# MISSOURI PUBLIC SERVICE COMMISSION

## CASE NO. ER-2007-0002

*Rebttl*

~~DIRECT~~ TESTIMONY

## OF

## J. RANDALL WOOLRIDGE

## ON BEHALF OF

## STATE OF MISSOURI

**FILED** [3]

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Missouri Public
Service Commission

**Jefferson City, Missouri**

**January 31, 2007**

# Union Electric Company

## Direct Testimony of
## J. Randall Woolridge

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## LIST OF EXHIBITS

1 Q. ARE YOU THE SAME DR. WOOLRIDGE WHO PREVIOUSLY FILED

2 TESTIMONY IN THIS PROCEEDING?

3 A. Yes, I have filed testimony in this proceeding on behalf of the State of Missouri.

4

5 Q. PLEASE OUTLINE YOUR REBUTTAL TESTIMONY.

6 A. Initially I provide an executive summary of the rate of return position of UE's rate of

7 return witnesses Dr. Vander Weide and Ms. McShane. I then evaluate the primary

8 rate of return approaches and results of UE's two witnesses in this case.

9
10 I. OVERVIEW
11

12 Q. PLEASE PROVIDE AN EXECUTIVE SUMMARY OF UE'S OVERALL

13 RATE OF RETURN RECOMMENDATION.

14 A. Dr. Vander Weide has employed Discounted Cash Flow (DCF), Risk Premium (RP),

15 and Capital Asset Pricing Model (CAPM) approaches. Ms. McShane employs the

16 same methodologies, and also uses a Comparable Earnings (CE) test to evaluate her

17 other equity cost rate results. I have employed the DCF and CAPM methodologies. I

18 have used Dr. Vander Weide's comparable group of electric utility companies. His

19 group is relatively large (thirty four) and includes virtually all of the companies

20 employed by Ms. McShane.

21 In terms of the DCF approaches, a major area of disagreement involves the

22 estimation of the expected growth rate. Dr. Vander Weide and I have used the

23 constant growth DCF approach. Ms. McShane uses both constant growth and a two-

24 stage growth DCF approaches. In the two-stage growth DCF model, she utilizes

| | |
|---|---|
| 1 | projected GDP growth as her second-stage growth rate. There are three primary |
| 2 | errors in the DCF analyses of the two company witnesses. First, both witnesses rely |
| 3 | simply on the forecasted earning per share (EPS) of Wall Street analysts and/or the |
| 4 | *Value Line Investment Survey* in determining a growth rate measure for their DCF |
| 5 | models. Second, neither witness has recognized the well-known upward bias in the |
| 6 | forecasted EPS growth rates of Wall Street analysts and *Value Line*. An third, Ms. |
| 7 | McShane has provided no justification for the use of projected GDP growth as a long- |
| 8 | term growth expectation proxy in her two-stage DCF model. I have used both |
| 9 | historic and projected growth rate measures, and have evaluated growth in dividends, |
| 10 | book value, and earnings per share. |
| 11 | The CAPM approach requires an estimate of the risk-free interest rate, beta, |
| 12 | and the equity risk premium. Whereas Dr. Vander Weide, Ms. McShane, and myself |
| 13 | are in agreement on the source for beta (*Value Line)*, we differ on the risk-free |
| 14 | interest rate and, in particular and most significantly, on the magnitude of the equity |
| 15 | risk premium. The risk-free rate of interest of both Company witnesses is well in |
| 16 | excess of the current yield on long-term Treasury bonds. As to the equity risk |
| 17 | premium, I highlight in my testimony that there are three procedures for estimating an |
| 18 | equity risk premium – historic returns, surveys, and expected return models. Dr. |
| 19 | Vander Weide relies on a historic equity risk premium of 7.10% and a projected |
| 20 | equity risk premium of 8.35% using a DCF model and analysts' projected EPS |
| 21 | growth rate forecasts for the S&P 500. Ms. McShane uses a historic equity risk |
| 22 | premium range of 7.0%-7.10% and a projected equity risk premium range of 7.2%- |
| 23 | 7.7%. I provide evidence that risk premiums based on historic returns series, as well |

1     as those using analysts' projected EPS growth rate forecasts, are upwardly-biased

2     measures of expected equity risk premiums. I use an equity risk premium of 4.15%

3     which (1) uses all three approaches to estimating an equity premium and (2) employs

4     the results of many studies of the equity risk premium.  As I note, my equity risk

5     premium is consistent with the equity risk premiums (1) discovered in recent

6     academic studies by leading finance scholars, (2) employed by leading investment

7     banks and management consulting firms, and (3) found in surveys of financial

8     forecasters and corporate CFOs.

9          Both Dr. Vander Weide and Ms. McShane also apply very similar RP

10     approaches.  Both estimate ex ante risk premiums by estimating DCF-derived expected

11     returns for electric utilities using analysts' projected EPS growth rate forecasts as a

12     measure of expected growth. They also both develop historic risk premiums using

13     historic returns on utility stocks and bonds.  Both the ex ante and historic risk

14     premiums of Dr. Vander Weide and Ms. McShane are subject to errors.  The ex ante

15     risk premiums do not account for the upwardly-biased EPS forecasts of Wall Street

16     analysts and the historic risk premiums are based on historic returns which are subject

17     to a number of empirical errors as measures of expected stock returns and therefore

18     forward-looking equity risk premiums.

19          Dr. Vander Weide and Ms. McShane also make an adjustment to their equity

20     cost rate estimates derived from their comparable groups to reflect the leverage

21     difference between the market value capital structures of the group and UE's book value

22     capital structure which is used for rate making purposes. The adjustment increases their

23     respective equity cost rate estimates by 70 basis points for Dr. Vander Weide and 60-

1    130 basis points for Ms. McShane. In my testimony I discuss why this adjustment is not

2    appropriate and highlight the fact that it produces illogical results.

3

4    Q.    PLEASE    SUMMARIZE    UE'S    OVERALL    RATE    OF    RETURN

5    RECOMMENDATION.

6    A.    The Company's proposed rate of return position is summarized below:

7

| Capital Source | Capitalization Ratio | Cost Rate | Weighted Cost Rate |
|---|---|---|---|
| Short Term Debt | 0.795% | 5.36% | 0.043% |
| Long Term Debt | 44.964% | 5.473% | 2.461% |
| Preferred Stock | 2.017% | 5.189% | 0.105% |
| Common Equity | 52.224% | 12.000% | 6.267% |
| Total Capitalization | 100.00% | | 8.876% |

8
9
10   Q.    PLEASE EVALUATE THE COMPANY'S RATE OF RETURN POSITION.

11   A.    The Company's requested rate of return is excessive due to an overstated equity cost

12   rate. I am employing the Company's proposed capital structure and senior capital cost

13   rates, but with the recognition that the Company's proposed capital structure has a lower

14   degree of financial risk as indicated by the higher common equity ratio. The equity cost

15   rate of 12.0% is extremely overstated and not reflective of current market fundamentals.

16   This equity cost rate is supported by Company witnesses Dr. Vander Weide and Ms.

17   McShane.

18

19   Q.    PLEASE    REVIEW    THE    EQUITY    COST    RATE    APPROACHES    AND

20   RESULTS OF DR. VANDER WEIDE AND MS. MCSHANE.

4

1   A.     The equity cost rate approaches and results for the two Company rate of return

2           witnesses are summarized below:

3           Dr. Vander Weide

| Approach | Cost of Equity |
|---|---|
| DCF | 10.7% |
| Ex Ante Risk Premium | 11.0% |
| Ex Post Risk Premium | 11.4% |
| Historical CAPM | 11.7% |
| DCF CAPM | 12.8% |
| Average | 11.5% |
| Capital Structure Adjustment | 0.70% |
| Equity Cost Rate | 12.2% |

4

5           Ms. McShane
6

7

| Approach | Range | Result |
|---|---|---|
| Discounted Cash Flow | 9.3%-11.0% | 10.0% |
| CAPM | 11.75%-12.25% | 12.0% |
| Achieved Utility Risk Premiums | 10.75%-11.75% | 11.25% |
| DCF-Based Risk Premium | 10.3%-10.8% | 10.5% |
| Average | | 11.0% |
| Capital Structure Adjustment | | 1.0% |
| Equity Cost Rate | 11.6%-12.3% | 12.0% |

11

12   Q.    **WHAT IS YOUR ASSESSMENT OF THE ANALYSES OF DR. VAN DER**

13           **WEIDE AND MS. MCSHANE?**

14   A.     Their equity cost rate approaches and results, as well as their testimonies themselves, are

15           almost identical. As such, I will jointly critique their analyses. In general, Dr. Vander

16           Weide and Ms. McShane overstate UE' equity cost rate due to a number of errors in

17           their analyses. These errors include: (1) they has given very little weight to their

18           DCF results; (2) in their DCF analyses, they has employed upwardly-biased and

19           unjustified expected growth rates. In addition, Ms. McShane has provided no

| | | |
|---|---|---|
| 1 | justification for her use of projected GDP growth as a long-term growth expectation |
| 2 | proxy in her two-stage DCF model; (3) in their risk premium and CAPM approaches, |
| 3 | they has employed inflated base interest rates and excessive risk premium estimates, |
| 4 | and (4) they both have made an inappropriate and illogical adjustment to their equity |
| 5 | cost rate estimates to reflect the leverage difference between the market value capital |
| 6 | structures of the group and UE's book value capital structure which is used for rate |
| 7 | making purposes. |

8                                            **II. DCF APPROACH**

9

10  **Q.  PLEASE SUMMARIZE THE DCF ESTIMATES OF THE TWO COMPANY**

11  **WITNESSES.**

12  A.    The DCF results for Dr. Vander Weide and Ms. McShane are summarized below

13

### Dr. Vander Weide's DCF Results

| | 34 Company ElectricUtility Group | 11 Company Gas Group |
|---|---|---|
| Dividend Yield | 4.32% | 3.43% |
| Long-Term Growth | 6.29% | 7.41% |
| Median Cost Rate | 10.61% | 10.84% |

14

15

### Ms. McShane's DCF Results

| | Model (A) Analysts L-T EPS Growth Forecasts | Model (B) Value Line L-T EPS Growth Forecasts | Model (C) L-T Growth Industry Avg. |
|---|---|---|---|
| Mean/Median Dividend Yield | 4.0%/3.8% | 4.0%/4.0% | 3.9%/3.8% |
| Mean/Median DCF Growth Rate | 6.7%/6.6% | 6.5%/5.5% | 6.7%/6.6% |
| $2^{nd}$ Stage DCF Growth | | | 5.2% |
| Mean/Median Median Cost Rate | 10.7%/10.4% | 11.0%/9.2% | 9.3/9.4% |

16

| 1 | Q. | PLEASE EVALUATE THE DCF RESULTS OF THE TWO WITNESSES. |

1   Q.   PLEASE EVALUATE THE DCF RESULTS OF THE TWO WITNESSES.

2   A.   There are several issues with the DCF results of the two Company rate of return

3        witnesses: (1) Neither have given much (if any) weight to their DCF results in

4        arriving at their equity cost rate recommendations, (2) both have relied on the

5        upwardly-biased forecasted EPS growth rate forecasts of Wall Street analysts and/or

6        the *Value Line Investment Survey* in determining a growth rate measure for their DCF

7        models, (3) both have made inappropriate adjustments to their dividend yields to

8        reflect the quarterly payment of dividends, (4) Dr. Vander Weide's DCF results for

9        his electric utility and gas company groups have been weighted so as to give the

10       greatest weight to companies with business operations outside of electric utility and

11       gas distribution service, and (5) McShane has provided no justification for the use of

12       projected GDP growth as a long-term growth expectation proxy in her two-stage DCF

13       model.

