BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of Duke Energy Ohio, Inc., for the Establishment of a Charge Pursuant to Revised Code Section 4909.18.	))))	Case No. 12-2400-EL-UNC
In the Matter of the Application of Duke Energy Ohio, Inc., for Approval to Change Accounting Methods.	)))	Case No. 12-2401-EL-AAM
In the Matter of the Application of Duke Energy Ohio, Inc. ., for the Approval of a Tariff for a New Service.	)))	Case No. 12-2402-EL-ATA

DIRECT TESTIMONY
Of
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On Behalf of the
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TABLE OF CONTENTS

Attachments

Exhibits

I. INTRODUCTION

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

A1. My name is J. Randall Woolridge. My business address is 310 S. Allen Street, Suite #704, State College, PA 16801. I am a Professor of Finance and the Goldman, Sachs & Co. and Frank P. Smeal Endowed University Fellow in Business Administration at the University Park Campus of the Pennsylvania State University. I am also the Director of the Smeal College Trading Room and President of the Nittany Lion Fund, LLC. A summary of my educational background, research, related business activities, as well as previous testifying experience is provided in Appendix A.

II. SUBJECT OF TESTIMONY AND SUMMARY OF RECOMMENDATIONS

Q2. WHAT IS YOUR PRIMARY RECOMMENDATION FOR THIS CASE?

A2. My primary recommendation for this case is that the Commission grant the Joint Motion to Dismiss the Duke Energy Ohio's Application, filed on October 4, 2012, by the OCC and several signatories to the Duke Energy Ohio, Inc. ("Duke," "Duke Energy Ohio" or the "Company") Electric Security Plan ("ESP") Stipulation.[1]

[1] *In the Matter of the Application of Duke Energy Ohio for Authority to Establish a Standard Service Offer Pursuant to Section 4928.143, Revised Code, in the Form of an Electric Security Plan, Accounting Modifications and Tariffs for Generation Service*, Case No. 11-3549-EL-SSO, et al., ("Duke ESP"),Stipulation and Recommendation (Oct. 24, 2011). (Approved, Opinion and Order (Nov. 22, 2011).

Q3. WHY IS IT YOUR PRIMARY RECOMMENDATION THAT THE COMMISSION GRANT THE MOTION TO DISMISS THE COMPANY'S APPLICATION?

A3. There are several reasons why the Commission should reject the Company's Application by granting the Motion to Dismiss. I understand these reasons have been fully addressed in the Joint Motion to Dismiss as well as in the Joint Comments and Joint Reply Comments filed by OCC and other signatories to the Duke Energy Ohio ESP Stipulation.[2] I have reviewed these pleadings and concur in the reasons set forth there.

First, the Commission should enforce the Stipulation it approved in the Duke Electric Security Plan proceeding (Case No. 11-3549-EL-SSO, et al.). There, the Company agreed to provide capacity for all load (both shopping and Standard Service Offer ("SSO") at market-based Reliability Pricing Model ("RPM") rates. And the Stipulation allowed Duke Energy Ohio to collect from customers a non-bypassable Electric Service Stability Charge ("ESSC") of $330 million over three years.[3] Duke Energy Ohio, OCC, the PUCO Staff, and multiple intervenors agreed to the terms of this Stipulation--and the Commission approved it. Customers through that Stipulation have paid and continued to pay the ESSC,

[2] See *In the Matter of the Application of Duke Energy Ohio, Inc. for the Establishment of a Charge Pursuant to Revised Code Section 4909.18,* Case Nos. 12-2400 et al., Joint Motion to Dismiss (October 4, 2012), and Comments of the Office of the Ohio Consumers' Counsel and Ohio Energy Group (January 2, 2013).

[3] ("Duke ESP"), Stipulation and Recommendation (Oct. 24, 2011). (approved, Opinion and Order (Nov. 22, 2011).

living up to their end of the agreement. Duke Energy Ohio should be required to, in turn, fulfill its commitments under that agreement. It committed to be compensated at market-based RPM capacity rates—not fully embedded capacity rates. The Company's application, seeking to unilaterally improve upon the Stipulation after seeing the outcome of the Ohio Power capacity proceeding, should be rejected. The integrity of that agreement should be upheld.[4]

Second, as authority for its request in this proceeding, Duke Energy Ohio cites the "newly adopted state compensation mechanism" -- referring to the mechanism adopted for Ohio Power (in Case No. 10-2929-EL-UNC). But the Ohio Power Capacity Case decision was not a generic PUCO decision that applies to all electric distribution utilities, including Duke.[5] Instead, the Commission limited its decision for a cost-based state compensation mechanism in the Ohio Power Capacity Case to Ohio Power.[6]

[4] See Case Nos. 12-2400-EL-UNC, et al., Joint Motion to Dismiss at 13-17 (October 4, 2012), and Comments of OCC and OEG at 2-4(January 2, 2013).

[5] Specifically, its October 17, 2012 Entry on Rehearing in the Ohio Power Capacity Case the Commission held that it: "initiated this proceeding *solely to review AEP-Ohio's capacity costs* and determine an appropriate capacity charge for *its FRR obligations. We have not considered the costs of any other capacity supplier subject to our jurisdiction nor do we find it appropriate to do so in this proceeding.* Entry on Rehearing at ¶77 at 32 *(emphasis added).* See also id. at 58 ("This proceeding was initiated by the Commission for the purpose of reviewing AEP Ohio's capacity charge for its FRR obligations.")

[6] See Case Nos. 12-2400-EL-UNC, et al., Comments of OCC and OEG at 2-4 (January 2, 2013).

Q4. OCC WITNESSES ROSE AND EFFRON TESTIFY THAT CUSTOMERS SHOULD NOT PROTECT THE COMPANY FOR LOSSES IT MAY INCUR IN THE COMPETITIVE MARKET. DO YOU AGREE?

A4. Yes. In the competitive generation market, utilities should be expected to fend for themselves, like any other non-regulated entity.

Q5. WHAT IS YOUR RECOMMENDATION IN THE EVENT THE COMMISSION DOES NOT GRANT THE MOTION TO DISMISS THE COMPANY'S APPLICATION OR REQUIRES CUSTOMERS TO COMPENSATE THE COMPANY FOR MARKET LOSSES?

A5. If the Commission does not grant the Motion to Dismiss or requires customers to compensate the Company for market losses, it should consider the conclusions that I reach with respect to Return On Equity ("ROE") and cost of capital for Duke Energy Ohio.

Q6. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A6. I have been asked by the Office of the Ohio Consumers' Counsel ("OCC") to evaluate the financial integrity testimonies presented by Company witnesses Ms. Julie Cannell, Mr. Stephen DeMay, and Dr. James Vander Weide. In addition, I have also been asked to provide an overall ROE and cost of capital recommendation for Duke Energy Ohio based on current capital market conditions.

Q7. PLEASE SUMMARIZE YOUR FINDINGS WITH RESPECT TO THE COMPANY'S FINANCIAL INTEGRITY TESTIMONY IN THIS PROCEEDING.

A7. My findings include the following:

1. The 11.15% Return On Equity ("ROE"), which Duke adopts in its application from the Ohio Power Capacity Case (Case No. 10-2929-EL-UNC), is not appropriate and not applicable, in this proceeding.

2. The appropriate entity for estimating an equity cost rate to be used in this proceeding, if such an equity cost rate is to be used in calculating the Company's embedded production capacity cost, is Duke Energy Ohio, and not just the generation operations of Duke Energy Ohio.

3. An ROE range of 4.11% to 8.75% is appropriate. The 4.11% ROE is the Company's recommended cost of debt presented in this proceeding. This represents a low-end estimate if the Commission believes that this proceeding effectively represents an emergency rate case to insure the financial integrity of Duke. If the Commission finds it is appropriate to price the capacity costs based on an approach different from the Reliability Pricing Model ("RPM"), and if this proceeding is not viewed as an emergency rate case, then I find that an equity cost rate of 8.75% is appropriate in today's capital markets. The 8.75% is my estimated equity cost rate as applied to a proxy group of electric utility companies. Using

the long-term debt cost and capital structure provided by Mr. Wathen in his testimony, these two figures produce costs of capital of 4.11% to 6.58%. These results are summarized in Exhibit JRW-1.

4. Since Ms. Cannell and Mr. DeMay do not provide empirical analyses of the financial integrity of the Company, I do not believe that their testimonies provide any insights into the financial integrity and rate of return issues of Duke associated with this proceeding.

