

COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION

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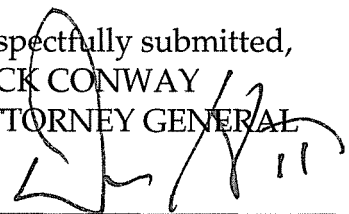
In the Matter of:

KENTUCKY UTILITIES COMPANY'S )  
APPLICATION FOR AN AMENDED )  
ENVIRONMENTAL COMPLIANCE PLAN, )  
A REVISED SURCHARGE TO RECOVER ) Case No. 2011-00161  
COSTS, AND CERTIFICATES OF PUBLIC )  
CONVENIENCE AND NECESSITY FOR THE )  
CONSTRUCTION OF NECESSARY )  
ENVIRONMENTAL EQUIPMENT )

**ATTORNEY GENERAL'S PRE-FILED TESTIMONY**

Comes now the intervenor, the Attorney General of the Commonwealth of Kentucky, by and through his Office of Rate Intervention, and files the following testimony in the above-styled matter.

Respectfully submitted,  
JACK CONWAY  
ATTORNEY GENERAL

  
\_\_\_\_\_  
DENNIS G. HOWARD, II  
LAWRENCE W. COOK  
ASSISTANT ATTORNEYS GENERAL  
1024 CAPITAL CENTER DRIVE  
SUITE 200  
FRANKFORT KY 40601-8204  
(502) 696-5453  
FAX: (502) 573-8315

*Certificate of Service and Filing*

Counsel certifies that an original and ten photocopies of the foregoing were served and filed by hand delivery to Jeff Derouen, Executive Director, Public Service Commission, 211 Sower Boulevard, Frankfort, Kentucky 40601; counsel further states that true and accurate copies of the foregoing were mailed via First Class U.S. Mail, postage pre-paid, to:

Lonnie Bellar  
Robert M. Conroy  
Allyson Sturgeon  
LG&E and KU Energy LLC  
220 W. Main St.  
Louisville, KY 40202

Thomas J FitzGerald  
Counsel & Director  
Kentucky Resources Council, Inc.  
P. O. Box 1070  
Frankfort, KY 40602

David Brown  
Stites & Harbison, PLLC  
1800 Providian Center  
400 W. Market St.  
Louisville, KY 40202

Hon. Kendrick R Riggs  
Attorney at Law  
Stoll Keenon Ogden, PLLC  
2000 PNC Plaza  
500 W. Jefferson St.  
Louisville, KY 40202-2828


Hon. Michael L. Kurtz  
Attorney at Law  
Boehm, Kurtz & Lowry  
36 E. 7<sup>th</sup> St.  
Ste. 1510  
Cincinnati, OH 45202

Edward George Zuger, III  
Zuger Law Office PLLC  
P.O. Box 728  
Corbin, KY 40702

Hon. Leslye M Bowman  
Director of Litigation  
Lexington-Fayette Urban County  
Government  
Department Of Law  
200 E. Main St.  
Lexington, KY 40507

Hon. Iris G Skidmore  
415 W. Main St.  
Ste. 2  
Frankfort, KY 40601

this 16<sup>th</sup> day of September, 2011

  
\_\_\_\_\_  
Assistant Attorney General

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COSTS, AND CERTIFICATES OF PUBLIC	)	
CONVENIENCE AND NECESSITY FOR THE	)	
CONSTRUCTION OF NECESSARY	)	
ENVIRONMENTAL EQUIPMENT	)	

**PRE-FILED DIRECT TESTIMONY  
OF  
DR. J. RANDALL WOOLRIDGE  
ON BEHALF OF THE  
OFFICE OF THE ATTORNEY GENERAL**

**September 16, 2011**

**Kentucky Utilities Company  
Case No. 2011-00161  
Direct Testimony of  
Dr. J. Randall Woolridge**

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**LIST OF EXHIBITS**

**Exhibit**

**Title**

JRW-1	Weighted Average Cost of Capital
JRW-2	Interest Rates – Treasury Yields and Utility Bonds
JRW-3	Treasury Yields and Yield Spreads
JRW-4	Summary Financial Statistics for Proxy Group
JRW-5	Capital Structure Ratios and Debt Cost Rate
JRW-6	The Relationship Between ROE and Market-to-Book Ratios
JRW-7	Public Utility Capital Cost Indicators
JRW-8	Industry Average Betas
JRW-9	Three-Stage DCF Model
JRW-10	DCF Study
JRW-11	CAPM Study
JRW-12	DCF Growth Rate Analysis

APPENDIX A Qualifications of Dr. J. Randall Woolridge

APPENDIX B Research on Analysts' Long-Term EPS Growth Rate Forecasts

APPENDIX C Building Blocks Equity Risk Premium

1           **I.       IDENTIFICATION OF WITNESS AND PURPOSE OF TESTIMONY**

2           **Q.       PLEASE STATE YOUR FULL NAME, ADDRESS, AND**  
3           **OCCUPATION.**

4           A.       My name is J. Randall Woolridge, and my business address is 120 Haymaker  
5                   Circle, State College, PA 16801. I am a Professor of Finance and the  
6                   Goldman, Sachs & Co. and Frank P. Smeal Endowed University Fellow in  
7                   Business Administration at the University Park Campus of the Pennsylvania  
8                   State University. I am also the Director of the Smeal College Trading Room  
9                   and President of the Nittany Lion Fund, LLC. A summary of my educational  
10                  background, research, and related business experience is provided in  
11                  Appendix A.

12  
13           **Q.       WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**  
14           **PROCEEDING?**

15           A.       I have been asked by the Kentucky Office of Attorney General (“OAG”) to  
16                   provide an opinion as to the overall fair rate of return or cost of capital for the  
17                   Kentucky Utilities Company (“KU” or “Company”) for its environmental cost  
18                   recovery (“ECR”) investment. The Company has requested to earn a return on  
19                   equity of 10.63%.

20  
21           **Q.       HOW IS YOUR TESTIMONY ORGANIZED?**

22           A.       First I review my cost of capital recommendation for KU. Second, I provide an  
23                   assessment of capital costs in today’s capital markets. Third, I discuss the

1 selection of a proxy group of electric utility companies for estimating the cost of  
2 capital for KU. Fourth, I present my recommendations for the Company's  
3 capital structure and debt cost rate. Fifth, I discuss the concept of the cost of  
4 equity capital, and then estimate the equity cost rate for KU. Finally, I review  
5 alternative financing proposals for the Company's ECR investment.  
6

7 **Q. PLEASE DISCUSS THE COMPANY'S PROPOSED ROE FOR ECR.**

8 A. The Company plans to add \$1.11B in environmental compliance projects in  
9 the coming years. The Company has proposed to earn a return on equity  
10 ("ROE") of 10.63% on this investment. This figure was the agreed upon  
11 figure by the eight signatories to the Stipulation in Case No. 2009-00548. The  
12 OAG's office did not sign on to this stipulation. In response to Staff No. 1-19,  
13 KU Witness Mr. Bellar indicated that the 10.63% falls within the range in the  
14 Stipulation (10.25% to 10.75%) and in the Commission's Order of July 30,  
15 2010 (9.75% to 10.75%). KU Witness Mr. Bellar also cites KU's request for  
16 a ROE of 11.0% in a pending rate case in Virginia (PUE-2011-00013) and the  
17 associated testimony of Dr. William Avera in that proceeding. He indicates  
18 that this "is reflective of the current economic conditions and provides further  
19 evidence that 10.63% ROE remains reasonable." Mr. Bellar provides no other  
20 studies or economic analyses to support the 10.63% ROE.  
21

1           **Q.    HOW DO THE CAPITAL COST INDICATORS COMPARE TODAY**  
2           **TO THOSE EMPLOYED IN CASE 2009-00548?**

3           A.    I filed testimony for the OAG in April of 2010 in Case No. 2009-00548.  In  
4           Exhibit JRW-2, I provide the yields on ten-year Treasury bonds and thirty-  
5           year utility bonds.  The yields today are somewhat below those at the time of  
6           Case No 2009-00548.  Panel A of Exhibit JRW-2 shows the yields on ten-year  
7           Treasury bonds for the six month periods - November, 2009 to April, 2010,  
8           and March 2011 to September 2011.  The average ten-year Treasury yields for  
9           these two periods are 3.67% and 2.88%, respectively.  These yields suggest a  
10          decline in capital costs.  Panel B of Exhibit JRW-2 shows the yields on thirty-  
11          year public utility bonds for the same six month periods - November, 2009 to  
12          April, 2010, and March 2011 to August 2011.  The average yields for these  
13          two periods are 5.80% and 5.24%, respectively.  These yields also indicate a  
14          decline in utility capital costs, albeit not as large as the change indicated by  
15          the Treasury data.

16  
17          **Q.    PLEASE DISCUSS THE FUNDING FOR ALTERNATIVE**  
18          **FINANCING PLAN FOR ECR.**

19          A.    In response to Staff Question No. 1-15, KU Witness Mr. Arbough has  
20          indicated that the Company plans to finance the proposed environmental  
21          compliance projects with a mix of debt and equity.  The Company plans to  
22          initially draw on short-term lines of credit and commercial paper until  
23          outstanding balances are large enough to issue a long-term first mortgage



1 bond. The first mortgage bond issuances would be expected to be in the range  
2 of \$250 million. Equity contributions would come in the form of retained  
3 earnings and equity contributions for KU's parent, LG&E and KU Energy  
4 LLC. These are expected to be of a size to maintain a capital structure similar  
5 to the current capital structure.  
6

7 **Q. PLEASE REVIEW YOUR RECOMMENDATIONS REGARDING THE**  
8 **APPROPRIATE RATE OF RETURN FOR KU.**

9 A. I have developed a capital structure for the Company that reflects the  
10 Company's current capitalization as well as prospective financing. I have  
11 used KU's current short-term and long-term debt cost rates. I applied the  
12 Discounted Cash Flow Model ("DCF") and the Capital Asset Pricing Model  
13 ("CAPM") to a proxy group of publicly-held electric utility companies  
14 ("Electric Proxy Group"). My analysis indicates that an equity cost rate of  
15 9.25% is appropriate for KU. Using my capital structure and debt and equity  
16 cost rates, I recommend an overall rate of return of 6.44% for KU.  
17

18 **II. CAPITAL COSTS IN TODAY'S MARKETS**

19 **Q. PLEASE DISCUSS CAPITAL COSTS IN U.S. MARKETS.**

20 A. Long-term capital cost rates for U.S. corporations are a function of the  
21 required returns on risk-free securities plus a risk premium. The risk-free rate  
22 of interest is the yield on long-term U.S Treasury yields. The yields on ten-

1 year U.S. Treasury bonds from 1953 to the present are provided on page 1 of  
2 Exhibit JRW-3. These yields peaked in the early 1980s and have generally  
3 declined since that time. In the summer of 2003, these yields hit a 60-year  
4 low at 3.33%. They subsequently increased and fluctuated between the 4.0%  
5 and 5.0% levels over the next four years in response to ebbs and flows in the  
6 economy. Ten-year Treasury yields began to decline in mid-2007 at the  
7 beginning of the current financial crisis. In 2008 Treasury yields declined to  
8 below 3.0% as a result of the expansion of the mortgage and subprime market  
9 credit crisis, the turmoil in the financial sector, the government bailout of  
10 financial institutions, and the economic recession. Overall, these economic  
11 developments led investors to seek out low risk investments. These yields  
12 have declined from 2.5% to just below 2.0% during the past six months.

13 Panel B on page 1 of Exhibit JRW-3 shows the differences in yields  
14 between ten-year Treasuries and Moody's Baa rated bonds since the year  
15 2000. This differential primarily reflects the additional risk required by bond  
16 investors for the risk associated with investing in corporate bonds. The  
17 difference also reflects, to some degree, yield curve changes over time. The  
18 Baa rating is the lowest of the investment grade bond ratings for corporate  
19 bonds. The yield differential hovered in the 2.0% to 3.0% area until 2005,  
20 declined to 1.5% until late 2007, and then increased significantly in response  
21 to the current financial crisis. This differential peaked at 6.0% at the height of  
22 the financial crisis in early 2009, due to tightening in credit markets, which  
23 increased corporate bond yields and the "flight to quality," which decreased

1 treasury yields. The differential subsequently declined and has been in the  
2 2.5% range over the past six months.

3 As previously noted, the risk premium is the return premium required  
4 by investors to purchase riskier securities. The risk premium required by  
5 investors to buy corporate bonds is observable based on yield differentials in  
6 the markets. The equity risk premium is the return premium required to  
7 purchase stocks as opposed to bonds. The equity risk premium is not readily  
8 observable in the markets (as are bond risk premiums) since expected stock  
9 market returns are not readily observable. As a result, equity risk premiums  
10 must be estimated using market data. There are alternative methodologies to  
11 estimating the equity risk premium, and the alternative approaches and equity  
12 risk premium results are subject to much debate. One way to estimate the  
13 equity risk premium is to compare the mean returns on bonds and stocks over  
14 long historical periods. Measured in this manner, the equity risk premium has  
15 been in the 5% to 7% range. However, studies by leading academics indicate  
16 the forward-looking equity risk premium is actually in the 4.0% to 5.0%  
17 range. These lower equity risk premium results are in line with the findings of  
18 equity risk premium surveys of CFOs, academics, analysts, companies, and  
19 financial forecasters.

20  
21 **Q. PLEASE DESCRIBE HOW THE FINANCIAL CRISIS HAS**  
22 **IMPACTED THE FINANCIAL MARKETS.**

23 A. United States Treasury Rates have declined to levels not seen since the 1950s.

1 This reflects the “flight to quality” in the credit markets, as investors have  
2 sought out low risk investments, and the massive monetary stimulus provided  
3 by the Federal Reserve Board. The credit market for corporate and utility debt  
4 experienced higher rates during the financial crisis.

5 However, the long-term credit market has improved significantly. The  
6 credit crisis was associated with concerns among credit providers – mainly  
7 financial institutions – in terms of making loans and investing in bonds due to  
8 the overleveraging and perceived weakness of the economy. Panel A of page  
9 2 of Exhibit JRW-3 provides the yields on A, BBB+, and BBB rated public  
10 utility bonds. These yields peaked in November 2008, declined by about 200  
11 to 300 basis points (“BPs”) through the summer of 2010, and have since  
12 increased about 50 to 75 BPs. For example, the yields on “A” rated utility  
13 bonds, which peaked at over 7.50% in November of 2008, declined to 5.0% to  
14 6.0% range in 2010. They have recently declined to the 4.75% range. Panel  
15 B of page 2 of Exhibit JRW-3 provides the yield spreads on A, BBB+, and  
16 BBB rated public utility bonds relative to Treasury bonds. These yield spreads  
17 increased dramatically in the third quarter of 2008 during the peak of the  
18 financial crisis and have since decreased to pre-crisis levels. For example, the  
19 yield spread between 30-year, ‘A’ rated utility bonds and 30-Year Treasury  
20 bonds, increased from 1.5% to 3.5% in November of 2008. This yield spread  
21 decreased to below 1.5% as of the summer of 2009, and has since declined  
22 below this figure.

23 In sum, while the economy continues to face significant problems, the

1 actions of the government and Federal Reserve had a large effect on the credit  
2 markets. The capital costs for utilities, as measured by the yields on 30-year  
3 utility bonds, have declined to pre-financial crisis levels.

### 4 5 **III. PROXY GROUP SELECTION**

6 **Q. PLEASE DESCRIBE YOUR APPROACH TO DEVELOPING A FAIR**  
7 **RATE OF RETURN RECOMMENDATION FOR KU.**

8 A. To develop a fair rate of return recommendation for KU, I evaluated the return  
9 requirements of investors on the common stock of a proxy group of publicly-  
10 held electric utility companies (“Electric Proxy Group”).

11  
12 **Q. PLEASE DESCRIBE YOUR PROXY GROUP OF COMPANIES.**

13 A. My Electric Proxy Group consists of twenty-eight electric utility companies.

14 The selection criteria include the following:

- 15 1. Listed as Electric Utility by *Value Line Investment Survey* and listed as a  
16 Electric Utility or Combination Electric & Gas company and *AUS Utilities*  
17 *Report*;
- 18 2. At least 50% of revenues from regulated electric operations as reported  
19 by *AUS Utilities Report*;
- 20 3. An investment grade bond rating as reported by *AUS Utilities Report*;
- 21 4. Pays a cash dividend;
- 22 5. Not involved in an acquisition of another utility, and/or is the target of an  
23 acquisition, in the past year; and

1           6.       Analysts' long-term EPS growth rate forecasts available from Yahoo,  
2           Reuters, and Zack's

3  
4                       The Electric Proxy Group includes twenty-eight companies. Summary  
5           financial statistics for the proxy group are listed on page 1 of Exhibit JRW-4.<sup>1</sup>  
6           The median operating revenues and net plant for the Electric Proxy Group are  
7           \$3,982.1M and \$8,578.7M, respectively. The group receives 79% of revenues  
8           from regulated electric operations, has an A-/BBB+ bond rating from Standard  
9           & Poor's, a current common equity ratio of 46.0%, and an earned return on  
10          common equity of 10.4%.

11  
12                       **IV. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES**

13           **Q.     WHAT IS KU'S CURRENT CAPITAL STRUCTURE FOR**  
14           **RATEMAKING PURPOSES?**

15           A.     In Case No. 2009-00548, KU proposed and the Commission approved a  
16           capital structure that included long-term debt and common equity ratios of  
17           46.14% and 53.86%. This included a long-term debt cost rate of 4.61%. As  
18           provided in response to PSC 1-49, the Company has used a capital structure as  
19           of August 31, 2010 that includes 1.59% short-term debt, 44.25% long-term  
20           debt, and 54.17% common equity. This capitalization is shown in Panel A of

---

<sup>1</sup> In my testimony, I present financial results using both mean and medians as measures of central tendency. However, due to outliers, I have used the median as a measure of central tendency.

1 Exhibit JRW-5. The Company has used short-term and long-term debt cost  
2 rates of 0.28% and 4.69%, and a common equity cost rate of 10.63%.

3  
4 **Q. WHAT ARE THE CAPITALIZATIONS OF KU, KU'S PARENT LG&E**  
5 **AND KU ENERGY LLC, AND PPL?**

6 A. The capitalizations for KU, LG&E and KU Energy LLC, and PPL are  
7 provided in Panels B, C, and D of Exhibit JRW-5 as of June 30, 2011. The  
8 capitalization of KU is similar to the capitalization authorized in Case No.  
9 Case No. 2009-00548. KU's parent, LG&E and KU Energy LLC, has a  
10 capital structure with a common equity ratio of 51.06%. PPL, on the other  
11 hand, has a capitalization with a common equity ratio of on 36.58%. As such,  
12 PPL has much more debt than KU and LG&E and KU Energy LLC. This is  
13 significant since the bond ratings of KU and KU Energy LLC ultimately are a  
14 function of the capitalization of PPL. In addition, electric utilities in general  
15 have more debt in their capitalizations than KU and LG&E and KU Energy  
16 LLC, but not to the degree of PPL. As shown in Exhibit JRW-4, the median  
17 common equity ratio for the Electric Proxy Group is 46.0%.

18  
19 **Q. WHAT CAPITAL STRUCTURE ARE YOU EMPLOYING FOR KU?**

20 A. My proposed capital structure is provided in Panel E of Exhibit JRW-5. I am  
21 using KU's amounts of long-term debt and shareholder's equity as of  
22 6/30/2011. In addition, I am including \$125M of short-term debt in the  
23 capital structure. As indicated by KU Witness Mr. Arbough, the Company

1 plans to initially draw on short-term lines of credit and commercial paper for  
2 financing until outstanding balances are large enough to issue a long-term first  
3 mortgage bond. He suggests that the first mortgage bond issuances would be  
4 expected to be in the range of \$250 million. As such, KU would have \$0 to  
5 \$250 million in short-term debt outstanding at any point in time between the  
6 first mortgage debt issuances. Therefore, the average short-term debt  
7 outstanding would be about \$125M. Including this amount of short-term debt,  
8 my proposed capital structure ratios are 3.08% short-term debt, 45.34% long-  
9 term debt, and 51.58% common equity.

10  
11 **Q. WHAT DEBT COST RATE ARE YOU USING IN YOUR COST OF**  
12 **CAPITAL CALCULATION FOR KU?**

13 A. I am employing the Company's short-term and long-term debt cost rates as of  
14 6/30/2011. These rates are 0.16% and 3.68%, respectively. These rates were  
15 provided by the Company in KU AG Q 2-2 (1) Redacted Attachment-Cost of  
16 LTD.

17  
18 **V. THE COST OF COMMON EQUITY CAPITAL**

19 **A. OVERVIEW**

20 **Q. WHY MUST AN OVERALL COST OF CAPITAL OR FAIR RATE OF**  
21 **RETURN BE ESTABLISHED FOR A PUBLIC UTILITY?**



1           A.    In a competitive industry, the return on a firm's common equity capital is  
2                   determined through the competitive market for its goods and services. Due to  
3                   the capital requirements needed to provide utility services and to the economic  
4                   benefit to society from avoiding duplication of these services, some public  
5                   utilities are monopolies. It is not appropriate to permit monopoly utilities to  
6                   set their own prices because of the lack of competition and the essential nature  
7                   of the services. Thus, regulation seeks to establish prices that are fair to  
8                   consumers and, at the same time, are sufficient to meet the operating and  
9                   capital costs of the utility (i.e., provide an adequate return on capital to attract  
10                  investors).

11

12           **Q.    PLEASE PROVIDE AN OVERVIEW OF THE COST OF CAPITAL IN**  
13                   **THE CONTEXT OF THE THEORY OF THE FIRM.**

14           A.    The total cost of operating a business includes the cost of capital. The cost of  
15                   common equity capital is the expected return on a firm's common stock that  
16                   the marginal investor would deem sufficient to compensate for risk and the  
17                   time value of money. In equilibrium, the expected and required rates of return  
18                   on a company's common stock are equal.

19                   Normative economic models of the firm, developed under very  
20                   restrictive assumptions, provide insight into the relationship between firm  
21                   performance or profitability, capital costs, and the value of the firm. Under  
22                   the economist's ideal model of perfect competition where entry and exit is  
23                   costless, products are undifferentiated, and there are increasing marginal costs

1 of production, firms produce up to the point where price equals marginal cost.  
2 Over time, a long-run equilibrium is established where price equals average  
3 cost, including the firm's capital costs. In equilibrium, total revenues equal  
4 total costs, and because capital costs represent investors' required return on  
5 the firm's capital, actual returns equal required returns, and the market value  
6 and the book value of the firm's securities must be equal.

7 In the real world, firms can achieve competitive advantage due to  
8 product market imperfections. Most notably, companies can gain competitive  
9 advantage through product differentiation (adding real or perceived value to  
10 products) and by achieving economies of scale (decreasing marginal costs of  
11 production). Competitive advantage allows firms to price products above  
12 average cost and thereby earn accounting profits greater than those required to  
13 cover capital costs. When these profits are in excess of that required by  
14 investors, or when a firm earns a return on equity in excess of its cost of  
15 equity, investors respond by valuing the firm's equity in excess of its book  
16 value.

17 James M. McTaggart, founder of the international management  
18 consulting firm Marakon Associates, described this essential relationship  
19 between the return on equity, the cost of equity, and the market-to-book ratio  
20 in the following manner:<sup>2</sup>

21 Fundamentally, the value of a company is determined  
22 by the cash flow it generates over time for its owners,  
23 and the minimum acceptable rate of return required by

---

<sup>2</sup> James M. McTaggart, "The Ultimate Poison Pill: Closing the Value Gap," *Commentary* (Spring 1988), p. 2.

1 capital investors. This “cost of equity capital” is used  
2 to discount the expected equity cash flow, converting it  
3 to a present value. The cash flow is, in turn, produced  
4 by the interaction of a company’s return on equity and  
5 the annual rate of equity growth. High return on equity  
6 (ROE) companies in low-growth markets, such as  
7 Kellogg, are prodigious generators of cash flow, while  
8 low ROE companies in high-growth markets, such as  
9 Texas Instruments, barely generate enough cash flow to  
10 finance growth.

11 A company’s ROE over time, relative to its cost of  
12 equity, also determines whether it is worth more or less  
13 than its book value. If its ROE is consistently greater  
14 than the cost of equity capital (the investor’s minimum  
15 acceptable return), the business is economically  
16 profitable and its market value will exceed book value.  
17 If, however, the business earns an ROE consistently  
18 less than its cost of equity, it is economically  
19 unprofitable and its market value will be less than book  
20 value.

21 As such, the relationship between a firm’s return on equity, cost of  
22 equity, and market-to-book ratio is relatively straightforward. A firm that  
23 earns a return on equity above its cost of equity will see its common stock sell  
24 at a price above its book value. Conversely, a firm that earns a return on  
25 equity below its cost of equity will see its common stock sell at a price below  
26 its book value.

27

28 **Q. PLEASE PROVIDE ADDITIONAL INSIGHTS INTO THE**  
29 **RELATIONSHIP BETWEEN RETURN ON EQUITY AND MARKET-**  
30 **TO-BOOK RATIOS.**

1           A.     This relationship is discussed in a classic Harvard Business School case study  
2                   entitled “A Note on Value Drivers.” On page 2 of that case study, the author  
3                   describes the relationship very succinctly:<sup>3</sup>

4                                 For a given industry, more profitable firms – those able  
5                                 to generate higher returns per dollar of equity – should  
6                                 have higher market-to-book ratios. Conversely, firms  
7                                 which are unable to generate returns in excess of their  
8                                 cost of equity should sell for less than book value.

	<u>Profitability</u>	<u>Value</u>
9		
10	<i>If ROE &gt; K</i>	<i>then Market/Book &gt; 1</i>
11	<i>If ROE = K</i>	<i>then Market/Book = 1</i>
12	<i>If ROE &lt; K</i>	<i>then Market/Book &lt; 1</i>

13                                 To assess the relationship by industry, as suggested above, I  
14                                 performed a regression study between estimated return on equity (“ROE”) and  
15                                 market-to-book ratios using natural gas distribution, electric utility and water  
16                                 utility companies. I used all companies in these three industries that are  
17                                 covered by *Value Line* and have estimated ROE and market-to-book ratio  
18                                 data. The results are presented in Panels A-C of Exhibit JRW-6. The  
19                                 average R-squares for the electric, gas, and water companies are 0.65, 0.60,  
20                                 and 0.92, respectively.<sup>4</sup> This demonstrates the strong positive relationship  
21                                 between ROEs and market-to-book ratios for public utilities.

22

23           **Q.     WHAT ECONOMIC FACTORS HAVE AFFECTED THE COST OF**  
24                   **EQUITY CAPITAL FOR PUBLIC UTILITIES?**

---

<sup>3</sup> Benjamin Esty, “A Note on Value Drivers,” Harvard Business School, Case No. 9-297-082, April 7, 1997.

<sup>4</sup> R-square measures the percent of variation in one variable (e.g., market-to-book ratios) explained by another variable (e.g., expected ROE). R-squares vary between zero and 1.0, with values closer to 1.0 indicating a higher relationship between two variables.

1           A.     Exhibit JRW-7 provides indicators of public utility equity cost rates over the  
2                   past decade. Page 1 shows the yields on long-term ‘A’ rated public utility  
3                   bonds. These yields peaked in the early 2000s at over 8.0%, declined to about  
4                   5.0% in 2005, and rose to 6.0% in 2006 and 2007. They stayed in that 6.0%  
5                   range until the third quarter of 2008 when they spiked to almost 7.5% during  
6                   the financial crisis. They have since retreated and are now below 5.0%.

