COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

AN ADJUSTMENT OF THE ELECTRIC	)	
RATES, TERMS AND CONDITIONS OF	)	CASE NO. 2003-00434
KENTUCKY UTILITIES COMPANY	)	

and

AN ADJUSTMENT OF THE ELECTRIC AND	)	
GAS RATES, TERMS AND CONDITIONS OF	)	CASE NO. 2003-00433
LOUISVILLE GAS AND ELECTRIC COMPANY	)	

**Testimony of Carl G. K. Weaver
Appearing on behalf of the Office of
The Attorney General for the Commonwealth of Kentucky
Office of Rate Intervention**

May 2004

Table of Contents

1 A. The cost of equity for the gas distribution operations is in a range from

2 10.10% to 10.60% with a mid-point of 10.35%.

3 **Q.** **Have you provided a description of your qualifications to perform this**

4 **study?**

5 A. Yes, it is included as Appendix I of this testimony.

6 **Q.** **Have you prepared an exhibit to support your testimony?**

7 A. Yes, it was prepared by me, and it is included as part of this testimony.

8 **Q.** **What is the order of your testimony's presentation?**

9 A. The topics are presented in the following order:

10 • A critique of the testimony of Robert G. Rosenberg, the witness for the

11 company;

12 • The cost of equity analysis of the electric utility operations for KU and

13 LG&E;

14 • The cost of equity analysis for the gas distribution business of LG&E; and

15 • A review of the capital structure and the cost of debt and preferred stock.

16

17 **I. CRITIQUE OF THE TESTIMONY OF ROBERT G. ROSENBERG**

18
19 **Q.** **Dr. Weaver, you indicated that you would comment on the testimony of Mr.**

20 **Robert G. Rosenberg. What is the purpose of these comments?**

21 A. Mr. Rosenberg has made errors in the implementation of or misstatements

22 regarding several of the methods he used to determine his cost of equity

23 recommendation. I wish to call the Commission's attention to them.

24 **Q.** **Would you provide an overview of the errors or misstatements that you**

25 **found?**

| 1 | A. | In his testimony, Mr. Rosenberg: |

2
3   •   Misrepresents the potential for measurement error in the DCF model;

4
5   •   Uses an incorrect nominal GDP growth rate in the DCF model;

6
7   •   Biases the results of the DCF sustainable growth calculation by including
8   non-representative values;

9
10 •   Uses a so-called "Empirical CAPM" which, in the formulation he uses,
11 has no theoretical foundation but is simply a model that increases beta;

12
13 •   Makes an incorrect adjustment for mid- or low-capitalization companies to
14 the results of his CAPM;

15
16 •   Develops and uses a risk premium model that is incorrectly specified, fails
17 the test of logical results, and cannot be validated because of the statistical
18 error, autocorrelation;

19
20 •   Uses a non-comparable group of companies to obtain data for the
21 comparable earnings analysis; and

22
23 •   Demonstrates a lack of knowledge about the appropriate use of the
24 arithmetic mean and the geometric mean.

25 Q. Would you please discuss these errors?

26 A.   Yes.

27 <u>**A. Misrepresentation of the Potential for Measurement Error in the DCF Model**</u>

28 Q. Where in his testimony did Mr. Rosenberg misrepresent the potential for

29 measurement error in the DCF model?

30 A.   The misrepresentation occurs in his KU testimony on page 13 beginning at

31 line 21 and continuing through page 16, line 8. In his LG&E testimony, the

32 misstatement occurs on page 17 beginning at line 1 and continues through page

33 19, line 14.

34 Q. What is the nature of the misrepresentation?

1 A. Mr. Rosenberg states that changes in the utility industry have a large effect

2   on the accuracy of the DCF model and infers that these changes are not present in

3   the CAPM, or risk premium method.

4 **Q.** **Does Mr. Rosenberg infer that the changes in the utility industry have a**

5 **larger effect on the DCF analysis than on the other analytical techniques?**

6 A. Yes. He begins his discussion of this phenomenon with the following

7   question: "Do you believe that there is the potential for large measurement error

8   associated with the DCF at the present time?" Three and one-half pages later he

9   concludes his discussion, "a DCF estimate will have the potential for more

10 measurement error than DCF calculations performed in the past under more stable

11 circumstances where investor expectations were determined with more certainty."

12 The allegation that current measures have the potential for more measurement

13 error than past measures is doubtful and Mr. Rosenberg's inference that the

14 changes in the industry only effects the DCF analysis is incorrect.

15 **Q.** **Why do you say that the assertion that current measures have the potential**

16 **for more measurement error than past measures is doubtful?**

17 A. Utility stocks attract a large number of institutional investors and this

18 mitigates the extent by which the industry changes cause measurement error. The

19 large number of institutional investors, that study the effects of such changes as

20 they occur, may have actually reduced the measurement error inherent in the use

21 of the cost of equity analytical models.

22 **Q.** **What do you mean by the term "institutional investors?"**

23 A. Institutional investors professionally manage portfolios that have one or

24 more specific investment objectives. Institutional investors include pension funds,

1	mutual funds, insurance companies, and trusts. These investors hold 45.1% of the
2	outstanding shares of Mr. Rosenberg's comparison group of electric companies
3	and 41.9% of the outstanding shares of his comparison group of gas distribution
4	companies. The percentage of each company's outstanding stock that is held by
5	institutional investors is shown in Schedule 1.
6	The professional managers of these funds daily follow the information that
7	becomes available in the utility industry. They are constantly making buy and sell
8	decisions based on their interpretation about the future impact that the information
9	might have on the returns of the companies that they follow. The fact that nearly
10	half of the outstanding shares of Mr. Rosenberg's comparison group of electric
11	and gas utilities are professionally managed cause the prices of these outstanding
12	shares to reflect information that is known about the future prospects of these
13	companies as rapidly as it becomes available. For this reason, the changes in the
14	utility industry may have been better assimilated into the data required for
15	implementation of the cost of equity models.
16	**Q.** **Since the industry is in a state of flux and many changes are occurring in the**
17	**utilities industry, regardless of the fact that there are a large number of**
18	**professional managers, would the DCF model be affected more than other**
19	**equity cost rate methods by the changes in the utility industry?**
20	A. Probably not. The changes in the utility industry will also affect the
21	measurement error in the CAPM and comparable earnings method.
22	**Q.** **What utility industry changes are you referring to?**
23	A. Mr. Rosenberg discusses five general changes that are occurring in the
24	utility industry. These are: 1) the industry is in a state of flux due to the

1   uncertainty associated with the deregulation that is occurring; 2) utilities are

2   assuming more conservative dividend payout policies in response to this

3   uncertainty; 3) some utility companies are engaged in repurchasing their common

4   stock and this has an affect on the stock price of those companies; 4) there is a

5   wave of merger activity in the industry that is having an effect on the stock prices

6   of the utility companies; and 5) the prospect that the 2003 changes in the federal

7   income tax on dividends might not be made permanent.

8   **Q.**   **How might the CAPM be affected?**

9   **A.**   The uncertainty associated with the five changes discussed by Mr.

10   Rosenberg will affect the systematic risk that is measured by beta. Historical data

11   is used for estimating the beta to use in the CAPM. It is generally measured as the

12   changes in a company's stock price relative to changes that occur in the stock

13   market as a whole.

14   Deregulation will change the systematic risk of the utility companies and

15   probably cause the utility industry to have greater systematic risk. However, the

16   issue of deregulation is being revisited in some states and the extent to which it

17   will occur is uncertain. Preservation of cash flow through more conservative

18   dividend payout policies will preserve cash flow and reduce the risk. Mergers will

19   change the company's betas. Diversification could lower the betas or industrial

20   concentration could cause the betas to increase. Changes in the income tax on

21   dividends will affect those investors that traditionally purchased utility stocks.

22   This will affect the price the utility company's stock. The betas will change

23   because the stock price changes relative to the market will change.

24   **Q.**   **How might the risk-premium model be affected?**

1   A.   To apply the risk-premium model, an analyst estimates a percentage

2   return-premium over some market interest rate. The estimation process uses

3   historical data for estimating the premium. For example, Mr. Rosenberg used two

4   approaches to estimate a risk premium. He calculated the market return for

5   Moody's Common Stock Index for electric and for gas utilities and subtracted this

6   from Moody's Composite Bond Yields for electric or for gas utilities to determine

7   the premium. His analysis for the electric utilities was from 1932 to 2001 and for

8   the gas industry was from 1954 to 2001. The changes that are affecting the utility

9   industry are a recent phenomenon and are not reflected in most of these data.

10   Consequently, the risk premium approach might also be affected by the

11   "measurement error" that Mr. Rosenberg attributes to the DCF model.

12   **B. An Incorrect Nominal GDP Growth Rate is used in the DCF Model**

13   Q.   **Dr. Weaver, please explain why you say that Mr. Rosenberg used an**

14   **incorrect nominal GDP growth rate in one of his DCF model analyses.**

15   A.   Mr. Rosenberg uses a two-stage DCF model for estimating the cost of

16   equity for his comparison groups. (Testimony, KU, p. 16, lines 18-19 and LG&E,

17   p. 20, lines 1-2.) Long-term nominal GDP is used as the growth rate in the second

18   stage of one of his three models. He "calculated projected growth in GDP for the

19   period 2008-2025 to be 5.91%," (testimony, KU, p. 18, lines 8-9, and LG&E, p.

20   21, lines 14-15).

21   First, there was no need for him to calculate the GDP nominal growth rate.

22   It is readily available from various sources including Value Line, Congressional

23   Budget Office, and Office of Management and Budget, and others. The CBO

24   forecast for the nominal growth in GDP, published in August of 2003, for the

1   years 2008 through 2013 was 5.3%, 5.1%, 5.0%, 4.8%, 4.9%, and 4.9%. (The

2   Budget and Economic Outlook: an Update, August 2003, Appendix C, CBO's

3   Economic Projections for 2003 through 2013.) The forecasts beyond 2013 would

4   be at the 4.9% rate. The average would be close to 5.0%, nearly 1% below the

5   5.91% he used. This forecast would have been available at the time he did his

6   testimony.

7 Q. **Why is the published forecast nearly 1% lower than the rate that Mr.**

8   **Rosenberg calculated?**

9 A.   Mr. Rosenberg made errors in his calculation. His response to questions

10   16c and 16d of the Attorney General's First Data Request to KU, which addressed

11   his calculation, shows the numerous estimates and errors he made in his failed

12   attempt to calculate the nominal GDP growth rate. First, he estimated the real

13   gross domestic product for 2008 because it was not available. He assumed a

14   linear GDP growth rate between the years of 2005 and 2010 of 3.4%. (The table

15   from which he obtained his data shows that the 2000 to 2025 growth rate was

16   3.0%.) He then compounded the 2005 real GDP at 3.4% for three years to arrive

17   at his estimate of 11,461. He then determined that the growth in real GDP, based

18   on the 2025 GDP estimate and his 2008 estimate to be 2.99%.

19   To go from a real rate to a nominal rate, he averaged GDP deflator and the

20   estimated CPI and added this average estimated value to his estimated 2.99%.

21   Two fatal errors were made here. First, he should only used the GDP deflator

22   when working with the GDP data and second, to inflate the real estimate of the

23   estimate, he should have multiplied as follows: $(1+r)(1+i)$ rather than adding.

24   Adding would produce a close estimate but it is technically wrong. Irrespective of

8

1		this, the CPI should not have been in the number he used. The CPI is for the
2		purchases that an average urban wage earner family of four would make. The
3		GDP deflator is for the total output of final goods and services in the domestic
4		economy. His 5.91% is meaningless.
5		Since Mr. Rosenberg used the nominal GDP growth rate for 195 of the
6		200 years included in his analysis, the model's results become more reflective of
7		the 195 periods. The growth rate was overstated about 0.9 percentage points
8		(5.91% - 5.0%). Instead of a 10.6% average outcome using his erroneous GDP
9		growth rate, it would have been approximately 9.7% provided that a correct
10		number had been used. His analysis using the erroneous GDP data should be
11		disallowed.
12	Q.	**Would the two-stage DCF results for the gas distribution companies using**
13		**the GDP estimate have the same errors?**
14	A.	Yes. He used the same incorrect 5.91% growth rate for the gas companies.
15		The average for this part of his analysis should have been around 10.2% if correct
16		data had been used. This part of his analysis should also be disallowed.

<p style="text-align:center"><u>C. The Averages for the DCF Sustainable Growth Methods are biased</u></p>

<p style="text-align:center"><u>because outliers are included in the calculation.</u></p>

19	Q.	**Dr. Weaver, why do you say that the average for Rosenberg's DCF**
20		**sustainable growth method is biased?**
21	A.	When Mr. Rosenberg computed the average of the results for his two-
22		stage DCF method using the sustainable growth, he eliminated CH Energy's
23		results because they were too low to be realistic. He left Exelon's results in the
24		calculation even though the results for that company at 15.8% are too high to be

1   realistic when one considers that this is a return that is expected to be earned for

2   200 years. Exelon's return is 2.9 percentage points higher than the next highest

3   company, MGE Energy. Six of the thirteen companies have a cost of equity

4   estimate that is closer to CH Energy than it is to Exelon.

5   If CH Energy is to be eliminated because it is too low, Exelon should be

6   eliminated because it is too high. The average DCF results without CH Energy

7   and Exelon is 10.2%.

8 Q. **Dr. Weaver, wouldn't the use of the median rather than the average**

9   **eliminate the bias caused by having such a high number is the results.**

10 A.   He shows the median in the summary results on his Schedule but he does

11   not use the median in arriving at his conclusion on page 24 in his testimony. He

12   uses the arithmetic average which is biased by the extreme cost of equity he

13   shows for Exelon.

14 Q.   **Does Mr. Rosenberg make a similar error in the analysis of his gas**

15   **distribution companies?**

16 A.   Yes. The sustainable growth projected DCF cost of equity estimate is

17   shown on page 2 of his schedule 6. It is shown in column 6 of this schedule that

18   Atmos Energy has a cost of equity estimate of 16.0%. The next closest company

19   is AGL Resources at 12.9%. Atmos is 3.1% higher and clearly an outlier. Without

20   Atmos, the median would be 10.0% and the arithmetic average would be 10.5%.

21   In the table on page 58 of his testimony, he uses an arithmetic average of 11.4%.

22   This nearly 1% difference in the average is caused by the extreme cost of equity

23   estimate for Atmos.

24 Q. **What do you recommend concerning this part of his analysis?**

1   A.   I recommend that this part of his analysis should be disregarded for both

2   his electric and gas recommendations.

3   **D. The "Empirical" Model Merely Increases Beta**

4   Q.   **Dr. Weaver, you indicated that Mr. Rosenberg used a model that increases**

5   **beta. You state that his "Empirical CAPM" model lacks theoretical**

6   **foundation and it merely increases beta as a result of misspecification. Please**

7   **explain how you reach these conclusions.**

8   A.   To answer your question, first let me give you a little background on the

9   so-called "Empirical" CAPM. Mr. Rosenberg notes in footnote 5 on page 24 of

10   his KU testimony and in footnote 5 on page 27 in his LG&E testimony that the

11   "Empirical" CAPM is also sometimes known as the "two-factor CAPM" or "zero-

12   beta CAPM."

13   The "zero-beta" CAPM was developed by Fisher Black, a University of

14   Chicago professor who is most noted for the development of the Black and

15   Scholes Options Pricing Theory. The purpose of Blacks "zero-beta" CAPM was

16   to eliminate the multicollinarity that exists in the traditional CAPM. Black's work

17   regarding the "zero-beta" CAPM is published as "Capital Market Borrowing with

18   Restricted Borrowing," *Journal of Business*, 45 (July 1972), 444-55.

19   The traditional CAPM is in the form of a regression equation. The

20   variables for the risk-free rate, R_f, and the market risk premium, $[E(RP)]$ should

21   be independent of each other to avoid the statistical problem called

22   multicolliniarity. The risk-free rate and the market risk-premium are not

23   independent because the expected market risk-premium, $[E(RP)]$, is equal to the

24   expected return on the market, $[E(K_m)]$ minus the risk-free rate, R_f. (Rosenberg,

11

1   KU testimony, p. 23, lines 25-27; and LG&E testimony, p. 27, lines 10-12). The

2   risk-free rate is also the first term in the CAPM. (Rosenberg, KU testimony, p. 23,

3   line 16; and LG&E testimony, p. 27, line 1)

4   Multicollinarity occurs where one independent variable, in addition to

5   helping determine the solution is also explaining a portion of the other

6   independent variable or variables. This can cause the solution of the model to be

7   misstated by the amount that the independent variables are explaining each other.

8   The interrelationship between these two variables is an arguable weakness in the

9   traditional CAPM, particularly when unadjusted betas are used in its

10   implementation. Black's research was done prior to Value Line publishing

11   adjusted betas as a part of its data services.

12   Black reformulated the CAPM into a two-part model that derives its return

13   from a zero-risk portfolio and from the total market portfolio. In Black's model,

14   Beta becomes the proportion of return that is derived from the zero-risk portfolio

15   and from the market portfolio. His model was stated as:

16   $$R_i = (1\text{-}b_i)\, R_z + b_i\, [E\, (K_m)].$$

17   Note the difference of Black's model with the model that Rosenberg used:

18   $$R_e = R_f + (n)(b_i)[E\, (RP)] + (1\text{-}n)[E\, (RP)].$$

19   In Rosenberg's model, there is a $(1\text{-}n)\, b_i$ and $(n)\, b_i$ and in Black's model there is

20   a $(1 - b_i)$ and b_i.

21   Black's "zero-beta" model contains a zero-covariance portfolio that is a

22   theoretical portfolio that is perfectly hedged against the gains or losses in the

23   capital market from stock prices either rising or falling. Black suggested that it

24   could be created in a perfectly hedged portfolio by having simultaneous short and

1   long positions. This hedged portfolio could then be substituted as the risk-free rate

2   and it would not have the R_e appear twice.

3   Q.   **Since Black's model was developed from a theoretical basis, why do you say**

4   **that Rosenberg's model does not have a theoretical basis?**

5   A.   The "empirical" model that Rosenberg shows that he is using is similar to

6   Black's model by using complimentary terms, $(1 - b_i)$ and b_i. But, other than that,

7   the two models are entirely different. Rosenberg's model also uses the risk-free

8   rate, the variable that Black was trying to eliminate. Even though Rosenberg

9   states that the "empirical" CAPM he used is sometimes called the "zero-beta"

10 CAPM, it is quite different from Black's "zero-beta" CAPM. Black's model has

11 eliminated the risk-free rate; Rosenberg's has it included twice in the model which

12 is one more time than it appears even in the traditional CAPM.

13 Q.   **Would you show where the "Empirical" model used by Rosenberg includes**

14   **the risk-free rate an additional time?**

15 A.   To answer this question, I will first show the difference between the

16 traditional CAPM and the so-called "empirical" CAPM. As Mr. Rosenberg

17 shows, the traditional CAPM is:

18 $$R_i = R_f + b_i \, [E(RP)]$$

19 and

20 his "Empirical" version of the CAPM is:

21 $$R_e = R_f + (n)(b_i)[E\,(RP)] + (1-n)[E\,(RP)].$$

22 The variables in the two models are:
23
24   R_i -   the required return on security I
25   R_e -   the required return on security I in the empirical CAPM;
26   R_f -   the risk-free rate of return
27   n -   an arbitrary % that is less than 100%

13

1	b_i	-	beta
2	E	-	a term denoting an expected value
3	RP	-	the market risk premium

Notice that the first term in the "empirical" version of the CAPM is the risk-free rate. The risk-free rate appears in the second term, $(n)(b_i)[E\ (RP)]$, because E (RP) is the return on the market minus the risk free rate. The third term, $(1-n)[E\ (RP)]$, also has E(RP) in which the risk-free rate is subtracted from the market return, just as it is in the second term. Rosenberg's second and third terms could be rewritten as $E\ (K_m) - R_f$.

10 Q. **Wouldn't the fact that the "empirical" CAPM used by Rosenberg is similar**

11 **to the model developed by Black make it close to correct?**

12 A. No. Rosenberg failed to recognize that the so-called "empirical" CAPM model he used is nothing more than the traditional CAPM model with an adjustment to increase beta. There is no hedged portfolio created. Rosenberg's model actually <u>increases</u> the multicollinarity by having the risk-free rate appear three times, once as R_f, and twice more by being implicit in each of the E (RP) terms (Testimony, KU, p. 32, lines 7-9; and LG&E, p. 35, lines 11-13).

18 Q. **Please explain why you say that the "empirical" CAPM adjusts the**

19 **traditional CAPM model and increases beta.**

20 A. The fact that the "empirical" CAPM is a traditional CAPM that increases beta can be shown by algebraically reducing Rosenberg's "empirical" model by collecting like-terms.

23 Q. **What like-terms are you referring to?**

24 A. As previously noted, E(RP) appears twice in Rosenberg's "empirical" model -- once in the middle term and once in the right hand term of the

14

"empirical" CAPM equation. These E (RP)'s can be simplified by factoring E(RP) into a single term as is done in the following steps.

First, since there is a beta in the term *(n)(b_i)* and not in the term *(1-n)*, a beta of "1" is inserted in the second term. The number "1" will not increase nor decrease the product of the multiplication. Furthermore, a beta of "1" is equal to the market beta. It neither increases nor decreases systematic risk.

$$R_e = R_f + [(n)(b_i) + (1-n)(1)] \, [E(RP)]$$

Next, substituting the values for *n, b_i,* and *(1-n)* that Mr. Rosenberg used provides the following:

$$R_e = R_f + [(0.75)(0.65) + (0.25)(1)] \, [E(RP)]$$

Finally, removing the parenthesis by performing the multiplication in the first set of brackets:

$$R_e = R_f + [0.4875 + 0.25][E(RP)]$$

Results in the following:

$$R_e = R_f + 0.7375 \, [E(RP)] \, .$$

Compare this with Rosenberg's original traditional form of the CAPM:

$$R_i = R_f + 0.65 \, [E(RP)]$$

Notice that the "empirical" CAPM is is nothing more than the traditional CAPM except that it first reduces beta by 25% and then it adds 0.25 to it. Beta was 0.65. This was reduced by 25% to .488. Then 0.25 was added so that it becomes .7375. In other words, the "Empirical" CAPM is simply the traditional CAPM with a higher beta.

1   **Q.**   **Did you detect any other problems with Mr. Rosenberg's implementation of**

2   **the "empirical" CAPM model?**

3   **A.**   Yes. Mr. Rosenberg used betas obtained from <u>Value Line</u> in his analysis

4   (KU testimony, page 25, lines 4-6; and LG&E testimony, page 28, lines 10-12).

5   <u>Value Line</u> makes an adjustment to its betas. Since the "empirical" CAPM makes

6   another adjustment to beta, the betas in Rosenberg's "empirical" CAPM were

7   adjusted twice.

8   **Q.**   **How does <u>Value Line</u> calculate its betas?**

9   **A.**   <u>Value Line</u> computes its betas by regressing weekly closing stock prices

10   on the weekly closing NYSE index for the previous five years. It then makes a

11   Bayesian statistical adjustment, which is proprietary, to the regression results. The

12   adjustment increases betas that are less than one and decreases betas that are

13   greater than one.

14   **Q.**   **What do you conclude as a result of the misspecification and implementation**

15   **error?**

16   **A.**   I conclude that the entire portion of Mr. Rosenberg's "empirical" CAPM

17   analysis should be disregarded for both his electric and his gas analysis.

E. The CAPM Results Are Incorrectly Adjusted for Mid- or Small-Capitalization Size

20   **Q.**   **Dr. Weaver, you stated that Mr. Rosenberg incorrectly adjusted the CAPM**

21   **results for mid- or small-capitalization size. Where in his testimony did he**

22   **make this error?**

23   **A.**   The erroneous adjustment appears on page 33 in his KU testimony; page

24   36, line 6 to the end of the page and on page 37 through line 4 of his LG&E

1		electric testimony; and on page 59, line 15 to the end of the page and on page 60
2		through line 10 in his LG&E gas testimony.
3	**Q.**	**What error did Mr. Rosenberg make?**
4	A.	He added a premium to the CAPM results ostensibly because some of the
5		companies in his comparison group were low- and mid-capitalization companies.
6	**Q.**	**Why is this adjustment incorrect?**
7	A.	If such a premium were needed, it would already be reflected in the
8		market prices of the mid- and low-capitalization companies. Most investors,
9		especially institutional investors, are sufficiently sophisticated to consider the
10		information that is known about a company when they make their buy and sell
11		decisions.
12	**Q.**	**Where are market prices of the common stock used in the implementation of**
13		**the CAPM?**
14	A.	Market prices of the common stock are used to compute the beta. The
15		market prices are also reflected in the expected return on the market because
16		market price appreciation is a part of the expected return.
17	**Q.**	**Why is the assertion that a size premium adjustment is needed erroneous?**
18	A.	The assertion that a size premium is needed is erroneous for two reasons.
19		First, it is erroneous because it implies that the market is inefficient and an
20		adjustment must be made for this inefficiency and the second, making a size
21		premium adjustment would cause it to be added twice, once by the market and
22		once by analysts.

1 Q. **What is the effect from implying that the market is not efficient?**

2 A. A fundamental underlying assumption of the CAPM theory is that the

3 market is efficient. If the market is inefficient, the entire theory that serves as the

4 basis for the model is invalid and this causes the CAPM to be invalid. Any results

5 from using an invalid model are meaningless. Furthermore, the large number of

6 institutional investors in the companies Mr. Rosenberg used for obtaining data

7 would be fully aware of the capitalization size of the companies and make their

8 buy and sell decisions accordingly.

9 Q. **Did Mr. Rosenberg make any other errors when he double-counted the size**

10 **premium?**

11 A. Yes. Even if a size premium adjustment was correct, which it isn't, he

12 incorrectly implemented it.

13 Q. **Why do you say he incorrectly implemented it?**

14 A. Any adjustment to the expected return on the market should be made to

15 the expected market return. Beta would then tailor the expected market risk

16 premium to reflect the systematic risk of the company. Mr. Rosenberg simply

17 added it to the final result.

18 Q. **Dr. Weaver, what do you conclude from your examination of the**

19 **capitalization size adjustment that Mr. Rosenberg made?**

20 A. The capitalization size adjustment should be disregarded for both his

21 electric and his gas analysis.

22   **F. Rosenberg's Risk Premiums Used in His Second Risk**
23   **Premium Analysis Are Flawed**

24 Q. **Dr. Weaver, where does Mr. Rosenberg discuss the second risk premium**

25 **analysis in his testimony?**

1   A.   The second risk premium analysis is presented on pages 37-40 in the KU

2   testimony, pages 40-43 in his LG&E-electric testimony, and on page 61-63 for his

3   LG&E-gas testimony.

4   Q.   **Why do you say that the risk premiums that Mr. Rosenberg determined in**

5   **his second analysis are flawed?**

6   A.   The regression model that Mr. Rosenberg uses to determine the equity risk

7   premium is specified incorrectly.

8   Q.   **Would you describe how his model is specified incorrectly?**

9   A.   In Mr. Rosenberg's description of how he constructed his model, he

10   started with a variable that he called "the implied risk premium." The "implied

11   risk premium" was determined by subtracting the average yield for Moody's

12   Utility Composite Bond Index in the two quarters prior to the averaged allowed

13   return from the quarterly average allowed returns in utility rate cases. This can be

14   set into an equation :

15
16 $$IRP_{(q)}) = AR_{(q)} - MBY_{(q-2)} \quad \text{where:}$$

17            $IRP_{(q)}$ =   Implied Risk Premium in a quarter
18            $AR_{(q)}$ =   Allowed Return in a quarter
19            $MBY_{(q-2)}$ =   Moody's Bond Yield in the prior two
20   quarters.
21
22   He then regressed the implied risk premium ($IRP_{(q)}$) as a dependent variable on

23   the yield on Long-term Treasury Bonds in the two quarters prior ($TBY_{(q-2)}$) . The

24   regression equation is:

25 $$IRP_{(q)} = a + B \ (TBY_{(q-2)})$$

26   Since IRP is equal to and can be rewritten as : $AR_{(q)} - MBY_{(q-2)}$ the regression

27   equation becomes:

28 $$AR_{(q)} - MBY_{(q-2)} = a + B \ (TBY_{(q-2)}).$$

1   The first problem that Mr. Rosenberg encounters is that Moody's Composite

2   Bond Yields in a given quarter will always be greater than U.S. Government

3   Treasury Bond Yields. In an economic expansion, investors become less risk

4   adverse. The spread between Moody's Composite Bond Yields and Treasury

5   Bond Yields decreases. In an economic decline, the spread between Moody's

6   Composite Bond Yields and Treasury Bond Yields becomes larger because

7   investors become more risk adverse. The spreads are not constant but change as

8   risk aversion change.

9   Q.   **How does this affect Mr. Rosenberg's model?**

10   A.   There is not a linear relationship between the implied risk premium and

11   yields on treasury securities. The regression model that Mr. Rosenberg used to

12   specify the relationship is a linear model. This causes his model to fail the test of

13   logical results.

14   Q.   **What do you mean by the expression, "test of logical results?"**
15
16   A.   The regression model simply doesn't provide results that make sense when

17   the model is tested with historical data.

18   Q.   **What historical data did you consider when you examined his model?**

19   A.   I tested the electric model using annual historical long-term treasury bonds

20   as the independent variable in Mr. Rosenberg's regression equation and examined

21   the risk premiums it produced. Quarterly returns and annual returns have a similar

22   pattern of change because the quarterly returns are a subset of the annual returns.

23   Q.   **Provide an example of some of the Treasury yields that you considered.**

24   A.   The model was tested for electric companies using annual 10-year

25   constant maturity yields on Treasury securities as follows:

Year	alpha Constant	+	Treasury Yield	X	Coefficient	=	Risk Premium
1980	6.477	+	11.43	X	-0.432	=	1.539
1985	6.477	+	10.62	X	-0.432	=	1.889
1990	6.477	+	8.55	X	-0.432	=	2.783
1995	6.477	+	6.57	X	-0.432	=	3.639
2000	6.477	+	6.03	X	-0.432	=	3.872
2003	6.477	+	4.01	X	-0.432	=	4.745

Notice that when interest rates were higher, such as in 1980 or 1985, the risk premiums produced by Rosenberg's model are around 1.5% to 2.0%. In 2003, when interest rates were low, the risk premium produced by the model is higher at 4.7%. His model implies that risk premiums and interest rates move in opposite directions.

Q.   **Couldn't this be explained by a hesitation on the part of regulatory authorities to allow the authorized return to fluctuate over as wide a range as interest rates fluctuate?**

A.   Perhaps, but I seriously doubt that any regulator would award a return on equity that is lower than the prevailing long-term Treasury Bond rates.