14

15  Q.   PLEASE INITIALLY ADDRESS YOUR SPECIFIC ISSUES WITH DR.

16       VANDER WEIDE AND MS. MCSHANE (ISSUES (4) AND (5)).

17  A.   Dr. Vander Weide has weighted his DCF results using the market values of the

18       companies in his electric utility and gas distribution groups. This results in giving the

19       greatest weights to companies with business interests outside of electric utility and gas

20       distribution service. These companies also have the highest equity cost rates. For the

21       electric utility group, Dominion Resources and TXU are two of the largest companies

22       and have the two highest equity cost rate estimates of 14.81% and 14.15%. They also

23       receive only 31% and 22%, respectively from regulated electric utility service. For

1     the gas group, Equitable Resources and Questar are the two largest companies and

2     they also have the two highest equity cost rate estimates (12.48% and 12.98%). They

3     are listed as integrated gas companies and receive 73% and 37%, respectively from

4     regulated gas service.

5

6   Q.   **PLEASE RESPOND TO MS. MCSHANE'S USE OF A LONG-TERM**

7       **PROJECTION OF GROSS DOMESTIC PRODUCT (GDP) GROWTH AS A**

8       **MEASURE OF LONG-TERM GROWTH EXPECTATION FOR ELECTRIC**

9       **UTILITY COMPANIES?**

10   A.   First, as indicated by her response to AG/UTI-171, Ms. McShane has provided no

11      empirical evidence to suggest that investors would expect that GDP growth is the

12      appropriate measure of long-term growth for electric utility companies. In her

13      response she has made the following statement; "I have not undertaken any specific

14      studies or reviewed any articles or treatises." As such, she has provided no evidence

15      that investors would presume that electric utilities have grown in the past, or would

16      be expected to grow in the future, at the GDP growth rate.

17

18   Q.   **PLEASE DISCUSS THE ADJUSTMENT TO THE DIVIDEND YIELD TO**

19       **REFLECT THE QUARTERLY PAYMENT OF DIVIDENDS.**

20   A.   Dr. Vander Weide and Ms. McShane adjust the dividend yield term of their DCF

21      models to reflect the quarterly timing of dividend payments. The quarterly timing

22      adjustment is in error and results in an overstated equity cost rate. First, as indicated

23      in the previously cited testimony of Dr. Myron Gordon before the FCC, the

| 1 | appropriate dividend yield adjustment for growth in the DCF model is the expected |
| 2 | dividend for the next quarter multiplied by four. The quarterly adjustment |
| 3 | procedure is clearly inconsistent with this approach. Second, the notion that an |
| 4 | adjustment is required to reflect the quarterly timing issue is refuted in a study by |
| 5 | Richard Bower of Dartmouth College. Bower acknowledges the timing issue and |
| 6 | downward bias addressed by Dr. Vander Wide. However, he demonstrates that this |
| 7 | does not result in a biased required rate of return. He provides the following |
| 8 | assessment: [1] |

| 9 | "... authors are correct when they say that the conventional cost of equity |
| 10 | calculation is a downward-biased estimate of the market discount rate. They |
| 11 | are not correct, however, in concluding that it has a bias as a measure of |
| 12 | required return. As a measure of required return, the conventional cost of |
| 13 | equity calculation (K*), ignoring quarterly compounding and even without |
| 14 | adjustment for fractional periods, serves very well." |
| 15 | |

| 16 | He also makes the following observation on the issue: |

| 17 | |
| 18 | "Too many rate cases have come and gone, and too many utilities have |
| 19 | survived and sustained market prices above book, to make downward bias in |
| 20 | the conventional calculation of required return a likely reality." |
| 21 | |

22 Q. **WHAT ARE YOUR CONCERNS WITH THE USE OF ANALYSTS' EPS**

23 **GROWTH RATE FORECASTS BY DR. VANDER WEIDE AND MS.**

24 **MCSHANE?**

25 A. As measures of growth in their DCF models, Dr. Vander Weide and Ms. McShane have

26 employed the EPS growth rate forecasts of Wall Street analysts for DCF growth. Ms.

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[1] See Richard Bower, The N-Stage Discount Model and Required Return: A Comment," *Financial Review* (February 1992), pp 141-9.

| 1 | McShane, in one DCF model, also uses the EPS growth rate forecasts of *Value Line.* |
| 2 | Both witnesses have ignored all other indicators of expected growth – including |
| 3 | expected growth in dividends and book value and have also ignored historic growth. It |
| 4 | seems highly unlikely that investors today would rely exclusively on the forecasts of |
| 5 | securities firms and analysts, and ignore historic growth, in arriving at expected growth. |
| 6 | In the academic world, the fact that the EPS forecasts of securities' analysts are overly |
| 7 | optimistic and biased upwards has been known for years. |
| 8 | |

9 **Q. PLEASE REVIEW THE BIAS IN ANALYSTS' GROWTH RATE**
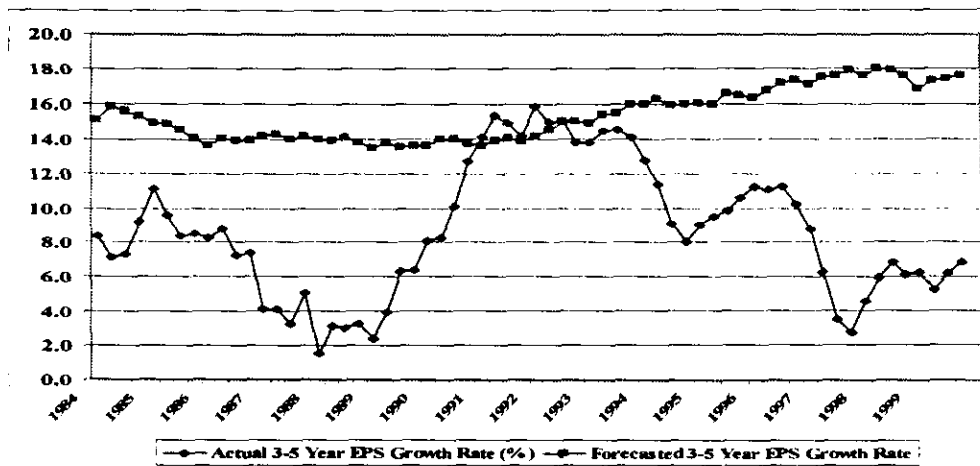10 **FORECASTS.**

11 A. Analysts' growth rate forecasts are collected and published by Zacks, First Call,

12 I/B/E/S, and Reuters. These services retrieve and compile EPS forecasts from Wall

13 Street Analysts. These analysts come from both the sell side (Merrill Lynch, Paine

14 Webber) and the buy side (Prudential Insurance, Fidelity).

15 The problem with using these forecasts to estimate a DCF growth rate is that

16 the objectivity of Wall Street research has been challenged, and many have argued

17 that analysts' EPS forecasts are overly optimistic and biased upwards. To evaluate the

18 accuracy of analysts' EPS forecasts, I have compared actual 3-5 year EPS growth

19 rates with forecasted EPS growth rates on a quarterly basis over the past 20 years for

20 all companies covered by the I/B/E/S data base. In the graph below, I show the

21 average analysts' forecasted 3-5 year EPS growth rate with the average actual 3-5

22 year EPS growth rate. Because of the necessary 3-5 year follow-up period to measure

23 actual growth, the analysis in this graph only (1) covers forecasted and actual EPS

1    growth rates through 1999, and (2) includes only companies that have 3-5 years of

2    actual EPS data following the forecast period.

3          The following example shows how the results can be interpreted. As of the

4    first quarter of 1995, analysts were projecting an average 3-5-year annual EPS growth

5    rate of 15.98%, but companies only generated an average annual EPS growth rate

6    over the next 3-5 years of 8.14%. This 15.98% figure represented the average

7    projected growth rate for 1,115 companies, with an average of 4.70 analysts'

8    forecasts per company over the 20 year period covered by the study. The only

9    periods when firms met or exceeded analysts' EPS growth rate expectations were for

10    six consecutive quarters in 1991-92 following the one-year economic downturn at the

11    turn of the decade.

12
13
14

**Analysts' Forecasted 3-5-Year Forecasted Versus**
**Actual EPS Growth Rates**
**1984-1999**



15
16    Source: J. Randall Woolridge.

17    Over the entire time period, Wall Street analysts have continually forecasted 3-5-year

18    EPS growth rates in the 14-18 percent range (mean = 15.32%), but these firms have

19    only delivered an average EPS growth rate of 8.75%.

11

1      The post-1999 period has seen the boom and then the bust in the stock market,

2      an economic recession, 9/11, and the Iraq war. Furthermore, and highly significant in

3      the context of this study, we have also had the Elliott Spitzer investigation of Wall

4      Street firms and the subsequent Global Securities Settlement in which nine major

5      brokerage firms paid a fine of $1.5B for their biased investment research.

