysts' projected earnings growth. However, in addition to and right alongside its earnings projections, Value Line also publishes 3- to 5-year dividend and book value growth rate projections for each company it follows. In his Exhibit No. RAM-E4,

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[19] Morin, R., Regulatory Finance, Utilities' Cost of Capital, Public Utilities Reports, Arlington, VA, 1994, p. 244.
[20] *Contemporary Accounting Research* 12 (1995), pp. 131-160. Brealey, Meyers, Allen, Principles of Corporate Finance, 8th Ed., McGraw-Hill Irwin, Boston, MA, (2006), p. 67.

showing why historical growth is not appropriate for the companies in his sample group, Dr. Morin references all three types of growth published by Value Line. Investors have equal access to all three growth rates (earnings, dividends and book value) and, it would be reasonable to assume, utilize all three when making a determination of long-term sustainable growth. Moreover, in theory, the DCF assumes that earnings, dividends and book value all grow at the same rate. Therefore, the use of the average of those three projected growth rate parameters published in Value Line would provide a more balanced growth rate analysis in Dr. Morin's mechanistic standard DCF model.

For example, Dr. Morin's Exhibit No. RAM-E5 contains his DCF analysis of his integrated electric utility sample group, based only on Value Line's earnings projections. Table II, below, replicates Dr. Morin's analysis using the most recent projected earnings, dividends and book value published by Value Line for each company, as well as the year-ahead dividend yield published in the September 28, 2008, edition of Value Line (*Summary & Index)*:

continued on next page

Table II

Morin Integrated Electric Sample Group

DCF – Value Line Projected Growth

Company	Value Line Projected Growth			Year-ahead
	Earnings	Dividends	Book Value	Div. Yield
ALLETE	2.50%	5.50%	6.50%	4.00%
Alliant Energy	6.00%	9.00%	6.00%	4.40%
American Electric Power	7.50%	8.00%	6.50%	4.70%
Ameren Corp.	3.50%	0.00%	3.00%	6.30%
Cleco Corp	10.50%	9.50%	6.00%	3.50%
CMS Energy Corp.	11.50%	nmf	5.00%	3.80%
DPL, Inc.	11.00%	5.00%	9.00%	4.90%
DTE Energy	5.00%	1.50%	4.00%	5.00%
Edison International	5.00%	7.00%	9.00%	3.20%
Empire District Electric	10.00%	1.50%	3.50%	5.90%
FPL Group	9.50%	7.50%	8.50%	3.50%
Hawaiian Electric	7.50%	1.00%	2.50%	4.70%
IDACORP Inc	2.00%	0.00%	2.00%	4.00%
MGE Energy	6.00%	0.50%	7.00%	4.30%
Northeast Utilities	11.00%	6.00%	5.50%	3.30%
PG&E Corp.	5.00%	9.00%	5.50%	3.90%
Pinnacle West Capital	2.00%	2.00%	2.00%	5.80%
PNM Resources	-1.00%	1.50%	0.00%	4.60%
Progress Energy	5.00%	1.00%	1.50%	5.60%
Puget Energy Inc.	5.00%	4.50%	3.50%	4.20%
Southern Company	5.50%	4.50%	6.00%	4.40%
TECO Energy	7.00%	3.00%	6.50%	4.90%
Westar Energy	2.00%	6.50%	3.50%	3.20%
Wisconsin Energy	2.00%	5.50%	4.50%	5.10%
Xcel Energy Inc.	8.00%	9.50%	6.50%	2.60%
Average	6.02%	4.48%	4.92%	
Overall Average		**5.14%**		**4.37%**
DCF Cost of Equity			**9.51%**	

(Note: Energy East and Entergy are not included in Dr. Morin's S&P Sample Group because Value Line does not currently publish growth rate projections for those companies, due to the acquisition of Energy East by a foreign company and the divestiture of Entergy's generation units.)

Table II, above, shows that the average of Value Line's projected earnings, dividends and book value (all of which are available to investors) is 5.14 percent, roughly 90 basis points below the 6.02 percent earnings-only Value Line growth rate preferred by Dr. Morin. Moreover, simply by using all the projected growth rate data available in Value Line instead of just some of it, the DCF equity cost estimate for the combination electric utilities is 9.51 percent. That equity cost estimate, is roughly 90 basis points below the 10.4 percent DCF result Dr. Morin provides in his Exhibit RAM-E5, page 2.