5. Dr. Vander Weide's equity cost rate estimated from his electric utility proxy group is excessive. His equity cost rate is excessive because, among other things, in his Discounted Cash Flow ("DCF") Model approach, he has relied exclusively on the overly-optimistic and upwardly-biased long-term Earning Per Share ("EPS") growth rate forecasts of Wall Street Analysts. And Dr. Vander Weide's equity cost rate is excessive because in his Capital Asset Pricing Model ("CAPM") and Risk Premium ("RP") approaches, the base interest rates are excessive and well above current market interest rates and the equity risk premiums are not reflective of prospective economic growth and market returns.

6. Dr. Vander Weide's proxy group of gas pipeline companies is not an appropriate proxy group in this proceeding. In addition, this group

produces highly improbable equity cost rate results and therefore the equity cost rate estimates from this proxy group should be ignored.

A. Summary of Company's Return on Equity Recommendation

Q8. PLEASE SUMMARIZE DUKE ENERGY OHIO'S REQUEST WITH RESPECT TO THE RETURN ON EQUITY IN THIS PROCEEDING.

A8. Duke Energy Ohio has requested to use traditional cost-based rate making to establish an average annual revenue requirement on its investment in resources to meet its capacity obligations as a PJM Fixed Resource Requirement ("FRR") entity. The Company requests that the capacity charge be in effect from August 1, 2012 through May 31, 2015. In its application, Duke Energy Ohio requested a return on rate base using the Company's cost of capital and an ROE of 11.15%. As justification for the 11.15% ROE, the Company cites the ROE approved by the Commission in the Ohio Power Capacity Case (Case No. 10-2929-EL-UNC). The Company has also supported the 11.15% ROE request with the testimony of Dr. James H. Vander Weide.

Q9. HOW HAS DUKE ENERGY OHIO SUPPORTED ITS 11.15% ROE REQUEST?

A9. As stated above, and in its Application, Duke Energy Ohio justified its requested 11.15% ROE by referencing to the Ohio Power Capacity Case Order in Case No. 10-2929-EL-UNC. This request was subsequently supported by the direct testimony of Dr. James A. Vander Weide filed in this proceeding. Dr. Vander Weide estimates an equity cost rate in the range of 10.2% to 12.6%. Based on these results, Dr. Vander Weide concludes that the 11.15% is a conservative ROE for the generating assets of Duke Energy Ohio.

Q10. HOW WAS THE 11.15% ROE DETERMINED IN THE OHIO POWER CAPACITY CASE?

A10. In Case No. 10-2929-EL-UNC, Ohio Power argued that it should receive a ROE of 11.15% or, at a minimum, a ROE of 10.5% which Ohio Power claimed was consistent with the ROE the Commission has recognized for certain generating assets. The 11.15% was recommended by Ohio Power witness Dr. Kelly Pearce.[7] Dr. Pearce also recommended that the ROE remain fixed for the term that the capacity rate was in effect. Dr. Pearce did not perform any studies to justify or support his 11.15% ROE recommendation. Instead, he indicated that 11.15% was the ROE recommendation by Ohio Power witness Dr. William Avera in Columbus Southern Power Company ("CSP") and Ohio Power Company

[7] Testimony of Dr. Kelly D. Pearce on behalf of Ohio Power Company, Case No. 10-2929-EL-UNC, March 23, 2012, page 11.

("OPCo") (collectively referred to as "Ohio Power") distribution rate cases (11-0351-EL-AIR and 11-0352-EL-AIR). Dr. Avera's testimony in the distribution rate case was filed on March 14, 2011.

Q11. PLEASE BRIEFLY DESCRIBE DR. AVERA'S TESTIMONY IN THE OHIO POWER DISTRIBUTION RATE CASE.

A11. Dr. Avera recommended a ROE of 11.15% in his testimony for the distribution service rates for CSP and OPCo. The 11.15% represented the midpoint of his range of 10.55% to 11.55%. In establishing his equity cost rate recommendation, Dr. Avera used a proxy group of twenty-four electric utilities. In his screening process to develop a proxy group, he did not include a screen so as to include distribution-only utilities in the proxy group.

Q12. DO YOU BELIEVE THAT THE 11.15% RETURN ON EQUITY ADOPTED IN THE OHIO POWER DISTRIBUTION RATE CASE IS APPLICABLE TO THIS PROCEEDING?

A12. No. First, as argued by OCC witnesses Ken Rose and Rick Hornby in this proceeding, the Ohio Power Capacity Cost case No. 10-2929-EL-UNC, and hence the decisions put forth by the Commission in that case, are not applicable to Duke Energy Ohio. Second, the 11.15% was the requested ROE by CSP and OPCo in the distribution cases. Dr. Pearce provided no study or analysis to support the 11.15% in his testimony in the Ohio Power Capacity proceeding. Third, financial market conditions, and especially the level of interest rates and capital costs, are

different today than they were in early 2011 when the Ohio Power Capacity and Distribution Rate cases were decided. In Exhibit JRW-2, I provide the interest rate assumptions used by Dr. Avera in recommending the 11.15% ROE for CSP and OPCo in the distribution rate case.

Dr. Avera based his 11.15% recommendation on a projected 30-year Treasury yield for 2013 ranging from 5.0% to 5.5%. The current 30-year Treasury yield is only 3.2%. Dr. Avera also used projected 2013 long-term AA yields ranging from 6.2% to 6.4%. The current yield on long-term AA utility bonds is only 4.0%. As such, the 11.15% recommended by Dr. Avera in Case Nos. 11-0351-EL-AIR and 11-0352-EL-AIR was based on interest rate and capital cost assumptions that are not reflective of today's market conditions. Therefore, the 11.15% ROE used in the Ohio Power case is not applicable or appropriate for Duke Energy Ohio.

B. The Appropriate Entity in this Proceeding is Duke Energy Ohio

Q13. ACCORDING TO THE COMPANY, WHAT IS THE APPROPRIATE ENTITY FOR ESTIMATING A REQUIRED RATE OF RETURN ON EQUITY IN THIS PROCEEDING?

A13. Dr. Vander Weide has implied that Duke Energy Ohio – and its generating assets – is the appropriate entity for estimating a required rate of return on equity in this proceeding. He argues that the risk level for independent power generators is very high. He also states that he cannot use a proxy group of independent power generators because: (1) none exist and (2) the ones that do exist are either in bankruptcy or in financial peril. Therefore, in addition to using a proxy group of electric utilities, he employed a proxy group of gas pipelines, since gas pipelines are subject to both regulated and open market competition.

Q14. DO YOU AGREE THAT THE GENERATING ASSETS OF DUKE ENERGY OHIO WOULD BE THE APPROPRIATE ENTITY FOR ESTIMATING A REQUIRED RATE OF RETURN IN THIS PROCEEDING?

A14. No. First of all, I want to emphasize that the Commission should dismiss this case entirely. Duke Energy Ohio is not entitled to any additional compensation above the RPM in providing capacity to the CRES providers within its service territory. In the event that some compensation above the RPM is allowed by the Commission, the financial integrity consideration and the return on equity and

cost of capital determination must be based on Duke Energy Ohio as a whole, and not just on the generation assets of Duke Energy Ohio.

There are several reasons that this is appropriate. First, the Company has not carried through with its intention as indicated in the ESP stipulation and order to transfer the generation assets out of Duke Energy Ohio.[8] Therefore, there has been no legal separation of the generation assets and there is no legal or operational entity that owns the generation assets of Duke Energy Ohio. Second, Duke is requesting a traditional revenue requirement, rate base-rate of return, rate making approach to cover its capacity charges associated its obligation to PJM. As such, this approach is effectively asking the Commission to treat its generation assets as a regulated entity. If Duke's request in this proceeding is approved, these generation assets will not be subject to competitive market pricing and hence face less risk than independent power producer. As a result, the appropriate entity to use for evaluating the ROE and cost of capital is Duke Energy Ohio. Third, investors of Duke Energy Ohio are looking at the risks of Duke Energy Ohio as an integrated entity. At this time, given there is no corporate separation, they do not evaluate the risks of the generation portion of the business separately from the transmission and distribution business.

[8] *In the Matter of Application of Duke Energy Ohio, Inc. for Authority to Establish a Standard Service Offer Pursuant to Section 4928.143, Revised Code, in the Form of an Electric Security Plan, Accounting Modifications, and Tariffs for Generation Service*, Case No. 11-3549-EL-SSO, et al., Opinion and Order at 29-31 (Nov. 22, 2011).

C. Dr. Vander Weide's 11.15% ROE Recommendation

Q15. PLEASE PROVIDE MORE DETAILS ON DR. VANDER WEIDE'S 11.15% RETURN ON EQUITY RECOMMENDATION.