Q.   **What is the consequence of using a linear model to describe a non-linear phenomenon?**

A.   The model is misspecified. It does not accomplish its intended results. For example, if Treasury yields were 15%, the risk premium, according to Mr. Rosenberg's model, would be near zero. If this were true, the cost of equity for electric utilities would be the same as long-term Treasury yields. According to the model, the cost of equity to utility companies would be lower than the rates on long-term Treasury bonds when their interest rate is greater than 15%. The yields on long-term Treasury bonds were close to and greater than 15% in the early 1980's.

21

1   The model's risk premium prediction flies in the face of Mr. Rosenberg's

2   statement in his explanation of the "rationale behind a risk premium analysis"

3   (page 34, lines 15-16 in the KU testimony, and page 37, lines 17-18 in the LG&E)

4   testimony that, "It is nearly universally agreed that investors require a higher rate

5   of return for an investment in the common equity for a particular company than

6   they do in its debt." It is also nearly universally agreed that when interest rates are

7   high, investors are more risk adverse and when interest rates are low, investors are

8   less risk adverse. Mr. Rosenberg's model shows just the opposite. This is not

9   logical.

10   **Q.**   **Are there other problems with Mr. Rosenberg's second risk premium**

11   **analysis?**

12   A.   Yes, but the other problems are not fatal like the incorrect specification

13   problem.

14   **Q.**   **What are some of the other problems?**

15   A.   First, there was no statistical test performed to determine the appropriate

16   number of quarters to lag the independent variables. When lagged variables are

17   used in regression analysis, the length of the lag, in this case whether it be one-

18   quarter, two-quarters, or more, should be tested to obtain optimality.

19   Second, the high R^2 that was obtained in the electric model and the gas

20   model was due, in part, to a statistical problem called autocorrelation. This occurs

21   in time-series analysis when one observation of an independent variable is

22   explaining a portion of the next observation of that same independent variable. In

23   other words, the data observations in that independent variable are related to one

24   another. One observation is explaining the next observation in that same series.

1   For example, it Treasury bonds go from 5% in one observation to 5.5% in the

2   next observation., the two observations are related to one another. One of the

3   reasons for the 5.5% level is that 5% was the starting point. The change was

4   0.5%. The 5% and the 5.5% are not independent of each other. When

5   autocorrelation is present, the variances in the model are incorrect and the

6   resulting model's statistics, such as the R^2s, are meaningless.

7   **Q.   Does the same problem exist in Mr. Rosenberg's second risk-premium**

8   **analysis for the gas distribution companies?**

9   A.   Yes, only worse. The equity risk-premium for the gas companies would

10   disappear if the yields on long-term Treasury Bonds reached 14.6%. It would be

11   negative at rates higher than 14.6%. In 1980, when the yield on long-term

12   Treasury Bonds was 11.43%, the equity risk premium would be 1.39%. This is

13   even more illogical than the results of his model for electrics.

14   **Q.   What do you conclude regarding Mr. Rosenberg's second risk premium**

15   **analysis?**

16   A.   His second risk premium analysis for both electric and gas should be

17   disregarded.

18   **G. The Companies Used in the Comparable Earnings Analysis**

19   **are not Comparable to the Electric and Gas Companies**

20   **Q.   Dr. Weaver, you also indicated that Mr. Rosenberg used a set of non-**

21   **comparable companies in his comparable earnings analysis. Would you**

22   **please explain how you determined this?**

23   A.   Mr. Rosenberg used 208 companies for his comparable earnings analysis.

24   He does not show the names of these companies or even how many companies he

| 1 | | used in his analysis in his testimony. This information was obtained in response to |

1 used in his analysis in his testimony. This information was obtained in response to

2 data request, question 33 of the Attorney General's first set to KU. These

3 companies, as a group, do not appear to be comparable to either his electric

4 comparison or gas comparison companies.

5 **Q.** **Why do you say that these companies do not appear to be comparable?**

6 A. Mr. Rosenberg selected 13 companies for his "Electric Comparison

7 Group" for obtaining data for his analysis. Only 5 of the 13 companies in

8 Rosenberg's "Electric Comparison Group" are included in the 208 companies used

9 for "Comparable Earnings Analysis." All of the 13 electric companies, if they are

10 comparable companies, should be among the companies chosen for the

11 "Comparable Earnings Analysis Group." Since nine of the thirteen companies are

12 not, the selection criteria for either the electric comparison group or for the

13 comparable earnings group is flawed.

14 **Q.** **Did the gas companies meet all of Mr. Rosenberg's selection criteria?**

15 A. No. Two of Mr. Rosenberg's gas companies did not meet his selection

16 criteria to be included as comparison companies to LG&E-gas.

17 **Q.** **Is there another reason why you do not believe that the companies used for**

18 **the "Comparable Earnings Analysis" are not comparable to KU and**

19 **LG&E?**

20 A. Yes. A casual examination of the earnings of the 208 companies indicates

21 that they are not even comparable to each other. The company with the lowest

22 return on equity (ROE) is Matsushita. Its ROE is the lowest in each year 2001

23 through 2002 and it also has the lowest projected 2006-2008 earnings. The

24 company with the highest ROE is Pitney Bowes.

Company	Return on Shareholder Equity				
	2001	2002	2003	2004	2006-8
Matsushita	nmf	nmf	1.5	2.0	3.5
Pitney Bowes	62.4	67.0	58.0	53.5	42.5

Neither of these two companies should be included in a comparable earnings test for electric or gas utilities. How could a company that has consistently made a 3.5% ROE for the last five years be considered comparable with LG&E or KU? For that matter, a company that has consistently made over 42.5% ROE should not be considered comparable either.

H. Confusion Concerning the Arithmetic and Geometric Mean

Q. **Dr. Weaver, you state that Mr. Rosenberg indicates that he does not understand when the arithmetic mean should be used and when the geometric mean should be used. Where in his testimony do you believe that he indicates this lack of understanding?**

A.   The lack of understanding between the geometric mean and the arithmetic mean is shown in his testimony for KU on pages 28-29 and in Appendix B. It is shown in his LG&E testimony on pages 31-32 and in Appendix B.

Q. **When should the arithmetic mean be used?**

A.   The arithmetic mean is a measure of central tendency. It is used to describe a group or population of numbers. The numbers usually measure some phenomenon either at a moment in time or over time. For example, when I show the average dividend yield for use in the DCF model, I use an arithmetic mean. If one were to ask what the return was in any given year since 1928 in the stock

25

1		market, the arithmetic mean should be used. The arithmetic mean is an average		
2		that describes any given year.		
3	Q.	**When should the geometric mean be used?**		
4	A.	The geometric mean is used to describe the compound rate of return over		
5		some given number of years. It always involves a period over time and it always		
6		is used to measure a compound rate of return. For example, when I determine the		
7		historical growth rate to use in the DCF model over a given number of years, the		
8		geometric mean is used. It represents a compound rate of return. The geometric		
9		mean would be used to measure the rate of return on an investment made in the		
10		stock market in 1928 to the present.		

11 Q. **Would you provide an example of why the geometric mean measures the**

12 **compound rate of return?**

13 A. I will show two examples why the geometric mean measures the

14 compound rate of return and the arithmetic mean does not. The first example

15 would occur when there is zero return over a period of years. The second example

16 will show where there is a positive return. Each example will be compared with

17 the arithmetic mean.

18 *Example I*

19 Suppose a mutual fund that capitalized the dividends had the following prices

20 between 1998 and 2002 and an investor paid $50 to purchase a share:

	1998	1999	2000	2001	2002
Price	$50	$60	$70	$60	$50

Arithmetic Mean	= 1.425%
G-mean	= 0%

1   If the investor started with $50.00 a share in the mutual fund

2 investment and ended up with $50.00, the rate of return that was earned on the

3 fund was zero, not 1.425% as indicated by the arithmetic mean.

4   Mr. Rosenberg errs when he states on lines 6-8, page 28 of his KU

5 testimony and on lines 11-13, page 31 of his LG&E testimony that, "I believe that

6 a rational investor would employ the arithmetic mean and would not use the

7 geometric mean, because that would provide an understatement of the expected

8 future return." It is just the opposite. The arithmetic mean overstates the rate of

9 return.

10 **Q. What is your second example?**

11 A.   The second example is similar to the first one except that the return is

12 positive.

Example II

	1998	1999	2000	2001	2002	2003
Price	$50	$60	$70	$60	$50	$70

Arithmetic Mean of the Annual Yield   = **9.14%**
G-mean = 1.0696 – 1   = **6.96%**

20 The G-mean is the correct measure of the compound rate of return. The
21 compound rate of return on $50 for 5 years at 6.96% = $(1+.0696)^5($50) =$ $70.00

22 The arithmetic mean overstates the compound rate of return. The compound rate
23 of return on $50 for 5 years at 9.14% = $(1+.0914)^5($50) =$ $77.43

25   The value of the investment at the end of 5 years was $70.00. The G-

26 mean, as the compound interest rate, produced a correct result. The investment

27 compounded at the arithmetic mean was $77.43. Compounding at the arithmetic

28 mean causes the result to be overstated by $7.43. This shows that the G-mean is

1   the correct measure for the rate of return over a period of years while he

2   arithmetic mean overstates the rate of return over that period.

3 Q. **Could you cite any authority that agrees with your explanation of the**

4   **geometric mean and the arithmetic mean?**

5 A.   Dr. Henry A. Latané, a past president of the American Finance

6   Association and Dr. Donald L. Tuttle, a past president of the Certified Financial

7   Analysts Association, on page 211 in their book, <u>Security Analysis and Portfolio</u>

8   <u>Management,</u> stated the following on the Arithmetic mean:

9   The most basic statistic of any distribution the analyst usually works with
10   is the arithmetic mean. The arithmetic mean is perhaps more widely used
11   to indicate the average value of a distribution than any other measure of
12   central tendency.

13   Also on page 211, they had the following to say about the geometric

14   mean:

15   Although the arithmetic mean return best reflects the central tendency of a
16   distribution consisting of returns calculated at a certain moment in time,
17   the geometric mean return is the most descriptive reflection of compound,
18   cumulative returns over time. The geometric mean is widely used in
19   finance, its most familiar guise being "compound interest."
20
21 Q. **Would you summarize your comparison of the geometric mean and the**

22   **arithmetic mean?**

23 A.   Yes. The arithmetic mean should be used to describe a population of

24   numbers. The geometric mean should be used to determine a compound rate of

25   growth or a compound rate of interest.

26 Q. **What about the Attachment 1 to Appendix B of Mr. Rosenberg's testimony**

27   **which shows a decision tree. Doesn't this show that the arithmetic mean is**

28   **correct?**

1   A.   Yes, it does because Mr. Rosenberg is trying to prove that the arithmetic

2   average of the decision points for each year represents the central tendency of the

3   potential returns in that year. He is absolutely correct. It does.

4   Mr. Rosenberg is using a wrong example in an attempt to prove his point.

5   The arithmetic average of each decision point, which he calls the "Expected Value

6   of Investment," is the correct representation. The compounding occurs across the

7   years, going from the initial investment to year 1, year 2, year 3 and year 4.

8   By discounting at a compound discount rate of 10%, Mr. Rosenberg also

9   proves that to measure the return across time, the compound rate of return or

10   compound discount rate should be used. The geometric mean represents the

11   compound rate of return -- not the arithmetic average of the annual rates of return.

12   It appears that Mr. Rosenberg was confused about what he is trying to prove.

13   **I. Other**

14   Q.   **Do you have other comments on Mr. Rosenberg's testimony?**

15   A.   Some of the companies that Mr. Rosenberg selected for obtaining data for

16   his electric cost of equity study are not comparable to LG&E and KU.

17   Q.   **Why do you say that some of Mr. Rosenberg's companies are not**

18   **comparable?**

19   A.   Two of Mr. Rosenberg's companies, CH Energy Group and NSTAR, do

20   not own generating plant. The companies are classified by Value Line as being in

21   the electric utilities industry but, by not owning their own generating plant, they

22   do not have the high level of fixed cost investment and they have a different

23   operating risk than KU and LG&E.

| 1 | | One of his companies, Consolidated Edison, is involved in a merger |

dispute with Northeast Utilities. This dispute is being settled in court. Mr.

Rosenberg stated that he eliminated companies involved in major merger

activities, but somehow, this one was missed.

Q. **Does this complete your review of Mr. Rosenberg's testimony?**

A. Yes.

THE COST OF EQUITY

A. Economic Principles for Determining the Cost of Equity

Q. **What economic principles are mandated for determining the cost of capital for regulated utilities?**

A. The economic principles for determining the cost of capital for regulated utilities have been set forth in the Bluefield Water Works & Improvement Co. v. P.S.C. of West Virginia, 262 U.S. 679 (1923), and F.P.C. v. Hope Natural Gas Co., 302 U.S. 591 (1944), Supreme Court decisions.

The Court, in the *Bluefield* case stated:

> The return should be reasonably sufficient to assure confidence in the
> financial soundness of the utility and should be adequate, under efficient
> and economical management, to maintain and support its credit and enable
> it to raise the money necessary for the proper discharge of its public
> duties. A rate of return may be reasonable at one time and become too
> high or too low by changes affecting opportunities for investment, the
> money market and business conditions generally.

From a financial perspective, there are three distinct points in the above

quotation that apply to the rate of return. First, the target return on equity must be

adequate, under efficient operating conditions, to assure the financial integrity of

the business and enable the utility to attract capital. Second, it should be

competitive with other opportunities for investment, and third, the target equity

1		rate should be changed as the level of interest rates and equity cost rates in the
2		capital market change.
3	Q.	**What additional criteria did the _Hope_ case provide?**
4	A.	Again, from a financial perspective, the _Hope_ case more precisely defines
5		what is meant by "financial integrity" and "capital attraction." In the _Hope_ case
6		the Court stated:

> 7 ... It is important that there be enough revenue not only for operating
> 8 expenses, but also for the capital costs of the business. These include
> 9 service on the debt and dividends on the stock.... By that standard, the
> 10 return to the equity owner should be commensurate with the return on
> 11 investments in other enterprises having corresponding risks. That return,
> 12 moreover, should be sufficient to assure confidence in the financial
> 13 integrity of the enterprise, so as to maintain its credit and to attract capital.
> 14

15   These principles have been confirmed in the <u>Permian Basin Area Rate Cases</u>, 390

16   U.S. 747 (1968) and the <u>Federal Power Comm. V. Memphis Light Gas & Water</u>

17   <u>Division</u>, 411 U.S. 458 (1973).

18 **Q.**   **How do your findings assure compliance with your interpretation of those**

19   **economic principles?**

20 **A.**   I have selected methods for determining the cost of equity capital that rely

21   on the opportunity cost principle. The reliance on the opportunity cost principle

22   assures compliance with my interpretation of the requirements of _Bluefield_ and

23   _Hope_.

24 **Q.**   **What is the opportunity cost principle?**

25 **A.**   The opportunity cost principle is discussed in Appendix II to this

26   testimony.

27 **Q.**   **Dr. Weaver, what steps did you take to determine the cost of equity in your**

28   **analysis?**

1   A.   My analysis was done in four distinct steps. First, I examined economic

2   data to gain information about investor expectations regarding capital costs rates.

3   Second, I selected a group of companies that, as close as possible, have similar

4   risks to KU and LG&E. Third, I examined data that provides information about

5   the risk differences between the selected companies, KU, and LG&E. Last, I used

6   evaluation models to estimate the cost of equity for that group of companies.

7   Q.   **What cost of equity evaluation models do you use in your analysis?**

8   A.   I use two versions of the discounted cash flow (DCF) technique, the

9   constant-growth DCF model and the multi-stage DCF model; the Capital Asset

10   Pricing Model (CAPM); and the bond-yield-plus-risk premium approach (bond-

11   risk-premium). These methods are also discussed in Appendix II of this

12   testimony.

B. Economic Analysis

14   Q.   **Dr. Weaver, what economic measures did you consider in your review of**

15   **present and prospective economic conditions?**

16   A.   I considered current and forecasted data about the business cycle as

17   measured by the real rate of change in the Gross Domestic Product (GDP), the

18   inflation rate as measured by the Consumer Price Index (CPI), and interest rates. I

19   also examined the index of Leading Economic Indicators (LEI) to gain additional

20   information about likely changes in the business cycle.

21   Q.   **What does the real rate of change in GDP indicate and why is it important?**

22   A.   The real rate of change in GDP provides the inflation-adjusted rate at

23   which finished goods and services are produced in our domestic economy.

1		Positive values indicate a growing economy and negative values indicate a
2		declining economy.
3		The rate of economic growth provides a mixed message for investors. Too
4		high a growth rate could be inflationary. The inflation would be caused by the
5		demand for goods and services outstripping the supply. A too low or negative
6		growth rate indicates a recession. In fact, a "rule of thumb" definition for a
7		recession is two consecutive quarters of declining GDP.
8	Q.	**What do you mean by "too high" or "too low" a growth rate in GDP?**
9	A.	I believe that an ideal growth rate should normally be in a range from 2%
10		to 5%. An annual growth rate that is less than 2% indicates that economic output
11		is increasing too slowly and the economy might be headed toward a recession. An
12		annual growth rate that is above 5% tends to indicate that the economy is over-
13		heating and could become inflationary, particularly when the economy is near full
14		employment. However, when the economy is in the early stages of a recovery,
15		such as occurred in the third quarter of 2003 and has less than full employment,
16		the rate may exceed 5% without being inflationary. Between 1992 and 2003, the
17		economy grew at an average annual rate of 3.2%. A recession occurred in 2001.
18		The growth in GDP was 0.3% that year. The National Bureau of Economic
19		Research assigned March 2001 as the beginning of the recession and November
20		2001 as its ending date.
21	Q.	**What is the expected GDP real rate of growth for the near-term future?**
22	A.	For the five-year period 2004 through 2008, the GDP growth rate is
23		expected to be between 2.7% and 4.8%. Forecasts for GDP growth are shown in

1		Schedule 3 of my Exhibit. This growth rate is within what I consider to be an
2		ideal range for investment growth -- neither too high nor too low.
3	**Q.**	**Do you have other information that confirms the reasonableness of these**
4		**growth forecasts?**
5	A.	Yes. I examined the Index of Leading Economic Indicators to obtain
6		information about the GDP growth forecasts. These data are shown in Schedule 4.
7		The change in the LEI Index has been positive throughout 2003 except in the
8		months of February, March, and September. The changes in 2003 indicate that
9		forecasts for real growth in GDP are reasonable and will most likely occur.
10	**Q.**	**Dr. Weaver, Schedule 2 also shows information about the consumer price**
11		**index. What information does this convey and why is it important?**
12	A.	The consumer price index provides a measure of inflation. Capital market
13		equity cost rates and interest rates contain a premium for expected inflation so
14		that investors can maintain the purchasing power of the dollars that they have
15		invested. When inflation rates are expected to increase, equity cost rates and
16		interest rates will also increase. When inflation is expected to remain low, longer-
17		termed capital market cost rates will also remain at a lower level, given the
18		prevailing level of risk-free interest rates.
19	**Q.**	**What are the near-term expectations about inflation?**
20	A.	Five-year forecasts for inflation are shown in Schedule 3. Both the Value
21		Line and the Congressional Budget Office forecasts indicate that inflation is
22		expected to remain within a range that is between 1.6% and 2.2% over the next
23		five years.
24	**Q.**	**What interest rate data did you examine?**

1   A.   I looked at long-term utility bond yields and short and long-term

2   government bond rates.

3   Q.   **What did you find?**

4   A.   Long-term utility bond yields were a little lower in 2003 than they were in

5   2002. Schedule 5 shows Moody's (Mergent's) Public Utility Bond Yields for Aaa,

6   Aa, A, and Baa rated public utility bonds since 1980. "A" rated bonds were in a

7   range from 7.11% to 6.04% in 2003. In 2002 they were 7.36%. LG&E's and KU's

8   bonds are in this rating category.

9   Q.   **What does the forecast for interest rates indicate?**

10 A.   The forecast for 3-month Treasury Bills and 10-year Treasury Bonds are

11   shown in Schedule 6. According to the forecasts, both short-term rates and long-

12   term rates are expected to slowly increase from 2004 through 2007.

13   The <u>Value Line</u> short-term 3-month rates are forecasted to increase by

14   1.3% over the four years. The CBO forecast indicates that these rates will

15   increase by 3.3%. In either case, the starting point is near 1%, so the 3-month

16   rates are expected to remain low.

17   Both of the forecasts for 10-year treasury notes are similar. These are

18   expected to increase by around 1% over the four years.

19 Q.   **Dr. Weaver, do recent changes in interest rates tend to confirm their relative**

20   **stability?**

21 A.   Yes. Schedule 7 shows the changes in interest rates that have occurred

22   from December 18 to January 15 and for the period January 15 to February 19.

23   Short-term rates were nearly stable during the first approximately 30-day period

24   and rates that are greater than one year fell anywhere from 6 to 22 basis points. In

1   the second approximately 30-day period, short-term rates tended to decrease and

2   longer-termed rates were nearly stable. The forecasts call for nearly stable rates

3   that will gradually increase over the next four years.

4 Q. **How do you expect the growth in economic activity and increase in interest**

5   **rates to affect the cost of equity for electric utilities?**

6 A.   The cost of equity for electric utilities will also slowly increase over the

7   near-term future.

8 Q. **What will cause this to happen?**

9 A.   The growth in economic activity will create the need for capacity

10   expansion. The expected increase in interest rates, although small, will put an

11   upward pressure on dividend yields. This will result in a downward pressure on

12   stock prices. More shares would have to be issued to obtain a given amount of

13   capital from the capital market, and when this happens, the cost of capital will be

14   higher. This must be considered when determining the cost of equity.

C. Company Selection - Electric Companies

16 Q. **Dr. Weaver, in the testimony that you filed for the ESM proceeding, you**

17   **selected a different set of companies for LG&E-electric than you did for KU.**

18   **Will you use two different sets of companies for this electric analysis?**

19 A.   No. In the ESM case, LG&E and KU, according to their capital structures,

20   used different amounts of financial leverage. LG&E's capital structure had

21   50.26% equity. KU's structure had 59.6% equity. In other words, KU had nearly 9

22   percentage points less financial leverage. As a result it had less financial risk and

23   required a different cost of equity that was lower than the cost of equity required

24   for LG&E.

36

1 In this general rate case the difference in the equity component in the

2 capital structure is 4.9 percentage points. The difference, on a relative basis to the

3 companies being considered as a data source, is not as great as the approximately

4 9.3 percentage points difference that existed in the ESM case. The equity

5 component of the twenty companies that I have selected as candidate companies

6 for obtaining data (Schedule 12) range from 22.7% (PPL Corp.) to 65.0% (DTE

7 Energy). This represents a 42.3% range in the equity component. There were

8 twenty companies that make up this range, so the average difference in the equity

9 component for each of these twenty companies is 2.1% . The difference in the

10 equity component for KU and LG&E @ 4.9% amounts to the difference of a little

11 over two of the companies on the list @ 4.2% (2 x 2.1%). In other words, on a

12 relative basis, the difference in the financial leverage is not as great as it was in

13 the ESM case.

14 Q. **Why are the capital structures different in this general rate case than they**

15   **were in the ESM case?**

16 A.   The principal difference is caused by the use of a thirteen- month moving

17 average capital structure and a different end of test-year period in the ESM case.

18 This general rate case uses an end of test year-year capital structure that ends on

19 September 30.

20 Q. **How did you select the companies that you used?**

21 A.   I started with the 59 companies classified by Value Line as electric

22 utilities. I sorted these companies by Value Line's Financial Strength Rating and

23 eliminated 8 companies that have a rating that is below a "B". These 59

24 companies and their respective Financial Strength Ratings are shown on Schedule

1   8 in my Exhibit. The companies that were eliminated in the first cut are shown at

2   the bottom of Schedule 8 and again at the top of Schedule 9.

3   **Q.   What is the Financial Strength Rating?**

4   A.   The Financial Strength Rating is an assessment of financial leverage,

5   business risk, company size, and other factors made by <u>Value Line</u> analysts for

6   each of the companies that they follow. A "B" rating is considered average.

7   **Q.   What did you do next?**

8   A.   I eliminated 5 companies that <u>Value Line</u> did not recommend to investors.

9   This is the second group of companies shown on Schedule 9.

10   **Q.   Schedule 9 also shows that you did not include companies that recently sold**

11   **or purchased major assets or divested the majority of their generation plant.**

12   **Why did you do this?**

13   A.   Major asset acquisitions or sales might change the earnings expectations

14   of a company undergoing such a change or at least change the certainty of the

15   earnings expectations.

16   **Q.   How did you define whether an asset acquisition or divestiture was "major"**

17   **or not?**

18   A.   I used the <u>Value Line</u> estimate of the dollar value of the acquisition or

19   divestiture and took it as a percent of the <u>Value Line</u> estimate of the company's

20   2003 total capital. If the acquisition or divestiture was greater than 10% of the

21   estimated total capital, I considered it major.

22   **Q.   How many companies were eliminated in this step?**

23   A.   There were 10 companies that had divested generating plant or were in the

24   process of buying or selling major assets or had eliminated their generating plant.

1 Q. **What did you do next?**

2 A. I next eliminated 2 companies that are in a merger dispute and 2 that have

3 a short operating history. I also eliminated Hawaiian Electric because its operating

4 system is not inter-connected. There were 31 companies remaining.

5 Q. **What did you do next in the company selection process?**

6 A. I examined the fuel mix for the 31 remaining companies to obtain insight

7 about the generation plant they owned. The fuel mix for the 31 companies is

8 shown in Schedule 10. I eliminated 11 of these 31 companies because their fuel

9 mix was too dissimilar to either KU or LG&E. These companies have a heavy

10 reliance on hydro, nuclear, or purchased power. The 11 companies that were

11 eliminated are shown at the very bottom of schedule 9.

12 Q. **How many companies remained after this step?**

13 There were 20 companies that remained. For each of these companies, I

14 calculated their equity as a percent of total capital. These data are shown in

15 Schedules 11 and 12. I also determined the electric revenues as a percent of total

16 revenues. The percent of electric revenues is shown in Schedule 13.

17 Q. **What did you use these data for?**

18 A. Six of the companies had an equity to total capital ratio that was lower

19 than 38% . I eliminated these six companies.

20 Q. **What did you consider next?**

21 A. I eliminated 5 companies that have electric revenues that are less than 60%

22 of total company revenues. I did this because this part of the proceeding is to

23 determine the cost of equity for electric companies. To obtain reliable data for the

1   electric companies, the companies should obtain the majority of their revenues

2   from electric operations.

3 Q.   **How many companies remained after this elimination process?**

4 A.   Nine companies remained. These companies have Financial Strength

5   Ratings that range from a B+ up to an A+. Their equity to total capital averages

6   48% as compared to 52% for KU and 48% for LG&E. Their electric revenues

7   average 85% of total revenues. This compares to a ratio of nearly 100% for KU

8   and 74% for LG&E.

9 Q.   **What are the names of the nine companies that you selected for obtaining**

10   **data for this proceeding?**

11 A.   The names of the nine companies that were selected were Ameren,

12   Cinergy, DTE Energy, Empire District, FPL Group, MGE Energy, PNM

13   Resources, Progress Energy, and Southern Company.

14

15   **<u>D. Risk Analysis - Electric Companies</u>**

16 Q.   **How did you use the information provided by the risk analysis?**

17 A.   I used the information from the risk analysis to adjust the results of the

18   cost of capital analysis when making my final recommendation. The use of capital

19   market price data from these companies, after being adjusted for the risk

20   difference between the nine companies and KU or LG&E, cause the results to be

21   in compliance with the *Bluefield* and *Hope* mandates.

22 Q.   **How did you proceed with your risk analysis?**

23 A.   I first compared the capital structures of the selected companies with KU

24   and with LG&E. I then examined cash flow measures, accounting measures, and

1		debt measures for comparison with KU and LG&E. Next, I examined <u>Value</u>
2		<u>Line's</u> measures and <u>Standard & Poor's</u> measures of the group of companies to
3		determine their homogeneity.
4	**Q.**	**What did you conclude from your examination of the capital structures?**
5	A.	The capital structures are shown in Schedule 15. Schedule 14 provides the
6		capitalization data from which the capital structures were constructed. Each
7		company's capital structure was measured as the percentage of long-term debt,
8		short-term debt, preferred stock, and common equity to total capital.
9	**Q.**	**What measure for capital structures of KU and LG&E-electric did you use?**
10	A.	The capital structures for KU and LG&E were the book value capital
11		structures as of September 30, 2003 taken from page 1 of Rives Exhibit 2. The
12		unadjusted book value capital structure represents one that would be available to
13		an investor who would be examining data from the company to access its risk.
14	**Q.**	**How does the average capital structure for the nine companies that you**
15		**selected compare to the capital structures for KU and LG&E?**
16	A.	The average capital structure for the nine companies compares very
17		favorably to the capital structures of KU and LG&E. The average common equity
18		component for the nine companies is 47.6%. KU's equity component is 52% and
19		LG&E's is 47.1%.
20	**Q.**	**What is the implication of the average capital structure regarding financial**
21		**risk?**
22	A.	Since the proportion of capital that is not equity is leverage, one minus
23		the equity capital percentage represents the financial leverage that is being used.
24		Leverage is an indicator of financial risk. The nine companies have an average of

1		52.4% leverage capital. KU has 48% leverage capital and LG&E had 52.9%
2		leverage capital. The nine companies, as a group, have about the same amount of
3		financial risk as KU and LG&E.
4	Q.	**Dr. Weaver, would you explain your cash flow analysis?**
5	A.	I evaluated cash flow ratios for the years 2001 and 2002 for each of the
6		companies selected for use with KU and LG&E. The ratios examined were the
7		cash flow coverage of: interest, total dividends, investing activities, and net
8		income.
9	Q.	**How do the cash flow ratios indicate how similar the companies are to one**
10		**another?**
11	A.	Companies that are similar to one another with respect to risk generally
12		have similar cash flow coverage of: interest, dividends, investments, and quality
13		of earnings.
14	Q.	**What source document do you use to construct the cash flow ratios?**
15	A.	The cash flow measures are taken from the Cash Flow Statement that is
16		compiled by each company and accompanies its Balance Sheet and Income
17		Statement as one of its principal financial statements.
18	Q.	**What accounting standard governs the Cash Flow Statement?**
19	A.	FASB 95 provides the methods for preparing the Cash Flow Statement.
20	Q.	**Are the coverage measures that you use the same ones that are used by**
21		**Standard & Poor's for interest coverage measures?**
22	A.	No. Standard & Poor's excludes changes in working capital in its
23		calculation of the amount of cash available from operating activities. The

1		coverage ratios that I use are calculated from "cash flow from operating
2		activities" that is defined by FASB 95.

The exclusion of working capital may be inconsequential when only minor changes occur in the current asset or liability accounts. However, when large changes occur, the amount of cash available for coverage would be either over- or under-stated unless the changes in working capital are recognized in the cash flow statement. For this reason, the coverage calculated according the FASB 95 provides better information for the analysis.

Q. **What Schedules show the cash flow coverage ratios for the selected companies?**

A. Data for each of the nine selected companies and for KU and LG&E are shown on Schedules 17 through 27. A summary of the cash flow coverages is shown in Schedule 16.

