OCC EXHIBIT _____

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of The East Ohio Gas Company d/b/a Dominion East Ohio for Authority to Increase Rates for its Gas Distribution Service.	))))	Case No. 07-829-GA-AIR
In the Matter of the Application of The East Ohio Gas Company d/b/a Dominion East Ohio for Approval of an Alternative Rate Plan for its Gas Distribution Service.	))))	Case No. 07-830-GA-ALT
In the Matter of the Application of The East Ohio Gas Company d/b/a Dominion East Ohio for Approval to Change Accounting Methods.	))))	Case No. 07-831-GA-AAM
In the Matter of the Application of The East Ohio Gas Company d/b/a Dominion East Ohio for Approval of Tariffs to Recover Certain Costs Associated with a Pipeline Infrastructure Replacement Program Through an Automatic Adjustment Clause and for Certain Accounting Treatment.	)))))))	Case No. 08-169-GA-ALT
In the Matter of the Application of The East Ohio Gas Company d/b/a Dominion East Ohio for Approval of Tariffs to Recover Certain Costs Associated with Automated Meter Reading and for Certain Accounting Treatment.	))))))	Case No. 06-1453-GA-UNC

DIRECT TESTIMONY
of
J. RANDALL WOOLRIDGE, Ph.D.

ON BEHALF OF THE
OFFICE OF THE OHIO CONSUMERS' COUNSEL
10 West Broad St., Suite 1800
Columbus, OH 43215

June 23, 2008

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1   *Q1.*   *PLEASE STATE YOUR FULL NAME, ADDRESS, AND OCCUPATION.*

2   *A1.*   My name is J. Randall Woolridge, and my business address is 120 Haymaker

3   Circle, State College, PA 16801. I am a Professor of Finance and the Goldman,

4   Sachs & Co. and Frank P. Smeal Endowed University Fellow in Business

5   Administration at the University Park Campus of the Pennsylvania State

6   University. I am also the Director of the Smeal College Trading Room and

7   President of the Nittany Lion Fund, LLC. A summary of my educational

8   background, research, and related business experience is provided in Appendix A.

9

10   **I.**   **SUBJECT OF TESTIMONY AND SUMMARY OF**

11   **RECOMMENDATIONS**

12   *Q2.*   *WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS*

13   *PROCEEDING?*

14   *A2.*   I have been asked by the Office of the Ohio Consumers' Counsel ("OCC") to

15   provide an opinion as to the overall fair rate of return or cost of capital for Dominion

16   East Ohio ("DEO" or "the Company") and to evaluate DEO's rate of return

17   testimony in this proceeding.

18

19   *Q3.*   *PLEASE REVIEW YOUR RECOMMENDATIONS REGARDING THE*

20   *APPROPRIATE RATE OF RETURN FOR DEO.*

21   *A3.*   I have adopted the Company's proposed capital structure and long-term debt cost

22   rate. I have applied the Discounted Cash Flow Model ("DCF") and the Capital

23   Asset Pricing Model ("CAPM") to a group of publicly-held gas distribution

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1   companies. My analysis indicates an equity cost rate of 9.50 percent is

2   appropriate for the Company. Using my capital structure and debt and equity cost

3   rates, I estimate an overall cost of capital of 7.84 percent for DEO. These

4   findings are summarized in Exhibit JRW-1.

5

6   **Q4. *PLEASE SUMMARIZE THE PRIMARY ISSUES REGARGING RATE OF***

7   ***RETURN IN THIS PROCEEDING.***

8   *A4.* DEO witness Michael J. Vilbert provides the Company's proposed capital

9   structure, long-term debt cost rate, and common equity cost rate. Dr. Vilbert

10   employs a regulatory capital structure which is based on the March 31, 2007

11   capitalization for DEO's parent, Dominion Resources, Inc ("DRI"). I am

12   adopting this capital structure, along with DEO's recommended long-term debt

13   cost rate. Therefore, the primary area of contention in this case is the proposed

14   equity cost rate for DEO. Dr. Vilbert's equity cost rate estimate is 12.00 percent.

15   I have estimated an equity cost rate for DEO of 9.50 percent. It is important to

16   note that in arriving at his 12.0 percent equity cost rate recommendation, Dr.

17   Vilbert has estimated a cost of capital for the companies in his proxy group using

18   their market value capital structures and then makes an upward adjustment to his

19   equity cost rate estimates to account for the higher financial risk in DEO's

20   recommended book value capital structure. Therefore, in addition to the other

21   errors in his equity cost rate studies, his equity cost rate includes an upward

22   adjustment to account for risk differential between the market value capital

23   structures of his proxy companies and DEO's book value capital structure. This

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1   adjustment adds approximately 200 basis points, on average, to the cost of equity

2   estimates in his equity cost rate studies. I will refer to this adjustment as his

3   'leverage adjustment.'

4

5   Both Dr. Vilbert and I have applied the DCF and the CAPM approaches to groups

6   of publicly-held gas distribution companies. As discussed in my testimony, my

7   equity cost rate recommendation is consistent with the current economic

8   environment. Long-term capital costs are at historical low levels. The yields on

9   long-term Treasury bonds have been in the 4-5 percent range for several years.

10   Prior to this cyclical decline in rates in 2002, these yields had not been this low

11   over an extended period of time since the 1960s. Long-term capital costs are also

12   low due to the decline in the equity risk premium and the Jobs and Growth Tax

13   Relief Reconciliation Act of 2003, which reduced the tax rates on dividend

14   income and capital gains.

15

16   Dr. Vilbert believes that the DCF model produces equity cost rate results that are

17   too low and therefore has given his DCF results very little weight in determining

18   an equity cost rate for DEO. On the other hand, I believe that the DCF model

19   provides a good estimation of equity cost rates for public utilities and have relied

20   on these results in this proceeding. With respect to the specifics of the DCF

21   model, the major area of disagreement is the DCF growth rate. Dr. Vilbert

22   employs both traditional and multistage DCF models, and in both cases he uses

23   growth rates that are not realistic estimates of investors' growth rate expectations.

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1   Dr. Vilbert relies exclusively on analysts' earnings per share ("EPS") growth rate

2   forecasts for his traditional DCF growth rate, and on both analysts' EPS forecasts

3   and GDP growth in his multistage DCF model. Even with these errors, he gives

4   very little weight to his DCF results in estimating an equity cost rate for the

5   Company.

6

7   Dr. Vilbert uses both a traditional CAPM and an Empirical CAPM (ECAPM).

8   The CAPM/ECAPM approaches require an estimate of the risk-free interest rate,

9   beta, and the equity risk premium. The ECAPM also requires an estimate of

10   alpha, the amount by which the intercept term in the Security Market Line

11   exceeds the risk-free rate of interest. There are several errors in Dr. Vilbert's

12   CAPM/ECAPM analyses. First, his risk-free interest rates are above current

13   market interest rates. Second, the alpha employed in Dr. Vilbert's ECAPM

14   analysis is not consistent with the manner in which his beta is estimated. Third,

15   and most importantly, Dr. Vilbert's equity risk premiums are excessive and do not

16   reflect current market fundamentals. The equity risk premium in Dr. Vilbert's

17   CAPM is based on historic stock and bond returns. I provide evidence that risk

18   premiums based on historic stock and bond returns are subject to a myriad of

19   empirical errors which result in upwardly biased measures of expected equity risk

20   premiums. I use an equity risk premium which (1) uses all three approaches to

21   estimating an equity premium and (2) employs the results of many studies of the

22   equity risk premium. As I note, my equity risk premium is consistent with the

23   equity risk premiums (1) discovered in recent academic studies by leading finance

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1   scholars, (2) employed by leading investment banks and management consulting

2   firms, and (3) that result from surveys of financial forecasters and corporate Chief

3   Financial Officers ("CFOs").

4

5   In the end, the most significant areas of disagreement between Dr. Vilbert and me

6   with respect to the cost of equity are: (1) the use of leverage adjustment to the cost

7   of equity which reflects the difference between the market value and book value

8   capital structures of his proxy group and the Company, (2) the appropriate DCF

9   growth rate, as well as relevance of the DCF model and its results in determining

10   an equity cost rate for the Company, and (3) the measurement and magnitude of

11   an equity risk premium which is used in CAPM methodologies.

12

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

14   *Q5.   PLEASE DISCUSS CAPITAL COSTS IN TODAY'S MARKETS.*

15   *A5.*   Long-term capital cost rates for U.S. corporations are currently at their lowest

16   levels in more than four decades. This is illustrated in the graph below.

17   Corporate capital cost rates are determined by the level of interest rates and the

18   risk premium demanded by investors to buy the debt and equity capital of

19   corporate issuers. The base level of long-term interest rates in the U.S. economy

20   is indicated by the rates on ten-year U.S. Treasury bonds. The rates are provided

21   in the graph below from 1953 to the present. As indicated, prior to the decline in

22   rates that began in the year 2000, the 10-year Treasury yield had not consistently

23   been in the 4-5 percent range over an extended period of time since the 1960s.

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1
2

Yields on Ten-Year Treasury Bonds
1953-Present

3
4
5   Source: http://research.stlouisfed.org/fred2/series/GS10?cid=115
6
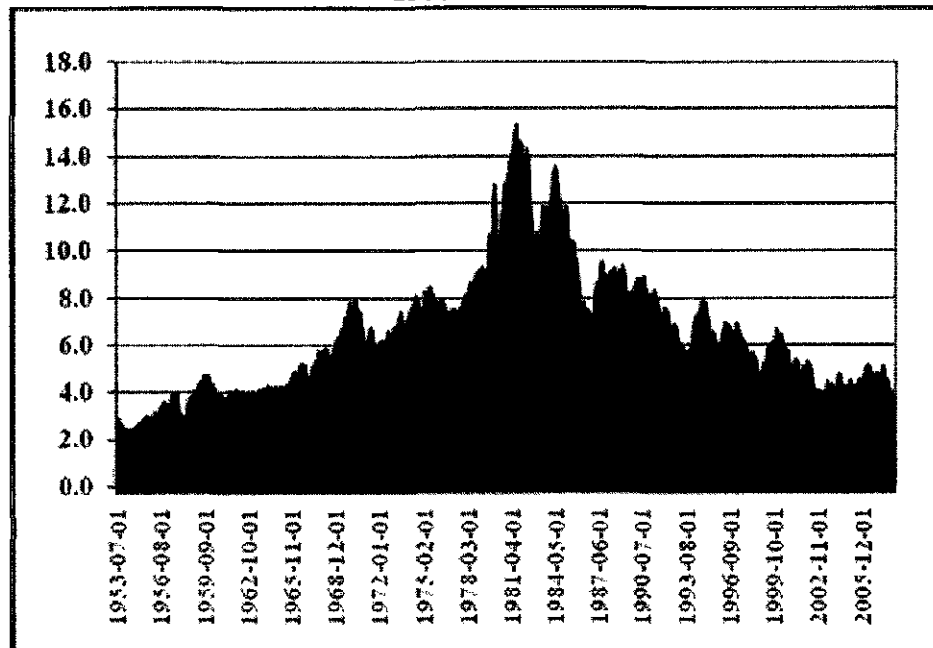
7   The second base component of the corporate capital cost rate is the risk premium.

8   The risk premium is the return premium required by investors to purchase riskier

9   securities. The equity risk premium is the return premium required to purchase

10   stocks as opposed to bonds. Since the equity risk premium is not readily

11   observable in the markets (as are bond risk premiums), and there are alternative

12   approaches to estimating the equity premium, it is the subject of much debate.

13   One way to estimate the equity risk premium is to compare the mean returns on

14   bonds and stocks over long historical periods. Measured in this manner, the

15   equity risk premium has been in the 5-7 percent range. But recent studies by

16   leading academics discussed below and on Page 3 of Exhibit JRW-7 indicate that

17   the forward-looking equity risk premium is in the 3-4 percent range. These

18   authors indicate that historical equity risk premiums are upwardly biased

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1   measures of expected equity risk premiums. Jeremy Siegel, a Wharton finance

2   professor and author of the book *Stocks for the Long Term*, published a study

3   entitled "The Shrinking Equity Risk Premium."[1] He concludes:

4   The degree of the equity risk premium calculated from data

5   estimated from 1926 is unlikely to persist in the future.

6   The real return on fixed-income assets is likely to be

7   significantly higher than estimated on earlier data. This is

8   confirmed by the yields available on Treasury index-linked

9   securities, which currently exceed 4 percent. Furthermore,

10   despite the acceleration in earnings growth, the return on

11   equities is likely to fall from its historical level due to the

12   very high level of equity prices relative to fundamentals.

13   Even Alan Greenspan, the former Chairman of the Federal Reserve Board,

14   indicated in an October 14, 1999, speech on financial risk, that the fact that equity

15   risk premiums have declined during the past decade is "not in dispute." His

16   assessment focused on the relationship between information availability and

17   equity risk premiums.

18   There can be little doubt that the dramatic improvements in

19   information technology in recent years have altered our

20   approach to risk. Some analysts perceive that information

21   technology has permanently lowered equity premiums and,

---

[1] Jeremy J. Siegel, "The Shrinking Equity Risk Premium," *The Journal of Portfolio Management* (Fall, 1999), p. 15.

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1   hence, permanently raised the prices of the collateral that

2   underlies all financial assets.

3   The reason, of course, is that information is critical to the

4   evaluation of risk. The less that is known about the current

5   state of a market or a venture, the less the ability to project

6   future outcomes and, hence, the more those potential

7   outcomes will be discounted.

8   The rise in the availability of real-time information has

9   reduced the uncertainties and thereby lowered the variances

10   that we employ to guide portfolio decisions. At least part of

11   the observed fall in equity premiums in our economy and

12   others over the past five years does not appear to be the

13   result of ephemeral changes in perceptions. It is

14   presumably the result of a permanent technology-driven

15   increase in information availability, which by definition

16   reduces uncertainty and therefore risk premiums. This

17   decline is most evident in equity risk premiums. It is less

18   clear in the corporate bond market, where relative supplies

19   of corporate and Treasury bonds and other factors we

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1   cannot easily identify have outweighed the effects of more

2   readily available information about borrowers.[2]

3   In sum, the relatively low interest rates in today's markets as well as the lower

4   risk premiums required by investors indicate that capital costs for U.S. companies

5   are the lowest in decades. In addition, the 2003 tax law further lowered capital

6   cost rates for companies, as further set forth below.

7

8   **Q6.**   ***HOW DID THE JOBS AND GROWTH TAX RELIEF RECONCILIATION***

9   ***ACT OF 2003 REDUCE THE COST OF CAPITAL FOR COMPANIES?***

10   **A6.**   On May 28, 2003, President Bush signed the Jobs and Growth Tax Relief

11   Reconciliation Act of 2003 ("2003 Tax Law"). The primary purpose of this

12   legislation was to reduce taxes to enhance economic growth. A primary

13   component of the new tax law was a significant reduction in the taxation of

14   corporate dividends for individuals. Dividends have been described as "double-

15   taxed." First, corporations pay taxes on the income they earn before they pay

16   dividends to investors, then investors pay taxes on the dividends that they receive

17   from corporations. One of the implications of the double taxation of dividends is

18   that, all else equal, it results in a higher cost of raising capital for corporations.

19   The tax legislation reduced the effect of double taxation of dividends by lowering

20   the tax rate on dividends from the 30 percent range (the average tax bracket for

21   individuals) to 15 percent.

---

[2] Alan Greenspan, "Measuring Financial Risk in the Twenty-First Century," Office of the Comptroller of the Currency Conference, October 14, 1999.

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1   Overall, the 2003 Tax Law reduced the pre-tax return requirements of investors,

2   thereby reducing corporations' cost of equity capital. This is because the

3   reduction in the taxation of dividends for individuals enhances their after-tax

4   returns and thereby reduces their pre-tax required returns. This reduction in pre-

5   tax required returns (due to the lower tax on dividends) effectively reduces the

6   cost of equity capital for companies. The 2003 Tax Law also reduced the tax rate

7   on long-term capital gains from 20 percent to 15 percent. The magnitude of the

8   reduction in corporate equity cost rates could be as large as 100 basis points.

9

10   **III.   PROXY GROUP SELECTION**

11   *Q7.   PLEASE DESCRIBE YOUR APPROACH TO DEVELOPING A FAIR RATE*

12   *OF RETURN RECOMMENDATION FOR DEO.*

13   *A7.*   To develop a fair rate of return recommendation for DEO, I have evaluated the

14   return requirements of investors on the common stock of two proxy groups of

15   publicly-held gas distribution companies.

16

17   *Q8.   PLEASE DESCRIBE YOUR PROXY GROUPS OF GAS DISTRIBUTION*

18   *COMPANIES.*

19   *A8.*   My primary proxy group ("Industry Gas Group" or "Proxy Group"), consists of ten

20   natural gas distribution companies covered by the Standard Edition of the *Value Line*

21   *Investment Survey*. Summary financial statistics for this proxy group are listed in

22   Exhibit JRW-2. The average operating revenues, net plant, and market

23   capitalization for the Industry Gas Group are $2,536.7 M, $2,157.4 M, and $1.5 B,

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1   respectively. On average, the group receives 68 percent of revenues from regulated

2   gas operations, has an 'A' S&P bond rating, a common equity ratio of 47 percent,

3   and an earned return on common equity of 11.7 percent.

4

5   As a second group, I am using Dr. Vilbert's subsample group of five gas distribution

6   companies ("Subsample Group"), which is a subset of my Industry Gas Group. I put

7   primary weight on the results for the Industry Gas Group because it provides a larger

8   group of companies to estimate an equity cost rate. I put less weight on the results

9   for the Subsample Group since it consists of only five companies. The Subsample

10 Group has average operating revenues, net plant, and market capitalization of

11 $1,939.2 M, $1,892.3 M, and $1.3 B, respectively. The Subsample Group, on

12 average, receives 75 percent of revenues from regulated gas operations, has an 'A'

13 S&P bond rating, a common equity ratio of 45 percent, and an earned return on

14 common equity of 11.4 percent. Overall, the financial statistics for the two groups

15 indicate that they are similar, which is not surprising given the considerable overlap

16 between the two groups. The Industry Gas Group is a little larger in terms of

17 revenues, net plant and market capitalization, and receives a lower percentage of

18 revenues from regulated gas operations. The Subsample Group has a lower average

19 return on common equity and common equity ratio.

20

21 On page 2 of Exhibit JRW-2, I have assessed the riskiness of the two groups and

22 DRI using six different risk measures published by *Value Line*. These measures

23 include Beta, Safety, Financial Strength, Stock Price Stability, Price Growth

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1   Persistence, and Earnings Predictability. The two groups are virtually identical in

2   risk on all six risk measures. DRI, DEO's parent, is equal in risk to the groups in

3   terms of Safety and Financial Strength. DRI's lower Beta and slightly higher

4   Stock Price Stability and Price Growth Persistence measures suggest that DEO's

5   parent is lower in risk than the groups. The lower Earnings Predictability measure

6   suggests that DRI is riskier than the groups. Overall, these results suggest that the

7   two gas groups are comparable in risk to each other and to DEO's parent

8   company, DRI.

9

10   **IV.**   **CAPITAL STRUCTURE RATIOS AND DEBT COST RATES**

11   ***Q9.***   ***WHAT CAPITAL STRUCTURE ARE YOU USING FOR THE COMPANY?***

12   ***A9.***   The Company has recommended the use of DRI's capital structure as of March

13   31, 2007. This capital structure consists of 54.33 percent long-term debt, 0.83

14   percent preferred stock, and 44.84 percent common equity. This capitalization

15   includes no short-term debt. I find these capital structure ratios reasonable and

16   will accept them in estimating an equity cost rate for DEO.

17

18   The Company has proposed a long-term debt cost rate of 6.50 percent. I will also

19   employ this figure in my cost of capital recommendation.

20

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1   Normative economic models of the firm, developed under very restrictive

2   assumptions, provide insight into the relationship between firm performance or

3   profitability, capital costs, and the value of the firm. Under the economist's ideal

4   model of perfect competition where entry and exit is costless, products are

5   undifferentiated, and there are increasing marginal costs of production, firms

6   produce up to the point where price equals marginal cost. Over time, a long-run

7   equilibrium is established where price equals average cost, including the firm's

8   capital costs. In equilibrium, total revenues equal total costs, and because capital

9   costs represent investors' required return on the firm's capital, actual returns equal

10   required returns and the market value and the book value of the firm's securities

11   must be equal.

12

13   In the real world, firms can achieve competitive advantage due to product market

14   imperfections. Most notably, companies can gain competitive advantage through

15   product differentiation (adding real or perceived value to products) and by

16   achieving economies of scale (decreasing marginal costs of production).

17   Competitive advantage allows firms to price products above average cost and

18   thereby earn accounting profits greater than those required to cover capital costs.

19   When these profits are in excess of that required by investors, or when a firm

20   earns a return on equity in excess of its cost of equity, investors respond by

21   valuing the firm's equity in excess of its book value.

22

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1   James M. McTaggart, founder of the international management consulting firm

2   Marakon Associates, has described this essential relationship between the return

3   on equity, the cost of equity, and the market-to-book ratio in the following

4   manner:[3]

5   Fundamentally, the value of a company is determined by the

6   cash flow it generates over time for its owners, and the

7   minimum acceptable rate of return required by capital

8   investors. This "cost of equity capital" is used to discount the

9   expected equity cash flow, converting it to a present value.

10   The cash flow is, in turn, produced by the interaction of a

11   company's return on equity and the annual rate of equity

12   growth. High return on equity (ROE) companies in low-growth

13   markets, such as Kellogg, are prodigious generators of cash

14   flow, while low ROE companies in high-growth markets, such

15   as Texas Instruments, barely generate enough cash flow to

16   finance growth.

17   A company's ROE over time, relative to its cost of equity, also

18   determines whether it is worth more or less than its book value.

19   If its ROE is consistently greater than the cost of equity capital

20   (the investor's minimum acceptable return), the business is

21   economically profitable and its market value will exceed book

---

[3] James M. McTaggart, "The Ultimate Poison Pill: Closing the Value Gap," *Commentary* (Spring 1988), p. 2.

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1   value. If, however, the business earns an ROE consistently less

2   than its cost of equity, it is economically unprofitable and its

3   market value will be less than book value.

4   As such, the relationship between a firm's return on equity, cost of equity, and

5   market-to-book ratio is relatively straightforward. A firm that earns a return on

6   equity above its cost of equity will see its common stock sell at a price above its

7   book value. Conversely, a firm that earns a return on equity below its cost of

8   equity will see its common stock sell at a price below its book value.

9

10   **Q12. PLEASE PROVIDE ADDITIONAL INSIGHTS INTO THE RELATIONSHIP**

11   **BETWEEN RETURN ON EQUITY AND MARKET-TO-BOOK RATIOS.**

12   *A12.* This relationship is discussed in a classic Harvard Business School case study

13   entitled "A Note on Value Drivers." On page 2 of that case study, the author

14   describes the relationship very succinctly:[4]

15   For a given industry, more profitable firms – those able to

16   generate higher returns per dollar of equity – should have

17   higher market-to-book ratios. Conversely, firms which are

18   unable to generate returns in excess of their cost of equity

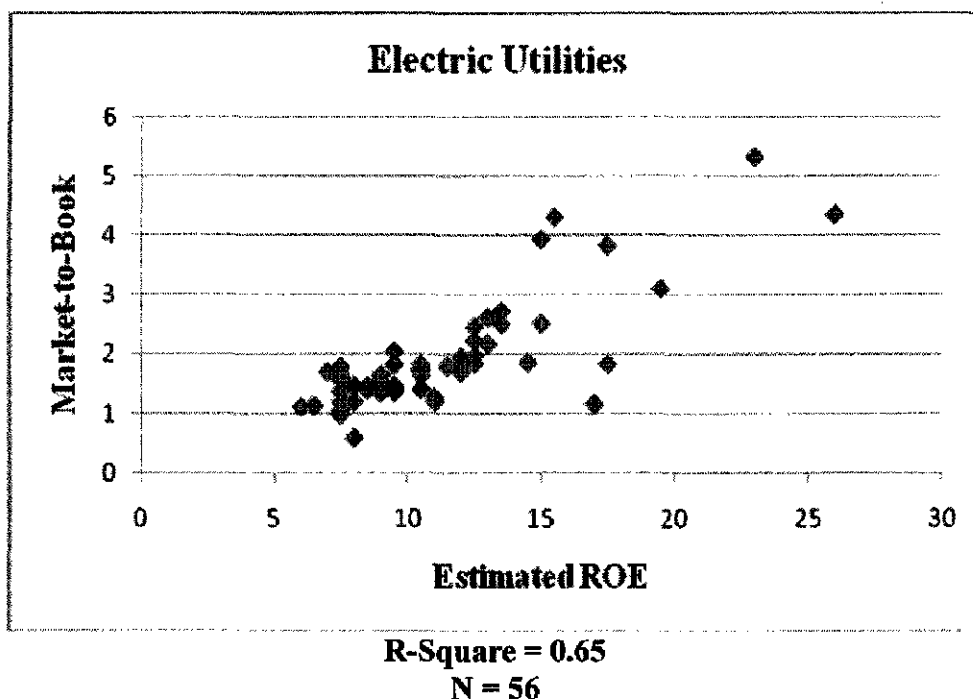19   should sell for less than book value.

---

[4] Benjamin Esty, "A Note on Value Drivers," Harvard Business School, Case No. 9-297-082, April 7, 1997.

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	Profitability		*Value*
1			
2	*If ROE > K*		*then Market/Book > 1*
3	*If ROE = K*		*then Market/Book = 1*
4	*If ROE < K*		*then Market/Book < 1*

5   where K is the cost of equity.

6   To assess the relationship by industry, as suggested above, I have performed a

7   regression study between estimated return on equity and market-to-book ratios

8   using natural gas distribution, electric utility and water utility companies. I used

9   all companies in these three industries which are covered by *Value Line* and

10   which have estimated return on equity and market-to-book ratio data. The results

11   are presented below.

12

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

14   **Value Line Electrics, Gas Distribution Companies, and Water Utilities**

15

R-Square = 0.65

N = 56

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Gas Distribution Companies

R-Square = 0.60
N = 12

Water Utilities

R-Square = 0.92
N = 4
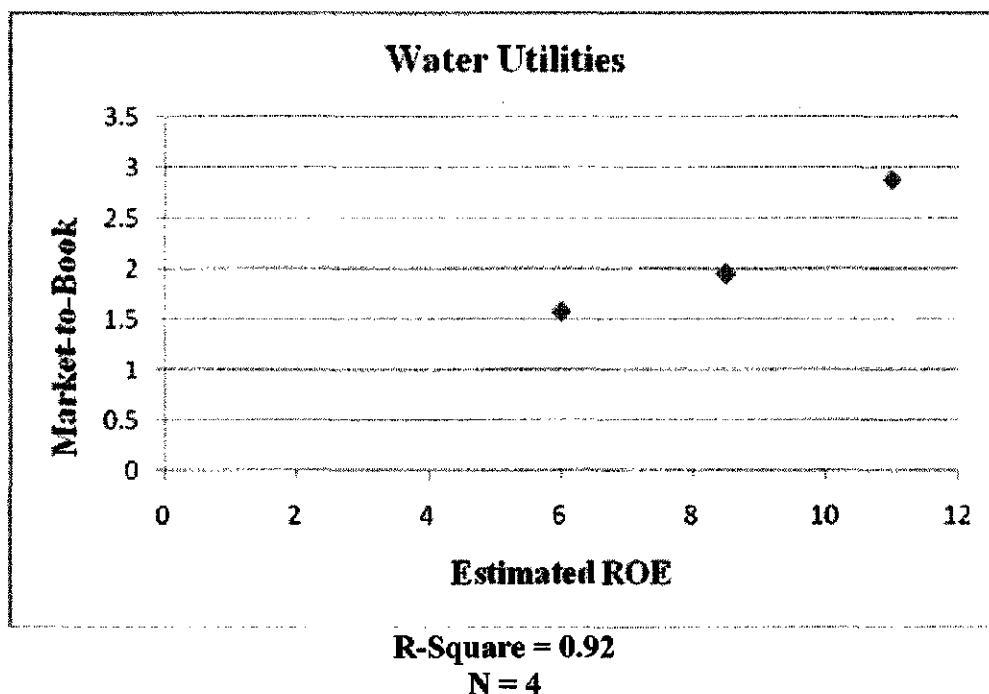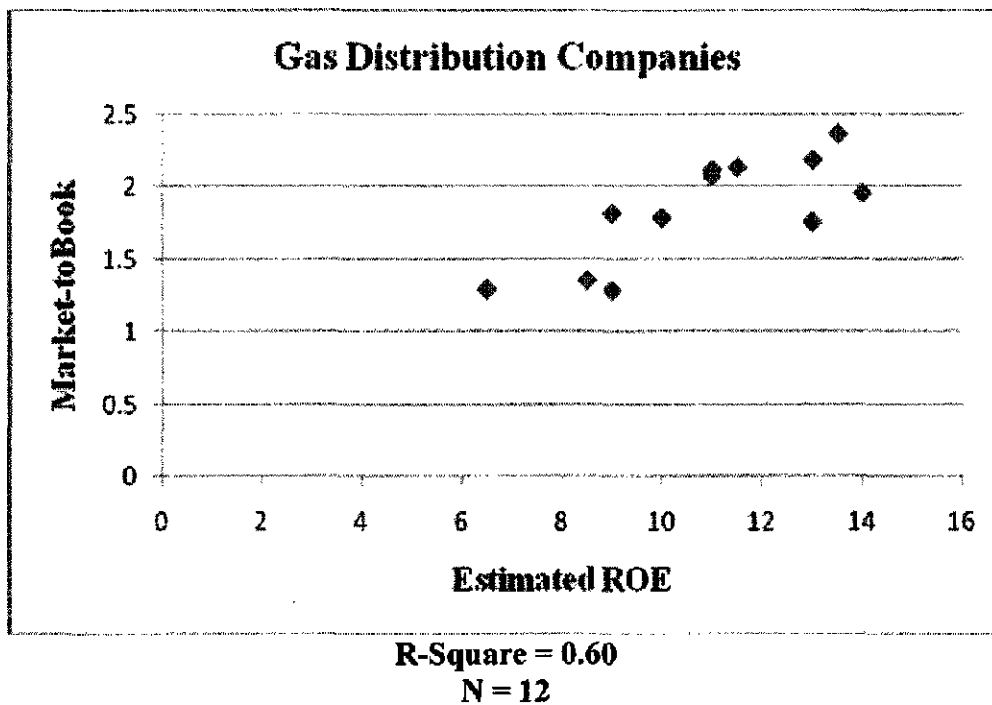
1
2
3
4
5
6
7
8   The R-squares for the electric, gas, and water companies are 0.65, 0.60, and 0.92.[5]

9   This demonstrates the strong positive relationship between ROEs and market-to-

---

[5] R-square measures the percent of variation in one variable (e.g., market-to-book ratios) explained by another variable (e.g., expected return on equity). R-squares vary between zero and 1.0, with values closer to 1.0 indicating a higher relationship between two variables.