A15. Dr. Vander Weide's estimates an equity cost rate is in the range of 10.2% to 12.6% and thereby concludes that the 11.15% is a conservative ROE for the generating assets of Duke Energy Ohio. Dr. Vander Weide applied the Discounted Cash Flow ("DCF"), Capital Asset Pricing Model ("CAPM"), and Risk Premium ("RP") equity cost rates approaches to two proxy groups. He employs a proxy group of twenty-seven electric utility companies and eleven gas pipeline companies. He claims that power generators are the appropriate proxy for the generating assets of the Company. However, due to poor financial results of the many power generators, he cannot identify a suitable proxy group of power generators. Therefore, he has also employed a proxy group of gas pipelines since they are subject to both regulated and open market competition.

Q16. ARE THERE ERRORS IN DR. VANDER WEIDE'S EQUITY COST RATE ANALYSES?

A16. Yes. Dr. Vander Weide's return on common equity estimate of 11.15% is too high for the following reasons. First, the use of the gas pipeline group as a proxy group is inappropriate because, as discussed above, the appropriate entity is Duke Energy Ohio and not just the generation assets. In addition, as I demonstrate later in my testimony, the gas pipeline group produces highly unlikely equity cost rate results.

In addition, the results for the electric group produce an inflated equity cost rate due to: (1) an excessive adjustment to the dividend yield used in his DCF approach; (2) an inflated growth rate used in his DCF approach; (3) excessive base interest rates and market risk premiums used in his RP and CAPM approaches; and (4) the addition of unwarranted flotation cost adjustments to his equity cost rate results.

D. The Appropriate ROE in this Proceeding is Between 4.11% and 8.75%

Q17. HOW HAVE YOU CONCLUDED THAT THE APPROPRIATE RETURN ON EQUITY IN THIS PROCEEDING IS BETWEEN 4.11% AND 8.75%?

A17. In this proceeding, Mr. Wathen uses a long-term debt cost rate for the Company of 4.11%. This should serve the low end of the weighted cost of capital for Duke Energy Ohio. Duke Energy Ohio is claiming deteriorating financial integrity based on projected ROEs in this proceeding. I was advised by counsel that in an emergency rate increase, the Commission will grant any increase in revenue requirements only at the "minimum level necessary to avert or relieve the emergency" (Opinion and Order in 00-2260-HT-AEM at page 3). Even though Duke is not filing this case as an emergency rate increase, if the Commission concludes that the financial integrity claim (based on the projected ROE claimed by Duke), is in effect an emergency rate increase, then there is a precedent of using the long-term debt cost rate as the ROE.

I have also performed an equity cost rate study on Dr. Vender Weide's proxy group of twenty-four electric utilities and employed the DCF and CAPM approaches. I find an equity cost rate range of 7.5% to 8.9%, and use 8.75% as a point estimate ROE. In arriving at this figure, I emphasize that the current interest rates and capital costs are at historically low levels.

Q18. WHAT WILL BE THE NEGATIVE IMPACT ON DUKE'S CUSTOMERS IF THE ROE OF 11.15% PROPOSED BY DUKE IS ADOPTED IN THIS PROCEEDING?

A18. According to another OCC witness, David Effron, if an ROE of 11.15% (instead of an ROE of 4.11%) is adopted in this proceeding, this will increase the annual revenue requirement by $93,025,000. (See Schedule DJE-7.) This is an additional and unjustified $93 million collected from Duke's customer.

III. CAPITAL COSTS IN TODAY'S MARKETS

Q19. PLEASE DISCUSS CAPITAL COSTS IN U.S. MARKETS.

A19. Long-term capital cost rates for U.S. corporations are a function of the required returns on risk-free securities plus a risk premium. The risk-free rate of interest is the yield on long-term U.S Treasury yields. The yields on ten-year U.S. Treasury bonds from 1953 to the present are provided on page 1 of Exhibit JRW-3. These yields peaked in the early 1980s and have generally declined since that time. In the summer of 2003, these yields hit a 60-year low at 3.33%. They subsequently increased and fluctuated between the 4.0% and 5.0% levels over the next four years in response to ebbs and flows in the economy. Ten-year Treasury yields began to decline in mid-2007 at the beginning of the financial crisis. In 2008 Treasury yields declined to below 3.0% as a result of the expansion of the mortgage and subprime market credit crisis, the turmoil in the financial sector, the government bailout of financial institutions, the monetary stimulus provided by the Federal Reserve, and the economic recession. From 2008 until 2011, these rates fluctuated between 2.5% and 3.5%. Over the past year, the yields on ten-year Treasuries have declined from 2.5% to about 2.0% as the Federal Reserve has continued to support a low interest rate environment and economic uncertainties have persisted.

Panel B on page 1 of Exhibit JRW-3 shows the differences in yields between ten-year Treasuries and Moody's Baa rated bonds since the year 2000. This

differential primarily reflects the additional risk required by bond investors for the risk associated with investing in corporate bonds. The difference also reflects, to some degree, yield curve changes over time. The Baa rating is the lowest of the investment grade bond ratings for corporate bonds. The yield differential hovered in the 2.0% to 3.5% range until 2005, declined to 1.5% until late 2007, and then increased significantly in response to the financial crisis. This differential peaked at 6.0% at the height of the financial crisis in early 2009, due to tightening in credit markets, which increased corporate bond yields and the "flight to quality," which decreased treasury yields. The differential subsequently declined and has been in the 2.5% to 3.5% range over the past three years.

As previously noted, the risk premium is the return premium required by investors to purchase riskier securities. The risk premium required by investors to buy corporate bonds is observable based on yield differentials in the markets. The market risk premium is the return premium required to purchase stocks as opposed to bonds. The market or equity risk premium is not readily observable in the markets (as are bond risk premiums) since expected stock market returns are not readily observable. As a result, equity risk premiums must be estimated using market data. There are alternative methodologies to estimate the equity risk premium, and these alternative approaches and equity risk premium results are subject to much debate. One way to estimate the equity risk premium is to compare the mean returns on bonds and stocks over long historical periods. Measured in this manner, the equity risk premium has been in the 5% to 7%

range. However, studies by leading academics indicate the forward-looking equity risk premium is actually in the 4.0% to 5.0% range. These lower equity risk premium results are in line with the findings of equity risk premium surveys of Chief Financial Officers, academics, analysts, companies, and financial forecasters.

Q20. PLEASE DISCUSS INTEREST RATES AND THE FINANCIAL CRISIS.

A20. The yields on Treasury securities decreased significantly at the onset of the financial crisis and have remained at historically low levels. In fact, these yields have declined to levels not seen since the 1940s. The decline in interest rates reflects several factors, including: (1) the "flight to quality" in the credit markets as investors sought out low risk investments during the financial crisis; (2) the very aggressive monetary actions of the Federal Reserve, which have been aimed at restoring liquidity and faith in the financial system as well as maintaining low interest rates to boost economic growth; and (3) the continuing slow recovery from the recession.

The credit market for corporate and utility debt experienced higher rates due to the credit crisis. The long-term corporate credit markets tightened during the financial crisis, but have improved significantly since 2009. Interest rates on utility and corporate debt have declined to historically low levels. These low rates reflect the monetary policy actions of the Federal Reserve and the weak economy.

Panel A of page 2 of Exhibit JRW-3 provides the yields on 'A' rated public utility bonds. These yields peaked in November 2008 at 7.75% and have since declined to about 4.25% as of February 2013. Panel B of page 2 of Exhibit JRW-3 provides the yield spreads between long-term 'A' rated public utility bonds relative to the yields on 20-year Treasury bonds. These yield spreads increased dramatically in the third quarter of 2008 during the peak of the financial crisis and have decreased significantly since that time. For example, the yield spreads between 20-year U.S. Treasury bonds and 'A' rated utility bonds peaked at 3.40% in November of 2008, declined to about 1.5% in the summer of 2012, and have since remained in that range.

In sum, while the economy continues to face significant problems, the actions of the government and Federal Reserve had a large effect on the credit markets. The capital costs for utilities, as measured by the yields on 30-year utility bonds, have declined to historically low levels.

Q21. ARE INTEREST RATES LIKELY TO REMAIN LOW FOR SOME TIME?

A21. Yes. On September 13, 2012, the Federal Reserve released its policy statement relating to Quantitative Easing III ("QE3"). In the statement, the Federal Reserve announced the following:[9]

> To support a stronger economic recovery and to help ensure that

[9] Board of Governors of the Federal Reserve System, "Statement Regarding Transactions in Agency Mortgage-Backed Securities and Treasury Securities," September 13, 2012.