7                                 Page 2 of Exhibit JRW-7 provides the dividend yields for the proxy  
8                   group. The dividend yields for the Electric Proxy Group generally declined  
9                   slightly over the decade until 2007. They increased in 2008 and 2009 in  
10                  response to the financial crisis, but declined in 2010 to about 4.75%.

11                                Average earned returns on common equity and market-to-book ratios  
12                  for the group are on page 3 of Exhibit JRW-7. The average earned returns on  
13                  common equity for the Electric Proxy Group were in the 9.0%-12.0% range  
14                  over the past decade, and ended 2010 at 9.75%. The average market-to-book  
15                  ratio for the group has been in the 1.20X to 1.80X during the decade. The  
16                  average declined to about 1.20X in 2009, but increased to 1.30X in 2010.

17

18           **Q.     WHAT FACTORS DETERMINE INVESTORS’ EXPECTED OR**  
19                   **REQUIRED RATE OF RETURN ON EQUITY?**

20           A.     The expected or required rate of return on common stock is a function of  
21                   market-wide as well as company-specific factors. The most important market  
22                   factor is the time value of money as indicated by the level of interest rates in  
23                   the economy. Common stock investor requirements generally increase and

1 decrease with like changes in interest rates. The perceived risk of a firm is the  
2 predominant factor that influences investor return requirements on a  
3 company-specific basis. A firm's investment risk is often separated into  
4 business and financial risk. Business risk encompasses all factors that affect a  
5 firm's operating revenues and expenses. Financial risk results from incurring  
6 fixed obligations in the form of debt in financing its assets.

7  
8 **Q. HOW DOES THE INVESTMENT RISK OF UTILITIES COMPARE**  
9 **WITH THAT OF OTHER INDUSTRIES?**

10 A. Due to the essential nature of their service as well as their regulated status,  
11 public utilities are exposed to a lesser degree of business risk than other, non-  
12 regulated businesses. The relatively low level of business risk allows public  
13 utilities to meet much of their capital requirements through borrowing in the  
14 financial markets, thereby incurring greater than average financial risk.  
15 Nonetheless, the overall investment risk of public utilities is below most other  
16 industries.

17 Exhibit JRW-8 provides an assessment of investment risk for 100  
18 industries as measured by beta, which according to modern capital market  
19 theory, is the only relevant measure of investment risk. These betas come  
20 from the *Value Line Investment Survey* and are compiled annually by Aswath  
21 Damodaran of New York University.<sup>5</sup> The study shows that the investment  
22 risk of utilities is very low. The average beta for electric, water, and gas

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<sup>5</sup> Available at <http://www.stern.nyu.edu/~adamodar>.

1 utility companies are 0.75, 0.70, and 0.65, respectively. These are well below  
2 the *Value Line* average of 1.15. As such, the cost of equity for utilities is  
3 among the lowest of all industries in the U.S.

4  
5 **Q. HOW CAN THE EXPECTED OR REQUIRED RATE OF RETURN ON**  
6 **COMMON EQUITY CAPITAL BE DETERMINED?**

7 A. The costs of debt and preferred stock are normally based on historical or book  
8 values and can be determined with a great degree of accuracy. The cost of  
9 common equity capital, however, cannot be determined precisely and must  
10 instead be estimated from market data and informed judgment. This return to  
11 the stockholder should be commensurate with returns on investments in other  
12 enterprises having comparable risks.

13 According to valuation principles, the present value of an asset equals  
14 the discounted value of its expected future cash flows. Investors discount  
15 these expected cash flows at their required rate of return that, as noted above,  
16 reflects the time value of money and the perceived riskiness of the expected  
17 future cash flows. As such, the cost of common equity is the rate at which  
18 investors discount expected cash flows associated with common stock  
19 ownership.

20 Models have been developed to ascertain the cost of common equity  
21 capital for a firm. Each model, however, has been developed using restrictive  
22 economic assumptions. Consequently, judgment is required in selecting  
23 appropriate financial valuation models to estimate a firm's cost of common

1 equity capital, in determining the data inputs for these models, and in  
2 interpreting the models' results. All of these decisions must take into  
3 consideration the firm involved as well as current conditions in the economy  
4 and the financial markets.

5  
6 **Q. HOW DO YOU PLAN TO ESTIMATE THE COST OF EQUITY**  
7 **CAPITAL FOR THE COMPANY?**

8 A. I rely primarily on the discounted cash flow ("DCF") model to estimate the  
9 cost of equity capital. Given the investment valuation process and the relative  
10 stability of the utility business, I believe that the DCF model provides the best  
11 measure of equity cost rates for public utilities. It is my experience that this  
12 Commission has traditionally relied on the DCF method. I have also  
13 performed a capital asset pricing model ("CAPM") study, but I give these  
14 results less weight because I believe that risk premium studies, of which the  
15 CAPM is one form, provide a less reliable indication of equity cost rates for  
16 public utilities.

17  
18 **B. DCF ANALYSIS**

19 **Q. DESCRIBE THE THEORY BEHIND THE TRADITIONAL DCF**  
20 **MODEL.**

21 A. According to the DCF model, the current stock price is equal to the discounted  
22 value of all future dividends that investors expect to receive from investment  
23 in the firm. As such, stockholders' returns ultimately result from current as



1 well as future dividends. As owners of a corporation, common stockholders  
2 are entitled to a *pro rata* share of the firm's earnings. The DCF model  
3 presumes that earnings that are not paid out in the form of dividends are  
4 reinvested in the firm so as to provide for future growth in earnings and  
5 dividends. The rate at which investors discount future dividends, which  
6 reflects the timing and riskiness of the expected cash flows, is interpreted as  
7 the market's expected or required return on the common stock. Therefore, this  
8 discount rate represents the cost of common equity. Algebraically, the DCF  
9 model can be expressed as:

$$10 \quad P = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \dots + \frac{D_n}{(1+k)^n}$$

11  
12  
13  
14 where P is the current stock price,  $D_n$  is the dividend in year n, and k is the  
15 cost of common equity.

16  
17 **Q. IS THE DCF MODEL CONSISTENT WITH VALUATION**  
18 **TECHNIQUES EMPLOYED BY INVESTMENT FIRMS?**

19 A. Yes. Virtually all investment firms use some form of the DCF model as a  
20 valuation technique. One common application for investment firms is called  
21 the three-stage DCF or dividend discount model ("DDM"). The stages in a  
22 three-stage DCF model are presented in Exhibit JRW-9. This model presumes  
23 that a company's dividend payout progresses initially through a growth stage,  
24 then proceeds through a transition stage, and finally assumes a steady-state  
25 stage. The dividend-payment stage of a firm depends on the profitability of its

1 internal investments, which, in turn, is largely a function of the life cycle of  
2 the product or service.

3 1. Growth stage: Characterized by rapidly expanding sales, high profit  
4 margins, and abnormally high growth in earnings per share. Because of  
5 highly profitable expected investment opportunities, the payout ratio is low.  
6 Competitors are attracted by the unusually high earnings, leading to a decline  
7 in the growth rate.

8 2. Transition stage: In later years increased competition reduces profit  
9 margins and earnings growth slows. With fewer new investment  
10 opportunities, the company begins to pay out a larger percentage of earnings.

11 3. Maturity (steady-state) stage: Eventually the company reaches a  
12 position where its new investment opportunities offer, on average, only  
13 slightly attractive ROEs. At that time its earnings growth rate, payout ratio,  
14 and ROE stabilize for the remainder of its life. The constant-growth DCF  
15 model is appropriate when a firm is in the maturity stage of the life cycle.

16 In using this model to estimate a firm's cost of equity capital,  
17 dividends are projected into the future using the different growth rates in the  
18 alternative stages, and then the equity cost rate is the discount rate that equates  
19 the present value of the future dividends to the current stock price.

20  
21 **Q. HOW DO YOU ESTIMATE STOCKHOLDERS' EXPECTED OR**  
22 **REQUIRED RATE OF RETURN USING THE DCF MODEL?**

1           A.     Under certain assumptions, including a constant and infinite expected growth  
2                     rate, and constant dividend/earnings and price/earnings ratios, the DCF model  
3                     can be simplified to the following:

4   
$$P = \frac{D_1}{k - g}$$

5  
6  
7  
8           where  $D_1$  represents the expected dividend over the coming year and  $g$  is the  
9                     expected growth rate of dividends. This is known as the constant-growth  
10                    version of the DCF model. To use the constant-growth DCF model to  
11                    estimate a firm's cost of equity, one solves for  $k$  in the above expression to  
12                    obtain the following:

13   
$$k = \frac{D_1}{P} + g$$

14  
15  
16  
17           **Q.     IN YOUR OPINION, IS THE CONSTANT-GROWTH DCF MODEL**  
18                     **APPROPRIATE FOR PUBLIC UTILITIES?**

19           A.     Yes. The economics of the public utility business indicate that the industry is  
20                     in the steady-state or constant-growth stage of a three-stage DCF. The  
21                     economics include the relative stability of the utility business, the maturity of  
22                     the demand for public utility services, and the regulated status of public  
23                     utilities (especially the fact that their returns on investment are effectively set  
24                     through the ratemaking process). The DCF valuation procedure for  
25                     companies in this stage is the constant-growth DCF. In the constant-growth  
26                     version of the DCF model, the current dividend payment and stock price are

1 directly observable. However, the primary problem and controversy in  
2 applying the DCF model to estimate equity cost rates entails estimating  
3 investors' expected dividend growth rate.

4  
5 **Q. WHAT FACTORS SHOULD ONE CONSIDER WHEN APPLYING**  
6 **THE DCF METHODOLOGY?**

7 A. One should be sensitive to several factors when using the DCF model to  
8 estimate a firm's cost of equity capital. In general, one must recognize the  
9 assumptions under which the DCF model was developed in estimating its  
10 components (the dividend yield and expected growth rate). The dividend  
11 yield can be measured precisely at any point in time, but tends to vary  
12 somewhat over time. Estimation of expected growth is considerably more  
13 difficult. One must consider recent firm performance, in conjunction with  
14 current economic developments and other information available to investors,  
15 to accurately estimate investors' expectations.

16  
17 **Q. PLEASE DISCUSS EXHIBIT JRW-10.**

18 A. My DCF analysis is provided in Exhibit JRW-10. The DCF summary is on  
19 page 1 of this Exhibit, and the supporting data and analysis for the dividend  
20 yield and expected growth rate are provided on the following pages of the  
21 Exhibit.

22

1           **Q.    WHAT DIVIDEND YIELDS ARE YOU EMPLOYING IN YOUR DCF**  
2           **ANALYSIS FOR THE PROXY GROUP?**

3           A.    The dividend yields on the common stock for the companies in the proxy  
4           group are provided on page 2 of Exhibit JRW-10 for the six-month period  
5           ending September 2011. For the DCF dividend yields for the Group, I use the  
6           average of the six month and September 2011 dividend yields. The table  
7           below shows these dividend yields.

8

<b>Proxy Group</b>	<b>September 2011 Dividend Yield</b>	<b>6-Month Average Dividend Yield</b>	<b>DCF Dividend Yield</b>
<b>Electric Proxy Group</b>	<b>4.7%</b>	<b>4.6%</b>	<b>4.65%</b>

9

10          **Q.    PLEASE DISCUSS THE APPROPRIATE ADJUSTMENT TO THE**  
11          **SPOT DIVIDEND YIELD.**

12          A.    According to the traditional DCF model, the dividend yield term relates to the  
13          dividend yield over the coming period. As indicated by Professor Myron  
14          Gordon, who is commonly associated with the development of the DCF model  
15          for popular use, this is obtained by: (1) multiplying the expected dividend  
16          over the coming quarter by 4 and (2) dividing this dividend by the current  
17          stock price to determine the appropriate dividend yield for a firm, that pays  
18          dividends on a quarterly basis.<sup>6</sup>

19                         In applying the DCF model, some analysts adjust the current dividend  
20          for growth over the coming year as opposed to the coming quarter. This can

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<sup>6</sup> *Petition for Modification of Prescribed Rate of Return*, Federal Communications Commission, Docket No. 79-05, Direct Testimony of Myron J. Gordon and Lawrence I. Gould at 62 (April 1980).

1 be complicated because firms tend to announce changes in dividends at  
2 different times during the year. As such, the dividend yield computed based  
3 on presumed growth over the coming quarter as opposed to the coming year  
4 can be quite different. Consequently, it is common for analysts to adjust the  
5 dividend yield by some fraction of the long-term expected growth rate.

6  
7 **Q. GIVEN THIS DISCUSSION, WHAT ADJUSTMENT FACTOR WILL**  
8 **YOU USE FOR YOUR DIVIDEND YIELD?**

9 A. I will adjust the dividend yield by one-half (1/2) the expected growth so as to  
10 reflect growth over the coming year.

11  
12 **Q. PLEASE DISCUSS THE GROWTH RATE COMPONENT OF THE**  
13 **DCF MODEL.**

14 A. There is much debate as to the proper methodology to employ in estimating  
15 the growth component of the DCF model. By definition, this component is  
16 investors' expectation of the long-term dividend growth rate. Presumably,  
17 investors use some combination of historical and/or projected growth rates for  
18 earnings and dividends per share and for internal or book value growth to  
19 assess long-term potential.

20 **Q. WHAT GROWTH DATA HAVE YOU REVIEWED FOR THE PROXY**  
21 **GROUP?**

1           A.     I have analyzed a number of measures of growth for companies in the Electric  
2                   Proxy Group. I reviewed *Value Line's* historical and projected growth rate  
3                   estimates for earnings per share ("EPS"), dividends per share ("DPS"), and  
4                   book value per share ("BVPS"). In addition, I utilized the average EPS  
5                   growth rate forecasts of Wall Street analysts as provided by Yahoo, Reuters  
6                   and Zacks. These services solicit five-year earnings growth rate projections  
7                   from securities analysts and compile and publish the means and medians of  
8                   these forecasts. Finally, I also assessed prospective growth as measured by  
9                   prospective earnings retention rates and earned returns on common equity.

10

11           **Q.     PLEASE DISCUSS HISTORICAL GROWTH IN EARNINGS AND**  
12                   **DIVIDENDS AS WELL AS INTERNAL GROWTH.**

13           A.     Historical growth rates for EPS, DPS, and BVPS are readily available to  
14                   virtually all investors and are presumably an important ingredient in forming  
15                   expectations concerning future growth. However, one must use historical  
16                   growth numbers as measures of investors' expectations with caution. In some  
17                   cases, past growth may not reflect future growth potential. Also, employing a  
18                   single growth rate number (for example, for five or ten years), is unlikely to  
19                   accurately measure investors' expectations due to the sensitivity of a single  
20                   growth rate figure to fluctuations in individual firm performance as well as  
21                   overall economic fluctuations (i.e., business cycles). However, one must  
22                   appraise the context in which the growth rate is being employed. According  
23                   to the conventional DCF model, the expected return on a security is equal to

1 the sum of the dividend yield and the expected long-term growth in dividends.  
2 Therefore, to best estimate the cost of common equity capital using the  
3 conventional DCF model, one must look to long-term growth rate  
4 expectations.

5 Internally generated growth is a function of the percentage of earnings  
6 retained within the firm (the earnings retention rate) and the rate of return  
7 earned on those earnings (the return on equity). The internal growth rate is  
8 computed as the retention rate times the return on equity. Internal growth is  
9 significant in determining long-run earnings and therefore, dividends.  
10 Investors recognize the importance of internally generated growth and pay  
11 premiums for stocks of companies that retain earnings and earn high returns  
12 on internal investments.

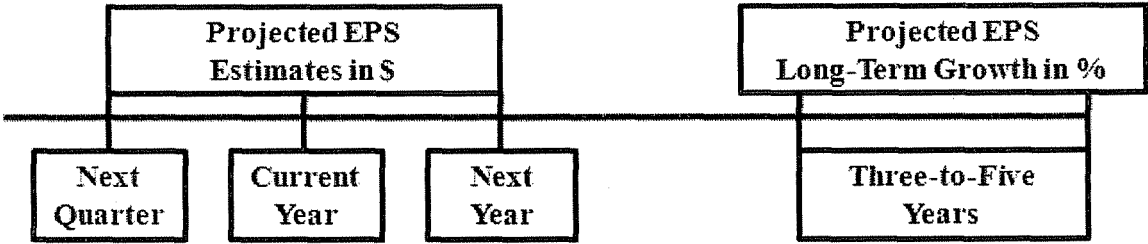
13  
14 **Q. PLEASE DISCUSS ANALYSTS' EPS FORECASTS.**

15 A. EPS forecasts are collected and published by a number of different services,  
16 including by Zack's, First Call, and Reuters. These services retrieve and  
17 compile EPS forecasts from Wall Street analysts. These analysts come from both  
18 sell side financial firms, such as Merrill Lynch and Morgan Stanley, and buy  
19 side financial firms, such as Prudential Insurance and Fidelity Investments.

20 These services collect and publish: (1) EPS estimates for future quarterly  
21 and annual time periods and (2) long-term EPS growth rate forecasts. The EPS  
22 estimates are in dollars and cents per share, and the services report the high, low  
23 and mean of the estimates collected for analysts. The long-term projected EPS



1 growth rate is expressed in percentage terms. As shown in the figure below, the  
 2 projected EPS near-term estimates are usually provided for the next quarter, the  
 3 current fiscal year, and the next fiscal year. The long-term projected EPS growth  
 4 rate is for a three-to-five year time period.



5  
6

7 **Q. PLEASE PROVIDE AN EXAMPLE OF THESE EPS FORECASTS.**

8 **A.** The following example provides the EPS forecasts compiled by Reuters for  
 9 AEP.

10  
11  
12  
13

Consensus Earnings Estimates  
 American Electric Power  
[www.reuters.com](http://www.reuters.com)  
 August 3, 2011

14  
15

	# of Estimates	Mean	High	Low
<b>Earnings (per share)</b>				
Quarter Ending Sep-11	8	1.11	1.17	1.07
Quarter Ending Dec-11	8	0.45	0.51	0.39
Year Ending Dec-11	22	3.13	3.26	3.06
Year Ending Dec-12	22	3.23	3.35	3.15
LT Growth Rate (%)	8	4.23	6.00	2.30

16  
17  
18

These figures can be interpreted as follows. The top line shows that eight analysts have provided EPS estimates for the quarter ending September 2011.

1 The mean, high and low estimates are \$1.11, \$1.17, and \$1.07, respectively.  
2 The second line shows the quarterly EPS estimates for the quarter ending  
3 December 2011. Lines three and four show the annual EPS estimates for the  
4 fiscal years ending December 2011 and 2012. The quarterly and annual EPS  
5 forecasts in lines 1-4 are expressed in dollars and cents. As in the AEP case  
6 shown here, it is common for more analysts to provide estimates of annual  
7 EPS as opposed to quarterly EPS. The long-term growth rate is expressed as a  
8 percent, and there are usually fewer analysts providing this figure. For AEP,  
9 eight analysts have provided long-term EPS growth rate forecasts, with mean,  
10 high and low growth rates of 4.23%, 6.00%, and 2.30%.

11  
12 **Q. WHICH OF THESE EPS FORECASTS IS USED IN DEVELOPING A**  
13 **DCF GROWTH RATE?**

14 A. The DCF growth rate is the long-term projected growth rate in EPS, DPS, and  
15 BVPS. Therefore, in developing an equity cost rate using the DCF model, the  
16 projected long-term growth rate is the projection used in the DCF model.

17  
18 **Q. WHY ARE YOU NOT RELYING EXCLUSIVELY ON THE EPS**  
19 **FORECASTS OF WALL STREET ANALYSTS IN ARRIVING AT A**  
20 **DCF GROWTH RATE FOR THE PROXY GROUP?**

21 A. There are several issues with using the EPS growth rate forecasts of Wall  
22 Street analysts as DCF growth rates. First, the appropriate growth rate in the  
23 DCF model is the dividend growth rate, not the earnings growth rate.

1           Nonetheless, over the very long-term, dividend and earnings will have to grow  
2           at a similar growth rate. Therefore, consideration must be given to other  
3           indicators of growth, including prospective dividend growth, internal growth,  
4           as well as projected earnings growth. Second, and most significantly, it is  
5           well-known that the long-term EPS growth rate forecasts of Wall Street  
6           securities analysts are overly optimistic and upwardly biased. This has been  
7           demonstrated in a number of academic studies over the years. Hence, using  
8           these growth rates as a DCF growth rate will provide an overstated equity cost  
9           rate. This issue is addressed in Appendix B – The Research on Analysts'  
10          Long-Term EPS Growth Rate Forecasts.

11

12          **Q. IS IT YOUR OPINION THAT STOCK PRICES REFLECT THE**  
13          **UPWARD BIAS IN THE EPS GROWTH RATE FORECASTS?**

14          A. Yes, I do believe that investors are well aware of the bias in analysts' EPS  
15          growth rate forecasts, and therefore, stock prices reflect the upward bias.

16

17          **Q. HOW DOES THAT AFFECT THE USE OF THESE FORECASTS IN A**  
18          **DCF EQUITY COST RATE STUDY?**

19          A. According to the DCF model, the equity cost rate is a function of the dividend  
20          yield and expected growth rate. Since stock prices reflect the bias, it would  
21          affect the dividend yield. In addition, the DCF growth rate needs to be adjusted  
22          downward from the projected EPS growth rate to reflect the upward bias.

23

1           **Q.   PLEASE DISCUSS THE HISTORICAL GROWTH OF THE**  
2           **COMPANIES IN THE GROUP AS PROVIDED IN THE *VALUE LINE***  
3           ***INVESTMENT SURVEY.***

4           A.   Historic growth rates for the companies in the Electric Proxy Group, as  
5           published in the *Value Line Investment Survey*, are provided on page 3 of  
6           Exhibit JRW-10. Due to the presence of outliers, I once again use the  
7           medians in the analysis. The historical growth measures in EPS, DPS, and  
8           BVPS for the Electric Proxy Group, as measured by the medians, range from -  
9           0.5% to 7.0%, with an average of 3.4%.

10

11           **Q.   PLEASE SUMMARIZE *VALUE LINE'S* PROJECTED GROWTH**  
12           **RATES FOR THE COMPANIES IN THE PROXY GROUP.**

13           A.   *Value Line's* projections of EPS, DPS and BVPS growth for the companies in  
14           the Electric Proxy Group are shown on page 4 of Exhibit JRW-10. As above,  
15           due to the presence of outliers, both the mean and medians are used in the  
16           analysis. For the Electric Proxy Group, the central tendency measure ranges  
17           from 3.5% to 5.5%, with an average of 4.4%.

18

19                       Also provided on page 4 of Exhibit JRW-10 are the sustainable or  
20           prospective internal growth rates for the proxy group as measured by *Value*  
21           *Line's* average projected retention rate and return on shareholders' equity. As  
22           noted above, sustainable or internal growth is significant and a primary driver  
23           of long-run earnings growth. For the Electric Proxy Group, the average  
          prospective sustainable growth rate is 4.2%.

1

2

**Q. PLEASE ASSESS GROWTH FOR THE PROXY GROUP AS MEASURED BY ANALYSTS' FORECASTS OF EXPECTED 5-YEAR EPS GROWTH.**

3

4

5

A. Yahoo, First Call, Zack's, and Reuters collect, summarize, and publish Wall Street analysts' five-year EPS growth rate forecasts for the companies in the proxy group. These forecasts are provided for the companies in the Electric Proxy Group on page 5 of Exhibit JRW-10. The medians of the analysts' projected EPS growth rates for the Electric Group is 4.9%.<sup>7</sup>

6

7

8

9

10

11

**Q. PLEASE SUMMARIZE YOUR ANALYSIS OF THE HISTORICAL AND PROSPECTIVE GROWTH OF THE PROXY GROUP.**

12

13

A. The summary DCF growth rate indicators for the Electric Proxy Group are shown on page 6 of Exhibit JRW-10. The average of the growth rate indicators for the Electric Proxy Group is 4.2%. The average *Value Line's* projected growth rates in EPS, DPS, and BVPS is 4.4% and *Value Line's* sustainable growth rate is 4.2 %. The average of analysts' projected EPS growth rates is 4.9%. The average of the projected and prospective growth rate indicators for the Group is 4.5%. Given these results, and giving more weight to the projections, an expected DCF growth rate in the 4.5% to 5.0% is

14

15

16

17

18

19

20

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<sup>7</sup> Since there is considerable overlap in analyst coverage between the three services, and not all of the companies have forecasts from the different services, I have averaged the expected five-year EPS growth rates from the three services for each company to arrive at an expected EPS growth rate by company.

1 reasonable. I will use the midpoint of this range, 4.75%, as my DCF growth  
 2 rate for the Electric Proxy Group.

3 **Q. BASED ON THE ABOVE ANALYSIS, WHAT IS YOUR INDICATED**  
 4 **COMMON EQUITY COST RATE FOR THE DCF MODEL?**

5 A. My DCF-derived equity cost rates for the group is:

6  
 7  
 8  
 9 DCF Equity Cost Rate (k) =  $\frac{D}{P}$  + g  
 10  
 11

12 **DCF Equity Cost Rates**

	<b>Dividend Yield</b>	<b>1 + ½ Growth Adjustment</b>	<b>DCF Growth Rate</b>	<b>Equity Cost Rate</b>
<b>Electric Proxy Group</b>	<b>4.65%</b>	<b>1.02375</b>	<b>4.75%</b>	<b>9.5%</b>

13  
 14 These results are summarized on page 1 of Exhibit JRW-10.

16 **C. CAPM RESULTS**

17 **Q. PLEASE DISCUSS THE CAPM.**

18 A. The CAPM is a risk premium approach to gauging a firm's cost of equity  
 19 capital. According to the risk premium approach, the cost of equity is the sum  
 20 of the interest rate on a risk-free bond (R<sub>f</sub>) and a risk premium (RP), and is  
 21 illustrated as follows:

22 k = R<sub>f</sub> + RP  
 23

1                   The yield on long-term U.S. Treasury securities is normally used as  $R_f$ .  
2 Risk premiums are measured in different ways. The CAPM is a theory of the  
3 risk and expected returns of common stocks. In the CAPM, two types of risk  
4 are associated with a stock: (1) firm-specific risk or unsystematic risk and (2)  
5 market or systematic risk, which is measured by a firm's beta. The only risk  
6 that investors receive a return for bearing is systematic risk.

7                   According to the CAPM, the expected return on a company's stock,  
8 which is also the equity cost rate ( $K$ ), is equal to:

$$K = (R_f) + \beta * [E(R_m) - (R_f)]$$

9                   Where:

- 11                   •  $K$  represents the estimated rate of return on the stock;
- 12                   •  $E(R_m)$  represents the expected return on the overall stock market.  
13 Frequently, the "market" refers to the S&P 500;
- 14                   •  $(R_f)$  represents the risk-free rate of interest;
- 15                   •  $[E(R_m) - (R_f)]$  represents the expected equity or market risk premium—  
16 the excess return that an investor expects to receive above the risk-free rate for  
17 investing in risky stocks; and
- 18                   •  $Beta$ —( $\beta$ ) is a measure of the systematic risk of an asset.

19                   To estimate the required return or cost of equity using the CAPM  
20 requires three inputs: (1) the risk-free rate of interest ( $R_f$ ), (2) the beta ( $\beta$ ), and  
21 (3) the expected equity or market risk premium  $[E(R_m) - (R_f)]$ .  $R_f$  is the easiest  
22 of the inputs to measure – it is the yield on long-term U.S. Treasury bonds.  $\beta$ ,  
23 the measure of systematic risk, is a little more difficult to measure because  
24 there are different opinions about what adjustments, if any, should be made to  
25 historical betas due to their tendency to regress to 1.0 over time. And finally,  
26

1 an even more difficult input to measure is the expected equity or market risk  
2 premium ( $E(R_m) - (R_f)$ ). I discuss each of these inputs below.