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1   book ratios for public utilities.

2

3   **Q13.**   **WHAT ECONOMIC FACTORS HAVE AFFECTED THE COST OF EQUITY**

4   **CAPITAL FOR PUBLIC UTILITIES?**

5   *A13.*   Exhibit JRW-4 provides indicators of public utility equity cost rates over the past

6   decade. Page 1 shows the yields on 10-year 'A' rated public utility bonds. These

7   yields peaked in the 1990s at 8.5 percent, then declined and again hit the 8.0

8   percent range in the year 2000. They subsequently declined, hovering in the 4.5

9   to 5.0 percent range between 2003 and 2005. They increased to 6.0 percent in

10   June, of 2006, declined and then once again increased to over 6.0 percent in the

11   summer of 2007. They have since retreated to the 5.50 percent range. Page 2

12   provides the dividend yields for the fifteen utilities in the Dow Jones Utilities

13   Average over the past decade. These yields peaked in 1994 at 7.2 percent and

14   have gradually declined over the past decade. As of 2007 these yields were 3.35

15   percent.

16

17   Average earned returns on common equity and market-to-book ratios are given on

18   page 3 of Exhibit JRW-4. Over the past decade, earned returns on common

19   equity have consistently been in the 11.0 percent-13.0 percent range. The average

20   ROE peaked at 13.45 percent in 2001 and subsequently declined through the year

21   2006 before recovering in 2007. Over the past decade, market-to-book ratios for

22   this group have increased gradually but with several ups and downs. The market-

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1   to-book average was 1.83 as of 2001, declined to 1.50 in 2003 and increased to

2   2.2 as of 2007.

3

4   The indicators in Exhibit JRW-4, coupled with the overall decrease in interest

5   rates, suggest that capital costs for the Dow Jones Utilities have decreased over

6   the past decade.

7

8   *Q14.*   ***WHAT FACTORS DETERMINE INVESTORS' EXPECTED OR REQUIRED***

9   ***RATE OF RETURN ON EQUITY?***

10   *A14.* The expected or required rate of return on common stock is a function of

11   market-wide, as well as company-specific, factors. The most important market

12   factor is the time value of money as indicated by the level of interest rates in the

13   economy. Common stock investor requirements generally increase and decrease

14   with like changes in interest rates. The perceived risk of a firm is the predominant

15   factor that influences investor return requirements on a company-specific basis.

16   A firm's investment risk is often separated into business and financial risk.

17   Business risk encompasses all factors that affect a firm's operating revenues and

18   expenses. Financial risk results from incurring fixed obligations in the form of

19   debt in financing its assets.

20

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1   *Q15.* **HOW DOES THE INVESTMENT RISK OF GAS DISTRIBUTION**

2   **COMPANIES COMPARE WITH THAT OF OTHER INDUSTRIES?**

3   *A15.* Due to the essential nature of their service as well as their regulated status, public

4   utilities are exposed to a lesser degree of business risk than other, non-regulated

5   businesses. The relatively low level of business risk allows public utilities to

6   meet much of their capital requirements through borrowing in the financial

7   markets, thereby incurring greater than average financial risk. Nonetheless, the

8   overall investment risk of public utilities is below most other industries.

9

10   Exhibit JRW-5 provides an assessment of investment risk for 100 industries as

11   measured by beta, which according to modern capital market theory is the only

12   relevant measure of investment risk that need be of concern for investors. These

13   betas come from the *Value Line Investment Survey* and are compiled by Aswath

14   Damodoran of New York University.[6]

15

16   The study shows that the investment risk of public utilities is relatively low

17   compared to other industries. Further, the study shows that the average beta for

18   gas distribution companies of 0.78 is in the bottom ten percent of all industries

19   and well below the *Value Line* average of 1.24. As such, the cost of equity for the

20   gas distribution industry is among the lowest of all industries in the U.S.

21

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[6] They may be found on the Internet at http:// www.stern.nyu.edu/~adamodar.

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1 *Q16.* ***HOW CAN THE EXPECTED OR REQUIRED RATE OF RETURN ON***

2 ***COMMON EQUITY CAPITAL BE DETERMINED?***

3 *A16.* The costs of debt and preferred stock are normally based on historical or book

4 values and can be determined with a great degree of accuracy. The cost of

5 common equity capital, however, cannot be determined precisely and must

6 instead be estimated from market data and informed judgment. This return to the

7 stockholder should be commensurate with returns on investments in other

8 enterprises having comparable risks.

9

10 According to valuation principles, the present value of an asset equals the

11 discounted value of its expected future cash flows. Investors discount these

12 expected cash flows at their required rate of return that, as noted above, reflects

13 the time value of money and the perceived riskiness of the expected future cash

14 flows. As such, the cost of common equity is the rate at which investors discount

15 expected cash flows associated with common stock ownership.

16

17 Models have been developed to ascertain the cost of common equity capital for a

18 firm. Each model, however, has been developed using restrictive economic

19 assumptions. Consequently, judgment is required in selecting appropriate

20 financial valuation models to estimate a firm's cost of common equity capital, in

21 determining the data inputs for these models, and in interpreting the models'

22 results. All of these decisions must take into consideration the firm involved as

23 well as current conditions in the economy and the financial markets.

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1   *Q17.   HOW DO YOU PLAN TO ESTIMATE THE COST OF EQUITY CAPITAL*

2   *FOR DEO?*

3   *A17.* I rely primarily on the DCF model to estimate the cost of equity capital. Given

4   the investment valuation process and the relative stability of the utility business, I

5   believe that the DCF model provides the best measure of equity cost rates for

6   public utilities. It is my experience that the Public Utilities Commission of Ohio

7   ("Commission" or "PUCO") has traditionally relied on the DCF method. I have

8   also performed a CAPM study, but I give these results less weight because I

9   believe that risk premium studies, of which the CAPM is one form, provide a less

10   reliable indication of equity cost rates for public utilities.

11

12   **B.   Discounted Cash Flow Analysis**

13   *Q18. DESCRIBE THE THEORY BEHIND THE TRADITIONAL DCF MODEL.*

14   *A18.* According to the DCF model, the current stock price is equal to the discounted

15   value of all future dividends that investors expect to receive from investment in

16   the firm. As such, stockholders' returns ultimately result from current as well as

17   future dividends. As owners of a corporation, common stockholders are entitled

18   to a pro-rata share of the firm's earnings. The DCF model presumes that earnings

19   that are not paid out in the form of dividends are reinvested in the firm so as to

20   provide for future growth in earnings and dividends. The rate at which investors

21   discount future dividends, which reflects the timing and riskiness of the expected

22   cash flows, is interpreted as the market's expected or required return on the

23   common stock. Therefore, this discount rate represents the cost of common

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1   equity. Algebraically, the DCF model can be expressed as:

2
3    $$P = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \dots \frac{D_n}{(1+k)^n}$$
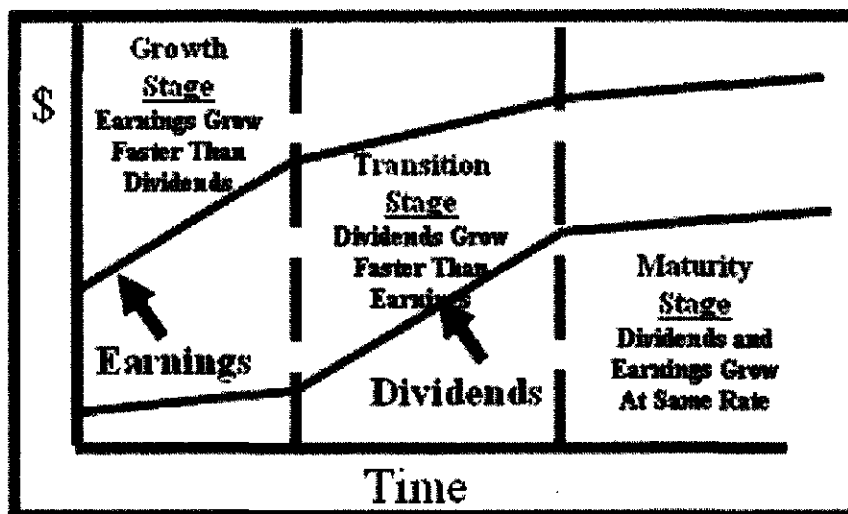4
5
6   where P is the current stock price, D_n is the dividend in year n, and k is the cost of

7   common equity.

8

9   **Q19.** **IS THE DCF MODEL CONSISTENT WITH VALUATION TECHNIQUES**

10   **EMPLOYED BY INVESTMENT FIRMS?**

11   *A19.* Yes. Virtually all investment firms use some form of the DCF model as a

12   valuation technique. One common application for investment firms is called the

13   three-stage DCF or dividend discount model ("DDM"). The stages in a three-

14   stage DCF model are discussed below. This model presumes that a company's

15   dividend payout progresses initially through a growth stage, then proceeds

16   through a transition stage, and finally assumes a steady-state stage. The dividend-

17   payment stage of a firm depends on the profitability of its internal investments,

18   which, in turn, is largely a function of the life cycle of the product or service.

19   These stages are depicted in the graphic below labeled the Three-Stage DCF

20   Model.[7]

---

[7] This description comes from William F. Sharp, Gordon J. Alexander, and Jeffrey V. Bailey, *Investments* (Prentice-Hall, 1995), pp. 590-91.

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1   **Three-Stage DCF Model**

2

3   1.   Growth stage: Characterized by rapidly expanding sales, high

4   profit margins, and abnormally high growth in earnings per share.

5   Because of highly profitable expected investment opportunities, the

6   payout ratio is low. Competitors are attracted by the unusually high

7   earnings, leading to a decline in the growth rate.

8   2.   Transition stage: In later years increased competition reduces

9   profit margins and earnings growth slows. With fewer new investment

10   opportunities, the company begins to pay out a larger percentage of

11   earnings.

12   3.   Maturity (steady-state) stage: Eventually the company reaches a

13   position where its new investment opportunities offer, on average, only

14   slightly attractive returns on equity. At that time its earnings growth rate,

15   payout ratio, and return on equity stabilize for the remainder of its life.

16   The constant-growth DCF model is appropriate when a firm is in the

17   maturity stage of the life cycle.

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1   In using this model to estimate a firm's cost of equity capital, dividends

2   are projected into the future using the different growth rates in the

3   alternative stages, and then the equity cost rate is the discount rate that

4   equates the present value of the future dividends to the current stock price.

5

6   *Q20.* *HOW DO YOU ESTIMATE STOCKHOLDERS' EXPECTED OR REQUIRED*

7   *RATE OF RETURN USING THE DCF MODEL?*

8   *A20.* Under certain assumptions, including a constant and infinite expected growth rate,

9   and constant dividend/earnings and price/earnings ratios, the DCF model can be

10   simplified to the following:

11
12
13
$$P = \frac{D_1}{k - g}$$

14   where D_1 represents the expected dividend over the coming year and g is the

15   expected growth rate of dividends. This is known as the constant-growth version

16   of the DCF model. To use the constant-growth DCF model to estimate a firm's

17   cost of equity, one solves for k in the above expression to obtain the following:

18
19
20
$$k = \frac{D_1}{P} + g$$

21

22   *Q21.* *IN YOUR OPINION, IS THE CONSTANT-GROWTH DCF MODEL*

23   *APPROPRIATE FOR PUBLIC UTILITIES?*

24   *A21.* Yes. The economics of the public utility business indicate that the industry is in

25   the steady-state or constant-growth stage of a three-stage DCF. The economics

26   include the relative stability of the utility business, the maturity of the demand for

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1   public utility services, and the regulated status of public utilities (especially the

2   fact that their returns on investment are effectively set through the ratemaking

3   process). The DCF valuation procedure for companies in this stage is the

4   constant-growth DCF. In the constant-growth version of the DCF model, the

5   current dividend payment and stock price are directly observable. However, the

6   primary problem and controversy in applying the DCF model to estimate equity

7   cost rates entails estimating investors' expected dividend growth rate.

8

9   *Q22.*   *WHAT FACTORS SHOULD ONE CONSIDER WHEN APPLYING THE DCF*

10   *METHODOLOGY?*

11   *A22.*   One should be sensitive to several factors when using the DCF model to estimate

12   a firm's cost of equity capital. In general, one must recognize the assumptions

13   under which the DCF model was developed in estimating its components (the

14   dividend yield and expected growth rate). The dividend yield can be measured

15   precisely at any point in time, but tends to vary somewhat over time. Estimation

16   of expected growth is considerably more difficult. One must consider recent firm

17   performance, in conjunction with current economic developments and other

18   information available to investors, to accurately estimate investors' expectations.

19

20   *Q23.*   *PLEASE DISCUSS YOUR DCF ANALYSIS.*

21   *A23.*   My DCF analysis is provided in Exhibit JRW-6. The DCF summary is on page 1

22   of this Exhibit, and the supporting data and analysis for the dividend yield and

23   expected growth rate are provided on the following pages of the Exhibit.

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1   *Q24.*   *WHAT DIVIDEND YIELDS ARE YOU EMPLOYING IN YOUR DCF*

2   *ANALYSIS FOR THE PROXY GROUPS?*

3   *A24.*   The dividend yields on the common stock for the companies in the proxy groups

4   are provided on page 2 of Exhibit JRW-6 for the six-month period ending June

5   2008. For the DCF dividend yields for the groups, I am using the average of the

6   six month and June 2008 dividend yields. The table below shows these dividend

7   yields.

8

Proxy Group	6-Month Average Dividend Yield	June 2008 Dividend Yield	DCF Dividend Yield
Industry Gas Group	3.9 %	3.8 %	3.9 %
Subsample Group	3.7 %	3.6 %	3.7 %

9

10   *Q25.*   *PLEASE DISCUSS THE APPROPRIATE ADJUSTMENT TO THE SPOT*

11   *DIVIDEND YIELD.*

12   *A25.*   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 Gordon,

14   who is commonly associated with the development of the DCF model for popular

15   use, this is obtained by: (1) multiplying the expected dividend over the coming

16   quarter by 4 and (2) dividing this dividend by the current stock price to determine

17   the appropriate dividend yield for a firm, that pays dividends on a quarterly basis.[8]

---

[8] *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).

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1   In applying the DCF model, some analysts adjust the current dividend for growth

2   over the coming year as opposed to the coming quarter. This can be complicated

3   because firms tend to announce changes in dividends at different times during the

4   year. As such, the dividend yield computed based on presumed growth over the

5   coming quarter as opposed to the coming year can be quite different.

6

7   **Q26. GIVEN THIS DISCUSSION, WHAT ADJUSTMENT FACTOR WILL YOU**

8   **USE FOR YOUR DIVIDEND YIELD?**

9   *A26.* Since companies announce changes in dividends at different time point in the

10   year, a conservative approach to the DCF growth rate adjustment is to adjust the

11   dividend yield by one-half (1/2) the expected growth so as to reflect growth over

12   the coming year. I will use this approach.

13

14   **Q27. PLEASE DISCUSS THE GROWTH RATE COMPONENT OF THE DCF**

15   **MODEL.**

16   *A27.* There is much debate as to the proper methodology to employ in estimating the

17   growth component of the DCF model. By definition, this component is the

18   investors' expectation of the long-term dividend growth rate. Presumably,

19   investors use some combination of historical and/or projected growth rates for

20   earnings and dividends per share and for internal or book value growth to assess

21   long-term potential.

22

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1   *Q28.*   ***WHAT GROWTH DATA HAVE YOU REVIEWED FOR THE PROXY***

2   ***GROUPS?***

3   *A28.*   I have analyzed a number of measures of growth for companies in the proxy

4   groups. I have reviewed *Value Line's* historical and projected growth rate

5   estimates for earnings per share ("EPS"), dividends per share ("DPS"), and book

6   value per share ("BVPS"). In addition, I have utilized the average EPS growth

7   rate forecasts of Wall Street analysts as provided by Zacks and First Call. These

8   services solicit five-year earnings growth rate projections from securities analysts

9   and compile and publish the averages of these forecasts on the Internet. Finally, I

10   have also assessed prospective growth as measured by prospective earnings

11   retention rates and earned returns on common equity.

12

13   *Q29.*   ***PLEASE DISCUSS HISTORICAL GROWTH IN EARNINGS AND***

14   ***DIVIDENDS AS WELL AS INTERNAL GROWTH.***

15   *A29.*   Historical growth rates for EPS, DPS, and BVPS are readily available to virtually

16   all investors and presumably an important ingredient in forming expectations

17   concerning future growth. However, one must use historical growth numbers as

18   measures of investors' expectations with caution. In some cases, past growth may

19   not reflect future growth potential. Also, employing a single growth rate number

20   (for example, for five or ten years), is unlikely to accurately measure investors'

21   expectations due to the sensitivity of a single growth rate figure to fluctuations in

22   individual firm performance as well as overall economic fluctuations (i.e.,

23   business cycles). However, one must appraise the context in which the growth

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1   rate is being employed. According to the conventional DCF model, the expected

2   return on a security is equal to the sum of the dividend yield and the expected

3   long-term growth in dividends. Therefore, to best estimate the cost of common

4   equity capital using the conventional DCF model, one must look to long-term

5   growth rate expectations.

6

7   Internally generated growth is a function of the percentage of earnings retained

8   within the firm (the earnings retention rate) and the rate of return earned on those

9   earnings (the return on equity). The internal growth rate is computed as the

10   retention rate times the return on equity. Internal growth is significant in

11   determining long-run earnings and therefore, dividends. Investors recognize the

12   importance of internally generated growth and pay premiums for stocks of

13   companies that retain earnings and earn high returns on internal investments.

14

15   **Q30.   WHY ARE YOU NOT RELYING EXCLUSIVELY ON THE EPS FORECASTS**

16   **OF WALL STREET ANALYSTS IN ARRIVING AT A DCF GROWTH RATE**

17   **FOR THE PROXY GROUPS?**

18   *A30.*   There are several issues with using the EPS growth rate forecasts of Wall Street

19   analysts as DCF growth rates. First, the appropriate growth rate in the DCF

20   model is the dividend growth rate, not the earnings growth rate. Nonetheless,

21   over the very long-term, dividend and earnings will have to grow at a similar

22   growth rate. Therefore, in my opinion, consideration must be given to other

23   indicators of growth, including prospective dividend growth, internal growth, as

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1   well as projected earnings growth. Second, and most significantly, it is well-

2   known that the EPS growth rate forecasts of Wall Street securities analysts are

3   overly optimistic and upwardly biased. Hence, using these growth rates as a DCF

4   growth rate will provide an overstated equity cost rate. This issue is discussed at

5   length in the rebuttal section of this testimony.

6

7   **Q31.   *PLEASE DISCUSS THE HISTORICAL GROWTH OF THE COMPANIES IN***

8   ***THE GROUPS AS PROVIDED IN THE VALUE LINE INVESTMENT***

9   ***SURVEY.***

10   *A31.*   Historic growth rates for the companies in the groups, as published in the *Value*

11   *Line Investment Survey*, are provided on page 3 of Exhibit JRW-6. Due to the

12   presence of outliers among the historic growth rate figures, both the mean and

13   medians are used in the analysis.[9] The historical growth measures in EPS, DPS,

14   and BVPS for the Industry Gas Group, as measured by the means and medians,

15   range from 2.0 percent to 6.8 percent, with an average of 4.4 percent. For the

16   Subsample Group, the range of the means and medians is from 1.0 percent to 6.0

17   percent, with an average of 3.5 percent.

18

19   **Q32.   *PLEASE SUMMARIZE VALUE LINE'S PROJECTED GROWTH RATES***

20   ***FOR THE COMPANIES IN THE PROXY GROUPS.***

21   *A32.*   *Value Line's* projections of EPS, DPS, and BVPS growth for the proxy groups are

22   shown on page 4 of Exhibit JRW-6. As above, due to the presence of outliers,

---

[9] Outliers are observations that are much larger or smaller than the majority of the observations that are being evaluated.

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1   both the mean and medians are used in the analysis. For the Industry Gas Group,

2   the central tendency measures range from 3.7 percent to 4.9 percent, with an

3   average of 4.2 percent. The range for the Subsample group is from 3.5 percent to

4   5.3 percent, with an average of 4.3 percent.

5

6   Also provided on page 4 of Exhibit JRW-6 is prospective internal growth for the

7   companies in the proxy groups as measured by *Value Line*'s average projected

8   retention rate and return on shareholders' equity. As noted above, internal growth

9   is significant in a primary driver of long-run earnings growth. For the Industry

10   Gas Group and Subsample groups, the average prospective internal growth rates

11   are 5.0 percent and 4.6 percent, respectively.

12

13   **Q33.   PLEASE ASSESS GROWTH FOR THE PROXY GROUPS AS MEASURED**

14   **BY ANALYSTS' FORECASTS OF EXPECTED 5-YEAR EPS GROWTH.**

15   *A33.* Zacks and Yahoo! First Call collect, summarize, and publish Wall Street analysts'

16   five-year EPS growth rate forecasts for the companies in the proxy group. These

17   forecasts are provided for the companies in the proxy groups on page 5 of Exhibit

18   JRW-6. The mean of the analysts' projected EPS growth rates for the Industry

19   and Subsample Groups are 6.0 percent and 6.2 percent, respectively.[10]

20

---

[10] 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.

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1 **Q34.** **PLEASE SUMMARIZE YOUR ANALYSIS OF THE HISTORICAL AND**

2 **PROSPECTIVE GROWTH OF THE PROXY GROUPs.**

3 **A34.** The table below shows the summary DCF growth rate indicators for the proxy

4 group.

5

DCF Growth Rate Indicators

Growth Rate Indicator	Industry Gas Group	Subsample Group
Historic *Value Line* Growth in EPS, DPS, and BVPS	4.4 %	3.5 %
Projected *Value Line* Growth in EPS, DPS, and BVPS	4.2 %	4.3 %
Internal Growth ROE * Retention rate	5.0 %	4.6 %
Projected EPS Growth from First Call, Reuters, and Zacks	6.0 %	6.2 %

6

7 Giving the overlap in companies, the growth rate indicators are similar for the two

8 groups. Giving primary weight to the projected growth rate indicators and to

9 prospective internal growth, an expected DCF growth rate in the 5.0 percent-6.0

10 percent range is appropriate for both groups. I will use the mid-point of this

11 range, 5.5 percent, as the DCF growth rate for both groups of gas companies.

12

13 **Q35.** **BASED ON THE ABOVE ANALYSIS, WHAT IS YOUR INDICATED**

14 **COMMON EQUITY COST RATE FROM THE DCF MODEL FOR THE**

15 **PROXY GROUPS?**

16 **A35.** My DCF-derived equity cost rate for the groups is:

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1
2　　DCF Equity Cost Rate (k)

$$k = \frac{D}{P} + g$$

3
4

5　　　　　　　　　**DCF Equity Cost Rates**

	Industry Gas Group	Industry Gas Group
Dividend Yield	3.9 %	3.7 %
1 + (½ Growth Rate Adjustment)	1.0275	1.0275
DCF Growth Rate	5.5 %	5.5 %
Equity Cost Rate	9.5 %	9.3 %

6　　These results are summarized on page 1 of Exhibit JRW-6.

7

8　　**C.　　Capital Asset Pricing Model Results**

9　*Q36.*　*PLEASE DISCUSS THE CAPITAL ASSET PRICING MODEL ("CAPM").*

10　*A36.*　The CAPM is a risk premium approach to gauging a firm's cost of equity capital.

11　According to the risk premium approach, the cost of equity is the sum of the

12　interest rate on a risk-free bond (R_f) and a risk premium (RP), as in the following:

13　　　　　　　　　$k = R_f + RP$

14　The yield on long-term Treasury securities is normally used as R_f. Risk premiums

15　are measured in different ways. The CAPM is a theory of the risk and expected

16　returns of common stocks. In the CAPM, two types of risk are associated with a

17　stock: firm-specific risk or unsystematic risk, and market or systematic risk,

18　which is measured by a firm's beta. The only risk that investors receive a return

19　for bearing is systematic risk.

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1   According to the CAPM, the expected return on a company's stock, which is also

2   the equity cost rate (K), is equal to:

3    $$K = (R_f) + ß * [E(R_m) - (R_f)]$$

4   Where:

5   • K represents the estimated rate of return on the stock;

6   • $E(R_m)$ represents the expected return on the overall stock market.
7   Frequently, the 'market' refers to the S&P 500;

8   • (R_f) represents the risk-free rate of interest;

9   • $[E(R_m) - (R_f)]$ represents the expected equity or market risk
10   premium—the excess return that an investor expects to receive above the
11   risk-free rate for investing in risky stocks; and

12   •   *Beta*—(ß) is a measure of the systematic risk of an asset.
13

14   To estimate the required return or cost of equity using the CAPM requires three

15   inputs: the risk-free rate of interest (R_f), the beta (ß), and the expected equity or

16   market risk premium $[E(R_m) - (R_f)]$. R_f is the easiest of the inputs to measure – it

17   is the yield on long-term Treasury bonds. ß, the measure of systematic risk, is a

18   little more difficult to measure because there are different opinions about what

19   adjustments, if any, should be made to historical betas due to their tendency to

20   regress to 1.0 over time. And finally, an even more difficult input to measure is

21   the expected equity or market risk premium $(E(R_m) - (R_f))$. I will discuss each of
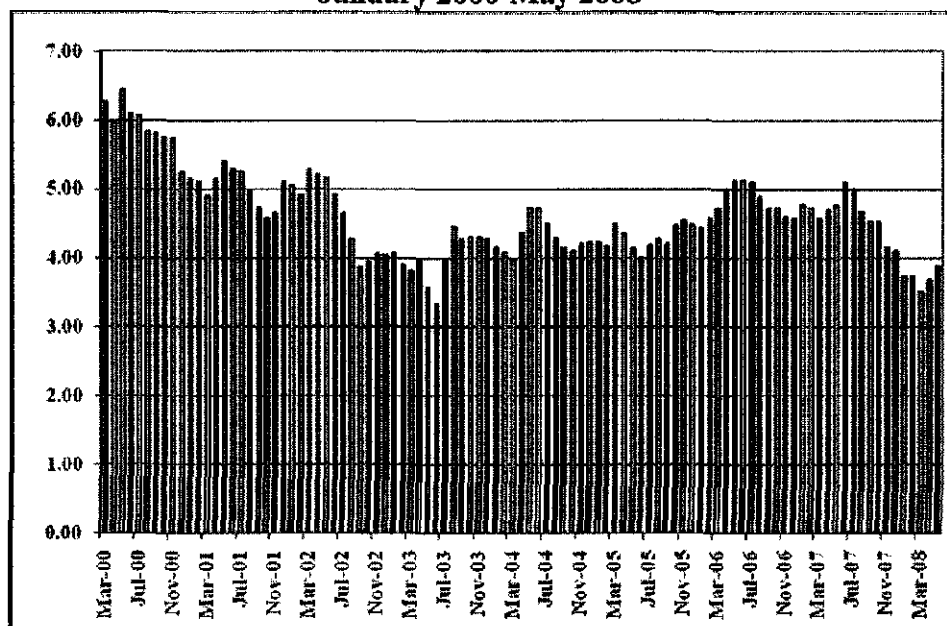
22   these inputs below.