> inflation, over time, is at the rate most consistent with its dual mandate, the Committee agreed today to increase policy accommodation by purchasing additional agency mortgage-backed securities at a pace of $40 billion per month. The Committee also will continue through the end of the year its program to extend the average maturity of its holdings of securities as announced in June, and it is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities. These actions, which together will increase the Committee's holdings of longer-term securities by about $85 billion each month through the end of the year, should put downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative.

The Federal Reserve also indicated that it intends to keep the target rate for the federal funds rate between 0 to ¼ percent through at least mid-2015. These monetary policy actions of the Federal Reserve, coupled with U.S. economic conditions of slow economic growth, high unemployment, and low inflation, should keep U.S. interest rates and capital costs low for several years. The likelihood that these conditions will keep interest rates and capital costs low for U.S. businesses is reinforced by the economic and political problems in Europe, as the U.S. is viewed as a safe haven for investment capital around the world.

Q22. PLEASE ALSO DISCUSS THE fED'S DECEMBER 12, 2012 PRESS RELEASE REGARDING AN EXPANSION OF the QE3 PROGRAM.

A22. On December 12, 2012, the Federal Reserve expanded its bond buying program and tied future monetary policy moves to unemployment rates and the level of interest rates. In the release, the Federal Reserve Board indicated the following:[10]

> Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee remains concerned that, without sufficient policy accommodation, economic growth might not be strong enough to generate sustained improvement in labor market conditions. Furthermore, strains in global financial markets continue to pose significant downside risks to the economic outlook. The Committee also anticipates that inflation over the medium term likely will run at or below its 2 percent objective.
>
> To support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate, the Committee will continue purchasing additional agency mortgage-backed securities at a pace of $40 billion per month. The Committee also will purchase longer-term Treasury securities after its program to extend the average maturity of its holdings of

[10] Board of Governors of the Federal Reserve System, FOMC Statement," December 12, 2012.

> Treasury securities is completed at the end of the year, initially at a pace of $45 billion per month. The Committee is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and, in January, will resume rolling over maturing Treasury securities at auction. Taken together, these actions should maintain downward pressure on longer-term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative.

With respect to tying monetary policy to interest rates and unemployment, the Fed indicated the following:

> In particular, the Committee decided to keep the target range for the federal funds rate at 0 to 1/4 percent and currently anticipates that this exceptionally low range for the federal funds rate will be appropriate at least as long as the unemployment rate remains above 6-1/2 percent, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee's 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored. The Committee views these thresholds as consistent with its earlier date-based guidance.

Overall, these recent policy announcements of the Federal Reserve Board, in which the Federal Reserve has attempted to clarify its monetary policy stance and tie it to interest and unemployment rates, indicate that interest rates are likely to remain low for several years into the future.

Q23. OVERALL, WHAT DOES YOUR REVIEW OF THE CAPITAL MARKET CONDITIONS INDICATE ABOUT THE EQUITY COST RATE FOR UTILITIES TODAY?

A23. The market data suggests that capital costs for utilities are at historically low levels and are likely to stay low for some time. As shown on page 1 of Exhibit JRW-3, the yield on long-term 'A' rated utility bonds is about 4.25%. As demonstrated later in my testimony, these lower capital costs are also indicated by the DCF and CAPM data for electric utility companies.

IV. PROXY GROUP SELECTION

Q24. PLEASE DESCRIBE YOUR APPROACH TO DEVELOPING A FAIR RATE OF RETURN RECOMMENDATION FOR DUKE ENERGY OHIO.

A24. To develop a fair rate of return recommendation for Duke Energy Ohio, I have evaluated the return requirements of investors on the common stock of a proxy group of publicly-held electric utilities ("Electric Group").

Q25. PLEASE DESCRIBE YOUR PROXY GROUP.

A25. I used the proxy group of twenty-seven electric utility companies developed by Dr. Vander Weide. A summary of financial statistics for the companies in this group are also listed in Exhibit JRW-4. The median operating revenues and net plant for the Electric Proxy Group are $4,152.9M and $10,071.8M, respectively.[11] The group receives 75% of revenues from regulated electric utility operations, has an 'A-/BBB+' bond rating, a common equity ratio of 45.1%, and an earned return on common equity of 9.7%.

Q26. ARE THERE SOME COMPANIES IN THE GROUP THAT YOU WOULD NORMALLY NOT USE IN A PROXY GROUP OF ELéCTRIC UTILITIES?

A26. There are several companies in the group that I would normally eliminate due to their low percentage of regulated electric revenues. These companies would

[11] In my testimony, I present financial results using both mean and medians as measures of central tendency. However, due to outliers, I have used the median as a measure of central tendency.

include Integrys, Otter Tail, SEMPRA, and Vectren. However, since this group is viewed as being comparable to Duke by Dr. Vander Weide, I will use this group.

V. THE COST OF COMMON EQUITY CAPITAL

A. Overview

Q27. WHY MUST AN OVERALL COST OF CAPITAL OR FAIR RATE OF RETURN BE ESTABLISHED FOR A PUBLIC UTILITY?

A27. In a competitive industry, the return on a firm's common equity capital is determined through the competitive market for its goods and services. Due to the capital requirements needed to provide utility services and to the economic benefit to society from avoiding duplication of these services, some public utilities are monopolies. It is not appropriate to permit monopoly utilities to set their own prices, because of the lack of competition and the essential nature of the services. Thus, regulation seeks to establish prices that are fair to consumers and, at the same time, are sufficient to meet the operating and capital costs of the utility (i.e., provide an adequate return on capital to attract investors).

Q28. PLEASE PROVIDE AN OVERVIEW OF THE COST OF CAPITAL IN THE CONTEXT OF THE THEORY OF THE FIRM.

A28. The total cost of operating a business includes the cost of capital. The cost of common equity capital is the expected return on a firm's common stock that the marginal investor would deem sufficient to compensate for risk and the time value of money. In equilibrium, the expected and required rates of return on a company's common stock are equal.

Normative economic models of the firm, developed under very restrictive assumptions, provide insight into the relationship between firm performance or profitability, capital costs, and the value of the firm. Under the economist's ideal model of perfect competition where entry and exit is costless, products are undifferentiated, and there are increasing marginal costs of production, firms produce up to the point where price equals marginal cost. Over time, a long-run equilibrium is established where price equals average cost, including the firm's capital costs. In equilibrium, total revenues equal total costs, and because capital costs represent investors' required return on the firm's capital, actual returns equal required returns, and the market value and the book value of the firm's securities must be equal.

In reality, firms can achieve competitive advantage due to product market imperfections. Most notably, companies can gain competitive advantage through product differentiation (adding real or perceived value to products) and by

achieving economies of scale (decreasing marginal costs of production). Competitive advantage allows firms to price products above average cost and thereby earn accounting profits greater than those required to cover capital costs. When these profits are in excess of that required by investors, or when a firm earns a return on equity in excess of its cost of equity, investors respond by valuing the firm's equity in excess of its book value.

James M. McTaggart, founder of the international management consulting firm Marakon Associates, has described this essential relationship between the return on equity, the cost of equity, and the market-to-book ratio in the following manner:[12]

> Fundamentally, the value of a company is determined by the cash flow it generates over time for its owners, and the minimum acceptable rate of return required by capital investors. This "cost of equity capital" is used to discount the expected equity cash flow, converting it to a present value. The cash flow is, in turn, produced by the interaction of a company's return on equity and the annual rate of equity growth. High return on equity (ROE) companies in low-growth markets, such as Kellogg, are prodigious generators of cash flow, while low ROE companies in high-growth

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

> markets, such as Texas Instruments, barely generate enough cash flow to finance growth.

> A company's ROE over time, relative to its cost of equity, also determines whether it is worth more or less than its book value. If its ROE is consistently greater than the cost of equity capital (the investor's minimum acceptable return), the business is economically profitable and its market value will exceed book value. If, however, the business earns an ROE consistently less than its cost of equity, it is economically unprofitable and its market value will be less than book value.

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

Q29. PLEASE PROVIDE ADDITIONAL INSIGHTS INTO THE RELATIONSHIP BETWEEN RETURN ON EQUITY AND MARKET-TO-BOOK RATIOS.

A29. This relationship is discussed in a classic Harvard Business School case study entitled "A Note on Value Drivers." On page 2 of that case study, the author describes the relationship very succinctly:[13]

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

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

Where K is the firm's cost of equity.

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

Q30. WHAT FACTORS DETERMINE INVESTORS' EXPECTED OR REQUIRED RATE OF RETURN ON EQUITY?