6      To evaluate the impact of these events on analysts' forecasts, the graph below

7      provides the average 3-5-year EPS growth rate projections for all companies provided

8      in the I/B/E/S database on a quarterly basis from 1985 to 2004. In this graph, no

9      comparison to actual EPS growth rates is made and hence there is no follow-up

10     period. Therefore, 3-5 year growth rate forecasts are shown until 2004 and, since

11     companies are not lost due to a lack of follow-up EPS data, these results are for a

12     larger sample of firms.[2] Analysts' forecasts for EPS growth were higher for this

13     larger sample of firms, with a more pronounced run-up and then decline around the

14     stock market peak in 2000. The average projected growth rate hovered in the 14.5%-

15     17.5% range until 1995, and then increased dramatically over the next five years to

16     23.3% in the fourth quarter of the year 2000. Forecasted growth has since declined to

17     the 15.0% range.

18

19

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21

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[2] The number of companies in the sample grows from 2,220 in 1984, peaks at 4,610 in 1998, and then declines to 3,351 in 2004. The number of analysts' forecasts per company averages between 3.75 to 5.10, with an overall mean of 4.37.

## Mean Analysts' 3-5-Year Forecasted EPS Growth Rates
## 1985-2004
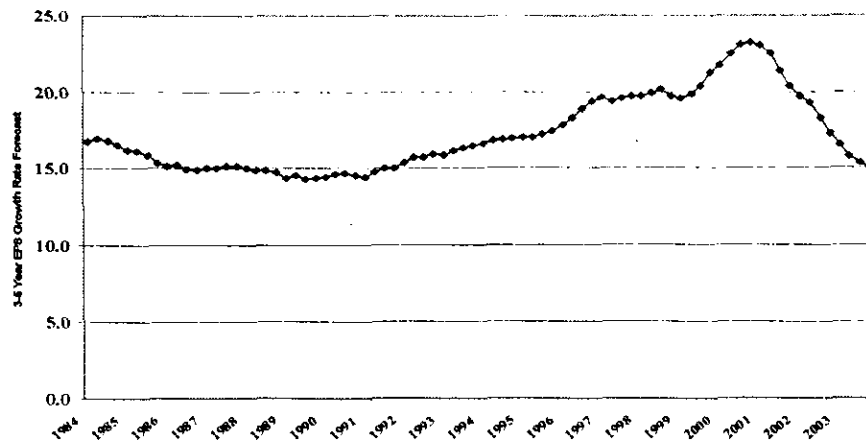


While analysts' EPS growth rates forecasts have subsided since 2000, these

results suggest that, despite the Elliot Spitzer investigation and the Global Securities

Settlement, analysts' EPS forecasts are still upwardly biased. The actual average 3-5

year EPS growth rate over time has been about one half the average projected 3-5

year growth rate forecast of 15.0%. Furthermore, as discussed above, historic growth

in GNP and corporate earnings has been in the 7% range. As such, an EPS growth

rate forecast of 15% does not reflect economic reality. This observation is supported

by a *Wall Street Journal* article entitled "Analysts Still Coming Up Rosy – Over-

Optimism on Growth Rates is Rampant – and the Estimates Help to Buoy the

Market's Valuation." The following quote provides insight into the continuing bias in

analysts' forecasts:

> Hope springs eternal, says Mark Donovan, who manages Boston Partners
> Large Cap Value Fund. 'You would have thought that, given what happened
> in the last three years, people would have given up the ghost. But in large
> measure they have not.'
> These overly optimistic growth estimates also show that, even with all the
> regulatory focus on too-bullish analysts allegedly influenced by their firms'

| 1 | | investment-banking relationships, a lot of things haven't changed: Research |
| 2 | | remains rosy and many believe it always will.[3] |
| 3 | | |

4 **Q. ARE ANALYSTS' EPS GROWTH RATE FORECASTS LIKEWISE**

5 **UPWARDLY BIASED FOR ELECTRIC UTILITY COMPANIES?**

6 A. Yes. To evaluate whether analysts' EPS growth rate forecasts are upwardly biased for

7 electric utility companies, I conducted a study similar to the one described above

8 using the electric utility companies employed by Dr. Vander Weide and myself. The

9 projected EPS growth rates, which were in the four percent range in the 1990s, have

10 increased over the past five years to the six percent range today. Actual EPS growth

11 has been volatile, and consistently below projected EPS growth rates. Over the entire

12 period, the average quarterly projected and actual EPS growth rates are 4.41% and

13 1.99%, respectively. It also appears that analysts tend to miss downturns in EPS

14 growth. Overall, the results here are consistent with the results for companies in

15 general -- analysts' projected EPS growth rate forecasts are upwardly-biased for

16 electric utility companies.

17

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[3] Ken Brown, "Analysts Still Coming Up Rosy – Over-Optimism on Growth Rates is Rampant – and the Estimates Help to Buoy the Market's Valuation," *Wall Street Journal*, (January 27, 2003), p. C1.

| 1 | **Analysts' Forecasted 3-5-Year Forecasted Versus Actual EPS Growth Rates** |
| 2 | **Electric Utility Group** |
| 3 | **1990-2006** |



Forecastsed Versus Actual Long-term EPS Growth

4
5
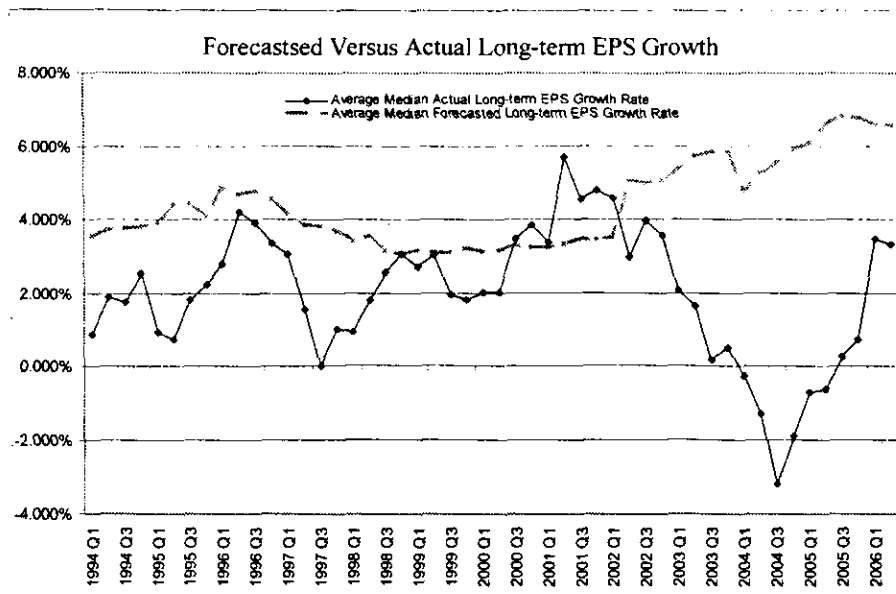
6 **Q.** **ARE *VALUE LINE*'S GROWTH RATE FORECASTS SIMILARILY**

7 **UPWARDLY BIASED?**

8 **A.** Yes. *Value Line* has a decidedly positive bias to its earnings growth rate forecasts as

9 well. To assess *Value Line's* earnings growth rate forecasts, I used the *Value Line*

10 *Investment Analyzer* (January 20, 2007 edition). The results are summarized in the table

11 below. I initially filtered the database and found that *Value Line* has 3-5 year EPS

12 growth rate forecasts for 2,611 firms. The average projected EPS growth rate was

13 16.1%. This is incredibly high given that the average historical EPS growth rate in the

14 US is about seven percent! Equally incredible is that *Value Line* only predicts negative

15 EPS growth for thirty companies. That is one percent of the companies covered by

16 *Value Line*. Given the ups and downs of corporate earnings, this is unreasonable.

17

| Value Line 3-5 year EPS Growth Rate Forecasts | | | |
|---|---|---|---|
| | Average Projected EPS Growth rate | Number of Negative EPS Growth Projections | Percent of Negative EPS Growth Projections |
| 2,611 Firms | 16.1% | 30 | 1.1% |

To put this figure in perspective, I screened the 2,611 firms with 3-5 year growth rate forecasts to see what percent had experienced negative EPS growth rates over the past five years. *Value Line* reported a five-year historic growth rate for 1,613 of the 2,613 companies. It should be noted that the past five years have been a period of rapidly rising corporate earnings as the economy and businesses have rebounded from the recession of 2001. These results, shown in the table below, indicate that the average historic growth was 9.40% and *Value Line* reported negative historic growth for 405 firms which represents 25.1% of these companies.

| Historic Five-Year EPS Growth Rates for Companies with Value Line 3-5 year EPS Growth Rate Forecasts | | | |
|---|---|---|---|
| | Average Historic EPS Growth rate | Number with Negative Historic EPS Growth | Percent with Negative Historic EPS Growth |
| 1,613 Firms | 9.40% | 405 | 25.1% |

These results indicate that *Value Line*'s EPS forecasts are excessive and unrealistic. It appears that analysts at *Value Line* are similar to the analysts at Wall Street firms and view future earnings through 'rose-colored' glasses and provide overly-optimistic forecasts of future growth.

Q. **DR. VANDER WEIDE HAS DEFENDED THE USE OF ANALYSTS' EPS FORECASTS IN HIS DCF MODEL BY CITING A STUDY HE PUBLISHED**

| 1 | | WITH DR. WILLARD CARLETON. PLEASE DISCUSS DR. VANDER |
|---|---|---|
| 2 | | WEIDE'S STUDY. |

1     WITH DR. WILLARD CARLETON.  PLEASE DISCUSS DR. VANDER

2     WEIDE'S STUDY.

3   A.   Dr. Vander Weide provided a copy of the study in response to AG-UTI-113.  In the

4       study, Dr. Vander Weide performs a linear regression of a company's stock price to

5       earnings ratio (P/E) on the dividend yield payout ratio (D/E), alternative measures of

6       growth (g), and three measures of risk (beta, covariance, r-squared, and the standard

7       deviation of analysts' growth rate projections).  He performed the study for three one-

8       year periods -- 1981-1982, and 1983 -- and used a sample of approximately 65

9       companies.  His results indicated that regressions measuring growth as analysts'

10       forecasted EPS growth were more statistically significant that those using various

11       historic measures of growth.  Consequently, he concluded that analysts' growth rates

12       are superior measures of expected growth.

13

14   Q.   **PLEASE CRITIQUE DR. VANDER WEIDE'S STUDY.**

15   A.   Before highlighting the errors in the study, it is important to note that the study was

16       published fifteen years ago, used a sample of only sixty five companies, and

17       evaluated a three-year time period (1981-93) that was over twenty years ago.  Since

18       that time, many more exhaustive studies have been performed using significantly

19       larger data bases and, from these studies, much has been learned about Wall Street

20       analysts and their stock recommendations and earnings forecasts.  Nonetheless, there

21       are several errors that invalidate the results of the study.