3

4 **Q. PLEASE DISCUSS EXHIBIT JRW-11.**

5 A. Exhibit JRW-11 provides the summary results for my CAPM study. Page 1  
6 shows the summary of the results, and pages 2-11 contain the supporting data.

7

8 **Q. PLEASE DISCUSS THE RISK-FREE INTEREST RATE.**

9 A. The yield on long-term U.S. Treasury bonds has usually been viewed as the  
10 risk-free rate of interest in the CAPM. The yield on long-term U.S. Treasury  
11 bonds, in turn, has been considered to be the yield on U.S. Treasury bonds  
12 with 30-year maturities.

13

14 **Q. WHAT RISK-FREE INTEREST RATE ARE YOU USING IN YOUR**  
15 **CAPM?**

16 A. The yield on 30-year Treasury bonds has been in the 3.5% to 4.5% range over  
17 the last six months. As of September 6 2011, the rate on 30-year U.S.  
18 Treasury Bonds was 3.26%. Given the recent range of yields, I use 4.0%, as  
19 the risk-free rate, or  $R_f$ , in my CAPM.

20

21 **Q. WHAT BETAS ARE YOU EMPLOYING IN YOUR CAPM?**

22 A. Beta ( $\beta$ ) is a measure of the systematic risk of a stock. The market, usually  
23 taken to be the S&P 500, has a beta of 1.0. The beta of a stock with the same



1 price movement as the market also has a beta of 1.0. A stock whose price  
2 movement is greater than that of the market, such as a technology stock, is  
3 riskier than the market and has a beta greater than 1.0. A stock with below  
4 average price movement, such as that of a regulated public utility, is less risky  
5 than the market and has a beta less than 1.0. Estimating a stock's beta involves  
6 running a linear regression of a stock's return on the market return.

7 As shown on page 3 of Exhibit JRW-11, the slope of the regression  
8 line is the stock's beta. A steeper line indicates the stock is more sensitive to  
9 the return on the overall market. This means that the stock has a higher beta  
10 and greater than average market risk. A less steep line indicates a lower beta  
11 and less market risk.

12 Numerous online investment information services, such as Yahoo and  
13 Reuters, provide estimates of stock betas. Usually these services report  
14 different betas for the same stock. The differences are usually due to: (1) the  
15 time period over which the beta is measured and (2) any adjustments that are  
16 made to reflect the fact that betas tend to regress to 1.0 over time. In  
17 estimating an equity cost rate for the Electric Proxy Group, I use the betas for  
18 the companies as provided in the *Value Line Investment Survey*. As shown on  
19 page 3 of Exhibit JRW-11, the median beta for the companies in the Electric  
20 Proxy Group is 0.70.

21  
22 **Q. PLEASE DISCUSS THE ALTERNATIVE VIEWS REGARDING THE**  
23 **EQUITY RISK PREMIUM.**

1           A.     The equity or market risk premium -  $(E(R_m) - R_f)$  - is equal to the expected  
2                    return on the stock market (e.g., the expected return on the S&P 500  $(E(R_m))$ )  
3                    minus the risk-free rate of interest  $(R_f)$ . The equity premium is the difference  
4                    in the expected total return between investing in equities and investing in  
5                    “safe” fixed-income assets, such as long-term government bonds. However,  
6                    while the equity risk premium is easy to define conceptually, it is difficult to  
7                    measure because it requires an estimate of the expected return on the market.

8

9           **Q.     PLEASE DISCUSS THE ALTERNATIVE APPROACHES TO**  
10                   **ESTIMATING THE EQUITY RISK PREMIUM.**

11           A.     Page 4 of Exhibit JRW-11 highlights the primary approaches to, and issues in,  
12                    estimating the expected equity risk premium. The traditional way to measure  
13                    the equity risk premium was to use the difference between historical average  
14                    stock and bond returns. In this case, historical stock and bond returns, also  
15                    called *ex post* returns, were used as the measures of the market’s expected  
16                    return (known as the *ex ante* or forward-looking expected return). This type  
17                    of historical evaluation of stock and bond returns is often called the “Ibbotson  
18                    Approach” after Professor Roger Ibbotson who popularized this method of  
19                    using historical financial market returns as measures of expected returns.  
20                    Most historical assessments of the equity risk premium suggest an equity risk  
21                    premium of 5% to 7% above the rate on long-term U.S. Treasury bonds.  
22                    However, this can be a problem because: (1) *ex post* returns are not the same  
23                    as *ex ante* expectations, (2) market risk premiums can change over time,

1 increasing when investors become more risk-averse and decreasing when  
2 investors become less risk-averse, and (3) market conditions can change such  
3 that *ex post* historical returns are poor estimates of *ex ante* expectations.

4 The use of historical returns as market expectations has been  
5 criticized in numerous academic studies.<sup>8</sup> The general theme of these studies  
6 is that the large equity risk premium discovered in historical stock and bond  
7 returns cannot be justified by the fundamental data. These studies, which fall  
8 under the category “Ex Ante Models and Market Data,” compute *ex ante*  
9 expected returns using market data to arrive at an expected equity risk  
10 premium. These studies have also been called “Puzzle Research” after the  
11 famous study by Mehra and Prescott in which the authors first questioned the  
12 magnitude of historical equity risk premiums relative to fundamentals.<sup>9</sup>

13 In addition, there are a number of surveys of financial professionals  
14 regarding the equity risk premium. There have been several published surveys  
15 of academics on the equity risk premium. *CFO Magazine* conducts a quarterly  
16 survey of CFOs which includes questions regarding their views on the current  
17 expected returns on stocks and bonds. Usually over 500 CFOs participate in  
18 the survey.<sup>10</sup> Questions regarding expected stock and bond returns are also  
19 included in the Federal Reserve Bank of Philadelphia’s annual survey of  
20 financial forecasters which is published as the *Survey of Professional*

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<sup>8</sup> The problems with using *ex post* historical returns as measures of *ex ante* expectations will be discussed at length later in my testimony.

<sup>9</sup> R. Mehra and Edward Prescott, “The Equity Premium: A Puzzle,” *Journal of Monetary Economics* (1985).

<sup>10</sup> See [www.cfosurvey.org](http://www.cfosurvey.org).

1            *Forecasters*.<sup>11</sup> This survey of professional economists has been published for  
2            almost 50 years. In addition, Pablo Fernandez conducts occasional surveys of  
3            financial analysts and companies regarding the equity risk premiums they use  
4            in their investment and financial decision-making.

5  
6            **Q.     PLEASE PROVIDE A SUMMARY OF THE EQUITY RISK PREMIUM**  
7            **STUDIES.**

8            A.     Derrig and Orr (2003), Fernandez (2007), and Song (2007) have completed  
9            the most comprehensive reviews to date of the research on the equity risk  
10           premium.<sup>12</sup> Derrig and Orr’s study evaluated the various approaches to  
11           estimating equity risk premiums as well as the issues with the alternative  
12           approaches and summarized the findings of the published research on the  
13           equity risk premium. Fernandez examined four alternative measures of the  
14           equity risk premium – historical, expected, required, and implied. He also  
15           reviewed the major studies of the equity risk premium and presented the  
16           summary equity risk premium results. Song provides an annotated  
17           bibliography and highlights the alternative approaches to estimating the equity  
18           risk summary.

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<sup>11</sup>Federal Reserve Bank of Philadelphia, *Survey of Professional Forecasters*, (February 11, 2011). The *Survey of Professional Forecasters* was formerly conducted by the American Statistical Association (“ASA”) and the National Bureau of Economic Research (“NBER”) and was known as the ASA/NBER survey. The survey, which began in 1968, is conducted each quarter. The Federal Reserve Bank of Philadelphia, in cooperation with the NBER, assumed responsibility for the survey in June 1990.

<sup>12</sup> See Richard Derrig and Elisha Orr, “Equity Risk Premium: Expectations Great and Small,” Working Paper (version 3.0), Automobile Insurers Bureau of Massachusetts, (August 28, 2003); Pablo Fernandez, “Equity Premium: Historical, Expected, Required, and Implied,” IESE Business School Working Paper, (2007); Zhiyi Song, “The Equity Risk Premium: An Annotated Bibliography,” CFA Institute, (2007).

1                   Page 5 of Exhibit JRW-11 provides a summary of the results of the  
2 primary risk premium studies reviewed by Derrig and Orr, Fernandez, and  
3 Song, as well as other more recent studies of the equity risk premium. In  
4 developing page 5 of Exhibit JRW-11, I have categorized the studies as  
5 discussed on page 4 of Exhibit JRW-11. I have also included the results of the  
6 “Building Blocks” approach to estimating the equity risk premium, including  
7 a study I performed, which is presented in Appendix C. The Building Blocks  
8 approach is a hybrid approach employing elements of both historic and *ex*  
9 *ante* models.

10  
11           **Q. PLEASE DISCUSS PAGE 5 OF EXHIBIT JRW-11.**

12           A. Page 5 of Exhibit JRW-11 provides a summary of the results of the equity risk  
13 premium studies that I have reviewed. These include the results of: (1) the  
14 various studies of the historical risk premium, (2) *ex ante* equity risk premium  
15 studies, (3) equity risk premium surveys of CFOs, Financial Forecasters,  
16 analysts, companies and academics, and (4) the Building Block approaches to  
17 the equity risk premium. There are results reported for over thirty studies, and  
18 the median equity risk premium is 4.61%.

19  
20           **Q. PLEASE HIGHLIGHT THE RESULTS OF THE MORE RECENT**  
21 **RISK PREMIUM STUDIES AND SURVEYS?**

22           A. The studies cited on page 5 of Exhibit JRW-11 include all equity risk  
23 premium studies and surveys I could identify that were published over the past

1 decade and that provided an equity risk premium estimate. Most of these  
2 studies were published prior to the financial crisis of the past two years. In  
3 addition, some of these studies were published in the early 2000s at the market  
4 peak. It should be noted that many of these studies (as indicated) used data  
5 over long periods of time (as long as fifty years of data) and so they were not  
6 estimating an equity risk premium as of a point in time (e.g., the year 2001).  
7 To assess the effect of the earlier studies on the equity risk premium, on page  
8 6 of Exhibit JRW-11 I have reconstructed page 5 of Exhibit JRW-11, but I  
9 have eliminated all studies dated before January 2, 2010. The median for this  
10 subset of studies is 5.10%.

11  
12 **Q. GIVEN THESE RESULTS, WHAT EQUITY RISK PREMIUM ARE**  
13 **YOU USING IN YOUR CAPM?**

14 A. I use the median equity risk premium for the 2010-11 studies and surveys,  
15 which is 5.10%.

16  
17 **Q. IS YOUR *EX ANTE* EQUITY RISK PREMIUM CONSISTENT WITH**  
18 **THE EQUITY RISK PREMIUMS USED BY CFOS?**

19 A. Yes. In the June CFO survey conducted by *CFO Magazine* and Duke  
20 University, the expected 10-year equity risk premium was 3.4%.

21

1           **Q.    IS YOUR *EX ANTE* EQUITY RISK PREMIUM CONSISTENT WITH**  
2           **THE EQUITY RISK PREMIUMS OF PROFESSIONAL**  
3           **FORECASTERS?**

4           A.    Yes. The financial forecasters in the previously referenced Federal Reserve  
5           Bank of Philadelphia survey project both stock and bond returns. As shown  
6           on Panels D and E of page 8 of Exhibit JRW-11, the mean long-term expected  
7           stock and bond returns were 7.37% and 4.50%, respectively. This provides an  
8           *ex ante* equity risk premium of 2.87%.

9  
10          **Q.    IS YOUR *EX ANTE* EQUITY RISK PREMIUM CONSISTENT WITH**  
11          **THE EQUITY RISK PREMIUMS OF FINANCIAL ANALYSTS AND**  
12          **COMPANIES?**

13          A.    Yes. Pablo Fernandez recently published the results of a 2011 survey of  
14          financial analysts and companies. This survey included over 6,000 responses.  
15          The median equity risk premium employed by both U.S. analysts and  
16          companies was 5.0% and 5.2%.

17  
18          **Q.    IS YOUR *EX ANTE* EQUITY RISK PREMIUM CONSISTENT WITH**  
19          **THE EQUITY RISK PREMIUMS USED BY THE LEADING**  
20          **CONSULTING FIRMS?**

21          A.    Yes. McKinsey & Co. is widely recognized as the leading management  
22          consulting firm in the world. It published a study entitled “The Real Cost of  
23          Equity” in which the McKinsey authors developed an *ex ante* equity risk

1 premium for the U.S. In reference to the decline in the equity risk premium,  
2 as well as what is the appropriate equity risk premium to employ for corporate  
3 valuation purposes, the McKinsey authors concluded the following:

4 We attribute this decline not to equities becoming less  
5 risky (the inflation-adjusted cost of equity has not  
6 changed) but to investors demanding higher returns in  
7 real terms on government bonds after the inflation  
8 shocks of the late 1970s and early 1980s. We believe  
9 that using an equity risk premium of 3.5 to 4 percent in  
10 the current environment better reflects the true long-  
11 term opportunity cost of equity capital and hence will  
12 yield more accurate valuations for companies.<sup>13</sup>

13  
14 **Q. HAS MCKINSEY REAFFIRMED ITS OPINION ON THE EQUITY**  
15 **RISK PREMIUM IN LIGHT OF THE FINANCIAL CRISIS?**

16 A. Yes. As previously discussed, McKinsey has published a study in which they  
17 reaffirm their estimate of the equity risk premium in light of the financial  
18 turmoil of the past two years.<sup>14</sup>

19  
20 **Q. WHAT EQUITY COST RATE IS INDICATED BY YOUR CAPM**  
21 **ANALYSIS?**

22 A. The results of my CAPM study for the proxy group are provided below:  
23  
24

---

<sup>13</sup> Marc H. Goedhart, *et al.*, "The Real Cost of Equity," *McKinsey on Finance* (Autumn 2002), p. 15.

<sup>14</sup> Richard Dobbs, Bin Jang, and Timothy Koeller, "Why the Crisis Hasn't Shaken the Cost of Capital," *McKinsey Quarterly* (December 2008), pp. 1-6.



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$$K = (R_f) + \beta * [E(R_m) - (R_f)]$$

	<b>Risk-Free Rate</b>	<b>Beta</b>	<b>Equity Risk Premium</b>	<b>Equity Cost Rate</b>
<b>Electric Proxy Group</b>	<b>4.0%</b>	<b>0.70</b>	<b>5.10%</b>	<b>7.6%</b>

These results are summarized on page 1 of Exhibit JRW-11.

#### **VI. EQUITY COST RATE SUMMARY**

**Q. PLEASE SUMMARIZE YOUR EQUITY COST RATE STUDY.**

A. The results for my DCF and CAPM analyses for the proxy group of electric utility companies re indicated below:

	<b>DCF</b>	<b>CAPM</b>
<b>Electric Proxy Group</b>	<b>9.5%</b>	<b>7.6%</b>

**Q. GIVEN THESE RESULTS, WHAT IS YOUR ESTIMATED EQUITY COST RATE FOR THE GROUP?**

A. These results indicate that the appropriate equity cost rate for Kentucky Utilities is in the 7.6% to 9.5% range. However, since I give greater weight to the results of the DCF model, I believe that the appropriate equity cost rate is in the 9.0% to 9.50% range. I use the midpoint of this range, 9.25%, as the equity cost rate for KU.

1

2

**Q. PLEASE INDICATE WHY A 9.25% RETURN IS APPROPRIATE FOR  
KU AT THIS TIME.**

3

4

A. There are several reasons why 9.25% ROE is an appropriate return for the Company in this case. First, as shown on in Exhibit JRW-8, the electric utility industry is among the lowest risk industries as measured by *Value Line's* beta. As such, the cost of equity capital for the industry is among the lowest in the U.S. according to the CAPM. Second, as shown in Exhibit JRW-3, capital costs for utilities, as indicated by long-term bond yields, have declined to their pre-financial crisis levels. Third, while the financial markets have recovered significantly in the past year, the economy has not. The economic times are still viewed as being difficult, with nearly nine percent unemployment. As a result, interest rates and inflation are at relatively low levels, and hence the expected returns on financial assets – from savings accounts to Treasury bills to common stocks – are low. Therefore, in my opinion, a 9.25% return is appropriate for KU.

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**Q. WHAT IS YOUR CONCLUSION CONCERNING THE COST OF  
CAPITAL?**

19

20

A. From a ratepayer perspective, the effect of the magnitude of the escalating costs could be quite formidable. I have provided evidence that the cost of capital for the Company is lower today than a year ago. This includes the cost of debt and equity capital. In response to Staff Question No. 15, KU Witness

21

22

23

1 Mr. Arbough has indicated that the Company was able to raise \$1.5B in debt  
2 capital at a cost of under 4.0% in November of 2010. Hence, the Company's  
3 marginal cost of raising debt finance has declined. In addition, with lower  
4 interest rates, the cost of equity capital has declined. As such, using the  
5 10.63% ROE from the last rate case is not appropriate. This is especially  
6 relevant in this proceeding, given the fact that the risks associated with ECR  
7 operations would appear to be lower than with the regular operations of the  
8 utility.

9  
10 **Q. ARE THERE ALTERNATIVE FINANCING PLANS THAT COULD**  
11 **OFFSET THE LARGE RATE INCREASES ASSOCIATED WITH THE**  
12 **COMPANY'S ECR?**

13 A. Yes. It would appear that securitization is a financing plan to consider in this  
14 case. While I am not an expert in the matter, I am generally familiar with the  
15 concept. It is my understanding that a number of states have adopted laws  
16 that allow for securitization. The ultimate effect is to lower the company's  
17 financial risk while also helping to reduce financing costs for specific utility  
18 projects and thereby reduce end-users' bills.

19  
20 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

21 A. Yes, it does.

22

COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION

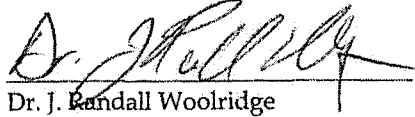
In the Matter of:

KENTUCKY UTILITIES COMPANY'S )  
APPLICATION FOR AN AMENDED )  
ENVIRONMENTAL COMPLIANCE PLAN, )  
A REVISED SURCHARGE TO RECOVER ) Case No. 2011-00161  
COSTS, AND CERTIFICATES OF PUBLIC )  
CONVENIENCE AND NECESSITY FOR THE )  
CONSTRUCTION OF NECESSARY )  
ENVIRONMENTAL EQUIPMENT )

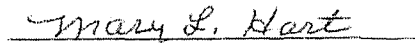
**AFFIDAVIT OF DR. J. RANDALL WOOLRIDGE**

Commonwealth of )  
Pennsylvania )  
)  
)

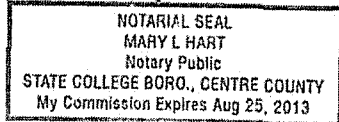
Dr. J. Randall Woolridge, being first duly sworn, states the following: The prepared Pre-Filed Direct Testimony, Schedules and Appendixes attached thereto constitute the direct testimony of Affiant in the above-styled case. Affiant states that he would give the answers set forth in the Pre-Filed Direct Testimony if asked the questions propounded therein. Affiant further states that, to the best of his knowledge, his statements made are true and correct. Further affiant saith not.

  
Dr. J. Randall Woolridge

SUBSCRIBED AND SWORN to before me this 14 day of September, 2011.

  
NOTARY PUBLIC

My Commission Expires: \_\_\_\_\_



Appendix A  
Educational Background, Research, and Related Business Experience  
J. Randall Woolridge

J. Randall Woolridge is a Professor of Finance and the Goldman, Sachs & Co. and Frank P. Smeal Endowed Faculty Fellow in Business Administration in the College of Business Administration of the Pennsylvania State University in University Park, PA. In addition, Professor Woolridge is Director of the Smeal College Trading Room and President and CEO of the Nittany Lion Fund, LLC.

Professor Woolridge received a Bachelor of Arts degree in Economics from the University of North Carolina, a Master of Business Administration degree from the Pennsylvania State University, and a Doctor of Philosophy degree in Business Administration (major area-finance, minor area-statistics) from the University of Iowa. At Iowa he received a Graduate Fellowship and was awarded membership in Beta Gamma Sigma, a national business honorary society. He has taught Finance courses at the University of Iowa, Cornell College, and the University of Pittsburgh, as well as the Pennsylvania State University. These courses include corporation finance, commercial and investment banking, and investments at the undergraduate, graduate, and executive MBA levels.

Professor Woolridge's research has centered on the theoretical and empirical foundations of corporation finance and financial markets and institutions. He has published over 35 articles in the best academic and professional journals in the field, including the *Journal of Finance*, the *Journal of Financial Economics*, and the *Harvard Business Review*. His research has been cited extensively in the business press. His work has been featured in the *New York Times*, *Forbes*, *Fortune*, *The Economist*, *Financial World*, *Barron's*, *Wall Street Journal*, *Business Week*, *Washington Post*, *Investors' Business Daily*, *Worth Magazine*, *USA Today*, and other publications. In addition, Dr. Woolridge has appeared as a guest to discuss the implications of his research on CNN's *Money Line*, CNBC's *Morning Call* and *Business Today*, and Bloomberg's *Morning Call*.

Professor Woolridge's popular stock valuation book, *The StreetSmart Guide to Valuing a Stock* (McGraw-Hill, 2003), was released in its second edition. He has also co-authored *Spinoffs and Equity Carve-Outs: Achieving Faster Growth and Better Performance* (Financial Executives Research Foundation, 1999) as well as a textbook entitled *Basic Principles of Finance* (Kendall Hunt, 2011). Dr. Woolridge is a founder and a managing director of [www.valuepro.net](http://www.valuepro.net) - a stock valuation website.

Professor Woolridge has also consulted with and prepared research reports for major corporations, financial institutions, and investment banking firms, and government agencies. In addition, he has directed and participated in over 500 university- and company- sponsored professional development programs for executives in 25 countries in North and South America, Europe, Asia, and Africa.

Dr. Woolridge has prepared testimony and/or provided consultation services in the following cases:

**Pennsylvania:** Dr. Woolridge has prepared testimony on behalf of the Pennsylvania Office of Consumer Advocate in the following cases before the Pennsylvania Public Utility Commission; Bell Telephone Company (R-811819), Peoples Natural Gas Company (R-832315), Pennsylvania Power Company (R-832409), Western Pennsylvania Water Company (R-832381), Pennsylvania Power Company (R-842740), Pennsylvania Gas and Water Company (R-850178), Metropolitan Edison Company (R-860384), Pennsylvania Electric Company (R-860413), North Penn Gas Company (R-860535), Philadelphia Electric Company (R-870629), Western Pennsylvania Water Company (R-870825), York Water Company (R-870749), Pennsylvania-American Water Company (R-880916), Equitable Gas Company (R-880971), the Bloomsburg Water Co. (R-891494), Columbia Gas of Pennsylvania, Inc. (R-891468), Pennsylvania-American Water Company (R-90562), Breezewood Telephone Company (R-901666), York Water Company (R-901813), Columbia Gas of Pennsylvania, Inc. (R-901873), National Fuel Gas Corporation (R-911912), Pennsylvania-American Water Company (R-911909), Borough of Media Water Fund (R-912150), UGI Utilities, Inc. - Electric Utility Division (R-922195), Dauphin Consolidated Water Supply Company - General Waterworks of Pennsylvania, Inc. (R-932604), National Fuel Gas Corporation (R-932548), Commonwealth Telephone Company (I-

Appendix A  
Educational Background, Research, and Related Business Experience  
J. Randall Woolridge

920020), Conestoga Telephone and Telegraph Company (I-920015), Peoples Natural Gas Company (R-932866), Blue Mountain Consolidated Water Company (R-932873), National Fuel Gas Corporation (R-942991), UGI - Gas Division (R-953297), UGI - Electric Division (R-953534), Pennsylvania-American Water Company (R-973944), Pennsylvania-American Water Company (R-994638), Philadelphia Suburban Water Company (R-994868;R-994877;R-994878; R-9948790), Philadelphia Suburban Water Company (R-994868), Wellsboro Electric Company (R-00016356), Philadelphia Suburban Water Company (R-00016750), National Fuel Gas Corporation (R-00038168), Pennsylvania-American Water Company (R-00038304), York Water Company (R-00049165), Valley Energy Company (R-00049345), Wellsboro Electric Company (R-00049313), National Fuel Gas Corporation (R-00049656), T.W. Phillips Gas and Oil Co. (R-00051178), PG Energy (R-00061365), City of Dubois Water Company (Docket No. R-00050671), R-00049165), York Water Company (R-00061322), Emporium Water Company (R-00061297), Pennsylvania-American Water Company (R-00072229), UGI Central Penn Gas (Docket No. R-2008-2079675), Columbia Gas of Pennsylvania, Inc. (R-2009-2149262), Pennsylvania-American Water Company – Claysville, Clarion, Northeast, and Coatesville (R-2010-2166210, R-2010-2166208, R-2010-2166212, and R-2010-2166214), Peoples Natural Gas Company (Docket No. R-2010-2201702), City of Lancaster Water Fund (Docket No. 2010-2179103).

**New Jersey:** Dr. Woolridge prepared testimony for the New Jersey Department of the Public Advocate, Division of Rate Counsel: New Jersey-American Water Company (R-91081399J), New Jersey-American Water Company (R-92090908J), and Environmental Disposal Corp. (R-94070319).

**Alaska:** Dr. Woolridge prepared testimony for Attorney General’s Office of Alaska: Golden Heart Utilities, Inc. and College Utilities Corp. (Water Public Utility Service TA-29-118 and Sewer Public Utility Service TA-82-97), Anchorage Water and Wastewater Utility (TA-106-122), Anchorage Water and Wastewater Utility (TA-08-157 and TA-08-158), Municipal Light & Power (TA304-121).

**Arizona:** Dr. Woolridge prepared testimony for Utility Division staff of the Arizona Corporation Commission, Arizona Public Service Company (Docket No. E-01345A-06-0009).

**Hawaii:** Dr. Woolridge prepared testimony for the Hawaii Office of the Consumer Advocate: East Honolulu Community Services, Inc. (Docket No. 7718).

**Delaware:** Dr. Woolridge prepared testimony for the Delaware Division of Public Advocate: Artesian Water Company (R-00-649). Dr. Woolridge prepared testimony for the staff of the Public Service Commission: Artesian Water Company (R-06-158).

**Ohio:** Dr. Woolridge prepared testimony for the Ohio Office of Consumers’ Council: SBC Ohio (Case No. 02-1280-TP-UNC R-00-649), Cincinnati Gas & Electric Company (Case No. 05-0059-EL-AIR), Dominion East Ohio Company (Case No. 07-829-GA-AIR), Cleveland Electric Illuminating Company and Toledo Edison Company (Case No. 08-935-EL-SSO), Columbia Gas of Ohio, Inc. (Case No. 08-0072-GA-AIR), and Columbus Southern Power Company (Case No. 08-917-EL-SSO).

**Texas:** Dr. Woolridge prepared testimony for the Atmos Cities Steering Committee: Mid-Texas Division of Atmos Energy Corp. (Docket No. 9670), Atmos Pipeline LLC (GUD No. 10000).