A30. The expected or required rate of return on common stock is a function of market-wide as well as company-specific factors. The most important market factor is the time value of money as indicated by the level of interest rates in the economy. Common stock investor requirements generally increase and decrease with like changes in interest rates. The perceived risk of a firm is the predominant factor that influences investor return requirements on a company-specific basis. A firm's investment risk is often separated into business and financial risk. Business risk encompasses all factors that affect a firm's operating revenues and expenses. Financial risk results from incurring fixed obligations in the form of debt in financing its assets.

Q31. HOW DOES THE INVESTMENT RISK OF UTILITIES COMPARE WITH THAT OF OTHER INDUSTRIES?

A31. Due to the essential nature of their service as well as their regulated status, public utilities are exposed to a lesser degree of business risk than other, non-regulated businesses. The relatively low level of business risk allows public utilities to meet much of their capital requirements through borrowing in the financial markets, thereby incurring greater than average financial risk. Nonetheless, the overall investment risk of public utilities is below most other industries.

Exhibit JRW-5 provides an assessment of investment risk for 100 industries as measured by beta, which according to modern capital market theory, is the only relevant measure of investment risk. These betas come from the *Value Line Investment Survey* and are compiled annually by Aswath Damodoran of New York University.[14] The study shows that the investment risk of utilities is very low. The average beta for electric, water, and gas utility companies are 0.73, 0.66, and 0.66, respectively. These are well below the *Value Line* average of 1.15. As such, the cost of equity for utilities is among the lowest of all industries in the U.S.

Q32. HOW CAN THE EXPECTED OR REQUIRED RATE OF RETURN ON COMMON EQUITY CAPITAL BE DETERMINED?

A32. The costs of debt and preferred stock are normally based on historical or book values and can be determined with a great degree of accuracy. The cost of common equity capital, however, cannot be determined precisely and must instead be estimated from market data and informed judgment. This return to the stockholder should be commensurate with returns on investments in other enterprises having comparable risks.

According to valuation principles, the present value of an asset equals the discounted value of its expected future cash flows. Investors discount these

[14] *Available* at http://www.stern.nyu.edu/~adamodar.

expected cash flows at their required rate of return that, as noted above, reflects the time value of money and the perceived riskiness of the expected future cash flows. As such, the cost of common equity is the rate at which investors discount expected cash flows associated with common stock ownership.

Models have been developed to ascertain the cost of common equity capital for a firm. Each model, however, has been developed using restrictive economic assumptions. Consequently, judgment is required in selecting appropriate financial valuation models to estimate a firm's cost of common equity capital, in determining the data inputs for these models, and in interpreting the models' results. All of these decisions must take into consideration the firm involved as well as current conditions in the economy and the financial markets.

Q33. HOW DO YOU PLAN TO ESTIMATE THE COST OF EQUITY CAPITAL FOR DUKE ENERGY OHIO?

A33. I rely primarily on the DCF model to estimate the cost of equity capital. Given the investment valuation process and the relative stability of the utility industry, I believe that the DCF model provides the best measure of equity cost rates for public utilities. It is my experience that this Commission has traditionally relied on the DCF method. I have also performed a CAPM study, but I give these results less weight because I believe that risk premium studies, of which the CAPM is one form, provide a less reliable indication of equity cost rates for public utilities due to the uncertainty in measuring the market risk premium.

B. Discounted Cash Flow Analysis

Q34. DESCRIBE THE THEORY BEHIND THE TRADITIONAL DCF MODEL.

A34. According to the DCF model, the current stock price is equal to the discounted value of all future dividends that investors expect to receive from investment in the firm. As such, stockholders' returns ultimately result from current as well as future dividends. As owners of a corporation, common stockholders are entitled to a pro rata share of the firm's earnings. The DCF model presumes that earnings that are not paid out in the form of dividends are reinvested in the firm so as to provide for future growth in earnings and dividends. The rate at which investors discount future dividends, which reflects the timing and riskiness of the expected cash flows, is interpreted as the market's expected or required return on the common stock. Therefore, this discount rate represents the cost of common equity. Algebraically, the DCF model can be expressed as:

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

where P is the current stock price, D_n is the dividend in year n, and k is the cost of common equity.

Q35. IS THE DCF MODEL CONSISTENT WITH VALUATION TECHNIQUES EMPLOYED BY INVESTMENT FIRMS?

A35. Yes. Virtually all investment firms use some form of the DCF model as a valuation technique. One common application for investment firms is called the three-stage DCF or dividend discount model ("DDM"). The stages in a three-stage DCF model are presented in Exhibit JRW-6. This model presumes that a company's dividend payout progresses initially through a growth stage, then proceeds through a transition stage, and finally assumes a steady-state stage. The dividend-payment stage of a firm depends on the profitability of its internal investments, which, in turn, is largely a function of the life cycle of the product or service.

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

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

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

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

Q36. HOW DO YOU ESTIMATE STOCKHOLDERS' EXPECTED OR REQUIRED RATE OF RETURN USING THE DCF MODEL?

A36. Under certain assumptions, including a constant and infinite expected growth rate, and constant dividend/earnings and price/earnings ratios, the DCF model can be simplified to the following:

$$P = \frac{D_1}{k - g}$$

where D_1 represents the expected dividend over the coming year and g is the expected growth rate of dividends. This is known as the constant-growth version

of the DCF model. To use the constant-growth DCF model to estimate a firm's cost of equity, one solves for k in the above expression to obtain the following:

$$k = \frac{D_1}{P} + g$$

Q37. IN YOUR OPINION, IS THE CONSTANT-GROWTH DCF MODEL APPROPRIATE FOR PUBLIC UTILITIES?

A37. Yes. The economics of the public utility business indicate that the industry is in the steady-state or constant-growth stage of a three-stage DCF. The economics include the relative stability of the utility business, the maturity of the demand for public utility services, and the regulated status of public utilities (especially the fact that their returns on investment are effectively set through the ratemaking process). The DCF valuation procedure for companies in this stage is the constant-growth DCF. In the constant-growth version of the DCF model, the current dividend payment and stock price are directly observable. However, the primary problem and controversy in applying the DCF model to estimate equity cost rates entails estimating investors' expected dividend growth rate.

Q38. WHAT FACTORS SHOULD ONE CONSIDER WHEN APPLYING THE DCF METHODOLOGY?

A38. One should be sensitive to several factors when using the DCF model to estimate

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

Q39. PLEASE DISCUSS EXHIBIT JRW-7.

A39. My DCF analysis is provided in Exhibit JRW-7. The DCF summary is on page 1 of this Exhibit, and the supporting data and analysis for the dividend yield and expected growth rate are provided on the following pages of the Exhibit.

Q40. WHAT DIVIDEND YIELDS ARE YOU EMPLOYING IN YOUR DCF ANALYSIS FOR THE PROXY Group?

A40. The dividend yields on the common stock for the companies in the proxy group are provided on pages 2 and 3 of Exhibit JRW-7 for the six-month period ending March 2013. For the DCF dividend yields for the group, I am using the median of the six month and March 2013 dividend yields. The table below shows these dividend yields.

	March 2013 Dividend Yield	**6-Month Average Dividend Yield**	**DCF Dividend Yield**
Electric Proxy Group	**4.0%**	**4.1%**	**4.05%**

Q41. PLEASE DISCUSS THE APPROPRIATE ADJUSTMENT TO THE SPOT DIVIDEND YIELD.

A41. According to the traditional DCF model, the dividend yield term relates to the dividend yield over the coming period. As indicated by Professor Myron Gordon, who is commonly associated with the development of the DCF model for popular use, this is obtained by: (1) multiplying the expected dividend over the coming quarter by 4, and (2) dividing this dividend by the current stock price to determine the appropriate dividend yield for a firm that pays dividends on a quarterly basis.[15]

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

[15] *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).

Q42. GIVEN THIS DISCUSSION, WHAT ADJUSTMENT FACTOR WILL YOU USE FOR YOUR DIVIDEND YIELD?

A42. I will adjust the dividend yield by one-half (1/2) the expected growth so as to reflect growth over the coming year. This is the approach employed by the Federal Energy Regulatory Commission ("FERC").[16] The DCF equity cost rate ("K") is computed as:

$$K = [(D/P) * (1 + 0.5g)] + g$$

Q43. PLEASE DISCUSS THE GROWTH RATE COMPONENT OF THE DCF MODEL.

A43. There is much debate as to the proper methodology to employ in estimating the growth component of the DCF model. By definition, this component is investors' expectation of the long-term dividend growth rate. Presumably, investors use some combination of historical and/or projected growth rates for earnings and dividends per share and for internal or book value growth to assess long-term potential.

Q44. WHAT GROWTH DATA HAVE YOU REVIEWED FOR THE PROXY GROUP?