22   Q.   **PLEASE DESCRIBE THE ERRORS IN DR. VANDER WEIDE'S STUDY.**

1    A.    The primary error in the study is that his regression model is misspecified. As a

2          result, he cannot conclude whether one growth rate measure is better than the other.

3          The misspecification results from the fact that Dr. Vander Weide did not actually

4          employ a modified version of the DCF model. Instead, he used a "linear

5          approximation." He used the approximation so that he did not have to measure $k$,

6          investors' required return, directly, but instead he used some proxy variables for risk.

7          The error in this approach is there can be an interaction between growth ($g$) and

8          investors' required return ($k$) which could lead him to conclude that one growth rate

9          measure is superior to others. Furthermore, due to this problem, analysts' EPS

10         forecasts could be upwardly biased and still appear to provide better measures of

11         expected growth.

12               There are other errors in the study as well that further invalidate the results.

13         Dr. Vander Weide does not use both historic and analysts' projections growth rate

14         measures in the same regression to assess if both historic and forecasts should be used

15         together to measure expected growth. In addition, he did not perform any tests to

16         determine if the difference between historic and projected growth measures is

17         statistically significant. Without such tests, he cannot make any conclusions about

18         the superiority of one measure versus the other.

19

20   Q.    **PLEASE SUMMARIZE YOUR ASSESSMENT OF THE DCF GROWTH**

21         **RATES OF DR. VANDER WEIDE AND MS. MCSHANE.**

22   A.    The DCF growth rate estimates are upwardly biased because the two Company

23         witnesses have relied solely on forecasts of EPS growth by Wall Street analysts and

18

1      *Value Line* to measure a DCF growth rate. Ms. McShane has also provided no

2      justification whatsoever for using projected GDP growth as a long-term growth

3      expectation proxy in her two-stage DCF model. Both Dr. Vander Weide and Ms.

4      McShane have ignored all other indicators of growth to measure investors' expectations.

5      As demonstrated and discussed above, it is well known that analysts' EPS growth rate

6      forecasts are upwardly biased measures of actual growth. Hence, it is highly unlikely

7      that investors would simply look to these biased forecasts as the only measures of

8      expected growth.

9

10 **Q.**    **ARE THERE ANY OTHER OBSERVATIONS REGARDING DR. VANDER**

11      **WEIDE'S ANALYSIS?**

12 **A.**    Yes, one other observation is worth noting. In the DCF model, investors are presumed

13      to be forecasting and discounting future dividends per share. *Value Line's* median

14      projected dividend growth rate for Dr. Vander Weide's electric utility group is only

15      4.0%. He gave no weight to this growth rate indicator, which is especially significant

16      *since the relevant growth variable in the DCF model is dividends.*

17

18                                     **III. CAPM**

19

20 **Q.**    **PLEASE PROVIDE A SUMMARY OF THE CAPM STUDIES PRESENTED BY**

21      **THE COMPANY WITNESSES.**

22 **A.**    The tables below provide the CAPM results of Dr. Vander Weide and Ms. McShane.

23

**Dr. Vander Weide's Historical CAPM Results**

|  | Electric Utility Group | Gas Distribution Group |
|---|---|---|
| Risk-Free Rate | 5.39% | 5.39% |
| Average Beta | .90 | .88 |
| Market Risk Premium | 7.1% | 7.1% |
| **Equity Cost Rate** | 11.78 % | 11.64% |

**Dr. Vander Weide's DCF-Based CAPM Results**

|  | Electric Utility Group | Gas Distribution Group |
|---|---|---|
| Risk-Free Rate | 5.39% | 5.39% |
| Average Beta | .90 | .88 |
| Market Risk Premium | 8.35% | 8.35% |
| **Equity Cost Rate** | 12.91% | 12.74% |

**Ms. McShane's CAPM Results**

|  |  | Electric Utility Group | Electric Utility Group |
|---|---|---|---|
| Risk-Free Rate |  | 5.0%% | 5.5% |
| Average Beta |  | .90 | .90 |
| Market Risk Premium |  | 7.5% | 7.5% |
| **Equity Cost Rate** |  | 11.75 % | 12.25% |

**Q.    WHAT ARE THE ERRORS IN THE CAPM ANALYSES OF DR. VANDER WEIDE AND MS. MCSHANE?**

A.    The CAPM analyses presented by Dr. Vander Weide and Ms. McShane are quite similar and suffer from the same errors. They both use a risk-free rate of interest which is well above current interest rates and an inflated equity risk premium.

**Q.    WHAT IS THE PROBLEM WITH THEIR RISK-FREE INTEREST RATES?**

A.    Both witnesses use forecasts of long-term Treasury yields as their risk-free interest rate. As previously discussed, the current yield on 30-year Treasury bonds is 4.95% which is below the forecasts. It is my opinion that long-term interest rate forecasts are not reliable, credible, or accurate, and I am not aware of any studies that indicate forecasted interest rates are better measures of future interest rates than today's interest

1    rates.   Furthermore, investors in the Treasury bond markets are primarily large

2    sophisticated financial institutions.  They are not going to buy treasuries at their current

3    yields if they expect interest rates to increase dramatically over the coming months.

4

5  Q.  **PLEASE ASSESS THE EQUITY RISK PREMIUMS USED BY DR. VANDER**

6      **WEIDE AND MS. MCSHANE.**

7  A.  Both witnesses use historic and an expected or ex ante equity risk premium estimates.

8      The historic equity risk premium is measured as the difference between arithmetic

9      mean stock returns and bond returns as complied by Ibbotson Associates.  The ex

10     ante or expected risk premiums are determined by using a DCF model to estimate

11     expected market returns with analysts' projected EPS growth rate forecasts for the

12     S&P 500 as the growth rate measure.  Dr. Vander Weide uses a historic equity risk

13     premium of 7.10% and a projected equity risk premium of 8.35%.  Ms. McShane

14     estimates a historic equity risk premium range of 7.0%-7.10% and a projected equity

15     risk premium range of 7.2%-7.7%.  I will initially highlight the problems with using

16     historic stock and bond returns to estimate an equity risk premium, and then assress

17     the ex ante equity risk premium.

18

19 Q.  **PLEASE ADDRESS THE ISSUE INVOLVING THE USE OF HISTORIC**

20     **STOCK AND BOND RETURNS TO COMPUTE A FORWARD-LOOKING**

21     **OR EX ANTE RISK PREMIUM.**

22 A.  This historic evaluation of stock and bond returns is often called the "Ibbotson

23     approach" after Professor Roger Ibbotson who popularized this method of assessing

| 1 | | historic financial market returns. Using the historic relationship between stock and |
| 2 | | bond returns to measure an ex ante equity risk premium is erroneous and, especially |
| 3 | | in this case, overstates the true market equity risk premium. The equity risk premium |
| 4 | | is based on expectations of the future and when past market conditions vary |
| 5 | | significantly from the present, historic data does not provide a realistic or accurate |
| 6 | | barometer of expectations of the future. At the present time, using historic returns to |
| 7 | | measure the ex ante equity risk premium ignores current market conditions and masks |
| 8 | | the dramatic change in the risk and return relationship between stocks and bonds. |
| 9 | | This change suggests that the equity risk premium has declined. |
| 10 | | |
| 11 | Q. | **PLEASE DISCUSS THE ERRORS IN USING HISTORIC STOCK AND BOND** |
| 12 | | **RETURNS TO ESTIMATE AN EQUITY RISK PREMIUM.** |
| 13 | A. | There are a number of flaws in using historic returns over long time periods to |
| 14 | | estimate expected equity risk premiums. These issues include: |
| 15 | a. | Biased historic bond returns; |
| 16 | b. | The arithmetic versus the geometric mean return; |
| 17 | c. | Unattainable and biased historic stock returns; |
| 18 | d. | Survivorship bias; |
| 19 | e. | The "Peso Problem;" |
| 20 | f. | Market conditions today are significantly different than the past; and |
| 21 | g. | Changes in risk and return in the markets. |
| 22 | | These issues will be addressed in order. |
| 23 | | |

1    <u>Biased Historic Bond Returns</u>

2  Q.  **HOW ARE HISTORIC BOND RETURNS BIASED?**

3  A.  An essential assumption of these studies is that over long periods of time investors'

4     expectations are realized. However, the experienced returns of bondholders in the

5     past violate this critical assumption. Historic bond returns are biased downward as a

6     measure of expectancy because of capital losses suffered by bondholders in the past.

7     As such, risk premiums derived from this data are biased upwards.

8

9     <u>The Arithmetic versus the Geometric Mean Return</u>

10 Q.  **PLEASE DISCUSS THE ISSUE RELATING TO THE USE OF THE**

11    **ARITHMETIC VERSUS THE GEOMETRIC MEAN RETURNS IN THE**

12    **IBBOTSON METHODOLOGY.**

13 A.  The measure of investment return has a significant effect on the interpretation of the

14    risk premium results. When analyzing a single security price series over time (i.e., a

15    time series), the best measure of investment performance is the geometric mean

16    return. Using the arithmetic mean overstates the return experienced by investors. In

17    a study entitled "Risk and Return on Equity: The Use and Misuse of Historical

18    Estimates," Carleton and Lakonishok make the following observation: "The

19    geometric mean measures the changes in wealth over more than one period on a buy

20    and hold (with dividends invested) strategy."[4] Since Dr. Vander Weide's and Ms.

21    McShane's studies cover more than one period (and he assumes that dividends are

---

[4] Willard T. Carleton and Josef Lakonishok, "Risk and Return on Equity: The Use and Misuse of Historical Estimates." *Financial Analysts Journal* (January-February, 1985), pp. 3?-47.

1    reinvested), they should be employing the geometric mean and not the arithmetic

2    mean.

3

4    Q.    **PLEASE PROVIDE AN EXAMPLE DEMONSTRATING THE PROBLEM**

5          **WITH USING THE ARITHMETIC MEAN RETURN.**

6    A.    To demonstrate the upward bias of the arithmetic mean, consider the following

7          example. Assume that you have a stock (that pays no dividend) that is selling for

8          $100 today, increases to $200 in one year, and then falls back to $100 in two years.