**New York:** Dr. Woolridge prepared testimony for the County of Nassau in New York State: Long Island Lighting Company (PSC Case No. 942354).

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**Florida:** Dr. Woolridge prepared testimony for the Office of Public Counsel in Florida: Florida Power & Light Co. (Docket No. 050045-EL), Tampa Electric Company (Docket No 080317-EI), Peoples Gas Company (Docket No 080318-GU), Florida Power & Light Co. (Docket Nos. 080677-EI & 090130-EI), and Progress Energy Florida, (Docket No. 090079-EI).

**Nebraska:** Dr. Woolridge prepared testimony for the Office of Public Advocate: Source Gas Distribution Co. (Docket No. NG-0060), Black Hills (Docket No. NG-0061), SourceGas Distribution Company (Docket No. NG-0060).

**Indiana:** Dr. Woolridge prepared testimony for the Indiana Office of Utility Consumer Counsel (OUCC) in the following cases: Southern Indiana Gas and Electric Company (IURC Cause No. 43111 and IURC Cause No. 43112), and Northern Indiana Public Service Company (IURC Cause No. 43526).

**Oklahoma:** Dr. Woolridge prepared testimony for the Oklahoma Industrial Energy Companies (OIEC) in the following cases: Public Service Company of Oklahoma (Cause No. PUD 200600285), Oklahoma Gas & Electric Company (Cause No. PUD 200700012).

**Connecticut:** Dr. Woolridge prepared testimony for the Office of Consumer Counsel in Connecticut: United Illuminating (Docket No. 96-03-29), Yankee Gas Company (Docket No. 04-06-01), Southern Connecticut Gas Company (Docket No. 03-03-17), the United Illuminating Company (Docket No. 05-06-04), Connecticut Light and Power Company (Docket No. 05-07-18), Birmingham Utilities, Inc. (Docket No. 06-05-10), Connecticut Water Company (Docket No. 06-07-08), Connecticut Natural Gas Corp. (Docket No. 06-03-04), Aquarion Water Company (Docket No. 07-05-09), Yankee Gas Company (Docket No. 06-12-02), Connecticut Light and Power Company (Docket No. 07-07-01), the United Illuminating Company (Docket No. 08-07-03), Connecticut Natural Gas Corp. (Docket No. 08-12-06), Southern Connecticut Gas Company (Docket No. 08-12-06), Connecticut Water Company (Docket No. 09-12-11), Connecticut Light and Power Company (Docket No. 09-12-05), Yankee Gas Company (Docket No. 10-12-02).

**California:** Dr. Woolridge prepared testimony for the Office of Ratepayer Advocate in California: San Gabriel Valley Water Company (Docket No. 05-08-021), Pacific Gas & Electric (Docket No. 07-05-008), San Diego Gas & Electric (Docket No. 07-05-007), Southern California Edison (Docket No. 07-05-003), California-American Water Company (Docket No. 08-05-003), Golden State Water Company (Docket No. 08-05-004), and California Water Service Company (Docket No. 08-05-002), California Water Utilities (Valencia, San Jose, San Gabriel, Park Valley, and Suburban (Docket No. 09-06-005).

**Colorado:** Dr. Woolridge prepared testimony for the Office of Consumer Counsel in Colorado: Public Service Company of Colorado (Docket No. 09AL-299E), and Public Service Company of Colorado (Docket No. 08S-520E).

**South Carolina:** Dr. Woolridge prepared testimony for the Office of Regulatory Staff in South Carolina: South Carolina Electric and Gas Company (Docket No. 2005-113-G), Carolina Water Service Co. (Docket No. 2006-87-WS), Tega Cay Water Company (Docket No. 2006-97-WS), United Utilities Companies, Inc. (Docket No. 2006-107-WS).

**Missouri:** Dr. Woolridge prepared testimony for the Department of Energy in Missouri: Kansas City Power & Light Company (Case No. ER-2006-0314). Dr. Woolridge prepared testimony for the Office of Attorney General of Missouri: Union Electric Company (CASE NO. ER-2007-0002).

**Kentucky:** Dr. Woolridge prepared testimony for the Office of Attorney General in Kentucky: Kentucky-American Water Company (Case No. 2004-00103), Union Heat, Light, and Power Company (Case No. 2004-00042), Kentucky Power Company (Case No. 2005-00341), Union Heat, Light, and Power Company (Case No. 2006-00172), Atmos Energy Corp. (Case No. 2006-00464), Columbia Gas Company (Case No. 2007-00008), Delta Natural Gas Company

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(Case No. 2007-00089), Kentucky-American Water Company (Case No. 2007-00143), Columbia Gas Company (Case No. 2009-00141), Kentucky-American Water Company (Case No. 2010-00136), Kentucky Utilities and Louisville Gas & Electric (Case No. 2009-00549 and Case No. 2009-00548).

**Massachusetts:** Dr. Woolridge prepared testimony for the Office of Attorney General: National Grid (Docket No. D.P.U. 09-39), National Grid (Docket No. D.P.U. 10-55), New England Gas Company (D.P.U. 10-114), Western Massachusetts Electric Company (D.P.U. 10-70), Fitchburg Gas and Electric Light Company (D.P.U. 11-01).

**Washington, D.C.:** Dr. Woolridge prepared testimony for the Office of the People's Counsel in the District of Columbia: Potomac Electric Power Company (Formal Case No. 939), Potomac Electric Power Company (Formal Case No. 1036), Washington Gas Light Company (Formal Case No. 1054).

**Washington:** Dr. Woolridge consulted with trial staff of the Washington Utilities and Transportation Commission on the following cases: Puget Energy Corp. (Docket Nos. UE-011570 and UG-011571); and Avista Corporation (Docket No. UE-011514).

**Kansas:** Dr. Woolridge prepared testimony on behalf of the Kansas Citizens' Utility Ratepayer Board in the following cases: Western Resources Inc. (Docket No. 01-WSRE-949-GIE), UtiliCorp (Docket No. 02-UTCG701-CIG), and Westar Energy, Inc. (Docket No. 05-WSEE-981-RTS).

**Utah:** Dr. Woolridge prepared testimony on behalf of the Utah Committee on Consumer Services (CCS) in the following case: Questar Gas Company (Docket No. No. 07-057-13).

**FERC:** Dr. Woolridge has prepared testimony on behalf of the Pennsylvania Office of Consumer Advocate in the following cases before the Federal Energy Regulatory Commission: National Fuel Gas Supply Corporation (RP-92-73-000) and Columbia Gulf Transmission Company (RP97-52-000).

**Vermont:** Dr. Woolridge prepared testimony for the Department of Public Service in the Central Vermont Public Service (Docket No. 6988) and Vermont Gas Systems, Inc. (Docket No. 7160).



Appendix B  
The Research on Analysts' Long-Term EPS Growth Rate Forecasts

1           **Q. PLEASE REVIEW THE ACADEMIC RESEARCH ON THE ACCURACY**  
2           **OF ANALYSTS' NEAR-TERM EPS ESTIMATES AND LONG-TERM EPS**  
3           **GROWTH RATE FORECASTS.**

4           A. There is a long history of studies that evaluate how well analysts forecast near-term  
5           EPS estimates and long-term EPS growth rates. Most of the early studies evaluated  
6           the accuracy of earnings forecasts for the next quarter or the next year. These  
7           studies document that analysts make overly optimistic EPS earnings forecasts  
8           (Stickel (1990); Brown (1997); Chopra (1998)).<sup>1</sup> Harris (1999) published the first  
9           study examining the accuracy of long-term EPS growth rate forecasts.<sup>2</sup> He  
10          evaluated the accuracy of analysts' long-term EPS forecasts over the 1982-1997  
11          time-period. He concluded the following: (1) the accuracy of analysts' long-term  
12          EPS forecasts is very low; (2) a superior long-run method to forecast long-term  
13          EPS growth is to assume that all companies will have an earnings growth rate  
14          equal to historic GDP growth; and (3) analysts' long-term EPS forecasts are  
15          significantly upwardly biased, with forecasted earnings growth exceeding actual  
16          earnings growth by seven percent per annum. Subsequent studies by DeChow, P.,  
17          A. Hutton, and R. Sloan (2000), and Chan, Karceski, and Lakonishok (2003) also

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<sup>1</sup> S. Stickel, "Predicting Individual Analyst Earnings Forecasts," *Journal of Accounting Research*, Vol. 28, 409-417, 1990. Brown, L.D., "Analyst Forecasting Errors: Additional Evidence," *Financial Analysts Journal*, Vol. 53, 81-88, 1997, and Chopra, V.K., "Why So Much Error in Analysts' Earnings Forecasts?" *Financial Analysts Journal*, Vol. 54, 30-37 (1998).

<sup>2</sup> R.D. Harris, "The Accuracy, Bias, and Efficiency of Analysts' Long Run Earnings Growth Forecasts," *Journal of Business Finance & Accounting*, pp. 725-55 (June/July 1999).

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1 conclude that analysts' long-term EPS growth rate forecasts are overly optimistic  
2 and upwardly biased.<sup>3</sup>

3 More recent studies have shown that the optimistic bias tends to be larger  
4 for longer-term forecasts and smaller for forecasts made nearer to the EPS  
5 announcement date. Richardson, Teoh, and Wysocki (2004) report that the  
6 upward bias in earnings growth rates declines in the quarters leading up to the  
7 earnings announcement date.<sup>4</sup> They call this result the "walk-down to beatable  
8 analyst forecasts." They hypothesize that the walk-down might be driven by the  
9 "earning-guidance game," in which analysts give optimistic forecasts at the start  
10 of a fiscal year, then revise their estimates downwards until the firm can beat the  
11 forecasts at the earnings announcement date.

12 In sum, there have been many studies of analysts' earnings forecasts. The  
13 studies conclude (almost unanimously) that analysts' earnings forecasts of short-  
14 term earnings estimates and long-term earnings growth rates are overly optimistic.  
15 In terms of analysts' projections of long-term earnings growth, all previous  
16 studies have come to this conclusion.

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<sup>3</sup> P. DeChow, A. Hutton, and R. Sloan, "The Relation Between Analysts' Forecasts of Long-Term Earnings Growth and Stock Price Performance Following Equity Offerings," *Contemporary Accounting Research* (2000) and K. Chan, L., Karceski, J., & Lakonishok, J., "The Level and Persistence of Growth Rates," *Journal of Finance* pp. 643–684, (2003).

<sup>4</sup> S. Richardson, S. Teoh, and P. Wysocki, "The Walk-Down to Beatable Analyst Forecasts: The Role of Equity Issuance and Insider Trading Incentives," *Contemporary Accounting Research*, pp. 885–924, (2004).

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1           **Q. PLEASE DISCUSS YOUR STUDY OF THE ACCURACY OF ANALYSTS'**  
2           **LONG-TERM EARNINGS GROWTH RATES.**

3           A. To evaluate the accuracy of analysts' EPS forecasts, I have compared actual 3-5  
4           year EPS growth rates with forecasted EPS growth rates on a quarterly basis over  
5           the past 20 years for all companies covered by the I/B/E/S data base. In Panel A  
6           of page 1 of Exhibit JRW-12, I show the average analysts' forecasted 3-5 year  
7           EPS growth rate with the average actual 3-5 year EPS growth rate for the past  
8           twenty years.

9                         The following example shows how the results can be interpreted. For the  
10           3-5 year period prior to the first quarter of 1999, analysts had projected an EPS  
11           growth rate of 15.13%, but companies only generated an average annual EPS  
12           growth rate over the 3-5 years of 9.37%. This projected EPS growth rate figure  
13           represented the average projected growth rate for over 1,510 companies, with an  
14           average of 4.88 analysts' forecasts per company. For the entire twenty-year  
15           period of the study, for each quarter there were on average 5.6 analysts' EPS  
16           projections for 1,281 companies. Overall, my findings indicate that forecast errors  
17           for long-term estimates are predominantly positive, which indicates an upward  
18           bias in growth rate estimates. The mean and median forecast errors over the  
19           observation period are 143.06% and 75.08%, respectively. The forecasting errors  
20           are negative for only eleven of the eighty quarterly time periods: five consecutive  
21           quarters starting at the end of 1995 and six consecutive quarters starting in 2006.  
22           As shown in Panel A of page 1 of Exhibit JRW-12, the quarters with negative  
23           forecast errors were for the 3-5 year periods following earnings declines

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1 associated with the 1991 and 2001 economic recessions in the U.S. Thus, there is  
2 evidence of a persistent upward bias in long-term EPS growth forecasts.

3 The average 3-5 year EPS growth rate projections for all companies  
4 provided in the I/B/E/S database on a quarterly basis from 1988 to 2008 are  
5 shown in Panel B of page 1 of Exhibit JRW-12. In this graph, no comparison to  
6 actual EPS growth rates is made, and hence, there is no follow-up period.  
7 Therefore, since companies are not lost from the sample due to a lack of follow-  
8 up EPS data, these results are for a larger sample of firms. Analysts' forecasts for  
9 EPS growth were higher for this larger sample of firms, with a more pronounced  
10 run-up and then decline around the stock market peak in 2000. The average  
11 projected growth rate hovered in the 14.5%-17.5% range until 1995 and then  
12 increased dramatically over the next five years to 23.3% in the fourth quarter of  
13 the year 2000. Forecasted EPS growth has since declined to the 15.0% range.

14 **Q. IS THE UPWARD BIAS IN ANALYSTS' GROWTH RATE FORECASTS**  
15 **GENERALLY KNOWN IN THE MARKETS?**

16 A. Yes. Page 2 of Exhibit JRW-12 provides an article published in the *Wall Street*  
17 *Journal*, dated March 21, 2008, that discusses the upward bias in analysts' EPS  
18 growth rate forecasts.<sup>5</sup> In addition, a recent *Bloomberg Businessweek* article also  
19 highlighted the upward bias in analysts' EPS forecasts, citing a study by McKinsey

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<sup>5</sup> Andrew Edwards, "Study Suggests Bias in Analysts' Rosy Forecasts," *Wall Street Journal* (March 21, 2008), p. C6.

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The Research on Analysts' Long-Term EPS Growth Rate Forecasts

1 Associates. This article is provided on pages 3 and 4 of Exhibit JRW-12. The  
2 article concludes with the following:<sup>6</sup>

3 *The bottom line: Despite reforms intended to improve Wall Street research, stock*  
4 *analysts seem to be promoting an overly rosy view of profit prospects.*

5  
6  
7 **Q. PLEASE ADDRESS THE ISSUE REGARDING THE SUPERIORITY OF**  
8 **ANALYSTS' EPS FORECASTS OVER HISTORIC AND TIME-SERIES**  
9 **ESTIMATES OF EPS GROWTH?**

10 A. As highlighted by the classic study by Brown and Rozeff (1976) and the other  
11 studies that followed, analysts' forecasts of quarterly earnings estimates are superior  
12 to the estimates derived from historic and time-series analyses.<sup>7</sup> This is often  
13 attributed to the information and timing advantage that analysts have over historic  
14 and time-series analyses. However, more recently Bradshaw, Drake, Myers, and  
15 Myers (2009) discovered that time-series estimates of annual earnings are more  
16 accurate over longer horizons than analysts' forecasts of earnings. As the authors  
17 state, "These findings suggest an incomplete and misleading generalization about  
18 the superiority of analysts' forecasts over even simple time-series-based earnings  
19 forecasts."<sup>8</sup>

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<sup>6</sup> Roben Farzad, 'For Analysts, Things are Always Looking Up,' *Bloomberg Businessweek* (June 14, 2010), pp. 39-40.

<sup>7</sup> L. Brown and M. Rozeff, "The Superiority of Analyst Forecasts as Measures of Expectations: Evidence from Earnings," *The Journal of Finance* 33 (1): pp. 1-16 (1976).

<sup>8</sup> M. Bradshaw, M. Drake, J. Myers, and L. Myers, "A Re-examination of Analysts' Superiority Over Time-Series

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1           With respect to long-term earnings growth, analysts' forecasts of long-term  
2 growth have not been found to be superior to other historic growth rate measures.  
3 Harris (1999) concluded that historic GDP growth was superior to analysts'  
4 forecasts for long run earnings growth. These results are supported by empirical  
5 results of Chan, Karceski, and Lakonishok (2003).

6       **Q.   WHAT IMPACT HAVE NEW STOCK MARKET AND REGULATORY**  
7       **DEVELOPMENTS HAD ON ANALYSTS' EPS GROWTH RATE**  
8       **FORECASTS?**

9       A.   Analysts' EPS growth rate forecasts have subsided somewhat since the stock  
10 market peak of 2000. Two regulatory developments over the past decade have  
11 potentially impacted analysts' EPS growth rate estimates. First, Regulation Fair  
12 Disclosure ("Reg FD") was introduced by the Securities and Exchange  
13 Commission ("SEC") in October of 2000. Reg FD prohibits private  
14 communication between analysts and management so as to level the information  
15 playing field in the markets. With Reg FD, analysts are less dependent on gaining  
16 access to management to obtain information and therefore, are not as likely to  
17 make optimistic forecasts to gain access to management. Second, the conflict of  
18 interest within investment firms with investment banking and analyst operations  
19 was addressed in the Global Analysts Research Settlements ("GARS"). GARS,  
20 as agreed upon on April 23, 2003, between the SEC, NASD, NYSE and ten of the  
21 largest U.S. investment firms, includes a number of regulations that were

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Forecasts," Workings paper, (1999), <http://ssrn.com/abstract=1528987>.

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1 introduced to prevent investment bankers from pressuring analysts to provide  
2 favorable projections.

3           The impact of these regulatory developments on the accuracy of short-  
4 term EPS estimates was addressed in a recent study by Hovakimian and  
5 Saenyasiri (2009).<sup>9</sup> They investigate analysts' forecasts of annual earnings for the  
6 following time periods: (1) the time prior to Reg FD (1984-2000); (2) the time  
7 period after Reg FD but prior to GARS (2000-2002);<sup>10</sup> and (3) the time period  
8 after GARS (2002-2006). For the pre-Reg FD period, Hovakimian and Saenyasiri  
9 find that analysts generally make overly optimistic forecasts of annual earnings.  
10 The forecast bias is higher for early forecasts and steadily declines in the months  
11 leading up to the earnings announcement. The results are similar for the time  
12 period after Reg FD but prior to GARS. However, the bias is lower in the later  
13 forecasts (the forecasts made just prior to the announcement). For the time period  
14 after GARS, the average forecasts declined significantly, but a positive bias  
15 remains. In sum, Hovakimian and Saenyasiri find that: (1) analysts make overly  
16 optimistic short-term forecasts of annual earnings; (2) Reg FD had no effect on  
17 this bias; and (3) GARS did result in a significant reduction in the bias, but  
18 analysts' short-term forecasts of annual earnings still have a small positive bias.

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<sup>9</sup> A. Hovakimian and E. Saenyasiri, "Conflicts of Interest and Analysts Behavior: Evidence from Recent Changes in Regulation," *Financial Analysts Journal* (July-August, 2010), pp. 96-107.

<sup>10</sup> Whereas the GARS settlement was signed in 2003, rules addressing analysts' conflict of interest by separating the research and investment banking activities of analysts went into effect with the passage of NYSE and NASD rules in July of 2002.

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1           Whereas Hovakimian and Saenyasiri evaluated the impact of regulations  
2           on analysts' short-term EPS estimates, there is little research on the impact of Reg  
3           FD and GARS on the long-term EPS forecasts of Wall Street analysts. My study  
4           with Patrick Cusatis did find that the long-term EPS growth rate forecasts of  
5           analysts did not decline significantly and have continued to be overly-optimistic  
6           in the post Reg FD and GARS period.<sup>11</sup> Analysts' long-term EPS growth rate  
7           forecasts before and after GARS are about two times the level of historic GDP  
8           growth. These observations are supported by a *Wall Street Journal* article entitled  
9           “Analysts Still Coming Up Rosy – Over-Optimism on Growth Rates is Rampant –  
10          and the Estimates Help to Buoy the Market’s Valuation.” The following quote  
11          provides insight into the continuing bias in analysts’ forecasts:

12                     Hope springs eternal, says Mark Donovan, who manages  
13                     Boston Partners Large Cap Value Fund. “You would have  
14                     thought that, given what happened in the last three years,  
15                     people would have given up the ghost. But in large measure  
16                     they have not.

17                     These overly optimistic growth estimates also show that,  
18                     even with all the regulatory focus on too-bullish analysts  
19                     allegedly influenced by their firms' investment-banking  
20                     relationships, a lot of things haven't changed. Research  
21                     remains rosy and many believe it always will.<sup>12</sup>

22  
23           **Q.     ARE THESE OBSERVATIONS CONSISTENT WITH THE FINDINGS OF**  
24           **A RECENT MCKINSEY STUDY ON THE IMPACT OF THESE**

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<sup>11</sup> P. Cusatis and J. R. Woolridge, “The Accuracy of Analysts’ Long-Term EPS Growth Rate Forecasts,” Working Paper, (July 2008).

<sup>12</sup> Ken Brown, “Analysts Still Coming Up Rosy – Over-Optimism on Growth Rates is Rampant – and the Estimates Help to Buoy the Market’s Valuation,” *Wall Street Journal*, p. C1, (January 27, 2003).



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1           **REGULATIONS ON THE ACCURACY OF ANALYSTS' EPS GROWTH**  
2           **RATE FORECASTS?**

3           A.     Yes. McKinsey recently published a study entitled “Equity Analysts: Still too  
4           Bullish” in which they reported on a study of the accuracy on analysts long-term  
5           EPS growth rate forecasts. They concluded that after a decade of stricter  
6           regulation, analysts’ long-term earnings forecasts continue to be excessively  
7           optimistic.

8           They made the following observation (emphasis added):<sup>13</sup>

9                     Alas, a recently completed update of our work only reinforces this view—  
10                    despite a series of rules and regulations, dating to the last decade, that  
11                    were intended to improve the quality of the analysts’ long-term earnings  
12                    forecasts, restore investor confidence in them, and prevent conflicts of  
13                    interest. For executives, many of whom go to great lengths to satisfy Wall  
14                    Street’s expectations in their financial reporting and long-term strategic  
15                    moves, this is a cautionary tale worth remembering. This pattern confirms  
16                    our earlier findings that analysts typically lag behind events in revising  
17                    their forecasts to reflect new economic conditions. When economic  
18                    growth accelerates, the size of the forecast error declines; when economic  
19                    growth slows, it increases. So as economic growth cycles up and down,  
20                    the actual earnings S&P 500 companies report occasionally coincide with  
21                    the analysts’ forecasts, as they did, for example, in 1988, from 1994 to  
22                    1997, and from 2003 to 2006. Moreover, analysts have been persistently  
23                    overoptimistic for the past 25 years, with estimates ranging from 10 to 12  
24                    percent a year, compared with actual earnings growth of 6 percent. Over  
25                    this time frame, actual earnings growth surpassed forecasts in only two  
26                    instances, both during the earnings recovery following a recession. On  
27                    average, analysts’ forecasts have been almost 100 percent too high.

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13 Marc H. Goedhart, Rishi Raj, and Abhishek Saxena, “Equity Analysts, Still Too Bullish,” *McKinsey on Finance*, pp. 14-17, (Spring 2010).

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1           **Q.    ARE ANALYSTS' EPS GROWTH RATE FORECASTS LIKEWISE**  
2           **UPWARDLY BIASED FOR UTILITY COMPANIES?**

3           A.    Yes. To evaluate whether analysts' EPS growth rate forecasts are upwardly biased  
4           for utility companies, I conducted a study similar to the one described above using  
5           a group of electric utility and gas distribution companies. The results are shown  
6           on Panels A and B of page 5 of Exhibit JRW-12. The projected EPS growth rates  
7           for electric utilities have been in the 4% to 6% range over the last twenty years,  
8           with the recent figures approximately 5%. As shown, the achieved EPS growth  
9           rates have been volatile and on average, below the projected growth rates. Over  
10          the entire period, the average quarterly 3-5 year projected and actual EPS growth  
11          rates are 4.59% and 2.90%, respectively.

12                   For gas distribution companies, the projected EPS growth rates have  
13          declined from about 6% in the 1990s to about 5% in the 2000s. The achieved  
14          EPS growth rates have been volatile. Over the entire period, the average quarterly  
15          3-5 year projected and actual EPS growth rates are 5.15% and 4.53%,  
16          respectively.

17                   Overall, the upward bias in EPS growth rate projections for electric utility  
18          and gas distribution companies is not as pronounced as it is for all companies.  
19          Nonetheless, the results here are consistent with the results for companies in  
20          general -- analysts' projected EPS growth rate forecasts are upwardly-biased for  
21          utility companies.

22

Appendix B  
The Research on Analysts' Long-Term EPS Growth Rate Forecasts

1           **Q.    ARE VALUE LINE'S GROWTH RATE FORECASTS OVERLY**  
2           **OPTIMISTIC?**

3           A.    Yes. *Value Line* has a decidedly positive bias to its earnings growth rate forecasts  
4           as well. To assess *Value Line's* earnings growth rate forecasts, I used the *Value*  
5           *Line Investment Analyzer*. The results are summarized in Panel A of Page 6 of  
6           Exhibit JRW-12. I initially filtered the database and found that *Value Line* has 3-  
7           5 year EPS growth rate forecasts for 1,996 firms. The average projected EPS  
8           growth rate was 14.45%. This is high given that the average historical EPS  
9           growth rate in the U.S. is about 7%. A major factor seems to be that *Value Line*  
10          only predicts negative EPS growth for 56 companies. This is less than three  
11          percent of the companies covered by *Value Line*. Given the ups and downs of  
12          corporate earnings, this is unreasonable.

13                    To put this figure in perspective, I screened the *Value Line* companies to  
14                    see what percent of companies covered by *Value Line* had experienced negative  
15                    EPS growth rates over the past five years. *Value Line* reported a five-year historic  
16                    growth rate for 2,147 companies. The results are shown in Panel B of page 6 of  
17                    Exhibit JRW-12 and indicate that the average 5-year historic growth rate was  
18                    8.38%, and *Value Line* reported negative historic growth for 654 firms which  
19                    represents 30.4% of these companies.

20                    These results indicate that *Value Line's* EPS forecasts are excessive and  
21                    unrealistic. It appears that the analysts at *Value Line* are similar to their Wall  
22                    Street brethren in that they are reluctant to forecast negative earnings growth.

Appendix C  
Building Blocks Equity Risk Premium

**Q. PLEASE DISCUSS YOUR DEVELOPMENT OF AN EQUITY RISK PREMIUM COMPUTED USING THE BUILDING BLOCKS METHODOLOGY.**

A. Ibbotson and Chen (2003) evaluate the ex post historical mean stock and bond returns in what is called the Building Blocks approach.<sup>1</sup> They use 75 years of data and relate the compounded historical returns to the different fundamental variables employed by different researchers in building ex ante expected equity risk premiums. Among the variables included were inflation, real EPS and DPS growth, ROE and book value growth, and price-earnings (“P/E”) ratios. By relating the fundamental factors to the ex post historical returns, the methodology bridges the gap between the ex post and ex ante equity risk premiums. Ilmanen (2003) illustrates this approach using the geometric returns and five fundamental variables – inflation (“CPI”), dividend yield (“D/P”), real earnings growth (“RG”), repricing gains (“PEGAIN”) and return interaction/reinvestment (“INT”).<sup>2</sup> This is shown on page 7 of Exhibit JRW-11. The first column breaks the 1926-2000 geometric mean stock return of 10.7% into the different return components demanded by investors: the historical U.S. Treasury bond return (5.2%), the excess equity return (5.2%), and a small interaction term (0.3%). This 10.7% annual stock return over the 1926-2000 period can then be broken down into the following fundamental elements: inflation (3.1%), dividend yield (4.3%),

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<sup>1</sup> Roger Ibbotson and Peng Chen, “Long Run Returns: Participating in the Real Economy,” *Financial Analysts Journal*, (January 2003).