23

24   *Q37.* *PLEASE DISCUSS YOUR CAPM RESULTS.*

25   *A37.* Exhibit JRW-7 provides the summary results for my CAPM study. Page 1 shows

26   the results, and pages 2-5 contain the supporting data.

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1   *Q38.*   *PLEASE DISCUSS THE RISK-FREE INTEREST RATE.*

2   *A38.*   The yield on long-term U.S. Treasury Bonds has usually been viewed as the risk-

3   free rate of interest in the CAPM. The yield on long-term U.S. Treasury Bonds,

4   in turn, has been considered to be the yield on U.S. Treasury Bonds with 30-year

5   maturities. However, when the Treasury's issuance of 30-year Bonds was

6   interrupted for a period of time in recent years, the yield on 10-year U.S. Treasury

7   Bonds replaced the yield on 30-year U.S. Treasury Bonds as the benchmark long-

8   term Treasury rate. The 10-year U.S. Treasury yields over the past five years are

9   shown in the chart below. These rates hit a 60-year low in the summer of 2003 at

10   3.33 percent. They increased with the rebounding economy and fluctuated in the

11   4.0-4.50 percent range during the 2004-2005 timeframe until advancing to 5.0

12   percent in early 2006 in response to a strong economy. In late 2006, long-term

13   interest rates retreated to the 4.5 percent area as commodity and energy prices

14   declined and inflationary pressures subsided. These rates rebounded to the 5.0

15   percent level in the first half of 2007. However, the effects of the housing and

16   sub-prime mortgage issues that surfaced in the summer of 2007 have led the

17   economy into a slowdown, causing ten-year Treasury yields to once again fall to

18   the 4.0 percent level.

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1
2

Ten-Year U.S. Treasury Yields
January 2000-May 2008

3
4
5   http://research.stlouisfed.org/fred2/series/GS10?cid=115
6

7   **Q39. *WHAT RISK-FREE INTEREST RATE ARE YOU USING IN YOUR CAPM?***

8   ***A39.***   The U.S. Treasury began to issue the 30-year Bond in the early 2000s as the U.S.

9   budget deficit increased. As such, the market has once again focused on its yield

10   as the benchmark for long-term capital costs in the U.S. As noted above, the

11   yields on the 10- and 30- year U.S. Treasuries decreased to below 5.0 percent in

12   response to the sub-prime mortgage and housing concerns. As of March 14, 2008,

13   as shown in the table below, the rates on 10- and 30- U.S. Treasury Bonds were 4.09

14   percent and 4.71 percent, respectively. Given this recent range and recent

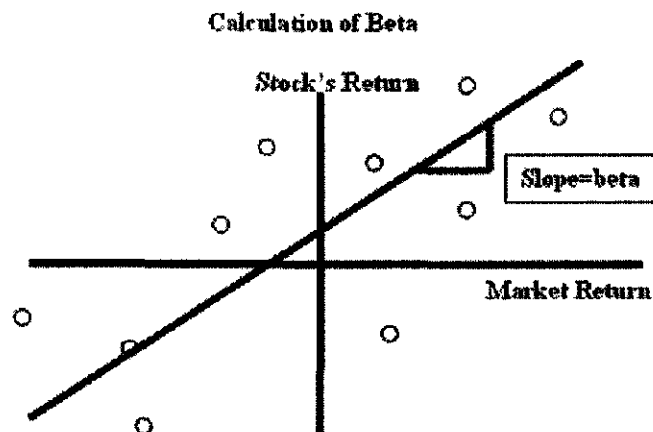15   downward movement, I will use 4.75 percent as the risk-free rate, or R_f, in my

16   CAPM.

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1
2

U.S. Treasury Yields
June 10, 2008

NOTES/BONDS

	COUPON	MATURITY DATE	CURRENT PRICE/YIELD
2-YEAR	2.625	05/31/2010	99-16½ / 2.88
5-YEAR	3.500	05/31/2013	99-27+ / 3.53
10-YEAR	3.875	05/15/2018	98-07 / 4.09
30-YEAR	4.375	02/15/2038	94-22¼ / 4.71

3
4

Source: www.bloomberg.com

5

6 **Q40.** **WHAT BETAS ARE YOU EMPLOYING IN YOUR CAPM?**

7 **A40.** Beta (ß) is a measure of the systematic risk of a stock. The market, usually taken

8 to be the S&P 500, has a beta of 1.0. The beta of a stock with the same price

9 movement as the market also has a beta of 1.0. A stock whose price movement is

10 greater than that of the market, such as a technology stock, is riskier than the

11 market and has a beta greater than 1.0. A stock with below average price

12 movement, such as that of a regulated public utility, is less risky than the market

13 and has a beta less than 1.0. Estimating a stock's beta involves running a linear

14 regression of a stock's return on the market return as in the following:

Calculation of Beta

15

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1   The slope of the regression line is the stock's ß. A steeper line indicates the stock

2   is more sensitive to the return on the overall market. This means that the stock

3   has a higher ß and greater than average market risk. A less steep line indicates a

4   lower ß and less market risk.

5

6   Numerous online investment information services, such as Yahoo! and Reuters,

7   provide estimates of stock betas. Usually these services report different betas for

8   the same stock. The differences are usually due to: (1) the time period over which

9   the ß is measured and (2) any adjustments that are made to reflect the fact that

10   betas tend to regress to 1.0 over time. In estimating an equity cost rate for the

11   proxy groups, I am using the betas for the companies as provided in the *Value*

12   *Line Investment Survey*. As shown on page 2 of Exhibit JRW-7, the average beta

13   for the Industry Gas Group and the Subsample Group are 0.87 and 0.86,

14   respectively.

15

16 *Q41.* **PLEASE DISCUSS THE OPPOSING VIEWS REGARDING THE EQUITY**

17   **RISK PREMIUM.**

18 *A41.* The equity or market risk premium - $(E(R_m) - R_f)$ - is equal to the expected return

19   on the stock market (e.g., the expected return on the S&P 500 ($E(R_m)$)) minus the

20   risk-free rate of interest (R_f). The equity premium is the difference in the expected

21   total return between investing in equities and investing in "safe" fixed-income

22   assets, such as long-term government bonds. However, while the equity risk

23   premium is easy to define conceptually, it is difficult to measure because it requires

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1   an estimate of the expected return on the market.

2

3 **Q42.** **PLEASE DISCUSS THE ALTERNATIVE APPROACHES TO ESTIMATING**

4   **THE EQUITY RISK PREMIUM.**

5 *A42.* The table below highlights the primary approaches to, and issues in, estimating

6   the expected equity risk premium. The traditional way to measure the equity risk

7   premium was to use the difference between historical average stock and bond

8   returns. In this case, historical stock and bond returns, also called ex post returns,

9   were used as the measures of the market's expected return (known as the ex ante

10   or forward-looking expected return). This type of historical evaluation of stock

11   and bond returns is often called the "Ibbotson approach" after Professor Roger

12   Ibbotson who popularized this method of using historical financial market returns

13   as measures of expected returns. Most historical assessments of the equity risk

14   premium suggest an equity risk premium of 5-7 percent above the rate on long-

15   term U.S. Treasury bonds. However, this can be a problem because: (1) ex post

16   returns are not the same as ex ante expectations, (2) market risk premiums can

17   change over time; increasing when investors become more risk-averse and

18   decreasing when investors become less risk-averse, and (3) market conditions can

19   change such that ex post historical returns are poor estimates of ex ante

20   expectations.

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1   **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.

2
3   Source: Antti Ilmanen, Expected Returns on Stocks and Bonds," *Journal of Portfolio*
4   *Management*, (Winter 2003), p. 8.
5
6   The use of historical returns as market expectations has been criticized in

7   numerous academic studies.[11] The general theme of these studies is that the large

8   equity risk premium discovered in historical stock and bond returns cannot be

9   justified by the fundamental data. These studies, which fall under the category

10   "Ex Ante Models and Market Data," compute ex ante expected returns using

11   market data to arrive at an expected equity risk premium. These studies have also

12   been called "Puzzle Research" after the famous study by Mehra and Prescott in

13   which the authors first questioned the magnitude of historical equity risk

14   premiums relative to fundamentals.[12]

15

---

[11] The problems with using ex post historical returns as measures of ex ante expectations will be discussed at length later in my testimony.

[12] Rahnish Mehra. and Ed Prescott, "The Equity Premium: A Puzzle," *Journal of Monetary Economics* (1985).

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1   *Q43. PLEASE SUMMARIZE SOME OF THE ACADEMIC STUDIES THAT*

2   *DEVELOP EX ANTE EQUITY RISK PREMIUMS.*

3   *A43.* Two of the most prominent studies of ex ante expected equity risk premiums were

4   by Eugene Fama and Ken French (2002) and James Claus and Jacob Thomas

5   (2001). The primary debate in these studies revolves around two related issues:

6   (1) the size of expected equity risk premium, which is the return equity investors

7   require above the yield on bonds and (2) the fact that estimates of the ex ante

8   expected equity risk premium using fundamental firm data (earnings and

9   dividends) are much lower than estimates using historical stock and bond return

10   data.

11

12   Fama and French (2002), two of the most preeminent scholars in finance, use

13   dividend and earnings growth models to estimate expected stock returns and ex

14   ante expected equity risk premiums.[13] They compare these results to actual stock

15   returns over the period 1951-2000. Fama and French estimate that the expected

16   equity risk premium from DCF models using dividend and earnings growth to be

17   between 2.55 percent and 4.32 percent. These figures are much lower than the ex

18   post historical equity risk premium produced from the average stock and bond

19   return over the same period, which is 7.40 percent. Fama and French conclude

20   that the ex ante equity risk premium estimates using DCF models and

21   fundamental data are superior to those using ex post historical stock returns for

---

[13] Eugene F. Fama and Kenneth R. French, "The Equity Premium," *The Journal of Finance*, (April 2002), pp. 637-59.

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1   three reasons: (1) the estimates are more precise (a lower standard error); (2) the

2   Sharpe ratio, which is measured as the [(expected stock return – risk-free

3   rate)/standard deviation], is constant over time for the DCF models but varies

4   considerably over time and more than doubles for the average stock-bond return

5   model; and (3) valuation theory specifies relationships between the market-to-

6   book ratio, return on investment, and cost of equity capital that favor estimates

7   from fundamentals. They also conclude that the high average stock returns over

8   the past 50 years were the result of low expected returns and that the average

9   equity risk premium has been in the 3-4 percent range.

10

11   The study by Claus and Thomas of Columbia University provides direct support

12   for the findings of Fama and French.[14] These authors compute ex ante expected

13   equity risk premiums over the 1985-1998 period by: (1) computing the discount

14   rate that equates market values with the present value of expected future cash

15   flows and (2) then subtracting the risk-free interest rate. The expected cash flows

16   are developed using analysts' earnings forecasts. The authors conclude that over

17   this period, the ex ante expected equity risk premium is in the range of 3.0

18   percent. Claus and Thomas note that, over this period, ex post historical stock

19   returns overstate the ex ante expected equity risk premium because, as the

20   expected equity risk premium has declined, stock prices have risen. In other

21   words, from a valuation perspective, the present value of expected future returns

---

[14] James Claus and Jacob Thomas, "Equity Risk Premia as Low as Three Percent? Empirical Evidence from Analysts' Earnings Forecasts for Domestic and International Stock Market," *Journal of Finance.* (October 2001), pp. 1629-1666.

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1   increase when the required rate of return decreases. The higher stock prices have

2   produced stock returns that have exceeded investors' expectations, and therefore,

3   ex post historical equity risk premium estimates are biased upwards as measures

4   of ex ante expected equity risk premiums.

5

6   **Q44. PLEASE PROVIDE A SUMMARY OF THE EQUITY RISK PREMIUM**

7   **STUDIES.**

8   *A44.* Derrig and Orr (2003), Fernandez (2007), and Song (2007 have completed the

9   most comprehensive reviews to date of the research on the equity risk premium.[15]

10   Derrig and Orr's study evaluated the various approaches to estimating equity risk

11   premiums as well as the issues with the alternative approaches and summarized

12   the findings of the published research on the equity risk premium. Fernandez

13   examined four alternative measures of the equity risk premium – historical,

14   expected, required, and implied. He also reviewed the major studies of the equity

15   risk premium and presented the summary equity risk premium results. Song

16   provides an annotated bibliography and highlights the alternative approaches to

17   estimating the equity risk summary.

18

19   Page 3 of Exhibit JRW-7 provides a summary of the results of the primary risk

20   premium studies reviewed by Derrig and Orr, Fernandez, and Song. In

21   developing page 3 of Exhibit JRW-7, I have categorized the studies as discussed

---

[15] 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), and Zhiyi Song, "The Equity Risk Premium: An Annotated Bibliography," CFA Institute, (2007).

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1   on page 40 of my testimony. I have also included the results of the "Building

2   Blocks" approach to estimating the equity risk premium, including a study I

3   performed, which is presented below. The Building Blocks approach is a hybrid

4   approach employing elements of both historic and ex ante models.

5

6   *Q45. PLEASE DISCUSS YOUR DEVELOPMENT OF AN EQUITY RISK*

7   *PREMIUM COMPUTED USING THE BUILDING BLOCKS*

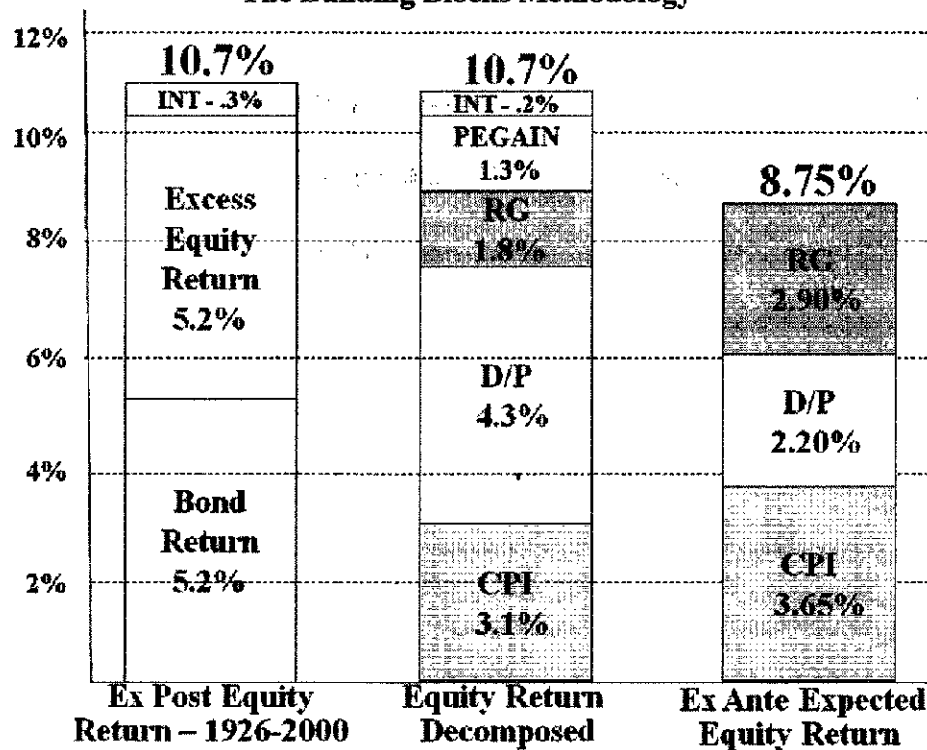8   *METHODOLOGY.*

9   *A45.*   Ibbotson and Chen (2003) evaluate the ex post historical mean stock and bond

10   returns in what is called the Building Blocks approach.[16] They use 75 years of

11   data and relate the compounded historical returns to the different fundamental

12   variables employed by different researchers in building ex ante expected equity

13   risk premiums. Among the variables included were inflation, real EPS and DPS

14   growth, ROE and book value growth, and price-earnings ("P/E") ratios. By

15   relating the fundamental factors to the ex post historical returns, the methodology

16   bridges the gap between the ex post and ex ante equity risk premiums. Ilmanen

17   (2003) illustrates this approach using the geometric returns and five fundamental

18   variables – inflation ("CPI"), dividend yield ("D/P"), real earnings growth

19   ("RG"), repricing gains ("PEGAIN") and return interaction/reinvestment

20   ("INT").[17] This is shown in the graph below. The first column breaks the 1926-

---

[16] Roger Ibbotson and Peng Chen, "Long Run Returns: Participating in the Real Economy," *Financial Analysts Journal*, (January 2003).

[17] Antti Ilmanen, Expected Returns on Stocks and Bonds," *Journal of Portfolio Management*, (Winter 2003), p. 11.

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1   2000 geometric mean stock return of 10.7 percent into the different return

2   components demanded by investors: the historical U.S. Treasury bond return (5.2

3   percent), the excess equity return (5.2 percent), and a small interaction term (0.3

4   percent). This 10.7 percent annual stock return over the 1926-2000 period can

5   then be broken down into the following fundamental elements: inflation (3.1

6   percent), dividend yield (4.3 percent), real earnings growth (1.8 percent),

7   repricing gains (1.3 percent) associated with higher P/E ratios, and a small

8   interaction term (0.2 percent).

9
10

Decomposing Equity Market Returns
**The Building Blocks Methodology**

11
12

13   *Q46. HOW ARE YOU USING THIS METHODOLOGY TO DERIVE AN EX ANTE*

14   *EXPECTED EQUITY RISK PREMIUM?*

15   *A46.* The third column in the graph above shows current inputs to estimate an ex ante

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1   expected market return. These inputs include the following:

2   CPI – To assess expected inflation, I have employed expectations of the

3   short-term and long-term inflation rate. The graph below shows the

4   expected annual inflation rate according to consumers, as measured by the

5   CPI, over the coming year. This survey is published monthly by the

6   University of Michigan Survey Research Center. In the most recent

7   report, the expected one-year inflation rate was 4.8 percent.

8   **Expected Inflation Rate**
9   **University of Michigan Consumer Research**
10   (Data Source: http://research.stlouisfed.org/fred2/series/MICH/98)

11
12
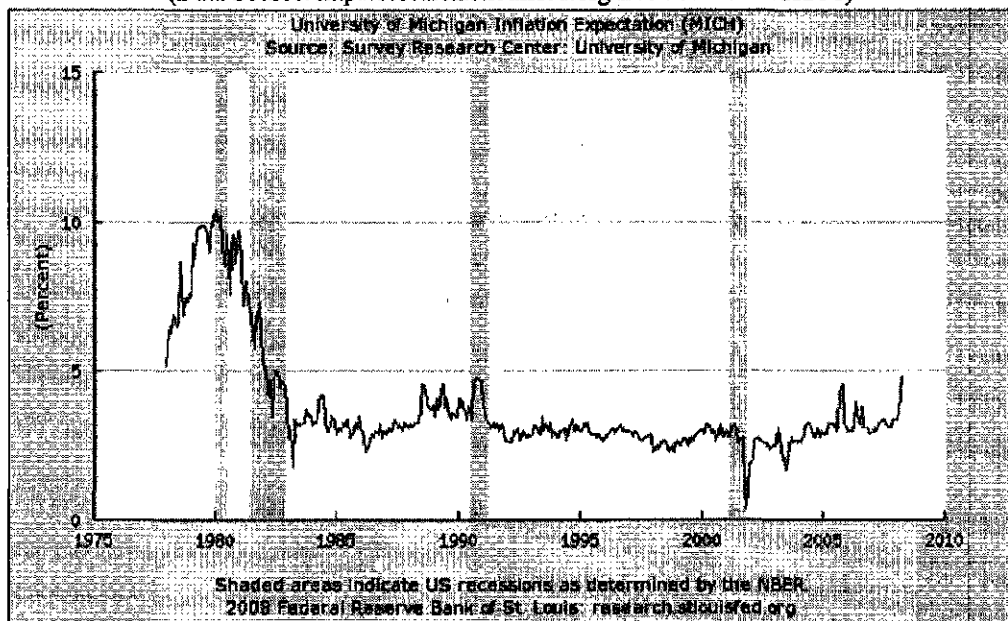
13   Longer term inflation forecasts are available in the Federal Reserve Bank of

14   Philadelphia's publication entitled *Survey of Professional Forecasters.*[18]

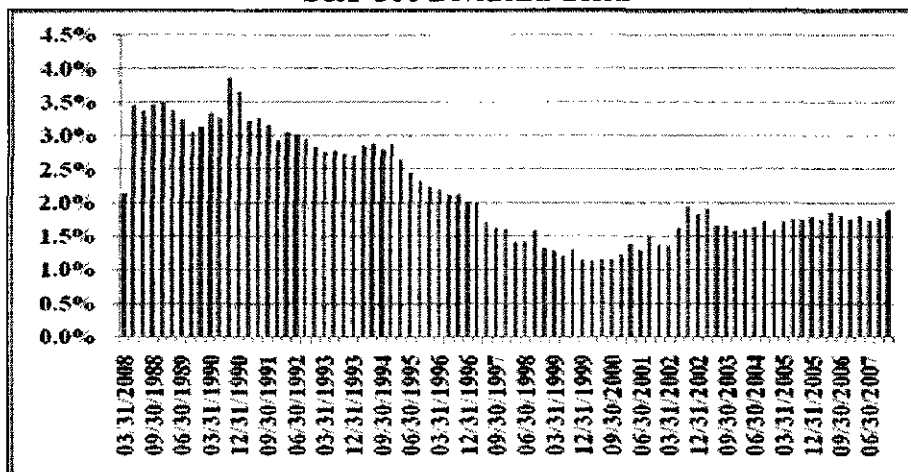15   This survey of professional economists has been published for almost 50

---

[18]Federal Reserve Bank of Philadelphia, *Survey of Professional Forecasters,* (February 12, 2008). 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.

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1   years. While this survey is published quarterly, only the first quarter survey

2   includes long-term forecasts of gross domestic product ("GDP") growth,

3   inflation, and market returns. In the first quarter 2008 survey, published on

4   February 12, 2008, the median long-term (10-year) expected inflation rate as

5   measured by the CPI was 2.5 percent (see page 4 of Exhibit JRW-7).

6

7   Given these results, I will use the average of the surveys of the University

8   of Michigan and Federal Reserve Bank of Philadelphia (4.8 percent and

9   2.5 percent), or 3.65 percent.

10   D/P – As shown in the graph below, the dividend yield on the S&P 500

11   has decreased gradually over the past decade. Today, it is far below its

12   average of 4.3 percent over the 1926-2000 time period. Whereas the S&P

13   dividend yield bottomed out at less than 1.4 percent in 2000, it is currently

14   at 2.2 percent which I use in the ex ante risk premium analysis.

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1

S&P 500 Dividend Yield

2

3   <u>RG</u> – To measure expected real growth in earnings, I use: (1) the historical

4   real earnings growth rate for the S&P 500 and (2) expected real GDP

5   growth. The S&P 500 was created in 1960. It includes 500 companies

6   which come from ten different sectors of the economy. Over the 1960-

7   2007 period, nominal growth in EPS for the S&P 500 was 7.36 percent.

8   On page 5 of Exhibit JRW-7, real EPS growth is computed using the CPI

9   as a measure of inflation. The real growth figure over 1960-2007 period

10   for the S&P 500 is 3.0 percent. As indicated by Ibbotson and Chen, real

11   earnings growth over the 1926-2000 period was 1.8 percent.

12

13   The second input for expected real earnings growth is expected real GDP

14   growth. The rationale is that over the long-term, corporate profits have

15   averaged a relatively consistent 5.50 percent of U.S. GDP. Real GDP

16   growth, according to McKinsey, has averaged 3.5 percent over the past 80

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1   years.[19] Expected GDP growth, according to the Federal Reserve Bank of

2   Philadelphia's *Survey of Professional Forecasters,* is 2.75 percent (see
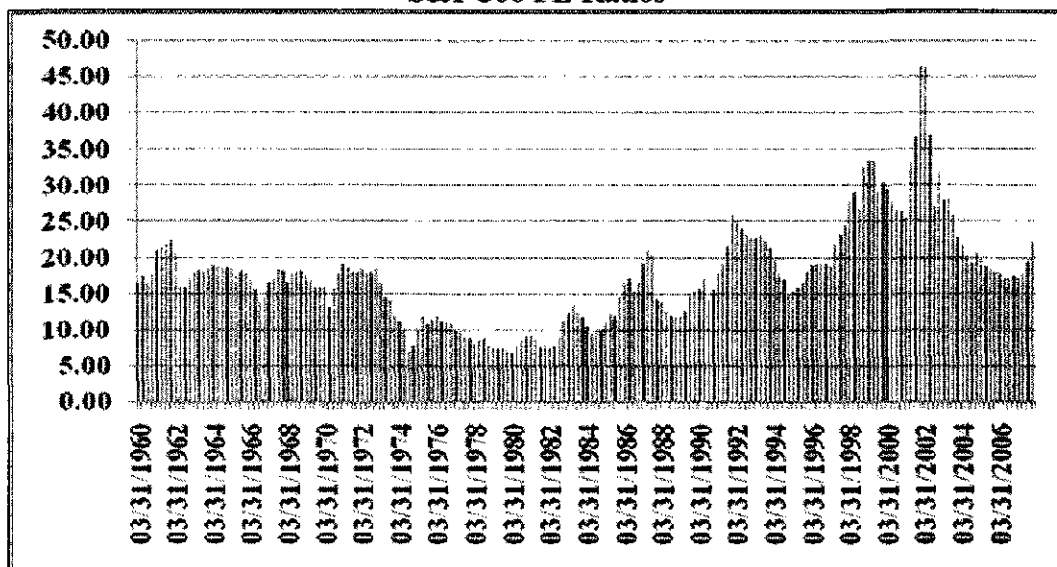
3   page 4 of Exhibit JRW-7).

4

5   Given these results, I will use the average of the historical S&P EPS real growth

6   and the projected real GDP growth (as reported by the Federal Reserve Bank of

7   Philadelphia Survey) -- 3.0 percent and 2.75 percent -- or 2.9 percent, for real

8   earnings growth.

9   PEGAIN – PEGAIN is the repricing gain associated with an increase in

10   the P/E ratio. It accounted for 1.3 percent of the 10.7 percent annual

11   stock return in the 1926-2000 period. In estimating an ex ante expected

12   stock market return, one issue is whether investors expect P/E ratios to

13   increase from their current levels. The graph below shows the P/E ratios

14   for the S&P 500 over the past 25 years. The run-up and eventual peak in

15   P/Es is most notable in the chart. The relatively low P/E ratios (in the

16   range of 10) over two decades ago are also quite notable. As of December

17   31, 2007, the P/E for the S&P 500 was 22.19. [20]

18

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[19]Marc. H. Goedhart, et al, "The Real Cost of Equity," *McKinsey on Finance* (Autumn 2002), p.14.

[20] Source: www.standardandpoors.com.

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1

S&P 500 PE Ratios

2

3   Given the current economic and capital markets environment, I do not believe that

4   investors expect even higher P/E ratios. Therefore, a PEGAIN would not be

5   appropriate in estimating an ex ante expected stock market return. There are two

6   primary reasons for this. First, the average historical S&P 500 P/E ratio is 15.74 –

7   thus the current P/E exceeds this figure. Second, as previously noted, interest

8   rates are at a cyclical low not seen in almost 50 years. This is a primary reason

9   for the high current P/Es. Given the current market environment with relatively

10   high P/E ratios and low relative interest rates, investors are not likely to expect to

11   get stock market gains from lower interest rates and higher P/E ratios.

12

13   *Q47. GIVEN THIS DISCUSSION, WHAT IS YOUR EX ANTE EXPECTED*

14   *MARKET RETURN AND EQUITY RISK PREMIUM USING THE*

15   *"BUILDING BLOCKS METHODOLOGY"?*

16   *A47.* My expected market return is represented by the last column on the right in the

17   graph entitled "Decomposing Equity Market Returns: The Building Blocks

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1   Methodology" set forth on page 45 of my testimony. As shown, my expected

2   market return of 8.75 percent is composed of 3.65 percent expected inflation, 2.2

3   percent dividend yield, and 2.9 percent real earnings growth rate.