9          The table below shows the prices and returns.

| Time Period | Stock Price | Annual Return |
|-------------|-------------|---------------|
| 0           | $100        |               |
| 1           | $200        | 100%          |
| 2           | $100        | -50%          |

10

11   The arithmetic mean return is simply (100% + (-50%))/2 = 25% per year. The

12   geometric mean return is $((2 * .50)^{(1/2)}) - 1$ = 0% per year. Therefore, the arithmetic

13   mean return suggests that your stock has appreciated at an annual rate of 25%, while

14   the geometric mean return indicates an annual return of 0%. Since after two years,

15   your stock is still only worth $100, the geometric mean return is the appropriate

16   return measure. For this reason, when stock returns and earnings growth rates are

17   reported in the financial press, they are generally reported using the geometric mean.

18   This is because of the upward bias of the arithmetic mean. As further evidence of the

19   appropriate mean return measure, the U.S. Securities and Exchange Commission

20   requires equity mutual funds to report historic return performance using geometric

1  mean and not arithmetic mean returns.[5] Therefore, Dr. Vander Weide's and Ms.

2  McShane's arithmetic mean return measures are inappropriate and should be

3  disregarded.

4

5  **Unattainable and Biased Historic Stock Returns**

6  Q.  **YOU NOTE THAT HISTORIC STOCK RETURNS ARE BIASED USING**

7  **THE IBBOTSON METHODOLOGY. PLEASE ELABORATE.**

8  A.  Returns developed using Ibbotson's methodology are computed on stock indexes and

9  therefore:  (1) cannot be reflective of expectations because these returns are

10  unattainable to investors, and (2) produce biased results.  This methodology assumes

11  (a) monthly portfolio rebalancing and (b) reinvestment of interest and dividends.

12  Monthly portfolio rebalancing presumes that investors rebalance their portfolios at the

13  end of each month in order to have an equal dollar amount invested in each security at

14  the beginning of each month.  The assumption would obviously generate extremely

15  high transaction costs and thereby render these returns unattainable to investors.  In

16  addition, an academic study demonstrates that the monthly portfolio rebalancing

17  assumption produces biased estimates of stock returns.[6]

18  Transaction costs themselves provide another bias in historic versus expected

19  returns.  The observed stock returns of the past were not the realized returns of

20  investors due to the much higher transaction costs of previous decades.  These higher

---

[5]  U.S. Securities and Exchange Commission, Form N-1A.

[6]  See Richard Roll, "On Computing Mean Returns and the Small Firm Premium," *Journal of Financial Economics* (1983), pp. 371-86.

1     transaction costs are reflected through the higher commissions on stock trades, and

2     the lack of low cost mutual funds like index funds.

3

4     **Survivorship Bias**.

5  Q.  **HOW DOES SURVIVORSHIP BIAS AFFECT DR. VANDER WEIDE'S**

6     **HISTORIC EQUITY RISK PREMIUM?**

7  A.  Using historic data to estimate an equity risk premium suffers from survivorship bias.

8     Survivorship bias results when using returns from indexes like the S&P 500.  The

9     S&P 500 includes only companies that have survived.  The fact that returns of firms

10    that did not perform so well were dropped from these indexes is not reflected.

11    Therefore these stock returns are upwardly biased because they only reflect the

12    returns from more successful companies.

13

14    **The "Peso Problem"**

15 Q.  **WHAT IS THE "PESO PROBLEM" AND HOW DOES IT AFFECT**

16    **HISTORIC RETURNS AND EQUITY RISK PREMIUMS?**

17 A.  Dr. Vander Weide's and Ms. McShane's use of historic return data also suffers from

18    the so-called "peso problem."  The "peso problem" issue was first highlighted by the

19    Nobel laureate, Milton Friedman, and gets its name from conditions related to the

20    Mexican peso market in the early 1970s.  This issue involves the fact that past stock

21    market returns were higher than were expected at the time because despite war,

22    depression, and other social, political, and economic events, the US economy

23    survived and did not suffer hyperinflation, invasion, and the calamities of other

1    countries.  As such, highly improbable events, which may or may not occur in the

2    future, are factored into stock prices, leading to seemingly low valuations.  Higher

3    than expected stock returns are then earned when these events do not subsequently

4    occur.  Therefore, the "peso problem" indicates that historic stock returns are

5    overstated as measures of expected returns.

6

7    **Market Conditions Today are Significantly Different than in the Past**

8  Q.  **FROM AN EQUITY RISK PREMIUM PERSPECTIVE, PLEASE DISCUSS**

9      **HOW MARKET CONDITIONS ARE DIFFERENT TODAY.**

10 A.  The equity risk premium is based on expectations of the future.  When past market

11     conditions vary significantly from the present, historic data does not provide a

12     realistic or accurate barometer of expectations of the future.  As noted previously,

13     stock valuations (as measured by P/E) are relatively high and interest rates are

14     relatively low, on a historic basis.  Therefore, given the high stock prices and low

15     interest rates, expected returns are likely to be lower on a going forward basis.

16

17    **Changes in Risk and Return in the Markets**

18 Q.  **PLEASE DISCUSS THE NOTION THAT HISTORIC EQUITY RISK**

19     **PREMIUM STUDIES DO NOT REFLECT THE CHANGE IN RISK AND**

20     **RETURN IN TODAY'S FINANCIAL MARKETS.**

21 A.  The historic equity risk premium methodology is unrealistic in that it makes the

22     explicit assumption that risk premiums do not change over time based on market

23     conditions such as inflation, interest rates, and expected economic growth.

27

1   Furthermore, using historic returns to measure the equity risk premium masks the

2   dramatic change in the risk and return relationship between stocks and bonds. The

3   nature of the change, as I will discuss below, is that bonds have increased in risk

4   relative to stocks. This change suggests that the equity risk premium has declined in

5   recent years.

6      Page 1 of Exhibit_(JRW-9) provides the yields on long-term U.S. Treasury

7   bonds from 1926 to 2005. One very obvious observation from this graph is that

8   interest rates increase dramatically from the mid-1960s until the early 1980s, and

9   since have returned to their 1960 levels. The annual market risk premiums for the

10  1926 to 2005 period are provided on page 2 of Exhibit_(JRW-9). The annual market

11  risk premium is defined as the return on common stock minus the return on long-term

12  Treasury Bonds. There is considerable variability in this series and a clear decline in

13  recent decades. The high was 54% in 1933 and the low was -38% in 1931. Evidence

14  of a change in the relative riskiness of bonds and stocks is provided on page 3 of

15  Exhibit_(JRW-9) which plots the standard deviation of monthly stock and bond

16  returns since 1930. The plot shows that, whereas stock returns were much more

17  volatile than bond returns from the 1930s to the 1970s, bond returns became more

18  variable than stock returns during the 1980s. In recent years stocks and bonds have

19  become much more similar in terms of volatility, but stocks are still a little more

20  volatile. The decrease in the volatility of stocks relative to bonds over time has been

21  attributed to several stock related factors: the impact of technology on productivity

22  and the new economy; the role of information (see former Federal Reserve Chairman

23  Greenspan's comments referred to earlier in this testimony) on the economy and

| 1 | markets; better cost and risk management by businesses; and several bond related |
| 2 | factors; deregulation of the financial system; inflation fears and interest rates; and the |
| 3 | increase in the use of debt financing. Further evidence of the greater relative |
| 4 | riskiness of bonds is shown on page 4 of Exhibit_(JRW-9), which plots real interest |
| 5 | rates (the nominal interest rate minus inflation) from 1926 to 2005. Real rates have |
| 6 | been well above historic norms during the past 10-15 years. These high real interest |
| 7 | rates reflect the fact that investors view bonds as riskier investments. |
| 8 | The net effect of the change in risk and return has been a significant decrease |
| 9 | in the return premium that stock investors require over bond yields. In short, the |
| 10 | equity or market risk premium has declined in recent years. This decline has been |
| 11 | discovered in studies by leading academic scholars and investment firms, and has |
| 12 | been acknowledged by government regulators. As such, using a historic equity risk |
| 13 | premium analysis is simply outdated and not reflective of current investor |
| 14 | expectations and investment fundamentals. |
| 15 | |
| 16 | Q. | PLEASE EVALUATE THE EX ANTE OR EXPECTED EQUITY RISK |
| 17 | | PREMIUMS USED BY DR. VANDER WEIDE AND MS. MCSHANE. |
| 18 | A. | Dr. Vander Weide and Ms. McShane have employed an ex ante equity or market risk |
| 19 | | premiums of 8.35% and 7.5% which come from applying a DCF model to the S&P |
| 20 | | 500 and subtracting the risk-free rate of interest. Dr. Vander Weide estimates an |
| 21 | | expected market return of 13.75% using an S&P 500 growth rate of 11.01%, and Ms. |
| 22 | | McShane expected market return is 12.7% using an S&P growth rate of 10.6%. |
| 23 | |

| 1 | Q. | PLEASE EVALUATE THE EXPECTED MARKET RETURNS. |
|---|----|----------------------------------------------|

2   A.   Expected market returns of 13.75% and 12.7% are out of line with historic norms and

3   are inconsistent with current market conditions. The primary reason is that the expected

4   growth rates of 11.01% and 10.6% are clearly excessive and inconsistent with economic

5   and earnings growth in the U.S. The average historic compounded return on large

6   company stocks in the U.S. has been 10.7% according to the 2006 *SBBI Yearbook.* To

7   suggest that investors are going to expect a return that is nearly 300 basis points above

8   this is not logical. This is especially so given current market conditions. As discussed

9   above, at the present time stock prices (relative to earnings) are high and interest rates

10   are low. Major stock market upswings which produce above average returns tend to

11   occur when stock prices are low and interest rates are high. Thus, historic norms and

12   current market conditions do not suggest above average stock returns. Consistent with

13   this observation, the financial forecasters in the Federal Reserve Bank of Philadelphia

14   survey expect a market return of 7.00% over the next ten years. In addition, the CFOs

15   surveyed by Duke University and *CFO Magazine* have an expected market return of

16   8.05%.