<sup>2</sup> Antti Ilmanen, Expected Returns on Stocks and Bonds,” *Journal of Portfolio Management*, (Winter 2003), p. 11.

Appendix C  
Building Blocks Equity Risk Premium

1 real earnings growth (1.8%), repricing gains (1.3%) associated with higher P/E  
2 ratios, and a small interaction term (0.2%).

3 **Q. HOW ARE YOU USING THIS METHODOLOGY TO DERIVE AN EX**  
4 **ANTE EXPECTED EQUITY RISK PREMIUM?**

5 A. The third column in the graph on page 7 of Exhibit JRW-11 shows current inputs  
6 to estimate an ex ante expected market return. These inputs include the  
7 following:

8 CPI – To assess expected inflation, I have employed expectations of the short-  
9 term and long-term inflation rate. Long term inflation forecasts are available in the  
10 Federal Reserve Bank of Philadelphia’s publication entitled *Survey of*  
11 *Professional Forecasters*. While this survey is published quarterly, only the first  
12 quarter survey includes long-term forecasts of gross domestic product (“GDP”)  
13 growth, inflation, and market returns. In the first quarter 2011 survey, published  
14 on February 11, 2011, the average long-term (10-year) expected inflation rate as  
15 measured by the CPI was 2.30% (see Panel A of page 8 of Exhibit JRW-11).

16 The University of Michigan’s Survey Research Center surveys consumers  
17 on their short-term (one-year) inflation expectations on a monthly basis. As  
18 shown on page 9 of Exhibit JRW-11, the current short-term expected inflation  
19 rate is 3.0%.

20 As a measure of expected inflation, I will use the average of the long-term  
21 (2.3%) and short-term (3.0%) inflation rate measures, or 2.65%.

22

Appendix C  
Building Blocks Equity Risk Premium

1            D/P – As shown on page 10 of Exhibit JRW-11, the dividend yield on the S&P  
2            500 has fluctuated from 1.0% to almost 3.5% over the past decade. Ibbotson and  
3            Chen (2003) report that the long-term average dividend yield of the S&P 500 is  
4            4.3%. Currently, the S&P 500 dividend yield is 1.9%. I will use this figure in my  
5            ex ante risk premium analysis.

6            RG – To measure expected real growth in earnings, I use the historical real  
7            earnings growth rate S&P 500 and the expected real GDP growth rate. The S&P  
8            500 was created in 1960 and includes 500 companies which come from ten  
9            different sectors of the economy. On page 11 of Exhibit JRW-11, real EPS  
10           growth is computed using the CPI as a measure of inflation. The real growth  
11           figure over 1960-2010 period for the S&P 500 is 2.6%.

12                    The second input for expected real earnings growth is expected real GDP  
13                    growth. The rationale is that over the long-term, corporate profits have averaged  
14                    a relatively consistent 5.50% of U.S. GDP.<sup>3</sup> Expected GDP growth, according to  
15                    the Federal Reserve Bank of Philadelphia's *Survey of Professional Forecasters*, is  
16                    2.9% (see Panel B of page 8 of Exhibit JRW-11).

17                    Given these results, I will use 2.75%, for real earnings growth.

18            PEGAIN – PEGAIN is the repricing gain associated with an increase in the P/E  
19            ratio. It accounted for 1.3% of the 10.7% annual stock return in the 1926-2000  
20            period. In estimating an ex ante expected stock market return, one issue is  
21            whether investors expect P/E ratios to increase from their current levels. The P/E

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<sup>3</sup>Marc. H. Goedhart, et al, "The Real Cost of Equity," *McKinsey on Finance* (Autumn 2002), p.14.

Appendix C  
Building Blocks Equity Risk Premium

1 ratios for the S&P 500 over the past 25 years are shown on page 10 of Exhibit  
2 JRW-11. The run-up and eventual peak in P/Es in the year 2000 is very evident  
3 in the chart. The average P/E declined until late 2006, and then increased to  
4 higher high levels, primarily due to the decline in EPS as a result of the financial  
5 crisis and the recession. The current average P/E for the S&P 500 is  
6 approximately 15.0, which is in line with the historic average. Since the current  
7 figure is near the historic average, a PEGAIN would not be appropriate in  
8 estimating an ex ante expected stock market return.

9  
10 **Q. GIVEN THIS DISCUSSION, WHAT IS THE EX ANTE EXPECTED**  
11 **MARKET RETURN AND EQUITY RISK PREMIUM USING THE**  
12 **“BUILDING BLOCKS METHODOLOGY”?**

13 A. My expected market return is represented by the last column on the right in the  
14 graph entitled “Decomposing Equity Market Returns: The Building Blocks  
15 Methodology” set forth on page 7 of Exhibit JRW-11. As shown, my expected  
16 market return of 7.30% is composed of 2.65% expected inflation, 1.90% dividend  
17 yield, and 2.75% real earnings growth rate.

18 **Q. IS AN EXPECTED MARKET RETURN OF 7.30% CONSISTENT WITH**  
19 **THE FORECASTS OF MARKET PROFESSIONALS?**

20 A. Yes. In the first quarter 2011 *Survey of Financial Forecasters*, published on  
21 February 11, 2011 by the Federal Reserve Bank of Philadelphia, the mean long-  
22 term expected return on the S&P 500 was 7.37% (see Panel D of page 8 of  
23 Exhibit JRW-11).

Appendix C  
Building Blocks Equity Risk Premium

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**Q. IS AN EXPECTED MARKET RETURN OF 7.30% CONSISTENT WITH THE EXPECTED MARKET RETURNS OF CORPORATE CHIEF FINANCIAL OFFICERS (CFOs)?**

A. Yes. John Graham and Campbell Harvey of Duke University conduct a quarterly survey of corporate CFOs. The survey is a joint project of Duke University and *CFO Magazine*. In the June 2011 survey, the mean expected return on the S&P 500 over the next ten years was 6.5%.<sup>4</sup>

**Q. GIVEN THIS EXPECTED MARKET RETURN, WHAT IS THE EX ANTE EQUITY RISK PREMIUM USING THE BUILDING BLOCKS METHODOLOGY?**

A. The current 30-year U.S. Treasury yield is approximately 4.0%. This ex ante equity risk premium is simply the expected market return from the Building Blocks methodology minus this risk-free rate:

$$\text{Ex Ante Equity Risk Premium} = 7.30\% - 4.0\% = 3.30\%$$

**Q. HOW ARE YOU USING THIS EQUITY RISK PREMIUM ESTIMATE IN YOUR CAPM EQUITY COST RATE STUDY?**

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<sup>4</sup> The survey results are available at [www.cfosurvey.org](http://www.cfosurvey.org).  
C-5



Appendix C  
Building Blocks Equity Risk Premium

- 1           A.    This is only one estimate of the equity risk premium.  As shown on page 5 of  
2                   Exhibit JRW-11, I am also using the results of over thirty other studies and  
3                   surveys to determine an equity risk premium for my CAPM.

**Exhibit JRW-1  
Kentucky Utilities Company  
Cost of Capital**

**Kentucky Utilities Company  
Weighted Average Cost of Capital**

<b>Capital Source</b>	<b>Capitalization Ratio</b>	<b>Cost Rate</b>	<b>Weighted Cost Rate</b>
<b>Short-Term Debt</b>	<b>3.08%</b>	<b>0.16%</b>	<b>0.00%</b>
<b>Long-Term Debt</b>	<b>45.34%</b>	<b>3.68%</b>	<b>1.67%</b>
<b>Common Equity</b>	<b>51.58%</b>	<b>9.25%</b>	<b>4.77%</b>
<b>Total Capital</b>	<b>100.0%</b>		<b>6.44%</b>

**Panel A**  
**Ten-Year Treasury Yields**  
**2009, 2010, and 2011**

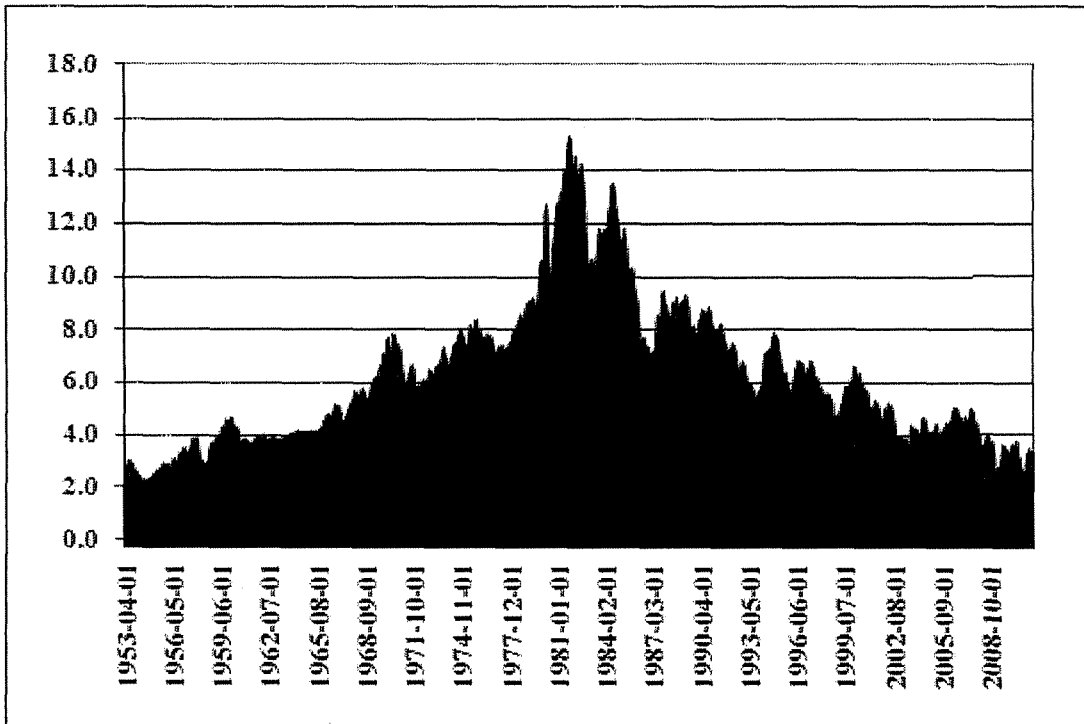
2009-11-01	3.40	4/1/2011	3.46
2009-12-01	3.59	5/1/2011	3.17
2010-01-01	3.73	6/1/2011	3.00
2010-02-01	3.69	7/1/2011	3.00
2010-03-01	3.73	8/1/2011	2.52
2010-04-01	3.85	9/1/2011	2.12
	3.67		2.88

**Panel B**  
**Thirty-Year, A-Rated Public Utility Bonds**  
**2009, 2010, and 2011**

11/6/2009	5.62	3/31/2011	5.58
12/4/2009	5.75	4/30/2011	5.54
1/1/2010	5.87	5/31/2011	5.24
2/5/2010	5.70	6/30/2011	5.35
3/5/2010	5.85	7/29/2011	5.11
4/2/2010	5.99	8/29/2011	4.66
	5.80		5.24

Exhibit JRW-2

Panel A  
Ten-Year Treasury Yields  
1953-Present



Panel B  
Long-Term Moody's Baa Yields Minus Ten-Year Treasury Yields  
2000-Present

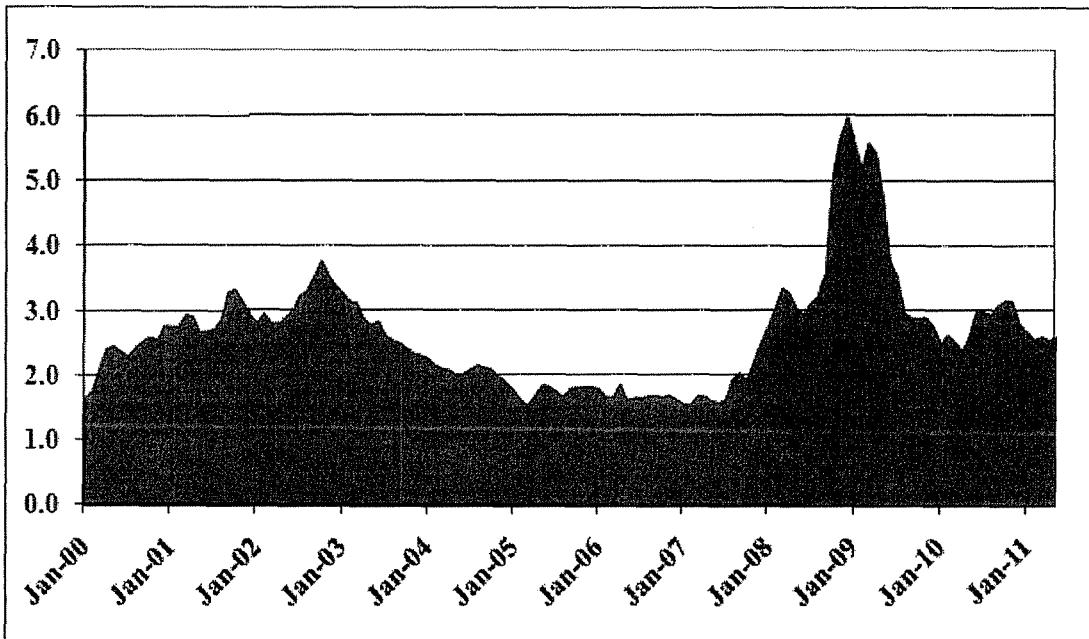
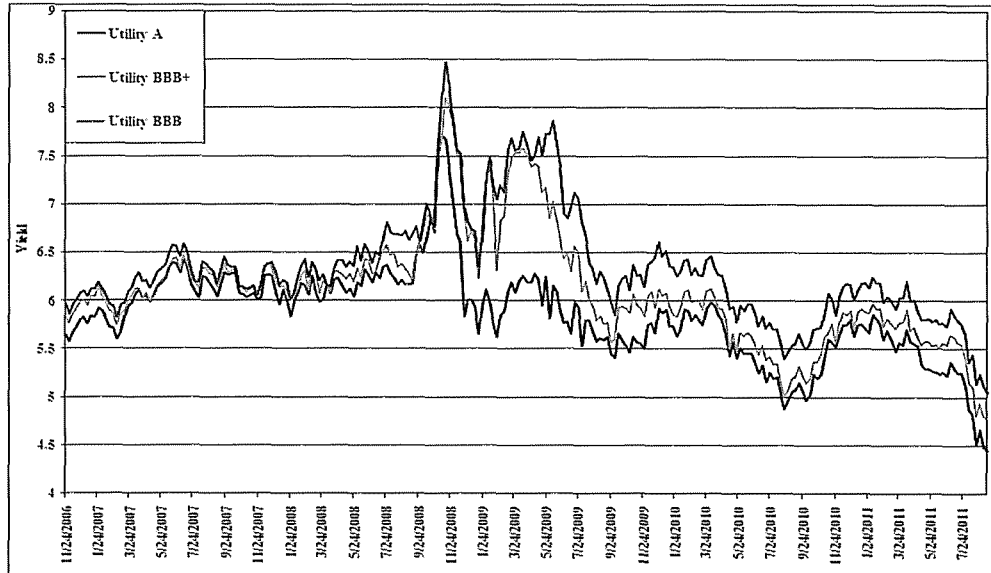


Exhibit JRW-3

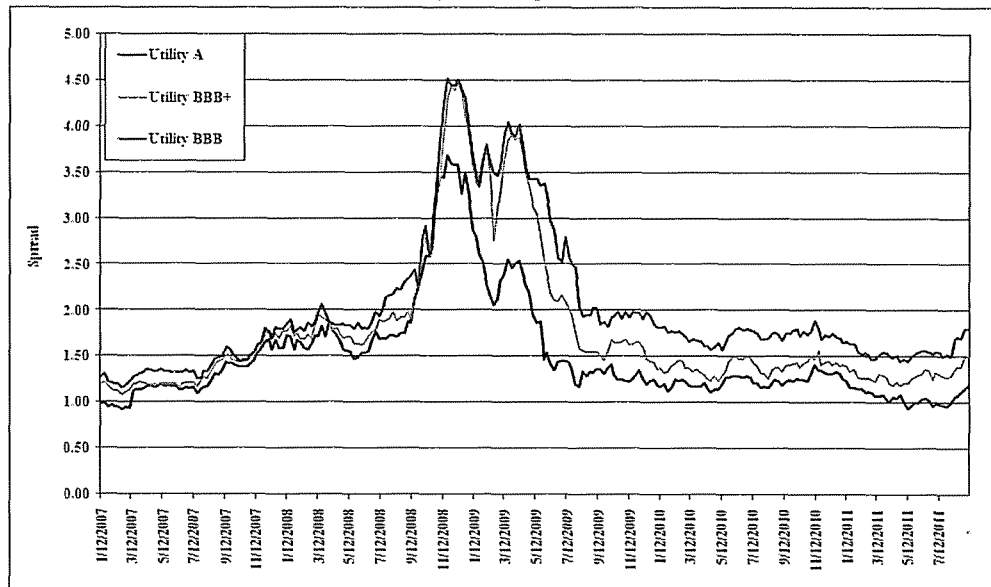
Panel A

Thirty-Year Public Utility Yields



Panel B

Thirty-Year Public Utility Yield Spread Over Treasuries



## Exhibit JRW-4

## Kentucky Utilities Company

## Summary Financial Statistics

## Proxy Group

Company	Operating Revenue (\$mil)	Percent Elec Revenue	Percent Gas Revenue	Net Plant (\$mil)	S&P Bond Rating	Moody's Bond Rating	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio	Return on Equity	Market to Book Ratio
ALLETE, Inc. (NYSE-ALE)	915.6	93		1,841.3	A-	Baa1	3.8	MN, WI	55.8	9.2	1.49
Alliant Energy Corporation (NYSE-LNT)	3,470.9	77	14	6,823.4	A-/BBB+	A2/A3	3.9	WS, IA, IL, MN	51.0	10.8	1.46
Ameren Corporation (NYSE-AEE)	7,626.0	86	14	17,888.0	BBB-	Baa2	3.1	IL, MO	49.9	1.4	0.90
American Electric Power Co. (NYSE-AEP)	14,588.0	94		35,766.0	BBB	Baa2	3.1	10 States	42.6	9.0	1.32
Avista Corporation (NYSE-AVA)	1,578.9	63	33	2,731.1	BBB+	Baa1	3.2	WA, OR, ID	47.6	9.5	1.30
Cleco Corporation (NYSE-CNL)	1,130.1	98		2,800.5	BBB	Baa2	3.9	LA	46.4	10.4	1.61
CMS Energy Corporation (NYSE-CMS)	6,520.0	59	37	10,138.0	BBB+	A3	2.5	MI	28.0	13.5	1.72
Consolidated Edison, Inc. (NYSE-ED)	13,213.0	68	13	24,018.0	A-	A3/Baa1	3.5	NY, PA	50.2	9.8	1.36
DTE Energy Company (NYSE-DTE)	8,535.0	59	20	13,053.0	A	A2	2.9	MI	46.1	8.6	1.26
Edison International (NYSE-EIX)	12,380.0	81		30,713.0	BBB+	A1	3.0	CA	43.4	11.8	1.17
Entergy Corporation (NYSE-ETR)	11,269.4	76	2	24,195.7	A-/BBB+	Baa1	4.2	AK, LA, MS, TX	41.2	14.7	1.39
Great Plains Energy Incorporated (NYSE-GXP)	2,241.5	100		6,885.6	BBB	Baa2	2.2	MO, KS	42.2	6.8	0.99
Hawaiian Electric Industries, Inc. (NYSE-HE)	2,756.6	90		3,175.4	BBB-	Baa2	3.3	HI	50.4	7.8	1.56
IDACORP, Inc. (NYSE-IDA)	1,034.6	100		3,232.6	A-	A2	3.0	ID	49.7	10.6	1.29
MGE Energy, Inc. (NYSE-MGEE)	537.6	68	30	969.6	AA-	A1	4.3	WI	59.4	11.6	1.79
Nextera Energy (NYSE-NEE)	14,829.0	70		39,937.0	A	Aa3	3.2	FL	40.7	11.9	1.65
OGE Energy Corp. (NYSE-OGE)	3,681.6	57	11	6,599.6	BBB+	Baa1	4.2	OK, AR	45.8	13.6	2.16
Pepco Holdings, Inc. (NYSE-POM)	6,854.0	71	4	7,760.0	A	A3	2.0	DC, MD, VA, NJ	47.6	1.4	1.02
PG&E Corporation (NYSE-PCG)	13,963.0	77	23	31,872.0	BBB+	A3	3.3	CA	47.2	9.5	1.48
Pinnacle West Capital Corp. (NYSE-PNW)	3,302.9	97		9,397.4	BBB-	Baa2	3.0	AZ	49.6	10.0	1.32
Portland General Electric (NYSE-POR)	1,818.0	99		4,179.0	A-	A3	2.8	OR	47.7	10.5	1.18
SCANA Corporation (NYSE-SCG)	4,454.0	54	20	9,567.0	A-	A3	2.9	SC, NC, GA	42.8	10.4	1.36
Southern Company (NYSE-SO)	17,310.3	95		42,634.0	A	A2/A3	4.1	GA, AL, FL, MS	42.4	11.5	2.00
TECO Energy, Inc. (NYSE-TE)	3,371.7	61	15	5,842.4	BBB+	Baa1	3.0	FL	40.9	11.0	1.88
UniSource Energy Corporation (NYSE-UNS)	1,480.4	82	10	3,006.7	BBB+	NR		AZ	30.4	13.7	1.69
Westar Energy, Inc. (NYSE-WR)	2,078.1	99		6,038.9	BBB+	Baa1	2.9	KS	43.5	8.7	1.25
Wisconsin Energy Corporation (NYSE-WEC)	4,282.6	70	28	9,639.0	A-	A1	3.4	WI	43.4	13.1	1.87
Xcel Energy Inc. (NYSE-XEL)	10,320.0	82	17	20,908.3	A	A3	3.1	MN, WI, ND, SD, MI	45.1	10.1	1.43
Mean	6,269.4	80	18	13,629.0	BBB+	A3/Baa1	3.3		45.4	10.0	1.46
Median	3,982.1	79	16	8,578.7	BBB+	A3/Baa1	3.1		46.0	10.4	1.41

Data Source: AUS Utility Reports, August, 2011; Pre-Tax Interest Coverage and Primary Service Territory are from Value Line Investment Survey, 2011.

**Exhibit JRW-5**  
**Kentucky Utilities Company**  
**Capital Structure Ratios and Debt Cost Rate**

**Panel A - KU's Capitalization Ratios and Debt Cost Rate**

Capital Source	Capitalization Ratio	Cost Rate	Cost Rate
Short-Term Debt	1.59%	0.28%	0.00%
Long-Term Debt	44.25%	4.69%	2.08%
Common Equity	54.17%	10.63%	5.76%
Total	100.00%		

Source: As of August 30, 2010 - Attachment to PSC-1 Q-49.xls

**Panel B - KU Capitalization Ratios as of June 30, 2011**

Capital Source	Capitalization Amount*	Capitalization Ratio
Short-Term Debt	0	0.00%
Long-Term Debt	1,840	46.78%
Common Equity	2,093	53.22%
Total	3,933	100.00%

\* Long-Term Debt and Common Equity as of 6/30/2011 - Response at AG No. 2-12

**Panel C - LG&E and KU Energy LLC as of June 30, 2011**

Capital Source	Capitalization Amount*	Capitalization Ratio
Short-Term Debt	0	0.00%
Long-Term Debt	3,825	48.94%
Common Equity	3,991	51.06%
Total	7,816	100.00%

\* Long-Term Debt and Common Equity as of 6/30/2011 - Response at AG No. 2-12

**Panel D - PPL Capitalization Ratios**

Capital Source	Capitalization Amount*	Capitalization Ratio
Short-Term Debt	431	0.16%
Long-Term Debt	18,034	61.94%
Common Equity	10,651	36.58%
Total	29,116	100.00%

\* Long-Term Debt and Common Equity as of 6/30/2011 - Response at AG No. 2-12

**Panel E - AG Recommended Capitalization Ratios**

Capital Source	Capitalization Amount*	Capitalization Ratio	Cost Rate**
Short-Term Debt	125	3.08%	0.16%
Long-Term Debt	1,840	45.34%	3.68%
Common Equity	2,093	51.58%	
Total	4,058	100.00%	

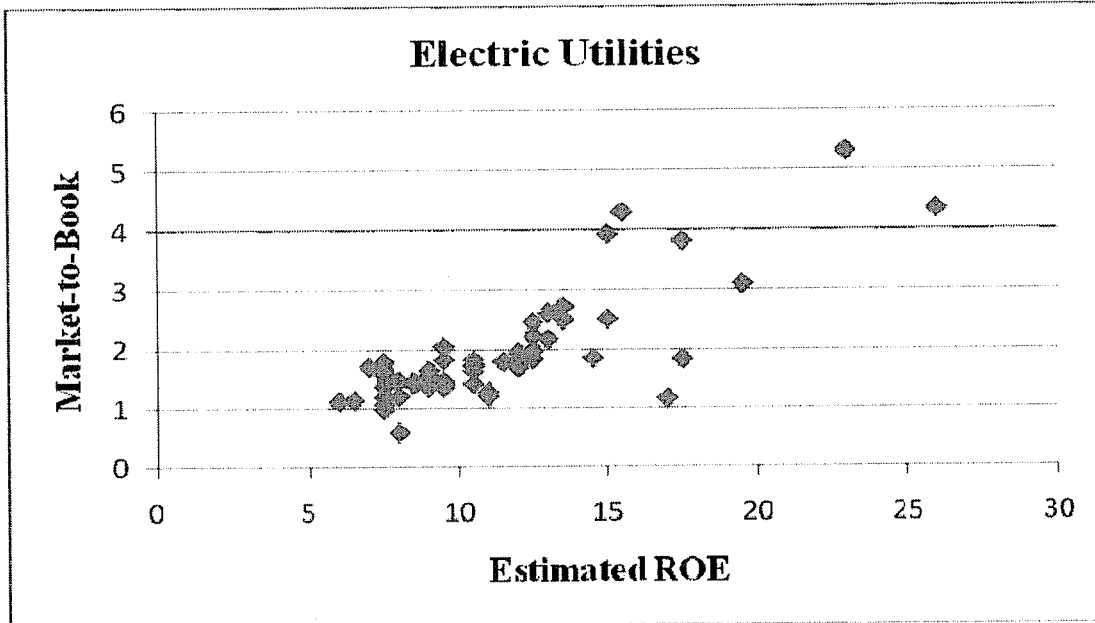
\* Long-Term Debt and Common Equity as of 6/30/2011 - Response at AG No. 2-12

\*\* Short-Term and Long-Term Debt Cost Rates as of 6/30/2011 - Response at AG No. 2-2