Q. **What does the cash flow coverage of interest indicate?**

A. The cash flow coverage of interest expense indicates how many times cash flow from operating activities before interest is paid covers the interest expense that was incurred in the year of measurement. It is calculated as cash flow from operating activities plus interest expense and this quantity is divided by interest expense. A low ratio would indicate a greater risk that the firm would have difficulty making its contractual interest payments. A higher ratio would indicate less risk.

Q. **What is the cash flow coverage of interest for the nine companies?**

The average for the nine-company group is 4.51 times coverage. This compares with a 7.14 times coverage for KU and 8.36 times coverage for LG&E.

1		The magnitude of this coverage indicates that all of the companies have ample
2		coverage to make interest payments and there is little risk of default on
3		outstanding debt. Both KU and LG&E have nearly twice the coverage than the
4		average for the nine companies.
5	Q.	**Please describe the cash flow coverage of total dividends.**
6	A.	The cash flow coverage of dividends shows the number of times that cash
7		flow from operating activities covers the common and preferred dividend
8		payments. Companies that have a low coverage might have the risk of having to
9		reduce or even eliminate a dividend payment.
10	Q.	**What is the cash flow coverage of dividends for KU and LG&E relative to**
11		**the nine companies?**
12	A.	The nine-companies cover their total dividend payments an average of
13		3.44 times. KU covers its dividend payments 40.73 times. The extremely high
14		ratio for KU results from KU not making a common dividend payment in 2002. In
15		2001, when it made both a common and preferred dividend payment, its coverage
16		was 5.86 times. When comparing this single year with the nine-company group,
17		KU's coverage was still higher.
18	Q.	**What does the cash flow coverage of investing activities represent?**
19	A.	The cash flow coverage of investing activities indicates how many times
20		cash flow from operating activities covers long-term investments in plant and
21		other assets. A ratio greater than 1.0 indicates that internally generated funds are
22		sufficient to cover investments provided that there were no dividend payment or
23		payments to cover maturing financial assets. When the coverage after dividends
24		and maturities exceed the proportion of equity in the capital structure, the

1   company can meet its external financing with debt and not have its capital

2   structure equity ratio decline.

3   The higher the coverage, the less likely the company will be forced to seek

4   substantial external financing for plant construction or other asset acquisitions.

5   Therefore, a high ratio indicates greater protection from the vagaries of the capital

6   market and shows a lower amount of risk.

7 Q.   **What was the cash flow coverage of investing activities for the nine-**

8   **companies and for KU and LG&E?**

9 A.   The nine companies' cash flow coverage of investing activities averaged

10   0.87 times as compared to 1.03 times coverage for KU and 1.05 times coverage

11   for LG&E.

12 Q.   **What does this indicate?**

13 A.   It indicates that both KU and LG&E have less risk than the average for the

14   nine companies although the difference is not great. Unless an unusually-large

15   asset expenditure was planned or a large change in dividend payments was

16   planned none of the companies should have to do substantial external financing in

17   the near future except to meet maturity obligations as they become due.

18 Q.   **What does the cash flow coverage of net income indicate?**

19 A.   The cash flow coverage of net income is a measure of the quality of

20   earnings. It represents the number of dollars of cash flow from operating

21   activities per dollar of net income reported on the income statement. It is

22   calculated as the cash flow from operating activities from the cash flow statement

23   divided by net income from the income statement.

1   **Q.**   **What did you find about this coverage measure for the nine companies, KU,**

2   **and LG&E?**

3   **A.**   The nine-companies' average coverage was 2.45 times while the coverage

4   for KU averaged 1.91 times and for LG&E it was 2.55 times.

5   **Q.**   **How do you interpret this quality of income measure?**

6   **A.**   All of the companies have an excellent quality of income. The nine

7   companies have $2.45 in cash flow from operating activities for each $1.00 in

8   reported net income. KU has $1.91 and LG&E has $2.55 in cash flow from

9   operations for each $1.00 of its reported net income.

10   **Q.**   **What accounting and financial measures did you examine?**

11   **A.**   I compared the average of the 2000 through 2002 dollar value of the total

12   assets of the companies, the sales to plant and equipment ratio, and the sales to

13   total assets ratio. The results of these comparisons are shown in Schedule 28.

14   **Q.**   **Dr. Weaver, how does the dollar value of the total assets of the nine companies**

15   **compare with KU and LG&E?**

16   **A.**   Both KU and LG&E are smaller than the average of the nine companies.

17   The average dollar value of assets for the nine-company group is 6.8 times greater

18   than KU and 5.2 times greater than LG&E. Smaller companies are considered to

19   be more risky than larger companies because larger companies have more

20   economical access to the capital markets and have greater diversity with regard to

21   generation capability and customer base.

22   The two factors, access to capital markets and generation diversity, do not

23   adversely affect KU and LG&E as much as it would if they were stand-alone

24   companies. They have access to the capital market through E.ON North America

1	and Fidelia. Both KU's and LG&E's generation diversity is increased by being
2	subsidiaries of one another.
3	**Q. What do you conclude with regard to the total asset size measure?**
4	A. KU and LG&E are a little more risky than the nine-company group.
5	**Q. What does the sales to plant and equipment ratio show?**
6	A. The sales to plant and equipment ratio indicates the number of dollars of
7	sales from each dollar invested in plant and equipment. It is a measure of the asset
8	utilization intensity. The more dollars worth of sales per dollar invested in assets,
9	given a similar profit margin, the greater the utilization and the more profitable
10	the investment in assets. Companies that have larger sales to plant and equipment
11	ratios are less risky. This ratio must be considered in conjunction with other ratios
12	because a lower ratio could be the result of a newer, less depreciated plant, or by
13	higher quality, more expensive equipment.
14	**Q. What is the sales to plant and equipment ratio for KU and LG&E?**
15	A. The sales to plant and equipment ratio for KU is 0.53 as compared to 0.70
16	for the nine-company group. LG&E's ratio is .50. This indicates that KU and
17	LG&E are more risky.
18	**Q. What does the sales to total assets ratio show?**
19	A. The sales to total assets ratio is calculated as sales divided by total assets.
20	It is similar to the sales to plant and equipment ratio. It represents the number of
21	dollars of sales for each dollar invested in total assets. It is a measure of the
22	intensity of use of the company's assets to produce sales.
23	**Q. How does it measure the intensity of use of the company's assets?**

1   A.   Companies that have more sales revenues per dollar of total assets would

2   either have higher prices for the electricity that they sell, have more fully

3   depreciated assets, or sell more energy per dollar invested in net assets. Price

4   differences for the electricity that is sold are mitigated because the companies are

5   regulated. The value of comparable assets would be mitigated when the

6   companies have a mixture of generating plants with respect to age. Consequently,

7   differences in the sales to total assets ratio would be caused primarily by

8   differences in the intensity of use of the assets to produce electricity. Companies

9   that have flatter peak loads would be able to have greater intensity of use of assets

10   than companies that have greater load variability over the course of a day.

11   Q.   **What were your findings from your examination of the sales to total assets**

12   **turnover?**

13   A.   The sales to total assets turnover, also in Schedule 28 of my Exhibit,

14   shows that KU achieves $0.47 in sales for each $1.00 invested in assets as

15   compared to $0.46 for the nine companies. LG&E's ratio is $0.42. KU's asset

16   utilization is nearly equal to the nine-company group. This mitigates the

17   difference in the sales to plant and equipment ratio. LG&E has a little more risk

18   than the nine companies.

19   Q.   **What debt measures did you consider?**

20   A.   I examined Moody's Bond Ratings and the 2000-2002 average times

21   interest earned ratios.

22   Q.   **What were the bond ratings of KU and LG&E and the nine companies that**

23   **you selected for each of them?**

1   A.   The bond ratings are shown in Schedule 29 of my Exhibit. KU and LG&E

2   have "A1" bond ratings. In the nine-company group, all of the companies except

3   two have a lower bond rating than KU or LG&E. Four of the companies are in the

4   "Baa" rating category. The remaining three companies are in the single "A"

5   category.

6   Q.   **What do the times-interest-earned ratios show?**

7   A.   KU has a 3-year average times interest earned ratio of 5.67 times and

8   LG&E's is 5.46 times. The nine-companies average 3.20 times. The greater

9   coverage that KU and LG&E have indicates that they have less financial risk.

10   Q.   **Dr. Weaver, would you summarize your risk measures?**

11   A.   Yes. A summary or the measures is as follows:

12   <u>Risk Summary</u>

Measure	KU	LG&E	Selected Companies	Result
Cap. St. Lev.	48.0%	52.9%	52.4%	~= risk
CF x Int. Cov.	7.14x	8.36x	4.51x	< risk
CF x Div. Cov.	*	6.65x	3.44x	< risk
CF x Inv. Act.	1.03x	1.05x	0.87x	< risk
Qual. of Earnings	1.91x	2.55x	2.45x	~= risk
Total Asset Size	$1.9 mill	$2.4mill	$12.6mill	> risk
Sales to P&E	0.53	0.50	0.70	> risk
Sales to Tot. Assets	0.47	0.42	0.46	~= risk
Moody's Bond Rat.	A1	A1		< risk
Times Int. Earned	5.67	5.46	3.20	< risk

* KU's coverage in 2001 was 5.86 times.

Key: ~= risk (approximately equal risk)
         < risk (less risk)
         > risk (greater risk)

32   Q.   **What do you conclude from this summary?**

33   A.   KU and LG&E are a little less risky than the selected companies but the

34   difference is small. The cash flow interest coverage, dividend coverage, coverage

1		of investing activities, bond ratings, and times interest earned indicate that KU
2		and LG&E have less risks. The leverage measure, quality of earnings, and sales to
3		total assets indicate that KU and LG&E have about the same risks. The total asset
4		size, and sales to plant and equipment indicate that KU and LG&E have greater
5		risks.
6	Q.	**What other risk measures did you evaluate?**
7	A.	I examined published risk measures from Value Line and Standard and
8		Poor's.
9	Q.	**Why do you examine published risk measures?**
10	A.	Many investors rely on published risk measures to make their stock
11		purchase and sell decisions. Value Line and Standard & Poor's are two widely
12		recognized investment data and advisory services. These publications provide
13		information for evaluating the risks of the selected companies and indicate the
14		degree of similarity of these companies.
15	Q.	**What Value Line measures did you consider?**
16	A.	I considered Value Line's Stock Price Stability Index, Safety Rating, and
17		Beta. These measures are shown in Schedule 30 of my Exhibit.
18	Q.	**What does Value Line's Stock Price Stability index measure and what does it**
19		**indicate?**
20	A.	The Stock Price Stability Index is based upon a ranking of the standard
21		deviation of weekly percent changes in the price of a stock over the last five
22		years. The top 5% that have the least amount of percentage price changes and are
23		assigned an index value of 100, the next 5% an index value of 95, and so forth.

1   Q.   **What is the Stock Price Stability Index for the nine companies selected for**

2   **obtaining data for the cost of equity determination for KU and LG&E?**

3   The Stock Price Stability Index is shown in the first column in Schedule

4   30. The stock price stability ratings for the group of nine companies range from

5   100 to 90. This indicates that these companies are in the top 15% of the most

6   stable companies based on stock price fluctuations that Value Line follows. The

7   closeness of the index values indicates that these nine companies are very similar

8   to one another with respect to earning expectations relative to their risk.

9   Q.   **What is the Value Line Safety Rank?**

10   A.   The Value Line Safety Rank is a combination of Value Line's Financial

11   Strength rating and the Stock Price Stability index. A rating of "1" is in the safest

12   20% of the companies that Value Line follows; a rating of "2" is the second safest

13   20% and so forth.

14   Q.   **What does this measure indicate for nine electric companies?**

15   A.   The Safety Rank for the nine companies averages 2. The average of 2

16   indicates that Value Line analysts believe that these companies have above

17   average safety.

18   Q.   **What is Beta?**

19   A.   Beta is an estimate of systematic risk—risk that is common in all

20   companies. Systematic risk could be caused by something like a change in the

21   rate of inflation, a political event, a war, or a change in social-economic

22   conditions. Systematic risk cannot be eliminated through diversification.

23   Obviously, some companies have greater exposure to the occurrence of any single

24   event than other companies and therefore have more systematic risk.

1   Beta is estimated from the company's stock sensitivity to general changes

2   in stock market prices. A Beta that equals 1 represents an average company

3   whose stock price changes are nearly identical to the market. Companies that are

4   less risky have Betas less than one. Companies that are more risky have Betas

5   greater than one.

6 **Q.**   **What were the _Value Line_ Betas for the nine companies?**

7 A.   The _Value Line_ Betas for the nine companies chosen to obtain data for the

8   cost of equity analysis averages 0.66.

9 **Q.**   **How do you interpret these Betas?**

10 A.   The selected electric companies have low systematic risk relative to an

11   average company that has shares of common stock traded in the equity market.

12   An average company would have a Beta of 1 as compared to the nine companies'

13   average Beta of 0.66.

14 **Q.**   **What _Standard & Poor's_ measures did you include in this analysis?**

15 A.   I included _Standard & Poor's_ Outlook, Relative Strength Rank, and Beta.

16   These are shown in Schedule 31 of my Exhibit.

17 **Q.**   **Please describe _Standard & Poor's_ Outlook measure.**

18 A.   _Standard &Poor's_ Outlook is a proprietary quantitative model that ranks

19   the stocks according to being the most overvalued, group 1, to the most

20   undervalued, group 5.

21 **Q.**   **What was the Outlook for the nine-company group?**

22 A.   The nine-company group is neither over- nor under-valued. The average

23   for the group is 3.

1   Q.   **What is the <u>Standard & Poor's</u> Relative Strength rank and what does it**

2   **show?**

3   A.   The <u>Standard & Poor's</u> Relative Strength Rank reports, on a scale of 1 to

4   99, how the stock has performed relative to the other companies that <u>Standard &</u>

5   <u>Poor's</u> follows. Companies that have a "1" have the lowest Relative Strength and

6   companies that have a "99" have the highest Relative Strength.

7   The Relative Strength Rank for the nine companies selected for obtaining

8   data averaged 33. A 50 would represent the Relative Strength Rank for an

9   average company. This indicates that these companies earnings growth has not

10   performed as well as the average company followed by <u>Standard & Poor's</u>.

11   Q.   **What was <u>Standard & Poor's</u> Beta?**

12   A.   <u>Standard & Poor's</u> Beta for the nine companies averaged 0.07. This is

13   shown in the right hand column of Schedule 31. According to this measure, these

14   companies have low systematic risk.

15   Q.   **Why are the <u>Value Line</u> and the <u>Standard & Poor's</u> Betas different?**

16   A.   <u>Value Line</u> makes a statistical adjustment to its Beta estimate. <u>Standard</u>

17   <u>and Poor's</u> does not adjust its results. Both investment services calculate Beta in a

18   similar manner. <u>Value Line</u> regresses the past five-years of week-ending stock

19   price data on the New York Stock Exchange Index. <u>Standard & Poor's</u> calculates

20   its Beta by regressing the past five-years of month-ending stock prices on the

21   S&P 500 Index. The adjustment accounts for the large difference.

22   Q.   **What do you conclude from your analysis of the published risk measures?**

1   A.   The published risk measures indicate that the nine companies are similar

2   to one another with respect to risk. Furthermore, these companies have low risk

3   relative to other companies that are followed by the investment advisory services.

E. The Cost of Equity - Electric Companies

5   Q.   **Dr. Weaver, you stated earlier that you use the constant-growth DCF model,**

6   **the two-stage growth DCF model, the CAPM, and the Bond-Yield-Risk**

7   **Premium methods. How do you combine the information from your**

8   **economic analysis, risk, and from these methods to make your**

9   **recommendation?**

10 A.   Once I obtain the information from the use of each of the equity valuation

11   models, I consider the implications from the risk and economic analysis on the

12   results, and use judgment to make a final recommendation.

13 Q.   **Do you weigh all of the models equally or do you value the output of some**

14   **models more than others?**

15   A.   I place the greatest emphases on the DCF constant growth

16   model. I believe that this method has greater use by participants in the capital

17   market than the multi-stage DCF or the Bond-Yield-Risk Premium models. It has

18   been in existence longer than other models and has been taught in undergraduate

19   finance courses for about 50 years. The CAPM has also had wide exposure.

20   The bond-yield-risk premium method is an *ex post* rather than an *ex ante*

21   method. It provides guidance as to what an average risk premium might be over a

22   longer period of time, but is less valuable for estimating the cost of equity for the

23   immediate future. For this reason, I also place a smaller weight on this method

24   than on the DCF analysis.

1 Q. **In what order will you present your cost of equity analysis?**

2 A. First, I will present the constant-growth DCF model results. Next, I will

3 discuss and present the results of the multi-stage DCF model. After this, the

4 CAPM and Bond-Yield-Risk Premium results are discussed and presented.

5 Q. **What is required to implement the constant growth DCF model?**

6 A. The constant-growth DCF method requires an estimate for growth and a

7 dividend yield.

8 Q. **How did you determine the growth estimate for use in the DCF model?**

9 A. I use historical data from <u>Value Line</u> and forecast data from analysts'

10 estimates of earnings growth from Zacks, Multex Investor Services, Thomson

11 Investor Network and <u>Value Line</u>. The use of the historical data and analysts'

12 forecasts are discussed in Appendix II.

13 Q. **What is the purpose of using historical growth rates?**

14 A. The objective of using historical data to formulate a growth estimate is to

15 emulate those investors who use the DCF model with a historical growth rate

16 when making their buy and sell investment decisions. The historical data that I

17 use is the compound growth rate that occurred over a recent period. When this is

18 implemented in the DCF model, the analyst implicitly assumes that the growth

19 that occurred in that past period will continue. For this reason, I believe that the

20 results obtained using forecasts data are more valuable. The results obtained using

21 historical data provide a good starting place for the analysis.

22 Q. **What historical growth rates did you use?**

23 A. I used the annual compound growth rate for earnings per share (EPS) and

24 cash flow per share (CFS) for the period 1992 to 2003.

1   Q.   **Why did you use 1992 through 2003 as the span of time for determining the**

2   **historical growth?**

3   A.   The economic analysis indicates that a period of economic growth is

4   expected in the near-term future. I used 1992 as the beginning year for taking the

5   data for determining the growth because a recession had ended in 1991and a

6   period of economic growth commenced in 1992. The recovery started in the latter

7   half of 1991 and lasted through the year 2000.

8   Another brief economic contraction occurred in early 2001 and expansion

9   resumed in 2002 and 2003. By having the historical period for taking data end in

10   the year 2003, there will be two periods of economic expansion and one period of

11   economic contraction.

12   Q.   **Dr. Weaver, in your ESM filing, you selected data for the growth estimates**

13   **using the period 1992 through 2000. Why do you now use 1992 through**

14   **2003?**

15   A.   I used 1992 as the starting year for both that analysis and for this analysis.

16   In the ESM analysis, I used 2000 as the final year for collecting data because a

17   recession officially began in March, 2002. A recovery from that recession began

18   in November 2001. In this general rate case, the data observation period goes

19   through the year 2003. Two years of recovery beyond the 2001 recession are

20   available and are included.

21   Q.   **What were the rates of economic growth that occurred in the period from**

22   **1992 to 2003?**

1   A.   During that period, economic growth, as measured by the change in real

2   GDP, was in a range between 0.3% and 4.4%. Data for each year is shown in

3   Schedule 2.

4   **Q.**   **Dr. Weaver, in your past testimony except in the ESM case, you used the**

5   **historical growth rate in dividends per share and book value per share. Why**

6   **aren't you using these in this analysis?**

7   A.   The advent of deregulation has brought about a fundamental change in the

8   electric utilities industry with respect to dividend payments. Prior to beginning of

9   deregulation, most companies increased their quarterly dividend payments once

10   each year. With the onset of deregulation, many electric companies have paid

11   constant dividends and some have reduced dividends. In the past, reducing a

12   dividend had terrible consequences on a utility company's stock price. Investors

13   who desired dividend income were attracted to utility companies because of their

14   reputation of paying constant and slowly growing dividends. With the advent of

15   deregulation, constant dividend income is less certain.

16   **Q.**   **What method did you use to measure the historical growth?**

17   A.   I measured the historical growth rates using the geometric mean. The

18   geometric mean provides the measure of the compound rate of growth that

19   occurred over the period being used, 1992 to 2003. An explanation of why the

20   geometric mean should be used to measure a growth rate over time is provided in

21   the portion of my testimony that contains my comments on the testimony of Mr.

22   Rosenberg.

23   **Q.**   **What were the nine companies' compound growth rates for EPS and CFS**

24   **from 1992 through 2003?**

1   A.   The growth rates in EPS and CFS are shown in Schedules 32 and 33.

2   Over the 1992 to 2003 period, EPS for the nine companies grew at the compound

3   rate of 2.7%. CFS grew at the compound rate of 2.5%.

4   Q.   **Which growth rate do you believe is most important, the growth in EPS or**

5   **the growth in CFS?**

6   A.   I think that, from a historical perspective, both provide measures of the

7   ability to pay dividends because dividends are a cash outflow. When projected

8   data is used, I think that growth in EPS is a better indicator.

9   Q.   **What analysts' forecast did you use for making your DCF estimates using**

10   **projected data?**

11   A.   I used four sources of data for obtaining the growth forecasts: Zacks,

12   Multex Investor Services, Thomson Investor Network, and Value Line.

13   Q.   **How are these forecasts compiled?**

14   A.   Zacks, Multex, and Thomson survey security analysts on a monthly basis

15   and they publish the average of the individual estimates. Value Line employs in-

16   house analysts who make three to five-year forecasts for revenues, cash flow,

17   EPS, DPS, and BVS.

18   Q.   **What were the projected growth rates?**

19   A.   The growth forecasts for the selected companies are shown in Schedule

20   34. The average forecast for the nine companies is 4.52%.

21   Q.   **How is this data used in the constant growth DCF model?**

22   A.   I combine the growth rate measures with the average expected dividend

23   yield for each of the nine companies that are used to obtain data.

24   Q.   **How did you calculate the expected dividend yield and what are the results?**

1   A.   A current yield was calculated by dividing the annual dividend rate by the

2   average week ending stock price for the weeks beginning September 19 through

3   February 17, 2003. The annual dividend rate was determined by multiplying the

4   most recent quarterly dividend amount by four. Schedule 35 shows these

5   calculations. The average current dividend yield for the nine companies was

6   4.85%.

7   Q.   **Why did you select the weeks from September 19 through February 17 to**

8   **determine the average week ending stock prices?**

9   A.   September 19 through February 17 represents a full four months of data.

10   These data are current, and therefore, reflect investors' current expectations. Four

11   months encompasses a sufficient period to wash out any abnormalities in the data.

12   Furthermore, the stability of these stock's prices can be noted by examining the

13   prices. Additional data observations would have little effect on the dividend yields

14   that were calculated.

15   Q.   **Why did you use the dividend rate rather than the actual amount of**

16   **dividends paid in the previous year to calculate the dividend yield?**

17   A.   Dividends are paid quarterly. The rate, based on the latest quarterly

18   amount multiplied by four, is generally higher than the sum of the latest four

19   quarterly dividend payments. This compensates for not compounding the

20   dividends on a quarterly basis.

21   Q.   **How did you apply the dividend yield to the DCF model?**

22   A.   The DCF model requires an expected dividend yield rather than a current

23   or most recent yield. The expected yield is determined by multiplying the current

1		yield times one plus the growth rate. The growth-adjusted dividend yields are
2		added to the growth rates and provide an estimate for the cost of equity.
3	Q.	**What are the DCF results?**
4	A.	The DCF results are shown in Schedule 36. The results are 8.88% when
5		both projected and historical growth rates are used. When only projected growth
6		rates are used, the cost of equity is 9.53%.
7	Q.	**Did you make a flotation cost adjustment to these results?**
8	A.	No. The financing arrangements for KU and LG&E are described in the
9		BWG Report on page I-3. Neither KU nor LG&E are expected to do any equity
10		financing in the near-term future.
11	Q.	**What did the multi-stage DCF model indicate that the cost of equity should**
12		**be?**
13	A.	The multi-stage DCF model, as shown in Schedules 37, indicates that the
14		cost of equity should be 8.79%.
15	Q.	**How did you implement the multi-stage DCF model?**
16	A.	The multi-stage DCF model is a technique where a change in a growth
17		rate converges on a forecasted growth rate incrementally over time. In this
18		implementation, I assume that the growth rate converges from the current 2002-
19		2003 rate to the analysts' forecasts in four years. Once a forecasted rate is
20		achieved, it is maintained into perpetuity.
21	Q.	**Why are the multi-stage DCF model results lower than the DCF constant**
22		**growth model using analysts' forecasts?**
23	A.	The DCF constant growth model assumes that analysts' forecasts are
24		achieved immediately and then continue into perpetuity. The multistage DCF

1		model assumes that the analysts' forecasts are gradually achieved and then
2		maintained in perpetuity.
3	Q.	**Were there any other steps required for the implementation of the two-stage**
4		**model?**
5	A.	Yes, I determined the perpetuity value for the dividends in the terminal
6		year of the analysis. The terminal year's dividend amount was divided by the
7		calculated rate of return minus each company's long-term growth rate (k-g). This
8		is the formula for determining the present value for a perpetual data series. Since
9		the rate of return is the rate being calculated and it is the same as the variable "k"
10		that is needed for the calculation, an iteration technique must be used.
11	Q.	**Why did you use the internal rate of return to determine the cost of equity**
12		**for the two-stage DCF model?**
13	A.	The DCF model is an internal rate of return model.
14	Q.	**Do you have another example where the perpetuity model is used in financial**
15		**models?**
16	A.	The constant growth DCF model is a perpetuity model when it is used in
17		the form to estimate a stock's price. This model is $P = D_1/(k - g)$.
18	Q.	**You indicated that you also used the CAPM. What do these results show?**
19	A.	The average CAPM return for the nine companies 9.64%. Schedule 38
20		shows the various combinations of data and the calculations of these results and
21		Schedule 39 provides notes that provide the sources for the data items.
22	Q.	**Dr. Weaver, how did you determine the bond-yield-equity-risk-premium?**
23	A.	I performed a study of the equity-risk-premiums for the nine companies.
24		To determine the risk premiums, I subtracted the realized annual holding period

1		returns on equity for the period 1993-2003 from the composite one-year constant
2		maturity interest rates on Treasury securities. In this determination, I examined
3		every possible combination of annual holding periods. Pages 1 through 4 of
4		Schedule 40 show the calculations for each step in the risk premium study. The
5		average equity-risk-premium for the nine companies was 4.61%.

6 **Q. How did you use this risk premium?**

7 A.   I added the risk premium to the average of the forecasted 10-year long-

8 term rates used in the CAPM study. Schedule 43, notes 2-5 provide the sources

9 for these rates The forecasted rates were:

CBO-2 year fore.	5.00%
CBO-9 year proj.	4.90%
Value Line-5 year proj.	5.12%
Conf. Board-1 year proj.	5.09%
Average	5.18%

15 **Q. Are these forecasts current?**

16 A.   Yes. The CBO rate was released in January 26, 2004, <u>Value Line</u> rate was

17 published November 28, and the Business Conference Board rate was dated

18 February 2004.

19 **Q. What do you find the bond-yield-risk-premium result to be?**

20 A.   The risk premium at 4.61% when added to the 5.18% forecasted rate

21 provides a cost of equity estimate of 9.79%.

22 **Q. Dr. Weaver, you stated that you determined the risk premiums using annual**

23 **holding period returns and then added this risk premium to forecasted long-**

24 **term rates. Aren't you miss-matching one-year risk premiums and long-term**

25 **bond rates?**

1	A.	No. Long-term bond rates already contain an inflation premium and a
2		marketability premium. Therefore, the only risk that needs to be accounted for is
3		the equity risk premium.
4	Q.	**Dr. Weaver, would you please summarize your findings for the electric**
5		**companies?**
6	A.	The outcomes of the models for the electric companies are summarized
7		below:

Constant-growth DCF	9.53%
Multi-stage DCF	8.79%
CAPM	9.64%
Bond-yield-equity-risk premium	<u>9.79%</u>
Average	9.44%

16 Q. **Did you make adjustments as a result of your risk or economic analysis?**

17 A. I found that the risk difference between KU, LG&E, and the nine

18 companies was small and no adjustment is necessary due to risk differences. I

19 concluded from my economic analysis that capital market cost rates will be

20 slowly increasing over the next two to four years and an adjustment for these

21 increasing costs rates is necessary. These increasing rates are already reflected in

22 the outcomes of CAPM and Bond-Yield-Equity-Risk-Premium models because

23 forecasted 10-year interest rates were used to implement those models. This is

24 why the results for the CAPM and Bond-Yield-Equity-Risk Premium models are

25 somewhat higher than the results of the two DCF models.

26 Q. **How did you determine the amount of adjustment to make?**

27 A. On February 19, 2004, 10-year constant maturity bond rates were 4.05%.

28 The CBO projected the 10-year Treasury Note rate for 2004-2005, released on

1	January 26, 2004, to average 5.0%. These projections indicate that these rates are
2	expected, over the next two years, to be 95 basis points higher than the February
3	19th rate. The two sets of DCF results should be adjusted 95 basis points higher.
4	The CAPM and BYRP models where implemented with the higher forecasted
5	rates. This will cause the average of the four models to increase by 48 basis points
6	(2X.95 / 4). The 9.44% average, when adjusted becomes 9.92%. Rounding up,
7	the cost of equity should be 10.0%.

8 **Q.** **Do you determine your final recommendation solely on the basis of these**

9 **average values?**

10 A.   I consider the average values but, as I have previously discussed, place a

11 greater weight on the DCF constant-growth results. Using the 10% average as a

12 mid-point puts a higher emphases on the DCF results. This also helps form a

13 range for the recommendation. The range for the cost of equity should be between

14 9.75% and 10.25%.

15 ## F. Company Selection - Gas Distribution Companies

16 **Q.** **How did you select the companies that you used?**

17 A.   I started with the 17 companies classified by <u>Value Line</u> as gas

18 distribution companies. I sorted these companies by <u>Value Line's</u> Financial

19 Strength Rating and eliminated 1 company that has a rating that is below a "B".

20 These 17 companies and their respective Financial Strength Ratings are shown on

21 Schedule 41 in my Exhibit. The company that was eliminated, SEMCO Energy,

22 is shown at the bottom of Schedule 41 and again at the top of Schedule 42.

23 **Q.** **What did you do next?**

1   A.   I eliminated 3 companies that <u>Value Line</u> did not recommend to investors.

2   This is the second group of companies shown on Schedule 42.

3   Q.   **Schedule 42 shows that you also eliminated companies that sold or purchased**

4   **major assets. Did you use the same decision rule to define an asset as major?**

5   A.   No. Since the gas distribution companies are smaller with respect to total

6   asset size, I reduced the cut-off point. If the acquisition or divestiture was greater

7   than 7% of total capital, I considered it major for the gas distribution companies.