17

18   Q.   **WHAT EVIDENCE CAN YOU PROVIDE THAT THE GROWTH RATES ARE**

19   **EXCESSIVE?**

20   A.   The expected S&P 500 EPS growth rates of 11.01% and 10.6% represent the forecasted

21   5-year EPS growth rates of Wall Street analysts. Earlier in my testimony I demonstrated

22   the upward bias in these projections. Furthermore, these growth rates are inconsistent

23   with economic and earnings growth in the U.S. The long-term economic and earnings

| 1 | growth rate in the U.S. has only been about 7%. Edward Yardeni, a well-known Wall |
| 2 | Street economist, calls this the "7% Solution" to growth in the U.S. The graph below |
| 3 | comes from his analysis of GNP and profit growth since 1960. |

**The 7% Solution**
**Nominal GNP and Profit Growth since 1960**
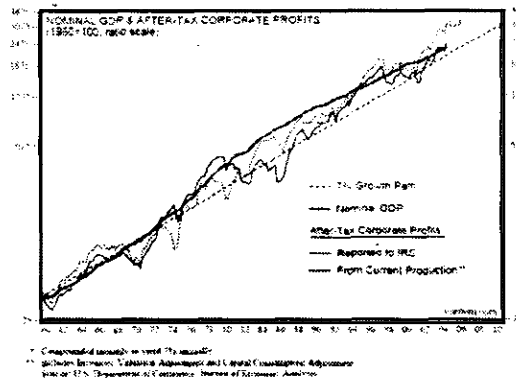


| 6 |
| 7 | Source: Edward Yardeni, Strategists Handbook, Oak Associates, April 2005 |
| 8 |

| 9 | As further evidence of the long-term growth rate in the U.S., I have performed |
| 10 | a study of the growth in nominal GNP, S&P 500 stock price appreciation, and S&P |
| 11 | 500 EPS and DPS growth since 1960. The results are provided on page 1 of |
| 12 | Exhibit_(JRW-10) and a summary is given in the table below. |

**GNP, S&P 500 Stock Price, EPS, and DPS Growth**
**1960-Present**

| | |
|---|---|
| Nominal GNP | 7.22% |
| S&P 500 Stock Price Appreciation | 7.05% |
| S&P 500 EPS | 7.11% |
| S&P 500 DPS | 5.54% |
| Average | 6.73% |

| 16 | These results offer compelling evidence that a long-run growth rate of about 7% is |
| 17 | appropriate for companies in the U.S. Dr. Vander Weide's and Ms. McShane's long- |
| 18 | run growth rate projections are clearly not realistic. These estimates suggest that |
| 19 | companies in the U.S. would be expected to (1) significantly increase their growth |

31

1  rate of EPS in the future, and (2) maintain that growth indefinitely in an economy that

2  is expected to growth at about one half his projected growth rates. Such a scenario

3  lacks rational economic reasoning.

4

5                                   **IV. Risk Premium Studies**

6

7  Q.   **PLEASE SUMMARIZE THE RISK PREMIUM STUDIES OF BY DR.**

8       **VANDER WEIDE AND MS. MCSHANE.**

9  A.   The tables below provide the RP results of Dr. Vander Weide and Ms. McShane.

10
### Dr. Vander Weide's Ex Ante RP Results

|                   | Electric Utility Group | Gas Distribution Group |
|-------------------|------------------------|------------------------|
| 'A' Rated PU Yield | 6.64%                 | 6.64%                  |
| Risk Premium      | 4.28%                  | 4.43%                  |
| **Equity Cost Rate** | 10.88 %             | 11.07 %                |

11
12
### Dr. Vander Weide's Historical RP Results

|                   | S&P Utilities | S&P 500 |
|-------------------|---------------|---------|
| 'A' Rated PU Yield | 6.64%        | 6.64%   |
| Risk Premium      | 4.45%         | 5.10%   |
| **Equity Cost Rate** | 11.1 %     | 11.7%   |

13
14
### Ms. McShane's Historical RP Results

|                      | S&P Electric Utilities | S&P Gas |
|----------------------|------------------------|---------|
| 20-Year Treasury Yield | 5.25%                | 5.25%   |
| Risk Premium         | 5.7%                   | 6.5%    |
| **Equity Cost Rate** | 10.75%                 | 11.75%  |

15
16
17
### Ms. McShane's DCF RP Results

|                     | Electric Utilities |
|---------------------|--------------------|
| 10-Year Treasury Yield | 5.00%-5.50%     |
| Risk Premium        | 5.30%              |
| **Equity Cost Rate** | 10.30%-10.80%     |

18

19

1　Q.　PLEASE REVIEW THE RISK PREMIUM ANALYSES.

2　A.　As in the DCF and CAPM analyses, the RP analyses of Dr. Vander Weide and Ms.

3　　　McShane are quite similar. Hence, I will critique them together. The equity cost

4　　　estimates in both cases are excessive due to an overstated base yield and biased and

5　　　inflated equity risk premiums.

6　Q.　**PLEASE DISCUSS THE BASE YIELD OF THE RISK PREMIUM**

7　　　**ANALYSIS.**

8　A.　The base yields in the RP analyses of both Dr. Vander Weide's and Ms. McShane are

9　　　excessive because they are well above current market yields. The current yields on

10　　　10-year Treasuries and long-term, 'A' rated public utility bonds are in the 4.8% and

11　　　6.0% ranges, respectively. Dr. Vander Weide's base yield, which is the projected

12　　　yield on 'A' rated utility bonds, also is erroneous and inflates the required return on

13　　　equity in two ways. First, long-term bonds are subject to interest rate risk, a risk

14　　　which does not affect common stockholders since dividend payments (unlike bond

15　　　interest payments) are not fixed but tend to increase over time. Second, the base yield

16　　　in Dr. Vander Weide's risk premium study is subject to credit risk since it is not

17　　　default risk-free like an obligation of the U.S. Treasury. As a result, its yield-to-

18　　　maturity includes a premium for default risk and therefore is above its expected

19　　　return. Hence using such a bond's yield-to-maturity as a base yield results in an

20　　　overstatement of investors' return expectations.

21

22　Q.　**WHAT ARE THE PROBLEMS WITH THE HISTORIC RISK PREMIUM**

23　　　**STUDIES PERFORMED BY DR. VANDER WEIDE AND MS. MCSHANE?**

33

1    A.    Both Dr. Vander Weide and Ms. McShane compute a historical risk premium as the

2          difference in the arithmetic mean stock and bond returns. The stock returns are

3          computed for different time periods for several different indexes, including S&P and

4          Moody's electric utility and gas distribution indexes as well as the S&P 500. The

5          bond returns are for long-term public utility bonds.

6                The errors in the historical evaluation of stock and bond returns to measure an

7          ex ante equity risk premium was discussed above. In short, using the historic

8          relationship between stock and bond returns is subject to a myriad of empirical biases

9          which results in an overstatement of the ex ante or expected equity risk premium.

10

11   Q.    **DR. VANDER WEIDE AND MS. MCSHANE ALSO EMPLOY A DCF-BASED**

12         **EX ANTE RISK PREMIUM APPROACH. PLEASE DISCUSS THE ERRORS**

13         **IN THIS APPROACH.**

14   A.    Both Dr. Vander Weide and Ms. McShane also compute a DCF-based equity risk

15         premium. Again, the approaches are almost identical and hence I will critique them

16         together. In both cases the Company witnesses estimate an expected return using the

17         DCF model and subtract a concurrent measure of interest rates. The expected return

18         is computed for utilities using a the DCF model with analysts' EPS growth rate

19         forecasts for the growth rate. The Dr. Vander Weide employs 'A' rated utility yields

20         as a measure of interest rates, while Ms. McShane uses the ten-year Treasury yield.

21               The primary error in both Dr. Vander Weide's and Ms. McShane DCF-based

22         or ex ante risk premium approaches is the use of analysts' EPS forecasts as the one

23         and only measure of growth in the DCF model. This issue was addressed above. In

34

| 1 | | short, as I discuss and demonstrate above, analysts' EPS growth rate forecasts are |
| 2 | | upwardly biased estimates of actual EPS growth for companies in general as well as |
| 3 | | for electric utilities. |
| 4 | | |

**V. Comparable Earnings Test**

7  **Q.**  **MS. MCSHANE ALSO EMPLOYS A COMPARABLE EARNINGS (CE) TEST**

8       **IN HER TESTIMONY. PLEASE EVALUATE THIS TEST.**

9  A.  Ms. McShane estimates an equity cost rate for the Company employing the CE

10      approach.  Her methodology involves averaging historic and projected returns on

11      common equity for a proxy group of 139 non-utility, unregulated companies

12      "comparable" in risk to her group of electric utilities. Ms. McShane's comparability is

13      based on six risk measures.  The average of the historic and projected median returns on

14      common equity for the group is 14.3%.

15          This approach is fundamentally flawed for several reasons.  She has not

16      performed any analysis to examine whether his return on equity figures are likely

17      measures of long-term earnings expectations.  More importantly, however, since Ms.

18      McShane has not evaluated the market-to-book ratios for these companies, she cannot

19      indicate whether the past and projected returns on common equity are above or below

20      investors' requirements.  These returns on common equity are excessive if the market-to-

21      book ratios for these companies are above 1.0.  For example, Kimberly-Clark Corp.

22      Sysco Corp are two of the 'comparable' companies.  The projected returns on equity for

23      Kimberly-Clark and Sysco are 33.8% and 48.5%.  But, I doubt if any financial analyst,

1      including Ms. McShane, would suggest that these are the equity cost rates for Kimberly-

2      Clark Corp and Sysco. Indeed, the market-to-book ratios for these companies are in

3      excess of 5.0. This indicates that its return on equity is well above its cost of equity

4      capital.

5

6      **VI. Capital Structure Adjustment**

7

8 Q.    **PLEASE CRITIQUE THE CAPITAL STRUCTURE ADJUSTMENT**

9      **EMPLOYED BY BOTH DR. VANDER WEIDE AND MS. MCSHANE.**

10 A.    Both Company rate of return witnesses apply a capital structure adjustment to their over

11      fair rate of return results. This adjustment increases the equity cost rates of Dr. Vander

12      Weide and Ms. McShane by .70% and 1.00%, respectively. The presumption behind the

13      adjustment is that (1) the market values are greater than book values for utilities, and (2)

14      the overall rate of return is applied to a book value capitalization in the ratemaking

15      process.