Q. DOES DR. MORIN DISCUSS THE ACCEPTANCE OF THE DCF METHODOLOGY?

A. Yes. Dr. Morin acknowledges in his Direct Testimony in this proceeding that the DCF is "appropriate," and that some regulatory bodies place principal reliance on the DCF to estimate equity capital costs.[21] For example, during the 1980s and early 1990s the Federal Energy Regulatory Commission (FERC) instituted a generic determination of the cost of equity capital for the electric utility industry. Following literally years of comments and reply comments from many participants regarding different equity-cost-estimation methods, the FERC selected the constant-growth DCF model as the single best method with which to estimate the cost of equity capital.[22] Also, a study of regulatory commission equity cost estimation methods by the National Association of Regulatory Utility Commissioners (NARUC), found that while nearly every regulatory body in the U.S. and Canada listed DCF as a methodology on which it relied, only 11 listed CAPM.[23] During cross-examination in a rate

[21] Morin Direct, p. 17.

[22] FERC anticipated that an administrative determination of an appropriate industry-wide cost of equity would limit debate on that issue in rate proceedings. It did not. Because FERC staff was devoting resources to producing a generic cost of equity estimate and continuing to litigate the issue in every rate proceeding, FERC ultimately discontinued the generic proceeding.

[23] National Association of Regulatory Utility Commissioners, "Utility Regulatory Policy in the United States and Canada," Compilation 1994-1995.

case in Georgia, Dr. Morin referenced the NARUC study and noted that DCF use was "almost unanimous," while no Commission relied solely on the CAPM.[24]

Q. DOES DR. MORIN THEREFORE RELY ON THE DCF AS HIS PRIMARY EQUITY COST ESTIMATION METHODOLOGY?

A. No, he does not. In his testimony in this proceeding, Dr. Morin appears to de-emphasize his reliance on the DCF. While acknowledging that all cost-of-equity methodologies are undertaken with theoretical assumptions, Dr. Morin elects to provide considerable criticism regarding the enabling assumptions for the DCF, making the claim that those assumptions conflict with the current investment environment for utilities. At the same time, Dr. Morin neglects to discuss in detail the theoretical assumptions and application problems of risk premium methods such as the CAPM. The difficulties with risk premium models that Dr. Morin elects not to discuss are the very reason why those methodologies tend to be less reliable indicators of the cost of equity capital than the DCF. Dr. Morin's testimony de-emphasizes the most widely-used equity cost estimation technique, the DCF, and emphasizes the results of more unreliable risk premium methods.

Q. PLEASE EXPLAIN WHY IT IS REASONABLE TO BELIEVE THAT THE DCF IS A RELIABLE INDICATOR OF EQUITY CAPITAL COSTS IN THE CURRENT CAPITAL MARKET ENVIRONMENT.

A. At page 27 of his Direct Testimony, Dr. Morin opines that "several fundamental structural changes have transformed the electric utility industry since the standard DCF

[24] *Atlanta Gas Light Company*, Georgia Public Service Commission Docket No. 18638-U, Tr. 500-501.

model and its assumptions were first developed." While that is generally true, it is also true for all other market-based, equity-cost-estimation methods including the CAPM, which was developed about the same time as the DCF (1960s and 1970s). Dr. Morin cannot reasonably claim the DCF is flawed because it was developed during another economic era, while simultaneously placing emphasis on other econometric models developed at the same time. Moreover, cost of equity methods do not model particular economic conditions, rather they model the manner in which investors make decisions. Dr. Morin has made no attempt to show that the DCF is no longer a reasonable proxy for the manner in which investors value stocks (i.e., that investors do not believe that the current stock price is the present value of the future income stream generated by that stock). His claim that the DCF is unreliable is not supported.

Q. HAS DR. MORIN TESTIFIED RECENTLY THAT THE DCF UNDERSTATES THE COST OF EQUITY WHEN MARKET PRICES ARE ABOVE BOOK VALUE AND OVERSTATES THE COST OF EQUITY WHEN MARKET PRICES ARE BELOW BOOK VALUE?