4

5   **Q48.   GIVEN THAT THE HISTORICAL COMPOUNDED ANNUAL MARKET**

6   **RETURN IS IN EXCESS OF 10 percent, WHY DO YOU BELIEVE THAT**

7   **YOUR EXPECTED MARKET RETURN OF 8.75 PERCENT IS**

8   **REASONABLE?**

9   *A48.*   As discussed above, in the development of the expected market return, stock

10   prices are relatively high at the present time in relation to earnings and dividends,

11   and interest rates are relatively low. Hence, it is unlikely that investors are going

12   to experience high stock market returns due to higher P/E ratios and/or lower

13   interest rates. In addition, as shown in the decomposition of equity market

14   returns, whereas the dividend portion of the return was historically 4.3 percent,

15   the current dividend yield is only 2.2 percent. Due to these reasons, lower market

16   returns are expected for the future.

17

18   **Q49.   IS YOUR EXPECTED MARKET RETURN OF 8.75 PERCENT**

19   **CONSISTENT WITH THE FORECASTS OF MARKET PROFESSIONALS?**

20   *A49.*   Yes. In the first quarter 2008 *Survey of Financial Forecasters*, published on

21   February 12, 2008 by the Federal Reserve Bank of Philadelphia, the mean long-

22   term expected return on the S&P 500 was 6.8 percent (see page 4 of Exhibit JRW-

23   7). This is consistent with my expected market return of 8.75 percent.

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1   *Q50.*   *IS YOUR EXPECTED MARKET RETURN CONSISTENT WITH THE*

2   *EXPECTED MARKET RETURNS OF CORPORATE CHIEF FINANCIAL*

3   *OFFICERS (CFOs)?*

4   *A50.*   Yes. John Graham and Campbell Harvey of Duke University conduct a quarterly

5   survey of corporate CFOs. The survey is a joint project of Duke University and

6   *CFO Magazine.* In the March 2008 survey, the mean expected return on the S&P

7   500 over the next ten years was 8.99 percent.[21]

8

9   *Q51.*   *GIVEN THIS EXPECTED MARKET RETURN, WHAT IS YOUR EX ANTE*

10   *EQUITY RISK PREMIUM USING THE BUILDING BLOCKS*

11   *METHODOLOGY?*

12   *A51.*   As shown on page 36, the current 30-year U.S. Treasury yield is 4.71 percent.

13   My ex ante equity risk premium is simply the expected market return from the

14   Building Blocks methodology minus this risk-free rate:

15   Ex Ante Equity Risk Premium = 8.75 percent - 4.71 percent   = 4.04
16   percent

17

18   *Q52.*   *GIVEN THIS DISCUSSION, HOW ARE YOU MEASURING AN EXPECTED*

19   *EQUITY RISK PREMIUM IN THIS PROCEEDING?*

20   *A52.*   As discussed above, page 3 of Exhibit JRW-7 provides a summary of the results

21   of the equity risk premium studies that I have reviewed. These include the results

22   of: (1) the various studies of the historical risk premium, (2) ex ante equity risk

23   premium studies, (3) equity risk premium surveys of CFOs, Financial Forecasters,

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[21] The survey results are available at www.cfosurvey.org.

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1   and academics, and (4) the Building Block approaches to the equity risk premium.

2   There are results reported for over thirty studies, and the average equity risk

3   premium is 4.65 percent, which I will use as the equity risk premium in my

4   CAPM study.

5

6 Q53. **IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE**

7   **EQUITY RISK PREMIUMS OF LEADING INVESTMENT FIRMS?**

8 A53. Yes. One of the first studies in this area was by Stephen Einhorn, one of Wall

9   Street's leading investment strategists.[22] His study showed that the market or

10   equity risk premium had declined to the 2.0 - 3.0 percent range by the early

11   1990s. Among the evidence he provided in support of a lower equity risk

12   premium is the inverse relationship between real interest rates (observed interest

13   rates minus inflation) and stock prices. He noted that the decline in the market

14   risk premium has led to a significant change in the relationship between interest

15   rates and stock prices. As suggested by Einhorn, one implication of this

16   development was that stock prices had increased higher than would be suggested

17   by the historical relationship between valuation levels and interest rates.

18

19   The equity risk premiums of some of the other leading investment firms today

20   support the result of the academic studies. An article in *The Economist* indicated

21   that some other firms like J.P. Morgan are estimating an equity risk premium for

---

[22] Steven G. Einhorn, "The Perplexing Issue of Valuation: Will the Real Value Please Stand Up?" *Financial Analysts Journal* (July-August 1990), pp. 11-16.

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1   an average risk stock in the 2.0 - 3.0 percent range above the interest rate on U.S.

2   Treasury Bonds.[23]

3

4   *Q54.*   *IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE*

5   *EQUITY RISK PREMIUMS USED BY CFOs?*

6   *A54.*   Yes. In the previously referenced March 2008 CFO survey conducted by *CFO*

7   *Magazine* and Duke University, the expected 10-year equity risk premium was

8   5.09 percent.

9

10   *Q55.*   *IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE*

11   *EX ANTE EQUITY RISK PREMIUMS OF PROFESSIONAL*

12   *FORECASTERS?*

13   *A55.*   Yes. The financial forecasters in the previously referenced Federal Reserve Bank

14   of Philadelphia survey project both stock and bond returns. As shown on page 4 of

15   Exhibit JRW-7, the mean long-term expected stock and bond returns were 6.80

16   percent and 4.84 percent, respectively. This provides an ex ante equity risk

17   premium of 1.96 percent.

18

19   *Q56.*   *IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE*

20   *EQUITY RISK PREMIUMS USED BY THE LEADING CONSULTING*

21   *FIRMS?*

---

[23] For example, see "Welcome to Bull Country," *The Economist* (July 18, 1998), pp. 21-3, and "Choosing the Right Mixture," *The Economist* (February 27, 1999), pp. 71-2.

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1   *A56.*   Yes. McKinsey & Co. is widely recognized as the leading management

2   consulting firm in the world. It published a study entitled "The Real Cost of

3   Equity" in which the McKinsey authors developed an ex ante equity risk premium

4   for the U.S. In reference to the decline in the equity risk premium, as well as

5   what is the appropriate equity risk premium to employ for corporate valuation

6   purposes, the McKinsey authors concluded the following:

7   We attribute this decline not to equities becoming less risky

8   (the inflation-adjusted cost of equity has not changed) but

9   to investors demanding higher returns in real terms on

10   government bonds after the inflation shocks of the late

11   1970s and early 1980s. We believe that using an equity

12   risk premium of 3.5 to 4 percent in the current environment

13   better reflects the true long-term opportunity cost of equity

14   capital and hence will yield more accurate valuations for

15   companies.[24]

16   *Q57.*   ***WHAT EQUITY COST RATE IS INDICATED BY YOUR CAPM ANALYSIS?***

17   *A57.*   The results of my CAPM study for the proxy group are provided below:

---

[24] Marc H. Goedhart, et al, "The Real Cost of Equity," *McKinsey on Finance* (Autumn 2002), p. 15.

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1

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

2

CAPM Equity Cost Rates

	Industry Gas Group	Subsample Group
Risk-Free Rate	4.75 %	4.75 %
Beta	0.87	0.86
Equity Risk Premium	4.65 %	4.65 %
Equity Cost Rate	8.8 %	8.7 %

3

4

5   **VI.   EQUITY COST RATE SUMMARY**

6   *Q58.   PLEASE SUMMARIZE YOUR EQUITY COST RATE STUDY.*

7   *A58.*   The results for my DCF and CAPM analyses for the proxy groups of natural gas

8   distribution companies are indicated below:

9

	DCF	CAPM
Industry Gas Group	9.5 %	8.8 %
Subsample Group	9.3 %	8.7 %

10

11   *Q59.   GIVEN THESE RESULTS, WHAT IS YOUR ESTIMATED EQUITY COST*

12   *RATE FOR DEO?*

13   *A59.*   I conclude that the appropriate equity cost rate for DEO is in the 8.7 percent-9.5

14   percent range. The midpoint of these figures is 9.15 percent. However, since (1)

15   I give greater weight to the DCF model, and (2) the Company's recommended

16   capital structure ratio includes a common equity ratio which is below that of the

17   proxy group, I am recommending an equity cost rate of 9.5 percent for DEO.

18

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1   *Q60.*   *ARE YOU MAKING AN EXPLICIT LEVERAGE ADJUSTMENT TO*

2   *REFLECT THE DIFFERENCE BETWEEN MARKET VALUE AND BOOK*

3   *VALUE CAPITAL STRUCTUREs AS DR. VILBERT HAS DONE?*

4   *A60.*   No. As discussed below at length in my critique of Dr. Vilbert's testimony, I

5   believe that such an adjustment is inappropriate and produces illogical results. I

6   have used the upper end of the range of my equity cost rate results, in part, to

7   reflect the higher degree of financial leverage in the Company's proposed capital

8   structure.

9

10   *Q61.*   *HAVE YOU PERFORMED ANY STUDIES WHICH INDICATE THAT*

11   *SUCH AN ADJUSTMENT IS NOT APPROPRIATE?*

12   *A61.*   Yes. On page 2 of Exhibit JRW-2 I compared the riskiness of the companies in

13   the two proxy groups and DRI, DEO's parent, using six different risk measures

14   listed by *Value Line*. As indicated earlier in my testimony, this study indicates

15   that DRI's risk measures do not differ in any significant way from the average

16   risk measures for the two proxy groups. As such, the lower common equity ratio

17   of DRI, whose capital structure is used for DEO in this proceeding, does not

18   translate into a higher level of investment risk as compared to the companies in

19   the proxy groups.

20

21   *Q62.*   *ISN'T YOUR EQUITY COST RATE RECOMMENDATION OF 9.5*

22   *PERCENT LOW COMPARED TO HISTORICAL AUTHORIZED*

23   *RETURNS?*

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1   *A62.*   Yes it is and appropriately so. My rate of return is low by historical standards for

2   three reasons. First, as discussed above, current capital costs are very low by

3   historical standards, with interest rates at a cyclical low not seen since the 1960s.

4   Second, the 2003 Tax Law, which reduces the tax rates on dividend income and

5   capital gains, lowers the pre-tax return required by investors. And third, as

6   discussed below, the equity or market risk premium has declined.

7

8   *Q63.*   *FINALLY, PLEASE DISCUSS YOUR RATE OF RETURN IN LIGHT OF*

9   *RECENT YIELDS ON 'A' RATED PUBLIC UTILITY BONDS.*

10 *A63.*   In recent months the yields on long-term public utility bonds have been in the 6.0-

11   6.5 percent range. My rate of return recommendation may appear to be too low

12   given these yields but, as previously noted, my recommendation must be viewed

13   in the context of the significant decline in the market or equity risk premium. As

14   a result, the return premium that equity investors require over bond yields is much

15   lower today.

16

17 *Q64.*   *HOW DID YOU TEST THE REASONABLENESS OF YOUR COST OF*

18   *EQUITY AND OVERALL RATE OF RETURN RECOMMENDATION?*

19 *A64.*   To test the reasonableness of my equity cost rate recommendation, I examined the

20   relationship between the return on common equity and the market-to-book ratios

21   for the companies in the proxy group of gas distribution companies.

22

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1   *Q65.*   ***WHAT DO THE RETURNS ON COMMON EQUITY AND MARKET-TO-***

2   ***BOOK RATIOS FOR THE TWO PROXY GROUPS OF GAS DISTRIBUTION***

3   ***COMPANIES INDICATE ABOUT THE REASONABLENESS OF YOUR***

4   ***RECOMMENDATION?***

5   *A65.*   Exhibit JRW-2 provides financial performance and market valuation statistics for

6   the two proxy groups of gas distribution companies. The mean current return on

7   equity and market-to-book ratios for the group are summarized below:

	Current ROE	**Market-to-Book Ratio**
Industry Gas Group	11.7 %	1.68
Subsample Group	11.4 %	1.69

8   Source: Exhibit JRW-2

9   These results indicate that, on average, these companies are earning returns on

10   equity above their equity cost rates. As such, this observation provides evidence

11   that my recommended equity cost rate is reasonable and fully consistent with the

12   financial performance and market valuation of the two proxy groups of gas

13   distribution companies.

14

15   **VII.**   **CRITIQUE OF DEO'S RATE OF RETURN TESTIMONY**

16   *Q66.*   ***PLEASE REVIEW DR. VILBERT'S EQUITY COST RATE***

17   ***APPROACHES AND RESULTS.***

18   *A66.*   Dr. Vilbert employs a proxy group of ten gas companies ("GAS LDC Sample") and

19   a proxy group of five gas companies ("Sample Group"). The table below

20   summarizes his equity cost results. Whereas the table suggests that Dr. Vilbert has

21   conducted a number of equity cost rate studies, he has simply used CAPM and DCF

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1   equity cost rate approaches with different inputs. He calls his CAPM approach a

2   Risk Positioning Approach, and uses a variant of the CAPM, which he calls the

3   ECAPM. He applies these models with both long-term and short-term interest rates,

4   with a different equity risk premium for the different interest rates. He also uses

5   alternative alpha levels for the ECAPM. Dr. Vilbert refers to the estimates in the

6   table below as the "implied" cost of equity for the Company since they include a

7   leverage adjustment to reflect the market value capital structures of the gas

8   companies relative to the proposed capital structure for DEO which includes a

9   common equity ratio of 44.8 percent.

10

11   Dr. Vilbert's equity cost rate estimates for DEO are summarized in the table

12   below. Based on these figures, he concludes that the appropriate equity cost rate

13   for the Company is 12.00 percent.

14   **Summary of Dr. Vilbert's Equity Cost Rate Approaches and Results**

16   **Risk Positioning**   **Risk Positioning**   **DCF**

17   **Long-Term Interest Rate**   **Short-Term Interest Rate**

	CAPM	a=0.5%	a=1.5 %	CAPM	a=1 %	a=2 %	a=3 %	Simple	Multi
Gas LDC Sample	12.7 %	12.8 %	13.0 %	13.0 %	13.3 %	13.5 %	13.7 %	10.3 %	10.7 %
Sub-Sample	12.4 %	12.5 %	12.7 %	12.7 %	12.9 %	13.2 %	13.4 %	9.9 %	10.6 %

20   **Risk Positioning Parameters:**   **Multistage DCF**
21   Long-Term Interest Rate: 5.1 percent   Short-Term Interest Rate: 4.1 percent DCF Growth
22   Equity Risk Premium: 6.5 percent   Equity Risk Premium: 8.0 percent   5.1 percent

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1   *Q67.*   ***PLEASE DISCUSS THE PRIMARY ISSUES WITH DR. VILBERT'S***

2   ***RECOMMENDED EQUITY COST RATE.***

3   *A67.*   The Company's proposed cost of capital is inflated due to an overstated implied

4   equity cost rate. The primary issues with Dr. Vilbert's equity cost rate studies are:

5   (1) he has included a leverage adjustment to his implied cost of equity estimate

6   that reflects the difference between the market value capital structures of his

7   proxy group and the Company's proposed capital structure, (2) he gives little

8   weight to his DCF results, and has used an inflated expected growth rate in both

9   his traditional and multistage DCF models, and (3) he uses an outdated and

10   arbitrary method to estimating an equity risk premium in his CAPM and ECAPM

11   approaches which produces an overstated equity risk premium that does not

12   reflect current market fundamentals. These are the most significant issues in Dr.

13   Vilbert's analysis and are addressed, along with other errors in his analyses, in the

14   discussion below.

15

16   A.   **Leverage Adjustment**

17   *Q68.*   ***PLEASE REVIEW DR. VILBERT'S LEVERAGE ADJUSTMENT.***

18   *A68.*   Dr. Vilbert's equity cost rate estimates include a financial risk or leverage

19   adjustment to reflect the difference between the market value capital structures of

20   the companies in his proxy groups and his recommended book value capital

21   structure for DEO. Dr. Vilbert calls this his After-Tax Weighted Average Cost of

22   Capital ("ATWACC") approach. As shown in my review of Dr. Vilbert's equity

23   cost rate approaches below, this adjustment adds about 200 basis points to his equity

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1   cost rate estimates in this case. Dr. Vilbert claims that this adjustment is needed

2   since the financial risk associated with the Company's recommended book value

3   capital structure is greater than the financial risk associated with the market value

4   capital structures of the proxy group companies. As such, Dr. Vilbert is requesting

5   that the Commission make this adjustment since (1) market values are greater than

6   book values for utilities and (2) the overall rate of return is applied to a book value

7   capitalization in the ratemaking process. This adjustment is erroneous and

8   unwarranted for the following reasons:

9   (1)   The market value of a firm's equity exceeds the book value of equity when

10   the firm is expected to earn more on the book value of investment than

11   investors require. This relationship is described very succinctly in the

12   Harvard Business School case study which I quote on pages 14-15 in my

13   testimony. As such, the reason that market values exceed book values is that

14   the company is earning a return on equity in excess of its cost of equity;

15   (2)   Despite Dr. Vilbert's contention is that this adjustment is necessary to adjust

16   for differences in financial risk. However, Dr. Vilbert is making an 'apples

17   and oranges' comparison in making this adjustment. He is comparing the

18   market value capital structures of proxy group companies to the book value

19   capital structure of the Company to account for differences in financial risk.

20   However, it is important to note that the financial obligations of the

21   Company, and therefore the Company's financial risk, do not change.

22   Hence, there is no need for a financial risk or leverage adjustment. The

23   Company's financial statements and fixed financial obligations remain the

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1   same. In addition, financial publications and investment firms report

2   capitalizations on a book value and not a market value basis;

3   (3)   Dr. Vilbert has presented his leverage adjustment in many rate cases before

4   many regulatory commissions. In OCC Request to Produce No. 135

5   (Attachment JRW-1), Dr. Vilbert was asked to list all rate cases in which a

6   regulatory commission adopted his leverage or financial risk adjustment.

7   His response is the following: " * * * Dr. Vilbert is not aware of any

8   decision which specifically and expressly states that a regulatory

9   commission "adopts" the ATWACC method as used by Dr. Vilbert in this

10   proceeding."

11   (4)   As discussed below, the adjustment produces illogical results.

12

13   *Q69.*   ***PLEASE EXPLAIN WHY YOU BELIEVE THAT REGULATORY***

14   ***COMMISSIONS HAVE REJECTED DR. VILBERT'S LEVERAGE***

15   ***ADJUSTMENT?***

16   *A69.*   I believe that Dr. Vilbert's leverage adjustment has been rejected by every

17   regulatory commission that has considered it because it is erroneous and produces

18   illogical results. The leverage adjustment is illogical because it increases the

19   ROEs for utilities that have high returns on common equity and decreases the

20   ROEs for utilities that have low returns on common equity.

21

22   In the graphs presented on pages 19-20, I have demonstrated that there is a strong

23   positive relationship between expected returns on common equity and market-to-

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1   book ratios for public utilities. Hence, in the context of Dr. Vilbert's leverage

2   adjustment, this means that: (1) for a utility with a relatively high market-to-book

3   ratio (e.g., 2.5) and ROE (e.g., 12.0 percent), the leverage adjustment will

4   increase the estimated equity cost rate, while (2) for a utility with a relatively low

5   market-to-book ratio (e.g., 0.5) and ROE (e.g., 5.0 percent), the leverage

6   adjustment will decrease the estimated equity cost rate. Such an adjustment

7   defies logic because you are increasing the estimated equity cost rate for the high

8   market-to-book utility and decreasing the estimated equity cost rate for the low

9   market-to-book utility. Therefore, the adjustment will result in even higher

10   market-to-book ratios for utilities with relatively high ROEs and even lower

11   market-to-book ratios for utilities with relatively low ROEs.

12

13   **B.   DCF Approach**

14   *Q70. PLEASE SUMMARIZE DR. VILBERT'S DCF ESTIMATES.*

15   *A70.*   On pages 36-37 of his testimony, Appendix D, and in Tables MJV-5 – MJV-8, Dr.

16   Vilbert develops an equity cost rate by applying traditional and multistage DCF

17   models to his two groups of gas companies. In the traditional DCF approach, the

18   equity cost rate is the sum of the dividend yield and expected growth. For his

19   traditional DCF, as discussed on page D-10 of his testimony, Dr. Vilbert uses a

20   growth rate which is the average of: (1) the projected EPS growth rate of Wall Street

21   analysts as listed by Bloomberg; and (2) the average projected EPS growth rate from

22   *Value Line.* Dr. Vilbert adjusts his DCF equity cost rate by his leverage adjustment

23   to reflect the difference between the market value capital structures of the gas

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1   companies and DEO's book value capital structure. Dr. Vilbert's multistage DCF

2   model uses the three growth rate stages: (1) stage 1 (years 1-5) the projected growth

3   rate used in his traditional DCF model; (2) stage 2 (years 5-10) a linear extrapolation

4   between the state 1 and stage 3 growth rates; and (3) stage 3 (years 11-forward) a

5   forecasted GDP growth rate of 5.1 percent. Dr. Vilbert's DCF results are

6   summarized below.

7   **DCF Equity Cost Rate**
8
9   **Traditional DCF**   **Multistage DCF**
10

	LDC Group	Sub Group	LDC Group	Sub Group
Adj. Dividend Yld.	3.7 %	3.7 %	3.7 %	3.7 %
Growth	4.7 %	4.5 %	5.0 %	4.5 %
DCF Result	8.4 %	8.2 %	8.7 %	8.6 %
Leverage Adj.	1.9 %	1.7 %	2.0 %	2.0 %
Leverage-Adj. DCF Equity Cost Rate	10.3 %	9.9 %	10.7 %	10.6 %

11

12   *Q71.*   *PLEASE EXPRESS YOUR CONCERNS WITH DR. VILBERT'S DCF STUDY.*

13   *A71.*   I have three primary issues with Dr. Vilbert's DCF equity cost rate approach: (1) the

14   leverage adjustment; (2) the sole reliance on analysts' and *Value Line*'s EPS growth

15   rate forecasts for a DCF growth rate; and (3) the use of projected GDP growth as a

16   long-term growth rate in the multistage DCF model.

17

18   *Q72.*   *PLEASE DISCUSS DR. VILBERT'S EXCLUSIVE RELIANCE ON*

19   *SELECTED ANALYSTS' AND VALUE LINE GROWTH RATE MEASURES.*

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1 *A72.* It seems highly unlikely that investors today would rely exclusively on the

2 forecasts of securities analysts and ignore historical growth in arriving at expected

3 growth. It is well known in the academic world that the EPS forecasts of

4 securities analysts are overly optimistic and biased upwards. In addition, as I

5 show below, *Value Line*'s EPS forecasts are excessive and unrealistic.

6

7 *Q73.* **PLEASE REVIEW THE BIAS IN ANALYSTS' GROWTH RATE FORECASTS.**

8 *A73.* Analysts' growth rate forecasts are collected and published by Zacks, First Call,

9 I/B/E/S, Bloomberg, and Reuters. These services retrieve and compile EPS

10 forecasts from Wall Street analysts. These analysts come from both the sell side

11 (Merrill Lynch, Paine Webber) and the buy side (Prudential Insurance, Fidelity).

12

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

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

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

16 the accuracy of analysts' EPS forecasts, I have compared actual 3-5 year EPS

17 growth rates with forecasted EPS growth rates on a quarterly basis over the past

18 20 years for all companies covered by the I/B/E/S data base. In the graph below, I

19 show the average analysts' forecasted 3-5 year EPS growth rate with the average

20 actual 3-5 year EPS growth rate. Because of the necessary 3-5 year follow-up

21 period to measure actual growth, the analysis in this graph only: (1) covers

22 forecasted and actual EPS growth rates through 1999 and (2) includes only

23 companies that have 3-5 years of actual EPS data following the forecast period.

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1
2

Long-Term Forecasted Versus Actual EPS Growth Rates
1988-2006
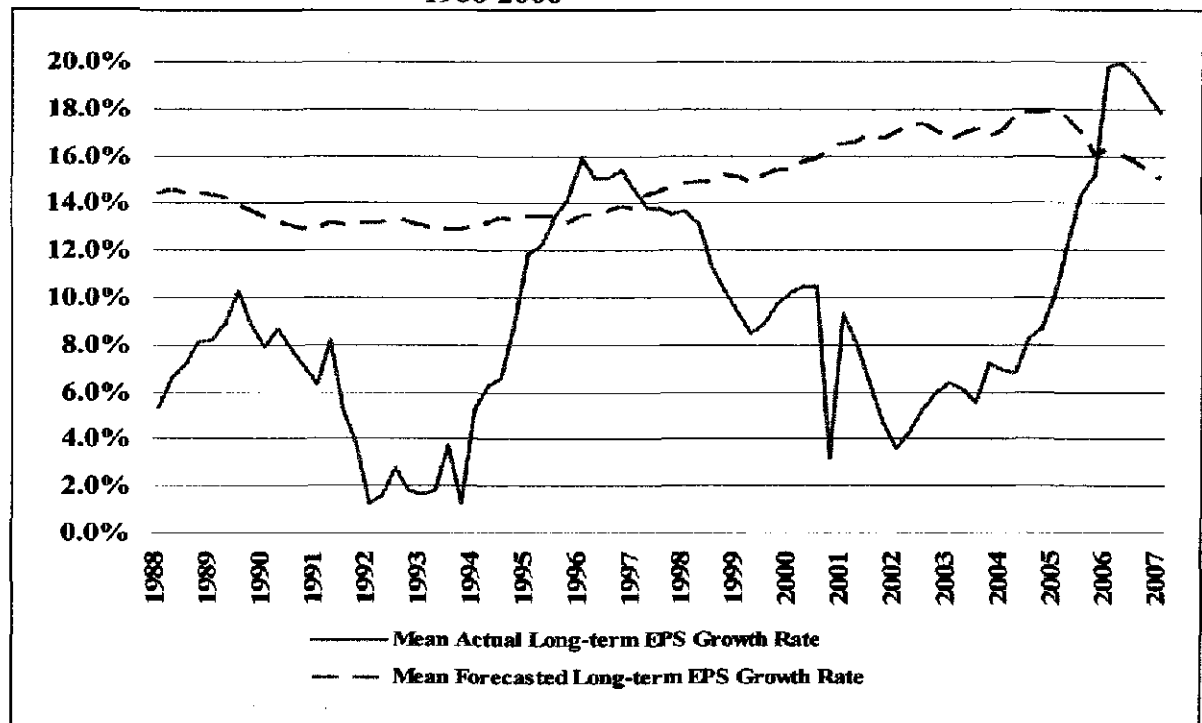
Source: Patrick J. Cusatis and J. Randall Woolridge, "The Accuracy of Analysts' Long-Term
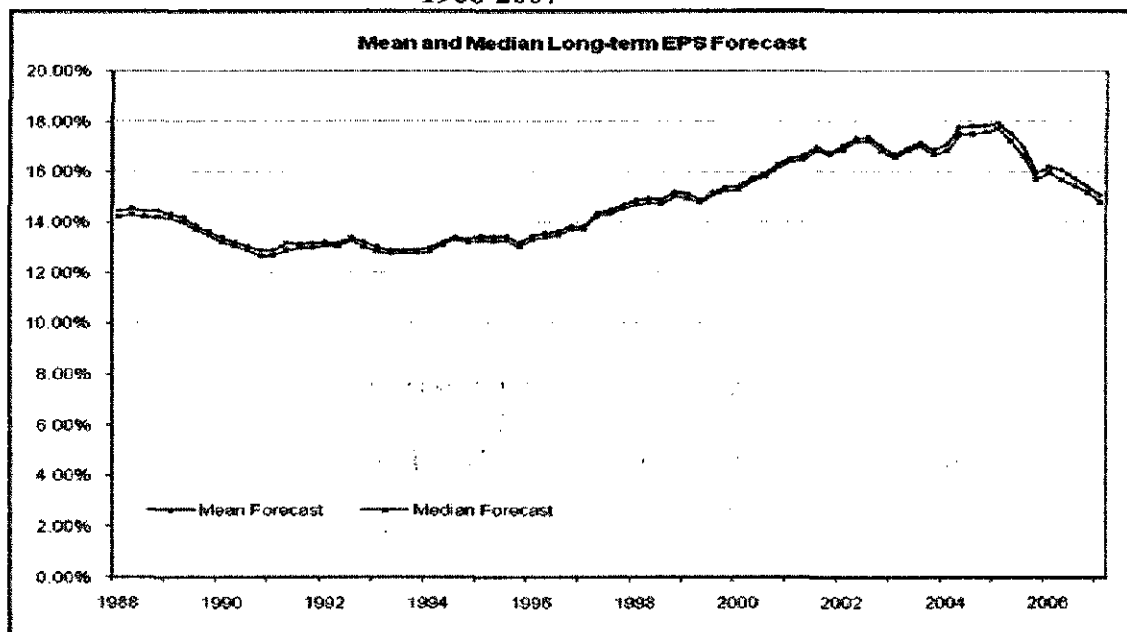Earnings Per Share Growth Rate Forecasts," (January 24, 2008).