8   Q.   **How many companies were eliminated in this step?**

9   A.   There were 3 companies in this group: Laclede Group, Piedmont Natural

10   Gas, and Southern Union.

11   Q.   **What did you do next?**

12   A.   I next eliminated 2 companies, UGI and Keyspan from the candidate

13   company group. UGI's gas utility operations represents 51% of its total income. In

14   my opinion, data from UGI does not reflects a gas distribution utility because

15   49% of its income is from other sources. Keyspan was eliminated for a similar

16   reason. Its gas revenues are 53% of total company revenues. It does not provide a

17   good representation of data from gas distribution companies. Keyspan also has a

18   low equity ratio @ 32%.

19   There were 8 companies that remained.

20   Q.   **What are the names of the eight companies that you selected for obtaining**

21   **data for the gas distribution companies?**

22   A.   The names of the eight companies that were selected were AGL

23   Resources, Atmos Energy, Cascade Natural Gas, Energen Corp., New Jersey

1		Resources, Northwest Natural Gas, Peoples Energy Corp., and South Jersey
2		Industries.

G. Risk Analysis - Gas Distribution Companies

4   **Q.**   **Was your risk analysis for the gas distribution companies similar to the one**

5   **you did for the electric companies?**

6   A.   Yes. I first compared the capital structures of the selected companies with

7   LG&E. I then examined cash flow measures, accounting measures, and debt

8   measures. Next, I examined Value Line's measures and Standard & Poor's

9   measures of the group of companies to determine their homogeneity.

10   **Q.**   **What did you conclude from your examination of the capital structures?**

11   A.   The capital structures are shown in Schedule 44 of my Exhibit. Schedule

12   43 provides the capitalization data from which the capital structures were

13   constructed. Each company's capital structure was measured as the percentage of

14   long-term debt, short-term debt, preferred stock, and common equity to total

15   capital.

16   **Q.**   **What measure of the capital structures of LG&E-gas did you use?**

17   A.   The capital structure for LG&E-gas was the book value capital structure as

18   of September 30, 2003 taken from Rives, Exhibit 2, page 1 of 2. The gas

19   capitalization is pro-rated on the basis of the rate base percentage causing the

20   capital structure for the gas utility to be the same as the percentage capital

21   structure for the electric utility. As with the electric analysis, unadjusted book

22   value capital structure represents one that would be available to an investor who

23   would be examining data from the company to access its risk.

1   **Q.**   **How does the average capital structure for the eight companies that you**

2   **selected compare to the capital structure for LG&E?**

3   **A.**   The average capital structure for the eight companies has less equity than

4   the capital structure for LG&E. The average common equity component for the

5   eight companies is 44.5%. LG&E has 47.1% equity.

6   Since the proportion of capital that is not equity is leverage, one minus

7   the equity capital percentage represents the financial leverage that is being used.

8   Leverage is an indicator of financial risk. The eight companies have 55.5%

9   leverage capital. LG&E has 52.9% leverage capital. The eight companies, as a

10   group, have 2.5 percentage points more leverage and a little more financial risk

11   than LG&E.

12   **Q.**   **Dr. Weaver, would you explain your cash flow analysis?**

13   **A.**   I evaluated cash flow ratios for the years 2001 and 2002 for each of the

14   gas distribution companies and compared these with LG&E.'s cash flows.

15   LG&E's cash flows are for the total company, both electric and gas. The ratios

16   examined were the cash flow coverage of: interest, total dividends, investing

17   activities, and net income.

18   **Q.**   **What Schedules show the cash flow coverage ratios for the selected gas**

19   **distribution companies?**

20   **A.**   Data for each of the selected companies and for LG&E are shown on

21   Schedules 46 through 54. A summary of the cash flow coverages is shown in

22   Schedule 45.

23   **Q.**   **What does the cash flow coverage of interest indicate for the selected**

24   **companies and for LG&E?**

1   A.   The cash flow coverage of interest expense, which indicates how many

2   times cash flow from operating activities before interest is paid covers the interest

3   expense, was 4.12 times for the eight companies and 8.36 times for LG&E.

4   **Q.   Does this mean that LG&E is half as risky as the eight companies?**

5   A.   No. The risk reduction, as the coverage increases is not linear. LG&E is

6   somewhat less risky than the eight companies, but the eight companies' coverage

7   is ample and they also have little risk.

8   **Q.   What is the cash flow coverage of dividends LG&E relative to the eight**

9   **companies?**

10 A.   The eight-companies cover their total dividend payments an average of

11   3.78 times. LG&E's coverage is 6.65 times. LG&E is again somewhat less risky

12   than the eight companies.

13 **Q.   What was the cash flow coverage of investing activities for the eight-**

14   **companies and for LG&E?**

15 A.   The eight companies' cash flow coverage of investing activities averaged

16   1.03 times as compared to 1.05 times coverage for LG&E. These coverage

17   measures are nearly equal.

18 **Q.   What does the quality of earnings measure show?**

19 A.   The cash flow coverage of net income, called the quality of earnings, is

20   2.38 for the eight companies and 2.55 for LG&E. This measure is nearly equal

21   and represents high quality.

22 **Q.   What accounting and financial measures did you examine?**

23 A.   I compared the average of the 2000 through 2002 dollar value of the total

24   assets of the companies, the sales to plant and equipment ratio, and the sales to

1		total assets ratio with 2002 measures for LG&E -gas. The LG&E measures were
2		constructed for the gas company original cost rate base, and 2002 data from the
3		FERC Form 2. The results of these comparisons are shown in Schedule 55.
4	Q.	**Dr. Weaver, how does the dollar value of the total assets of the eight**
5		**companies compare with LG&E's rate base?**
6	A.	The average of the eight companies is larger than LG&E's gas distribution
7		rate base. The average for the eight companies include assets from other
8		activities. Even given this, LG&E-gas is a smaller company than the average for
9		the eight.
10	Q.	**What do you conclude with regard to the total asset size measure?**
11	A.	LG&E is a little more risky than the eight company group.
12	Q.	**What does the sales to plant and equipment ratio show?**
13	A.	The sales to plant and equipment ratio indicates that the eight companies
14		have $1.07 in sales to each $1.00 invested in plant and equipment. LG&E has
15		$0.90 for each $1.00 invested in P&E. This measure indicates that the data from
16		the eight companies will be representative of LG&E.
17	Q.	**What does the sales to total assets ratio show?**
18	A.	The sales to total assets ratio is 0.70 for the eight companies and 0.85 for
19		LG&E. This indicates that both have a similar intensity of use of the company's
20		assets to produce sales.
21	Q.	**What were the bond ratings for LG&E and for the eight companies?**
22	A.	The bond ratings, shown in Schedule 56, shows that LG&E has an "A1"
23		bond rating and the eight-company group has ratings that range from Baa1 to A2.
24		The LG&E measures are for the total company.

1   **Q.**   **What do the times-interest-earned ratios show?**

2   **A.**   LG&E's times-interest-earned ratio is 5.46 times. The eight-companies

3   average 4.17 times. LG&E has somewhat less financial risk as a result of its

4   greater coverage. The eight companies also have little risk of default as indicated

5   by this measure.

6   **Q.**   **Dr. Weaver, would you summarize your risk measures for the gas**

7   **companies?**

8   **A.**   Yes. A summary or the measures is as follows:

9   <u>Risk Summary</u>

Measure	LG&E	Companies	Selected Result
Cap. St. Lev.	52.9%	55.5%	< risk
CF x Int. Cov.	8.36x	4.12x	< risk
CF x Div. Cov.	6.65x	3.78x	< risk
CF x Inv. Act.	1.05x	1.03x	~= risk
Qual. of Earnings	2.55x	2.38x	~= risk
Total Asset Size	$316mill	$1.695bill	> risk
Sales to P&E	0.90	1.07	> risk
Sales to Tot. Assets	0.85	0.70	< risk
Moody's Bond Rat.	A1	Baa1 - A2	~= risk
Times Int. Earned	5.46	4.17	< risk

Key: ~= risk (approximately equal risk)
            < risk (less risk)
            > risk (greater risk)

27   **Q.**   **What do you conclude from this summary?**

28   **A.**   LG&E is a little less risky than the selected companies but the difference

29   is small.

30   **Q.**   **What other risk measures did you evaluate?**

31   **A.**   I examined published risk measures from <u>Value Line</u> and <u>Standard and</u>

32   <u>Poor's</u>.

33   **Q.**   **Why do you examine published risk measures?**

1 A. These publications provide information for evaluating the risks of the

2   selected companies and indicate the degree of similarity of these companies.

3 Q. **What Value Line measures did you consider?**

4 A. I considered Value Line's Stock Price Stability Index, Safety Rating, and

5   Beta. These measures are shown in Schedule 57.

6 Q. **What is the Stock Price Stability Index for the eight companies selected for**

7   **obtaining data for the cost of equity determination for LG&E - gas?**

8   The Stock Price Stability Index is shown in the first column in Schedule

9   57. The stock price stability ratings for the group of eight companies range from

10   100 to 80 and average 96. This indicates that, as a group, these companies are in

11   the top 10% of the most stable companies, based on stock price fluctuations, that

12   Value Line follows.

13 Q. **What is the Value Line Safety Rank for the eight gas distribution**

14   **companies?**

15 A. The Value Line Safety Rank for the eight companies averages 2. This

16   indicates that they have an above average safety rank.

17 Q. **What is Value Line Beta for the gas distribution companies?**

18 A. The Value Line Betas for the eight companies chosen to obtain data for

19   the cost of equity analysis averages 0.68.

20 Q. **What Standard & Poor's measures did you include in this analysis?**

21 A. I included Standard & Poor's Outlook, Relative Strength Rank, and Beta.

22   These are shown in Schedule 58.

23 Q. **What was the Outlook for the eight-company group?**

1   A.   The eight-company group averages 3 which indicates that these companies

2   are neither over- nor under-valued.

3   **Q.   What is the <u>Standard & Poor's</u> Relative Strength rank for the eight**

4   **companies?**

5   A.   The Relative Strength Rank for the eight companies selected for obtaining

6   data averaged 40. A 50 would represent the Relative Strength Rank for an

7   average company. This indicates that these companies earnings growth has not

8   performed as well as the average company followed by <u>Standard & Poor's</u>.

9   **Q.   What was <u>Standard & Poor's</u> Beta?**

10   A.   <u>Standard & Poor's</u> Beta for the eight companies averaged 0.03. This is

11   shown in the right hand column of Schedule 58. According to this measure, these

12   companies have low systematic risk.

13   **Q.   What do you conclude from your analysis of the published risk measures?**

14   A.   The published risk measures indicate that the eight companies are similar

15   to one another with respect to risk. Furthermore, these companies have low risk

16   relative to other companies that are followed by the investment advisory services.

17   **<u>H. The Cost of Equity - Gas Distribution Companies</u>**

18   **Q.   Did you present the analysis in the same order as you did for the electric**

19   **analysis?**

20   A.   Yes. First, I present the constant-growth DCF model results. Next, the

21   results of the multi-stage DCF model is presented and discussed. After this, the

22   CAPM and Bond-Yield-Risk Premium results are discussed and presented.

1   **Q.**   **Did you use the compound growth rate for earnings per share and cash flow**

2   **per share for the period 1992 to 2003 for the historical part of you DCF**

3   **analysis?**

4   **A.**   Yes.

5   **Q.**   **What method did you use to measure the historical growth?**

6   **A.**   I measured the historical growth rates using the geometric mean. The

7   geometric mean provides the measure of the compound rate of growth.

8   **Q.**   **What were the eight companies' compound growth rates for EPS and CFS**

9   **from 1992 through 2003?**

10   **A.**   The growth rates in EPS and CFS are shown in Schedules 59 and 60.

11   Over the 1992 to 2003 period, EPS for the eight companies grew at the compound

12   rate of 5.7%. CFS grew at the compound rate of 4.2%.

13   **Q.**   **What analysts' forecast did you use for making your DCF estimates using**

14   **projected data?**

15   **A.**   I used four sources of data for obtaining the growth forecasts: Zacks,

16   Multex Investor Services, Thomson Investor Network, and <u>Value Line.</u>

17   **Q.**   **What were the projected growth rates?**

18   **A.**   The growth forecasts for the selected companies are shown in Schedule

19   61. The average forecast for the eight companies is 5.5%.

20   **Q.**   **Dr. Weaver, in the electric analysis, you used the projected growth rates for**

21   **the DCF analysis. Which did you use here, the projected or the historical**

22   **growth rates?**

1   A.   I used the projected growth rates for this analysis. The economy is in the

2   beginnings of an expansion phase. The higher cost of equity that results from the

3   using projected growth rates is more realistic.

4   Q.   **Dr. Weaver, what was the expected dividend yield for the eight companies?**

5   A.   The dividend yield for the eight companies is 4.02%. This is shown in

6   Schedule 62. The expected dividend yield, which the dividend yield multiplied by

7   one plus the growth rate is shown in Schedule 63. Depending on the growth rate

8   used, the expected dividend yield ranges from 4.19% to 4.26%.

9   Q.   **What are the DCF results?**

10   A.   The DCF results are shown in Schedule 63. The results are 9.69% when

11   projected growth rates are used

12   Q.   **What did the multi-stage DCF model indicate that the cost of equity should**

13   **be?**

14   A.   The multi-stage DCF model, as shown in Schedule 64, indicates that the

15   cost of equity should be 8.92%.

16   Q.   **You also used the CAPM. What do these results show?**

17   A.   The average CAPM return for the eight companies 9.74%. Schedule 65

18   shows the various combinations of data and the calculations of these results and

19   Schedule 39 provides notes that provide the sources for the data items.

20   Q.   **Dr. Weaver, what risk premium did you determine for the eight gas**

21   **companies in your bond-yield-equity-risk-premium analysis?**

22   A.   The average equity-risk-premium for the eight companies was 6.81%.

23   Q.   **Did you use the same 5.18% bond yield in this analysis?**

24   A.   Yes.

1   **Q.**   **What do you find the bond-yield-risk-premium result to be?**

2   **A.**   The risk premium at 6.81% when added to the 5.18% forecasted rate

3   provides a cost of equity estimate of 11.99%. The other models yielded results

4   that were from 8.92% to 9.74%. The bond-yield-risk-premium results, being

5   2.25% higher than the other outcomes (11.99% - 9.74%), is not representative of

6   the cost of equity for the gas distribution companies. I used 11.0% when I

7   averaged this outcome with the results from the other models.

8   **Q.**   **What adjustment did you make to the unadjusted results?**

9   **A.**   I made the same economic adjustment that I made for the electric

10   companies.

11   **Q.**   **Dr. Weaver, would you please summarize your findings for the gas**

12   **distribution companies?**

13   **A.**   The outcomes of the models for the gas distribution companies are

14   summarized below:

	Unadjusted	Adjusted
Constant-growth DCF	9.69%	10.64%
Multi-stage DCF	8.92%	9.87%
CAPM	9.74%	9.74%
Bond-yield-equity-risk premium	11.00%	11.00%
Average	9.84%	10.31%

23   **Q.**   **What is your recommendation for the cost of equity for LG&E - gas?**

24   **A.**   The range for the cost of equity for LG&E - gas should be between

25   10.10% and 10.60%. Its mid-point is 10.35%.

26

27   **CAPITAL STRUCTURE AND OTHER CAPITAL COST RATES**

1   Q.   **Dr. Weaver, do you have any comments on the capitalization that is proposed**

2   **for this proceeding**

3   A.   Yes. I have examined the capitalization and capital structure proposed by

4   the company and I agree that the test year-end capitalization is the appropriate

5   starting point for determining the overall rate of return. In this case, Mr. Henkes

6   is responsible for addressing the appropriateness of the electric and gas allocation

7   and for evaluating the Company's capitalization adjustments.

8   Q.   **Do you believe that the capitalization amount should be adjusted for changes**

9   **that have occurred since the end of the test-year?**

10 A.   No. The purpose to the test-year in rate of return regulation is to establish

11   a period for measuring the Company's assets, liabilities, revenues, and expenses.

12   This is necessary so that a determination can be made regarding the adequacy the

13   of current revenues that are derived from rates for preserving the financial

14   integrity of the company, earning a return that is comparable to other companies

15   that have similar risks, and enabling the Company to attract capital.

16   If the capitalization amount is updated as changes occur, all of the other

17   assets, liabilities, expenses, costs, and revenues must also be changed so that the

18   Company financial integrity, comparability of returns with similar risk companies

19   and capital attraction ability can be evaluated at the new levels.

20 Q.   **What is your opinion regarding the Commission's use of return on**

21   **capitalization rather than return on rate base?**

22 A.   I believe that the return should be determined based upon the smaller of

23   the rate base or capitalization. It would be an accident of accounting if the rate

24   base is equal to the capitalization amount. It could be smaller or larger depending

1   upon the amount of "below the line" activities that the company is engaged-in and

2   the amount of "rule of thumb" assets in the rate base such as cash working capital

3   allowance or assets associated with non-obligated net free cash flows.

4   If the rate base is smaller than the capitalization, the return on the rate base

5   will provide sufficient funds to pay the interest, preferred dividends, and provide a

6   return on the common equity that finances the assets dedicated to serving the

7   utility function. The other capital service would need to come from the company's

8   other "below the line" activities. If the capitalization is smaller than the rate base,

9   then a portion of the rate base assets are being financed by non-obligated free cash

10   flows or by assets that are created by rate making formulas.

11   **Q.   Do you believe that the capital cost rates should be updated as conditions in**

12   **the capital market change beyond the test-year and before a final decision is**

13   **made on the case?**

14   A.   Yes. If interest rates change or other capital cost rates change, the new

15   capital cost rates should be used in the determination of the rate of return so that

16   the company has a reasonable opportunity to earn its allowed rate of return.

17   **Q.   Do you believe that the capital structure ratios should be updated beyond the**

18   **test-year and before a final decision is made on the case?**

19   A.   Yes, provided that the changes are minor so that there is only a small

20   change in the company's financial risk. If the company's financial risk changes too

21   much, the entire cost of equity determination, made under the end-of-test-year

22   capital structure, could be wrong and no longer valid. I believe that minor

23   changes, which were approved by the Commission as being prudent and that do

24   not change the financial risk of the company can be included in the rate of return

1   determination. Changes beyond the test-year that effect the financial risk of the

2   company should not allowed.

3 **Q.**   **Have you examined the capital costs rates for debt and preferred stock that**

4   **the Company is proposing be used in this case?**

5 A.   Yes. These rates appear reasonable for this case.

6 **Q.**   **Dr. Weaver, does this complete your testimony?**

7 **A.**   **Yes.**

AFFIDAVIT

The affiant, Carl G. K. Weaver, being duly sworn, deposes and states that the prepared testimony, attached hereto and made a part hereof, constitutes the prepared direct testimony of this affiant in Case No. 2003-00433 and Case No. 2003-00434, An Adjustment of the Electric Rates, Terms and Conditions of Kentucky Utilities Company and An adjustment of the Gas and Electric Rates, Terms and Conditions of Louisville Gas and Electric Company, and that if asked the questions propounded therein, this affiant would make the answers set forth in the attached prepared direct testimony.

Affiant further states that he will be present and available for cross-examination and for such additional direct examination as may be appropriate at the hearing in these cases when scheduled by the Public Service Commission, at which time affiant will further affirm the attached prepared testimony as his direct testimony in such case.

_____
Carl G. K. Weaver

Commonwealth of Virginia
City of Harrisonburg

Subscribed and sworn to before me by Carl G. K. Weaver on this 18th the day of March, 2004.

My commission expires: September 30, 2005
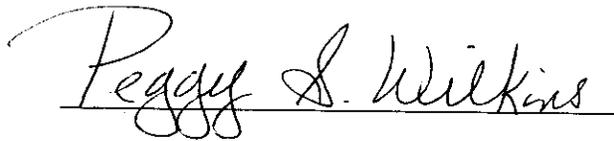
_____
Notary Public

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

An Adjustment of the Electric Rates, Terms and Conditions of Kentucky Utilities Company	))	Case No. 2003-00433
and		
An Adjustment of the Gas and Electric Rates, Terms and Conditions of Louisville Gas and Electric Company	)))	Case No. 2003-00434

Exhibit of Carl G. K. Weaver
Appearing on behalf of the Office of
The Attorney General for the Commonwealth of Kentucky
Office of Rate Intervention

Institutional Holdings
Rosenberg's Comparison Groups

Company	Percent Held
Electric Companies:	
Alliant Energy	38.98
Ameren Corporation	47.15
CH Energy Group	40.80
Consolidated Edison	38.75
DTE Energy	50.61
Exelon Corp.	60.84
MGE Energy	20.83
NSTAR	40.10
Pinnacle West	74.82
SCANA Corp	41.48
Southern Company	35.05
Vectren Corp.	39.82 *
Wisconsin Energy	57.07
Average Electric	45.10
Gas Distribution Companies:	
AGL Resources	53.08
Atmos Energy	36.98
KEYSpan	49.16
Laclede Group	24.02 **
Northwest Natural Gas	40.90
Peoples Energy	47.52
Average Gas Distribution	41.94

Sources:
Electric: Reuters Investor Research as of 1/26/04
*Value Line, 01/02/04
Gas: Reuters Investor Research as of 1/30/04
** Value Line, 12/19/03

Historical
GDP and CPI
Annual Average Real Rate of Change

Year	Real GDP % Change (1)	CPI % Change (2)
1979	2.5	11.3
1980	-0.5	13.5
1981	1.8	10.3
1982	-2.2	6.2
1983	3.9	3.2
1984	6.2	4.3
1985	3.2	3.6
1986	2.9	1.9
1987	3.1	3.6
1988	3.9	4.1
1989	2.5	4.8
1990	1.2	5.4
1991	-0.5	4.2
1992	3.0	3.0
1993	2.7	3.0
1994	4.0	2.6
1995	2.7	2.8
1996	3.6	2.9
1997	4.4	2.3
1998	4.3	1.5
1999	4.1	2.2
2000	3.8	3.4
2001	0.3	2.8
2002	2.4	1.6
2003 est.	2.9	2.1
Avg. 1992-2003	**3.2**	**2.5**

Sources: (1) 1979 - 1990 from Survey of Current Business, March 1996. 1991 through 2000 from "Quantity and Price Indexes for Gross Domestic Product and Percent Changes," Department of Commerce, Bureau of Economic Analysis, accessed by (http://www.gpo.ucop.edu/cgi-bin/wais.access.gpo.go). 1998-2003 data from Value Line Selection and Opinion, Nov. 28, 2003, p.2617.

(2) For all Urban Consumers, Monthly Labor Review. 1992 - 1993 from Value Line Selection and Opinion, May 30, 1997. 1994 through 1997 from Value Line Selection and Opinion, March 3 2000, p. 5037; 1998 through 2003 from Value Line Selection and Opinion, Nov. 28, 2003, p. 2617.

Real GDP and CPI
Percentage Change
Actual versus Forecast

Year	Real GDP			CPI All Urban Consumers		
Actual:						
1999	4.1			2.2		
2000	3.8			3.4		
2001	0.3			2.8		
2002	2.4			1.6		
2003 est.	3.2			2.3		
Forecast:	*Value Line*	*CBO*		*Value Line*	*CBO*	
2004	4.2	4.8		1.7	1.6	
2005	3.6	4.2		1.8	1.7	
2006	3.6	3.2		2.0	2.0	
2007	3.7	2.7		2.2	2.2	
2008	na	2.8		na	2.2	

Source: Value Line Selection and Opinion, November 28, 2003, p. 2616; CBO's
Economic Projections for 2004 through 2014, Appendix E: Released,
January 26, 2004.

Leading Economic Indicators and Change in GDP
January 2000 through September 2003

Year	Month	Index of Leading Economic Indicators (LEI)	Change in Index of LEI	Quarterly Change in LEI	Quarterly GDP % Change (2)
2000	Jan	110.9			
	Feb	110.3	-0.5		
	Mar	110.5	0.2	-0.4	2.6
	Apr	110.7	0.2		
	May	110.3	-0.4		
	June	110.3	0.0	-0.4	4.8
	July	110.2	-0.1		
	Aug	110.0	-0.2		
	Sep	110.0	0.0	-0.2	0.6
	Oct	109.7	-0.3		
	Nov	109.4	-0.3		
	Dec	108.7	-6.0	-0.9	1.1
2001	Jan	108.8	0.1		
	Feb	108.6	-0.2		
	Mar	108.4	-0.2	-0.4	-0.6
	Apr	108.6	0.2		
	May	109.3	0.6		
	June	109.4	0.1	0.7	-1.6
	July	109.7	0.3		
	Aug	109.6	-0.1		
	Sep	108.8	-0.7	-0.8	-0.3
	Oct	109.2	0.4		
	Nov	110.1	0.8		
	Dec	111.3	1.1	1.9	2.7
2002	Jan	111.8	0.4		
	Feb	111.9	0.1		
	Mar	111.9	0.0	0.1	5.0
	Apr	111.6	-0.3		
	May	112.3	0.6		
	June	112.1	-0.2	0.4	1.3
	July	112.0	-0.1		
	Aug	111.8	-0.2		
	Sep	111.4	-0.4	-0.5	3.1
	Oct	111.3	-0.1		
	Nov	111.3	0.7		
	Dec	112.1	0.1	0.7	1.4
2003	Jan	112.1	0.0		
	Feb	111.6	-0.4		
	Mar	111.8	-0.1	-0.3	1.4
	Apr	111.6	0.1		
	May	111.8	0.1		
	June	111.9	0.1	0.3	3.3
	July	112.3	0.4		
	Aug	112.8	0.4		
	Sep	113.0	0.2	0.6	8.2
	Oct	113.6	0.5		
	Nov	114.2	0.5		
	Dec	114.3	0.1	1.2	5.9
2004	Jan	115.0	0.6		

Sources: LEI from: U.S. Release Archive, "Business Cycle Indicators,"
The Conference Board, (http:www.globalindicators.org);
GDP from "Gross Domestic Product and Related Price Measures:
Indexes and Percent Changes," Department of Commerce,
Bureau of Economic Analysis, (http://www.bea.doc.gov)

Mergent's Public Utility Bond Yields
Annual Average

Year	Aaa	Aa	A	Baa
1980	12.30	13.00	13.34	13.95
1981	14.64	15.30	15.95	16.60
1982	14.22	14.79	15.86	16.45
1983	12.52	12.83	13.66	14.20
1984	12.72	13.66	14.03	14.53
1985	11.68	12.06	12.47	12.96
1986	8.92	9.30	9.58	10.00
1987	9.52	9.77	10.10	10.53
1988	10.05	10.26	10.49	11.00
1989	9.32	9.56	9.77	9.97
1990	9.45	9.65	9.86	10.06
1991	8.85	9.09	9.36	9.55
1992	8.19	8.55	8.69	8.86
1993	7.29	7.44	7.59	7.91
1994	8.07	8.21	8.31	8.63
1995	7.68	7.77	7.89	8.29
1996	7.49	7.57	7.75	8.17
1997	7.42	7.54	7.60	7.95
1998	6.77	6.91	7.04	7.26
1999	7.21	7.51	7.62	7.88
2000	7.88	8.06	8.24	8.36
2001	7.47	7.59	7.78	8.02
2002	na	7.19	7.36	8.02
2003 Range	na	6.96-6.01	7.11-6.04	7.57-6.13

Sources: Mergent's 2003 Public Utility Manual; Ranges are from Corporate
News Reports Monthly.

Short-term and Long-term Interest Rates
Actual versus Forecast

Year	3-month T-bills	10-Year Treasury Note Rate
1999	4.6	5.6
2000	5.8	6.0
2001	3.4	5.0
2002	1.6	4.6
2003 est.	1.0	4.0

Forecast:

	3-month T-bills		10-Year Treasury Note Rate	
	Value Line	*CBO*	*Value Line*	*CBO*
2004	1.2	1.3	4.7	4.6
2005	1.7	3.0	5.5	5.4
2006	2.2	4.0	5.6	5.5
2007	2.5	4.6	5.8	5.5

Comparison of Recent Interest Rates

	2003 Dec 18	2004 Jan 15	2004 Feb 19	Basis Point Difference 15-Jan 18-Dec	Basis Point Difference 19-Feb 15-Jan
Market Compilation:					
Federal Funds Rate	1.01	1.04	1.00	3	(4)
3 Month T-Bills, Sec. Mkt.	0.87	0.98	na	11	(98)
Constant Maturities					
3-Month	0.89	0.88	0.94	(1)	0
6-Month	0.96	0.96	1.00	-	4
1-Year	1.24	1.18	1.23	(6)	5
2-Year	1.85	1.67	1.70	(18)	3
3-Year	2.38	2.16	2.20	(22)	4
5-Year	3.17	2.97	3.02	(20)	5
7-Year	3.67	3.48	3.54	(19)	6
10-Year	4.16	3.99	4.05	(17)	6
20-Year	4.99	4.87	4.91	(12)	4
Treasury long-term average					
Over 25 years	5.03	4.93	4.96	(10)	3

Source: Federal Reserve Statistical Release H.15 Selected Interest Rates, December 22, 2003, January 20, 2004, and February 20, 2004. (http://www.federalreserve.gov/releases/H15/)

Value Line Companies
Classified as Electric Utilities

Company Name	Date of Value Line Report	Financial Strength Rating	Price Earnings Ratio
CH Energy Group	12/5/03	A	17.3
Cinergy	1/2/04	A	14.8
Constellation Energy	12/5/03	A	12.9
Exelon Corp.	12/5/03	A	12
Great Plains Energy	1/2/04	A	14.6
Hawaiian Electric	11/14/03	A	16.4
MGE Energy	1/2/04	A	16.6
NSTAR	12/5/03	A	14.5
Otter Tail Corp.	1/2/04	A	17.5
Pinnacle West	11/14/03	A	13.8
SCANA Corp.	12/5/03	A	13.4
Southern Company	12/5/03	A	15.3
Vectren Corp	1/2/04	A	15.5
Ameren	1/2/04	A+	15.4
FPL Group, Inc.	12/5/03	A+	12.6
MDU Resources	11/14/03	A+	14.7
Con Edison	12/5/03	A++	13.6
Avista Corp.	11/14/03	B	17.1
DPL Inc.	1/2/04	B	22.5
Duquesne Light Holdings, Inc.	12/5/03	B	15.1
NiSource Inc.	1/2/04	B	13.1
PEPCO Holdings	12/5/03	B	12.9
TECO Energy	12/5/03	B	20.4
Xcel Energy	11/14/03	B	11.1
Alliant Energy	1/2/04	B+	14.8
American Electric Pwr	1/2/04	B+	13.9
Black Hills Corp.	11/14/03	B+	15.1
Cleco Corporation	1/2/04	B+	13.5
DTE Energy	1/2/04	B+	10.2
Duke Energy	12/5/03	B+	18.6
El Paso Electric	11/14/03	B+	18.7
Empire District	1/2/04	B+	17.2
First Energy	12/5/03	B+	14.2
IDACorp, Inc.	11/14/03	B+	19.1
Northeast Utilities	12/5/03	B+	16.1
PPL Corp.	12/5/03	B+	11.6
PS Enterprise Group	12/5/03	B+	11.2
Puget Energy	11/14/03	B+	13.7
UIL Holdings	12/5/03	B+	20
Allete	1/2/04	B++	18.4
Cent. Vermont P.S.	12/5/03	B++	16
Dominion Resources	12/5/03	B++	14.6
Energy East	12/5/03	B++	14.4
Entergy Corp.	1/2/04	B++	13.6
Green Mtn. Power	12/5/03	B++	12.3
OGE Energy	1/2/04	B++	14.7
PNM Resources	11/14/03	B++	15.7
Progress Energy	12/5/03	B++	12.3
Sempra Energy	11/14/03	B++	8.5
Wisconsin Energy	1/2/04	B++	14.7
WPS Resources	1/2/04	B++	14.8
Allegheny Energy	12/5/03	C	nmf
Aquila	1/2/04	C	nmf
PG&E Corp.	11/14/03	C	nmf
Sierra Pacific Res.	11/14/03	C+	nmf
Edison International	11/14/03	C++	10.3
TXU Corp.	1/2/04	C++	11.2
Unisource Energy	11/14/03	C++	14.4
Westar Energy	1/2/04	C++	12.3

Note: Sorted by Financial Strength Rating letter assignment.