16      This adjustment is erroneous and unwarranted for the following reasons:

17    (1) As noted above, the market value of a firm's equity exceeds the book value of equity

18      when the firm is expected to earn more on the book value of investment than investors

19      require. As such, the reason that market values exceed book values is that the electric

20      utility company are earning rates of return on common equity that are in excess of their

21      costs of equity capital;

22    (2) Financial publications and investment firms report capitalizations on a book value and

23      not a market value basis; and

1    (3) Neither of the Company's rate of return witnesses have provided any evidence that they

2        have recommended this capital structure adjustment before other regulatory

3        commissions and it has been adopted in a final order as an appropriate adjustment in the

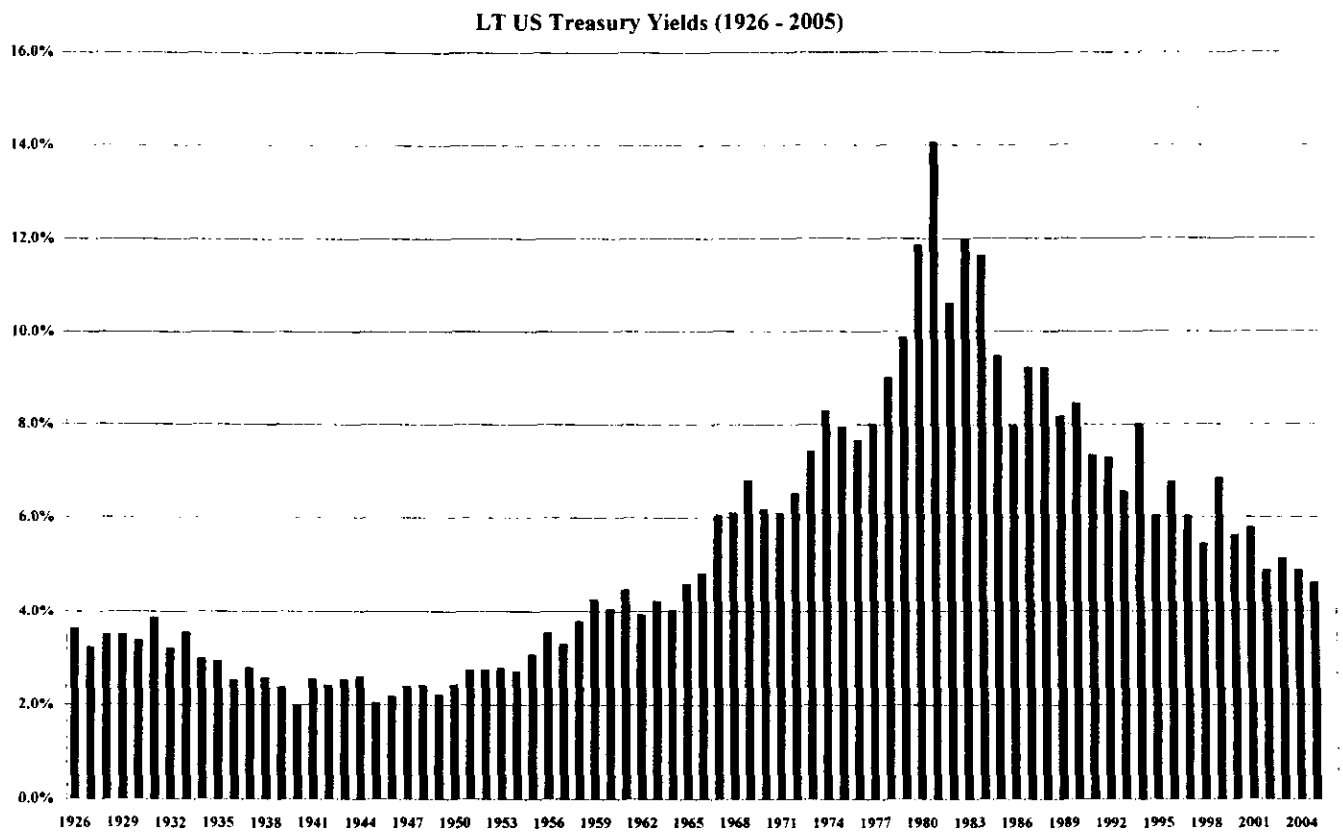4        determination of the fair rate of return.

5

6  Q.  DOES THIS CAPITAL STRUCTURE ADJUSTMENT PRODUCE LOGICAL

7      RESULTS?

8  A.  No. In addition to being erroneous and unwarranted, the adjustment is illogical

9      because it works to increase the returns for utilities that have high returns on common

10     equity and decrease the returns for utilities that have low returns on common equity.
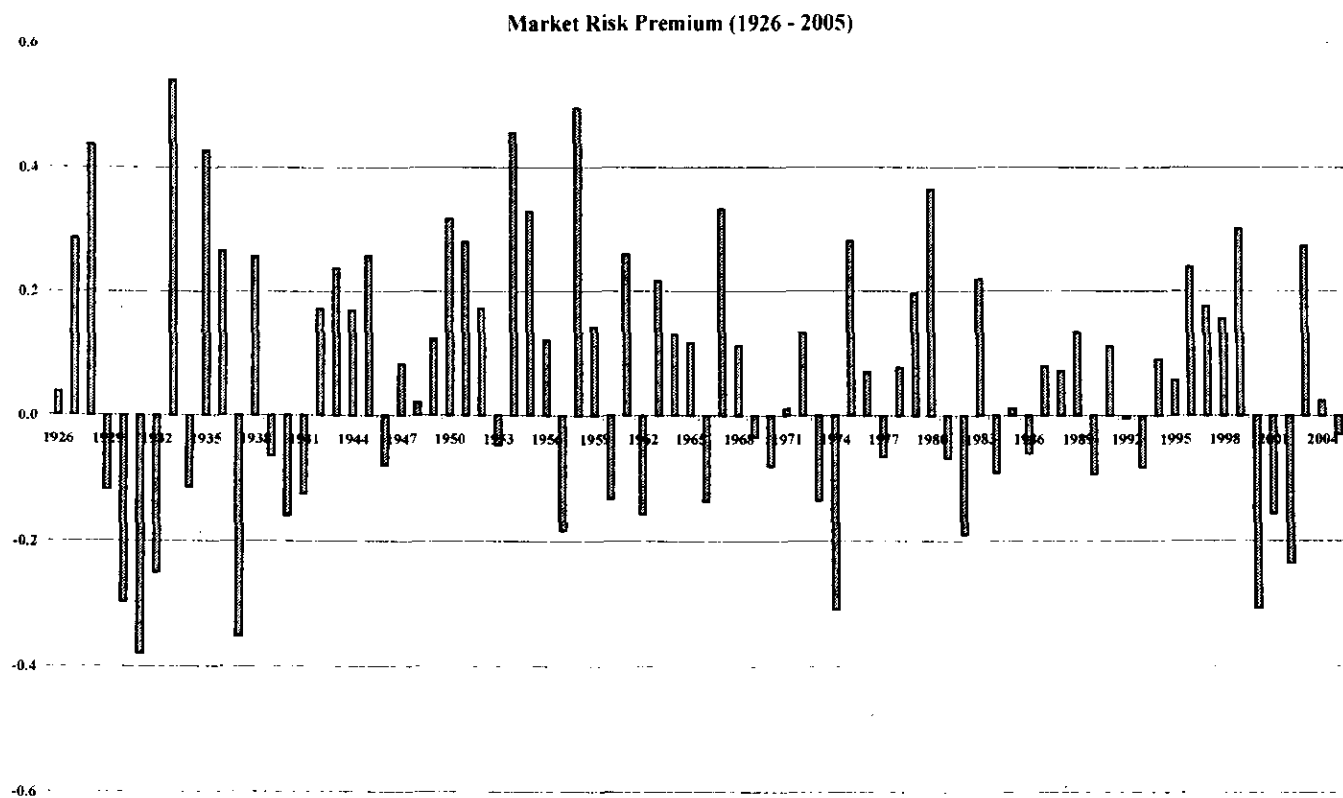
11         In the graphs presented above, I have demonstrated that there a strong positive

12     relationship between expected returns on common equity and market-to-book ratios for

13     public utilities. Hence, in the context of capital structure adjustment, this means that (1)

14     for a utility with a relatively high market-to-book (e.g., 2.5) and ROE (e.g., 12.0%), the

15     leverage adjustment will increase the estimated equity cost rate, while (2) for a utility

16     with a relatively low market-to-book (e.g., 0.5) and ROE (e.g., 5.0%), the leverage

17     adjustment will decrease the estimated equity cost rate. Such an adjustment defies logic

18     because you are increasing the estimated equity cost rate and recommended return on

19     equity for the high market-to-book utility and decreasing the estimated equity cost rate

20     and return on equity for the low market-to-book utility. Therefore, the adjustment will

21     result in even higher market-to-book ratios for utilities with relatively high ROEs and

22     even lower market-to-book ratios for utilities with relatively low ROEs.

23  Q.  DOES THIS CONCLUDE YOUR TESTIMONY?

1    A.    Yes.

# BEFORE THE PUBLIC SERVICE COMMISSION
## OF THE STATE OF MISSOURI

In the Matter of the Application of Union )
Electric Company to Modify Its Tariff to ) Case No. ER-2007-0002
Begin the Implementation of Its Regulatory Plan )

## AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA )
)  SS.
COUNTY OF CENTRE )

BEFORE ME, the undersigned notary public, this day personally appeared J. RANDALL WOOLRIDGE, to me known, who being duly sworn according to law, deposes and says:

"My name is J. Randall Woolridge. I am of legal age and a resident of the Commonwealth of Pennsylvania. I certify that the foregoing testimony and exhibits, offered by me on behalf of the State of Missouri, are true and correct to the best of my knowledge and belief."

_____
J. Randall Woolridge

SUBSCRIBED AND SWORN to before me, a notary public, on this 3O day of January, 2007.

_____
Notary Public in the Commonwealth of Pennsylvania

My Commission Expires:

```
NOTARIAL SEAL
Mary L. Hart, Notary Public
State College Boro., Centre County
My commission expires August 25, 2009
```

## LT US Treasury Yields (1926 - 2005)



Data Source: Ibbotson Associates. *SBBI Yearbook*, 2006.