A. Yes. While he has not provided that opinion in Direct Testimony in this proceeding, he testified to that effect in his rebuttal testimony in Puget Energy's recent 2008 rate case[25] and also in direct testimony before the Hawaii Public Utilities Commission in 2007.[26]

Q. HAS HIS POSITION ON THIS ISSUE BEEN CONSISTENT?

A. No, Dr. Morin's first text on the cost of capital, Utilities' Cost of Capital, was published in 1984, and was conceived and written during a time period for utilities in which interest rates were very high and market prices were generally below book value. As shown in

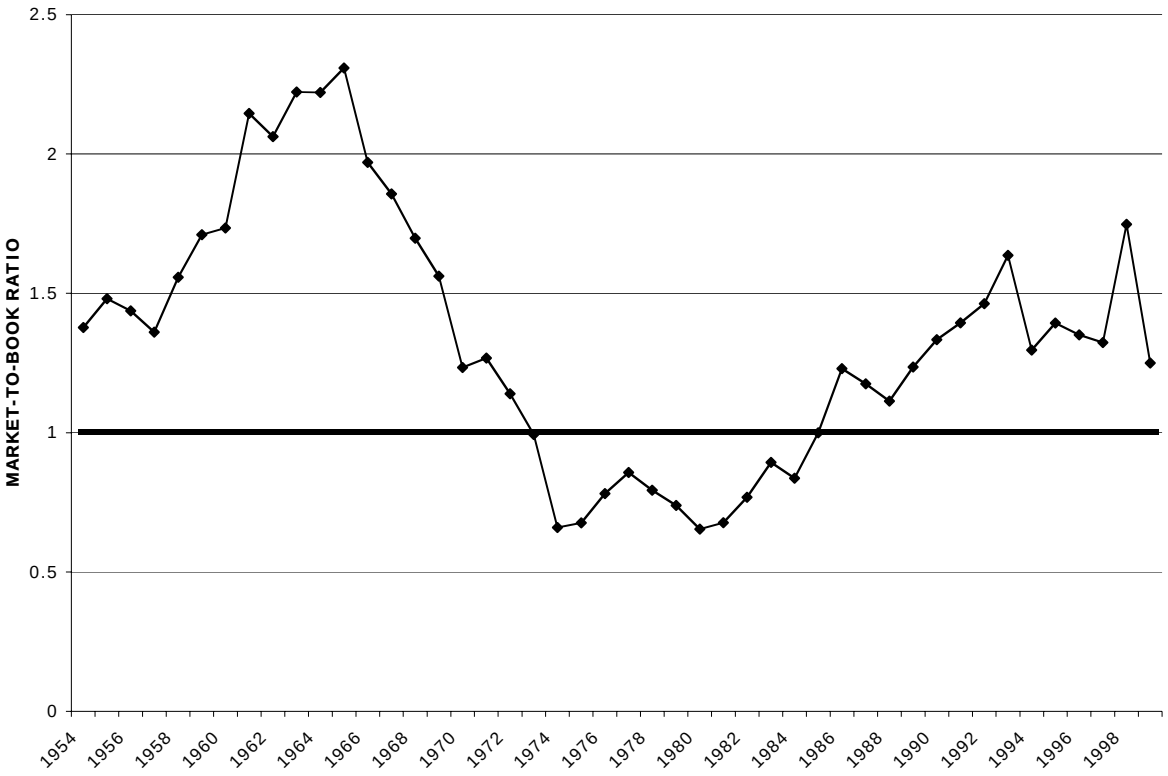
[25] *Washington Utility & Transportation Commission v. Puget Sound Energy*, Docket No, UE-072300/UG-072301, Morin Rebuttal, pp. 9, 10.

the chart below, the market price of Moody's Electric Utilities was below 1.0 for the ten-year period from 1974 through 1984 and averaged only 0.75 of book value during that time.

Chart III

Market-to-Book Ratio

Moody's Electric Utilities



All data from Mergent 2001 Public Utility Manual.

There is no indication in Dr. Morin's 1984 text that when market prices are below book value (as they were at that time), the DCF overstates the cost of equity (as Dr. Morin now claims).[27] Not only does Dr. Morin's original text not support his current position that a market price

[26] Hawaiian Electric Company, H.P.U.C. Docket No. 2006-0386.

[27] The logic on which Dr. Morin bases his claim that the DCF understates the cost of equity when market prices exceed book value also indicates that the DCF overstates the cost of equity when market prices are less than book value.

below book value indicates that the DCF overstates the cost of equity, but it actually adopts an opposing view. At page 98 of his 1984 text, Dr. Morin states that the application of the standard DCF model to a public utility whose market-to-book ratio was below one would result in a "downward-biased estimate of the cost of equity," i.e., the DCF would understate the cost of equity.