Company Selection
Value Line Companies
Classified as Electric Utilities
Eliminated Companies

Company	Reason for Elimination

Financial Strength Rating of C++ or lower

Allegheny Energy	C
Aquila	C
Edison International	C++
PG&E Corp	C
Sierra Pacific Resources	C+
TXU Corp.	C++
Unisource Energy	C+
Westar Energy	C++

Stock Purchase NOT Recommended by Value Line to a Investor Class

Duke Energy	"Investors should look elsewhere."
First Energy	"..., This doesn't compensate investors adequately for the current uncertainties."
DPL Inc.	"... we'd still avoid an investment in these shares, for now."
NiSource, Inc	"We don't recommend this equity."
PEPCO Holdings	"It's best that investors consider other alternatives, given the uncertainties."

Companies that have recently sold or purchased major assets or divested the majority of their generation plant:

American Electric Power	Selling $1.9 billion non-core and $1.7 billion in Texas. ~17% 2003 tot. cap.
Alliant Energy	selling 41% of nuclear plant for $90 million, divesting $450 book value oil and gas assets and water operations for $21 million ~ 13% 2003 tot cap.
Allete	plans to split the company into electric opns and auto services
Black Hills Corp.	completed the sale of hydro assets ~12% of 2003 tot. cap.
CH Energy Group	Sold generating plants in 2001.
Duquesne Light Holdings	Sold generating plants in 2002.
NSTAR	Sold fossil plants in '98 and nuclear plant in '99.
Scana Corp.	Sold telecommunications assets for $437 million and planning $154 million more. ~ 10.3% 2003 total capital.
Sempra Energy	"Has divested its generation."
UIL Holdings	"UIL no longer owns any retail [generation] plants."

Pending settlement of a major law suit:

Con. Edison	Merger agreement with Northeast in dispute.
Northeast Utilities	Merger agreement with Con. Edison in dispute.

Short operating history:

Exelon Corp:	Formed October 20, 2000
Vectren Corp.	Formed March 31, 2000

Other:

Hawaiian Electric	Operating system not inter-connected.

Fuel mix, as reported by Value Line, is too dissimilar with KU or LG&E.

Avista Corp.	Gen. Mix: 39% hydro, 16% fossil, purch. pwr. 45%.
Central Vermont P.S.	Gen Mix: 45% nuclear, 36% hydro, and 19% other.
El Paso Electric	Gen Mix: 31% fossil, 52% nuclear, 17% purch pwr.
Energy East	Gen Mix: 7% nuclear, 1% hydro, 92% purch. pwr.
Entergy Corp.	Gen Mix: 54% folssil, nuclear 46%.
Green Mountain Pwr.	Gen Mix: 4% fossil, 34.9% nuclear, 40.8% hydro, 4.1% other, and 16.2% purch. pwr.
IDACorp	Gen. Mix: 45% hydro, 55% thermal
Otter Tail Corp.	Gen. Mix: 46% fossil, 54% purch pwr.
Pinnacle West Capital	Gen. Mix: 32% fossil, 18% nuclear, 50% purch pwr.
Pub. Ser. Enterprise Gp.	Gen Mix in '01: 34% fossil, 60% nuclear, 6% other.
Puget Energy	Gen. Mix: 17% fossil, 5% hydro, purch. pwr. 74%, other 4%.

Source: Quoted text from individual company reports in Value Line.

1992 FUEL MIX

		Coal Oil Gas	Nuclear	Hydro	Other**	Purch. Pwr
Ameren Corp.		87%	8%	5%	0%	0%
Avista Corp.		0%	0%	39%	16%	45%
Central Vermont P.S.		0%	45%	36%	19%	0%
Cinergy		95%	0%	0%	5%	0%
Cleco Corp.		55%	0%	0%	0%	45%
Constellation		44%	53%	0%	3%	0%
Dominion Resources		47%	32%	0%	2%	19%
DTE Energy		64%	16%	0%	3%	17%
El Paso Electric		31%	52%	0%	0%	17%
Empire District		55%	0%	1%	0%	44%
Energy East	*	0%	7%	1%	0%	92%
Entergy Corp.		54%	46%	0%	0%	0%
FPL Group		56%	24%	0%	0%	20%
Great Plains		73%	22%	0%	0%	5%
Green Mountain Pwr		4%	35%	41%	4%	16%
IDACorp.		0%	0%	45%	55%	0%
MDU Resources		72%	0%	0%	0%	28%
MGE Energy		60%	0%	0%	1%	39%
OGE Energy Corp		87%	0%	0%	0%	13%
Otter Tail Corp		46%	0%	0%	0%	54%
Pennacle West Capital		24%	18%	0%	8%	50%
PNM Resources		69%	31%	0%	0%	0%
PPL Corp	*	69%	20%	8%	0%	3%
Progress Energy		63%	36%	1%	0%	0%
Pub Ser Enterprise	*	34%	60%	0%	0%	6%
Puget Energy		21%	0%	5%	0%	74%
Southern Company		77%	15%	2%	0%	6%
TECO Energy		100%	0%	0%	0%	0%
Wisconsin Energy		59%	25%	2%	0%	14%
WPS Resources		56%	19%	2%	0%	23%
XCEL Energy		60%	13%	0%	2%	25%
KU	1	66%	0%	0%	2%	32%
LG&E	1	76%	0%	1%	1%	22%

Source: Value Line
* indicates the data source is for 2001
** Other may include thermal, pumped storage, or combustion turbine.
1- LG&E & KU data from FERC Form 1, p. 401a, lines 3-10.

Capitalization
Candidate Companies
2002

Company Name	Short-term Debt*	Long-term Debt	Preferred Stock	Common Equity	Total
Ameren	271,000	3,433,000	193,000	3,842,000	7,739,000
Cinergy	667,973	4,080,768	62,828	3,293,476	8,105,045
CLECO	315,300	868,684	17,508	562,470	1,763,962
Constellation Energy	10,500	4,613,900	190,000	3,862,300	8,676,700
Dominion Resources	1,193,000	11,968,000	257,000	10,213,000	23,631,000
DTE Energy	414,000	2,047,000	0	4,565,000	7,026,000
Empire District	22,541	360,535	0	329,313	712,389
ᶠPL Group, Inc.	2,197,000	5,790,000	226,000	6,390,000	14,603,000
Great Plains	44,700	1,124,700	39,000	894,400	2,102,800
MDU Resources	20,000	819,558	16,200	1,299,945	2,155,703
MGE Energy	34,298	192,149	0	232,777	459,224
OGE Energy Corp	275,000	1,501,900	0	983,900	2,760,800
PNM Resources	150,000	980,092	12,800	974,049	2,116,941
PPL Corp	943,000	6,562,000	82,000	2,224,000	9,811,000
Progress Energy	275,397	9,747,293	92,831	6,677,009	16,792,530
Southern Company	1,007,000	8,658,000	298,000	8,710,000	18,673,000
TECO Energy	360,500	3,324,300	649,100	2,611,700	6,945,600
Wisconsin Energy	953,100	3,030,500	30,400	2,139,400	6,153,400
WPS Resources	29,800	824,400	51,100	782,800	1,688,100
XCEL Energy	1,541,963	6,550,248	0	4,664,984	12,757,195
Average	536,304	3,823,851	110,888	3,262,626	7,733,669

Source: Compact Disclosure, August 2003 Disk.

Note: Short-term debt does **not** include current portion long-term debt

Capital Structures
Candidate Companies
2002

Company Name	Short-term Debt	Long-term Debt	Preferred Stock	Common Equity	Total
Ameren	3.5%	44.4%	2.5%	49.6%	100.0%
Cinergy	8.2%	50.3%	0.8%	40.6%	100.0%
CLECO	17.9%	49.2%	1.0%	31.9%	100.0%
Constellation Energy	0.1%	53.2%	2.2%	44.5%	100.0%
Dominion Resources	5.0%	50.6%	1.1%	43.2%	100.0%
DTE Energy	5.9%	29.1%	0.0%	65.0%	100.0%
Empire District	3.2%	50.6%	0.0%	46.2%	100.0%
FPL Group, Inc.	15.0%	39.6%	1.5%	43.8%	100.0%
Great Plains	2.1%	53.5%	1.9%	42.5%	100.0%
MDU Resources	0.9%	38.0%	0.8%	60.3%	100.0%
MGE Energy	7.5%	41.8%	0.0%	50.7%	100.0%
OGE Energy Corp	10.0%	54.4%	0.0%	35.6%	100.0%
PNM Resources	7.1%	46.3%	0.6%	46.0%	100.0%
PPL Corp	9.6%	66.9%	0.8%	22.7%	100.0%
Progress Energy	1.6%	58.0%	0.6%	39.8%	100.0%
Southern Company	5.4%	46.4%	1.6%	46.6%	100.0%
TECO Energy	5.2%	47.9%	9.3%	37.6%	100.0%
Wisconsin Energy	15.5%	49.2%	0.5%	34.8%	100.0%
WPS Resources	1.8%	48.8%	3.0%	46.4%	100.0%
XCEL Energy	12.1%	51.3%	0.0%	36.6%	100.0%
Average	6.9%	48.5%	1.4%	43.2%	100.0%
Kentucky Utilities	8.9% *	36.7%	2.4%	52.0%	100.0%
Louisville Gas & Electric Co.	7.8% *	41.5%	3.7%	47.1%	100.0%

Source: Prior Exhibit; KU from Rives, Exhibit 2, page 1 of 1; and LG&E from Rives, Exhibit 2, page 1 of 2. Both KU and LG&E from column 2, capital structure per books, 09-30-03.

* Includes A/R Securitization

Company Selection
Value Line Companies
Classified as Electric Utilities

Company Name	Value Line Financial Strength Rating*		Equity to Total Capital	Percent Electric Revenues	Source
Eliminated for low equity capitalization					
CLECO	B+	40.0%	32%	96%	CD
OGE Energy Corp	B+	40.0%	36%	46%	VL
PPL Corp	B+	40.0%	23%	80%	CD
TECO Energy	B	20.0%	38%	57%	CD
Wisconsin Energy	B++	60.0%	35%	65%	CD
XCEL Energy	B	20.0%	37%	58%	CD
Eliminated for electric revenues being less than 60%					
Constellation Energy	A	80.0%	45%	52%	CD
Dominion Resources	B++	60.0%	43%	57%	CD
Great Plains	B++	60.0%	43%	54%	CD
MDU Resources	A+	100.0%	60%	19%	CD
WPS Resources	B++	60.0%	46%	26%	VL
Selected Companies					
Ameren	A+	100.0%	50%	92%	S&P
Cinergy	A	80.0%	41%	85%	VL
DTE Energy	B+	40.0%	65%	81%	CD
Empire District	B+	40.0%	46%	96%	CD
FPL Group Inc.	A+	100.0%	44%	89%	CD
MGE Energy	A	80.0%	51%	64%	CD
PNM Resources	B++	60.0%	46%	77%	VL
Progress Energy	B++	60.0%	40%	82%	VL
Southern Company	A	80.0%	47%	97%	CD
Sel. Company Avg.	~A-	71%	48%	85%	
KU			52%	100%	
LG&E			47%	74%	

* Value Line Financial Strength Rating is converted to numerical percent with an equal scaler difference of 20% between each rating from B to A+.

** LG&E and KU would have a "B++" rating which is assumed to be the mid-point between an A+ and a B.

Sources: Financial Strength Rating is from Value Line.
Equity to Total Capital from Schedule 11.
Percent Electric Revenues from Compant Disclosure(CD), August 2003 disc; from Value Line (VL) and from Standard & Poor's. KU and LG&E from FERC Form 1, p.114 line 2, col. E/ col. C.

Capitalization Selected Companies

Company Name	Short-term Debt	Long-term Debt	Preferred Stock	Common Equity	Total
Ameren	271,000	3,433,000	193,000	3,842,000	7,739,000
Cinergy	667,973	4,080,768	62,828	3,293,476	8,105,045
DTE Energy	414,000	2,047,000	0	4,565,000	7,026,000
Empire District	22,541	360,535	0	329,913	712,989
FPL Group Inc.	2,197,000	5,790,000	226,000	6,390,000	14,603,000
MGE Energy	34,298	192,149	0	232,777	459,224
PNM Resources	150,000	980,092	12,800	974,049	2,116,941
Progress Energy	275,397	9,747,293	92,831	6,677,009	16,792,530
Southern Company	1,007,000	8,658,000	298,000	8,710,000	18,673,000
Average	559,912	3,920,982	98,384	3,890,469	8,469,748

Source: Compact Disclosure & Testimony, Rives, Exhibit 2, page 1.

Capitalization Selected Companies

Company Name	Short-term Debt	Long-term Debt	Preferred Stock	Common Equity	Total
Ameren	3.5%	44.4%	2.5%	49.6%	100.0%
Cinergy	8.2%	50.3%	0.8%	40.6%	100.0%
DTE Energy	5.9%	29.1%	0.0%	65.0%	100.0%
Empire District	3.2%	50.6%	0.0%	46.3%	100.0%
FPL Group Inc.	15.0%	39.6%	1.5%	43.8%	100.0%
MGE Energy	7.5%	41.8%	0.0%	50.7%	100.0%
PNM Resources	7.1%	46.3%	0.6%	46.0%	100.0%
Progress Energy	1.6%	58.0%	0.6%	39.8%	100.0%
Southern Company	5.4%	46.4%	1.6%	46.6%	100.0%
Average	6.4%	45.2%	0.8%	47.6%	100.0%
Kentucky Utilities	8.9%	36.7%	2.4%	52.0%	100.0%
LG&E	7.8%	41.5%	3.7%	47.1%	100.0%

Source: Previous Schedule

Cash Flow Summary

| Company | Average Cash Flow Coverage of: | | | |
Name	Interest	Dividends	Investing Activities	Quality of Earnings
Ameron	nmf*	2.16	0.85	1.88
Cinergy	4.34	2.92	0.79	2.19
DTE Energy	2.76	2.69	0.61	1.99
Empire District	2.83	2.15	0.72	3.19
FPL Group Inc.	7.76	5.50	0.65	3.71
MGE Energy	6.05	2.94	1.88	2.38
PNM Resources	4.32	6.56	0.64	1.84
Progress Energy	3.32	3.31	0.79	2.82
Southern Company	4.67	2.77	0.91	2.02
Average	4.51	3.44	0.87	2.45
Kentucky Utilities	7.14	40.73	1.03	1.91
LG&E	8.36	6.65	1.05	2.55

Source: Schedule 17 through 27.

* Compact Disclosure reports a low interest expense relative to the amount of debt

Cash Flow Analysis
Ameron Corp.
(thousands of dollars)

	2001	2002	Average
Cash Flow from Operating Activities	738,000	833,000	785,500
Cash Flow from Investing Activities	(1,104,000)	(803,000)	(953,500)
Cash Flow from Financing Activities	307,000	531,000	419,000
Change in Cash Flow	(59,000)	561,000	251,000
Cash Flow Coverage of Interest	185.50	139.83	162.67
Cash Flow Coverage of Total Dividends	2.11	2.22	2.16
Cash flow Coverage of Investing Activities	0.67	1.04	0.85
Quality of Earnings	1.57	2.18	1.88

Source: January 2004 Compact Disclosure

Cash Flow Analysis
Cinergy Corp
(thousands of dollars)

	2001	2002	Average
Cash Flow from Operating Activities	717,849	996,199	857,024
Cash Flow from Investing Activities	(1,567,099)	(889,408)	(1,228,254)
Cash Flow from Financing Activities	867,263	3,225	435,244
Change in Cash Flow	18,013	110,016	64,015
Cash Flow Coverage of Interest	3.70	4.99	4.34
Cash Flow Coverage of Total Dividends	2.51	3.34	2.92
Cash flow Coverage of Investing Activities	0.46	1.12	0.79
Quality of Earnings	1.62	2.76	2.19

Source: August 2003 Compact Disclosure

Cash Flow Analysis
DTE Energy
(thousands of dollars)

	2001	2002	Average
Cash Flow from Operating Activities	811,000	974,000	892,500
Cash Flow from Investing Activities	(2,286,000)	(1,115,000)	(1,700,500)
Cash Flow from Financing Activities	1,679,000	6,000	842,500
Change in Cash Flow	204,000	(135,000)	34,500
Cash Flow Coverage of Interest	2.73	2.78	2.76
Cash Flow Coverage of Total Dividends	2.50	2.88	2.69
Cash flow Coverage of Investing Activities	0.35	0.87	0.61
Quality of Earnings	2.44	1.54	1.99

Source: August 2003 Compact Disclosure

Cash Flow Analysis
Empire District Electric Co.
(thousands of dollars)

	2001	2002	Average
Cash Flow from Operating Activities	35,433	76,037	55,735
Cash Flow from Investing Activities	(78,792)	(76,876)	(77,834)
Cash Flow from Financing Activities	52,308	3,838	28,073
Change in Cash Flow	8,949	2,999	5,974
Cash Flow Coverage of Interest	2.18	3.49	2.83
Cash Flow Coverage of Total Dividends	1.57	2.73	2.15
Cash flow Coverage of Investing Activities	0.45	0.99	0.72
Quality of Earnings	3.41	2.98	3.19

Source: August 2003 Compact Disclosure

Cash Flow Analysis
FPL Group
(thousands of dollars)

	2001	2002	Average
Cash Flow from Operating Activities	1,942,000	2,338,000	2,140,000
Cash Flow from Investing Activities	(3,269,000)	(3,267,000)	(3,268,000)
Cash Flow from Financing Activities	1,280,000	1,113,000	1,196,500
Change in Cash Flow	(47,000)	184,000	68,500
Cash Flow Coverage of Interest	6.99	8.52	7.76
Cash Flow Coverage of Total Dividends	5.15	5.85	5.50
Cash flow Coverage of Investing Activities	0.59	0.72	0.65
Quality of Earnings	2.49	4.94	3.71

Source: August 2003 Compact Disclosure

Cash Flow Analysis
MGE Energy
(thousands of dollars)

	2001	2002	Average
Cash Flow from Operating Activities	75,918	57,629	66,774
Cash Flow from Investing Activities	(24,533)	(86,377)	(55,455)
Cash Flow from Financing Activities	(53,271)	29,325	(11,973)
Change in Cash Flow	(1,886)	577	(655)
Cash Flow Coverage of Interest	6.51	5.59	6.05
Cash Flow Coverage of Total Dividends	3.40	2.49	2.94
Cash flow Coverage of Investing Activities	3.09	0.67	1.88
Quality of Earnings	2.79	1.97	2.38

Source: August 2003 Compact Disclosure

Cash Flow Analysis
PNM Resources
(thousands of dollars)

	2001	2002	Average
Cash Flow from Operating Activities	327,346	97,251	212,299
Cash Flow from Investing Activities	(407,014)	(200,427)	(303,721)
Cash Flow from Financing Activities	385	78,470	39,428
Change in Cash Flow	(79,283)	(24,706)	(51,995)
Cash Flow Coverage of Interest	6.05	2.58	4.32
Cash Flow Coverage of Total Dividends	10.27	2.84	6.56
Cash flow Coverage of Investing Activities	0.80	0.49	0.64
Quality of Earnings	2.18	1.51	1.84

Source: August 2003 Compact Disclosure

Cash Flow Analysis
Progress Energy, Inc.
(thousands of dollars)

	2001	2002	Average
Cash Flow from Operating Activities	1,421,907	1,597,963	1,509,935
Cash Flow from Investing Activities	(1,655,785)	(2,211,834)	(1,933,810)
Cash Flow from Financing Activities	187,687	621,521	404,604
Change in Cash Flow	(46,191)	7,650	(19,271)
Cash Flow Coverage of Interest	3.11	3.52	3.32
Cash Flow Coverage of Total Dividends	3.29	3.33	3.31
Cash flow Coverage of Investing Activities	0.86	0.72	0.79
Quality of Earnings	2.63	3.02	2.82

Source: August 2003 Compact Disclosure

Cash Flow Analysis
Southern Company
(thousands of dollars)

	2001	2002	Average
Cash Flow from Operating Activities	2,384,000	2,831,000	2,607,500
Cash Flow from Investing Activities	(2,736,000)	(2,961,000)	(2,848,500)
Cash Flow from Financing Activities	507,000	49,000	278,000
Change in Cash Flow	155,000	(81,000)	37,000
Cash Flow Coverage of Interest	4.20	5.14	4.67
Cash Flow Coverage of Total Dividends	2.59	2.96	2.77
Cash flow Coverage of Investing Activities	0.87	0.96	0.91
Quality of Earnings	1.89	2.15	2.02

Source: August 2003 Compact Disclosure

Cash Flow Analysis
Kentucky Utilities Co.
(thousands of dollars)

	2001	2002	Average
Cash Flow from Operating Activities	191,978	170,561	181,270
Cash Flow from Investing Activities	(142,792)	(237,909)	(190,351)
Cash Flow from Financing Activities	(46,206)	69,444	11,619
Change in Cash Flow	2,980	2,096	2,538
Cash Flow Coverage of Interest	6.64	7.64	7.14
Cash Flow Coverage of Total Dividends	5.86	75.60	40.73
Cash flow Coverage of Investing Activities	1.34	0.72	1.03
Quality of Earnings	1.99	1.83	1.91

Source: 2002 FERC Form 1

Cash Flow Analysis
Louisville Gas & Electric Co.
(thousands of dollars)

	2001	2002	Average
Cash Flow from Operating Activities	292,138	209,350	250,744
Cash Flow from Investing Activities	(253,795)	(220,004)	(236,900)
Cash Flow from Financing Activities	(38,726)	25,557	(6,585)
Change in Cash Flow	(383)	14,903	7,260
Cash Flow Coverage of Interest	8.70	8.02	8.36
Cash Flow Coverage of Total Dividends	10.44	2.86	6.65
Cash flow Coverage of Investing Activities	1.15	0.95	1.05
Quality of Earnings	2.74	2.35	2.55

Source: 2002 FERC Form 1

Accounting/Financial Measures
Comparing Selected Companies with KU and LG&E

Company Name	Total Asset Size (000)	2000-2002 Average	
		Sales to Plant & Equipment	Sales to Total Assets
Ameren	10,538,143	0.46	0.37
Cinergy	12,645,523	1.39	0.87
DTE Energy	16,925,000	0.64	0.34
Empire District	896,704	0.37	0.31
FPL Group Inc.	17,517,667	0.67	0.45
MGE Energy	581,524	0.77	0.58
PNM Resources	2,943,537	0.99	0.58
Progress Energy	20,784,702	0.56	0.32
Southern Company	30,985,333	0.45	0.33
Average	12,646,459	0.70	0.46
Kentucky Utilities	1,854,934	0.53	0.47
LG&E	2,411,839	0.50	0.42

Source: Compac Disclosure August 2003 disc and Ameren Jan 2004 disc

Debt Measures
Comparing Selected Companies with KU and LG&E

Company Name	Moody's Bond Ratings	2000-2002 Average Times Interest Earned
Ameren	A1	nmf**
Cinergy	Baa2	3.62
DTE Energy	A3	1.98
FPL Group Inc.	A2	4.45
MGE Energy*	Aa2	4.32
Southern Company	A3	3.28
Empire District	Baa1	2.03
PNM Resources	Baa3	3.61
Progress Energy	Baa1	2.32
Average		3.20
Kentucky Utilities	A1	5.67
LG&E	A1	5.46

Source: Compac Disclosure August 2003 disc.
* MGE for 2001 and 2002 only.
**nmf for Ameren interest exp.is low for the amount of debt causing the coverage to be high but not representative or meaningful.

Value Line Measures
Selected Companies

Company Name	(1) Stock Price Stability	(2) Safety Rating	(3) Beta
Ameren	100	1	0.70
Cinergy	95	2	0.70
DTE Energy	100	3	0.60
Empire District	95	3	0.60
FPL Group Inc.	95	1	0.60
MGE Energy	100	1	0.55
PNM Resources	90	2	0.70
Progress Energy	90	2	0.85
Southern Company	100	2	0.65
Average	96	2	0.66

Source: Value Line, January 2, 2004; December 5, 2003; November 14, 2003.

(1) Stock Price Stability: 100 is the most stable and 0 is the least stable.

(2) Safety Rank: 1 is the safest and 5 is the least safe.

(3) Beta: 1=market. A beta less than 1indicates that a stock's price rises or falls less than the average market price rises or falls. A Beta greater than 1 indicates that the stock's price rises or falls greater than the average market price rises or falls.

Standard and Poor's Measures
Selected Companies

Company Name	(1) Outlook	(2) Relative Strength Rank	(3) Beta
Ameren	2-	35	0.08
Cinergy	3-	36	-0.02
DTE Energy	2	48	-0.03
Empire District	1-	19	0.04
FPL Group Inc.	4	28	0.18
MGE Energy	na	35	0.10
PNM Resources	3-	32	0.63
Progress Energy	4-	39	0.09
Southern Company	2-	27	-0.45
Average*	3	33	0.07

Source: Standard and Poor's Stock Reports, November 29, 2003

* To calculate the average for Outlook, the numbers with a minus value were reduced by 0.01. For example, 2- is treated as 1.99.

(1) Outlook: 1 is the lowest, 5 is the highest.

(2) Relative Strength Rank: 1 is the lowest, 99 is the highest.

(3) Beta: 1=market; A Beta less than 1 indicates that the stock's price rises or falls less than the average market price rises or falls. A Beta greater than 1 indicates that the stock's price rises or falls greater than the average market price rises or falls.

EPS Historical Growth Rates
Selected Companies

Company Name	1993 EPS	2003 EPS	Compound Growth Rate
Ameren	2.77	2.95	0.6%
Cinergy Corp	2.16	2.55	1.7%
DTE Energy	3.34	2.65	-2.3%
Empire District	1.16	1.30	1.1%
FPL Group	2.75	4.90	5.9%
MGE Energy	1.51	1.80	1.8%
PNM Resources	1.21	1.75	3.8%
Progress Energy	2.23	3.55	4.8%
Southern Company	1.57	1.90	1.9%
Average	2.08	2.59	2.7% *

Source: Value Line, November 14 and December 5, 2003 and January 2, 2004.
2003 EPS are estimates which provide information known near the
date of publication.

* Average exludes DTE Energy.

CFS Historical Growth Rates
Selected Companies

Company Name	1993 CFS	2003 CFS	Compound Growth Rate
Ameren	4.83	5.85	1.9%
Cinergy Corp	3.87	4.95	2.5%
DTE Energy	6.43	6.95	0.8%
Empire District	2.49	2.45	-0.2%
FPL Group	5.85	9.55	5.0%
MGE Energy	2.86	3.80	2.9%
PNM Resources	3.51	4.35	2.2%
Progress Energy	5.09	6.95	3.2%
Southern Company	3.13	3.50	1.1%
Average	4.23	5.37	2.5% *

Source: Value Line, November 14 and December 5, 2003 andJanuary 2, 2004.
2003 CFS are estimates which provide information known near the
date of publication.

* Average exludes Empire District.

EPS Growth Forecasts - Electric
Selected Companies

Company Name	Zacks EPS	Multex Investor EPS	Thomson Investor Network EPS	Value Line EPS	Average
Ameren Corp.	2.90%	2.94%	3.00%	1.0%	2.95% *
Cinergy Corp	3.60%	3.60%	4.00%	3.0%	3.55%
DTE Energy	4.70%	4.71%	4.50%	5.5%	4.85%
Empire District	na	6.50%	2.00%	6.0%	4.83%
FPL Group	4.50%	4.06%	5.00%	5.0%	4.64%
MGE Energy	na	na	na	6.0%	6.00%
PNM Resources	5.00%	5.00%	5.00%	-4.5%	5.00% *
Progress Energy	3.90%	3.42%	4.00%	0.5%	3.77% *
Southern Company	4.60%	4.67%	5.00%	6.0%	5.07%
Average	4.17%	4.36%	4.06%	5.25% *	4.52% *

Source: Zacks from MSN Money, Stocks, 2/23/04:http://moneycentral.msn.com;
      Multex from Reuters Investor Earnings Estimates, 11/5/03;
      Thomson from Yahoo Finance 2/18/04.
      Value Line dated November 14, 2003, December 5, 2003, January 2, 2004.

* Excludes Ameren, PNM, and Progress.