3
4
5
6

7   The following example shows how the results can be interpreted. For the 3-5-

8   year period prior to the first quarter of 1999, analysts had projected an EPS

9   growth rate of 15.13 percent, but companies only generated an average annual

10   EPS growth rate over the 3-5 years of 9.37 percent.[25] This projected EPS growth

11   rate figure represented the average projected growth rate for over 1,510

12   companies, with an average of 4.88 analysts' forecasts per company. For the

13   entire twenty-year period of the study, there were on average 5.60 analysts' EPS

14   projections for 1,281 companies. Overall, my findings indicate that forecast errors

15   for long-term estimates are predominantly positive or over-estimates, which

---

[25] Patrick J. Cusatis and J. Randall Woolridge, "The Accuracy of Analysts' Long-Term Earnings Per
Share Growth Rate Forecasts," (January 24, 2008).

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1   indicates an upward bias in growth rate estimates. The mean and median forecast

2   errors over the observation period are 143.06 percent and 75.08 percent,

3   respectively. The forecast errors are negative for only eleven of the eighty

4   quarterly time periods: five consecutive quarters starting at the end of 1995 and

5   six consecutive quarters starting in 2006. As shown in the figure below, the

6   quarters with negative forecast errors were for the 3-5 year periods following

7   earnings declines associated with the 1991 and 2001 economic recessions in the

8   U.S. With this explanation, overall, there is evidence of a persistent upward bias

9   in long-term EPS growth forecasts.

10

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

12   economic recession, 9/11, and the Iraq war. Furthermore, and highly significant

13   in the context of this study, we have also had the New York State investigation of

14   Wall Street firms and the subsequent Global Securities Settlement in which nine

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

16

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

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

19   provided in the I/B/E/S database on a quarterly basis from 1988 to 2006. In this

20   graph no comparison to actual EPS growth rates is made, and hence, there is no

21   follow-up period. Therefore, 3-5 year growth rate forecasts are shown until 2006.

22   Analysts' forecasts for EPS growth were higher for this larger sample of firms,

23   with a more pronounced run-up and then decline around the stock market peak in

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1   2000. The average projected growth rate hovered in the 14.5 percent-17.5 percent

2   range until 1995 and then increased dramatically over the next five years to 23.3

3   percent in the fourth quarter of the year 2000. Forecasted growth has since

4   declined to the 15.0 percent range.

5   **Long-Term IBES Forecasted EPS Growth Rates**
6   **1988-2007**

7
8
9   Source: Patrick J. Cusatis and J. Randall Woolridge, "The Accuracy of Analysts' Long-Term
10   Earnings Per Share Growth Rate Forecasts," (January 24, 2008).
11
12
13   While analysts' EPS growth rate forecasts have subsided since 2000, these results

14   suggest that, despite the New York State investigation and the Global Analysts

15   Research Settlement, analysts' EPS forecasts are still upwardly biased. The actual

16   3-5 year EPS growth rate over time has been about one half the projected 3-5 year

17   growth rate forecast of 15.0 percent. Furthermore, as discussed later in my

18   testimony, historic growth in GNP and corporate earnings has been approximately 7

19   percent. This observation is supported by a *Wall Street Journal* article entitled

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1   "Analysts Still Coming Up Rosy – Over-Optimism on Growth Rates is Rampant –

2   and the Estimates Help to Buoy the Market's Valuation." The following quote

3   provides insight into the continuing bias in analysts' forecasts:

4   Hope springs eternal, says Mark Donovan, who manages

5   Boston Partners Large Cap Value Fund. "You would have

6   thought that, given what happened in the last three years,

7   people would have given up the ghost. But in large measure

8   they have not."

9   These overly optimistic growth estimates also show that, even

10   with all the regulatory focus on too-bullish analysts allegedly

11   influenced by their firms' investment-banking relationships, a

12   lot of things haven't changed: Research remains rosy and many

13   believe it always will.[26]

14   **Q74. *IS THE BIAS IN ANALYSTS' GROWTH RATE FORECASTS GENERALLY***

15   ***KNOWN IN THE MARKETS?***

16   *A74.* Yes. Exhibit JRW-8 provides an additional recent article published in the *Wall*

17   *Street Journal* that discusses the upward bias in analysts' EPS growth rate forecasts.

18

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

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1   *Q75.* *ARE ANALYSTS' EPS GROWTH RATE FORECASTS LIKEWISE*

2   *UPWARDLY BIASED FOR NATURAL GAS DISTRIBUTION COMPANIES?*

3   *A75.* Yes. To evaluate whether analysts' EPS growth rate forecasts are upwardly biased

4   for natural gas distribution companies, I conducted a study similar to the one

5   described above using a group of gas companies. The results are shown in the

6   chart below. The projected EPS growth rates have declined from about six

7   percent in the 1990s to about five percent in the 2000s. As shown, the achieved

8   EPS growth rates have been volatile. Overall, the upward bias in EPS growth rate

9   projections is not as pronounced for gas distribution companies it is for all

10   companies. Over the entire period, the average quarterly 3-5 year projected and

11   actual EPS growth rates are 5.15 percent and 4.53 percent, respectively. The

12   results here are consistent with the results for companies in general – analysts'

13   projected EPS growth rate forecasts are upwardly-biased for utility companies.

14

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1   **Analysts' Forecasted 3-5-Year Forecasted Versus Actual EPS Growth Rates**
2   **Natural Gas Distribution Companies**
3   **1990-2007**

4
5
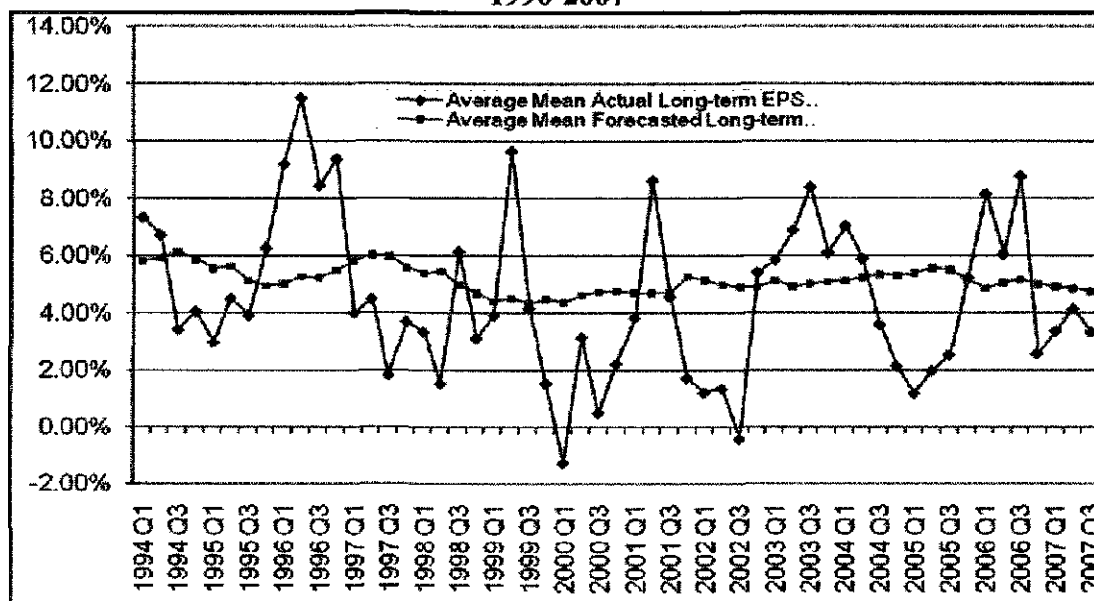
6   *Q76. ARE VALUE LINE'S GROWTH RATE FORECASTS SIMILARILY*

7   *UPWARDLY BIASED?*

8   *A76.*   Yes. *Value Line* has a decidedly positive bias to its earnings growth rate forecasts as

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

10   *Investment Analyzer*. The results are summarized in the table below. I initially

11   filtered the database and found that *Value Line* has 3-5 year EPS growth rate

12   forecasts for 2,453 firms. The average projected EPS growth rate was 14.6 percent.

13   This is high given that the average historical EPS growth rate in the U.S. is about 7

14   percent. A major factor seems to be that *Value Line* only predicts negative EPS

15   growth for 47 companies. This is less than two percent of the companies covered by

16   *Value Line.*

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1

Value Line 3-5 year EPS Growth Rate Forecasts

	Average Projected EPS Growth rate	Number of Negative EPS Growth Projections	Percent of Negative EPS Growth Projections
2,453 Firms	14.6 %	47	1.9 %

2
3
4 To put this figure in perspective, I screened the *Value Line* companies to determine

5 what percent of companies covered by *Value Line* had experienced negative EPS

6 growth rates over the past five years. *Value Line* reported a five-year historic growth

7 rate for 2,371 companies. The results shown in the table below indicate that the

8 average 5-year historic growth rate was 12.9 percent, and *Value Line* reported

9 negative historic growth for 476 firms which represents 20.1 percent of these

10 companies. It should be noted that the past five years have been a period of rapidly

11 rising corporate earnings growth as the economy and businesses have rebounded

12 from the recession of 2001.

13

14 ### 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
2,371 Companies	12.9 %	476	20.1 %

15
16
17 These results indicate that *Value Line*'s EPS forecasts are excessive and unrealistic.

18 Their forecasts are upwardly biased because they are reluctant to forecast negative

19 growth.

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1   **Q77. PLEASE DISCUSS DR. VILBERT'S USE OF PROJECTED GDP GROWTH**

2   **AS THE LONG-TERTM DCF GROWTH RATE IN HIS MULTISTAGE DCF**

3   **MODEL.**

4   *A77.* The error in using projected GDP growth as the long-term growth rate in his

5   multistage DCF model is that, as indicated in response to OCC Request to Produce

6   No. 141 (Attachment JRW-3), Dr. Vilbert's has neither conducted or referenced any

7   theoretical or empirical studies to indicate why investors would presume that gas

8   companies would be expected to grow at the same growth rate as GDP. Therefore,

9   there is no basis or support for the most important component of his multistage DCF

10   model.

11

12   **C.   CAPM Analysis**

13   **Q78. PLEASE DISCUSS DR. VILBERT'S CAPM.**

14   *A78.* On pages 35 to 36, Appendix C, and Tables MJV-9 – MJV-11, Dr. Vilbert applies

15   the CAPM/ECAPM methodologies to his two groups of gas companies. His results

16   are summarized below:

17
CAPM Equity Cost Rate

	LDC Group (L-T Rates)	LDC Group (S-T Rates)	Sub Group (L-T Rates)	Sub Group (S-T Rates)
Risk-Free Rate	5.1 %	4.1 %	5.1 %	4.1 %
Beta	0.84	0.84	0.83	0.83
Market Risk Premium	6.5 %	8.0 %	6.5 %	8.0 %
CAPM Result	10.5 %	10.8 %	10.5 %	10.7 %
Leverage Adjust.	2.2 %	2.2 %	1.9 %	2.0 %
CAPM Equity Cost Rate	12.7 %	13.0 %	12.4 %	12.7 %

18

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1
2

ECAPM Equity Cost Rate
LDC Group

	L-T Rates a = 0.5 %	L-T Rates a = 1.5 %	S-T Rates a = 1.0 %	S-T Rates a = 2.0 %	S-T Rates a = 3.0 %
Risk-Free Rate	5.1 %	5.1 %	4.1 %	4.1 %	4.1 %
Beta	0.84	0.84	0.84	0.84	0.84
Market Risk Premium	6.5 %	6.5 %	8.0 %	8.0 %	8.0 %
CAPM Result	10.6 %	10.8 %	10.9 %	11.1 %	11.3 %
Leverage Adjust.	2.2 %	2.2 %	2.4 %	2.4 %	2.4 %
CAPM Equity Cost Rate	12.8 %	13.0 %	13.3 %	13.5 %	13.7 %

3

4
5

ECAPM Equity Cost Rate
Sub Group

	L-T Rates a = 0.5 %	L-T Rates a = 1.5 %	S-T Rates a = 1.0 %	S-T Rates a = 2.0 %	S-T Rates a = 3.0 %
Risk-Free Rate	5.1 %	5.1 %	4.1 %	4.1 %	4.1 %
Beta	0.83	0.83	0.83	0.83	0.83
Market Risk Premium	6.5 %	6.5 %	8.0 %	8.0 %	8.0 %
CAPM Result	10.6 %	10.8 %	10.9 %	11.1 %	11.3 %
Leverage Adjust.	1.9 %	1.9 %	2.0 %	2.1 %	2.1 %
CAPM Equity Cost Rate	12.5 %	12.7 %	12.9 %	13.2 %	13.4 %

6

7 **Q79. PLEASE DISCUSS THE ERRORS IN DR. VILBERT'S CAPM/ECAPM**

8 **STUDIES.**

9 *A 79.* There are four flaws with Dr. Vilbert's CAPM/ECAPM analyses: (1) the leverage or

10 financial risk adjustment; (2) the long-term and short-term risk-free interest rates of

11 5.1 percent and 4.1 percent; (3) the application of the ECAPM approach; and (4) the

12 equity risk premiums of 6.5 percent using long-term interest rates and 8.0 percent

13 using short-term interest rates. It is important to note, as discussed below, that the

14 equity risk premium is the most critical flaw in Dr. Vilbert's equity cost rate study.

15 The leverage adjustment was addressed above on pages 64-67; the other three issues

16 are discussed below.

17

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1 *Q80.* *PLEASE REVIEW THE RISK-FREE RATE OF DR. VILBERT'S CAPM.*

2 *A80.* Dr. Vilbert develops his long-term and short-term risk-free interest rates of 5.1

3   percent and 4.1 percent on page C-16 of his testimony. Dr. Vilbert's long-term

4   rate is the forecasted rate on long-term Treasury Bonds, and his short-term rate is

5   the implied short-term rate from the term structure of interest rates. The problem

6   with both of these rates is that they are both above current market interest rates.

7   The current yields on long-term Treasury Bonds are approximately 4.25 percent-

8   4.75 percent, and the current yields on short-term Treasury Bills are

9   approximately 2.0 percent-2.5 percent. As such, the base interest rates in Dr.

10   Vilbert's CAPM and ECAPM analyses are both excessive.

11

12 *Q81.* *WHAT ISSUES DO YOU HAVE WITH DR. VILBERT'S ECAPM?*

13 *A81.* On page C-17 of his testimony, Dr. Vilbert has employed a variation of the CAPM

14   which he calls the 'ECAPM.' In his so-called ECAPM, Dr. Vilbert attempts to

15   model the well-known finding of tests of the CAPM that have indicated the

16   Security Market Line (SML) is not as steep as predicted by the CAPM. As such,

17   Dr. Vilbert's ECAPM is nothing more than an ad hoc version of the CAPM which

18   has not been theoretically or empirically validated as a measure of expected return

19   in refereed journals. In response to OCC Request to Produce No. 140 (Attachment

20   JRW-2), Dr. Vilbert provides copies of the studies he reviewed to determine the

21   alphas for his ECAPM. He uses alpha ranges of 0.5 percent-1.5 percent and 1.0

22   percent-3.0 percent for his long-term and short-term ECAPM studies.

23

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1   There are two critical errors in Dr. Vilbert's ECAPM analysis. First, and most

2   importantly, none of the CAPM tests cited by Dr. Vilbert to justify the ECAPM

3   use adjusted betas such as the *Value Line* betas used by Dr. Vilbert. In response

4   to OCC Request to Produce No. 147 (Attachment JRW-4), Dr. Vilbert provided

5   the beta adjustment mechanism used by *Value Line*. Adjusted betas address the

6   empirical issues with the CAPM by increasing the expected returns for low beta

7   stocks and decreasing the returns for high beta stocks. The second flaw with Dr.

8   Vilbert's ECAPM is that a Security Market Line ("SML") with a slope coefficient

9   which is not as steep as predicted by the CAPM is also consistent with a declining

10   equity risk premium. I provide empirical evidence in this testimony regarding the

11   decline in the equity risk premium.

12

13   *Q82.   PLEASE REVIEW THE EQUITY MARKET RISK PREMIUM IN DR.*

14   *VILBERT'S CAPM/ECAPM APPROACHES.*

15   *A82.*   The primary problem with Dr. Vilbert's CAPM/EACPM analyses is the size of the

16   equity risk premium. Dr. Vilbert uses equity risk premiums of 6.5 percent using

17   long-term interest rates and 8.0 percent using short-term interest rates for both his

18   CAPM and ECAPM studies. These premiums are based on the historical arithmetic

19   mean difference between stock returns and the returns on long-term Treasury Bonds

20   (6.5 percent) and Treasury Bills (8.0 percent) over the 1926-2006 time period as

21   published by Ibbotson Associates.

22

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1   *Q83.*   **WHY IS THE EQUITY RISK PREMIUM THE MOST IMPORTANT ERROR**

2   **IN DR. VILBERT'S CAPM/ECAPM ANALYSES?**

3   *A83.*   Dr. Vilbert's equity risk premium is the most important error in his equity cost rate

4   study for three reasons. First, it is the largest component of his estimated

5   CAPM/EACPM equity cost rates and it is also is the most difficult component of an

6   equity cost rate to measure. Second, as discussed below, Dr. Vilbert's historical

7   equity risk premium is measured with a very large degree of error. And third, Dr.

8   Vilbert uses his CAPM/ECAPM results to suggest that the equity cost rate results of

9   the DCF model are too low.

10

11   *Q84.*   **PLEASE ADDRESS THE ISSUES INVOLVED IN USING HISTORICAL**

12   **STOCK AND BOND RETURNS TO COMPUTE A FORWARD-LOOKING OR**

13   **EX ANTE RISK PREMIUM.**

14   *A84.*   Using the historical relationship between stock and bond returns to measure an ex

15   ante equity risk premium is erroneous and especially in this case, overstates the

16   true equity risk premium. The equity risk premium is based on expectations of the

17   future and when past market conditions vary significantly from the present,

18   historic data does not provide a realistic or accurate barometer of expectations of

19   the future. In particular, using historical returns to measure the ex ante equity risk

20   premium ignores current market conditions and masks the dramatic change in the

21   risk and return relationship between stocks and bonds. This change suggests that

22   the equity risk premium has declined. In addition, there are a number of empirical

23   issues with historical returns that indicate these returns are poor measures of

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1   expected future returns.

2

3   **Q85.** ***PLEASE DISCUSS THE ERRORS IN USING HISTORIC STOCK AND***

4   ***BOND RETURNS TO ESTIMATE AN EQUITY RISK PREMIUM.***

5   **A85.** There are a number of flaws in using historic returns over long time periods to

6   estimate expected equity risk premiums. These issues include:

7   (A)   Biased historical bond returns;

8   (B)   The arithmetic versus the geometric mean return;

9   (C)   The large error in measuring the equity risk premium using historical returns;

10   (D)   Unattainable and biased historical stock returns;

11   (E)   Company Survivorship bias;

12   (F)   The "Peso Problem" - U.S. stock market survivorship bias;

13   (G)   Market conditions today are significantly different than the past; and

14   (H)   Changes in risk and return in the markets.

15   These issues will be addressed in order.

16

17   **D.   Biased Historical Bond Returns**

18   **Q86.** ***HOW ARE HISTORICAL BOND RETURNS BIASED?***

19   **A86.** An essential assumption of these studies is that over long periods of time investors'

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

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

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

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

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1   **E.   The Arithmetic versus the Geometric Mean Return**

2   *Q87. PLEASE DISCUSS THE ISSUE RELATING TO THE USE OF THE*

3   *ARITHMETIC VERSUS THE GEOMETRIC MEAN RETURNS IN THE*

4   *IBBOTSON METHODOLOGY.*

5   *A87.* The measure of investment return has a significant effect on the interpretation of

6   the risk premium results. When analyzing a single security price series over time

7   (i.e., a time series), the best measure of investment performance is the geometric

8   mean return. Using the arithmetic mean overstates the return experienced by

9   investors. In a study entitled "Risk and Return on Equity: The Use and Misuse of

10   Historical Estimates," Carleton and Lakonishok make the following observation:

11   "The geometric mean measures the changes in wealth over more than one period

12   on a buy and hold (with dividends invested) strategy."[27] Since Dr. Vilbert's study

13   covers more than one period (and he assumes that dividends are reinvested), he

14   should be employing the geometric mean and not the arithmetic mean.

15

16   *Q88. PLEASE PROVIDE AN EXAMPLE DEMONSTRATING THE PROBLEM*

17   *WITH USING THE ARITHMETIC MEAN RETURN.*

18   *A88.* To demonstrate the upward bias of the arithmetic mean, consider the following

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

20          $100 today, increases to $200 in one year, and then falls back to $100 in two

21   years. The table below shows the prices and returns.

---

[27] Willard T. Carleton and Josef Lakonishok, "Risk and Return on Equity: The Use and Misuse of Historical Estimates," *Financial Analysts Journal* (January-February, 1985), pp. 38-47.

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

1

2 The arithmetic mean return is simply (100 percent + (-50 percent))/2 = 25 percent

3 per year. The geometric mean return is $((2 * .50)^{(1/2)}) - 1 = 0$ percent per year.

4 Therefore, the arithmetic mean return suggests that your stock has appreciated at

5 an annual rate of 25 percent, while the geometric mean return indicates an annual

6 return of 0 percent. This shows the upward bias of the arithmetic mean. Since

7 after two years, your stock is still only worth $100, the geometric mean return is

8 the appropriate return measure. For this reason, when stock returns and earnings

9 growth rates are reported in the financial press, they are generally reported using

10 the geometric mean. As further evidence of the appropriate mean return measure,

11 the U.S. Securities and Exchange Commission requires equity mutual funds to

12 report historic return performance using geometric mean and not arithmetic mean

13 returns.[28] Therefore, Dr. Vilbert's arithmetic mean return measures are biased

14 and should be disregarded.

15

16 F.   The Large Error in Measuring the Equity Risk Premium Using

17   Historical Returns

18 *Q89. PLEASE DISCUSS THE LARGE ERROR IN MEASURING THE EQUITY*

19   *RISK PREMIUM USING HISTORICAL STOCK AND BOND RETURNS.*

20 *A89.* Measuring the equity risk premium using historical stock and bond return is subject

---

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

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1   to a very large forecasting error. For example, the long-term equity risk premium of

2   6.5 percent has a standard deviation of 20.6 percent. This may be interpreted in the

3   following way with respect to the historical distribution of the long-term equity risk

4   premium using a standard normal distribution and a 95 percent, +/- two standard

5   deviation confidence interval: We can say, with a 95 percent degree of confidence,

6   that the true equity risk premium is between -34.7 percent and +47.7 percent. As

7   such, Dr. Vilbert's historical equity risk premium is measured with a large degree of

8   error.

9

10 **G   Unattainable and Biased Historic Stock Returns**

11 *Q90.*   *YOU NOTE THAT HISTORIC STOCK RETURNS ARE BIASED USING*

12   *THE IBBOTSON METHODOLOGY. PLEASE ELABORATE.*

13 *A90.*   Returns developed using Ibbotson's methodology are computed on stock indexes

14   and therefore (1) cannot be reflective of expectations because these returns are

15   unattainable to investors and (2) produce biased results. This methodology assumes:

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

17   Monthly portfolio rebalancing presumes that investors rebalance their portfolios at

18   the end of each month in order to have an equal dollar amount invested in each

19   security at the beginning of each month. The assumption would obviously generate

20   extremely high transaction costs and thereby render these returns unattainable to

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1   investors. In addition an academic study demonstrates that the monthly portfolio

2   rebalancing assumption produces biased estimates of stock returns.[29]

3

4   Transaction costs themselves provide another bias in historic versus expected

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

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

7   higher transaction costs are reflected through the higher commissions on stock

8   trades and the lack of low cost mutual funds like index funds.

9

10   **H.   Company Survivorship Bias**

11   *Q91.   HOW DOES COMPANY SURVIVORSHIP BIAS AFFECT DR. VILBERT'S*

12   *HISTORIC EQUITY RISK PREMIUM?*

13   *91A.*   Using historic data to estimate an equity risk premium suffers from company

14   survivorship bias. Company survivorship bias results when using returns from

15   indexes like the S&P 500. The S&P 500 includes only companies that have

16   survived. The returns of firms that did not perform so well have been dropped

17   from these indexes and therefore are not reflected in the index returns. Therefore,

18   these stock returns are upwardly biased because they only reflect the returns from

19   more successful companies.

20

---

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

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1   **I.   The "Peso Problem" - U.S. Stock Market Survivorship Bias**

2   *Q92.   WHAT IS THE "PESO PROBLEM," AND HOW DOES IT RELATE TO*

3   *SURVIVORSHIP BIAS IN U. S. STOCK MARKET RETURNS?*

4   *A92.*   Dr. Vilbert's use of historic return data also suffers from the so-called "Peso

5   Problem," which is also known as U.S. stock market survivorship bias. The "peso

6   problem" issue was first highlighted by the Nobel laureate, Milton Friedman, and

7   gets its name from conditions related to the Mexican peso market in the early

8   1970s. This issue involves the fact that past stock market returns were higher

9   than were expected at the time because despite war, depression, and other social,

10   political, and economic events, the U.S. economy survived and did not suffer

11   hyperinflation, invasion, and/or the calamities of other countries. As such, highly

12   improbable events, which may or may not occur in the future, are factored into

13   stock prices, leading to seemingly low valuations. Higher than expected stock

14   returns are then earned when these events do not subsequently occur. Therefore,

15   the "peso problem" indicates that historic stock returns are overstated as measures

16   of expected returns because the U.S. markets have not experienced the disruptions

17   and therefore have achieved higher historic returns than other major markets

18   around the world.

19

20   **J.   Market Conditions Today are Significantly Different than in the Past**

21 *Q93.   FROM AN EQUITY RISK PREMIUM PERSPECTIVE, PLEASE DISCUSS*

22   *HOW MARKET CONDITIONS ARE DIFFERENT TODAY.*

23 *A93.*   The equity risk premium is based on expectations of the future. When past market

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

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

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

4   are relatively low, compared to historic levels. Therefore, given the high stock

5   prices and low interest rates, expected returns are likely to be lower on a going

6   forward basis.

7

8   **K.   Changes in Risk and Return in the Markets**

9   *Q94. PLEASE DISCUSS THE NOTION THAT HISTORIC EQUITY RISK*

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

11 *RETURN IN TODAY'S FINANCIAL MARKETS.*

12 *A94.* The historic equity risk premium methodology is unrealistic in that it makes the

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

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

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

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

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

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

19 recent years.

20

21 Page 1 of Exhibit JRW-8 provides the yields on long-term U.S. Treasury Bonds

22 from 1926 to 2007. One very obvious observation from this graph is that interest

23 rates increase dramatically from the mid-1960s until the early 1980s and have

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1   since returned to their 1960 levels. The annual market risk premiums for the 1926

2   to 2007 period are provided on page 2 of Exhibit JRW-8. The annual market risk

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

4   U.S. Treasury Bonds. There is considerable variability in this series and a clear

5   decline in recent decades. The high was 54 percent in 1933, and the low was -38

6   percent in 1931. Evidence of a change in the relative riskiness of bonds and

7   stocks is provided on page 3 of Exhibit JRW-8, which plots the standard deviation

8   of monthly stock and bond returns since 1930. The plot shows that, whereas

9   stock returns were much more volatile than bond returns from the 1930s to the

10   1970s, bond returns became more variable than stock returns during the 1980s.

11   Over the last twenty years, stocks and bonds have become much more similar in

12   terms of volatility, but stocks are still a little more volatile. The decrease in the

13   volatility of stocks relative to bonds over time has been attributed to several stock

14   related factors: (1) the impact of technology on productivity and the new

15   economy; (2) the role of information (see former Federal Reserve Chairman

16   Greenspan's comments on pages 8-9 in this testimony) on the economy and

17   markets; (3) better cost and risk management by businesses; (4) several bond

18   related factors; (5) deregulation of the financial system; (6) inflation fears and

19   interest rates; and (7) the increase in the use of debt financing. Further evidence

20   of the greater relative riskiness of bonds is shown on page 4 of Exhibit JRW-8,

21   which plots real interest rates (the nominal interest rate minus inflation) from

22   1926 to 2007. Real rates have been well above historic norms during the past 10-

23   15 years. These high real interest rates reflect the fact that investors view bonds

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1   as riskier investments.