In 1984, when utility stock prices had been below book value for a decade, Dr. Morin is on record stating that the DCF understates the cost of capital when market prices are below book value. Now that utility stock prices are generally above book value, Dr. Morin is on record stating that the DCF understates the cost of capital because market prices are above book value. Dr. Morin's published opinions regarding the accuracy of the DCF relative to current market-to-book values is inconsistent and this published theoretical inconsistency, in my view, undermines the reliability of Dr. Morin's current position on this subject.

Q. WHAT EXAMPLE DOES DR. MORIN USE TO SUPPORT HIS CURRENT POSITION REGARDING THE RELIABILITY OF DCF ESTIMATES?

A. Dr. Morin, in his Rebuttal Testimony in Puget Sound Energy's most recent rate case (Docket Nos. UE-072300/UG-072301), and at pages 434 and 435 of his text, New Regulatory Finance (Public Utilities Reports, Vienna, VA, 2006), sets out the following numerical example:

Dr. Morin's Market-to-Book Example

	Situation 1	Situation 2	Situation 3
1 Initial Purchase Price	$25.00	$50.00	$100.00
2 Initial Book Value	$50.00	$50.00	$50.00
3 Initial M/B	0.50	1.00	2.00
4 DCF Return 10% = 5% + 5%	10.00%	10.00%	10.00%
5 Dollar Return	$5.00	$5.00	$5.00
6 Dollar Dividends 5% Yield	$1.25	$2.50	$5.00
7 Dollar Growth 5% Growth	$3.75	$2.50	$0.00
8 Market Return	20.00%	10.00%	5.00%

Dr. Morin's explanation of the "impact" of market-to-book ratios on the DCF cost of equity in "Situation 3" (when market prices are above book value) proceeds as follows:

> [t]he DCF cost rate of 10%, made up of a 5% dividend yield and a 5% growth rate, is applied to the book value rate base of $50 to produce $5.00 of earnings. Of the $5.00 of earnings, the full $5.00 are required for dividends to produce a dividend yield of 5% on a stock price of $100.00, and no dollars are available for growth. The investor's return is therefore only 5% versus his required return of 10%. A DCF cost rate of 10%, which implies $10.00 of earnings, translates to only $5.00 of earnings on book value, or a 5% return.[28]

Dr. Morin elects not to discuss "Situation 1" in which market prices are below book value and the DCF, supposedly, overstates the cost of equity. Of course, as I noted previously, during the time period when market prices were actually below book value, Dr. Morin expressed no concerns that the DCF overstated the cost of equity due to differences in market price and book value—he expressed the opposite view.

[28] Morin, R., New Regulatory Finance, Public Utilities Reports, Vienna, VA, (2006), p. 435.

Q. DOES DR. MORIN'S NUMERICAL EXAMPLE, SET OUT ABOVE, SUPPORT HIS THESIS THAT THE DCF IS INACCURATE WHEN MARKET PRICES ARE DIFFERENT FROM BOOK VALUE?

A. No. In attempting to show that the DCF estimates the cost of equity incorrectly when market prices are different from book value, Dr. Morin has created a hypothetical situation that cannot exist in reality and is contrary to one of the most fundamental precepts in finance.

In attempting to show that the DCF understates the cost of capital when market prices are above book value, Dr. Morin's "Situation 3" example posits a firm that has an allowed return of 10 percent (which is assumed to be determined by the DCF), a book value of $50, and for which investors are paying a stock price equal to twice book value ($100). That company will earn $5 on its rate base investment (10 percent allowed return x $50 rate base/book value), and that $5 return represents only a 5 percent return to the investors that paid $100 for the stock. Dr. Morin, through this example, ostensibly concludes that the DCF does not provide the investors' required 10 percent return (the investor-required return assumed to be provided by the DCF) when it is applied to a rate base (book value) that is smaller than the market price. This is a spurious conclusion for two reasons.

First, if the investor's required return is actually 10 percent (which appears to be Dr. Morin's assumption) and the utility is expected to earn a 10 percent return on its book value of $50, or $5, then no investor would pay twice book value for that stock. Therefore, the situation on which Dr. Morin's DCF unreliability rationale is grounded cannot exist.

Imagine a stockbroker trying to sell a stock to an investor who requires a 10 percent return. "I've got a stock for you that's going to pay you $5 annually, but each share will cost you $100. What do you say?" No investor would knowingly pay $100 for a stock

that will earn $5 when he or she requires a 10% return for that type of stock, a fact which Dr. Morin himself confirms:

> "Investors will not provide equity capital at the current market price if the earnable return on equity is below the level they require..."[29]

Yet, that is the logical construct on which Dr. Morin's "Situation 3" example rests.