Weekly Stock Prices and Dividend Yields
Electric Comparison Companies

Company Name: Week Beginning	Ameren Corp	Cinergy Corp	DTE Energy	Empire District	FPL Group Inc.	MGE Energy	PNM Resources	Progress Energy	Southern Company
					Adjusted Closing Stock Prices				
09/19/03	41.98	34.69	35.47	21.90	61.96	31.92	28.31	42.33	28.59
09/22/03	42.35	35.44	36.45	21.37	62.22	29.79	27.40	43.52	28.73
09/29/03	42.88	36.20	37.20	21.86	64.19	32.05	28.52	44.32	28.83
10/06/03	42.80	35.45	35.35	21.82	63.88	31.07	28.01	43.45	28.92
10/13/03	43.31	35.61	35.32	21.68	62.61	30.93	28.51	42.69	28.68
10/20/03	43.83	35.81	36.21	21.45	63.25	30.31	28.37	43.01	29.62
10/27/03	44.02	35.87	36.39	20.89	63.14	31.26	28.06	42.56	29.46
11/03/03	43.67	35.76	34.98	21.93	63.50	31.67	27.39	42.31	29.04
11/10/03	43.49	36.25	35.79	21.32	64.52	30.93	27.34	42.72	28.97
11/17/03	42.79	35.65	35.88	21.11	62.70	31.77	27.03	41.72	28.32
11/24/03	43.50	36.10	37.21	21.16	63.55	32.01	27.80	43.27	28.93
12/01/03	44.19	36.60	36.97	21.01	64.56	31.08	27.29	43.75	29.43
12/08/03	44.44	37.42	38.28	21.09	64.32	31.95	27.77	44.59	29.31
12/15/03	45.29	37.35	38.41	21.50	64.30	31.61	27.78	44.34	29.57
12/22/03	45.44	37.68	38.86	21.50	64.71	31.99	27.69	44.44	29.64
12/29/03	45.80	38.30	39.49	21.92	65.03	31.77	28.27	44.93	29.71
01/05/04	45.40	37.86	38.70	21.40	63.75	31.65	28.14	44.82	29.51
01/12/04	46.10	37.29	38.27	21.50	65.25	31.90	28.96	43.90	29.09
01/20/04	47.52	38.74	39.18	21.65	65.82	31.90	30.15	43.82	29.89
01/26/04	48.29	38.67	39.10	21.80	65.75	31.32	30.10	44.78	29.80
02/02/04	46.28	37.35	39.10	22.40	63.98	32.17	30.32	44.55	29.24
02/09/04	46.34	38.41	39.19	23.11	64.64	31.25	31.26	45.50	29.50
02/17/04	46.50	38.92	39.88	23.23	65.45	31.50	31.74	46.35	29.91
Avg. Prices	44.618	36.844	37.464	21.678	64.047	31.470	28.531	43.812	29.247
Dividend Rate	2.56	1.88	2.08	1.28	2.40	1.36	0.92	2.32	1.40
Dividend Yields:	5.74%	5.10%	5.55%	5.90%	3.75%	4.32%	3.22%	5.30%	4.79%
Selected Companies Avg. Div. Yield:									4.85%

Source: YAHOO! Finance, Historical Quotes, February 18, 2004; the Dividend Rate is
the latest quarterly dividend multiplied times 4.

Electric
Constant Growth DCF Cost of Equity
Selected Companies

Company Name	Dividend Yield	Growth Rate	Expected Dividend Yield	Cost of Equity
Historical Growth				
EPS	4.85	2.70	4.98	7.68
CFS	4.85	2.50	4.97	7.47
Projected Growth				
Zacks	4.85	4.17	5.05	9.22
Multex	4.85	4.36	5.06	9.42
Thomson	4.85	4.06	5.05	9.11
Value Line	4.85	5.25	5.10	10.35
Average Cost of Equity				**8.88**
Average Cost of Equity - Projected Growth Rates Only				**9.53**

Sources: proir exhibits

Electric
Multi-stage DCF Model

Company Name: Year	Ameren Corp. Growth	Div.	Cinergy Corp. Growth	Div.	DTE Energy Growth	Div.	Empire District Growth	Div.	FPL Group Growth	Div.	MGE Energy Growth	Div.	PNM Resources Growth	Div.	Progress Energy Growth	Div.	Southern Company Growth	Div.
2/17/04 Stock Price		-46.50		-38.92		-39.88		-23.23		-65.45		-31.50		-31.74		-46.35		-29.9
2003	0.00	2.56	2.20%	1.88	0.00	2.08	0.00	1.28	3.40%	2.40	0.70%	1.36	5.80%	0.92	3.70%	2.32	2.20%	1.40
2004	0.74%	2.58	2.54%	1.93	1.21%	2.11	1.21%	1.30	3.71%	2.49	2.03%	1.39	5.60%	0.97	3.72%	2.41	2.92%	1.44
2005	1.48%	2.62	2.88%	1.98	2.43%	2.16	2.42%	1.33	4.02%	2.59	3.35%	1.43	5.40%	1.02	3.74%	2.50	3.64%	1.49
2006	2.22%	2.68	3.21%	2.05	3.64%	2.23	3.62%	1.37	4.33%	2.70	4.68%	1.50	5.20%	1.08	3.75%	2.59	4.35%	1.56
2007	2.95%	2.75	3.55%	2.12	4.85%	2.34	4.83%	1.44	4.64%	2.83	6.00%	1.59	5.00%	1.13	3.77%	2.69	5.07%	1.64
2008	2.95%	2.84	3.55%	2.19	4.85%	2.46	4.83%	1.51	4.64%	2.96	6.00%	1.69	5.00%	1.19	3.77%	2.79	5.07%	1.72
2009	2.95%	2.92	3.55%	2.27	4.85%	2.58	4.83%	1.58	4.64%	3.09	6.00%	1.79	5.00%	1.25	3.77%	2.89	5.07%	1.81
2010	2.95%	3.01	3.55%	2.35	4.85%	2.70	4.83%	1.66	4.64%	3.24	6.00%	1.90	5.00%	1.31	3.77%	3.00	5.07%	1.90
2011	2.95%	3.09	3.55%	2.44	4.85%	2.83	4.83%	1.74	4.64%	3.39	6.00%	2.01	5.00%	1.37	3.77%	3.12	5.07%	2.00
2012	2.95%	3.19	3.55%	2.52	4.85%	2.97	4.83%	1.82	4.64%	3.55	6.00%	2.13	5.00%	1.44	3.77%	3.23	5.07%	2.10
2013	2.95%	3.28	3.55%	2.61	4.85%	3.11	4.83%	1.91	4.64%	3.71	6.00%	2.26	5.00%	1.52	3.77%	3.36	5.07%	2.20
2014	2.95%	3.38	3.55%	2.71	4.85%	3.26	4.83%	2.01	4.64%	3.88	6.00%	2.39	5.00%	1.59	3.77%	3.48	5.07%	2.31
2015	2.95%	3.48	3.55%	2.80	4.85%	3.42	4.83%	2.10	4.64%	4.06	6.00%	2.54	5.00%	1.67	3.77%	3.61	5.07%	2.43
2016	2.95%	3.58	3.55%	2.90	4.85%	3.59	4.83%	2.20	4.64%	4.25	6.00%	2.69	5.00%	1.75	3.77%	3.75	5.07%	2.56
2017	2.95%	3.68	3.55%	3.00	4.85%	3.76	4.83%	2.31	4.64%	4.45	6.00%	2.85	5.00%	1.84	3.77%	3.89	5.07%	2.68
PV of dividend perpetuity in 2018:		74.35		68.37		84.84		49.14		134.93		79.49		69.09		84.47		65.91
Internal Rate of Return:		8.1%		8.1%		9.5%		9.8%		8.1%		9.8%		7.8%		8.6%		9.4%
Average Internal Rate of Return:																		8.79%

Notes: The Current Dividend is the latest quarterly dividend times 4 from Schedule 37.

The 2003 rate of growth is the dividend growth rate achieved from 2002-2003 from Value Line.

The 2003 rate of growth converges on the 3-5 year growth forcast (the average of the Zacks, Multex, Thomson, and Value Line EPS for each company) in the year 2007 which is 4 years beyond the forecast date.

The formula for determining the PV of perpetual dividends equals [$D_{(Year)}(1+g)/(k-g)$] where k is the iteratively determined IRR and g is the growth rate.

Capital Asset Pricing Model Analysis
Average Value Line Betas
Electric

		Risk Free Rate (Rf)		Avg. Value Line Beta	Market Return (Km)		CAPM Estimated Cost of Equity
Rf	**Km**						
Long-term Current	Zacks	4.05%	(1)	0.66	13.6%	(6)	**10.35%**
Long-term Current	Value Line	4.05%		0.66	10.5%	(7)	**8.31%**
Long-term CBO Forecast	Zacks	5.00%	(2)	0.66	13.6%		**10.68%**
Long-term CBO Forecast	Value Line	5.00%		0.66	10.5%		**8.63%**
Long-term OMB Forecast	Zacks	4.90%	(3)	0.66	13.6%		**10.64%**
Long-term OMB Forecast	Value Line	4.90%		0.66	10.5%		**8.60%**
Long-term VL Forecast	Zacks	5.12%	(4)	0.66	13.6%		**10.72%**
Long-term VL Forecast	Value Line	5.12%		0.66	10.5%		**8.67%**
Long-term Conf. Bd. Forecast	Zacks	5.09%	(5)	0.66	13.6%		**10.71%**
Long-term Conf. Bd. Forecast	Value Line	5.09%		0.66	10.5%		**8.66%**
Average of CAPM Analysis:							**9.60%**

Notes: See CAPM Notes on Schedule 39.

Notes
CAPM Analysis

Risk Free Rates

1. Current 10-year constant maturity rate on February 19 @ 4.05% from Federal Reserve Statistical Releases H.15 (http://www.federalreserve.gov/releases/H15/).

2. Forecasted 10-year Treasury Note rate @ 5.0%, projected annual average 2004-2005, from Congressional Budget Office in CBO's Projections for 2004 through 2014 in Appendix E, Table E-1 released on January 26, 2004 (http://www.cbo.gov).

3. Forecasted 10-year Treasury Note rate @ 4.9% which is the average for the annual projected rates for the years 2006 through 2014 from Congressional Budget Office in CBO's Projections for 2004 through 2014 in Appendix E, Table E-1 released on January 26, 2004 (http://www.cbo.gov).

4. Forecasted 10-year Treasury Note rate @ 5.12% which is the average for the years 2003 through 2007 from Value Line Selection and Opinion, November 28, 2003, page 2617.

5. Forecasted 10-year Treasury Bond rate @ 5.09%, a 2004 annual rate, from The Conference Board, Straight Talk – Economics, February 2004 (http://www.conference-board.org/economics/stalk.cfm).

Market Returns

6. Projected S&P 5 year EPS growth estimate from Compuserve @ 12.0% plus the S&P 500 estimated dividend yield @ 1.6%)] from Zacks Company Report as of 10/31/03 for a 13.6% estimated market return.

7. Three to five year estimated median price appreciation potential of all 1700 stocks @ 40% plus the median of estimated dividend yields@ 1.7% from Value Line Summary and Index dated February 13, 2004. The computation was:
$\{[(1+.40)^{1/4}] - 1\} + 1.7\% = 10.5\%$.

Electric
Realized Return on Equity
Bond Yield - Equity Risk Premium

Company	Stock Price & Dividend	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003*
Ameren Corp.	High	38.80	44.62	39.50	42.00	44.12	43.75	44.31	42.93	46.93	46.00	45.25	48.34
	Low	31.80	35.75	30.75	34.62	36.00	34.50	35.56	32.00	27.56	36.53	34.72	37.87
	Mid-Range	35.30	40.19	35.13	38.31	40.06	39.13	39.94	37.47	37.25	41.27	39.99	43.11
	Dividend	2.26	2.33	2.40	2.46	2.51	2.54	2.54	2.54	2.54	2.54	2.54	2.54
	HPR		1.204	0.934	1.161	1.111	1.040	1.086	1.002	1.062	1.176	1.031	1.142
Cinergy Corp	High	26.58	29.62	27.75	31.12	34.25	39.12	39.87	34.87	35.25	35.60	37.19	39.23
	Low	22.25	23.87	20.75	23.37	27.60	32.00	30.81	23.43	20.00	28.00	25.40	31.05
	Mid-Range	24.42	26.75	24.25	27.25	30.93	35.56	35.34	29.15	27.63	31.80	31.30	35.14
	Dividend	1.65	1.68	1.39	1.72	1.74	1.80	1.80	1.80	1.80	1.80	1.80	1.88
	HPR		1.164	0.959	1.194	1.199	1.208	1.044	0.876	1.009	1.216	1.041	1.183
DTE Energy	High	35.25	37.12	30.25	34.87	37.25	34.75	40.25	44.88	41.31	47.13	47.70	44.95
	Low	30.25	29.87	24.25	25.75	27.62	26.12	33.43	31.06	28.43	33.12	33.05	34.00
	Mid-Range	32.75	33.50	27.25	30.31	32.44	30.44	36.84	37.97	34.87	40.13	40.38	39.48
	Dividend	1.98	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06
	HPR		1.086	0.875	1.188	1.138	1.002	1.278	1.087	0.973	1.210	1.058	1.029
Empire District	High	24.75	24.87	20.50	19.75	19.50	20.00	26.12	26.75	30.75	26.56	21.99	23.48
	Low	20.12	19.12	15.00	15.87	17.12	15.75	18.37	20.68	18.93	17.50	15.06	17.00
	Mid-Range	22.44	22.00	17.75	17.81	18.31	17.88	22.25	23.72	24.84	22.03	18.53	20.24
	Dividend	1.26	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28
	HPR		1.037	0.865	1.075	1.100	1.046	1.316	1.124	1.101	0.938	0.899	1.162
FPL Group	High	38.37	41.00	39.12	46.50	48.12	60.00	72.56	61.93	73.00	71.62	65.31	68.08
	Low	32.00	35.50	26.87	34.00	41.50	42.62	56.06	41.12	36.37	51.21	45.00	56.00
	Mid-Range	35.19	38.25	33.00	40.25	44.81	51.31	64.31	51.53	54.69	61.42	55.16	62.04
	Dividend	2.43	2.47	1.88	1.76	1.84	1.92	2.00	2.08	2.16	2.24	2.32	2.48
	HPR		1.157	0.912	1.273	1.159	1.188	1.292	0.834	1.103	1.164	0.936	1.170

Source: Standard & Poor's Stock Reports dated November 30, 2002. High/Low 1992 Stock Prices for Ameren and MGE from Value Line.

Notes: The average annual price is the mid-range of the high and low price for the year.

HPR (Holding period Return) = (price$_1$ + dividend$_1$)/price$_0$

* 2003 high/low stock price is for the 52 weeks ending February 23, 2004 from Yahoo Finance.

Electric
Realized Return on Equity
Bond Yield - Equity Risk Premium

Company	Stock Price & Dividend	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003*
MGE Energy	High	23.00	24.50	23.33	23.33	27.50	23.75	23.75	23.87	23.68	27.80	30.14	35.84
	Low	19.00	20.16	20.66	20.33	19.62	18.50	20.62	16.37	16.75	20.87	24.58	25.00
	Mid-Range	21.00	22.33	22.00	21.83	23.56	21.13	22.19	20.12	20.22	24.34	27.36	30.42
	Dividend	1.19	1.23	1.25	1.26	1.27	1.29	1.30	1.31	1.32	1.33	1.34	1.35
	HPR		1.122	1.041	1.050	1.137	0.951	1.112	0.966	1.070	1.270	1.179	1.161
PNM Resources	High	14.12	13.87	13.62	18.25	20.50	23.68	24.75	21.50	28.31	37.80	30.76	31.82
	Low	9.37	9.75	11.00	12.12	17.25	15.75	17.37	14.84	14.62	22.87	17.25	19.57
	Mid-Range	11.75	11.81	12.31	15.19	18.88	19.72	21.06	18.17	21.47	30.34	24.01	25.70
	Dividend	0.00	0.00	0.00	0.00	0.36	0.63	0.77	0.80	0.80	0.80	0.86	0.96
	HPR		1.006	1.042	1.234	1.267	1.078	1.107	0.901	1.225	1.451	0.820	1.110
Progress Energy	High	28.18	34.62	30.00	34.62	38.75	42.68	49.62	47.87	49.37	49.25	52.70	48.00
	Low	24.43	27.00	22.50	26.12	33.75	32.75	39.18	29.25	28.25	38.78	32.84	38.24
	Mid-Range	26.31	30.81	26.25	30.37	36.25	37.72	44.40	38.56	38.81	44.02	42.77	43.12
	Dividend	1.58	1.64	1.70	1.76	1.82	1.88	1.94	2.00	2.06	2.12	2.18	2.30
	HPR		1.234	0.907	1.224	1.254	1.092	1.229	0.914	1.060	1.189	1.021	1.062
Southern Company	High	19.56	23.62	22.06	25.00	25.87	26.25	31.56	29.62	35.00	35.72	31.14	32.00
	Low	15.18	18.43	17.00	19.37	21.12	19.87	23.93	22.06	20.37	20.89	23.22	27.60
	Mid-Range	17.37	21.03	19.53	22.19	23.50	23.06	27.75	25.84	27.69	28.31	27.18	29.80
	Dividend	1.10	1.14	1.18	1.22	1.26	1.30	1.34	1.34	1.34	1.34	1.35	1.40
	HPR		1.276	0.985	1.198	1.116	1.037	1.261	0.980	1.123	1.071	1.008	1.148

Source: Standard & Poor's Stock Reports dated November 30, 2002. High/Low 1992 Stock Prices for Ameren and MGE from Value Line.

Notes: The average annual price is the mid-range of the high and low price for the year.

HPR (Holding period Return) = (price$_1$ + dividend$_1$)/price$_0$

*2003 high/low stock price is for the 52 weeks ending February 23, 2004 from Yahoo Finance.

Electric
Realized Return on Equity
Bond Yield - Equity Risk Premium

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
One-year HPR Summary:											
Ameren Corp.	1.204	0.934	1.161	1.111	1.040	1.086	1.002	1.062	1.176	1.031	1.142
Cinergy Corp	1.164	0.959	1.194	1.199	1.208	1.044	0.876	1.009	1.216	1.041	1.183
DTE Energy	1.086	0.875	1.188	1.138	1.002	1.278	1.087	0.973	1.210	1.058	1.029
Empire District	1.037	0.865	1.075	1.100	1.046	1.316	1.124	1.101	0.938	0.899	1.162
FPL Group	1.157	0.912	1.273	1.159	1.188	1.292	0.834	1.103	1.164	0.936	1.170
MGE Energy	1.122	1.041	1.050	1.137	0.951	1.112	0.966	1.070	1.270	1.179	1.161
PNM Resources	1.006	1.042	1.234	1.267	1.078	1.107	0.901	1.225	1.451	0.820	1.110
Progress Energy	1.234	0.907	1.224	1.254	1.092	1.229	0.914	1.060	1.189	1.021	1.062
Southern Company	1.276	0.985	1.198	1.116	1.037	1.261	0.980	1.123	1.071	1.008	1.148
One-year Treasury											
Constant Maturity HPR:	1.034	1.053	1.059	1.055	1.056	1.051	1.051	1.061	1.035	1.020	1.024
One-year HPY Risk Premiums:											
Ameren Corp.	0.170	-0.119	0.101	0.056	-0.016	0.035	-0.049	0.001	0.141	0.011	0.118
Cinergy Corp	0.130	-0.095	0.135	0.144	0.152	-0.006	-0.175	-0.052	0.181	0.021	0.159
DTE Energy	0.051	-0.178	0.154	0.083	-0.054	0.228	0.036	-0.088	0.175	0.038	0.005
Empire District	0.003	-0.188	0.016	0.045	-0.010	0.266	0.073	0.040	-0.096	-0.121	0.138
FPL Group	0.123	-0.141	0.214	0.104	0.132	0.242	-0.217	0.042	0.129	-0.084	0.146
MGE Energy	0.088	-0.012	-0.010	0.082	-0.105	0.061	-0.085	0.009	0.235	0.159	0.137
PNM Resources	-0.029	-0.011	0.174	0.212	0.022	0.057	-0.150	0.164	0.416	-0.200	0.086
Progress Energy	0.199	-0.146	0.165	0.198	0.036	0.178	-0.137	-0.001	0.154	0.001	0.038
Southern Company	0.242	-0.068	0.139	0.061	-0.019	0.211	-0.071	0.062	0.036	-0.012	0.124
Average HPY Risk Premium:	0.109	-0.107	0.121	0.109	0.015	0.141	-0.086	0.020	0.152	-0.021	0.106
Average HPR Risk Premium:	1.109	0.893	1.121	1.109	1.015	1.141	0.914	1.020	1.152	0.979	1.106

Notes: Summary is from pages 1 and 2.
One-year constant maturity yields on Treasury Securities from Federal Reserve, www.federalreserve.gov
One-year HPY Risk Premiums are the one-year company HPR minus the 1-year constant maturity T-bond yields.
Average HPR Risk Premium = 1 + Average HPY Risk Premium.

Electric
Return Relative Risk Premiums
All Possible Combinations of Annual Returns on Portfolio

Investment made at end of:	Return Relative at the End of the Year:										
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
1992	1.1086	0.995	1.035	1.053	1.046	1.061	1.039	1.036	1.049	1.041	1.047
1993		0.893	1.001	1.036	1.031	1.052	1.027	1.026	1.041	1.034	1.041
1994			1.121	1.115	1.081	1.096	1.056	1.050	1.064	1.053	1.059
1995				1.109	1.061	1.087	1.041	1.037	1.055	1.044	1.051
1996					1.015	1.076	1.019	1.019	1.045	1.033	1.043
1997						1.141	1.021	1.021	1.052	1.037	1.048
1998							0.914	0.965	1.024	1.013	1.031
1999								1.020	1.084	1.048	1.062
2000									1.152	1.062	1.076
2001										0.979	1.040
2002											1.106
Sum	1.1086	1.889	3.157	4.314	5.233	6.513	7.118	8.175	9.566	10.345	11.605
Average	1.1086	0.9444	1.0524	1.0784	1.047	1.0855	1.0168	1.022	1.0629	1.0345	1.055

Average Return Relative Risk Premium: **1.0461**

Average Return Risk Premium: **4.61%**

Note: Investment is assumed to be made at first of the year and return is realized at end of year.
Return relative is the HPR (1+HPY).
Return risk premium is HPR - 1.

Value Line Companies
Classified as Gas Distribution Utilities

Company Name	Date of Value Line Report	Financial Strength Rating	Price Earnings Ratio
Nicor Inc.	12/19/03	A	17.1
Peoples Energy	12/19/03	A	14.6
Cascade Natural Gas	12/19/03	B	15.9
Southern Union	12/19/03	B	13.4
Southwest Gas	12/19/03	B	14.8
Atmos Energy Corp	12/19/03	B+	14.4
Laclede Group	12/19/03	B+	15.8
NUI Corp.	12/19/03	B+	17.6
UGI Corp.	12/19/03	B+	14.0
AGL Resources	12/19/03	B++	14.2
Energen Corp.	12/19/03	B++	13.2
Keyspan Corp.	12/19/03	B++	13.6
New Jersey Resources	12/19/03	B++	15.8
Northwest Natural Gas	12/19/03	B++	15.8
Piedmont Natural Gas	12/19/03	B++	17.8
South Jersey Industries	12/19/03	B++	14.5
SEMCO Energy, Inc.	12/19/03	C++	22.7

Note: Sorted by Financial Strength Rating letter assignment.

Company Selection
Value Line Companies
Classified as Gas Distribution Utilities
Eliminated Companies

Company	Reason for Elimination

Financial Strength Rating of C++ or lower:
SEMCO Energy   C++

Stock Purchase NOT Recommended by Value Line:
NUI   "... most investors should avoid this stock."
Nicor Inc.   "Nonetheless, there are better choices in the LDC group."
Southwest Gas   "In our opinion, investors should look elsewhere for now."

Companies that have recently sold or purchased major assets:
Laclede Group   Purchased SM&P for $43 million - 7.1% '03 tot. cap.
Piedmont Natural Gas Completed purchase of NCNG - 38% of '03 tot. cap.
Southern Union   Completed merger with Valley Resources, Fall River Gas, and Providence Energy
                      in Sept. 2000. Sold Southern Union Gas Co. in Jan. 2003.

Other:
UGI Corp.   Gas utitility ~ 51% total income.
Keyspan Corp.   Company has a 32% equity ratio and a 53% gas to total revenues ratio.

Capitalization
Candidate Companies

Company Name	Short-term Debt	Long-term Debt	Preferred Stock	Common Equity	Total
AGL Resources (2)	388,600	767,000	0	710,100	1,865,700
Atmos Energy Corp.(1)	118,595	863,918	0	857,517	1,840,030
Cascade Natural Gas(2)	0	164,930	0	114,181	279,111
Energen Corp.(2)	113,000	512,954	0	582,810	1,208,764
New Jersey Resources (1)	185,800	257,899	0	418,941	862,640
Northwest Natural Gas (2)	69,802	445,945	8,250	483,103	1,007,100
Peoples Energy Corp.(1)	287,871	554,014	0	806,324	1,648,209
South Jersey Industries (2)	166,500	238,016	0	237,792	642,308
LG&E Gas	23,794 *	126,606	11,176	143,851	305,428

Source: Compact Disclosure, January 2003 Disk. LG&E Gas from Testimony, Rives, Exhibit 2, page 1, per books, 9/30/03 column 4 which was allocated for rate base percentage.

* includes A/R Securitization

Note: Short-term debt does not include current portion long-term debt
(1) Fiscal Year ending September 30, 2003.
(2) Calendar Year ending December 31, 2003.

Capital Structures
Selected Companies
2002

Company Name	Short-term Debt	Long-term Debt	Preferred Stock	Common Equity	Total
AGL Resources (2)	20.8%	41.1%	0.0%	38.1%	100.0%
Atmos Energy Corp.(1)	6.4%	47.0%	0.0%	46.6%	100.0%
Cascade Natural Gas(2)	0.0%	59.1%	0.0%	40.9%	100.0%
Energen Corp.(2)	9.3%	42.4%	0.0%	48.2%	100.0%
New Jersey Resources (1)	21.5%	29.9%	0.0%	48.6%	100.0%
Northwest Natural Gas (2)	6.9%	44.3%	0.8%	48.0%	100.0%
Peoples Energy Corp.(1)	17.5%	33.6%	0.0%	48.9%	100.0%
South Jersey Industries (2)	25.9%	37.1%	0.0%	37.0%	100.0%
Average	13.6%	41.8%	0.1%	44.5%	100.0%
Louisville Gas	7.8% *	41.5%	3.7%	47.1%	100.0%

Source: Prior Exhibit
   * Includes A/R Securitization

Cash Flow Summary

Company Name	Average Cash Flow Coverage of:			
	Interest	Dividends	Investing Activities	Quality of Earnings
AGL Resources	3.44	4.16	1.36	2.24
Atmos Energy Corp.	3.90	3.50	1.05	2.84
Cascade Natural Gas	2.09	1.32	0.69	1.44
Energen Corp.	4.45	6.42	0.70	4.48
New Jersey Resources	5.80	3.83	1.39	1.14
Northwest Natural Gas	3.87	3.08	1.15	2.13
Peoples Energy	5.99	4.12	11.91	2.83
South Jersey Gas	3.44	3.82	0.86	1.92
Average	4.12	3.78	1.03 *	2.38
LG&E (includes elec.)	8.36	6.65	1.05	2.55

Source: Schedule 19 through 29.

* Average Cash Flow Coverage of Investing Activities excludes Peoples Energy.

Cash Flow Analysis
AGL Resources
(thousands of dollars)

	2001*	2002*	Average
Cash Flow from Operating Activities	151,600	285,500	218,550
Cash Flow from Investing Activities	(160,500)	(160,400)	(160,450)
Cash Flow from Financing Activities	(22,000)	(124,000)	(73,000)
Change in Cash Flow	(30,900)	1,100	(14,900)
Cash Flow Coverage of Interest	2.56	4.32	3.44
Cash Flow Coverage of Total Dividends	2.96	5.37	4.16
Cash flow Coverage of Investing Activities	0.94	1.78	1.36
Quality of Earnings	1.71	2.77	2.24

Source: January 2004 Compact Disclosure

* 2001 year ended September 30; 2002 year ended December 31.

Cash Flow Analysis
Atmos Energy Corp.
(thousands of dollars)

	2002*	2003*	Average
Cash Flow from Operating Activities	297,395	49,451	173,423
Cash Flow from Investing Activities	(158,235)	(233,385)	(195,810)
Cash Flow from Financing Activities	(106,432)	151,626	22,597
Change in Cash Flow	32,728	(32,308)	210
Cash Flow Coverage of Interest	6.03	1.78	3.90
Cash Flow Coverage of Total Dividends	6.11	0.89	3.50
Cash flow Coverage of Investing Activities	1.88	0.21	1.05
Quality of Earnings	4.99	0.69	2.84

Source: January 2004 Compact Disclosure

* Fiscal Year ending September 30

Cash Flow Analysis
Cascade Natural Gas Corp.
(thousands of dollars)

	2002*	2003*	Average
Cash Flow from Operating Activities	(7,996)	36,004	14,004
Cash Flow from Investing Activities	(21,549)	(20,551)	(21,050)
Cash Flow from Financing Activities	27,835	(12,187)	7,824
Change in Cash Flow	(1,710)	3,266	778
Cash Flow Coverage of Interest	0.21	3.96	2.09
Cash Flow Coverage of Total Dividends	-0.75	3.40	1.32
Cash flow Coverage of Investing Activities	-0.37	1.75	0.69
Quality of Earnings	-0.46	3.35	1.44

Source: January 2004 Compact Disclosure

* Fiscal Year ending September 30.

Cash Flow Analysis
Energen Corp.
(thousands of dollars)

	2002*	2003*	Average
Cash Flow from Operating Activities	21,361	213,507	117,434
Cash Flow from Investing Activities	(35,681)	(268,222)	(151,952)
Cash Flow from Financing Activities	15,469	53,037	34,253
Change in Cash Flow	1,149	(1,678)	(265)
Cash Flow Coverage of Interest	3.01	5.88	4.45
Cash Flow Coverage of Total Dividends	3.91	8.92	6.42
Cash flow Coverage of Investing Activities	0.60	0.80	0.70
Quality of Earnings	5.84	3.11	4.48

Source: January 2004 Compact Disclosure

* Fiscal Year ending December 31.

Cash Flow Analysis
New Jersey Resources
(thousands of dollars)

	2002*	2003*	Average
Cash Flow from Operating Activities	49,765	92,136	70,951
Cash Flow from Investing Activities	(43,448)	(56,529)	(49,989)
Cash Flow from Financing Activities	(9,079)	(35,050)	(22,065)
Change in Cash Flow	(2,762)	557	(1,103)
Cash Flow Coverage of Interest	4.01	7.58	5.80
Cash Flow Coverage of Total Dividends	4.37	3.30	3.83
Cash flow Coverage of Investing Activities	1.15	1.63	1.39
Quality of Earnings	0.88	1.41	1.14

Source: January 2004 Compact Disclosure

* Fiscal Year ending September 30.

Cash Flow Analysis
Northwest Natural Gas Co
(thousands of dollars)

	2001*	2002*	Average
Cash Flow from Operating Activities	71,521	123,827	97,674
Cash Flow from Investing Activities	(87,269)	(84,127)	(85,698)
Cash Flow from Financing Activities	14,905	(42,812)	(13,954)
Change in Cash Flow	(843)	(3,112)	(1,978)
Cash Flow Coverage of Interest	3.12	4.63	3.87
Cash Flow Coverage of Total Dividends	2.28	3.87	3.08
Cash flow Coverage of Investing Activities	0.82	1.47	1.15
Quality of Earnings	1.43	2.83	2.13

Source: January 2004 Compact Disclosure

* Fiscal Year ending December 31.

Cash Flow Analysis
Peoples Energy Corp.
(thousands of dollars)

	2002*	2003*	Average
Cash Flow from Operating Activities	328,092	205,779	266,936
Cash Flow from Investing Activities	(14,512)	(169,499)	(92,006)
Cash Flow from Financing Activities	(373,313)	(28,065)	(200,689)
Change in Cash Flow	(59,733)	8,215	(25,759)
Cash Flow Coverage of Interest	6.81	5.16	5.99
Cash Flow Coverage of Total Dividends	5.88	2.37	4.12
Cash flow Coverage of Investing Activities	22.61	1.21	11.91
Quality of Earnings	3.68	1.98	2.83

Source: January 2004 Compact Disclosure

* Fiscal Year ending September 30.