A44. I have analyzed a number of measures of growth for companies in the proxy group. I reviewed Value Line's historical and projected growth rate estimates for

[16] Opinion No. 414-A, *Transcontinental Gas Pipe Line Corp*., 84 FERC ¶61,084 (1998).

earnings per share ("EPS"), dividends per share ("DPS"), and book value per share ("BVPS"). In addition, I utilized the average EPS growth rate forecasts of Wall Street analysts as provided by Yahoo, Reuters and Zacks. These services solicit five-year earnings growth rate projections from securities analysts and compile and publish the means and medians of these forecasts. Finally, I also assessed prospective growth as measured by prospective earnings retention rates and earned returns on common equity.

Q45. PLEASE DISCUSS HISTORICAL GROWTH IN EARNINGS AND DIVIDENDS AS WELL AS INTERNAL GROWTH.

A45. Historical growth rates for EPS, DPS, and BVPS are readily available to investors and are presumably an important ingredient in forming expectations concerning future growth. However, one must use historical growth numbers as measures of investors' expectations with caution. In some cases, past growth may not reflect future growth potential. Also, employing a single growth rate number (for example, for five or ten years), is unlikely to accurately measure investors' expectations due to the sensitivity of a single growth rate figure to fluctuations in individual firm performance as well as overall economic fluctuations (i.e., business cycles). However, one must appraise the context in which the growth rate is being employed. According to the conventional DCF model, the expected return on a security is equal to the sum of the dividend yield and the expected long-term growth in dividends. Therefore, to best estimate the cost of common

equity capital using the conventional DCF model, one must look to long-term growth rate expectations.

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

Q46. PLEASE DISCUSS THE SERVICES THAT PROVIDE ANALYSTS' EPS FORECASTS.

A46. Analysts' EPS forecasts for companies are collected and published by a number of different investment information services, including Institutional Brokers Estimate System ("I/B/E/S"), Bloomberg, FactSet, Zacks, First Call and Reuters, among others. Thompson Reuters publishes analysts' EPS forecasts under different product names, including I/B/E/S, First Call, and Reuters. Bloomberg, FactSet, and Zacks publish their own set of analysts' EPS forecasts for companies. These services do not reveal: (1) the analysts who are solicited for forecasts; or (2) the actual analysts who actually provide the EPS forecasts that are used in the compilations published by the services. I/B/E/S, Bloomberg, FactSet, and First Call are fee-based services. These services usually provide detailed reports and other data in addition to analysts'

EPS forecasts. Thompson Reuters and Zacks do provide limited EPS forecasts data free-of-charge on the internet. Yahoo finance (http://finance.yahoo.com) lists Thompson Reuters as the source of its summary EPS forecasts. The Reuters website (www.reuters.com) also publishes EPS forecasts from Thompson Reuters, but with more detail. Zacks (www.zacks.com) publishes its summary forecasts on its website. Zack's estimates are also available on other websites, such as msn.money (http://money.msn.com).

Q47. PLEASE PROVIDE AN EXAMPLE OF THESE EPS FORECASTS.

A47. The following example provides the EPS forecasts compiled by Reuters for ALLETE Inc. (stock symbol "ALE").

Consensus Earnings Estimates

ALLETE Inc. **(ALE)**
www.reuters.com
March 7, 2012

	# of Estimates	Mean	High	Low
Earnings (per share)				
Quarter Ending Mar-13	4	0.76	0.80	0.74
Quarter Ending Jun-13	3	0.43	0.45	0.41
Year Ending Dec-13	5	2.74	2.76	2.70
Year Ending Dec-14	4	3.01	3.06	2.95
LT Growth Rate (%)	1	6.00	6.00	6.00

These figures can be interpreted as follows. The top line shows that four analysts have provided EPS estimates for the quarter ending March 31, 2013. The mean, high and low estimates are $0.76, $0.80, and $0.74, respectively. The second line shows the quarterly EPS estimates for the quarter ending June 30, 2013. Lines three and four show the annual EPS estimates for the fiscal years ending December 2013 and 2014. The quarterly and annual EPS forecasts in lines 1-4 are expressed in dollars and cents. As in the ALE case shown here, it is common for more analysts to provide estimates of annual EPS as opposed to quarterly EPS. The bottom line shows the projected long-term EPS growth rate which is expressed as a percentage. For ALE, one analyst has provided long-term EPS growth rate forecasts, with mean, high and low growth rates of 6.00%.

Q48. WHICH OF THESE EPS FORECASTS IS USED IN DEVELOPING A DCF GROWTH RATE?

A48. The DCF growth rate is the long-term projected growth rate in EPS, DPS, and BVPS. Therefore, in developing an equity cost rate using the DCF model, the projected long-term growth rate is the projection used in the DCF model.

Q49. WHY ARE YOU NOT RELYING EXCLUSIVELY ON THE EPS FORECASTS OF WALL STREET ANALYSTS IN ARRIVING AT A DCF GROWTH RATE FOR THE PROXY GROUPS?

A49. There are several issues with using the EPS growth rate forecasts of Wall Street analysts as DCF growth rates. First, the appropriate growth rate in the DCF

model is the dividend growth rate, not the earnings growth rate. Nonetheless, over the very long-term, dividend and earnings will have to grow at a similar growth rate. Therefore, consideration must be given to other indicators of growth, including prospective dividend growth, internal growth, as well as projected earnings growth. Second, a recent study by Lacina, Lee, and Xu (2011) has shown that analysts' long-term earnings growth rate forecasts are not more accurate at forecasting future earnings than naïve random walk forecasts of future earnings.[17] Employing data over a twenty year period, these authors demonstrate that using the most recent year's EPS figure to forecast EPS in the next 3-5 years proved to be just as accurate as using the EPS estimates from analysts' long-term earnings growth rate forecasts. In the authors' opinion, these results indicate that analysts' long-term earnings growth rate forecasts should be used with caution as inputs for valuation and cost of capital purposes.

Finally, and most significantly, it is well-known that the long-term EPS growth rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased. This has been demonstrated in a number of academic studies over the years. This issue is discussed at length in Appendix B of this testimony. Hence, using these growth rates as a DCF growth rate will provide an overstated equity cost rate. On this issue, a study by Easton and Sommers (2007) found that optimism in analysts' growth rate forecasts leads to an upward bias in estimates of

[17] M. Lacina, B. Lee & Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101.

the cost of equity capital of almost 3.0 percentage points.[18]

Q50. IS IT YOUR OPINION THAT STOCK PRICES REFLECT THE UPWARD BIAS IN THE EPS GROWTH RATE FORECASTS?

A50. Yes, I do believe that investors are well aware of the bias in analysts' EPS growth rate forecasts, and therefore, stock prices reflect the upward bias.

Q51. HOW DOES THAT AFFECT THE USE OF THESE FORECASTS IN A DCF EQUITY COST RATE STUDY?

A51. According to the DCF model, the equity cost rate is a function of the dividend yield and expected growth rate. Since stock prices reflect the bias, it would affect the dividend yield. In addition, the DCF growth rate needs to be adjusted downward from the projected EPS growth rate to reflect the upward bias.

Q52. PLEASE DISCUSS THE HISTORICAL GROWTH OF THE COMPANIES IN THE PROXY GROUP AS PROVIDED BY VALUE LINE.

A52. Page 3 of Exhibit JRW-7 provides the 5- and 10- year historical growth rates for the companies in the group, as published in the *Value Line Investment Survey*. The historical growth measures in EPS, DPS, and BVPS for the Electric Proxy Group, as measured by the medians, range from 2.0% to 4.0%, with an average of 3.1%.

[18] Peter D. Easton & Gregory A. Sommers, *Effect of Analysts' Optimism on Estimates of the Expected Rate of Return Implied by Earnings Forecasts*, 45 J. ACCT. RES. 983–1015 (2007).

Q53. PLEASE SUMMARIZE VALUE LINE'S PROJECTED GROWTH RATES FOR THE COMPANIES IN THE PROXY GROUP.

A53. *Value Line's* projections of EPS, DPS and BVPS growth for the companies in the proxy group are shown on page 4 of Exhibit JRW-7. As above, due to the presence of outliers, the medians are used in the analysis. For the Electric Proxy Group, the medians range from 4.0% to 5.5%, with an average of 4.5%.

Also provided on page 4 of Exhibit JRW-7 is prospective sustainable growth for the proxy group as measured by *Value Line*'s average projected retention rate and return on shareholders' equity. As noted above, sustainable growth is a significant and a primary driver of long-run earnings growth. For the Electric Proxy Group, the median prospective sustainable growth rate is 4.1%.