Second, the only reason for an investor to pay $100 for a stock that will provide a $5 income stream is if that investor requires a 5 percent return for that type of stock. In Dr. Morin's "Situation 3" example if we take the 10 percent number to be the allowed return (the expected return on the $50 rate base), and the investor's cost of capital to be 5 percent (a DCF result derived from a 5 percent dividend yield and 0 percent growth), then his numerical example makes economic sense. If the investor's required return is 5 percent and the stock in question is expected to pay a 10 percent return on a $50 book value, then, *and only then*, is the $100 stock price rational.

Therefore, the only situation under which the numerical conditions set out in Dr. Morin's example can exist is one that conforms to the widely accepted relationship between market price, book value, ROE and the cost of capital.[30] Namely, when the expected return (r = 10% in "Situation 3," above) exceeds the investors' required return (K = 5% in "Situation 3," above) the market price (P = $100) will exceed the book value (B = $50).

In summary, Dr. Morin's numerical example, which purports to show that the DCF understates the cost of equity when market prices are different from book value, does not

[29] Morin Direct, p. 6, ll. 7-9.

[30] Gordon, M.J., The Cost of Capital to a Public Utility, MSU Public Utilities Studies, East Lansing, Michigan, (1974), pp., 63-64; Kolbe, Read, Hall, The Cost of Capital: Estimating the Rate of Return for Public Utilities, 25-33 (1986); Lawrence Booth, ("The Importance of Market-to-Book Ratios in Regulation," NRRI Quarterly Bulletin, Vol. 18, No. 4, at 415-16 (Winter 1997).

do so. Instead, under the only circumstance that makes economic sense, his example shows that when utility market prices are significantly above book value, the investors' required return (the cost of equity capital) is below the ROE expected to be earned by those companies.

Q. DID THE ORIGINATOR OF THE DCF, PROFESSOR MYRON GORDON, INDICATE THAT THE DCF WOULD PROVIDE EQUITY COST ESTIMATES THAT WERE SKEWED DOWNWARD (UPWARD) IF THE MARKET PRICE WAS ABOVE (BELOW) BOOK VALUE?

A. No, he did not. Professor Gordon was certainly aware that utility market prices could differ from book value. However, there is no discussion in his text regarding differences between market price and book value having any impact on the ability of the DCF to estimate investors' expected return on common equity (the cost of equity capital). Professor Gordon does note, however, that if market prices are well above book value, that situation indicates that the expected accounting return (the return on book value) exceeds the cost of common equity. The integrated electric utilities used by Dr. Morin as a similar-risk proxy for AmerenUE have an expected return on book equity of 10.6 percent during the 2009 period, according to Value Line's most recent editions of *Ratings and Reports*. AUS Utility Reports indicates that those same companies have a current average market-to-book ratio of 1.56. While those relationships do not pinpoint the cost of capital, according to the originator of the DCF, they indicate that a current cost of equity capital of 11.15 percent (the cost of equity recommended in this proceeding by Dr. Morin) is not plausible.