Cash Flow Analysis
South Jersey Gas Co.
(thousands of dollars)

	2001*	2002*	Average
Cash Flow from Operating Activities	15,081	72,560	43,821
Cash Flow from Investing Activities	(49,486)	(51,370)	(50,428)
Cash Flow from Financing Activities	32,966	(20,886)	6,040
Change in Cash Flow	(1,439)	304	(568)
Cash Flow Coverage of Interest	1.75	5.13	3.44
Cash Flow Coverage of Total Dividends	0.86	6.78	3.82
Cash flow Coverage of Investing Activities	0.30	1.41	0.86
Quality of Earnings	0.71	3.13	1.92

Source: January 2004 Compact Disclosure

* Fiscal Year ending December 31.

Cash Flow Analysis
Louisville Gas & Electric Co.*
(thousands of dollars)

	2001	2002	Average
Cash Flow from Operating Activities	292,138	209,350	250,744
Cash Flow from Investing Activities	(253,795)	(220,004)	(236,900)
Cash Flow from Financing Activities	(38,726)	25,557	(6,585)
Change in Cash Flow	(383)	14,903	7,260
Cash Flow Coverage of Interest	8.70	8.02	8.36
Cash Flow Coverage of Total Dividends	10.44	2.86	6.65
Cash flow Coverage of Investing Activities	1.15	0.95	1.05
Quality of Earnings	2.74	2.35	2.55

Source: 2002 FERC Form 2 and same as 2002 FERC Form 1
* Total Company

Accounting/Financial Measures
Selected Companies

Company Name	Total Asset Size (000)	2000-2002 Average Sales to Plant & Equipment	Sales to Total Assets
AGL Resources	3,232,667	0.43	0.26
Atmos Energy Corp.	2,178,691	1.47	0.93
Cascade Natural Gas	353,417	1.02	0.84
Energen Corp.	1,324,763	0.43	0.34
New Jersey Resources	1,383,661	2.72	1.55
Northwest Natural Gas	1,352,175	0.63	0.45
Peoples Energy	2,876,110	1.10	0.68
South Jersey Industries	858,600	0.76	0.52
Average	1,695,010	1.07	0.70
LG&E includes elec.	316,046 *	0.90 **	0.85 ***

Source: Compac Disclosure January 2004 disc.

*   LG&E data for total company is $2,411,839. The gas distributio rate
     base is $316,046, Rives, Exhibit 3, page 1.

**   Sales to Plant and Equipment for LG&E is computed from 2002 gas
     revenues (FERC Form 2, page 114, col g) divided by Gas Net Utility
     Plant (FERC Form 2, page 201, col d, line 15.)

*** Sales to Total Assets is computed from 2002 gas revenues (FERC
     Form 2, page 114, col d) divided by Gas Rate Base.

Debt Measures
Selected Companies

Company Name	Moody's Bond Ratings	2000-2002 Average Times Interest Earned
AGL Resources	Baa1	2.73
Atmos Energy Corp.	A3	8.49
Cascade Natural Gas	Baa1	3.09
Energen Corp.	Baa1	2.22
New Jersey Resources	nr	6.90
Northwest Natural Gas	A2	3.16
Peoples Energy	A3	3.59
South Jersey Gas	Baa1	3.15
Average	Baa1-A2	4.17
LG&E - electric & gas	A1	5.46

Source: Mergent's 2003 Public Utility Manual Compac Disclosure
January 2004 Disc.

Value Line Measures
Selected Companies

Company Name	(1) Stock Price Stability	(2) Safety Rating	(3) Beta
AGL Resources	100	2	0.75
Atmos Energy Corp.	96	3	0.65
Cascade Natural Gas	90	3	0.70
Energen Corp.	80	2	0.70
New Jersey Resources	100	2	0.70
Northwest Natural Gas	100	2	0.60
Peoples Energy	100	1	0.75
South Jersey Industries	100	2	0.55
Average	96	2	0.68

Source: Value Line, December 19, 2003.

(1) Stock Price Stability: 100 is the most stable and 0 is the least stable.

(2) Safety Rank: 1 is the safest and 5 is the least safe.

(3) Beta: 1=market. A beta less than 1 indicates that a stock's price rises or falls less than the average market price rises or falls. A Beta greater than 1 indicates that the stock's price rises or falls greater than the average market price rises or falls.

Standard and Poor's Measures
Selected Companies

Company Name	(1) Outlook	(2) Relative Strength Rank	(3) Beta
AGL Resources	4-	37	0.24
Atmos Energy Corp.	3-	32	0.01
Cascade Natural Gas	3	34	0.08
Energen Corp.	2-	58	0.09
New Jersey Resources	1-	48	0.04
Northwest Natural Gas	4	47	-0.22
Peoples Energy	2-	24	-0.07
South Jersey Industries	3-	42	0.08
Average*	3	40	0.03

Source: Standard and Poor's Stock Reports, November 29, 2003
 * To calculate the average for Outlook, the numbers with a minus value
    were reduced by 0.01. For example, 2- is treated as 1.99.

(1) Outlook: 1 is the lowest, 5 is the highest.

(2) Relative Strength Rank: 1 is the lowest, 99 is the highest.

(3) Beta: 1=market; A Beta less than 1 indicates that the stock's price rises
     or falls less than the average market price rises or falls. A Beta
     greater than 1 indicates that the stock's price rises or falls greater
     than the average market price rises or falls.

EPS Historical Growth Rates
Selected Companies

Company Name	1993 EPS	2003 EPS	Compound Growth Rate
AGL Resources	1.08	2.00	6.4%
Atmos	1.19	1.71	3.7%
Cascade Natural Gas	1.05	0.87	-1.9%
Energen Corp.	0.89	3.10	13.3%
New Jersey Resources	1.15	2.38	7.5%
Northwest Natural Gas	1.74	1.75	0.1%
Peoples Energy	2.11	2.87	3.1%
South Jersey Industries	1.55	2.65	5.5%
Average	1.35	2.17	5.7% *

Source: Value Line, December 19, 2003.
2003 EPS are estimates which provide information known near the
    date of publication.

* Average excludes Cascade

CFS Historical Growth Rates
Selected Companies

Company Name	1993 CFS	2003 CFS	Compound Growth Rate
AGL Resources	2.25	3.45	4.4%
Atmos	2.39	3.25	3.1%
Cascade Natural Gas	2.04	2.25	1.0%
Energen Corp.	2.10	6.25	11.5%
New Jersey Resources	2.14	3.55	5.2%
Northwest Natural Gas	3.74	3.80	0.2%
Peoples Energy	3.85	5.85	4.3%
South Jersey Industries	3.08	4.45	3.7%
Average	2.70	4.11	4.17%

Source: Value Line, December 19, 2003.
2003 CFS are estimates which provide information known near the date of publication.

EPS Growth Forecasts
Selected Companies

Company Name	Zacks EPS	Multex Investor EPS	Thomson Investor Network EPS	Value Line EPS	Average
AGL Resources	5.00%	5.00%	5.00%	6.5%	5.38%
Atmos	6.00%	5.80%	5.00%	7.5%	6.08%
Cascade Natural Gas	na	5.00%	4.00%	4.5%	4.50%
Energen	7.20%	7.00%	7.00%	nmf	7.07%
New Jersey Resources	5.30%	5.50%	6.50%	8.0%	6.33%
Northwest Natural Gas	4.20%	4.88%	4.50%	5.0%	4.65%
Peoples Energy	4.00%	5.33%	5.00%	4.0%	4.58%
South Jersey Industries	4.00%	5.00%	5.00%	6.5%	5.13%
Average	5.1%	5.4%	5.3%	6.0%	5.5%

Source: Compact Disclosure Reports from January 2004 Disc.
Multex from Reuters Investor Earnings Estimates, 2/18/04;
Thomson from Yahoo Finance 2/18/04.
Value Line dated December 19, 2003.

Weekly Stock Prices and Dividend Yields
Gas Comparison Companies

Company Name: Week Beginning	AGL Resources	Atmos Energy Corp	Cascade Natural Gas	Energen Corp	New Jersey Resources	Northwest Natural Gas	Peoples Energy	South Jersey Gas
				Adjusted Closing Stock Prices				
09/19/03	27.81	23.95	19.37	36.36	36.93	28.56	41.70	38.82
09/22/03	27.77	23.52	18.99	35.32	35.74	28.25	41.12	37.49
09/29/03	28.41	24.39	19.27	37.85	37.11	29.63	41.92	38.26
10/06/03	27.75	24.17	19.82	37.62	37.15	29.31	41.34	38.84
10/13/03	27.38	24.34	19.40	36.85	36.38	29.09	40.50	38.66
10/20/03	26.81	23.95	19.42	36.19	35.89	28.11	39.94	37.60
10/27/03	27.60	24.19	19.30	36.53	37.52	28.70	39.94	37.54
11/03/03	27.94	24.12	20.14	37.89	38.01	29.79	39.56	38.25
11/10/03	28.21	24.37	20.04	37.29	37.52	29.90	39.62	38.25
11/17/03	27.32	24.35	19.78	37.74	37.02	29.69	38.61	38.13
11/24/03	28.13	24.65	19.79	38.77	38.07	30.19	39.70	38.99
12/01/03	28.17	24.59	20.04	38.55	37.69	29.69	39.84	38.91
12/08/03	28.55	24.58	20.88	39.18	38.60	29.94	40.69	39.78
12/15/03	28.85	24.15	20.30	40.33	38.18	30.15	41.70	39.99
12/22/03	28.92	24.81	21.09	41.14	39.07	30.75	41.90	40.28
12/29/03	28.71	24.73	20.98	41.05	38.78	30.36	41.95	40.42
01/05/04	28.59	24.55	22.74	42.84	38.13	30.03	41.47	40.88
01/12/04	29.03	24.59	22.13	42.79	38.41	30.30	41.95	40.80
01/20/04	29.50	25.46	22.42	44.51	38.90	31.41	42.76	41.32
01/26/04	29.08	25.60	21.87	42.81	38.59	30.80	42.46	41.16
02/02/04	28.64	25.24	22.22	42.59	39.59	30.79	43.14	41.30
02/09/04	28.68	26.18	21.50	42.56	38.80	31.17	43.18	41.77
02/17/04	28.30	26.44	22.23	42.41	39.45	31.28	43.30	41.85
Avg. Prices:	28.267	24.649	20.597	39.529	37.893	29.908	41.230	39.534
Dividend Rate:	1.12	1.20	0.96	0.72	1.28	1.28	2.12	1.60
Dividend Yields:	3.96%	4.87%	4.66%	1.82%	3.38%	4.28%	5.14%	4.05%

Selected Companies Avg. Div. Yield: **4.02%**

Source: YAHOO! Finance, Historical Quotes, February 18, 2004; the Dividend Rate is
the latest quarterly dividend multiplied times 4.

Gas
Constant Growth DCF Cost of Equity
Selected Companies

Company Name	Dividend Yield	Growth Rate	Expected Dividend Yield	Cost of Equity
Historical Growth				
EPS	4.02	5.70	4.25	9.95
CFS	4.02	4.17	4.19	8.36
Projected Growth				
Zacks	4.02	5.10	4.23	9.33
Multex	4.02	5.40	4.24	9.64
Thomson	4.02	5.30	4.23	9.53
Value Line	4.02	6.00	4.26	10.26
Average Cost of Equity				**9.51**
Average Cost of Equity - Projected Growth Rates Only				**9.69**

Sources: proir exhibits

Gas
Multi-stage DCF Model

Company		AGL Resources		Atmos Energy		Cascade Natural Gas		Energen Corp.		New Jersey Resources		Northwest Natural Gas		Peoples Energy		South Jersey Industries	
Name:	Year	Growth	Div.	Growth	Div.	Growth	Div.	Growth	Div.	Growth	Div.	Growth	Div.	Growth	Div.	Growth	Div.
2/17/04																	
Stock Price			-28.30		-26.44		-22.23		-42.41		-39.45		-31.28		-43.30		-41.85
	2003	2.80%	1.12	1.70%	1.20	0.00%	0.96	2.80%	0.72	2.50%	1.28	0.80%	1.28	2.40%	2.12	3.30%	1.60
	2004	0.74%	1.13	2.80%	1.23	1.13%	0.97	3.87%	0.75	3.46%	1.32	1.76%	1.30	2.95%	2.18	3.76%	1.66
	2005	1.48%	1.14	3.89%	1.28	2.25%	0.99	4.94%	0.78	4.42%	1.38	2.73%	1.34	3.49%	2.26	4.22%	1.73
	2006	2.22%	1.17	4.99%	1.35	3.38%	1.03	6.00%	0.83	5.37%	1.46	3.69%	1.39	4.04%	2.35	4.67%	1.81
	2007	5.38%	1.23	6.08%	1.43	4.50%	1.07	7.07%	0.89	6.33%	1.55	4.65%	1.45	4.58%	2.46	5.13%	1.90
	2008	5.38%	1.30	6.08%	1.51	4.50%	1.12	7.07%	0.95	6.33%	1.65	4.65%	1.52	4.58%	2.57	5.13%	2.00
	2009	5.38%	1.37	6.08%	1.61	4.50%	1.17	7.07%	1.02	6.33%	1.75	4.65%	1.59	4.58%	2.69	5.13%	2.10
	2010	5.38%	1.44	6.08%	1.70	4.50%	1.22	7.07%	1.09	6.33%	1.86	4.65%	1.66	4.58%	2.81	5.13%	2.21
	2011	5.38%	1.52	6.08%	1.81	4.50%	1.28	7.07%	1.17	6.33%	1.98	4.65%	1.74	4.58%	2.94	5.13%	2.33
	2012	5.38%	1.60	6.08%	1.92	4.50%	1.34	7.07%	1.25	6.33%	2.11	4.65%	1.82	4.58%	3.07	5.13%	2.44
	2013	5.38%	1.69	6.08%	2.03	4.50%	1.40	7.07%	1.34	6.33%	2.24	4.65%	1.91	4.58%	3.21	5.13%	2.57
	2014	5.38%	1.78	6.08%	2.16	4.50%	1.46	7.07%	1.44	6.33%	2.38	4.65%	2.00	4.58%	3.36	5.13%	2.70
	2015	5.38%	1.88	6.08%	2.29	4.50%	1.52	7.07%	1.54	6.33%	2.53	4.65%	2.09	4.58%	3.52	5.13%	2.84
	2016	5.38%	1.98	6.08%	2.43	4.50%	1.59	7.07%	1.65	6.33%	2.69	4.65%	2.19	4.58%	3.68	5.13%	2.99
	2017	5.38%	2.08	6.08%	2.58	4.50%	1.67	7.07%	1.76	6.33%	2.86	4.65%	2.29	4.58%	3.85	5.13%	3.14
PV of dividend perpetuity in 2018:			65.13		67.12		45.20		127.59		104.58		64.69		88.58		93.77
Internal Rate of Return:		8.8%		10.1%		8.4%		8.6%		9.2%		8.4%		9.1%		8.7%	
Average Internal Rate of Return:		**8.92%**															

Notes: The Current Dividend is the latest quarterly dividend times 4 from Schedule 37.

The 2003 rate of growth is the dividend growth rate achieved from 2002-2003 from Value Line.

The 2003 rate of growth converges on the 3-5 year growth forcast (the average of the Zacks, Multex, Thomson, and Value Line EPS for each company) in the year 2007 which is 4 years beyond the forecast date.

The formula for determining the PV of perpetual dividends equals [$D_{(Year)}(1+g)/(k-g)$] where k is the iteratively determined IRR and g is the growth rate.

Capital Asset Pricing Model Analysis
Average Value Line Betas
Gas

		Risk Free Rate (Rf)		Avg. Value Line Beta	Market Return (Km)		CAPM Estimated Cost of Equity
Rf	*Km*						
Long-term Current	Zacks	4.05%	(1)	0.68	13.6%	(6)	**10.54%**
Long-term Current	Value Line	4.05%		0.68	10.5%	(7)	**8.44%**
Long-term CBO Forecast	Zacks	5.00%	(2)	0.68	13.6%		**10.85%**
Long-term CBO Forecast	Value Line	5.00%		0.68	10.5%		**8.74%**
Long-term OMB Forecast	Zacks	4.90%	(3)	0.68	13.6%		**10.82%**
Long-term OMB Forecast	Value Line	4.90%		0.68	10.5%		**8.71%**
Long-term VL Forecast	Zacks	5.12%	(4)	0.68	13.6%		**10.89%**
Long-term VL Forecast	Value Line	5.12%		0.68	10.5%		**8.78%**
Long-term Conf. Bd. Forecast	Zacks	5.09%	(5)	0.68	13.6%		**10.88%**
Long-term Conf. Bd. Forecast	Value Line	5.09%		0.68	10.5%		**8.77%**
Average of CAPM Analysis:							**9.74%**

Notes: See CAPM Notes on Schedule 39.

Gas
Realized Return on Equity
Bond Yield - Equity Risk Premium

Company	Stock Price & Dividend	1992**	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003*
AGL Resources	High	19.50	21.25	19.43	20.00	22.00	21.62	23.37	23.37	23.18	24.50	25.00	30.63
	Low	15.13	17.00	14.56	14.87	17.12	17.75	17.68	15.56	15.50	18.95	17.25	22.03
	Mid-Range	17.31	19.13	17.00	17.44	19.56	19.69	20.53	19.47	19.34	21.73	21.13	26.33
	Dividend	1.03	1.04	1.04	1.04	1.07	1.08	1.08	1.08	1.08	1.08	1.08	1.12
	HPR		1.165	0.943	1.087	1.183	1.062	1.098	1.001	1.049	1.179	1.022	1.299
Atmos Energy	High	15.88	20.25	23.00	31.00	27.87	32.25	33.00	26.25	25.75	24.55	25.50	26.70
	Low	12.63	15.87	16.12	20.87	22.12	24.75	19.62	14.25	19.45	17.56	20.85	20.85
	Mid-Range	14.25	18.06	19.56	25.94	25.00	28.50	26.31	20.25	22.60	21.06	23.18	23.78
	Dividend	0.83	0.88	0.92	0.96	1.01	1.06	1.11	1.14	1.16	1.18	1.20	1.22
	HPR		1.329	1.134	1.375	1.003	1.183	0.962	0.813	1.173	0.984	1.158	1.079
Cascade Natural Gas	High	17.00	18.12	17.50	17.50	19.00	18.68	19.75	20.87	22.80	24.17	20.75	23.05
	Low	13.63	12.75	13.00	13.32	15.25	14.62	14.37	13.37	17.37	15.50	18.00	18.00
	Mid-Range	15.31	15.44	15.25	15.41	17.13	16.65	17.06	17.12	20.09	19.84	19.38	20.53
	Dividend	0.93	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
	HPR		1.071	1.050	1.073	1.174	1.028	1.082	1.060	1.229	1.035	1.025	1.109
Energen Corp.	High	9.60	13.37	11.93	12.56	15.62	20.62	22.50	21.25	33.56	40.25	29.99	44.72
	Low	7.50	9.06	9.62	10.06	10.87	14.50	15.12	13.12	14.68	21.50	21.65	29.42
	Mid-Range	8.55	11.22	10.78	11.31	13.25	17.56	18.81	17.19	24.12	30.88	25.82	37.07
	Dividend	0.51	0.53	0.55	0.57	0.59	0.61	0.63	0.65	0.67	0.69	0.71	0.74
	HPR		1.374	1.010	1.103	1.223	1.372	1.107	0.948	1.443	1.309	0.859	1.464

Source: Standard & Poor's Stock Reports dated November 30, 2002.

Notes: The average annual price is the mid-range of the high and low price for the year.

HPR (Holding period Return) = (price$_1$ + dividend$_1$)/price$_0$

* 2003 high/low stock price is for the 52 weeks ending February 23, 2004 from Yahoo Finance.

**1992 high/low data from Value Line

Gas
Realized Return on Equity
Bond Yield - Equity Risk Premium

Company	Stock Price & Dividend	1992**	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003*
New Jersey Resources	High	16.80	18.25	20.33	19.91	28.00	26.83	27.41	29.75	32.53	33.60	39.25	40.00
	Low	12.20	13.16	14.33	17.75	18.75	21.00	22.41	24.12	24.84	24.35	30.01	31.55
	Mid-Range	14.50	15.71	17.33	18.83	23.38	23.92	24.91	26.94	28.69	28.98	34.63	35.78
	Dividend	1.01	1.01	1.01	1.03	1.07	1.09	1.12	1.15	1.17	1.20	1.24	1.30
	HPR		1.153	1.168	1.146	1.298	1.070	1.088	1.127	1.108	1.052	1.238	1.071
Northwest Natural Gas	High	22.70	25.83	24.33	22.83	25.87	31.37	30.75	27.87	27.50	26.75	30.70	31.97
	Low	17.20	19.00	18.83	18.33	20.83	23.00	24.25	19.50	17.75	21.65	23.46	24.13
	Mid-Range	19.95	22.42	21.58	20.58	23.35	27.19	27.50	23.69	22.63	24.20	27.08	28.05
	Dividend	1.15	1.17	1.17	1.18	1.20	1.21	1.22	1.23	1.24	1.25	1.26	1.30
	HPR		1.182	1.015	1.008	1.193	1.216	1.056	0.906	1.008	1.125	1.171	1.084
Peoples Energy	High	31.63	32.12	32.00	37.37	39.87	40.12	40.25	46.93	44.62	40.45	45.25	45.25
	Low	24.38	23.31	24.25	29.62	31.25	32.12	31.75	26.18	34.35	27.80	34.93	34.93
	Mid-Range	28.00	27.72	28.13	33.50	35.56	36.12	36.00	36.56	39.49	34.13	40.09	40.09
	Dividend	1.76	1.80	1.80	1.83	1.87	1.91	1.95	1.99	2.03	2.07	2.11	2.16
	HPR		1.054	1.080	1.256	1.117	1.069	1.051	1.071	1.136	0.917	1.237	1.054
South Jersey Industries	High	23.13	27.50	24.00	23.50	24.62	30.50	30.75	30.75	30.12	34.10	36.65	41.57
	Low	19.13	21.81	16.62	17.87	20.12	21.00	22.00	21.50	24.50	27.60	28.20	41.40
	Mid-Range	21.13	24.66	20.31	20.69	22.37	25.75	26.38	26.13	27.31	30.85	32.43	41.49
	Dividend	1.41	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.46	1.49	1.51	1.62
	HPR		1.235	0.882	1.089	1.151	1.215	1.080	1.045	1.101	1.184	1.100	1.329

Source: Standard & Poor's Stock Reports dated November 30, 2002.

Notes: The average annual price is the mid-range of the high and low price for the year.

HPR (Holding period Return) = (price$_1$ + dividend$_1$)/price$_0$

*2003 high/low stock price is for the 52 weeks ending February 23, 2004 from Yahoo Finance.

** 1992 high/low stock price data is from Value Line

Gas
Realized Return on Equity
Bond Yield - Equity Risk Premium

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
One-year HPR Summary:											
AGL Resources	1.165	0.943	1.087	1.183	1.062	1.098	1.001	1.049	1.179	1.022	1.299
Atmos Energy	1.329	1.134	1.375	1.003	1.183	0.962	0.813	1.173	0.984	1.158	1.079
Cascade Natural Gas	1.071	1.050	1.073	1.174	1.028	1.082	1.060	1.229	1.035	1.025	1.109
Energen	1.374	1.010	1.103	1.223	1.372	1.107	0.948	1.443	1.309	0.859	1.464
New Jersey Resources	1.153	1.168	1.146	1.298	1.070	1.088	1.127	1.108	1.052	1.238	1.071
Northwest Natural Gas	1.182	1.015	1.008	1.193	1.216	1.056	0.906	1.008	1.125	1.171	1.084
Peoples Energy	1.054	1.080	1.256	1.117	1.069	1.051	1.071	1.136	0.917	1.237	1.054
South Jersey Industries	1.235	0.882	1.089	1.151	1.215	1.080	1.045	1.101	1.184	1.100	1.329
One-year Treasury											
Constant Maturity HPR:	1.034	1.053	1.059	1.055	1.056	1.051	1.051	1.061	1.035	1.020	1.024
One-year HPY Risk Premiums:											
AGL Resources	0.130	-0.110	0.028	0.128	0.005	0.047	-0.050	-0.012	0.144	0.002	0.275
Atmos Energy	0.295	0.081	0.316	-0.053	0.126	-0.088	-0.238	0.112	-0.051	0.138	0.055
Cascade Natural Gas	0.036	-0.003	0.039	0.118	-0.028	0.032	0.009	0.168	0.000	0.005	0.085
Energen	0.339	-0.043	0.043	0.168	0.316	0.057	-0.103	0.381	0.274	-0.161	0.440
New Jersey Resources	0.118	0.115	0.087	0.243	0.013	0.038	0.077	0.047	0.017	0.218	0.047
Northwest Natural Gas	0.148	-0.038	-0.051	0.138	0.160	0.006	-0.145	-0.054	0.090	0.151	0.060
Peoples Energy	0.020	0.027	0.197	0.062	0.013	0.000	0.020	0.075	-0.118	0.217	0.030
South Jersey Industries	0.201	-0.171	0.030	0.096	0.159	0.030	-0.006	0.040	0.149	0.080	0.305
Average HPY Risk Premium:	0.161	-0.018	0.086	0.113	0.096	0.015	-0.054	0.095	0.063	0.081	0.162
Average HPR Risk Premium:	1.161	0.982	1.086	1.113	1.096	1.015	0.946	1.095	1.063	1.081	1.162

Notes: Summary is from pages 1 and 2.
One-year constant maturity yields on Treasury Securities from Federal Reserve, www.federalreserve.gov
One-year HPY Risk Premiums are the one-year company HPR minus the 1-year constant maturity T-bond yields.
Average HPR Risk Premium = 1+ Average HPY Risk Premium.

Gas
Return Relative Risk Premiums
All Possible Combinations of Annual Returns on Portfolio

Investment made at end of:	Return Relative at the End of the Year:										
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
1992	1.161	1.068	1.074	1.083	1.086	1.074	1.054	1.059	1.060	1.062	1.071
1993		0.982	1.033	1.059	1.068	1.057	1.038	1.046	1.048	1.051	1.062
1994			1.086	1.099	1.098	1.077	1.049	1.057	1.057	1.060	1.071
1995				1.113	1.104	1.074	1.040	1.051	1.053	1.057	1.069
1996					1.096	1.055	1.017	1.036	1.041	1.048	1.063
1997						1.015	0.980	1.017	1.028	1.039	1.058
1998							0.946	1.017	1.032	1.044	1.067
1999								1.095	1.079	1.080	1.100
2000									1.063	1.072	1.101
										1.081	1.121
											1.162
Sum	1.161	2.050	3.192	4.354	5.451	6.351	7.123	8.377	9.462	10.594	11.946
Average	1.161	1.0249	1.0641	1.0885	1.09	1.0584	1.0176	1.047	1.0513	1.0594	1.086

Average Return Relative Risk Premium: **1.0681**

Average Return Risk Premium: **6.81%**

Note: Investment is assumed to be made at first of the year and return is realized at end of year.
Return relative is the HPR (1+HPY).
Return risk premium is HPR - 1.

Appendix I
Statement of Qualifications
of
Carl G. K. Weaver

Q. **PLEASE BRIEFLY DESCRIBE YOUR PROFESSIONAL EXPERIENCE AND**

EDUCATIONAL BACKGROUND.

A. I was with the Virginia State Corporation Commission from June, 1976, to

August, 1979. This Commission has regulatory authority over public utilities, banks,

insurance companies, railroads, and motor carrier transportation companies operating in

Virginia. In July, 1977, I founded the Economic Research and Development Division at

the Virginia SCC and became its first Director.

The Economic Research and Development Division was established to provide

financial and economic support for other divisions of the Commission. Prior to founding it

and becoming its first Director, I served the Commission as a public utility financial and

economic analyst in the Public Utility Accounting Division.

During this time, I also was a lecturer in the Graduate School of Business

Administration of the College of William and Mary. I taught a course in portfolio theory

in the fall semester of 1977 and 1978, and in the spring semester of 1979.

I left the State Corporation Commission and joined the faculty of James Madison

University in August, 1979. While at JMU, I worked with M.S. Gerber and Associates,

Inc., a utility consulting firm. I participated in the development of the Financial

Information Model and the Midas Model which is marketed by EPRI. I also served as

Director of JMU's M.B.A. program for the years 1993-1995. I retired at the end of

June, 1998 and am an Emeritus Professor of Finance at JMU. Since retirement, I have

served as an adjunct professor of finance at Eastern Mennonite University and a Visiting

Professor at Washington and Lee University.

Prior to joining the State Corporation Commission, I was an assistant professor of

Finance at Virginia Commonwealth University from 1967 through 1976. I taught courses

in financial management, investments, and decision mathematics. I received a leave of

absence from V.C.U. from September, 1971, to June, 1973, to pursue and complete the

course work for a doctoral degree at Florida State University. I was awarded the Doctor

of Business Administration degree in June, 1975. I majored in finance and minored in

statistics.

I was a field manager with Ford Motor Company prior to joining Virginia

Commonwealth University. A large portion of the job activities consisted of performing

financial analysis of dealers in an assigned zone and advising them in financial management

so that they would be in a better position to represent Ford Motor Company and sell its

products. Other duties included assisting dealers in negotiating financing arrangements. I

was employed by Ford Motor Company in 1964. My military service also provided me

with financial experience. I was in the Finance Corps and spent the majority of my active

duty at the Finance and Accounting Office at Fort Dix, New Jersey.

**Q.   DR. WEAVER, PLEASE SUMMARIZE YOUR EXPERIENCE AS AN EXPERT
WITNESS.**

A.   The duties of the Economic Research and Development Division included

providing financial and economic expert testimony before the Commission regarding fair

rate of return and other matters. As director of the Economic Research and Development

Division, I provided financial and economic expert testimony before the Virginia

Commission. The topics of testimony included the cost of capital, capital structure, cash

flow analysis, attrition, and sale and lease-back financing arrangements. I have also

provided testimony before the Kentucky Public Service Commission and in other

jurisdictions.

Q.   **PLEASE IDENTIFY THE CASES FOR WHICH YOU PROVIDED TESTIMONY.**

A.   I testified in twenty-two cases concerning utility matters before the Virginia State

Corporation Commission. These cases and their topical areas are as follows: Virginia

Electric and Power Company's application for approval for the financial arrangement for

an office building in Case No. 19734; ex parte in regard to investigation of the fuel

adjustment clauses of Appalachian Power Company, et al. in Case No. 19526; on attrition

on Potomac Electric Power Company's application for an increase in rates in Case No.