Q54. PLEASE ASSESS GROWTH FOR THE PROXY GROUP AS MEASURED BY ANALYSTS' FORECASTS OF EXPECTED 5-YEAR eps GROWTH.

A54. Yahoo, Zacks, and Reuters collect, summarize, and publish Wall Street analysts' long-term EPS growth rate forecasts for the companies in the proxy groups. These forecasts are provided for the companies in the proxy group on page 5 of Exhibit JRW-7. The median of analysts' projected EPS growth rates for the Electric Proxy Group is 5.2%.[19]

[19] 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.

Q55. PLEASE SUMMARIZE YOUR ANALYSIS OF THE HISTORICAL AND PROSPECTIVE GROWTH OF THE PROXY GROUP.

A55. Page 6 of Exhibit JRW-7 shows the summary DCF growth rate indicators for the proxy group. The historical growth rate indicators for the Electric Proxy Group imply a baseline growth rate in the range of 3.1%. The high end of the range for the Electric Proxy Group is 5.2% which is the projected EPS growth rates of Wall Street analysts. The average of the historic, sustainable, and projected growth rate indicators is 4.2%, and the average of the sustainable and projected EPS growth rates is 4.6%. As indicated, analysts' projected EPS growth for the companies in the Electric Proxy Group is 5.2%. Focusing primarily on the sustainable and projected growth rate measures, I believe that an expected growth rate in the 4.5% to 5.0% range is appropriate for the Electric Proxy Group. Given these figures, I will use the mid-point of this range, 4.75%, as the DCF growth rate for the Electric Proxy Group.

Q56. BASED ON THE ABOVE ANALYSIS, WHAT ARE YOUR INDICATED COMMON EQUITY COST RATES FROM THE DCF MODEL FOR THE GROUP?

A56. My DCF-derived equity cost rates for the groups are summarized on page 1 of Exhibit JRW-7.

	Dividend Yield	1 + ½ Growth Adjustment	DCF Growth Rate	Equity Cost Rate
Electric Proxy Group	**4.05%**	**1.02375**	**4.75%**	**8.9%**

C. Capital Asset Pricing Model Results

Q57. PLEASE DISCUSS THE CAPITAL ASSET PRICING MODEL ("CAPM").

A57. The CAPM is a risk premium approach to gauging a firm's cost of equity capital. According to the risk premium approach, the cost of equity is the sum of the interest rate on a risk-free bond (R_f) and a risk premium (RP), as in the following:

$$k = R_f + RP$$

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

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

$$K = (R_f) + ß * [E(R_m) - (R_f)]$$

Where:

K represents the estimated rate of return on the stock;

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

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

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

Beta—(ß) is a measure of the systematic risk of an asset.

To estimate the required return or cost of equity using the CAPM requires three inputs: the risk-free rate of interest (R_f), the beta (ß), and the expected equity or market risk premium $[E(R_m) - (R_f)]$. R_f is the easiest of the inputs to measure – it is represented by the yield on long-term Treasury bonds. ß, the measure of systematic risk, is a little more difficult to measure because there are different opinions about what adjustments, if any, should be made to historical betas due to their tendency to regress to 1.0 over time. And finally, an even more difficult input to measure is the expected equity or market risk premium $(E(R_m) - (R_f))$. I will discuss each of these inputs below.

Q58. PLEASE DISCUSS EXHIBIT JRW-8.

A58. Exhibit JRW-8 provides the summary results for my CAPM study. Page 1 shows the results, and the following pages contain the supporting data.

Q59. PLEASE DISCUSS THE RISK-FREE INTEREST RATE.

A59. The yield on long-term U.S. Treasury bonds has usually been viewed as the risk-free rate of interest in the CAPM. The yield on long-term U.S. Treasury bonds, in turn, has been considered to be the yield on U.S. Treasury bonds with 30-year maturities.

Q60. WHAT RISK-FREE INTEREST RATE ARE YOU USING IN YOUR CAPM?

A60. The yield on 30-year Treasury bonds has been in the 2.5% to 4.0% range over 2011 – 2013 time period. These rates are currently in the middle of this range. Given the recent range of yields, and the prospect of higher rates in the future, I will use 4.0%, as the risk-free rate, or R_f, in my CAPM.

Q61. WHAT BETAS ARE YOU EMPLOYING IN YOUR CAPM?

A61. Beta (ß) is a measure of the systematic risk of a stock. The market, usually taken to be the S&P 500, has a beta of 1.0. The beta of a stock with the same price movement as the market also has a beta of 1.0. A stock whose price movement is greater than that of the market, such as a technology stock, is riskier than the market and has a beta greater than 1.0. A stock with below average price movement, such as that of a regulated public utility, is less risky than the market

and has a beta less than 1.0. Estimating a stock's beta involves running a linear regression of a stock's return on the market return.

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

Several online investment information services, such as Yahoo and Reuters, provide estimates of stock betas. Usually these services report different betas for the same stock. The differences are usually due to: (1) the time period over which the ß is measured; and (2) any adjustments that are made to reflect the fact that betas tend to regress to 1.0 over time. In estimating an equity cost rate for the proxy group, I am using the betas for the companies as provided in the *Value Line Investment Survey*. As shown on page 3 of Exhibit JRW-8, the median beta for the companies in the Electric Proxy Group is 0.70.

Q62. PLEASE DISCUSS THE ALTERNATIVE VIEWS REGARDING THE EQUITY RISK PREMIUM.

A62. The equity or market risk premium - $(E(R_m) - R_f)$ - is equal to the expected return on the stock market (e.g., the expected return on the S&P 500 ($E(R_m)$ minus the risk-free rate of interest (R_f). The equity premium is the difference in the expected total return between investing in equities and investing in "safe" fixed-income assets, such as long-term government bonds. However, while the equity risk premium is easy to define conceptually, it is difficult to measure because it requires an estimate of the expected return on the market.

Q63. PLEASE DISCUSS THE ALTERNATIVE APPROACHES TO ESTIMATING THE EQUITY RISK PREMIUM.

A63. Page 4 of Exhibit JRW-8 highlights the primary approaches to, and issues in, estimating the expected equity risk premium. The traditional way to measure the equity risk premium was to use the difference between historical average stock and bond returns. In this case, historical stock and bond returns, also called ex post returns, were used as the measures of the market's expected return (known as the ex ante or forward-looking expected return). This type of historical evaluation of stock and bond returns is often called the "Ibbotson approach" after Professor Roger Ibbotson, who popularized this method of using historical financial market returns as measures of expected returns. Most historical assessments of the equity risk premium suggest an equity risk premium of 5-7 percent above the rate on long-term U.S. Treasury bonds. However, this can be a problem because: (1) ex

post returns are not the same as ex ante expectations, (2) market risk premiums can change over time, increasing when investors become more risk-averse and decreasing when investors become less risk-averse, and (3) market conditions can change such that ex post historical returns are poor estimates of ex ante expectations.

The use of historical returns as market expectations has been criticized in numerous academic studies.[20] The general theme of these studies is that the large equity risk premium discovered in historical stock and bond returns cannot be justified by the fundamental data. These studies, which fall under the category "Ex Ante Models and Market Data," compute ex ante expected returns using market data to arrive at an expected equity risk premium. These studies have also been called "Puzzle Research" after the famous study by Mehra and Prescott in which the authors first questioned the magnitude of historical equity risk premiums relative to fundamentals.[21]

In addition, there are a number of surveys of financial professionals regarding the equity risk premium. There have been several published surveys of academics on the equity risk premium. *CFO Magazine* conducts a quarterly survey of CFOs which includes questions regarding their views on the current expected returns on

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

[21] Rajnish Mehra & Edward C. Prescott, *The Equity Premium: A Puzzle*, J. MONETARY ECON. 145 (1985).

stocks and bonds. Usually over 500 CFOs participate in the survey.[22] Questions regarding expected stock and bond returns are also included in the Federal Reserve Bank of Philadelphia's annual survey of financial forecasters which is published as the *Survey of Professional Forecasters*.[23] This survey of professional economists has been published for almost 50 years. In addition, Pablo Fernandez conducts occasional surveys of financial analysts and companies regarding the equity risk premiums they use in their investment and financial decision-making.

Q64. PLEASE PROVIDE A SUMMARY OF THE EQUITY RISK PREMIUM STUDIES.

A64. Derrig and Orr (2003), Fernandez (2007), and Song (2007) have completed the most comprehensive reviews to date of the research on the equity risk premium.[24] Derrig and Orr's study evaluated the various approaches to estimating equity risk premiums as well as the issues with the alternative approaches and summarized the findings of the published research on the equity risk premium. Fernandez examined four alternative measures of the equity risk premium – historical,

[22] *See*, www.cfosurvey.org.