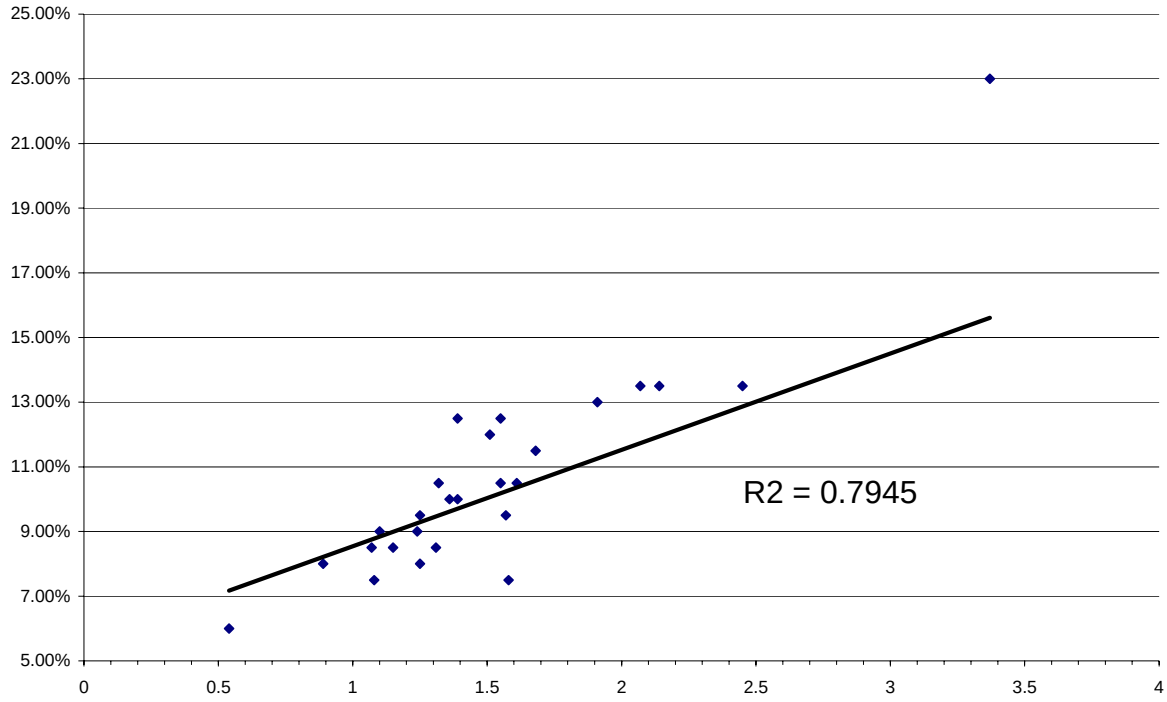
In fact, as shown in Chart IV, below, comparing the expected 2008 ROE published by Value Line for each of Dr. Morin's sample companies to each company's market-to-book ratio published by AUS Utility Reports, shows: 1) expected return on book value is highly correlated with market-to-book ratio for utilities; and, 2) the expected return at

which market price is only slightly above book value is approximately 9 percent. Again, a comparison of the expected return on equity and market-to-book ratios of Dr. Morin's sample group indicate that his 11.15 percent equity return recommendation does not comport with the data related to his sample group of companies and is not an accurate estimate of the cost of equity capital.

Chart IV

Morin's Sample Group

M/B Ratio v. 2009 R.O.E.



Q. DOESN'T DR. MORIN PROVIDE A QUOTE FROM "ONE OF THE LEADING EXPERTS ON REGULATION" THAT DISCUSSES THE "DANGERS" OF RELYING SOLELY ON THE DCF?

A. Yes, he does. However, Dr. Morin failed to provide the Commission the opinion of that same "leading expert" regarding the CAPM, which follows immediately after the quote he chose to cite in his testimony. At page 20 of his Direct Testimony, Dr. Morin quotes from Dr. Charles Phillips' text The Regulation of Public Utilities Theory and Practice. The very next paragraph following the text provided by Dr. Morin reads as follows:

> The CAPM holds that the cost of equity capital or expected return on a utility's common equity is equivalent to that on a riskless security plus a risk premium related to the risk inherent in a particular utility's stock; that is, the model combines risk and return in a single measure.
>
> * * *
>
> Despite its appeal, the CAPM also has both theoretical and practical problems. The theoretical issues include the reliability of the model's basic assumptions and the static nature of the model. The practical problems surround the beta coefficient, "the only variable in the CAPM equation that is unique to the particular firm for which the cost of equity capital is being determined." They include: How should beta be measured—stock market price alone or total return on investment (i.e., dividends plus capital gains)? What period of time should be used for such measurement? What is the proper measure of stock market performance (e.g., Dow Jones index, Standard & Poor's index, etc.)? What is the proper measure of the risk-free return (e.g. Treasury notes or Treasury bonds)? Finally, the evidence suggests that betas are unstable over time and that they move in the opposite direction from investors' perceptions of risk. These issues have led some to conclude that the CAPM, at least at this stage in its development, "is inaccurate, incomplete, and unreliable as a measure of a firm's equity cost of capital."[31]

Q. ARE THE ENABLING ASSUMPTIONS OF RISK PREMIUM ANALYSES RESTRICTIVE?

[31] Phillips, C.F., The Regulation of Public Utilities Theory and Practice, Public Utilities Reports, Arlington, VA, 1993, pp. 396, 397, (footnotes omitted).