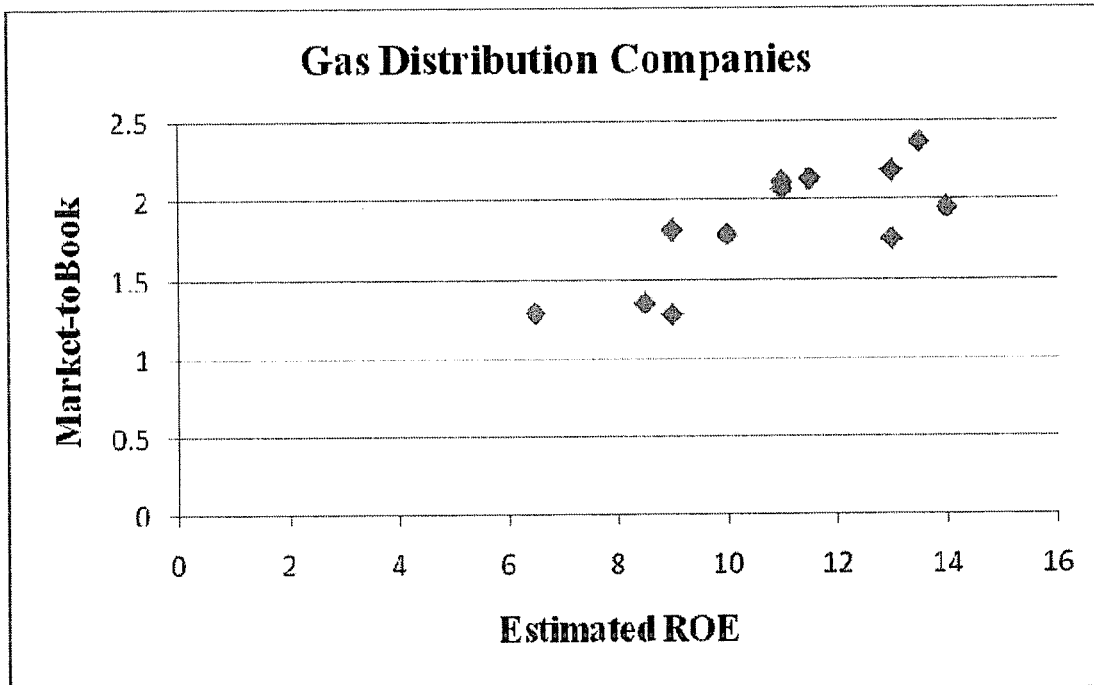
The Relationship Between Estimated ROE and Market-to-Book Ratios

Exhibit JRW-6

Panel A



Panel B

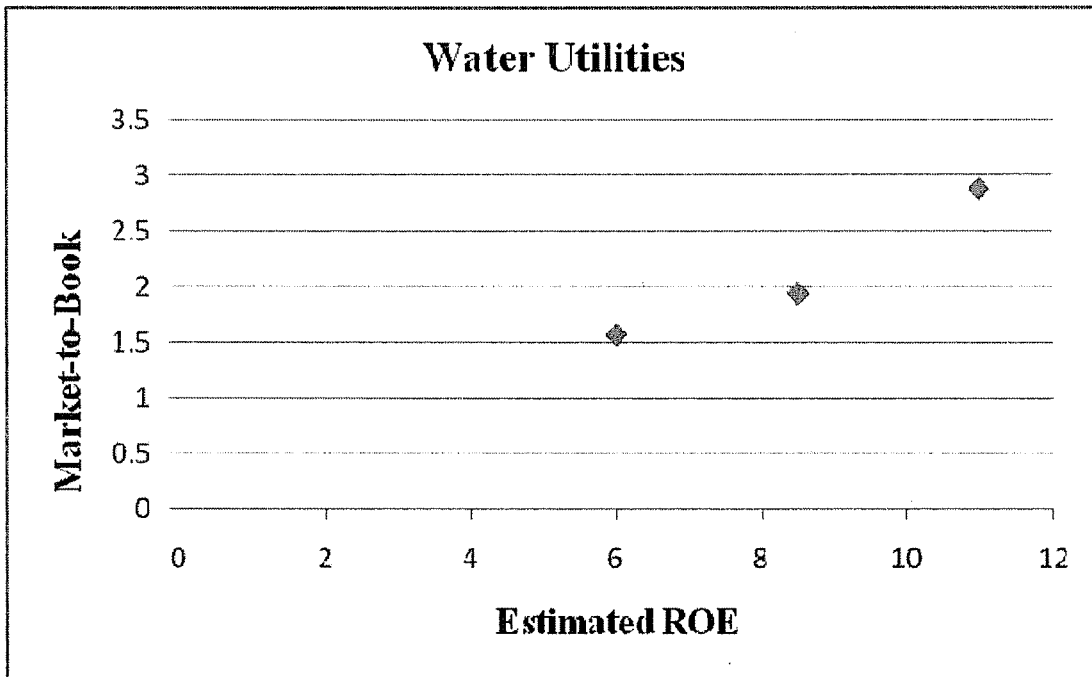




The Relationship Between Estimated ROE and Market-to-Book Ratios

Exhibit JRW-6

Panel C



R-Square = .92, N=4.

Exhibit JRW-7  
Long-Term 'A' Rated Public Utility Bonds

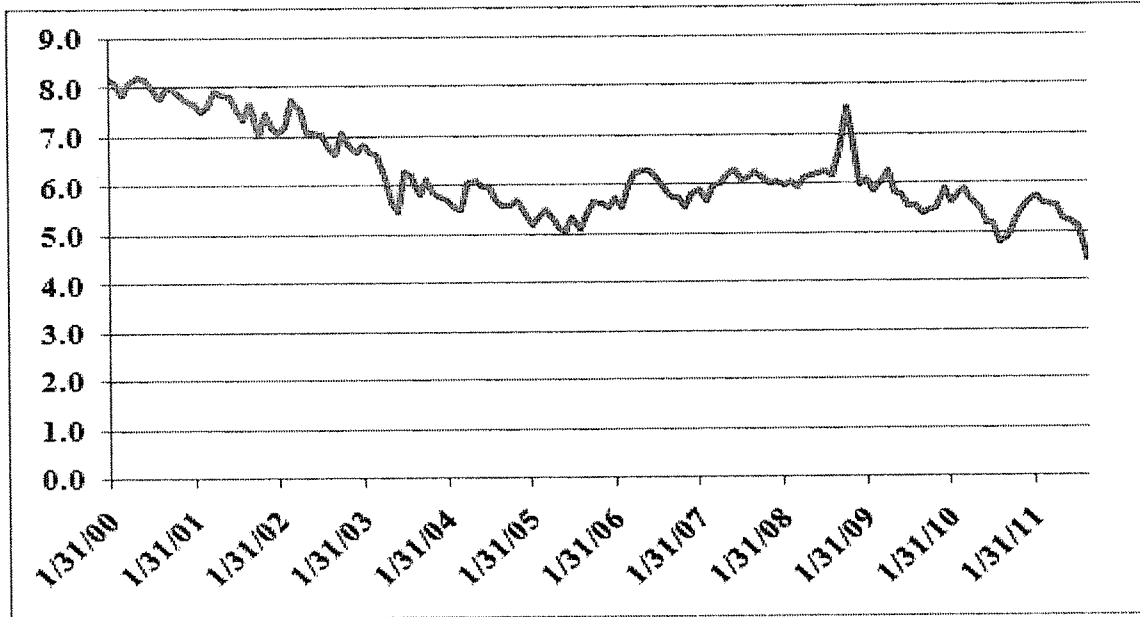
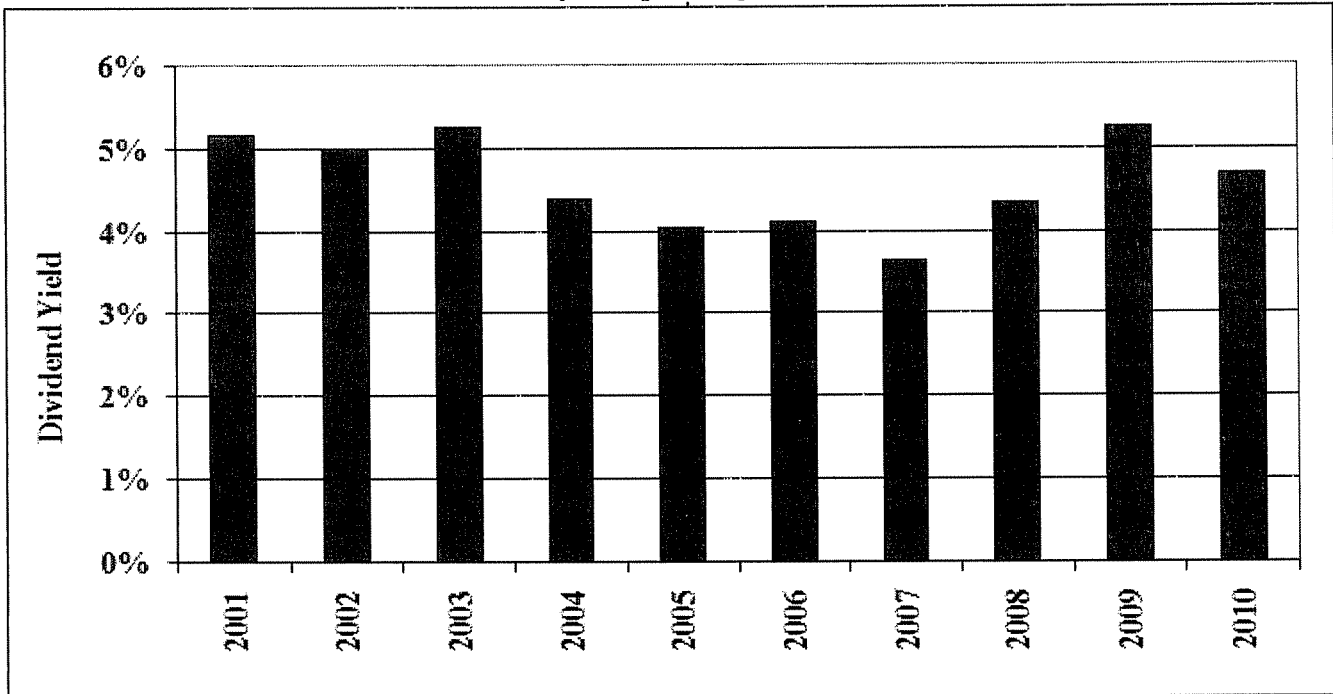


Exhibit JRW-7

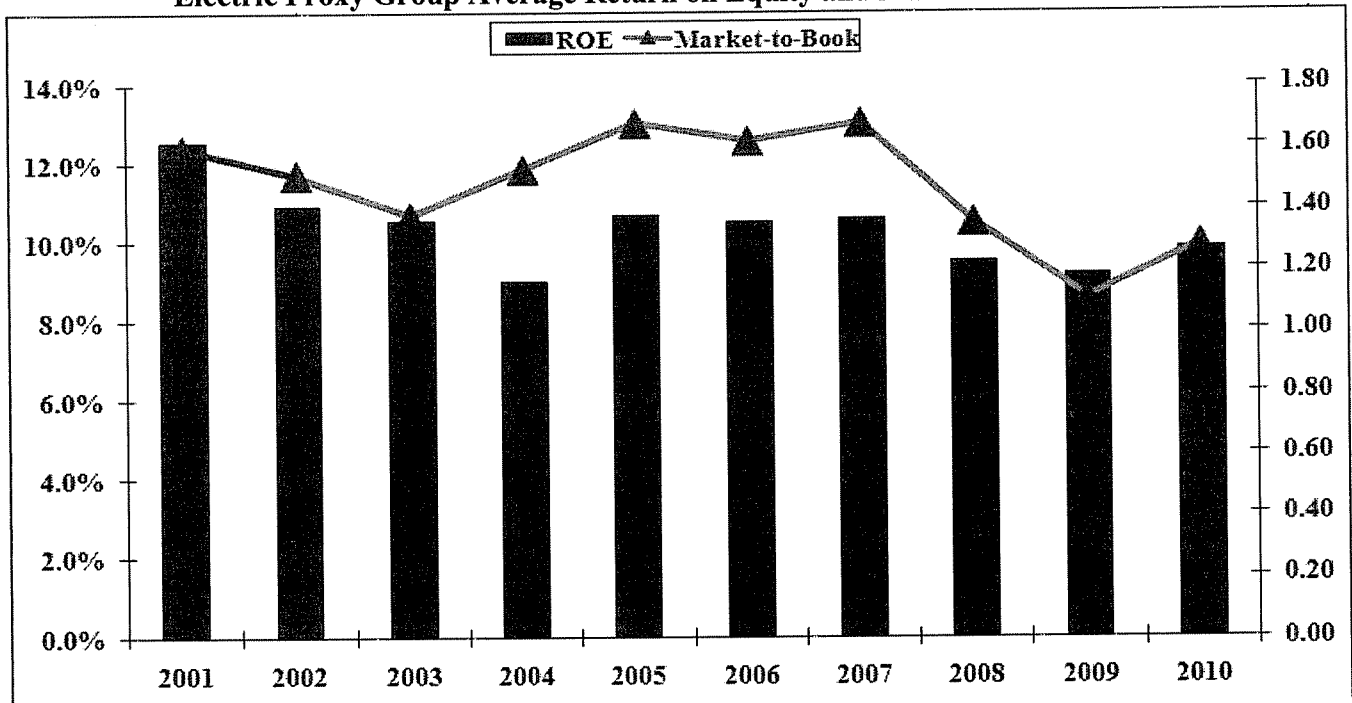
Electric Proxy Group Average Dividend Yield



Data Source: Value Line Investment Survey.

Exhibit JRW-7

Electric Proxy Group Average Return on Equity and Market-to-Book Ratios



Data Source: Value Line Investment Survey.

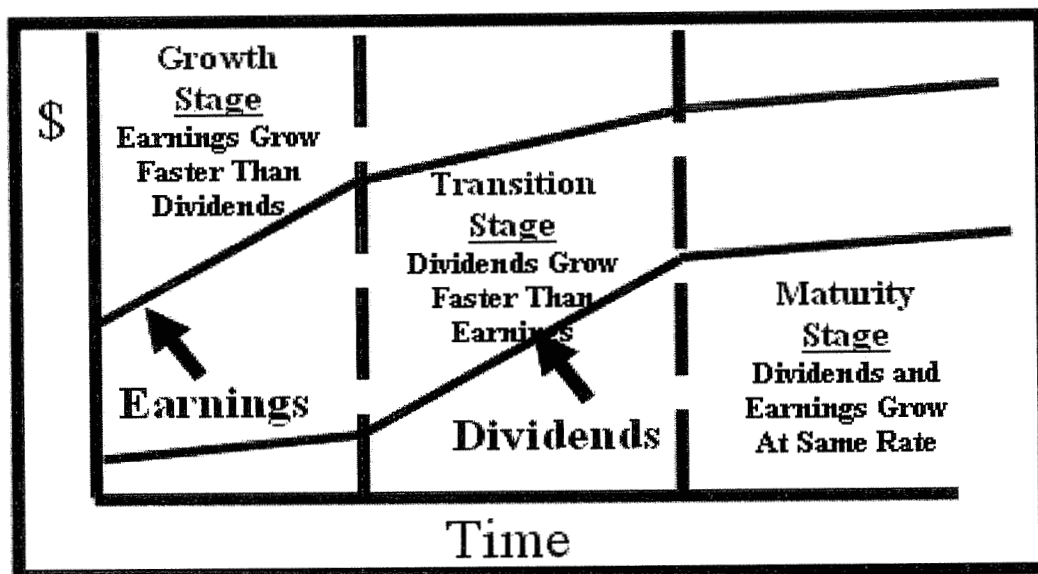
Exhibit JRW-8

Industry Average Betas

Industry Name	No.	Beta	Industry Name	No.	Beta	Industry Name	No.	Beta
Public/Private Equity	8	2.18	Retail Store	38	1.33	Packaging & Container	27	1.06
Heavy Truck/Equip Make	8	1.94	Building Materials	47	1.33	Computer Software/Svcs	247	1.06
Advertising	28	1.79	Metals & Mining (Div.)	69	1.33	Telecom. Equipment	104	1.04
Semiconductor Equip	14	1.79	Restaurant	60	1.33	Telecom. Utility	28	1.03
Auto Parts	47	1.78	Electrical Equipment	79	1.32	Medical Supplies	231	1.02
Hotel/Gaming	52	1.76	Shoe	18	1.31	Telecom. Services	85	1.01
Steel (Integrated)	13	1.72	Publishing	23	1.30	Utility (Foreign)	5	0.99
Entertainment	75	1.72	R.E.I.T.	6	1.29	Reinsurance	8	0.98
Newspaper	13	1.71	Chemical (Basic)	17	1.28	Oil/Gas Distribution	12	0.97
Furn/Home Furnishings	30	1.67	Railroad	14	1.28	Pharmacy Services	19	0.96
Engineering & Const	17	1.65	Computers/Peripherals	101	1.27	Bank (Midwest)	40	0.96
Steel (General)	19	1.59	Precision Instrument	83	1.27	Industrial Services	137	0.96
Coal	25	1.59	Toiletries/Cosmetics	15	1.27	Healthcare Information	26	0.94
Semiconductor	115	1.56	Wireless Networking	48	1.25	Insurance (Prop/Cas.)	67	0.92
Retail (Special Lines)	143	1.54	Natural Gas (Div.)	32	1.25	Retail Building Supply	8	0.92
Paper/Forest Products	37	1.52	Securities Brokerage	25	1.25	Beverage	34	0.92
Chemical (Diversified)	31	1.51	Funeral Services	5	1.22	Medical Services	139	0.88
Recreation	52	1.50	Diversified Co.	111	1.22	Food Processing	109	0.87
Automotive	19	1.50	Machinery	114	1.22	Bank (Canadian)	7	0.86
Oilfield Svcs/Equip.	95	1.48	Petroleum (Integrated)	23	1.21	Pipeline MLPs	11	0.85
Office Equip/Supplies	24	1.45	Air Transport	40	1.21	Environmental	69	0.85
Human Resources	24	1.44	Property Management	27	1.20	Educational Services	37	0.79
Metal Fabricating	30	1.44	Trucking	33	1.20	Electric Util. (Central)	23	0.78
Retail Automotive	15	1.44	Precious Metals	74	1.18	Electric Utility (West)	14	0.75
Cable TV	24	1.43	Household Products	22	1.17	Bank	418	0.75
Homebuilding	24	1.39	Aerospace/Defense	63	1.15	Retail/Wholesale Food	29	0.74
Entertainment Tech	31	1.39	Canadian Energy	10	1.14	Tobacco	13	0.73
Insurance (Life)	31	1.39	E-Commerce	52	1.14	Electric Utility (East)	25	0.73
Financial Svcs. (Div.)	230	1.37	Foreign Electronics	9	1.14	Water Utility	12	0.70
Maritime	53	1.37	Biotechnology	120	1.13	Thrift	181	0.70
Chemical (Specialty)	83	1.37	Electronics	158	1.13	Natural Gas Utility	27	0.65
Petroleum (Producing)	163	1.36	Drug	301	1.11	<b>Total Market</b>	<b>5928</b>	<b>1.15</b>
Apparel	48	1.35	Internet	180	1.11			
Power	68	1.34	Information Services	26	1.10			

Source: Damodaran Online 2011 - <http://pages.stern.nyu.edu/~adamodar/>

Exhibit JRW-9  
Three-Stage DCF Model



Source: William F. Sharpe, Gordon J. Alexander, and Jeffrey V. Bailey, Investments (Prentice-Hall, 1995), pp. 590-91.

**Exhibit JRW-10**

**Kentucky Utilities Company  
Discounted Cash Flow Analysis**

**Proxy Group**

<b>Dividend Yield*</b>	<b>4.65%</b>
<b>Adjustment Factor</b>	<b><u>1.02375</u></b>
<b>Adjusted Dividend Yield</b>	<b>4.8%</b>
<b>Growth Rate**</b>	<b><u>4.75%</u></b>
<b>Equity Cost Rate</b>	<b>9.5%</b>

\* Page 2 of Exhibit JRW-10

\*\* Based on data provided on pages 3, 4, 5, and  
6 of Exhibit JRW-10

## Exhibit JRW-10

Kentucky Utilities Company  
Monthly Dividend Yields

## Electric Proxy Group

Company	Apr	May	Jun	Jul	Aug	Sep	Mean
ALLETE, Inc. (NYSE-ALE)	4.7%	4.5%	4.5%	4.5%	4.3%	4.9%	4.6%
Alliant Energy Corporation (NYSE-LNT)	4.4%	4.4%	4.2%	4.2%	4.2%	4.5%	4.3%
Ameren Corporation (NYSE-AEE)	5.6%	5.4%	5.2%	5.3%	5.4%	5.4%	5.4%
American Electric Power Co. (NYSE-AEP)	5.4%	5.2%	4.7%	4.9%	4.9%	5.0%	5.0%
Avista Corporation (NYSE-AVA)	4.8%	4.7%	4.4%	4.4%	4.2%	4.7%	4.5%
Cleco Corporation (NYSE-CNL)	3.0%	2.9%	3.2%	3.2%	3.2%	3.4%	3.2%
CMS Energy Corporation (NYSE-CMS)	4.4%	4.3%	4.2%	4.3%	4.2%	4.4%	4.3%
Consolidated Edison, Inc. (NYSE-ED)	4.8%	4.7%	4.5%	4.5%	4.5%	4.4%	4.6%
DTE Energy Company (NYSE-DTE)	4.7%	4.5%	4.3%	4.8%	4.7%	5.0%	4.7%
Edison International (NYSE-EIX)	3.3%	3.3%	3.3%	3.3%	3.3%	3.6%	3.4%
Energy Corporation (NYSE-ETR)	5.1%	4.9%	4.8%	4.8%	4.9%	5.4%	5.0%
Great Plains Energy Incorporated (NYSE-GXP)	4.3%	4.2%	4.0%	4.0%	4.0%	4.6%	4.2%
Hawaiian Electric Industries, Inc. (NYSE-HE)	5.1%	5.1%	4.9%	5.2%	5.0%	5.5%	5.1%
IDACORP, Inc. (NYSE-IDA)	3.2%	3.1%	3.0%	3.1%	3.0%	3.3%	3.1%
MGE Energy, Inc. (NYSE-MGEE)	3.8%	3.7%	3.6%	3.7%	3.6%	3.7%	3.7%
Nextra Energy (NYSE-NEE)	4.1%	4.0%	3.8%	3.9%	3.9%	4.1%	4.0%
OGE Energy Corp. (NYSE-OGE)	3.1%	2.9%	2.9%	3.1%	2.9%	3.3%	3.0%
Pepco Holdings, Inc. (NYSE-POM)	5.9%	5.9%	5.4%	5.5%	5.6%	5.8%	5.7%
PG&E Corporation (NYSE-PCG)	4.2%	4.0%	4.0%	4.3%	4.3%	4.4%	4.2%
Pinnacle West Capital Corp. (NYSE-PNW)	5.0%	4.9%	4.6%	4.8%	4.8%	5.0%	4.9%
Portland General Electric (NYSE-POR)	4.4%	4.3%	4.0%	4.0%	4.1%	4.7%	4.3%
SCANA Corporation (NYSE-SCG)	5.0%	4.9%	4.6%	5.0%	4.8%	5.0%	4.9%
Southern Company (NYSE-SO)	4.9%	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%
TECO Energy, Inc. (NYSE-TE)	4.5%	4.4%	4.5%	4.6%	4.5%	5.0%	4.6%
UniSource Energy Corporation (NYSE-UNS)	4.7%	4.7%	4.5%	4.5%	4.4%	4.7%	4.6%
Westar Energy, Inc. (NYSE-WR)	4.9%	4.9%	4.7%	4.8%	4.8%	5.1%	4.9%
Wisconsin Energy Corporation (NYSE-WEC)	3.5%	3.5%	3.3%	3.3%	4.3%	3.4%	3.6%
Xcel Energy Inc. (NYSE-XEL)	4.3%	4.2%	4.0%	4.1%	4.3%	4.5%	4.2%
Mean	4.5%	4.4%	4.2%	4.3%	4.3%	4.6%	4.4%
Median	4.6%	4.5%	4.4%	4.5%	4.3%	4.7%	4.6%

Data Source: AUS *Utility Reports*, monthly issues.