19686; on rate of return in Appalachian Power Company's application for an increase in

rates in Case No. 19723; on merger and rate of return in Norfolk and Carolina Telephone

Company of Virginia's application for an increase in rates in Case No. 19727; on rate of

return in General Telephone Company of Southeast's application for an increase in rates in

Case No. 19778; on rate of return in Potomac Edison Company's application for an

increase in rates in Case No. 19810; on cash flow analysis in Virginia Electric and Power

Company's application for an increase in rates in Case No. 19730; on fuel adjustment

clause in the investigation of Virginia Electric and Power Company's clause in Case No.

19818; on rate of return in Amelia Telephone Corporation's application for an increase in

rates in Case No. 19891; on rate of return in Virginia American Water Company's application for an increase in rates in Case No. 19903; on rate of return in Clifton Forge - Waynesboro Telephone Company's application for an increase in rates in Case No. 19910; on rate of return in Virginia Pipe Line Company and Lynchburg Gas Company's application for an increase in rates in Case No. 19919; on rate of return in Shenandoah Telephone Company's application for an increase in rates in Case No. 19920; on rate of return in Roanoke Gas Company's application for an increase in rates in Case No. 19985; on rate of return in Columbia Gas of Virginia, Inc.'s application for an increase in rates in Case No. 19988; on rate of return in Washington Gas Light Company's application for an increase in rates in Case No. 19992; on rate of return in General Telephone Company of the Southeast's application for an increase in rates in Case No. 20003; on rate of return in Virginia American Water Company's application for an increase in rates in Case No. 20039; on rate of return in Old Dominion Power Company's application for an increase in rates in Case No. 20106; on rate of return in Virginia American Water Company's application for an increase in rates in Case No. 20177; and on rate to return in Virginia American Water Company's application for an increase in rates in Case No. PUE790021.

I presented testimony before the Commonwealth of Kentucky's Public Service Commission on CWIP in Louisville Gas & Electric Company's application for an increase in rates in Case No. 7799; on CWIP in Kentucky Utility Company's application for an increase in rates in Case No. 7804; on Union Light, Heat and Power Company's application for rate increase Case No. 8046, and Case No. 9029, on rate of return in Louisville Gas & Electric Company's applications for an increase in rates in Case No.

8284, in Case No. 8616, in Case No. 8924; and in Case No. 10064; on rate of return in

Kentucky Utility Company's application for an increase in rates in Case No. 8624; on

Louisville Gas & Electric Company's continuance of construction on Trimble County Unit

Number 1 in Case No. 9243, and on rate of return in General Telephone Company of the

South's application for an increase in rates in Case No. 9678, on rate of return in

Kentucky-American Water Company's application for an increase in rates in Case No. 89-

348, on rate of return in Western Kentucky Gas Company's application for an increase in

rates in Case No. 90-013 and 99-070, on rate of return in Union Light, Heat and Power

Company's application for an increase in rates in Case No. 90-041, on rate of return in

Louisville Gas and Electric Company's application for an increase in rates in Case No. 90-

158, on rate of return in Union Light, Heat and Power Company's application for an

increase in rates in Case No. 91-370, on rate of return in Union Light, Heat and Power

Company's application for an increase in rates in Case No. 92-346, on rate of return in

Kentucky-American Water Company's application for an increase in rates in Case No. 95-

554, on rate of return in Delta Natural Gas Co., Inc.'s Case No. 97-066 and 99-046

which was merged into Case No. 99-176, made a presentation on the cost of equity in the

conferences held on Louisville Gas and Electric Company's and Kentucky Utilities

Company's application for approval of an alternative method of regulation of its rates and

services and provided testimony on the cost of capital in Kentucky-American Water

Company's application for an adjustment in rates, Case No. 2000-120; on the rate of

return in Union Light, Heat and Power Company's application for an increase in rates in

Case No. 2001-092; and on rate of return in Kentucky Power Company d/b/a American

Electric and Power Company's Case No. 2002-169.

Also, I presented testimony in five cases before the Interstate Commerce Commission regarding cash flow analysis and rate of return. These cases were heard on ICC Docket Numbers 37339F, 37354, 37322, 37507, I&S Docket Number 9242F, Case No. 37516, and Ex Parte hearing numbers 415 and 436.

In addition, I presented testimony in four cases before the Ontario Energy Board. These involved an accounting policy for Union Gas Limited's gas take-or-pay contract in E.B.R.O. 418, and rate design issues involving ICG Utilities, Ltd., Consumers Gas Company, Ltd., and Union Gas Limited in E.B.R.O. 410-2, 411-2, 412-2, 414-2, 429, and 430-1.

I testified in three cases before the Washington, D.C. Public Service Commission and one before the New Hampshire Public Service Commission involving the use of the Regulatory Analysis model (RAm) for analyzing regulatory policies and evaluating the economic feasibility of converting an oil-generating plant to coal. This testimony was presented in Case Numbers 715, 737, and 759 in Washington, D.C. and in Case No. DE80-175 in New Hampshire. I also testified in one case before the Oklahoma Corporation Commission on rate of return for Arkansas-Oklahoma Gas Company in Cause PUD No. 000079.

Q. **WHAT OTHER WORK HAVE YOU DONE IN REGARD TO PUBLIC UTILITY REGULATION?**

A. I served as a faculty member for the NARUC Annual Regulatory Studies Program held at Michigan State University in the summers of 1982, 1983, 1984, and 1985. I taught

the sessions in public utility accounting and financial analysis at this institute.

I have also authored or co-authored the following articles which have appeared in the Public Utilities Fortnightly: "Cash Flow Statement and Risk Evaluation", published February 15, 1990; "The Future of Competition in the Telecommunications Industry", published March 5, 1987; "Capital Structure Maintenance: A Challenge for Public Utilities", published September 4, 1986; "The Accelerated Cost Recovery System - A Catch 22?", published May 13, 1982; "A Resolution of the Rate Base Construction Work in Progress Controversy", published April 15, 1982.

In addition, I have presented papers to professional associations and have served on several panels in regard to regulatory matters.

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June 1976 - August 1979	Director, Division of Economic Research and Development, Virginia State Corporation Commission, Richmond, VA
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PUBLICATIONS:

Articles (Refereed)

Bond Ratings: A Poor Predictor of Equity Risk, Public Utilities Fortnightly, October, 1994.

"Risk Evaluation Using the FASB Cash Flow Statement," Public Utilities Fortnightly, February, 1990.

"The Future of Competition in the Telecommunications Industry," Public Utilities Fortnightly, March 1987, Co-author.

"Capital Structure Maintenance: A Challenge for Public Utilities," Public Utilities Fortnightly, September 1986, Co-author.

"The Accelerated Cost Recovery System - A Catch 22?," Public Utilities Fortnightly, May 1982, Co-author.

"A Resolution of the Rate Base Construction Work in Progress Controversy," Public Utilities Fortnightly, April 1982, Co-author.

"Systematic Risk Reduction through International Diversification," Review of Business and Economic Research, XV Fall 1979, Co-author.

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"The Organized Options Market," <u>Virginia Social Science Journal</u>, 11, April 1976.

"Evaluation of Portfolio Performance Using a Paired Difference T-Test," <u>Atlantic Economic Journal</u>, IV April 1976, Co-author.

OTHER PUBLICATIONS:

"Stable Utility Rates to Benefit Consumers," <u>Lawyers Title News: Economic Forecast Issue</u>, January-February 1984.

<u>Feasibility of the Conversion of Shiller Units 4, 5 and 6 and Newington Station from Oil to Coal Generation</u>, Report to the New Hampshire Public Utilities Commission, May 1981, Co-author.

<u>A Study of the Feasibility of Energy Distributing Companies to Finance Home and Business Insulation</u>, Report to the Governor and General Assembly of Virginia, Richmond: Department of Purchases and Supply, November 1978, Co-author.

"Tax Planning in Real Estate Investments: A Case Study," presented at and published in <u>Proceedings of International Association for Financial Planning, 1986 Academic Symposium</u>, Chicago, Illinois, October 1986.

"Public Utility Diversification and the Cost of Capital," presented and published in <u>Proceedings of NARUC Biennial Regulatory Information Conference</u>, Columbus, Ohio, September 1986.

"The Electric Utility Industry's Financial Challenges for the Ninety's," presented at annual conference, National Association of Regulatory Commissioner's Sub-Committee on Computers, Salt Lake City, Utah, February 1986, Co-author.

Other Publications:
(continued)

"An Evaluation System for Utility Financing Authority Applications," presented and published in <u>Proceedings of NARUC Biennial Regulatory Information Conference</u>, Columbus, Ohio, September 1984, Co-author.

"Micro-Computer Applications for Regulation," presented and published in <u>Proceedings of NARUC Biennial Regulatory Information Conference</u>, Columbus, Ohio, September 1984, Co-author.

"Use of Computer Models in Regulatory Analysis," presented at annual conference, National Association of Regulatory Commissioner's Sub-Committee on Computers, Indianapolis, Indiana, May 1983, Co-author.

"Budgeting and Control in a Not-for-Profit Environment," presented at annual conference, Virginia Association of Children's Homes, Roanoke, Virginia, November 1982.

"Regulatory Considerations for Removal of AFUDC," presented and published in <u>Proceedings of NARUC Biennial Regulatory Information Conference</u>, Columbus, Ohio, September 1978, Co-author.

"A Temporal Evaluation of Risk for Regulated Firms," presented and published in <u>Proceedings of Southwestern Finance Association</u>, New Orleans, Louisiana, March 1977, Co-author.

"An investigation of the Impact of International Diversification on Homogeneous Groupings of Financial Markets," presented and published in <u>Proceedings of Southwestern Finance Association</u>, San Antonio, Texas, March 1976, Co-author.

"Characteristics of Option Premiums: Development of a Valuation Model," presented and published in <u>Proceedings of Atlantic Economic Society</u>, Washington, D.C., September 1975.

PROFESSIONAL ACTIVITIES:

Faculty Marshall, James Madison University, 1997-98.

Speaker, Faculty Senate, James Madison University, 1996-97.

Chair, MBA Program Review Committee, James Madison University.

Member, Presidential Search Committee, James Madison University

Receipient of Graduate Faculty Teaching Award, College of Business, 1990-91 Academic Year.

Chair, Principal Committee on Administrative Processes, Financial Resources, James Madison University Self-Study for Accredation by the Southern Association of Colleges and Schools, 1990-1991 Academic Year.

Founded and became first Director of the Economic Research and Development Division of the Virginia State Corporation Commission.

Co-developer of FIN, the Financial Information Model. This micro computer based, financial simulation, strategic analytical model has been adapted for use by five state regulatory commissions and by the planning departments of nine electric and gas distribution companies. Its logic has been adapted by EPRI in the MIDAS model and by Decision Focus in the LMSTM model.

Developed and conducted three day seminars on the application of financial analytical techniques in regulation for the Staffs of the Pennsylvania Public Utilities Commission, Maryland Public Service Commission, Maine Public Utilities Commission and the Ohio Public Utilities Commission.

Served as expert cost of capital witness on behalf of regulatory commission staffs, regulated companies, and state attorney generals in over forty-five electric utility company, gas distribution company and telephone rate proceedings.

PROFESSIONAL ACTIVITIES:
(Continued)

Served as expert cost of capital witness on behalf of regulated companies or industry trade associations in annual generic proceedings before the Interstate Commerce Commission for determining measures of railroad revenue adequacy in years 1981-1984.

Served as a consultant before state regulatory commissions in numerous proceedings for the evaluation of utility accounting procedures, utility company construction programs, and external financing arrangements.

Served as faculty member, NARUC Annual Regulatory Studies Program, Michigan State University for the years 1982-1985.

Served as panelist on:

Competition in the Telecommunications Industry, New England NARUC meeting, Dixville Notch, NH, 1987;

Workshop on Micro-Computers, APPA national meeting, 1983;

Treatment of P & C Insurance Income, Virginia SCC, 1981;

DOE's Workshop on National Energy Act, December, 1978; and

Outlook for Energy Costs, Valley Economic Seminar, 1977.

1
2 **APPENDIX II**
3
4 **Concepts of**
5 **Cost of Capital, Risk, Cost of Equity**
6 **and**
7 **Cost of Equity Evaluation Methods**

8 **Q.** **Dr. Weaver, would you please briefly discuss the concept of the cost of capital?**

9 **A.** The cost of capital represents the price paid for acquiring money from the capital

10 market. To obtain capital, a firm issues financial assets such as shares of stock, bonds, or

11 notes to investors. A financial asset represents a claim on the earning power and property

12 of the issuer. The priority and security of the claims depend upon the contractual

13 conditions associated with each type of financial asset. Differences in the respective

14 contracts cause risk to differ between the shares of stock, bonds, or notes.

15 The shares of stocks, bonds or notes are generally issued to investors through an

16 investment bank or a commercial bank. An investment bank is the intermediary between

17 the borrowers (demanders) and the lenders (suppliers) of long term funds. The commercial

18 bank is the intermediary between the demanders of funds and the money market.

19 In some instances where subsidiary financing is involved, a parent corporation

20 obtains its funds from the capital market and its subsidiary issues financial assets to the

21 parent in exchange for these funds. In other instances, the subsidiary may place bonds or

22 notes directly with an insurance company or other lender. In this direct placement case,

23 the involvement of an investment bank is limited to locating a lender and assisting in the

1   transaction. In some instances, an investment bank may not be used at all.

2   The capital market differs from the market for real goods because the item traded

3   in exchange for the financial assets, money, is homogeneous. Investors are the suppliers of

4   money to this market. At any moment in time, the financial assets, shares of stock, bonds

5   or notes issued by different firms are competing with one another for investors' funds.

6   Investors are offered a broad range of choices with respect to the selection of the firms in

7   which they invest and the instruments that are used.

8   A single firm demanding funds is in competition with all other firms that are

9   acquiring capital, and the shares of stock, bonds or notes it issues to acquire those funds

10   are competing with all other forms of securities that are available in the capital market.

11   This is true not only for new issues, but also for existing issues that are traded among

12   investors.

13   In regulation, the cost of capital is measured using a weighted average of the costs

14   of the outstanding debt, preferred stock and common stock. It is assumed that the funds

15   obtained from issuing these securities were used to purchase the assets that are needed to

16   provide service to the utility's customers. To apply the weighted average approach, the

17   cost of each capital component in a firm's capital structure must be determined. The cost

18   of debt and preferred stock, which are fixed, are determined on the basis of the embedded

19   costs of the actual outstanding amounts. The cost of equity is not contractually fixed and

20   its cost must be estimated.

21   **Q.   Dr. Weaver, would you please briefly explain the concept of the cost of equity?**

1   A.   Equity cost is based on an expected or future return. Investors in the equity market

2   supply funds to corporate users on the basis of what they either explicitly or implicitly

3   expect the return will be in the future and on how certain they feel that expectation will be

4   realized. The expected return is realized through the receipt of dividend income,

5   appreciation of the security's market price, or some combination of both dividend income

6   and market price appreciation.

7   The rate of return is determined by the sum of the future dividend income and

8   price appreciation relative to the amount of investment required. Past returns can be used

9   to forecast the future returns, but actual future returns will differ from those that were

10   estimated when the investment decision was made.

.1   Q.   **Please describe risk that is associated with the return estimate.**

12   A.   Risk is the likelihood that the actual return may be less than the expected return.

13   Risk, therefore, is caused by any phenomenon that may result in the actual future return

14   being less than the return anticipated when the investment was made. The greater the

15   likelihood that an actual return will vary on the downside from its anticipated return, the

16   greater the risk. Risk may be caused by conditions external to the firm or from conditions

17   that are, to some degree, within the firm's control. Some examples of external conditions

18   are the prospective state of the economy, inflation, and capital market conditions. Internal

19   factors include management efficiency, technology changes, liquidity, and financial

20   structure.

21   In regulation, the allowed return should be similar to the return that is earned by

1   other companies that have similar risk. Risk, as it applies to the cost of equity, should be

2   considered as total risk rather than the risk that would result from the occurrence of any

3   single factor. Risk that results from any one particular phenomenon could be offset by the

4   occurrence of other phenomena. For example, the state of the economy may improve

5   causing an increase in actual returns. However, if improvement in the economy was

6   accompanied by an increasing inflation rate, the real return may remain the same, or even

7   decrease.

8   Risk, by definition, stems from differences between the actual future return and the

9   return that was anticipated when the investment was made. As such, it is a future

10   phenomenon and must be estimated. Past returns to an investor are known with certainty;

1   and therefore, there is no risk associated with their measurement. Evaluation of past data

12   can be used to make implications concerning risk, but past measures are useful only to the

13   extent they correspond to the risk that investors perceive to be embodied in an equity

14   investment.

15 Q. **Please explain how expected return and risk provide the opportunity cost principle**

16   **framework for determining the cost of equity.**

17 A.   Investors consider two measures when choosing among alternative investments.

18   The first is the anticipated or expected return for each investment. The second is risk.

19   These two measures, expected return and risk, are combined into a framework known as

20   the opportunity cost principle. The principle states that, for a given level of risk, investors

21   will choose the alternative that provides the highest expected return.

1   The opportunity cost principle provides a model that explains a rational risk-averse

2   investor's selection process. The investor must first determine his/her risk threshold and

3   the amount of risk he can assume must not exceed that level. Typically, there will be a

4   large number of investments in the capital market that have risk below the threshold

5   amount. In order to make a rational choice among this large number of alternatives, the

6   investor must derive for each alternative both the expected return on investment, and the

7   risk or likelihood that the anticipated return will not be realized. The investor will then

8   choose the alternative that promises the highest expected return relative to the level of risk

9   assumed.

10   Security prices reflect the composite behavior of all investors. If investors

1   do not choose to purchase a particular security, that security's price will fall until

12   its anticipated rate of return is comparable to other investment alternatives at the

13   same risk level. In an efficient market, this process occurs very rapidly causing

14   market prices to reflect investor expectations for return and risk.

15   **Q.   Does this same adjustment process hold for securities that have different risk levels?**

16   A.   Because investors continually apply the opportunity cost principle to market

17   prices, securities which are perceived to have greater risk have higher levels of expected

18   returns. An investor requires a risk premium in the form of higher expected returns in

19   order to assume increased risk. Risk premiums enable riskier firms to compete for

20   investor-supplied funds in the capital market with the less risky firms. For example, stocks

21   and bonds compete with one another for capital.

1   This does not imply that the higher levels of expected returns for the more risky

2   securities are always realized. If the expected return of a particular common stock were

3   always realized, there would be no risk associated with that investment opportunity. The

4   security's return, always being realized, would be a certain return and it would have no

5   risk premium in its cost rate. Its return or cost rate would be similar to that of a high-

6   grade bond. The more risky the security, the greater the likelihood that its actual return

7   will differ from the return that was expected when the investment was made.

8 **Q.**   **Please explain the problem associated with using past data as an exact measure of**

9   **the cost of equity.**

10 **A.**   Past returns to a security are known with certainty and there is no risk associated

1   with their measurement. For this reason, it is not correct to use historical data as an

12   absolute measure for the cost of equity. Historical data can provide guidance when

13   estimating expected returns or the cost of equity. However, care must be taken to

14   eliminate biases in the data and judgment must be used when evaluating the derived

15   measures.

16   For these reasons, no precise formula exists for determining the cost of equity. The

17   cost of equity is based upon the opportunity cost principle; and opportunity cost combines

18   investor expectations (or investor thinking) about future returns - that is, future dividends

19   and market price appreciation - and the future risk that the expectations will not be

20   realized. As such, informed judgment is required to formulate the estimate.

21 **Q.**   **What technique did you use to formulate your recommendation for the cost of**

1   **equity?**

2   A.   No precise method has been developed to determine the cost of equity. Equity

3   valuation models provide information and analysts use this information to form an estimate

4   of the cost of equity. To obtain information, I use the discounted cash flow (DCF)

5   method, the Capital Asset Pricing Model (CAPM) and a bond yield-risk premium method.

6   Q. **Dr. Weaver, please briefly describe the DCF technique.**

7   A.   Common stockholders receive a return on their investment through the receipt of

8   dividend income and through increases in the market price of their investment. The DCF

9   technique directly evaluates this return. The DCF model is derived from the premise that

10 the market price of a share of common stock is the present value of the future dividends

1   that are received during the holding period and the expected market price at the end of

12 that same holding period. This stems directly from the opportunity cost principle. The

13 discount rate that equates the expected dividend income and future market price to the

14 current market price is the investor's opportunity cost. The derivation of the model for

15 various holding periods is presented in the Attachment to this Appendix.

16 Q. **What assumptions are required to implement the technique?**

17 A.   I use two forms of the DCF model -- a constant growth model, and a two-stage

18 growth model. The constant growth model provides the basis for the model=s derivation

19 and the two-stage model is a variation of the constant growth model.

20   Two assumptions are required for the derivation of the constant growth DCF

21 model. The derivation requires that (1) the combination of dividend increases and market

1   price appreciation occur at a constant growth rate and (2) that growth rate is lower that

2   the overall cost of equity rate. The assumption of constant growth expectations is not

3   intended to be a description of what has occurred in the past or of what will actually occur

4   in the future. This assumption implies that at a given moment in time, investors have

5   constant growth expectations regarding the future. For example, if an investor were

6   choosing between two stocks of equal risk, he would choose to invest in the stock that he

7   believed would afford the highest return over the holding period. At the moment the

8   investment decision is being made, it is unlikely that the investor would segment the time

9   horizon into several shorter time intervals and determine an expected return for each stock

10   in each sub-interval selected and compare the several returns one to another.

.1   A rational investor would choose to invest in the stock that has the highest

12   expected return in the first sub-interval, and then he would reevaluate the investment

13   alternative prior to the start of the second interval. Thus, the investor would assume a

14   constant return over the shorter interval of time.

15   The two-stage growth DCF model assumes that the growth rate changes over

16   time. Generally, it is assumed that the growth rate converges on an average growth rate

17   for the market. In a pure two-stage model, the growth rate is constant for a fixed period

18   and then it changes and is constant at the different rate beyond that period. Sometimes

19   multiple stages are used to provide for a more gradual convergence on the market growth

20   rate.

21   **Q.**   **How does the constant growth assumption apply to the rate making process?**

1   A.   Constant growth must be assumed for the length of time between rate cases. For

2   example, if a utility were to seek rate relief every two years, then its cost of equity would

3   be reevaluated every two years as a part of the rate making process. Therefore, the growth

4   rate need only be assumed constant for two years since it is reevaluated and may be

5   changed after that period.

6   Q.   **Are any other assumptions required when using the constant growth DCF**

7   **technique?**

8   A.   No other assumptions other than a constant growth that is lower than the cost of

9   equity are required in its implementation. Cost of capital witnesses sometimes regard the

10   earnings stream to be important in estimating the growth that accrues to the firm (net

.1   income) or the growth that accrues to the investors (dividend income and market price

12   appreciation).

13   Q.   **Since some investors consider earnings and others consider dividends, why aren=t**

14   **other assumptions required?**

15   a.   Changes in the firm's earnings stream must determine market price appreciation

16   and dividend income when the dividend payout ratio and the price-earnings ratio are

17   constant. However, even if these ratios were not constant, the average income stream

18   accruing to the firm would have to approximate the dividends and price appreciation

19   earnings stream over a long period of time.

20   The reason that the two earnings streams must be approximately the same in the

?1   long-run is as follows. If earnings are retained and invested internally at the firm's overall

1 rate of return, future earnings will increase, causing future market price appreciation and

2 future dividend increases. If dividends had been paid out, then additional stock must be

3 sold to finance the same amount of investment. Assuming a constant overall rate of return,

4 earnings on the new investment would be sufficient to provide the new stockholders the

5 same return that is realized by the old stockholders.

6 In one case, investors enjoy larger future dividends and price appreciation, while in

7 the other they enjoy more sizeable current dividends. With a constant rate of return and a

8 stable risk structure, the present value of the increase in future dividends and price

9 appreciation must equal the present value of the increase in current dividends.

10 In the short-run, the two earnings streams may not be equal. It then becomes a

1 question concerning which expected earnings stream do investors capitalize - the earnings

12 accruing to the firm or the dividends and market price appreciation which accrues to the

13 investors themselves. I doubt that consistency exist as to what value investors capitalize. I

14 believe that some investors consider their personal income (i.e., dividends and price

15 appreciation) to be more relevant than the firm's income and they therefore capitalize

16 dividends and price appreciation. Other investors believe that growth in market prices and

17 future dividends are more important. For these reasons, I use earnings per share,

18 dividends per share and the growth in book value per share in the analysis that I perform.

19 **Q.** **How did you formulate your estimate for the growth variable used in the DCF**

20 **model?**

21 A. I use several different methods to formulate an estimate of growth for use in the

1   DCF model. I do this to obtain information to augment my analysis. I use a variety of

2   sources for estimating growth because the growth estimate in the DCF model represents

3   investor beliefs about the rate of increase for dividends and market prices. It is the

4   participants in the market that determine the cost of equity, so there is no single method

5   that provides Athe answer".

6   One way is to use analysts= forecasts for future growth in earning per share,

7   dividends, or book value. Three sources for these forecasts are Value Line, I/B/E/S, and

8   Zacks. Value Line analysts forecast the three to five year growth in earnings, dividends,

9   and book value for each of the approximately 1,700 which they follow. I/B/E/S and Zacks

10   survey the stock brokerage research departments to obtain the estimates that are being

-1   made by the professional security analysts. Academic studies have shown that analysts=

12   forecast provide reasonably good estimates for use in the DCF model.

13   Past data may also be used to estimate the future growth rate. Judgement must be

14   exercised when using past data because past events are not perfect predictors of future

15   events. For this reason, several data items should be used to provide insight on the

16   appropriate values for formulating this estimate because different investors probably use

17   different variables to estimate growth.

18 **Q.** **Would you use different growth rates in the constant growth DCF model versus the**

19   **multi-stage model?**

20 a. Yes. Analysts= forecasts are generally for a three to five year period. When a

^1   company has an exceptionally low or an exceptionally high growth forecast, the multi-

1   stage model becomes more useful. The actual rate is converged on the forecasted rate in

2   the first stage and a different rate is used and converged upon in the other stages. A large

3   change in the growth rate will not generally occur in a single year. Where large changes in

4   growth are expected, it is appropriate to assume the changes will occur gradually over

5   multiple periods.

6   **Q.   What growth rate do you use for the second stage in the two-stage DCF model?**

7   a.   I use the average of the long-term returns for large company common stocks from

8   Ibbotson Associates. The returns consist of two values -- a dividend yield and a growth

9   rate. I subtract the average dividend yield from the compound rate of return and the

10   remainder is the compound growth rate for the second stage. If a rate is used that is less

1   than this, the analyst is assuming that the company is not able to maintain its share of the

12   economic output. If a rate greater than this is used, over time, the analyst is assuming that

13   the company is commanding an increasing share of the economic output.

14   **CAPITAL ASSET PRICING MODEL**

15   **Q.   Would you please explain the capital asset pricing model?**

16   a.   Yes. The CAPM presumes that investors are risk averse. More risky securities

17   must provide a higher expected return or investors would have no reason to include them

18   in their investment portfolios.

19   This higher-risk/higher-expected-return principle permits the cost of equity to be

20   split into two components: (1) a default-free rate, and (2) a risk premium. The default-

21   free rate is assumed to be the same for all securities. The risk premium is larger for more

1   risky securities and smaller for less risky securities.

2   According to CAPM, the amount of risk premium can be determined in two steps.

3   The first requires that the average risk premium for the equity market be estimated. In

4   the second step, this average risk premium must be adjusted either upward or downward,

5   depending upon whether the security being considered is more or less risky than the

6   average. This adjustment is made by multiplying the market's average risk premium by

7   Beta. Beta is a measure of the risk of an individual security relative to an average security.

8   A security that has the same risk premium as an average security would have a beta equal

9   to one. Less risky securities have betas less than one and more risky securities have betas

10   greater than one.

.1   The CAPM is formulated as:

12   $$K_i = R_f + B(K_m - R_f) \qquad \textbf{where:}$$

13   K_I = The expected return on security I;
14   R_f = The expected default-free rate;
15   K_m = The expected return on an average security;
16            $K_m - R_f$ = The risk premium for an average security; and
17   B = Beta
18

19   Q.   **What data are required to implement the CAPM?**

20   A.   Three data elements are required to implement the CAPM. These are the expected

21   default-free rate; the expected return on an average security; and beta.

22   Q.   **What are the data sources for these data?**

23   A.   A short- or a long-term bond rate is generally used as a proxy for the expected

1 default-free rate. a short-term rate is preferred because it is more independent to the

2 market return rate -- that is, there is less covariance.

3   The variable to use as a proxy for the expected return on an average security is

4 more difficult to determine. Some of the variables that are used include a long-term

5 historical average risk premium, estimates made from data provided by conventional

6 financial information sources such as Value Line, or estimates that were made in published

7 studies by brokerage houses. An estimate of beta can be obtained from numerous sources

8 but these can also vary considerably, depending on the source.

9 **Q.** **How does the use of data from different sources affect the validity of the CAPM**

10 **results?**

1 a. Obviously, using different data will give different results. For this reason, several

12 estimates should be made using data from different sources or different combinations of

13 data. This will result in a range of solutions being determined. Since different investors

14 will use different methods and data to make their buy and sell decisions, this will reflect

15 the market as a whole and provide a range for the cost of equity. The true cost of equity

16 will most likely be somewhere within the bounds of that range.

17   **BOND-YIELD-RISK-PREMIUM METHOD**

18 **Q.** **Please explain the bond-yield-risk-premium method.**

19 a. Yes. The bond-yield-risk-premium method calls for simply adding a risk premium

20 to a bond yield. The risk premium is the difference between the cost of debt versus the

21 cost of equity. Risk premiums are difficult to estimate and risk premiums change as

1   investor's risk aversion change in response to changing economic conditions. When there

2   are periods of economic optimism for future economic conditions, risk premiums tend to

3   become small. When there is economic uncertainty and pessimism, risk premiums are

4   larger.

5   One way to estimate a risk premium is to determine what the total return on a

6   company's common stock has been relative to some particular market bond yield.

7   Another way is to survey analysts to determine what their estimates are. A weakness with

8   this method is that the premiums change over time and surveys become out of date.

9   **Q.**   **How did you implement this method?**

10   a.   I used data from the past ten years for the analysis. The risk premium that persisted

1   in this period, in my judgement, reflects the expected risk premium for the near-term

12   future. I determine the realized return for the same group of companies that I used for the

13   DCF analysis and CAPM analysis. I determined the difference for all of the possible one-

14   year holding period returns from the group of companies with holding period yields on

15   government bonds for the same period. The risk premium is the difference between the

16   average stock returns and the average bond return. I add this risk premium to the

17   forecasted yield on government bonds to obtain an estimate of the cost of equity.

18   **Q.**   **What does the sum of the risk premium and bond yield represent?**

19   a.   The government bond yield represents a default free rate of return that contains

20   only a premium for expected inflation and marketability. The stock's risk premium

21   represents the additional return that is required for the risk of the similar public utility

1   companies. The sum of the two represents the return on equity.

2 **Q.**   **Dr. Weaver, did you use the methods you have discussed here in your testimony?**

3 A.   Yes. I did.