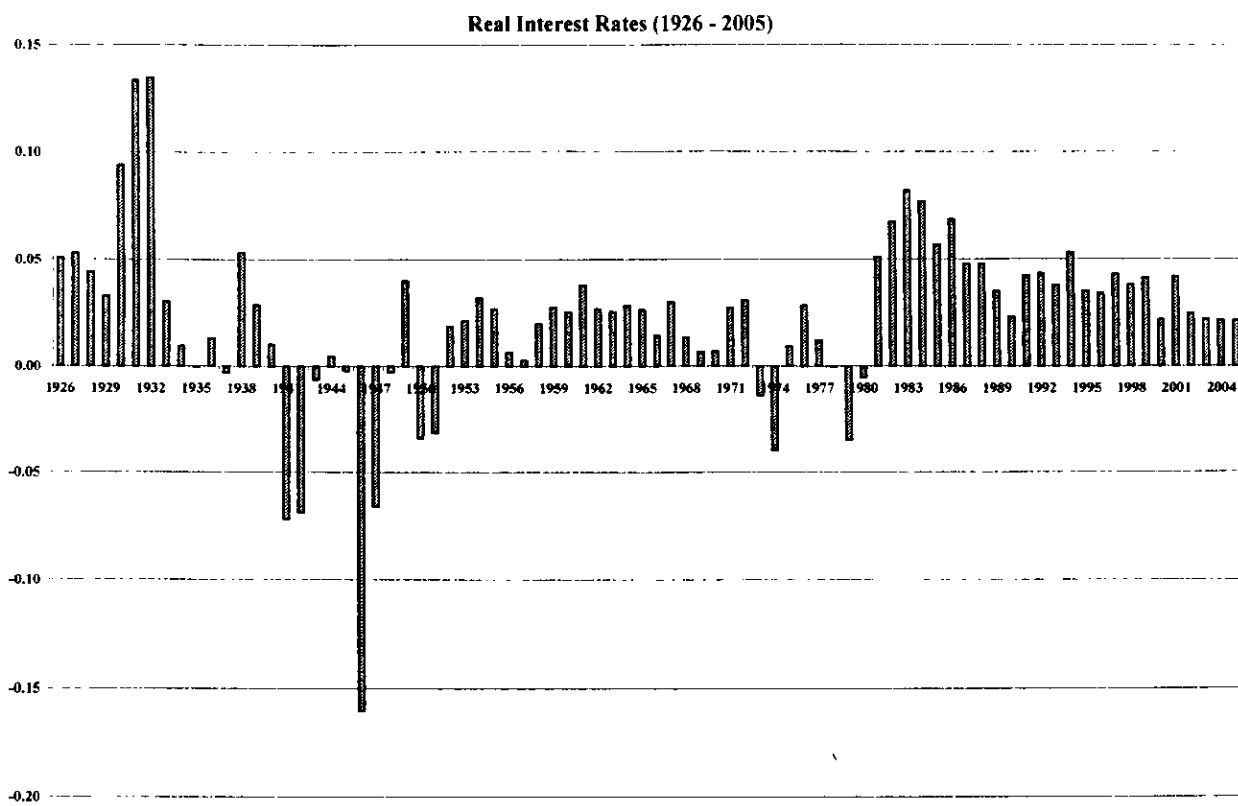**Market Risk Premium (1926 - 2005)**



Data Source: Ibbotson Associates, *SBBI Yearbook*, 2006.

## Stocks and Bonds Monthly Standard Deviations (1930 - 2005)
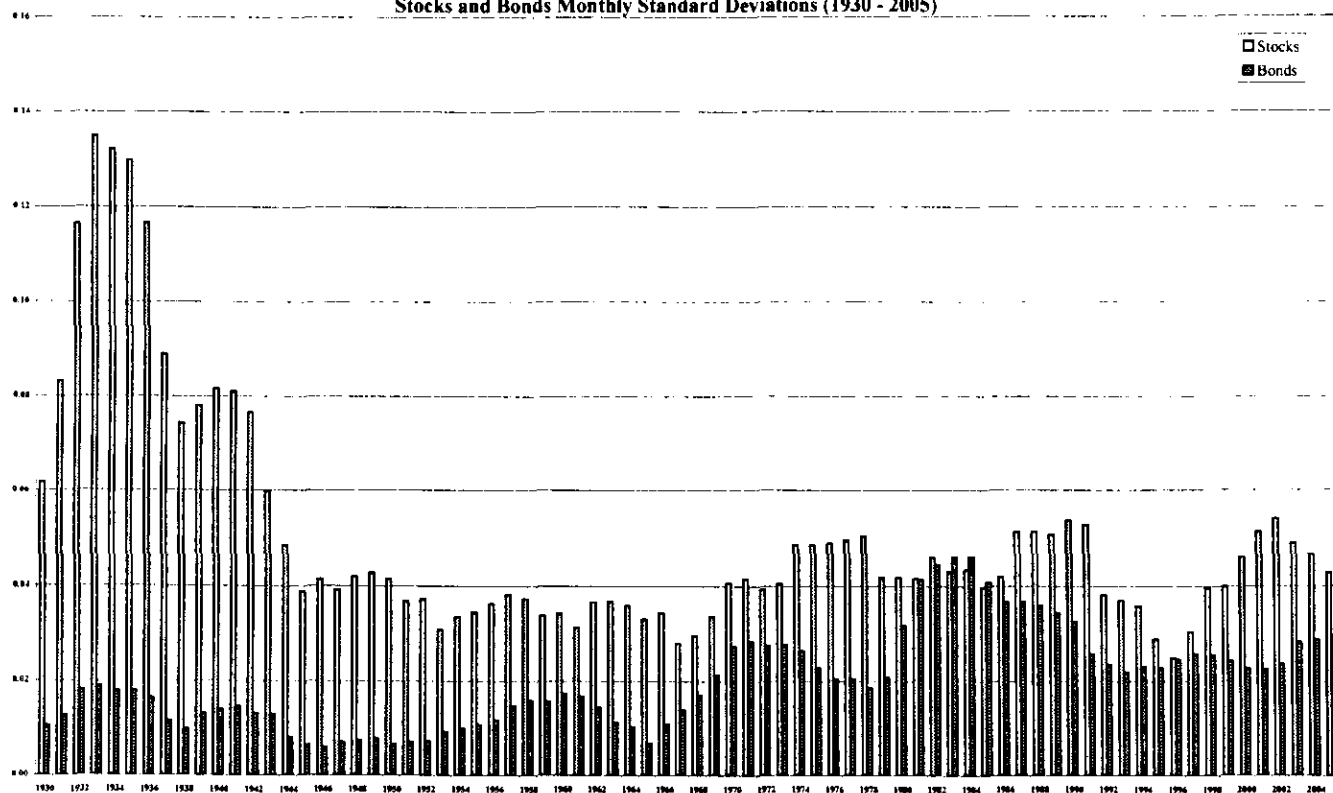


Data Source: Ibbotson Associates, *SBBI Yearbook*, 2006.

Real Interest Rates (1926 - 2005)

Data Source: Ibbotson Associates, *SBBI Yearbook*, 2006.

# Union Electric Company
## Growth Rates
### GNP, S&P 500 Price, EPS, and DPS

| | GNP | S&P 500 | Earnings | Dividends | |
|---|---|---|---|---|---|
| 1960 | 529.8 | 58.11 | 3.10 | 1.98 | |
| 1961 | 531.5 | 71.55 | 3.37 | 2.04 | |
| 1962 | 579.6 | 63.1 | 3.67 | 2.15 | |
| 1963 | 606.9 | 75.02 | 4.13 | 2.35 | |
| 1964 | 654.6 | 84.75 | 4.76 | 2.58 | |
| 1965 | 701.1 | 92.43 | 5.30 | 2.83 | |
| 1966 | 775.8 | 80.33 | 5.41 | 2.88 | |
| 1967 | 823.2 | 96.47 | 5.46 | 2.98 | |
| 1968 | 885.7 | 103.86 | 5.72 | 3.04 | |
| 1969 | 967.3 | 92.06 | 6.10 | 3.24 | |
| 1970 | 1023.6 | 92.15 | 5.51 | 3.19 | |
| 1971 | 1105.8 | 102.09 | 5.57 | 3.16 | |
| 1972 | 1198.7 | 118.05 | 6.17 | 3.19 | |
| 1973 | 1346.2 | 97.55 | 7.96 | 3.61 | |
| 1974 | 1464.0 | 68.56 | 9.35 | 3.72 | |
| 1975 | 1581.4 | 90.19 | 7.71 | 3.73 | |
| 1976 | 1788.3 | 107.46 | 9.75 | 4.22 | |
| 1977 | 1960.1 | 95.1 | 10.87 | 4.86 | |
| 1978 | 2172.1 | 96.11 | 11.64 | 5.18 | |
| 1979 | 2490.1 | 107.94 | 14.55 | 5.97 | |
| 1980 | 2763.2 | 135.76 | 14.99 | 6.44 | |
| 1981 | 3084.1 | 122.55 | 15.18 | 6.83 | |
| 1982 | 3222.8 | 140.64 | 13.82 | 6.93 | |
| 1983 | 3416.9 | 164.93 | 13.29 | 7.12 | |
| 1984 | 3846.6 | 167.24 | 16.84 | 7.83 | |
| 1985 | 4145.8 | 211.28 | 15.68 | 8.20 | |
| 1986 | 4409.4 | 242.17 | 14.43 | 8.19 | |
| 1987 | 4628.2 | 247.08 | 16.04 | 9.17 | |
| 1988 | 4977.6 | 277.72 | 22.77 | 10.22 | |
| 1989 | 5390.9 | 353.4 | 24.03 | 11.73 | |
| 1990 | 5746.9 | 330.22 | 21.73 | 12.35 | |
| 1991 | 5926.3 | 417.09 | 19.10 | 12.97 | |
| 1992 | 6227.2 | 435.71 | 18.13 | 12.64 | |
| 1993 | 6580.0 | 466.45 | 19.82 | 12.69 | |
| 1994 | 6940.2 | 459.27 | 27.05 | 13.36 | |
| 1995 | 7335.8 | 615.93 | 35.35 | 14.17 | |
| 1996 | 7666.2 | 740.74 | 35.78 | 14.89 | |
| 1997 | 8142.6 | 970.43 | 39.56 | 15.52 | |
| 1998 | 8615.1 | 1229.23 | 38.23 | 16.20 | |
| 1999 | 9097.2 | 1469.25 | 45.17 | 16.71 | |
| 2000 | 9661.9 | 1320.28 | 52.00 | 16.27 | |
| 2001 | 10060.2 | 1148.09 | 44.23 | 15.74 | |
| 2002 | 10361.7 | 879.82 | 47.24 | 16.08 | |
| 2003 | 10781.3 | 1111.91 | 54.15 | 17.88 | |
| 2004 | 11546.1 | 1211.92 | 67.01 | 19.41 | |
| 2005 | 12225.0 | 1248.29 | 68.32 | 22.38 | Average |
| Growth | 7.22% | 7.05% | 7.11% | 5.54% | 6.73% |