Exhibit JRW-10

Kentucky Utilities Company  
DCF Equity Cost Growth Rate Measures  
Value Line Historic Growth Rates

Electric Proxy Group

Company	Value Line Historic Growth					
	Past 10 Years			Past 5 Years		
	Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
ALLETE, Inc. (NYSE-ALE)				3.5%	17.5%	6.0%
Alliant Energy Corporation (NYSE-LNT)	3.0%	-3.5%	1.0%	9.0%	0.5%	3.5%
Ameren Corporation (NYSE-AEE)	-0.5%	-3.0%	3.5%	-1.5%	-6.0%	2.5%
American Electric Power Co. (NYSE-AEP)	2.5%	-3.5%	1.0%	2.0%	2.0%	5.0%
Avista Corporation (NYSE-AVA)	4.0%	2.0%	4.0%	11.5%	10.0%	4.0%
Cleco Corporation (NYSE-CNL)	4.5%	1.0%	7.5%	7.5%	0.5%	11.0%
CMS Energy Corporation (NYSE-CMS)	-7.5%	-9.5%	-6.0%	17.5%		1.5%
Consolidated Edison, Inc. (NYSE-ED)	1.0%	1.0%	3.5%	3.0%	1.0%	2.5%
DTE Energy Company (NYSE-DTE)		0.5%	3.5%	2.5%	1.0%	3.5%
Edison International (NYSE-EIX)		2.5%	9.5%	10.0%	15.5%	10.5%
Entergy Corporation (NYSE-ETR)	10.0%	9.0%	4.0%	10.0%	10.5%	4.0%
Great Plains Energy Incorporated (NYSE-GXP)	-3.5%	-4.0%	4.0%	-11.5%	-8.0%	7.0%
Hawaiian Electric Industries, Inc. (NYSE-HE)	-2.5%		2.0%	-6.0%		1.0%
IDACORP, Inc. (NYSE-IDA)	-0.5%	-4.5%	3.5%	11.0%	-2.5%	4.5%
MGE Energy, Inc. (NYSE-MGEE)	4.5%	1.0%	6.5%	7.0%	1.5%	6.5%
Nextra Energy (NYSE-NEE)	8.0%	6.0%	7.5%	12.0%	7.5%	9.0%
OGE Energy Corp. (NYSE-OGE)	3.5%	0.5%	5.0%	9.0%	1.5%	8.5%
Pepco Holdings, Inc. (NYSE-POM)	-0.5%		0.5%	-0.5%	1.5%	1.0%
PG&E Corporation (NYSE-PCG)		3.5%	5.5%	7.0%		10.5%
Pinnacle West Capital Corp. (NYSE-PNW)	-2.5%	4.5%	2.5%	0.5%	3.0%	0.5%
Portland General Electric (NYSE-POR)				7.5%		2.0%
SCANA Corporation (NYSE-SCG)	4.5%	3.5%	4.0%	2.0%	5.0%	4.5%
Southern Company (NYSE-SO)	2.0%	2.5%	2.5%	2.5%	4.0%	5.5%
TECO Energy, Inc. (NYSE-TE)	-5.5%	-4.5%	-1.5%	12.0%	-0.5%	5.0%
UniSource Energy Corporation (NYSE-UNS)	7.0%		8.0%	8.5%	13.0%	4.5%
Westar Energy, Inc. (NYSE-WR)		-4.5%	-3.0%	1.0%	7.0%	6.0%
Wisconsin Energy Corporation (NYSE-WEC)	8.0%	-1.0%	6.0%	8.5%	10.0%	7.5%
Xcel Energy Inc. (NYSE-XEL)	-1.0%	-4.0%		4.0%	4.0%	4.0%
Mean	1.8%	-0.2%	3.4%	5.3%	4.1%	5.1%
Median	2.3%	0.5%	3.5%	7.0%	2.5%	4.5%
Data Source: Value Line Investment Survey.				Average of Median Figures = 3.4%		

Exhibit JRW-10

Kentucky Utilities Company  
DCF Equity Cost Growth Rate Measures  
Value Line Projected Growth Rates

Company	Proxy Group			Value Line		
	Value Line			Value Line		
	Projected Growth			Sustainable Growth		
	Est'd. '08-'10 to '14-'16			Return on	Retention	Internal
	Earnings	Dividends	Book Value	Equity	Rate	Growth
ALLETE, Inc. (NYSE-ALE)	4.5%	2.0%	3.0%	9.5%	33.0%	3.1%
Alliant Energy Corporation (NYSE-LNT)	7.0%	6.0%	3.0%	12.0%	38.0%	4.6%
Ameren Corporation (NYSE-AEE)	-2.0%	-3.0%	1.5%	7.0%	38.0%	2.7%
American Electric Power Co. (NYSE-AEP)	4.5%	4.0%	4.5%	10.5%	45.0%	4.7%
Avista Corporation (NYSE-AVA)	4.5%	9.0%	3.0%	9.0%	32.0%	2.9%
Cleco Corporation (NYSE-CNL)	6.0%	9.5%	6.5%	9.5%	41.0%	3.9%
CMS Energy Corporation (NYSE-CMS)	7.0%	14.0%	5.0%	12.5%	42.0%	5.3%
Consolidated Edison, Inc. (NYSE-ED)	3.0%	1.0%	2.5%	9.5%	37.0%	3.5%
DTE Energy Company (NYSE-DTE)	3.5%	4.0%	3.5%	9.0%	36.0%	3.2%
Edison International (NYSE-EIX)	-1.0%	2.0%	5.0%	8.0%	54.0%	4.3%
Entergy Corporation (NYSE-ETR)	1.5%	3.0%	6.0%	11.5%	49.0%	5.6%
Great Plains Energy Incorporated (NYSE-GXP)	6.0%	1.5%	1.5%	7.5%	33.0%	2.5%
Hawaiian Electric Industries, Inc. (NYSE-HE)	11.0%	1.0%	3.0%	10.5%	35.0%	3.7%
IDACORP, Inc. (NYSE-IDA)	4.0%	4.0%	5.0%	8.5%	55.0%	4.7%
MGE Energy, Inc. (NYSE-MGEE)	4.0%	2.0%	4.0%	12.0%	45.0%	5.4%
Nextra Energy (NYSE-NEE)	3.5%	5.5%	7.0%	11.0%	51.0%	5.6%
OGE Energy Corp. (NYSE-OGE)	6.5%	4.0%	7.5%	12.0%	58.0%	7.0%
Pepco Holdings, Inc. (NYSE-POM)	2.5%	1.0%	2.0%	7.5%	29.0%	2.2%
PG&E Corporation (NYSE-PCG)	6.0%	4.5%	5.5%	11.5%	48.0%	5.5%
Pinnacle West Capital Corp. (NYSE-PNW)	6.0%	1.5%	2.5%	9.0%	35.0%	3.2%
Portland General Electric (NYSE-POR)	7.5%	3.0%	3.5%	9.0%	48.0%	4.3%
SCANA Corporation (NYSE-SCG)	3.0%	2.0%	5.0%	9.5%	41.0%	3.9%
Southern Company (NYSE-SO)	6.0%	4.0%	5.5%	13.0%	32.0%	4.2%
TECO Energy, Inc. (NYSE-TE)	10.5%	4.5%	5.0%	13.0%	40.0%	5.2%
UniSource Energy Corporation (NYSE-UNS)	9.5%	9.0%	5.0%	12.5%	39.0%	4.9%
Westar Energy, Inc. (NYSE-WR)	8.5%	3.0%	2.5%	10.0%	41.0%	4.1%
Wisconsin Energy Corporation (NYSE-WEC)	8.5%	15.5%	4.0%	14.0%	43.0%	6.0%
Xcel Energy Inc. (NYSE-XEL)	5.0%	3.0%	5.0%	0.0%	45.0%	0.0%
Mean	5.2%	4.3%	4.2%	9.9%	41.5%	4.1%
Median	5.5%	3.5%	4.3%	9.8%	41.0%	4.2%
Average of Median Figures =		4.4%				4.2%

Data Source: Value Line Investment Survey.

Exhibit JRW-10

Kentucky Utilities Company  
 DCF Equity Cost Growth Rate Measures  
 Analysts Projected EPS Growth Rate Estimates

Electric Proxy Group

Company	Yahoo First Call	Zack's	Reuters	Average
ALLETE, Inc. (NYSE-ALE)	5.8%	5.0%	6.0%	5.6%
Alliant Energy Corporation (NYSE-LNT)	5.9%	6.0%	5.7%	5.9%
Ameren Corporation (NYSE-AEE)	1.0%	4.0%	3.0%	2.7%
American Electric Power Co. (NYSE-AEP)	4.0%	4.0%	4.2%	4.1%
Avista Corporation (NYSE-AVA)	4.7%	4.7%	4.7%	4.7%
Cleco Corporation (NYSE-CNL)	3.0%	7.0%	3.0%	4.3%
CMS Energy Corporation (NYSE-CMS)	6.0%	5.5%	5.7%	5.8%
Consolidated Edison, Inc. (NYSE-ED)	3.4%	3.0%	3.9%	3.4%
DTE Energy Company (NYSE-DTE)	3.5%	5.0%	3.5%	4.0%
Edison International (NYSE-EIX)	2.9%	5.0%	3.5%	3.8%
Entergy Corporation (NYSE-ETR)	-1.1%	-0.2%	3.3%	0.7%
Great Plains Energy Incorporated (NYSE-GXP)	6.0%	9.0%	5.9%	6.9%
Hawaiian Electric Industries, Inc. (NYSE-HE)	8.6%	8.6%	7.0%	8.1%
IDACORP, Inc. (NYSE-IDA)	4.7%	4.7%	4.7%	4.7%
MGE Energy, Inc. (NASDAQ-MGEE)	4.0%	4.0%	4.0%	4.0%
NextEra Energy (NYSE-NEE)	5.8%	6.7%	5.8%	6.1%
OGE Energy Corp. (NYSE-OGE)	7.2%	6.0%	6.6%	6.6%
Pepco Holdings, Inc. (NYSE-POM)	5.0%	4.3%	3.3%	4.2%
PG&E Corporation (NYSE-PCG)	3.8%	5.0%	5.2%	4.7%
Pinnacle West Capital Corp. (NYSE-PNW)	6.8%	5.3%	6.5%	6.2%
Portland General Electric (NYSE-POR)	4.7%	5.0%	5.5%	5.1%
SCANA Corporation (NYSE-SCG)	4.8%	4.3%	4.5%	4.6%
Southern Company (NYSE-SO)	6.0%	5.0%	5.9%	5.6%
TECO Energy, Inc. (NYSE-TE)	6.3%	4.7%	6.1%	5.7%
UniSource Energy Corporation (NYSE-UNS)	3.0%	3.0%	7.5%	4.5%
Westar Energy, Inc. (NYSE-WR)	6.4%	6.1%	6.2%	6.2%
Wisconsin Energy Corporation (NYSE-WEC)	7.1%	8.0%	8.2%	7.8%
Xcel Energy Inc. (NYSE-XEL)	5.6%	4.9%	5.6%	5.4%
Mean	4.8%	5.1%	5.2%	5.0%
Median	4.9%	5.0%	5.6%	4.9%

Data Sources: www.reuters.com, www.zacks.com, http://quote.yahoo.com, August 30, 2011.

Exhibit JRW-10

Kentucky Utilities Company  
DCF Growth Rate Indicators

Summary Growth Rates

Growth Rate Indicator	Proxy Group
Historic <i>Value Line</i> Growth in EPS, DPS, and BVPS	3.4%
Projected <i>Value Line</i> Growth in EPS, DPS, and BVPS	4.4%
Sustainable Growth ROE * Retention Rate	4.2%
Projected EPS Growth from First Call, Zacks, and Reuters	4.9%
Average of Historic and Projected Growth Rates	4.2%
Average of Sustainable and Projected Growth Rates	4.5%

**Exhibit JRW-11**

**Kentucky Utilities Company  
Capital Asset Pricing Model**

**Electric Proxy Group**

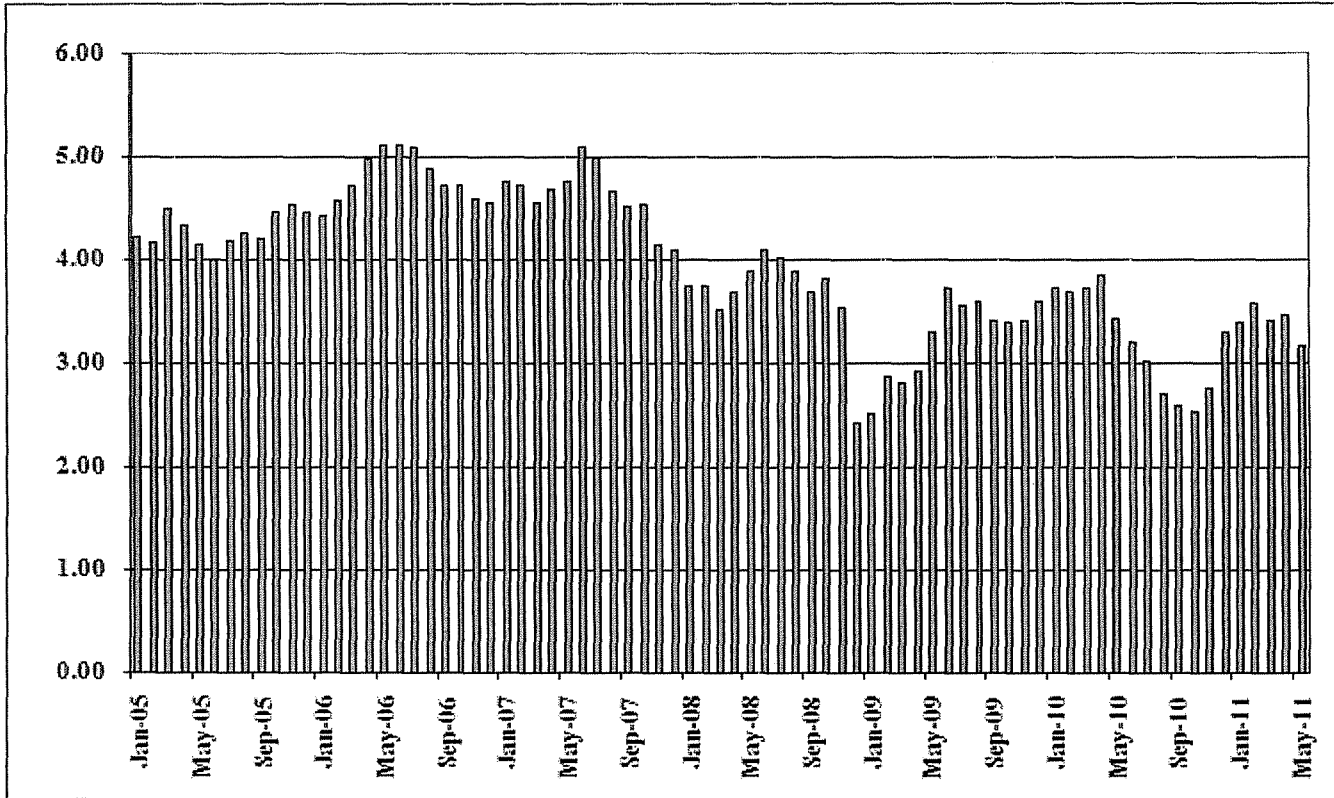
<b>Risk-Free Interest Rate</b>	<b>4.00%</b>
<b>Beta*</b>	<b>0.70</b>
<b>Ex Ante Equity Risk Premium**</b>	<b>5.10%</b>
<b>CAPM Cost of Equity</b>	<b>7.6%</b>

\* See page 3 of Exhibit JRW-11

\*\* See pages 5 and 6 of Exhibit JRW-11

Exhibit JRW-11

Panel A  
 Ten-Year U.S. Treasury Yields  
 January 2000-Present



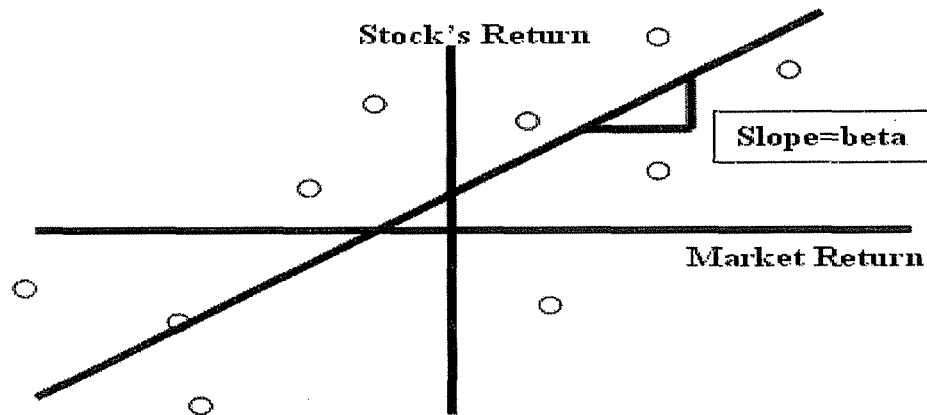
Panel B  
 Current Rates

U.S. Treasuries			
	Coupon	Maturity	PR. CEYIELD
3-Month	0.000	12/01/2011	0.02 / 0.02
6-Month	0.000	02/01/2012	0.06 / 0.06
12-Month	0.000	08/29/2012	0.11 / 0.11
2-Year	0.125	08/21/2013	95.27% / 0.20
3-Year	0.500	08/15/2014	100.16+ / 0.32
5-Year	1.000	08/31/2015	100.18% / 0.58
7-Year	1.500	08/21/2018	100.20 / 1.39
10-Year	2.125	08/15/2021	101.12% / 1.97
30-Year	3.750	08/15/2041	108.15+ / 3.25

Exhibit JRW-11

Panel A

Calculation of Beta



Electric Proxy Group

Company Name	Beta
1 ALLETE, Inc. (NYSE-ALE)	0.70
2 Alliant Energy Corporation (NYSE-LNT)	0.70
3 Ameren Corporation (NYSE-AEE)	0.80
4 American Electric Power Co. (NYSE-AEP)	0.70
5 Avista Corporation (NYSE-AVA)	0.70
6 Cleco Corporation (NYSE-CNL)	0.65
7 CMS Energy Corporation (NYSE-CMS)	0.75
8 Consolidated Edison, Inc. (NYSE-ED)	0.65
9 DTE Energy Company (NYSE-DTE)	0.75
10 Edison International (NYSE-EIX)	0.80
11 Entergy Corporation (NYSE-ETR)	0.70
12 Great Plains Energy Incorporated (NYSE-GXP)	0.75
13 Hawaiian Electric Industries, Inc. (NYSE-HE)	0.70
14 IDACORP, Inc. (NYSE-IDA)	0.70
15 MGE Energy, Inc. (NASDAQ-MGEE)	0.60
16 NextEra Energy (NYSE-NEE)	0.75
17 OGE Energy Corp. (NYSE-OGE)	0.75
18 Pepco Holdings, Inc. (NYSE-POM)	0.80
19 PG&E Corporation (NYSE-PCG)	0.55
20 Pinnacle West Capital Corp. (NYSE-PNW)	0.70
21 Portland General Electric (NYSE-POR)	0.75
22 SCANA Corporation (NYSE-SCG)	0.65
23 Southern Company (NYSE-SO)	0.55
24 TECO Energy, Inc. (NYSE-TE)	0.85
25 UniSource Energy Corporation (NYSE-UNS)	0.75
26 Westar Energy, Inc. (NYSE-WR)	0.75
27 Wisconsin Energy Corporation (NYSE-WEC)	0.65
28 Xcel Energy Inc. (NYSE-XEL)	0.65
Mean	0.71
Median	0.70

Data Source: Value Line Investment Survey, 2011.

Exhibit JRW-11

**Risk Premium Approaches**

	Historical Ex Post Excess Returns	Surveys	Ex Ante Models and Market Data
Means of Assessing the Equity-Bond Risk Premium	Historical average is a popular proxy for the ex ante premium – but likely to be misleading	Investor and expert surveys can provide direct estimates of prevailing expected returns/premiums	Current financial market prices (simple valuation ratios or DCF-based measures) can give most objective estimates of feasible ex ante equity-bond risk premium
Problems/Debated Issues	Time variation in required returns and systematic selection and other biases have boosted valuations over time, and have exaggerated realized excess equity returns compared with ex ante expected premiums	Limited survey histories and questions of survey representativeness.  Surveys may tell more about hoped-for expected returns than about objective required premiums due to irrational biases such as extrapolation.	Assumptions needed for DCF inputs, notably the trend earnings growth rate, make even these models' outputs subjective.  The range of views on the growth rate, as well as the debate on the relevant stock and bond yields, leads to a range of premium estimates.

Source: Antti Ilmanen, "Expected Returns on Stocks and Bonds," *Journal of Portfolio Management*, (Winter 2003).



Exhibit JRW-11

Kentucky Utilities Company  
 Capital Asset Pricing Model  
 Equity Risk Premium

Study	Study Authors	Publication Date	Time Period Of Study	Methodology	Return Measure	Range		Midpoint of Range	Mean	Median
						Low	High			
<b>Historical Risk Premium</b>										
	Ibbotson	2011	1926-2010	Historical Stock Returns - Bond Returns	Arithmetic				6.00%	
					Geometric				4.40%	
	Bate	2008	1900-2007	Historical Stock Returns - Bond Returns	Geometric				4.50%	
	Shiller	2006	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				7.00%	
					Geometric				5.50%	
	Damodoran	2006	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				6.70%	
					Geometric				5.10%	
	Siegel	2005	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				6.10%	
					Geometric				4.60%	
	Dimson, Marsh, and Staunton	2006	1900-2005	Historical Stock Returns - Bond Returns	Arithmetic				5.50%	
	Goyal & Welch	2006	1872-2004	Historical Stock Returns - Bond Returns					4.77%	
	<b>Median</b>									5.50%
<b>Ex Ante Models (Puzzle Research)</b>										
	Claus Thomas	2001	1985-1998	Abnormal Earnings Model					3.00%	
	Arnott and Bernstein	2002	1810-2001	Fundamentals - Div Yld + Growth					2.40%	
	Constantinides	2002	1872-2000	Historical Returns & Fundamentals - P/D & P/E					6.90%	
	Cornell	1999	1926-1997	Historical Returns & Fundamental GDP/Earnings		3.50%	5.50%	4.50%	4.50%	
	Easton, Taylor, et al	2002	1981-1998	Residual Income Model					5.30%	
	Fama French	2002	1951-2000	Fundamental DCF with EPS and DPS Growth		2.55%	4.32%		3.44%	
	Harris & Marston	2001	1982-1998	Fundamental DCF with Analysts' EPS Growth					7.14%	
	Best & Byrne	2001								
	McKinsey	2002	1962-2002	Fundamental (P/E, D/P, & Earnings Growth)		3.50%	4.00%		3.75%	
	Siegel	2005	1802-2001	Historical Earnings Yield	Geometric				2.50%	
	Grabowski	2006	1926-2005	Historical and Projected		3.50%	6.00%	4.75%	4.75%	
	Maheu & McCurdy	2006	1885-2003	Historical Excess Returns, Structural Breaks, Bond Yields, Credit Risk, and Income Volatility		4.02%	5.10%	4.56%	4.56%	
	Bostock	2004	1960-2002	Bond Yields, Credit Risk, and Income Volatility		3.90%	1.30%	2.60%	2.60%	
	Bakshi & Chen	2005	1982-1998	Fundamentals - Interest Rates					7.31%	
	Donaldson, Kamstra, & Kramer	2006	1952-2004	Fundamental, Dividend yld., Returns, & Volatility		3.00%	4.00%	3.50%	3.50%	
	Campbell	2008	1982-2007	Historical & Projections (D/P & Earnings Growth)		4.10%	5.40%		4.75%	
	Best & Byrne	2001	Projection	Fundamentals - Div Yld + Growth					2.00%	
	Fernandez	2007	Projection	Required Equity Risk Premium					4.00%	
	DeLong & Magin	2008	Projection	Earnings Yield - TIPS					3.22%	
	Damodoran	2011	Projection	Fundamentals - Implied from FCF to Equity Model					6.39%	
<b>Social Security</b>										
	Office of Chief Actuary		1900-1995							
	John Campbell	2001	1860-2000	Historical & Projections (D/P & Earnings Growth)	Arithmetic	3.00%	4.00%	3.50%	3.50%	
			Projected for 75 Years		Geometric	1.50%	2.50%	2.00%	2.00%	
	Peter Diamond	2001	Projected for 75 Years	Fundamentals (D/P, GDP Growth)		3.00%	4.80%	3.90%	3.90%	
	John Shoven	2001	Projected for 75 Years	Fundamentals (D/P, P/E, GDP Growth)		3.00%	3.50%	3.25%	3.25%	
	<b>Median</b>									3.75%
<b>Surveys</b>										
	Survey of Financial Forecasters	2011	10-Year Projection	About 50 Financial Forecasters					2.87%	
	Duke - CFO Magazine Survey	2011	10-Year Projection	Approximately 500 CFOs					3.40%	
	Welch - Academics	2008	30-Year Projection	Random Academics		5.00%	5.74%	5.37%	5.37%	
	Fernandez - Academics	2011	Long-Term	Survey of Academics					5.50%	
	Fernandez - Analysts	2011	Long-Term	Survey of Analysts					5.00%	
	Fernandez - Companies	2011	Long-Term	Survey of Companies					5.20%	
	<b>Median</b>									5.10%
<b>Building Block</b>										
	Ibbotson and Chen	2011	1926-2010	Historical Supply Model (D/P & Earnings Growth)	Arithmetic			5.99%	4.95%	
					Geometric			3.91%		
	Woolridge		2011	Current Supply Model (D/P & Earnings Growth)					3.30%	
	<b>Median</b>									4.13%
<b>Mean</b>										4.62%
<b>Median</b>										4.61%



Exhibit JRW-11

Kentucky Utilities Company  
 Decomposing Equity Market Returns  
 The Building Blocks Methodology

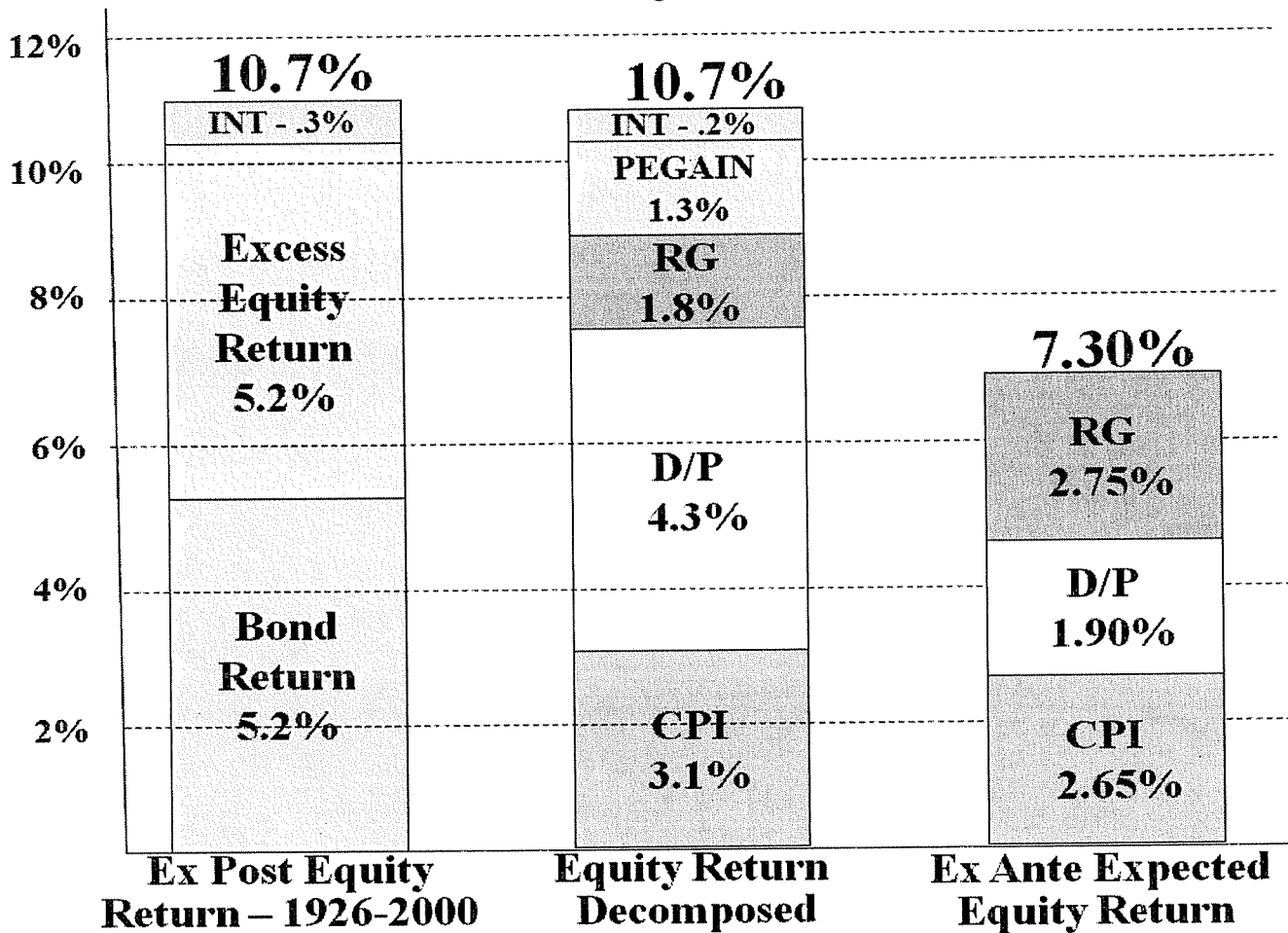


Exhibit JRW-11

Kentucky Utilities Company

2011 Survey of Professional Forecasters  
 Philadelphia Federal Reserve Bank  
 Long-Term Forecasts

Table Seven  
 LONG-TERM (10 YEAR) FORECASTS

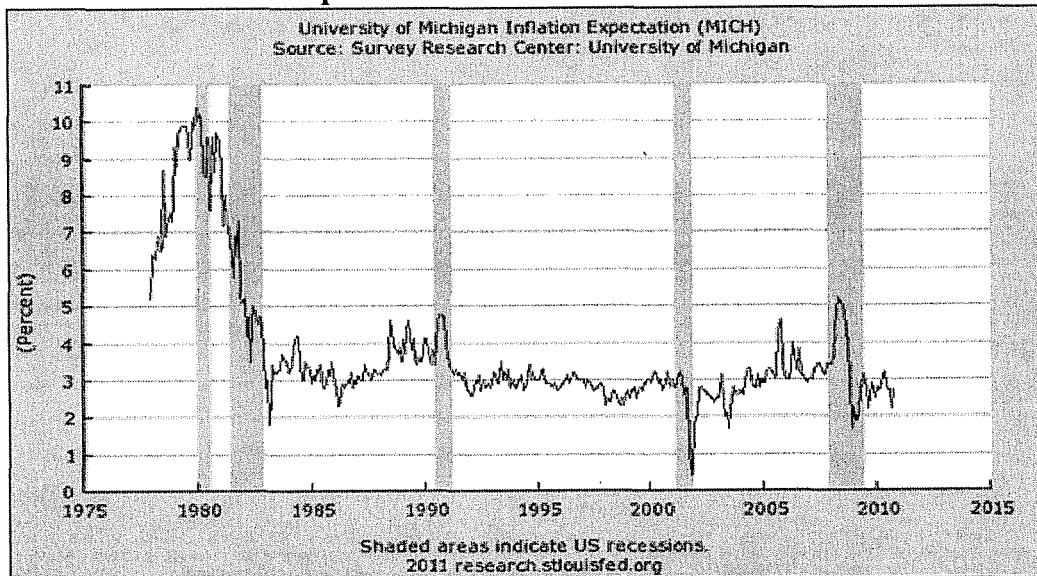
Panel A		Panel B	
<u>SERIES: CPI INFLATION RATE</u>		<u>SERIES: REAL GDP GROWTH RATE</u>	
STATISTIC		STATISTIC	
MINIMUM	0.70	MINIMUM	1.70
LOWER QUARTILE	2.00	LOWER QUARTILE	2.70
MEDIAN	2.30	MEDIAN	2.84
UPPER QUARTILE	2.50	UPPER QUARTILE	3.20
MAXIMUM	3.50	MAXIMUM	4.00
MEAN	2.30	MEAN	2.93
STD. DEV.	0.55	STD. DEV.	0.48
N	36	N	34
MISSING	7	MISSING	9
Panel C		Panel D	
<u>SERIES: PRODUCTIVITY GROWTH</u>		<u>SERIES: STOCK RETURNS (S&amp;P 500)</u>	
STATISTIC		STATISTIC	
MINIMUM	1.50	MINIMUM	4.20
LOWER QUARTILE	1.80	LOWER QUARTILE	6.30
MEDIAN	2.00	MEDIAN	7.25
UPPER QUARTILE	2.20	UPPER QUARTILE	8.25
MAXIMUM	3.00	MAXIMUM	12.00
MEAN	2.04	MEAN	7.37
STD. DEV.	0.35	STD. DEV.	1.80
N	26	N	20
MISSING	17	MISSING	23
Panel E		Panel F	
<u>SERIES: BOND RETURNS (10-YEAR)</u>		<u>SERIES: BILL RETURNS (3-MONTH)</u>	
STATISTIC		STATISTIC	
MINIMUM	-4.00	MINIMUM	-2.00
LOWER QUARTILE	4.25	LOWER QUARTILE	2.75
MEDIAN	4.88	MEDIAN	3.00
UPPER QUARTILE	5.00	UPPER QUARTILE	3.31
MAXIMUM	6.50	MAXIMUM	4.75
MEAN	4.50	MEAN	2.93
STD. DEV.	1.80	STD. DEV.	1.13
N	30	N	30
MISSING	13	MISSING	13

Source: Philadelphia Federal Reserve Bank, Survey of Professional Forecasters, February 11, 2011.