A. Yes. The assumptions that enable the existence of the CAPM analysis are far more restrictive than those that support the DCF. At page 19 of his Direct Testimony, Dr. Morin references Dr. Eugene F. Brigham as a "widely respected scholar of finance and academician." Dr. Brigham provides a concise list of the assumptions that underlie the Capital Asset Pricing Model:

> 1. All investors think in terms of a single period, and they choose among alternative portfolio's expected return and standard deviation over that period.
>
> 2. All investors can borrow or lend an unlimited amount of money at a given risk-free rate of interest, k_{RF}, and there are no restrictions on short sales of any asset.
>
> 3. All investors have identical estimates of the expected values, standard deviations, and correlations of returns among all assets; that is, investors have "homogeneous expectations."
>
> 4. All assets are perfectly divisible and are perfectly marketable at the going price.
>
> 5. There are no transaction costs.
>
> 6. There are no taxes.
>
> 7. All investors are price takers (that is, all investors assume that their own buying and selling activity will not affect market prices).
>
> 8. The quantities of all assets are given and fixed.[32]

Those restrictive CAPM assumptions are also shown at page 170 of Dr. Morin's New Regulatory Finance.[33]

It should be clear, even to the most casual observer, that many of the assumptions on which the CAPM is predicated are violated in applying the CAPM to the determination of the

[32] Brigham, E.F., Gapenski, L., Intermediate Financial Management, 5th Ed., Dryden Press, Fort Worth, TX, 1994, p. 68.

[33] In defense of his reliance on CAPM, Dr. Morin has recently taken the position that if the CAPM is considered to be a special case of the Arbitrage Pricing Model (APM), its assumptions are less restrictive. Unfortunately, although the APM has less restrictive assumptions, it was derived after the CAPM as an attempt to solve some of the CAPM's problems and does not negate the assumptions on which the CAPM rests. Further, Dr. Morin has relied on the CAPM, not the APM to estimate the cost of equity capital and reference to the latter to mollify the strict nature of the assumptions on which the CAPM rests is inappropriate.

cost of capital of a particular type of security. All investors are not single-period investors; all investors can't borrow and lend unlimited amounts of money at the risk-free rate; all investors do not have identical return expectations. Furthermore, all assets are not perfectly divisible; there are taxes; there are transaction costs; and many large institutional investors are acutely aware that buying and selling large amounts of any particular stock may affect stock prices. Each of these everyday stock market realities violates at least one of the assumptions on which the CAPM is grounded.

There are broader theoretical questions regarding the CAPM that I discuss in some detail in my Direct Testimony. For example, while analysts commonly use a broad market index (S&P 500 or NYSE) to represent "the market" in the CAPM, the model is actually designed to consider all capital investments (bonds, art, real estate, human capital) not just stocks. Moreover, since there is no "index" for all capital investments, the "true" CAPM cost of equity is unknowable, technically speaking.

The CAPM also has problems with its primary risk measure, beta. Although he fails to do so in his Direct Testimony in this proceeding, Dr. Morin discussed many of the problems with beta in his 2006 text:

> **Practical and Conceptual Difficulties**
> **Computational Issues.** Absolute estimates of beta may vary over a wide range when different computational methods are used. The return data, the time period used, its duration, the choice of market index, and whether annual, monthly, or weekly return figures are used will influence the final result.
>
> * * *
>
> **Beta Stability.** Several empirical studies of beta coefficients, notably by Blume (1975) and Levy (1971), have revealed the market instability of betas over time.
>
> * * *

> **Historical versus True Beta.** The true beta of a security can never be observed. Historically estimated betas serve only as proxies for the true beta.
>
> * * *
>
> **Relevance of Beta.** According to both financial theory and empirical evidence, betas are critical and sufficient measures of risk. …But the relevance of beta as the only measure of risk remains controversial.[34]

Two researchers that Dr. Morin cites for authority, Eugene Fama and Kenneth French, published findings in the early 1990s regarding beta that show the primary risk measure in the CAPM to be essentially meaningless.[35] As Value Line noted in its *Industry Review*, March 13, 1992, Fama and French established in dramatic fashion the lack of a statistical relationship between return and beta. That finding was important because Fama's early econometric work in the 1970s on the CAPM and beta had lent credibility to the model. Those findings led the researchers to conclude:

> In short, our tests do not support the most basic prediction of the SLB [Sharpe-Litner-Black, CAPM] model, that average returns are positively related to market ßs. [36]

Fama and French have continued their investigation of the CAPM since their 1992 article and have postulated that a more accurate CAPM would use two additional risk measures in addition to beta. However, it is important to note that while those authors tout the superiority of their three-factor CAPM to the single-beta CAPM on theoretical grounds, they recognize that there are significant problems with any type of asset pricing model when it comes to using the model to estimate the cost of equity capital. Even in reference to their three-factor CAPM, Fama and

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[34] Morin, R. New Regulatory Finance, Public Utilities Reports, Arlington, VA, (2006), pp. 71-81.
[35] "The Cross-Section of Expected Stock Returns," The Journal of Finance, Vol. XLVII, No. 2, (June 1992), pp. 427-465).
[36] *Id.*, p. 428.