2

3   The net effect of the change in risk and return has been a significant decrease in the

4   return premium that stock investors require over bond yields. In short, the equity or

5   market risk premium has declined in recent years. This decline has been discovered

6   in studies by leading academic scholars and investment firms, and has been

7   acknowledged by government regulators such as ex- Federal Reserve Chairman

8   Greenspan. As such, using a historic equity risk premium analysis is simply

9   outdated and not reflective of current investor expectations and investment

10   fundamentals.

11

12   *Q95.* **DO YOU HAVE ANY OTHER THOUGHTS ON THE USE OF HISTORICAL**

13   **RETURN DATA TO ESTIMATE AN EQUITY RISK PREMIUM?**

14   *A95.* Yes. Jay Ritter, a Professor of Finance at the University of Florida, identified the

15   use of historical stock and bond return data to estimate a forward-looking equity

16   risk premium as one of the "Biggest Mistakes" taught by the finance profession.[30]

17   His argument is based on the theory behind the equity risk premium, the excessive

18   results produced by historical returns, and the previously-discussed errors such as

19   survivorship bias in historical data.

20

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[30] Jay Ritter, "The Biggest Mistakes We Teach," *Journal of Financial Research* (Summer 2002).

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1   *Q96.*   *PLEASE PROVIDE A SUMMARY ASSESSMENT OF THE EQUITY RISK*

2   *PREMIUM IN DR. VILBERT'S CAPM/ECAPM ANALYSES.*

3   *A96.*   In using an equity risk premiums derived from historical stock and bond returns,

4   Dr. Vilbert has used an outdated approach which ignores twenty years of academic

5   and professional research on the equity risk premium. As discussed above on

6   pages 82-91, estimating equity risk premium using historical returns is subject to

7   a myriad of empirical errors and ignores current market conditions. In contrast, I

8   have employed an equity risk premium that reflects the results of thirty

9   professional and academic studies and surveys. These studies incorporate the

10   three approaches to estimating the equity risk premium: (1) using historical stock

11   and bond returns, (2) developing ex-ante expected market returns and equity risk

12   premiums from fundamental data (primarily earnings and dividends), and (3)

13   employing surveys of financial professionals. This research includes the results on

14   the equity risk premium as discovered in studies from leading scholars in finance,

15   investment banks and consulting firms as well as surveys of CFOs, academics, and

16   financial forecasters.

17

18   Dr. Vilbert's approach to estimating an equity risk premium is especially out of

19   touch with the real world of finance. Investment banks, consulting firms, and

20   CFOs use the equity risk premium concept every day in making financing,

21   investment, and valuation decisions. These financial professionals are well aware

22   of the annual Ibbotson historic risk premium results. Nonetheless, the results of

23   studies and surveys from the real world of finance indicate an equity risk

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1   premium in the 4 percent range and not in the 7 percent range. Hence, Dr.

2   Vilbert's equity risk premium approach is outdated and is not reflective of how

3   financial professionals in the real world view and employ the equity risk

4   premium.

5

6   **VIII.   CRITIQUE OF STAFF REPORT**

7   *Q97.   PLEASE SUMMARIZE THE COST OF CAPITAL STUDY PERFORMED BY*

8   *THE STAFF OF THE PUBLIC UTILITIES COMMISSION OF OHIO.*

9   *A97.*   The Staff's cost of capital recommendation for DEO is summarized in the table

10   below.

11

12
Staff Report Rate of Return

	Capital Ratios	Cost Rate	Weighted Cost Rate
Debt	48.66 %	6.50 %	3.16 %
Common Equity	51.34 %	9.85 %-10.88 %	5.06 %-5.59 %
Total	100.00 %		8.22 %-8.75 %

13
14
15   The Staff uses a proxy group of only five companies. Of the five companies, only

16   National Fuel Gas Corporation (NFG) is not part of the proxy groups used by Dr.

17   Vilbert and myself. The Staff recommends a hypothetical capital structure which is

18   the average book value capital structure of the five companies in the Staff's proxy

19   group. The Staff adopts DEO's long-term debt cost rate of 6.50 percent.

20

21   The Staff's equity cost rate range uses a range of 9.85 percent to 10.88 percent is

22   the average of their DCF and CAPM results, adjusted for flotation costs. The

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1   Staff arrives at this range in the following manner. The Staff's recommendation

2   is based on the average of their CAPM (9.96 percent) and DCF (10.26 percent)

3   results, which is 10.11 percent. The Staff uses a 100 basis point range (+/- 50

4   BPs) around this result, to arrive at a range of 9.61 percent to 10.61 percent. The

5   Staff then applies a flotation cost adjustment factor of 1.02523 to this range to

6   arrive at the final recommended range of 9.85 percent to 10.88 percent.[31]

7   The Staff's Equity cost rate approaches are summarized below:

8

9   <u>CAPM Approach – 9.96 percent</u>
10

RF	4.44 percent	Average of 10- and 30- year Treasuries – one year
Beta	0.85	Value Line
Equity RP	6.5 percent	Ibbotson arithmetic means

15   <u>DCF Approach – 10.26 percent</u>
16

17   Staff uses a non-constant DCF model applied to each of the five proxy companies
18   using:
19

Dividends	Sum of past four quarters
Stock Price	One-year average annual stock price
Years 1-5 Growth Rate	Average of projected EPS growth from Reuters, Yahoo, MSN, and Value Line
Years 6-25 Growth Rate	Linear change from Years 1-5 growth rate to Year 25- growth rate
Years 25- Growth Rate	Long-term growth rate in GNP from 1929-2005 as provided by US Dept. of Commerce

30   *Q98.*   *PLEASE PROVIDE YOUR ASSESSMENT OF THE STAFF'S COST OF*

31   *CAPITAL STUDY.*

32   *A98.*   The errors in the Staff's cost of capital study include:

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[31] Staff Report, May 23, 2008, p. 22.

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1   Capital Structure and Debt Cost Rate

2   The Staff employs a hypothetical capital structure which is the average book value

3   capital structure of the proxy group and then adopts the debt cost rate of DEO.

4   There are two errors to this approach. First, the capitalization used for rate making

5   purposes should reflect the capital structure used to attract and raise capital for the

6   Company. This is DRI's capital structure, and not a hypothetical capital structure.

7   Second, there must be synchronization between the adopted capital structure and the

8   cost of debt capital. By using the capital structure for the proxy companies and

9   DEO's debt cost rate, the Staff's capital structure and debt cost rate are not

10   synchronized.

11

12   In addition, the hypothetical capital structure developed by the Staff is against

13   precedent established in Commission proceedings[32] The Commission has stated:

14   A hypothetical capital structure produces distorted results because

15   the costs associated with the various components of the capital

16   structure are a function of the existing capitalization.

17   * * *

18   In addition, because a potential investor considers actual capital

19   structure in making his or her investment decisions, the use of a

20   *hypothetical capital* structure, which does not necessarily

---

[32] *In re Toledo Edison Company*, Case No. 81-620-EL-AIR, Order (June 9, 1982) ("To treat the exchange as if it had not occurred . . . would require us to determine the weighted cost of capital with reference to a *hypothetical capital* structure, a measure we have consistently rejected . . . . Further, such an approach runs afoul of the provision of §4909.15(D)(2)(a), Revised Code, which requires the commission to employ a cost rate for debt which reflects the actual embedded cost of debt of the utility in question for purposes of the rate of return determination." Emphasis sic.).

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1   correspond to the applicant's capital structure at any point in time,

2   is inappropriate.[33]

3

4   <u>CAPM</u>

5   The primary error in the staff's CAPM analysis is the equity risk premium of 6.5

6   percent which is the Ibbotson historic equity risk premium which is based on the

7   difference in the arithmetic mean stock and bond returns between 1926 and 2007.

8   As discussed at length above, this approach is subject to a myriad of empirical errors

9   which make these historical returns poor measures of expected returns. As

10   discussed earlier in my testimony, the use of historical return to estimate an

11   expected risk premium can be erroneous because (1) ex post returns are not the

12   same as ex ante expectations, (2) market risk premiums can change over time,

13   increasing when investors become more risk-averse, and decreasing when

14   investors become less risk-averse, and (3) market conditions can change such that

15   ex post historical returns are poor estimates of ex ante expectations. Furthermore,

16   there are a number of flaws in using historical returns over long time periods to

17   estimate expected equity risk premiums. These issues, as discussed *in my*

18   testimony, include: (1) historical bond returns are downward biased; (2) there are

19   measurement problems with the arithmetic mean return; (3) there is a very large

20   measurement error is the equity risk premium measured using historical stock and

21   bond returns; (4) historical stock returns are unattainable and upwardly biased; (5)

22   historic stock returns include only companies that have survived ("survivorship

---

[33] *In re Dayton Power and Light Company,* Case No. 81-1256-EL-AIR, Order (December 22, 1982), 50
P.U.R.4th 457, 472-473.

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1   bias"); (6) the stock market in the U.S. in the twentieth century was extremely

2   successful and did not suffer the calamities of other markets around the world ("Peso

3   Problem"); (7) capital market conditions today are significantly different than they

4   were in the past; and (8) the relative risk of stocks and bonds have changed over

5   time, with stocks becoming less risky and bonds becoming more riskier.

6

7   In sum, The Staff makes the same error as Dr. Vilbert by using an equity risk

8   premium based on historical stock and bond returns. This approach is outdated,

9   ignores twenty years of academic and professional research on the equity risk

10   premium, and is out of touch with the real world of finance. As indicated earlier in

11   my testimony, investment banks, consulting firms, and CFOs use the equity risk

12   premium concept every day in making financing, investment, and valuation

13   decisions and their research indicates an equity risk premium in the 4 percent range

14   is appropriate.

15

16   DCF

17   There are two errors in the Staff's DCF analysis. First, the Staff uses a Year 1-5

18   DCF growth rate equal to the average of projected EPS growth from Reuters,

19   Yahoo!, MSN, and *Value Line*. I provide ample evidence earlier in my testimony

20   that the projected EPS growth rate forecasts of Wall Street analysts (as provided

21   by Reuters, Yahoo, MSN) and *Value Line* are upwardly biased measures of future

22   earnings. As such, using these growth rates as the expected growth provides an

23   overstated DCF equity cost rate. Second, the Staff had provided no theoretical or

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1   empirical support to justify using the projected GNP growth rate as the expected

2   DCF growth rate for years 25 and forward. Without theoretical or empirical

3   support, there is no reason for investors to expect GNP growth to reflect the

4   expected long-term dividend and earnings growth rate for gas companies.

5

6   Flotation Costs

7   The Staff adjusts their CAPM and DCF equity cost rates for flotation costs by

8   applying an adjustment factor of 1.02523. This adjustment factor is erroneous for

9   several reasons. First, Staff has not identified any actual flotation costs for the

10   Company, and the Company has not requested a flotation cost adjustment.

11   Therefore, the Staff is recommending that the Company receives annual revenues

12   in the form of a higher return on equity for flotation costs that have not been

13   identified by either the Staff or the Company. Second, it is commonly argued that

14   a flotation cost adjustment (such as that used by Staff) is necessary to prevent the

15   dilution of the existing shareholders. In this situation, a floatation cost adjustment

16   is justified by reference to bonds and the manner in which issuance costs are

17   recovered by including the amortization of bond flotation costs in annual

18   financing costs. However, this argument is incorrect for several reasons:

19   (1) If an equity flotation cost adjustment is similar to a debt flotation cost

20   adjustment, the fact that the market-to-book ratios for gas companies are nearly

21   2.0 actually suggests that there should be a flotation cost reduction (and not

22   increase) to the equity cost rate. This occurs because when (a) a bond is issued at

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1   a price in excess of face or book value, and (b) the difference between market

2   price and the book value is greater than the flotation or issuance costs, the cost of

3   that debt lower than the coupon rate of the debt. Since market values are almost

4   twice book values for gas companies (see page 1 of Exhibit JRW-2), the amount

5   by which market values of gas companies are in excess of book values is much

6   greater than flotation costs. Hence, if common stock flotation costs were exactly

7   like bond flotation costs, and one was making an explicit flotation cost adjustment

8   to the cost of common equity, the adjustment would be downward;

9   (2) If a flotation cost adjustment is needed to prevent dilution of existing

10   stockholders' investment, then the reduction of the book value of stockholder

11   investment associated with flotation costs can occur only when a company's stock

12   is selling at a market price at/or below its book value. As noted above, gas

13   companies are selling at market prices well in excess of book value. Hence, when

14   new shares are sold, existing shareholders realize an increase in the book value

15   per share of their investment, not a decrease;

16   (3) Flotation costs consist primarily of the underwriting spread or fee and not out-

17   of-pocket expenses. On a per share basis, the underwriting spread is the

18   difference between the price the investment banker receives from investors and

19   the price the investment banker pays to the company. Hence, these are not

20   expenses that must be recovered through the regulatory process. Furthermore, the

21   underwriting spread is known to the investors who are buying the new issue of

22   stock, who are well aware of the difference between the price they are paying to

23   buy the stock and the price that the Company is receiving. The offering price

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1   which they pay is what matters when investors decide to buy a stock based on its

2   expected return and risk prospects. Therefore, the company is not entitled to an

3   adjustment to the allowed return to account for those costs; and

4   (4) Flotation costs, in the form of the underwriting spread, are a form of a

5   transaction cost in the market. They represent the difference between the price

6   paid by investors and the amount received by the issuing company. Whereas the

7   Staff believes that the Company should be compensated for these transactions

8   costs, they have not accounted for other market transaction costs in determining a

9   cost of equity for the Company. Most notably, brokerage fees that investors pay

10   when they buy shares in the open market are another market transaction cost.

11   Brokerage fees increase the effective stock price paid by investors to buy shares.

12   If the Staff had included these brokerage fees or transaction costs in their DCF

13   analysis, the higher effective stock prices paid for stocks would lead to lower

14   dividend yields and equity cost rates. This would result in a downward

15   adjustment to their DCF equity cost rate.

16

17   Failure to Reduce the Recommended ROE

18   *Q99. HAVE THE COMPANY AND STAFF RECOMMENDED A REVENUE*

19   *DECOUPLING MECHANISM IN THIS CASE?*

20   *A99.* Yes.   The Company has proposed a revenue decoupling mechanism which

21   would reduce revenue volatility. However, Staff rejected the proposed revenue

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1   decoupling mechanism in favor of the adoption of a straight-fixed variable

2   ("SFV") rate design which they maintain would serve the same purpose.[34]

3

4   *Q100. HAS THE COMPANY PROPOSED ANY OTHER RISK REDUCING*

5   *MECHANISM TO BE CONSIDERED BY THE COMMISSION IN THIS*

6   *CASE?*

7   *A100.* Yes. The Company filed Case No. 08-169-GA-ALT requesting an automatic

8   recovery of costs associated with a Pipeline Infrastructure Replacement Program

9   ("PIRP") which, if approved, would provide the Company further revenue

10   stability and reduce the risks that the Company faces with respect to revenues and

11   cost recovery.

12

13   *Q101. HAS THE STAFF RECOGNIZED THAT THE PIRP WOULD REDUCE THE*

14   *RISKS THAT THE COMPANY FACES WITH RESPECT TO REVENUES*

15   *AND COST RECOVERY?*

16   *A101.* Yes. Staff unambiguously recognized that the adoption of the PIRP would reduce

17   the risks faced by the Company with respect to revenues and cost recovery as

18   stated on page 22 of the Staff Report.

19

20   *Q102. WHAT IS THE STAFF AND COMMISSION POSITION REGARDING THE*

21   *GOALS OF THE SFV AND REVENUE DECOUPLING?*

22   *A102.* On page 22 of the Staff Report, Staff states that "in response to the Company's

---

[34] Staff Report, May 23, 2008, page 22.

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1   [revenue decoupling] proposal, the Staff is advocating adoption of a straight-fixed

2   variable rate design that would serve the same purpose." Further, the Commission

3   recent decision in Case No. 07-589-GA-AIR[35] provides more evidence that the

4   Commission believes that SFV is a type of revenue decoupling mechanism which

5   achieves the same goals as a conventional revenue decoupling mechanism, which

6   are revenues and earnings stability and certainty in cost recovery.

7

8   *Q103. DO YOU BELIEVE THAT THE ADOPTION OF AN SFV OR A REVENUE*

9   *DECOUPLING MECHANISM SHOULD RESULT IN A SIMILAR*

10   *REDUCTION IN RETURN ON EQUITY?*

11   *A103.* Yes. Both mechanisms guarantee that the Company's revenues and earnings are

12   stable, eliminate the need for frequent rate cases and rate case expenses; and

13   insure certainty in cost recovery.

14

15   *Q104. HAVE THE COMPANY AND STAFF RECOMMENDED ANY*

16   *ADJUSTMENT IN THE RETURN ON EQUITY IN THE EVENT THE*

17   *COMMISSION APPROVED THE PROPOSED PIRP, REVENUE*

18   *DECOUPLING OR SFV?*

19   *A104.* No. Even though Staff recognized that the PIRP and the SFV mechanisms would

---

[35] Case No. 07-0589-GA-AIR et al, Opinion and Order, page 18 (May 28, 2008) reads: "The Commission, therefore, concludes that a rate design which separates or "decouples" a gas company's recovery of its cost of delivering the gas from the amount of gas customers actually consume is necessary to align the new market realities with important regulatory objectives... On balance, the Commission finds the levelized rate design advocated by Duke and Staff to be preferable to a decoupling rider. Both methods would address revenue and earnings stability issues in that the fixed costs of delivering gas to the home will be recovered regardless of consumption."

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1   reduce the risks that the Company faces with respect to revenues and cost

2   recovery and concluded that "[i]nasmuch as the costs of capital reflect risks, the

3   reductions in business and regulatory risks should be considered,"[36] no downward

4   adjustment to the recommended return on equity was proposed.

5

6   *Q105. HAVE STATE UTILITY COMMISSIONS RECOGNIZED THE IMPACT OF*

7   *DECOUPLING ON THE COST OF EQUITY?*

8   *A105.* Yes. State Regulatory Commissions have begun to reflect the impact of

9   decoupling mechanisms on allowed return on equity levels for public utility

10   companies.

11

12   *Q106. CAN YOU GIVE EXAMPLES OF STATE COMMISSION DECISIONS THAT*

13   *MAKE THIS ADJUSTMENT TO ALLOWED ROE LEVELS?*

14   *A106.* Yes. In a December 22, 2006 Decision in Docket Nos. 7175 and 7176, the

15   Vermont Public Service Board reduced the Green Mountain Power Corporation's

16   allowed ROE by 50 basis points for the adoption of an alternative regulation plan

17   that included a decoupling mechanism.

18   In a July 19, 2007 Decision in Order No. 81517 Case No. 9092, the Maryland

19   Public Service Commission adjusted Potomac Electric Power Company's

20   authorized ROE downward by 50 basis points to reflect reduced risk associated

21   with a decoupling mechanism.

22

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[36] Id.

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1   On the same date, the Maryland Public Service Commission in Order No. 81518

2   Case No. 9093 also reduced the authorized ROE by 50 basis points for the

3   Delmarva Power & Light Company due to the adoption of a decoupling

4   mechanism.

5

6   *Q107. WHAT IS YOUR RECOMMENDATION IF THE COMPANY'S*

7   *DECOUPLING PROPOSAL, THE STAFF'S PROPOSED SFV OR THE PIRP*

8   *IS APPROVED BY THE COMMISSION?*

9   *A107.* If the decoupling proposal or the proposed SFV is adopted as a permanent

10   decoupling mechanism or rate design by the Commission, I recommend that the

11   Company's equity cost rate be reduced by 25 basis points to recognize the

12   reduction in business risk of the Company. I also recommend that an additional

13   25 basis points be reduced from the Company's approved ROE if the Commission

14   approves the pending PIRP proposed by DEO in Case No. 07-830-GA-ALT.

15

16   IX.   CONCLUSION

17   *Q108. DOES THIS CONCLUDE YOUR TESTIMONY?*

18   *A108.* Yes. However, I reserve the right to address new issues and incorporate new

19   information that may subsequently become available through outstanding

20   discovery or otherwise. Additionally, I reserve the right to supplement my

21   testimony in the event that the Staff fails to support the recommendations it has

22   made in the Staff Report filed with this Commission on May 23, 2008.

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 Televisions' *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 new textbook entitled *Applied Principles of Finance* (Kendall Hunt, 2006). Dr. Woolridge is a founder and a managing director of 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-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),

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).

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), and Cincinnati Gas & Electric Company (Case No. 05-0059-EL-AIR).

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

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

Florida: Dr. Woolridge prepared testimony for the Office of Public Counsel in Florida: Florida Power & Light Co.

(Docket No. 050045-EL).

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).

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), and Connecticut Light and Power Company (Docket No. 07-07-01).

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), and Southern California Edison (Docket No. 07-05-003).

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 (Case No. 2007-00089), Kentucky-American Water Company (Case No. 2007-00143).

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).

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).

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).

The East Ohio Gas Company d/b/a Dominion East Ohio
Case No. 07-0829-GA-AIR
Response to Data Requests

Requesting Party:

OCC

Data Request Set:

Request to Produce - 6th Set

Question Number:	**Subpart:**
135	

Request Date:	**Due Date:**
02/25/2008	03/18/2008

Topic:

Section D - Rate of Return

Question:

With reference to page 10, lines 2-19 of Dr. Vilbert's testimony, please:

(a) List all regulatory cases (by name, docket number, and filing date) in which Dr. Vilbert has provided rate of return testimony and proposed computing a cost of capital using a market value capital structure;

(b) Indicate all cases (by name, docket number, and date), in which a regulatory commission has adopted Dr. Vilbert's recommendation of computing a cost of capital using a market value capital structure in arriving at an overall rate of return; and

(c) Provide copies of the 'Rate of Return' section of the Commission's decisions for all cases in which a regulatory commission has adopted Dr. Vilbert's recommendation of computing a cost of capital using a market value capital structure the adjustment.

Answer:

(a) Please refer to Appendix A of Dr. Vilbert's testimony for a list of proceedings in which Dr. Vilbert has testified. Dr. Vilbert has always used the same ATWACC methodology to adjust for differences in financial risk as is used in this proceeding. When testifying before the FERC, Dr. Vilbert replicates the FERC's specified DCF method as required by that commission.

(b) DEO objects to this interrogatory on the ground that the term "adopted" is vague and undefined. Subject to and without waiving this objection, DEO answers as follows: In Dr. Vilbert's experience, regulatory decisions are frequently not specific as to how the allowed rate of return was determined, and Dr. Vilbert is not aware of any decision which specifically and expressly states that a regulatory commission "adopts" the ATWACC method as used by Dr. Vilbert in this proceeding. Some regulators (for example, the Canadian National Energy Board), however, have acknowledged the theoretical strength of the approach, and this approach is used in Australia, New Zealand and England. See, for example, "Government owned corporations – Cost of Capital Principles,"

Queensland Government Treasury, The State of Queensland, February 2006;
"Estimating the Cost of Capital for Crown Entities and State-Owned
Enterprises. A Handbook Prepared for Treasury Staff." The New Zealand
Treasury, published by The Treasury, October 1997 (Status: Current as of April
16, 2008); and "Economic regulation and the Cost of Capital – Annex," Civil
Aviation Authority, London, UK, November 2001.

(c) Please see the response and objection to part (b) of this data request.

Preparer Of Response: **Date Prepared:**
Jeff Murphy   02/26/2008 08:33:30 AM EST

Attachments:
No

The East Ohio Gas Company d/b/a Dominion East Ohio
Case No. 07-0829-GA-AIR
Response to Data Requests

Requesting Party:
OCC

Data Request Set:
Request to Produce - 6th Set

Question Number: **Subpart:**
140

Request Date: **Due Date:**
02/25/2008   03/18/2008

Topic:
Section D - Rate of Return

Question:
With reference to page 23, line 8 to page 24, line 15, and Appendix C and Table
MJV-C1 of Dr. Vilbert's testimony, please:
(a) Provide copies of all theoretical and empirical studies that support the
use of the 'empirical CAPM';
(b) Provide copies of all studies used to justify the magnitude of the alpha
used in the ECAPM;
(c) Indicate the page number in the study in (2) which shows the alpha used;
and
(d) Provide an explanation of the methodology used to compute the Betas in
each of the studies provided in response to OCC Request for Production of
Documents No. 135(b).

Answer:
Refer to attachment.

Preparer Of Response: **Date Prepared:**
Jeff Murphy   02/26/2008 08:38:41 AM EST

Attachments:
Yes
Attachment Names:
Response#140.pdf

(a)   DEO objects to this interrogatory on the ground that it is overbroad and seeks a universal and unlimited set of studies. Subject to and without waiving this objection, DEO answers as follows: A representative sample of articles supporting the ECAPM is listed in Table MJV-C1 at the end of Appendix C of Dr. Vilbert's testimony.

(b)   See response to part (a) of this request.

(c)   The tables referenced in the studies are provided below. They contain estimates which, in the context of each studies specific implementation, can be used to determine alphas implied for the ECAPM model as implemented in Dr. Vilbert's Direct Testimony.

Note: All the following academic studies, except Pettengill, Sundaram, & Mathur, 1995, use 30-day risk-free rate. Pettengill, et al. uses the 90-day rate.

Fisher Black, 1993

Exhibits 2. 3. 4. for period 1931-1991.
  $\hat{\alpha}$ ranges from −3.6% to 3.6%

Look at table 4 for full period :
  Alpha = 1% for betas in 0 - .80 range
  Alpha = 1% − 3% for betas in range 1.20 and up.

Black, Jensen & Scholes, 1972

Figures 1 − 5:

Graphs of excess monthly returns vs. β s

Table 4	γ_0
1931-1965	0.00359*12 = 4.31%
1931-1939	-0.00801*12 = -9.61%
1939-1948	0.00439*12 = 5.27%
1948-1957	0.00777*12 = 9.32%
1957-1965	0.01020*12 = 12.24%

Fama & MacBeth, 1973

Cross-sectional regressions:

Table 4	$\bar{\bar{\gamma}}_0$	Risk-free Rate	$(\bar{\bar{\gamma}}_0 - r_f)*12$
1935-1968	0.0061	0.0013	5.76%
1935-1945	0.0039	0.0002	4.44%
1946-1955	0.0087	0.0009	9.36%
1956-1968	0.0060	0.0026	4.08%

Fama & French, 1992

Cross-sectional regressions:

Table AIV	a	r_f	$a - r_f$
1941-1990	0.98*12 = 11.76%	4.44%	7.32%
1941-1965	0.84*12 = 10.08%	1.64%	8.44%
1966-1990	1.13*12 = 13.56%	7.24%	6.32%

Risk-free rate from Ibbotson.

Litzenberger & Ramaswamy, 1979

Before Tax Version (1936-1977):

Table 1	$\hat{\gamma}_0'$
OLS	0.00681*12 = 8.17%
GLS	0.00516*12 = 6.19%
MLE	0.00443*12 = 5.32%

Pettengill, Sundaram, & Mathur, 1995

Risk-free rate is the 90-day rate. Cross-sectional regression:

$$\hat{\gamma}_0 \quad r_f$$

Table 6 $9.1\% - 4.5\% = 4.6\%$

The average 3-month Treasury (auction high, no TCM going back to 1936) from 1941 to 1990 is 4.5%. The average 1-month risk-free rate from Ibbotson is 4.04%.

Litzenberger, Ramaswamy & Sosin, 1980
1926-1978 monthly data

Note: r_u is excess return in the paper

Table 1	Bayesian :	$\hat{\alpha} = \bar{r}_0 = 0.136*12 = 1.63\%$
	Raw:	$\hat{\alpha}' = 0.326*12 = 3.912\%$

Table 2	Bayesian :	$\hat{\alpha}' = 0.321*12 = 3.85\%$
	Raw:	$\hat{\alpha}' = 0.420*12 = 5.04\%$

Table 1 is estimated based on a consistent estimation technique while the higher numbers in Table 2 are based on inconsistent GLS estimation techniques.

(d) Dr. Vilbert relies on betas estimated by *Value Line* whenever such betas are available for the sample companies. Whenever betas are not available from *Value Line*, Dr. Vilbert estimates beta by regressing the excess returns on the company against the excess return on the market using standard regression analysis. He uses the returns on the S&P500 Index as the market proxy and the 30-day Treasury bill return as the risk free rate. (Note: Excess returns are the returns in excess of the return on 30-day Treasury bills.) In Canada, the market proxy is the TSX index and Canadian Treasury bills.