Exhibit JRW-11

Kentucky Utilities Company

University of Michigan Survey Research Center  
Expected Short-Term Inflation Rate

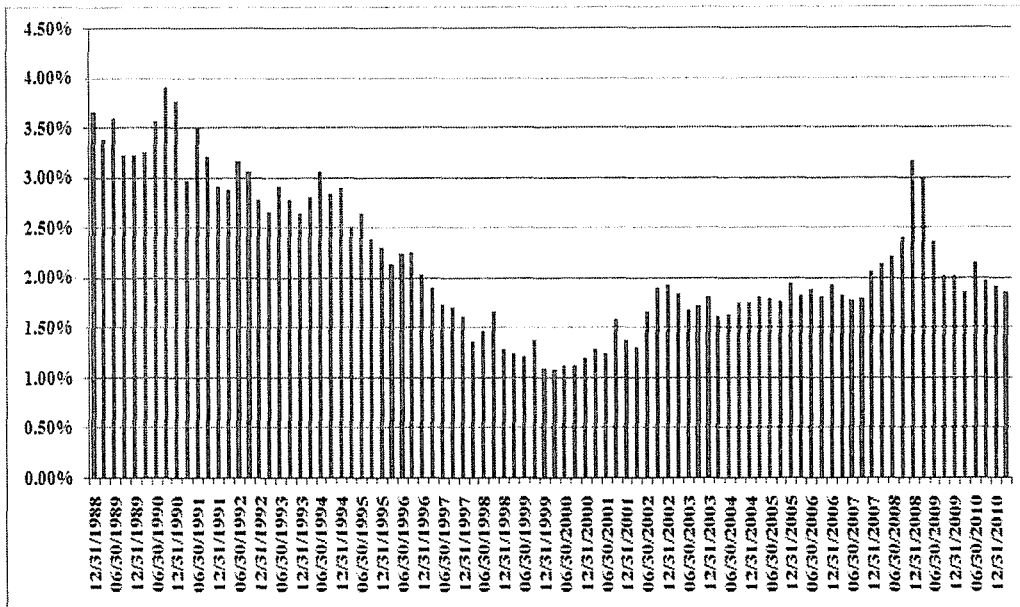


Data Source: <http://research.stlouisfed.org/fred2/series/MICH?cid=98>

Exhibit JRW-11

Decomposing Equity Market Returns  
The Building Blocks Methodology

S&P 500 Dividend Yield



S&P 500 P/E Ratio

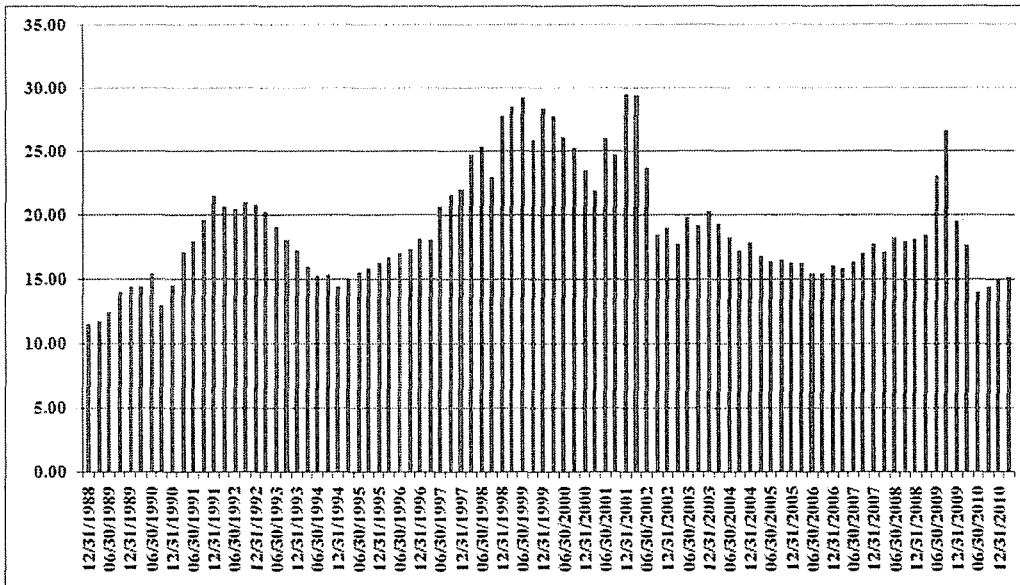


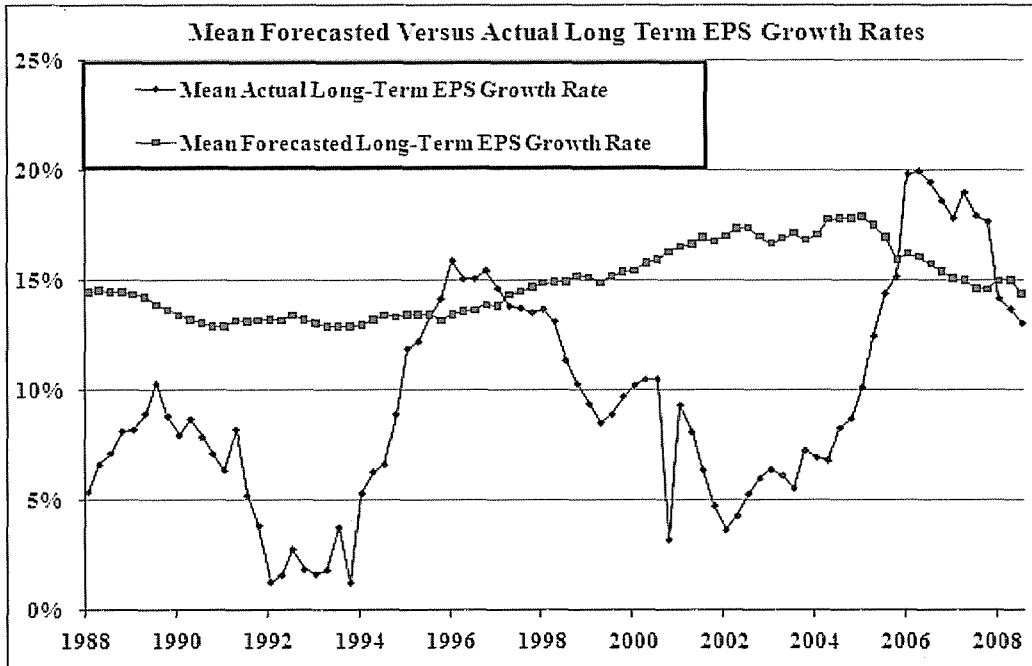
Exhibit JRW-11

Kentucky Utilities Company  
 CAPM

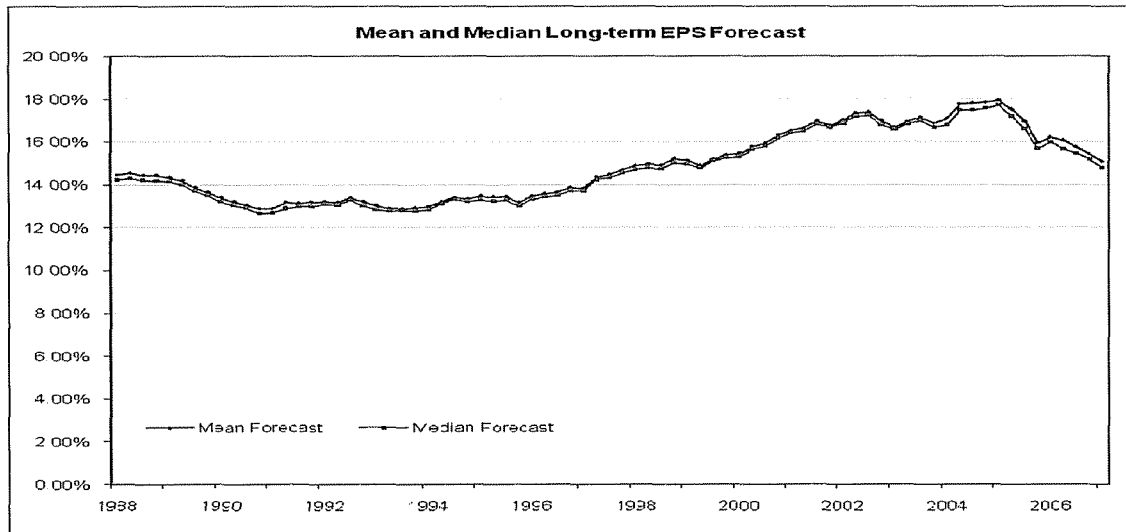
Real S&P 500 EPS Growth Rate

Year	S&P 500 EPS	Annual Inflation CPI	Inflation Adjustment Factor	Real S&P 500 EPS	
1960	3.10	1.48		3.10	
1961	3.37	0.07	1.01	3.35	
1962	3.67	1.22	1.02	3.59	
1963	4.13	1.65	1.04	3.99	
1964	4.76	1.19	1.05	4.55	
1965	5.30	1.92	1.07	4.97	
1966	5.41	3.35	1.10	4.90	
1967	5.46	3.04	1.14	4.80	
1968	5.72	4.72	1.19	4.81	
1969	6.10	6.11	1.26	4.83	10-Year
1970	5.51	5.49	1.34	4.13	2.89%
1971	5.57	3.36	1.38	4.04	
1972	6.17	3.41	1.43	4.33	
1973	7.96	8.80	1.55	5.13	
1974	9.35	12.20	1.74	5.37	
1975	7.71	7.01	1.86	4.14	
1976	9.75	4.81	1.95	4.99	
1977	10.87	6.77	2.08	5.22	
1978	11.64	9.03	2.27	5.13	
1979	14.55	13.31	2.57	5.66	10-Year
1980	14.99	12.40	2.89	5.18	2.30%
1981	15.18	8.94	3.15	4.82	
1982	13.82	3.87	3.27	4.23	
1983	13.29	3.80	3.40	3.91	
1984	16.84	3.95	3.53	4.77	
1985	15.68	3.77	3.66	4.28	
1986	14.43	1.13	3.70	3.90	
1987	16.04	4.41	3.87	4.15	
1988	22.77	4.42	4.04	5.64	
1989	24.03	4.65	4.22	5.69	10-Year
1990	21.73	6.11	4.48	4.85	-0.65%
1991	19.10	3.06	4.62	4.14	
1992	18.13	2.90	4.75	3.81	
1993	19.82	2.75	4.88	4.06	
1994	27.05	2.67	5.01	5.40	
1995	35.35	2.54	5.14	6.88	
1996	35.78	3.32	5.31	6.74	
1997	39.56	1.70	5.40	7.33	
1998	38.23	1.61	5.48	6.97	
1999	45.17	2.68	5.63	8.02	10-Year
2000	52.00	3.39	5.82	8.93	6.29%
2001	44.23	1.55	5.92	7.48	
2002	47.24	2.38	6.06	7.80	
2003	54.15	1.88	6.17	8.77	
2004	67.01	3.26	6.37	10.51	5-Year
2005	68.32	3.42	6.60	10.35	3.00%
2006	81.96	2.54	6.77	12.11	
2007	87.51	4.08	7.04	12.43	
2008	65.39	0.09	7.05	9.28	
2009	59.65	2.72	7.24	8.24	
2010	83.66	1.50	7.35	11.39	
Data Source: <a href="http://pages.stern.nyu.edu/~adamodar/">http://pages.stern.nyu.edu/~adamodar/</a>				Real EPS Growth	2.6%

**Panel A**  
**Long-Term Forecasted Versus Actual EPS Growth Rates**  
**1988-2009**



**Panel B**  
**Long-Term Forecasted EPS Growth Rates**  
**1988-2007**



Source: Patrick J. Cusatis and J. Randall Woolridge, "The Accuracy of Analysts' Long-Term Earnings Per Share Growth Rate Forecasts," (July, 2008).



# THE WALL STREET JOURNAL.

## Study Suggests Bias in Analysts' Rosy Forecasts

By **ANDREW EDWARDS**

*March 21, 2008; Page C6*

Despite an economy teetering on the brink of a recession -- if not already in one -- analysts are still painting a rosy picture of earnings growth, according to a study done by Penn State's Smeal College of Business.

The report questions analysts' impartiality five years after then-New York Attorney General Eliot Spitzer forced analysts to pay \$1.5 billion in damages after finding evidence of bias.

"Wall Street analysts basically do two things: recommend stocks to buy and forecast earnings," said J. Randall Woolridge, professor of finance. "Previous studies suggest their stock recommendations do not perform well, and now we show that their long-term earnings-per-share growth-rate forecasts are excessive and upwardly biased."

The report, which examined analysts' long-term (three to five years) and one-year per-share earnings expectations from 1984 through 2006 found that companies' long-term earnings growth surpassed analysts' expectations in only two instances, and those came right after recessions.

Over the entire time period, analysts' long-term forecast earnings-per-share growth averaged 14.7%, compared with actual growth of 9.1%. One-year per-share earnings expectations were slightly more accurate: The average forecast was for 13.8% growth and the average actual growth rate was 9.8%.

"A significant factor in the upward bias in long-term earnings-rate forecasts is the reluctance of analysts to forecast" profit declines, Mr. Woolridge said. The study found that nearly one-third of all companies experienced profit drops over successive three-to-five-year periods, but analysts projected drops less than 1% of the time.

The study's authors said, "Analysts are rewarded for biased forecasts by their employers, who want them to hype stocks so that the brokerage house can garner trading commissions and win underwriting deals."

They also concluded that analysts are under pressure to hype stocks to generate trading commissions, and they often don't follow stocks they don't like.

**Write to Andrew Edwards at [andrew.edwards@dowjones.com](mailto:andrew.edwards@dowjones.com)**

Markets & Finance June 10, 2010, 5:00PM EST

**Bloomberg  
Businessweek**

## For Analysts, Things Are Always Looking Up

### They're raising earnings estimates for U.S. companies at a record pace

By Roben Farzad

For years, the rap on Wall Street securities analysts was that they were shills, reflexively producing upbeat research on companies they cover to help their employers win investment banking business. The dynamic was well understood: Let my bank take your company public, or advise it on this acquisition, and—wink, wink—I will recommend your stock through thick or thin. After the Internet bubble burst, that was supposed to change. In April 2003 the Securities & Exchange Commission reached a settlement with 10 Wall Street firms in which they agreed, among other things, to separate research from investment banking.

Seven years on, Wall Street analysts remain a decidedly optimistic lot. Some economists look at the global economy and see troubles—the European debt crisis, persistently high unemployment worldwide, and housing woes in the U.S. Stock analysts as a group seem unfazed. Projected 2010 profit growth for companies in the Standard & Poor's 500-stock index has climbed seven percentage points this quarter, to 34 percent, data compiled by Bloomberg show. According to Sanford C. Bernstein (AB), that's the fastest pace since 1980, when the Dow Jones industrial average was quoted in the hundreds and Nancy Reagan was getting ready to order new window treatments for the Oval Office.

Among the companies analysts expect to excel: Intel (INTL) is projected to post an increase in net income of 142 percent this year. Caterpillar, a multinational that gets much of its revenue abroad, is expected to boost its net income by 47 percent this year. Analysts have also hiked their S&P 500 profit estimate for 2011 to \$95.53 a share, up from \$92.45 at the beginning of January, according to Bloomberg data. That would be a record, surpassing the previous high reached in 2007.

With such prospects, it's not surprising that more than half of S&P 500-listed stocks boast overall buy ratings. It is telling that the proportion has essentially held constant at both the market's October 2007 high and March 2009 low, bookends of a period that saw stocks fall by more than half. If the analysts are correct, the market would appear to be attractively priced right now. Using the \$95.53 per share figure, the price-to-earnings ratio of the S&P 500 is a modest 11 as of June 9. If, however, analysts end up being too high by, say, 20 percent, the P/E would jump to almost 14.

If history is any guide, chances are good that the analysts are wrong. According to a recent McKinsey report by Marc Goedhart, Rishi Raj, and Abhishek Saxena, "Analysts have been persistently over-optimistic for 25 years," a stretch that saw them peg earnings growth at 10 percent to 12 percent a year when the actual number was ultimately 6 percent. "On average," the researchers note, "analysts' forecasts have been almost 100 percent too high," even after regulations were enacted to weed out conflicts and improve the rigor of their calculations. As the chart below shows, in most years analysts have been forced to lower their estimates after it became apparent they had set them too high.

While a few analysts, like Meredith Whitney, have made their names on bearish calls, most are chronically bullish. Part of the problem is that despite all the reforms they remain too aligned with the companies they cover. "Analysts still need to get the bulk of their information from companies, which have an incentive to be over-optimistic," says Stephen Bainbridge, a professor at UCLA Law School who specializes in the securities industry. "Meanwhile, analysts don't want to threaten that ongoing access by being too negative." Bainbridge says that with the era of the overpaid, superstar analyst long over, today's job description calls for resisting the urge to be an iconoclast. "It's a matter of herd behavior," he says.

So what's a more plausible estimate of companies' earning power? Looking at factors including the strengthening dollar, which hurts exports, and higher corporate borrowing costs, David Rosenberg, chief economist at Toronto-based investment shop Gluskin Sheff + Associates, says "disappointment looms." Bernstein's Adam Parker says every 10 percent drop in the value of the euro knocks U.S. corporate earnings down by 2.5 percent to 3 percent. He sees the S&P 500 earning \$86 a share next year.

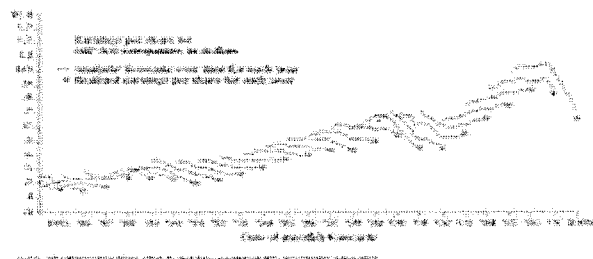
As realities hit home, "It's only natural that analysts will have to revise down their views," says Todd Salamone, senior vice-president at Schaeffer's Investment Research. The market may be making its own downward adjustment, as the S&P 500 has already fallen 14 percent from its high in April. If precedent holds, analysts are bound to curb their enthusiasm belatedly, telling us next year what we really needed to know this year.

*The bottom line: Despite reforms intended to improve Wall Street research, stock analysts seem to be promoting an overly rosy view of profit prospects.*

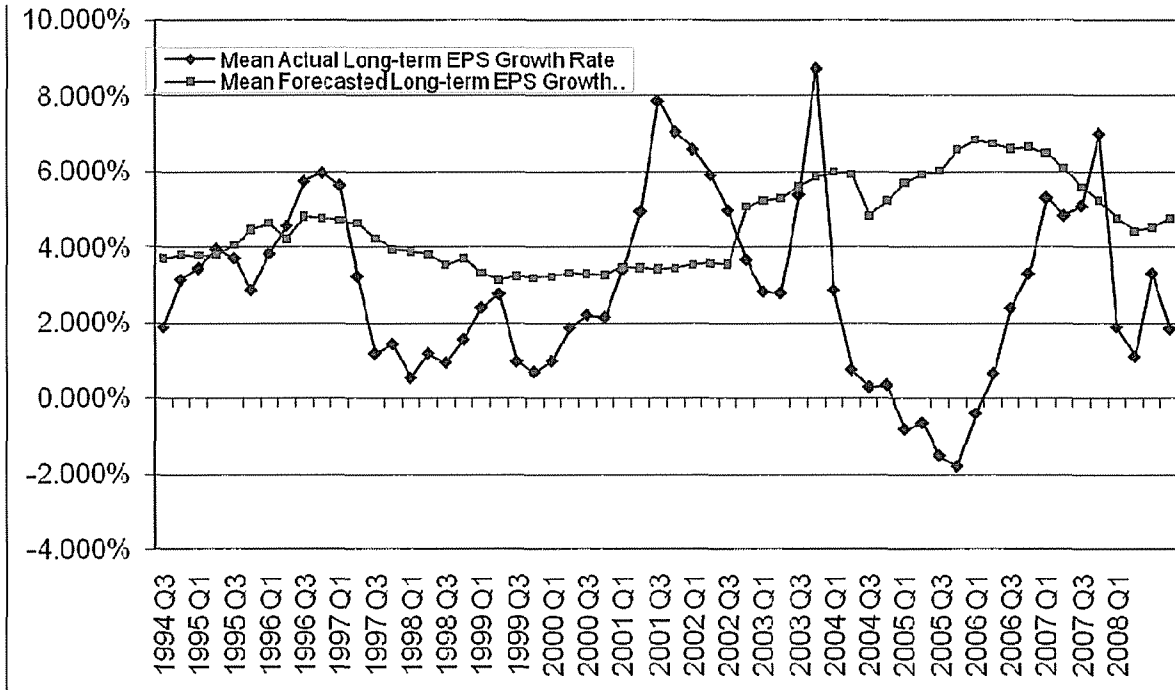
*Bloomberg Businessweek* Senior Writer Farzad covers Wall Street and international finance.

### The Earnings Roller Coaster

Analysts have a long history of overestimating future profits. As this chart from *Bloomberg Businessweek* shows, analysts on average tend to start high and ratchet their numbers down as a few companies get it wrong in reworking their forecasts. Initial estimates proved to be too low in only a few cases.

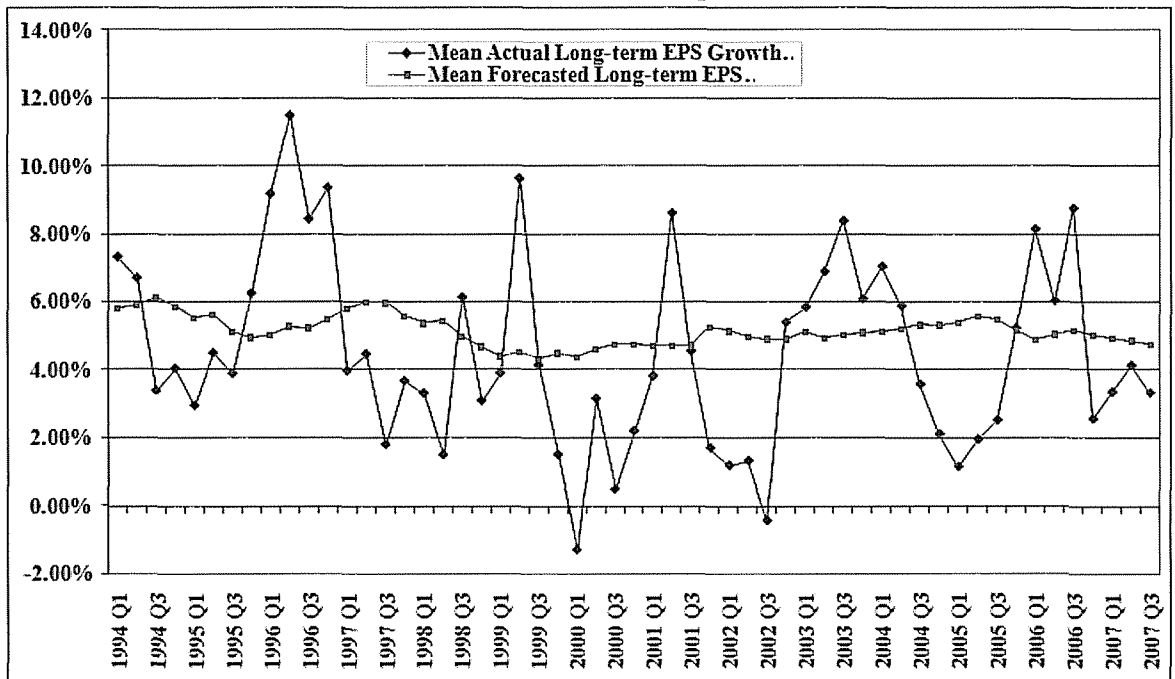


**Panel A**  
**Long-Term Forecasted Versus Actual EPS Growth Rates**  
**Electric Utility Companies**  
**1988-2008**



Data Source: IBES

**Panel B**  
**Long-Term Forecasted Versus Actual EPS Growth Rates**  
**Gas Distribution Companies**



## Panel A

## Value Line 3-5 year EPS Growth Rate Forecasts

	Average Projected EPS Growth rate	Number of Negative EPS Growth Projections	Percent of Negative EPS Growth Projections
<b>1,996 Companies</b>	<b>14.45%</b>	<b>56</b>	<b>2.81%</b>

## Panel B

## Historical Five-Year EPS Growth Rates for Value Line Companies

	Average Historical EPS Growth rate	Number with Negative Historical EPS Growth	Percent with Negative Historical EPS Growth
<b>2,147 Companies</b>	<b>8.38%</b>	<b>654</b>	<b>30.40%</b>

Source: *Value Line Investment Analyzer*, April 2011.