French indicate the equity cost estimates produced are "woefully imprecise."[37] In 2004, those authors stated in the *Journal of Economic Perspectives*, that the CAPM's structural problems render the model "invalid".

> The attraction of the CAPM is that it offers powerful and intuitively pleasing predictions about how to measure risk and the relation between expected return and risk. Unfortunately, the empirical record of the model is poor—poor enough to invalidate the way it is used in applications. The CAPM's empirical problems may reflect theoretical failings, the result of many simplifying assumptions. But they may also be caused by difficulties in implementing valid tests of the model….In the end, we argue that whether the model's problems reflect weaknesses in the theory or in its empirical implementation, the failure of the CAPM in empirical tests implies that most applications of the model are invalid. [38]

In summary, the CAPM analysis has very strong assumptions that violate real-world financial market conditions. Also, the fundamental risk measure on which CAPM is based (beta) has many problems—a fact discussed in detail by Dr. Morin in his text as well as by others on whom Dr. Morin relies for authority. While the CAPM remains an elegant description of capital market behavior that is widely used in academia as a theoretical framework, that model has significant application problems. Although those problems do not negate its use, they do call for the limits on use of the CAPM as a supporting equity-cost-estimation procedure. Unfortunately, Dr. Morin places primary emphasis on risk premium-type models in his equity cost analysis in this proceeding.

Q. DO YOU USE THE CAPM IN DETERMINING YOUR RECOMMENDATION IN THIS PROCEEDING?

A. Yes, I do. Although the CAPM has numerous practical difficulties that can cause wide swings in the results, it remains a reasonable description of capital market behavior.

[37] Fama, E., French, K., "Industry Costs of Equity," *Journal of Financial Economics*, 43 (1977), pp. 153-193.

I believe, with well-reasoned application of the risk-free rate, beta and a forward-looking market risk premium, it can produce reasonable estimates of the cost of equity.

I do not place primary reliance on the CAPM because of both the theoretical and practical implementation problems associated with the CAPM. Moreover, it is important to understand that the same "leading expert" Dr. Morin cites in downplaying the importance of DCF, also indicates the CAPM is "unreliable."[39]

Q. ARE THERE OTHER PROBLEMS RELATED TO RISK-PREMIUM ANALYSES THAT YOU HAVE NOT DISCUSSED IN THIS PORTION OF YOUR TESTIMONY?

A. Yes, there are other important concerns regarding the risk premium-type analysis on which Dr. Morin elects to rely. I have discussed those problems in my Direct Testimony. Simply put, historical risk premiums (e.g., the Morningstar historical return data) overstate current investor risk premium expectations. There has been much research on this issue in the financial economic literature over the past decade, which indicates that investors' current risk premium expectations are considerably lower than that indicated by long-term averages of historical return data.

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY IN THIS PROCEEDING, MR. HILL?

A. Yes, it does.

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[38] Fama, E., French, K., "The Capital Asset Pricing Model: Theory and Evidence," *Journal of Economic Perspectives*, Vol. 18, No. 3, (Summer 2004), pp. 25-46.

[39] Phillips, C.F., The Regulation of Public Utilities Theory and Practice, Public Utilities Reports, Arlington, VA, 1993, p. 397.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a AmerenUE for Authority to File Tariffs Increasing Rates for Electric Service Provided to Customers in the Company's Missouri Service Area.	)))))	Case No. ER-2008-0318

AFFIDAVIT OF STEPHEN G. HILL

STATE OF MISSOURI)
) ss.
COUNTY OF St. Louis)

Stephen G. Hill, of lawful age, on his oath states: that he has participated in the preparation of the foregoing Rebuttal Testimony in question and answer form, consisting of 45 pages to be presented in the above case; that the answers in the foregoing Rebuttal Testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true and correct to the best of his knowledge and belief.

Stephen G. Hill

Subscribed and sworn to before me this 8th day of October, 2008.

JEREMY HAGEMEYER
Notary Public - Notary Seal
State of Missouri - County of St. Louis
My Commission Expires Feb. 17, 2009
Commission #05668582

Notary Public