The East Ohio Gas Company d/b/a Dominion East Ohio
Case No. 07-0829-GA-AIR
Response to Data Requests

Requesting Party:
OCC

Data Request Set:
Request to Produce - 6th Set

Question Number: **Subpart:**
141   /

Request Date: **Due Date:**
02/25/2008   03/18/2008

Topic:
Section D - Rate of Return

Question:
With reference to page 26, lines 20-21, and Appendix D of Dr. Vilbert's
testimony please provide copies of:
(a) All theoretical and empirical studies used to justify using the forecasted
GDP growth as the long-term DCF growth rate for gas distribution companies; and
(b) Copies of the source documents used for the GDP growth rate forecasts.

Answer:
(a) DEO objects to this interrogatory on the ground that it is overbroad and
seeks a universal and unlimited set of studies, and further that it does not
specify by whom the studies are or were used. Subject to and without waiving
this objection, DEO answers as follows: Please refer to p. 37 of Dr. Vilbert's
Direct Testimony. As noted in Q&A 59 regarding the DCF model, there is
generally no publicly available information on the expected growth of earnings
or dividends for any period after year 5, but the DCF model requires
information on growth rates literally for an infinite period. To address this
issue analysts frequently use an estimate of forecast GDP growth as an estimate
of the long-term, but unobservable, growth rate of dividends and earnings in
the model. The rationale for such an assumption is that any company forecast
to grow faster (or slower) than the rest of the economy will become an
increasingly larger (or smaller) part of the economy in the future. Only a
forecast equal to the growth of GDP leaves the relative size of the company
unchanged within the economy.

(b) Please refer to Table No. MJV-6, note [9] for the source of the GDP growth
forecast, to which the March 10, 2007, edition of the Blue Chip Economic
Indicators is attached.

Preparer Of Response: **Date Prepared:**
Jeff Murphy   02/26/2008 08:39:35 AM EST

Attachments:

No

The East Ohio Gas Company d/b/a Dominion East Ohio
Case No. 07-0829-GA-AIR
Response to Data Requests

Requesting Party:
OCC

Data Request Set:
Request to Produce - 6th Set

Question Number: **Subpart:**
147

Request Date: **Due Date:**
02/25/2008   03/18/2008

Topic:
Section D - Rate of Return

Question:
With reference to page C-16, lines 16-19 of Dr. Vilbert's testimony, please
provide the methodology used by Value Line to compute beta, including the data
and market index employed, as well as any adjustments to historic beta
estimates.

Answer:
From responses that The Brattle Group has received from Value Line to inquiries
such as this, their estimation method is reported as follows:

The return on security I is regressed against the return on the New
York Stock Exchange Composite Index in the following form:

$$Ln(p\,It\,/\,pIt\text{-}1) = aI + BI * Ln(pm\,t\,/\,pmt\text{-}1)$$

Where:
pIt   - The price of security I at time t

pIt-1   - The price of security I one week before time t

pmt and pmt-1 are the corresponding values of the NYSE Composite
Index.

The natural log of the price ratio is used as an approximation of the return
and no adjustment is made for dividends paid during the week.

The regression estimate of beta, B I, is computed from data over the past five
years, so that 259 observations of weekly price changes are used.

Value Line adjusts its estimate of beta for regression by the method described
by Blume (1971). The reported beta is the adjusted beta computed as:

Adjusted BI = $0.35 + .67 * BI$

Preparer Of Response: **Date Prepared:**
Jeff Murphy   02/26/2008 08:45:09 AM EST

Attachments:
No

Exhibit JRW-1
Dominion East Ohio Company
Cost of Capital

As of March 31, 2007

Capital Source	Capital	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	16,467,054,606	54.33%	6.50%	3.53%
Preferred Stock	251,495,616	0.83%	6.25%	0.05%
Common Equity	13,592,347,823	44.84%	9.50%	4.26%
Total	$ 30,310,898,045	100.00%		7.84%

Exhibit JRW-2
Dominion East Ohio Company
Summary Financial Statistics

Panel A
Industry Gas Group

Company	Symbol	S&P Bond Rating	Market Cap ($B)	Operating Revenue ($mil)	Percent Gas Revenue	Net Plant ($mil)	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio*	Return on Equity	Price/ Earnings Ratio	Market to Book Ratio
AGL Resources	ATG	A-	2.7	2,494.0	67%	3,566.0	3.7	GA,VA	42	12.9%	12.5	1.58
Atmos Energy	ATO	BBB	2.4	5,953.3	56%	3,888.1	2.8	LA,KY,TX, CO,KS	47	8.1%	14.0	1.11
Laclede Group, Inc.	LG	A	0.8	2,023.4	55%	800.0	3.0	MO	40	12.0%	14.8	1.73
New Jersey Resources	NJR	AA-	1.3	3,091.4	34%	978.7	6.0	NJ,Canada	49	10.2%	19.5	1.95
Nicor, Inc.	GAS	AA-	1.5	3,176.3	83%	2,730.2	4.6	IL	52	15.3%	10.6	1.57
Northwest Natural Gas Company	NWN	AA-	1.1	1,033.2	98%	1,495.9	3.5	OR,WA	47	12.5%	15.3	1.90
Piedmont Natural Gas, Inc.	PNY	A	1.8	1,822.5	82%	2,158.9	4.0	NC,SC,TN	45	12.6%	16.6	2.09
South Jersey Industries	SJI	A	1.0	956.4	65%	948.9	4.8	NJ	50	13.6%	16.3	2.13
Southwest Gas	SWX	BBB-	1.1	2,152.1	84%	2,845.3	2.4	AZ,NV,CA	43	8.8%	13.9	1.17
WGL Holdings, Inc.	WGL	AA-	1.6	2,664.7	57%	2,161.6	5.7	DC,MD,VA	51	11.1%	14.4	1.58
Mean			1.5	2,536.7	68%	2,157.4	4.1		47	11.7%	14.8	1.68

Data Source: AUS *Utility Reports*, June, 2008; *Value Line Investment Survey*, 2008.

Panel B
Subsample Group

Company	Symbol	S&P Bond Rating	Market Cap ($B)	Operating Revenue ($mil)	Percent Gas Revenue	Net Plant ($mil)	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio*	Return on Equity	Price/ Earnings Ratio	Market to Book Ratio
Laclede Group, Inc.	LG	A	0.8	2,023.4	55%	800.0	3.0	MO	40	12.0%	14.8	1.73
Northwest Natural Gas Company	NWN	AA-	1.1	1,033.2	98%	1,495.9	3.5	OR,WA	47	12.5%	15.3	1.90
Piedmont Natural Gas, Inc.	PNY	A	1.8	1,822.5	82%	2,158.9	4.0	NC,SC,TN	45	12.6%	16.6	2.09
Southwest Gas	SWX	BBB-	1.1	2,152.1	84%	2,845.3	2.4	AZ,NV,CA	43	8.8%	13.9	1.17
WGL Holdings, Inc.	WGL	AA-	1.6	2,664.7	57%	2,161.6	5.7	DC,MD,VA	51	11.1%	14.4	1.58
Mean		A	1.3	1,939.2	75%	1,892.3	3.7		45	11.4%	15.0	1.69

Data Source: AUS *Utility Reports*, June, 2008; *Value Line Investment Survey*, 2008.

Exhibit JRW-2
Dominion East Ohio Company
Value Line **Risk Metrics**

Panel A
Industry Gas Group

Company	Beta	Safety	Financial Strength	Stock Price Stability	Price Growth Persistence	Earnings Predict
AGL Resources	0.85	2	B++	100	70	80
Atmos Energy	0.85	2	B+	100	25	80
Laclede Group, Inc.	0.90	2	B+	95	55	65
New Jersey Resources	0.85	1	A	100	70	55
Nicor, Inc.	1.00	3	A	90	25	75
Northwest Natural Gas Company	0.80	1	A	100	65	80
Piedmont Natural Gas, Inc.	0.85	2	B++	100	55	80
South Jersey Industries	0.80	2	B++	100	95	85
Southwest Gas	0.90	3	B	100	50	65
WGL Holdings, Inc.	0.85	1	A	100	50	65
Mean	0.87	2	B++	99	56	73

Dominion Resources, Inc.	0.80	2	B++	100	70	60

Data Source: *Value Line Investment Survey*, 2008.

Panel B
Subsample Group

Company	Beta	Safety	Financial Strength	Stock Price Stability	Price Growth Persistence	Earnings Predict
Laclede Group, Inc.	0.90	2	B+	95	55	65
Northwest Natural Gas Company	0.80	1	A	100	65	80
Piedmont Natural Gas, Inc.	0.85	2	B++	100	55	80
Southwest Gas	0.90	3	B	100	50	65
WGL Holdings, Inc.	0.85	1	A	100	50	65
Mean	0.86	2	B++	99	55	71

Data Source: *Value Line Investment Survey*, 2008.

Exhibit JRW-2
Dominion East Ohio Company
Value Line Risk Metrics

Beta - A relative measure of the historical sensitivity of the stock's price to overall fluctuations in the New York Stock Exchange Composite Index. A Beta of 1.50 indicates a stock tends to rise (or fall) 50% more than the New York Stock Exchange Composite Index. The "Beta coefficient" is derived from a regression analysis of the relationship between weekly percentage changes in the price of a stock and weekly percentage changes in the NYSE Index over a period of five years. In the case of shorter price histories, a smaller time period is used, but two years is the minimum. The Betas are adjusted for their long-term tendency to converge toward 1.00. Additionally, Value Line shows betas computed based on monthly total returns for the trailing three year, five-year and 10-year periods.

Safety Rank - A measurement of potential risk associated with individual common stocks. The Safety Rank is computed by averaging two other Value Line indexes - the Price Stability Index and the Financial strength Rating. Safety Ranks range from 1 (Highest) to 5 (Lowest). Conservative investors should try to limit their purchases to equities ranked 1 (Highest) and 2 (Above Average) for Safety.

Financial Strength Rating - A relative measure of financial strength of the companies reviewed by Value Line. The relative ratings range from A++ (strongest) down to C (weakest), in nine steps.

Price Stability Index - A measure of the stability of a stock's price. It includes sensitivity to the market (see Beta) as well as the stock's inherent volatility. Value Line Stability ratings range from 100 (highest) to 5 (lowest).

Price Growth Persistence - The historic tendency of a stock to show persistent growth compared with the average stock. Expressed as an index ranging from 100 (highest) to 5 (lowest) in increments of 5.

Earnings Predictability Index - A measure of the reliability of an earnings forecast. Predictability is based upon the stability of year-to-year comparisons, with recent years being weighted more heavily that earlier ones. The most reliable forecasts tend to be those with the highest rating (100); the least reliable, the lowest (5). The earnings stability is derived from the standard deviation of percentage changes in quarterly earnings over an eight-year period. Special adjustments are made for comparisons around zero and from plus to minus.

Exhibit JRW-3
Dominion East Ohio Company
Capital Structure Ratios

Panel A - DEO Recommended Capitalization Ratios

Capital	Capitalization Amounts	Capitalization Ratios
Long-Term Debt	16,467,054,606	54.33%
Preferred Stock	251,495,616	0.83%
Common Equity	13,592,347,823	44.84%
Total Capital	$ 30,310,898,045	100.00%

Testimony of Dr. Vilbert
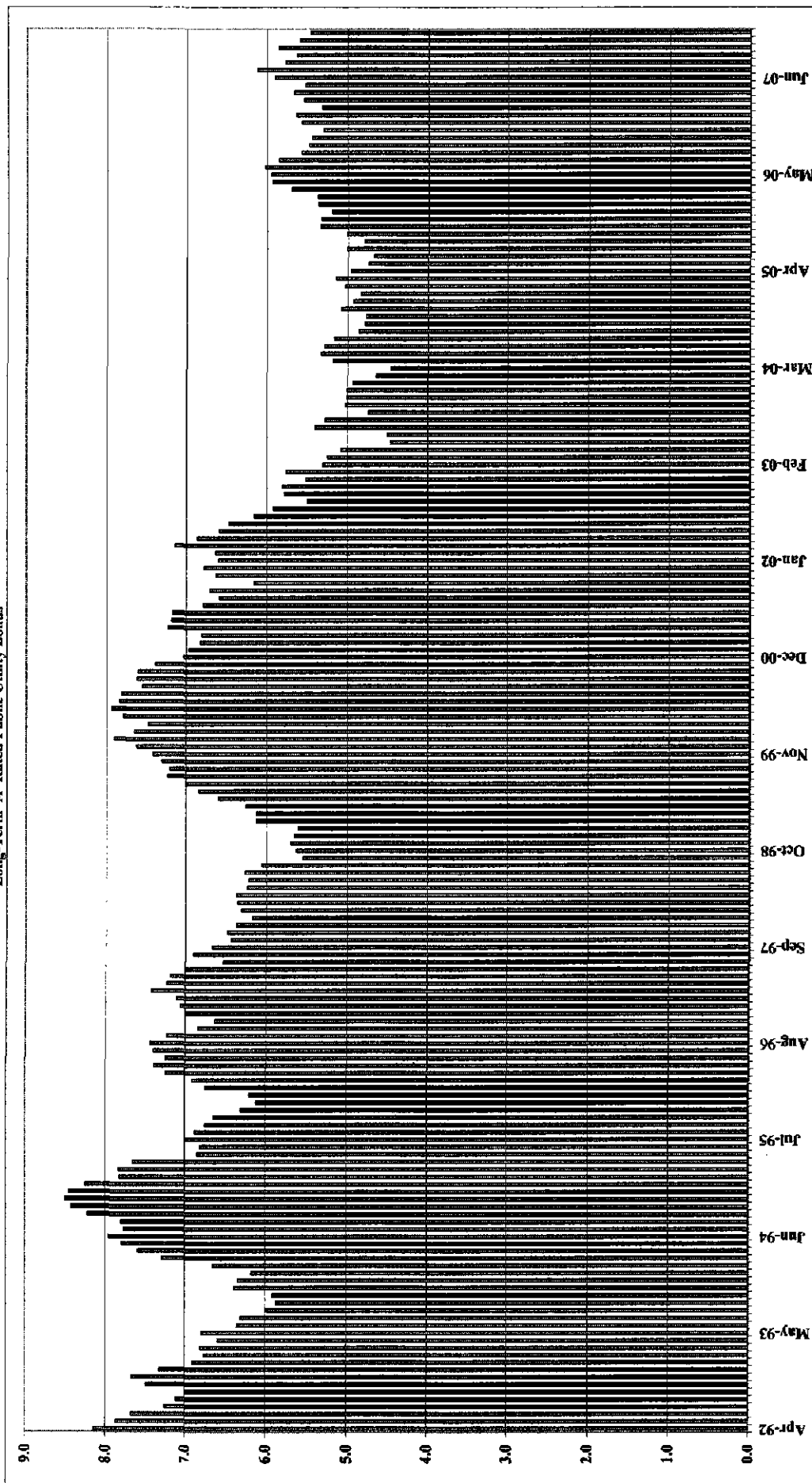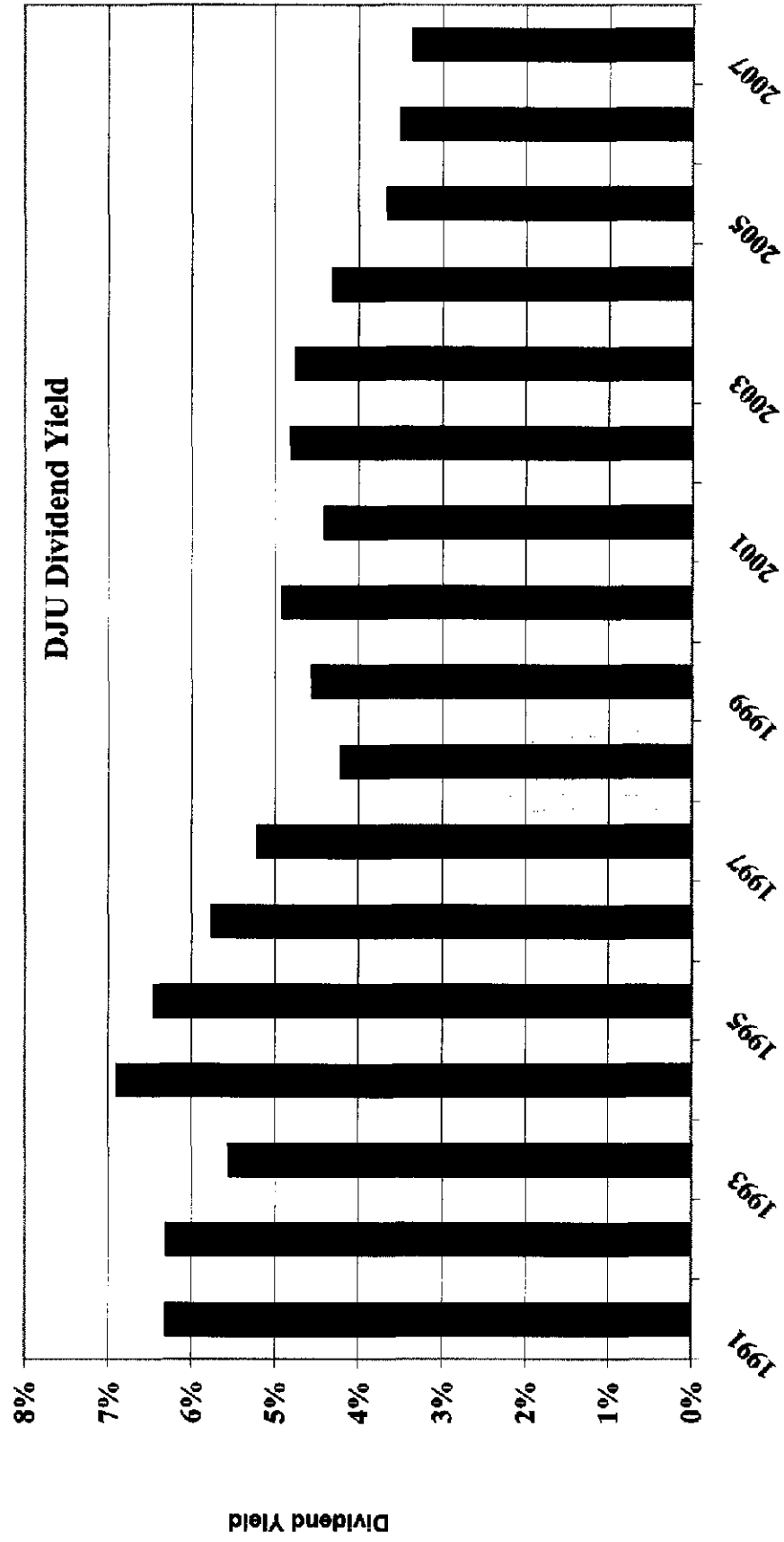
Exhibit JRW-4
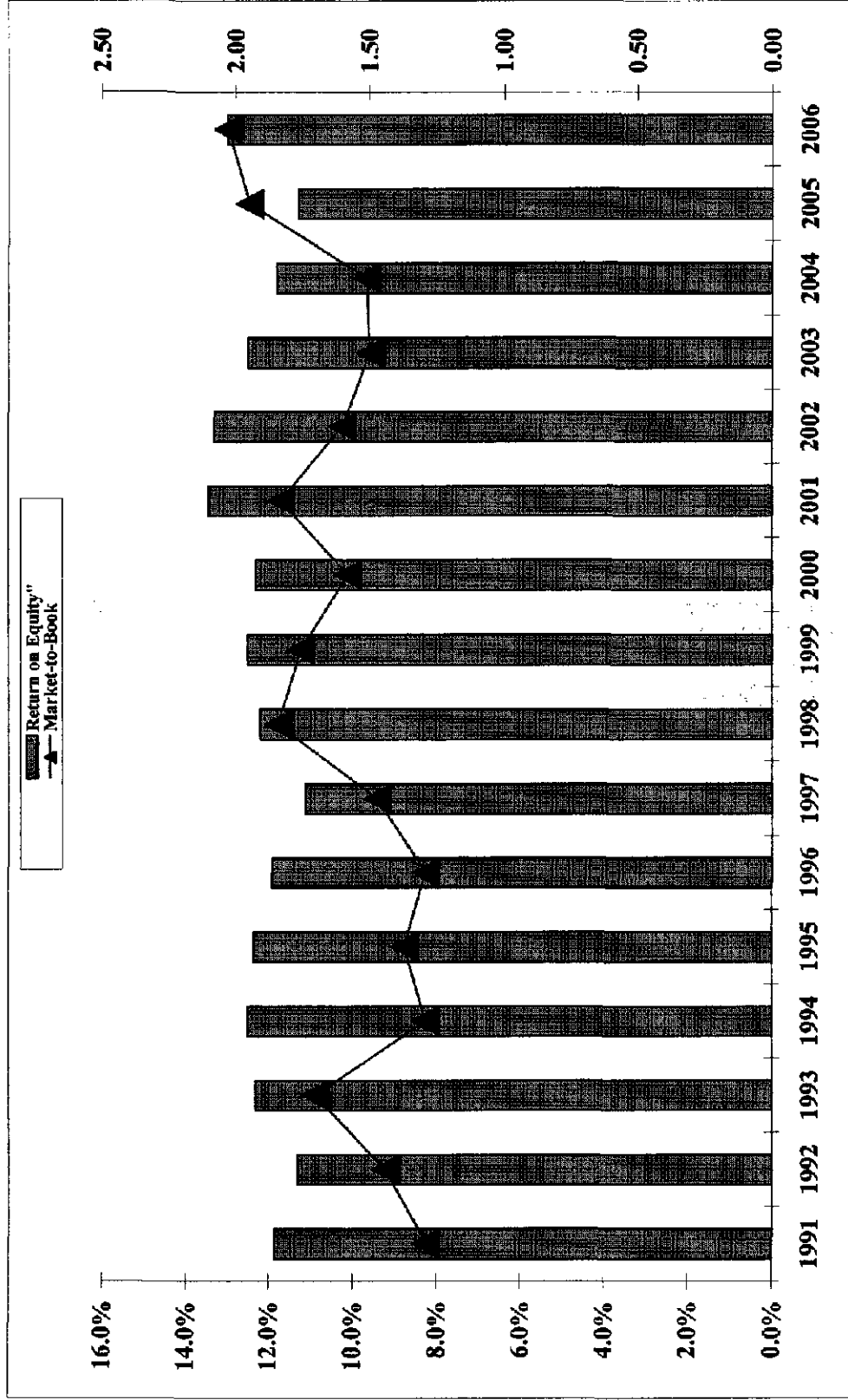Long-Term 'A' Rated Public Utility Bonds

Exhibit JRW-4
Dow Jones Utilities Dividend Yield

DJU Dividend Yield

Dividend Yield

Data Source: Value Line Investment Survey

Exhibit JRW-4

Dow Jones Utilities – Market to Book and ROE

Data Source: Value Line Investment Survey

Exhibit JRW-5

Industry Average Betas

Industry Name	Number of Firms	Beta	Industry Name	Number of Firms	Beta	Industry Name	Number of Firms	Beta
Semiconductor	138	2.59	Telecom. Services	152	1.34	Utility (Foreign)	6	1.01
Semiconductor Equip	16	2.51	Electronics	179	1.32	Petroleum (Producing)	186	1.00
Wireless Networking	74	2.20	Investment Co.(Foreign)	15	1.31	Environmental	89	1.00
E-Commerce	56	2.08	Educational Services	39	1.27	Grocery	15	0.99
Entertainment Tech	38	2.06	Retail (Special Lines)	164	1.26	Home Appliance	11	0.95
Telecom. Equipment	124	1.98	Hotel/Gaming	75	1.25	Insurance (Life)	40	0.94
Steel (Integrated)	14	1.97	Heavy Construction	12	1.25	Electric Util. (Central)	25	0.93
Internet	266	1.97	Retail Building Supply	9	1.23	Paper/Forest Products	39	0.93
Manuf. Housing/RV	18	1.92	Railroad	16	1.23	Restaurant	75	0.93
Power	58	1.87	Industrial Services	196	1.22	Natural Gas (Div.)	31	0.93
Computers/Peripherals	144	1.86	Newspaper	18	1.21	Healthcare Information	38	0.91
Drug	368	1.78	Aerospace/Defense	69	1.19	Property Management	12	0.91
Coal	18	1.71	Metal Fabricating	37	1.19	R.E.I.T.	147	0.90
Steel (General)	26	1.71	Machinery	126	1.19	Household Products	28	0.89
Securities Brokerage	31	1.66	Chemical (Diversified)	37	1.16	Insurance (Prop/Cas.)	87	0.89
Precision Instrument	103	1.66	Financial Svcs. (Div.)	294	1.14	Beverage	44	0.89
Homebuilding	36	1.64	Office Equip/Supplies	25	1.13	Electric Utility (West)	17	0.88
Advertising	40	1.60	Packaging & Container	35	1.12	Maritime	52	0.87
Retail Automotive	16	1.58	Precious Metals	84	1.11	Apparel	57	0.87
Cable TV	23	1.56	Retail Store	42	1.11	Bank (Midwest)	38	0.85
Computer Software/Svcs	376	1.56	Furn/Home Furnishings	39	1.10	Toiletries/Cosmetics	21	0.85
Auto & Truck	28	1.54	Oilfield Svcs/Equip.	113	1.10	Electric Utility (East)	27	0.84
Recreation	73	1.54	Medical Services	178	1.10	Canadian Energy	13	0.80
Entertainment	93	1.53	Foreign Electronics	10	1.08	Food Wholesalers	19	0.79
Chemical (Basic)	19	1.52	Building Materials	49	1.07	Water Utility	16	0.78
Biotechnology	103	1.51	Pharmacy Services	19	1.07	Natural Gas Utility	26	0.78
Shoe	20	1.47	Chemical (Specialty)	90	1.06	Food Processing	123	0.77
Auto Parts	56	1.45	Metals & Mining (Div.)	78	1.05	Oil/Gas Distribution	15	0.72
Medical Supplies	274	1.43	Information Services	38	1.05	Investment Co.	18	0.71
Air Transport	49	1.40	Trucking	32	1.04	Tobacco	11	0.70
Human Resources	35	1.38	Diversified Co.	107	1.03	Bank (Canadian)	8	0.67
Publishing	40	1.35	Petroleum (Integrated)	26	1.02	Bank	504	0.63
Electrical Equipment	86	1.35	Reinsurance	11	1.01	Thrift	234	0.59
Data Source: http://pages.stern.nyu.edu/~adamodar/						Total/Average	7364	1.24

Exhibit JRW-6

Dominion East Ohio Company
Discounted Cash Flow Analysis

Panel A
Industry Gas Group

Dividend Yield*	3.9%
Adjustment Factor	1.0275
Adjusted Dividend Yield	4.0%
Growth Rate**	5.5%
Equity Cost Rate	9.5%

Panel B
Subsample Group

Dividend Yield*	3.7%
Adjustment Factor	1.0275
Adjusted Dividend Yield	3.8%
Growth Rate**	5.5%
Equity Cost Rate	9.3%

* Based on data provided on page 2 of Exhibit JRW-6
** Based on data provided on pages 3, 4, and
5 of Exhibit JRW-6

Exhibit JRW-6

Dominion East Ohio Company
Monthly Dividend Yields
January - June 2008

Panel A
Industry Gas Group

Company	Jan	Feb	Mar	Apr	May	June	Mean
AGL Resources	4.6%	4.4%	4.6%	4.9%	4.7%	4.6%	4.6%
Atmos Energy	4.9%	4.8%	4.8%	5.1%	4.8%	4.6%	4.8%
Laclede Group, Inc.	4.5%	4.4%	4.5%	4.2%	4.1%	3.6%	4.2%
New Jersey Resources	3.3%	3.3%	3.4%	3.6%	3.4%	3.3%	3.4%
Nicor Inc.	4.4%	4.6%	4.9%	5.7%	5.2%	4.7%	4.9%
Northwest Natural Gas Company	3.2%	3.0%	3.3%	3.6%	3.3%	3.4%	3.3%
Piedmont Natural Gas, Inc.	3.9%	3.9%	4.0%	4.0%	3.8%	3.9%	3.9%
South Jersey Industries	3.1%	2.9%	3.0%	3.1%	2.9%	2.8%	3.0%
Southwest Gas	3.0%	3.0%	3.1%	3.3%	3.0%	2.9%	3.1%
WGL Holdings, Inc.	4.3%	4.1%	4.2%	4.4%	4.2%	4.0%	4.2%
Mean	3.9%	3.8%	4.0%	4.2%	3.9%	3.8%	3.9%

Data Source: AUS *Utility Reports*, monthly issues

Panel B
Subsample Group

Company	Jan	Feb	Mar	Apr	May	June	Mean
Laclede Group, Inc.	4.5%	4.4%	4.5%	4.2%	4.1%	3.6%	4.2%
Northwest Natural Gas Company	3.2%	3.0%	3.3%	3.6%	3.3%	3.4%	3.3%
Piedmont Natural Gas, Inc.	3.9%	3.9%	4.0%	4.0%	3.8%	3.9%	3.9%
Southwest Gas	3.0%	3.0%	3.1%	3.3%	3.0%	2.9%	3.1%
WGL Holdings, Inc.	4.3%	4.1%	4.2%	4.4%	4.2%	4.0%	4.2%
Mean	3.8%	3.7%	3.8%	3.9%	3.7%	3.6%	3.7%

Data Source: AUS *Utility Reports*, monthly issues

Exhibit JRW-6

Dominion East Ohio Company
DCF Equity Cost Growth Rate Measures
Value Line Historic Growth Rates

Panel A
Industry Gas Group

Company	Sym	*Value Line* Historic Growth					
		Past 10 Years			Past 5 Years		
		Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
AGL Resources	ATG	7.0%	2.5%	6.5%	15.0%	4.0%	10.5%
Atmos Energy	ATO	3.5%	2.5%	7.0%	7.5%	1.5%	9.0%
Laclede Group, Inc.	LG	3.0%	1.0%	3.0%	9.5%	1.0%	4.5%
New Jersey Resources	NJR	6.5%	3.5%	7.5%	6.0%	4.0%	10.0%
Nicor Inc.	GAS	1.5%	4.0%	3.0%	-3.0%	2.5%	2.5%
Northwest Natural Gas Comp:	NWN	2.0%	1.0%	4.0%	3.5%	1.5%	3.5%
Piedmont Natural Gas, Inc.	PNY	5.0%	5.0%	6.0%	6.0%	4.5%	6.5%
South Jersey Industries	SJI	9.5%	2.0%	6.0%	12.0%	3.5%	13.5%
Southwest Gas	SWX	12.0%	0.0%	3.0%	6.0%	0.0%	3.5%
WGL Holdings, Inc.	WGL	2.0%	1.5%	4.0%	5.0%	1.5%	3.5%
Mean		5.2%	2.3%	5.0%	6.8%	2.4%	6.7%
Median		4.3%	2.3%	5.0%	6.0%	2.0%	5.5%
Average of Mean and Median I					4.4%		

Data Source: *Value Line Investment Survey, 2008.*

Panel B
Subsample Group

Company	Sym	*Value Line* Historic Growth					
		Past 10 Years			Past 5 Years		
		Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
Laclede Group, Inc.	LG	3.0%	1.0%	3.0%	9.5%	1.0%	4.5%
Northwest Natural Gas Comp:	NWN	2.0%	1.0%	4.0%	3.5%	1.5%	3.5%
Piedmont Natural Gas, Inc.	PNY	5.0%	5.0%	6.0%	6.0%	4.5%	6.5%
Southwest Gas	SWX	12.0%	0.0%	3.0%	6.0%	0.0%	3.5%
WGL Holdings, Inc.	WGL	2.0%	1.5%	4.0%	5.0%	1.5%	3.5%
Mean		4.8%	1.7%	4.0%	6.0%	1.7%	4.3%
Median		3.0%	1.0%	4.0%	6.0%	1.5%	3.5%
Average of Mean and Median I					3.5%		

Data Source: *Value Line Investment Survey, 2008.*

Exhibit JRW-6

Dominion East Ohio Company
DCF Equity Cost Growth Rate Measures
Value Line **Projected Growth Rates**

Panel A
Industry Gas Group

Company	Sym	*Value Line* Projected Growth Est'd. '05-'07 to '11-'13			*Value Line* Internal Growth		
		Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
AGL Resources	ATG	3.5%	4.0%	1.5%	14.5%	43.0%	6.2%
Atmos Energy	ATO	4.5%	2.0%	3.5%	9.5%	42.0%	4.0%
Laclede Group, Inc.	LG	3.5%	2.5%	5.0%	11.0%	40.0%	4.4%
New Jersey Resources	NJR	6.0%	6.0%	9.0%	10.5%	45.0%	4.7%
Nicor Inc.	GAS	4.0%	0.5%	4.0%	13.5%	42.0%	5.7%
Northwest Natural Gas Company	NWN	7.0%	5.5%	3.5%	11.0%	44.0%	4.8%
Piedmont Natural Gas, Inc.	PNY	5.0%	4.0%	3.5%	12.5%	32.0%	4.0%
South Jersey Industries	SJI	NMF	5.5%	5.0%	14.5%	57.0%	8.3%
Southwest Gas	SWX	7.5%	4.0%	3.5%	10.0%	69.0%	6.9%
WGL Holdings, Inc.	WGL	3.5%	2.5%	5.0%	10.5%	38.0%	4.0%
Mean		4.9%	3.7%	4.4%	11.8%	45.2%	5.3%
Median		4.5%	4.0%	3.8%	11.0%	42.5%	4.8%
Average of Mean and Median Figures =		4.2%				Average =	5.0%

Data Source: *Value Line Investment Survey, 2008.*

Panel B
Subsample Group

Company	Sym	*Value Line* Projected Growth Est'd. '05-'07 to '11-'13			*Value Line* Internal Growth		
		Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
Laclede Group, Inc.	LG	3.5%	2.5%	5.0%	11.0%	40.0%	4.4%
Northwest Natural Gas Company	NWN	7.0%	5.5%	3.5%	11.0%	44.0%	4.8%
Piedmont Natural Gas, Inc.	PNY	5.0%	4.0%	3.5%	12.5%	32.0%	4.0%
Southwest Gas	SWX	7.5%	4.0%	3.5%	10.0%	69.0%	6.9%
WGL Holdings, Inc.	WGL	3.5%	2.5%	5.0%	10.5%	38.0%	4.0%
Mean		5.3%	3.7%	4.1%	11.0%	44.6%	4.8%
Median		5.0%	4.0%	3.5%	11.0%	40.0%	4.4%
Average of Mean and Median Figures =		4.3%				Average =	4.6%

Data Source: *Value Line Investment Survey, 2008.*

Exhibit JRW-6

Dominion East Ohio Company
DCF Equity Cost Growth Rate Measures
Analysts Projected EPS Growth Rate Estimates

Panel A
Industry Gas Group

Company	Sym	Yahoo First Call	Zack's	Average
AGL Resources	ATG	5.25%	4.80%	5.0%
Atmos Energy	ATO	4.75%	5.30%	5.0%
Laclede Group, Inc.	LG	3.50%	10.00%	6.8%
New Jersey Resources	NJR	6.00%	7.30%	6.7%
Nicor Inc.	GAS	4.20%	5.70%	5.0%
Northwest Natural Gas Compan	NWN	4.80%	6.20%	5.5%
Piedmont Natural Gas, Inc.	PNY	5.18%	6.00%	5.6%
South Jersey Industries	SJI	6.60%	7.90%	7.3%
Southwest Gas	SWX	5.67%	8.00%	6.8%
WGL Holdings, Inc.	WGL	5.00%	7.30%	6.2%
Mean		5.1%	6.9%	6.0%

Data Sources: www.zacks.com, http://quote.yahoo.com, June, 2008

Panel B
Subsample Group

Company	Sym	Yahoo First Call	Zack's	Average
Laclede Group, Inc.	LG	3.50%	10.00%	6.8%
Northwest Natural Gas Compan	NWN	4.80%	6.20%	5.5%
Piedmont Natural Gas, Inc.	PNY	5.18%	6.00%	5.6%
Southwest Gas	SWX	5.67%	8.00%	6.8%
WGL Holdings, Inc.	WGL	5.00%	7.30%	6.2%
Mean		4.8%	7.5%	6.2%

Data Sources: www.zacks.com, http://quote.yahoo.com, June, 2008

Exhibit JRW-7

Dominion East Ohio Company
Capital Asset Pricing Model

Panel A
Industry Gas Group

Risk-Free Interest Rate	4.75%
Beta*	0.87
Ex Ante Equity Risk Premium**	4.65%
CAPM Cost of Equity	8.8%

Panel B
Subsample Group

Risk-Free Interest Rate	4.75%
Beta*	0.86
Ex Ante Equity Risk Premium**	4.65%
CAPM Cost of Equity	8.7%

* See page 2 of Exhibit JRW-7

** See page 3 of Exhibit JRW-7

Exhibit JRW-7

Dominion East Ohio Company
Beta

Panel A
Industry Gas Group

Company		Beta
AGL Resources	ATG	0.85
Atmos Energy	ATO	0.85
Laclede Group, Inc.	LG	0.90
New Jersey Resources	NJR	0.85
Nicor Inc.	GAS	1.00
Northwest Natural Gas Company	NWN	0.80
Piedmont Natural Gas, Inc.	PNY	0.85
South Jersey Industries	SJI	0.80
Southwest Gas	SWX	0.90
WGL Holdings, Inc.	WGL	0.85
Mean		0.87

Data Source: *Value Line Investment Survey, 2008.*

Exhibit JRW-7

Dominion East Ohio Company
Capital Asset Pricing Model
Equity Risk Premium

Category	Study Authors	Publication Date	Time Period Of Study	Methodology	Return Measure	Range Low	Range High	Midpoint of Range	Mean	Average
Historical Risk Premium										
	Ibbotson	2008	1926-2007	Historical Stock Returns - Bond Returns	Arithmetic				6.50%	
					Geometric				4.90%	
	Shiller	2006	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				7.00%	
					Geometric				5.50%	
	Damodorun	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%	
	AVERAGE									5.67%
Ex Ante Models (Puzzle Research)										
	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%	
	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,		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 Projection	Historical & Projections (D/P & Earnings Growth)		4.10%	5.40%		4.75%	
	Fernandez	2007	Projection	Required Equity Risk Premium					4.00%	
	Social Security 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%	
					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%	
	AVERAGE									4.15%
Surveys										
	Survey of Financial Forecasters	2008	10-Year Projection	About 50 Financial Forecasters					1.96%	
	Duke - CFO Magazine Survey	2008	10-Year Projection	Approximately 500 CFOs					5.09%	
	Welch - Academics	2008	30-Year Projection	Random Academics		5.00%	5.74%		5.37%	
	AVERAGE									4.14%
Building Block										
	Ibbotson and Chen	2008	1926-2007	Historical Supply Model (D/P & Earnings Growth)	Arithmetic			6.23%	5.24%	
					Geometric			4.24%		
	Woolridge		2008	Current Supply Model (D/P & Earnings Growth)					4.04%	
	AVERAGE									4.64%
OVERALL AVERAGE										4.65%

Exhibit JRW-7

Dominion East Ohio Company

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

Table Seven
LONG-TERM (10 YEAR) FORECASTS

SERIES: CPI INFLATION RATE		SERIES: REAL GDP GROWTH RATE	
STATISTIC		STATISTIC	
MINIMUM	1.600	MINIMUM	2.200
LOWER QUARTILE	2.200	LOWER QUARTILE	2.500
MEDIAN	2.500	MEDIAN	2.750
UPPER QUARTILE	2.750	UPPER QUARTILE	2.800
MAXIMUM	4.200	MAXIMUM	3.100
MEAN	2.520	MEAN	2.700
STD. DEV.	0.520	STD. DEV.	0.230
N	45	N	43
MISSING	5	MISSING	7

SERIES: PRODUCTIVITY GROWTH		SERIES: STOCK RETURNS (S&P 500)	
STATISTIC		STATISTIC	
MINIMUM	0.900	MINIMUM	2.700
LOWER QUARTILE	1.800	LOWER QUARTILE	6.000
MEDIAN	2.000	MEDIAN	6.500
UPPER QUARTILE	2.200	UPPER QUARTILE	8.000
MAXIMUM	3.000	MAXIMUM	9.000
MEAN	2.000	MEAN	6.800
STD. DEV.	0.390	STD. DEV.	1.300
N	39	N	31
MISSING	11	MISSING	19

SERIES: BOND RETURNS (10-YEAR)		SERIES: BILL RETURNS (3-MONTH)	
STATISTIC		STATISTIC	
MINIMUM	3.200	MINIMUM	2.400
LOWER QUARTILE	4.500	LOWER QUARTILE	3.000
MEDIAN	5.000	MEDIAN	4.000
UPPER QUARTILE	5.200	UPPER QUARTILE	4.250
MAXIMUM	5.800	MAXIMUM	5.300
MEAN	4.840	MEAN	3.840
STD. DEV.	0.590	STD. DEV.	0.680
N	38	N	38
MISSING	12	MISSING	12

Source: Philadelphia Federal Researve Bank, Survey of Professional Forecasters, February 12, 2008.
http://www.phil.frb.org/files/spf/spfq107.pdf

Exhibit JRW-7

Dominion East Ohio 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		
Data Source: http://pages.stern.nyu.edu/~adamodar/				Real EPS Growth	3.0%	

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
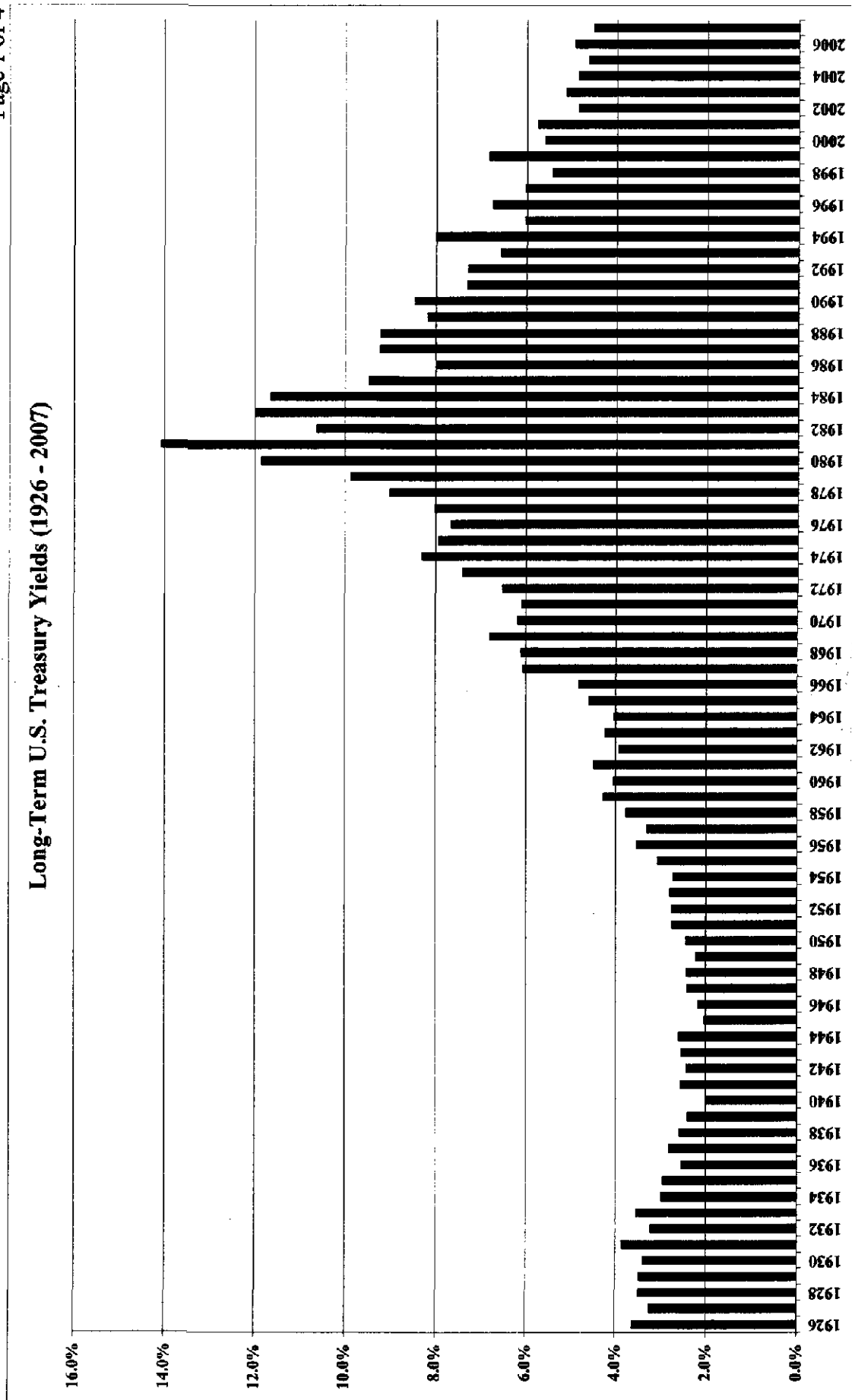right after recessions.

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-
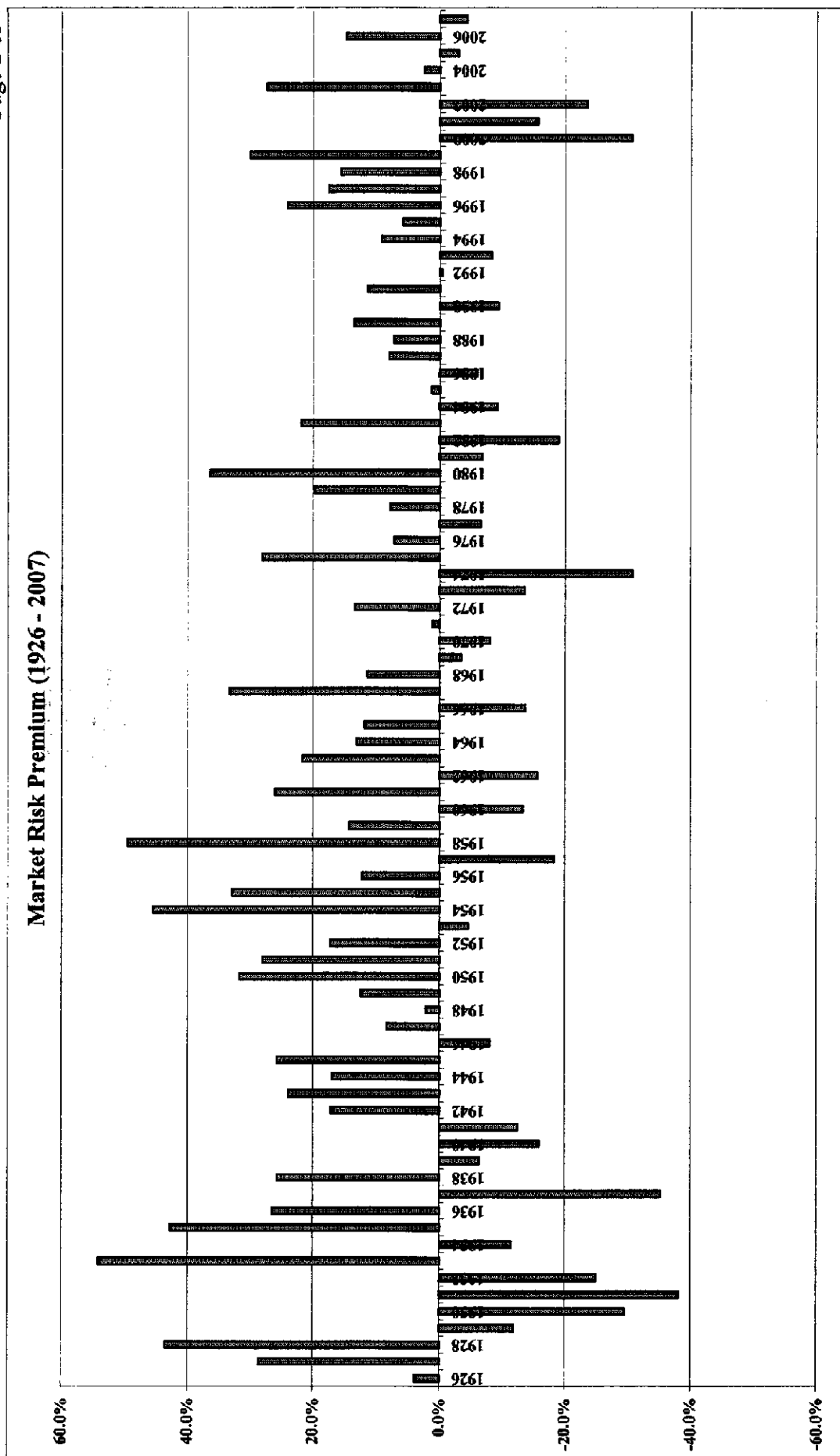to-five-year periods, but analysts projected drops less than 1% of the time.

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

Long-Term U.S. Treasury Yields (1926 - 2007)

Market Risk Premium (1926 - 2007)

60.0% 40.0% 20.0% 0.0% -20.0% -40.0% -60.0%

1926 1928 1936 1938 1942 1944 1948 1950 1952 1954 1956 1958 1964 1968 1972 1976 1978 1980 1988 1992 1994 1996 1998 2004 2006
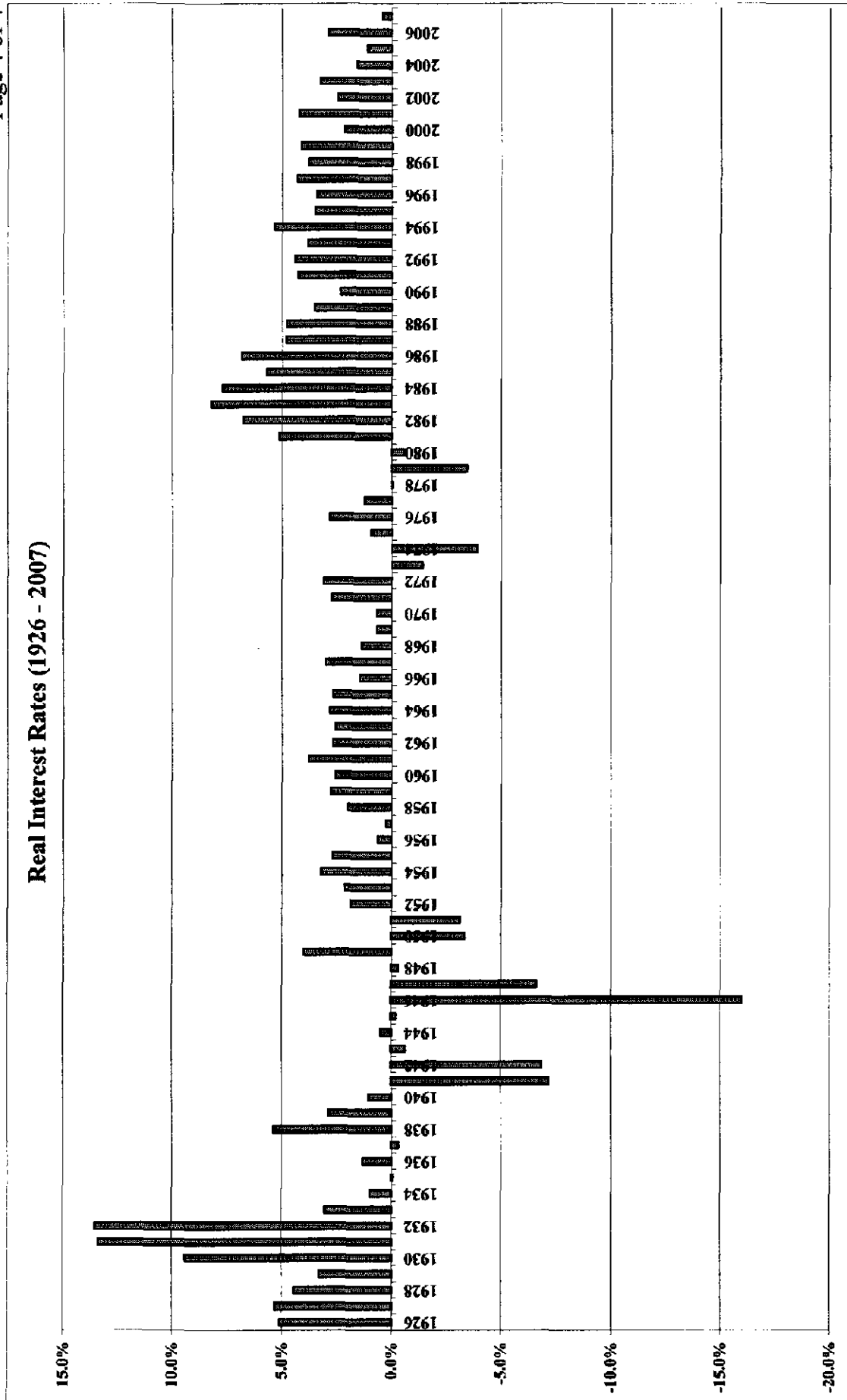
Data Source: Morningstar, *SBBI Yearbook*, 2008.

Stocks and Bonds Monthly Standard Deviations (1930 - 2007)

Data Source: Morningstar, *SBBI Yearbook*, 2008.

Real Interest Rates (1926 - 2007)
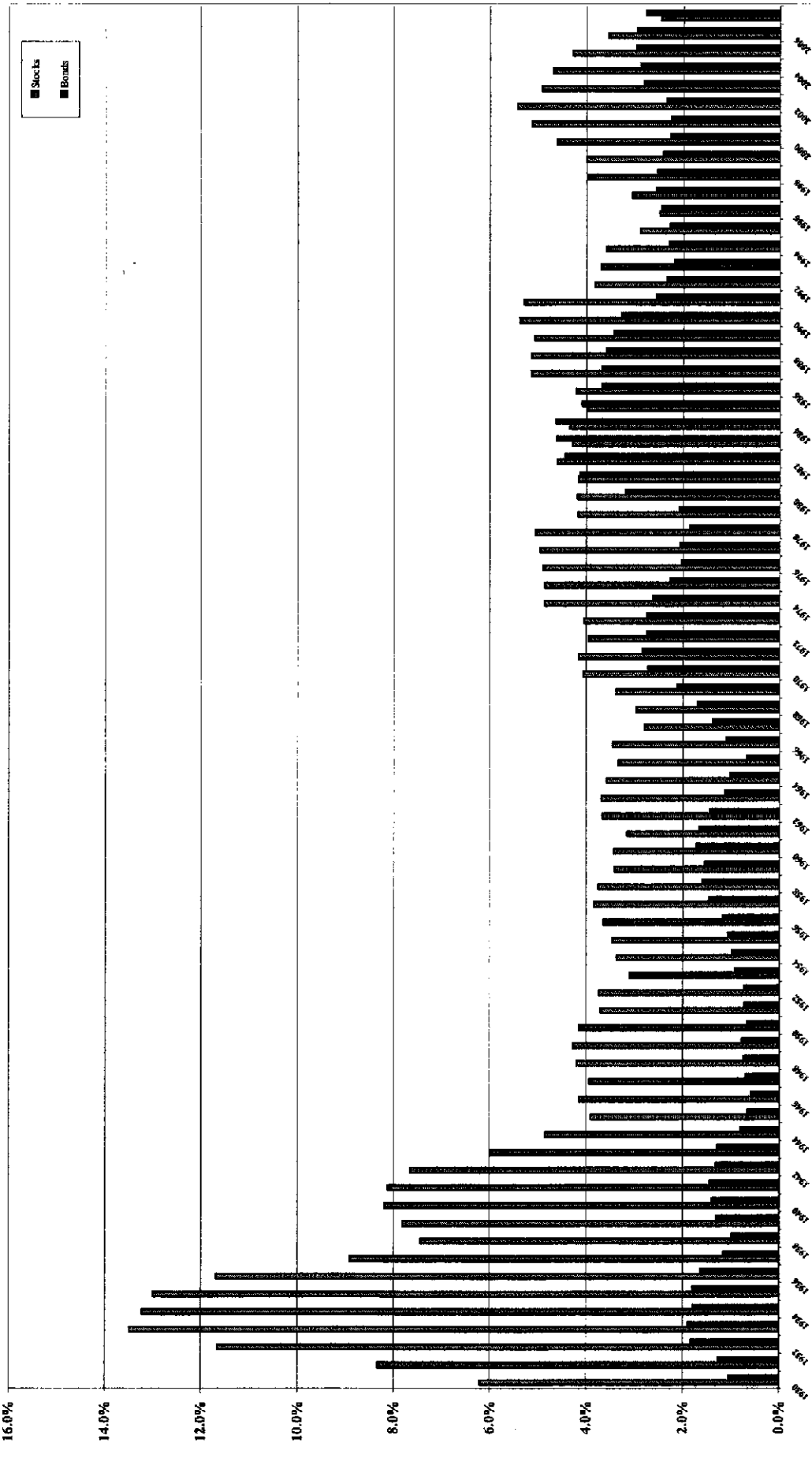
Data Source: Morningstar, *SBBI Yearbook*, 2008.

CERTIFICATE OF SERVICE

It is hereby certified that a true copy of the foregoing the *Direct Testimony of J. Randall Woolridge, Ph.D. on Behalf of the Office of the Ohio Consumers' Counsel* has been served via First Class US Mail (electronically upon DEO & DEO Counsel), this 23rd day of June, 2008.

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