[23] Federal Reserve Bank of Philadelphia, *Survey of Professional Forecasters*, (February 15, 2013). 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.

[24] *See* Richard Derrig & Elisha Orr, "Equity Risk Premium: Expectations Great and Small," Working Paper (version 3.0), Automobile Insurers Bureau of Massachusetts, (August 28, 2003); Pablo Fernandez, "Equity Premium: Historical, Expected, Required, and Implied," IESE Business School Working Paper, (2007); Zhiyi Song, "The Equity Risk Premium: An Annotated Bibliography," CFA Institute, (2007).

expected, required, and implied. He also reviewed the major studies of the equity risk premium and presented the summary equity risk premium results. Song provides an annotated bibliography and highlights the alternative approaches to estimating the equity risk summary.

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

Q65. PLEASE DISCUSS PAGE 5 OF EXHIBIT JRW-8.

A65. Page 5 of JRW-8 provides a summary of the results of the equity risk premium studies that I have reviewed. These include the results of: (1) the various studies of the historical risk premium, (2) ex ante equity risk premium studies, (3) equity risk premium surveys of CFOs, Financial Forecasters, analysts, companies and academics, and (4) the Building Block approaches to the equity risk premium. There are results reported for over thirty studies and the median equity risk premium is 4.93%.

Q66. PLEASE HIGHLIGHT THE RESULTS OF THE MORE RECENT RISK PREMIUM STUDIES AND SURVEYS.

A66. The studies cited on page 5 of Exhibit JRW-8 include all equity risk premium studies and surveys I could identify that were published over the past decade and that provided an equity risk premium estimate. Most of these studies were published prior to the financial crisis of the past two years. In addition, some of these studies were published in the early 2000s at the market peak. It should be noted that many of these studies (as indicated) used data over long periods of time (as long as fifty years of data) and so they were not estimating an equity risk premium as of a point in time (e.g., the year 2001). To assess the effect of the earlier studies on the equity risk premium, on page 6 of Exhibit JRW-8, I have reconstructed page 5 of Exhibit JRW-8, but I have eliminated all studies dated before January 2, 2010. The median for this subset of studies is 4.79%.

Q67. GIVEN THESE RESULTS, WHAT EQUITY RISK PREMIUM ARE YOU USING IN YOUR CAPM?

A67. I use a market or equity risk premium of 5.0%.

Q68. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE EQUITY RISK PREMIUMS USED BY CFOs?

A68. Yes. In the March 2013 CFO survey conducted by CFO Magazine and Duke University, the expected 10-year equity risk premium was 4.1%.

Q69. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE EQUITY RISK PREMIUMS OF PROFESSIONAL FORECASTERS?

A69. Yes. The financial forecasters in the previously referenced Federal Reserve Bank of Philadelphia survey project both stock and bond returns. As shown on Panels D and E of page 2 of Exhibit JRW-C1, the median long-term expected stock and bond returns were 6.13% and 3.83%, respectively. This provides an ex ante equity risk premium of 2.30%.

Q70. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE EQUITY RISK PREMIUMS OF FINANCIAL ANALYSTS AND COMPANIES?

A70. Yes. Pablo Fernandez recently published the results of a 2012 survey of financial analysts and companies.[25] This survey included over 7,000 responses. The median equity risk premium employed by U.S. analysts and companies was 5.0% and 5.5%, respectively.

Q71. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE EQUITY RISK PREMIUMS USED BY THE LEADING CONSULTING FIRMS?

A71. Yes. McKinsey & Co. is widely recognized as the leading management consulting firm in the world. It published a study entitled "The Real Cost of

[25] Pablo Fernandez, Javier Auirreamalloa, and Javier Corres, "Market Risk Premium Used in 56 Countries in 2011: A survey with 6,014 Answers, Working Paper WP-920, May 2011.

Equity" in which the McKinsey authors developed an ex ante equity risk premium for the U.S. In reference to the decline in the equity risk premium, as well as what is the appropriate equity risk premium to employ for corporate valuation purposes, the McKinsey authors concluded the following:

> We attribute this decline not to equities becoming less risky (the inflation-adjusted cost of equity has not changed) but to investors demanding higher returns in real terms on government bonds after the inflation shocks of the late 1970s and early 1980s. We believe that using an equity risk premium of 3.5 to 4 percent in the current environment better reflects the true long-term opportunity cost of equity capital and hence will yield more accurate valuations for companies.[26]

[26] Marc H. Goedhart, *et al.*, "The Real Cost of Equity," *McKinsey on Finance* (Autumn 2002), p. 15.

Q72. WHAT EQUITY COST RATE IS INDICATED BY YOUR CAPM ANALYSIS?

A72. The results of my CAPM study for the proxy group are provided below:

$$K = (R_f) + ß * [E(R_m) - (R_f)]$$

	Risk-Free Rate	Beta	Equity Risk Premium	Equity Cost Rate
Electric Proxy Group	**4.00%**	**0.70**	**5.0%**	**7.5%**

These results are summarized on page 1 of Exhibit JRW-8.

VI. EQUITY COST RATE SUMMARY

Q73. PLEASE SUMMARIZE YOUR EQUITY COST RATE STUDY.

A73. The results for my DCF and CAPM analyses for the proxy group of electric utility companies are indicated below:

	DCF	CAPM
Electric Proxy Group	**8.9%**	**7.5%**

Q74. GIVEN THESE RESULTS, WHAT IS YOUR ESTIMATED EQUITY COST RATE FOR THE GROUP?

A74. Given these results, I conclude that the appropriate equity cost rate for the Electric Proxy Group is in the 7.5% to 8.9% range. However, since I give greater weight to the DCF model, I am using the upper end of the range as the equity cost rate. Therefore, I conclude that the appropriate equity cost rate is 8.75%.

Q75. DO YOU HAVE ANY OTHER THOUGHTS ON WHY AN 8.75% RETURN ON EQUITY IS APPROPRIATE AT THIS TIME?

A75. Yes. There are several reasons why an 8.75% return on equity is appropriate for Duke Energy Ohio in this case. First, as shown on in Exhibit JRW-8, the electric utility is one the lowest risk industries as ranked by Beta in *Value Line*. As such, electric utility companies have one of the lowest equity cost rates of any industry in the U.S. according to the CAPM. Second, as shown in Exhibit JRW-3, capital costs for utilities, as indicated by long-term bond yields, have declined to historically low levels. The current yield on 30-year, A rated utility bonds is about 4.25%. Finally, while the financial markets have recovered over the past four years, the economy has not. The economic times are viewed as being difficult, with almost eight percent unemployment and slow economic growth. With the weak economy, interest rates and inflation are at low levels, and hence the expected returns on financial assets – from savings accounts to Treasury Bonds to common stocks – are low. Therefore, in my opinion, an 8.75% return is a very fair and reasonable for an electric utility company.

VII. CRITIQUE OF DUKE ENERGY OHIO'S FINANCIAL INTEGRITY TESTIMONY

Q76. PLEASE SUMMARIZE DUKE ENERGY OHIO'S TESTIMONY ON FINANCIAL INTEGRITY.

A76. The Company's testimony on financial integrity is offered by Ms. Julie M. Cannell, Mr. Stephen G. DeMay, and Dr. James H. Vander Weide. Ms. Cannell's testimony is offered from the perspective of investors in electric utilities. Mr. DeMay discusses the Companies' financial objectives and credit quality, regulatory environment, and the perspective of equity investors. Dr. Vander Weide's testimony is to support the 11.15% ROE for Duke Energy Ohio that Ohio Power received in Case No. 10-2929-EL-UNC.

A. Testimonies of Ms. Cannell and Mr. DeMay

Q77. PLEASE PROVIDE ADDITIONAL DETAILS ABOUT MS. CANNELL'S TESTIMONY.

A77. In her discussion of the investors' perspective, Ms. Cannell discusses who equity investors are (individuals and institutions), the risk of investing in electric utilities, regulatory climate, investors' views of regulation, and services that review and evaluate state regulatory environment. She also speculates on how investors might view the current proceeding involving the Company's request to recover capacity

charges on a cost basis and she also speculates on how investors may view the Commission in the event the Company's request is denied.

Q78. PLEASE ALSO PROVIDE ADDITIONAL DETAILS ABOUT MR. DEMAY'S TESTIMONY.

A78. Mr. DeMay: (1) discusses the Company's financial objectives with respect to capital structure, credit ratings, and earned returns; (2) indicates that the Company's request in the proceeding is driven by the negative returns being earned in generation assets; (3) reviews the Company's current credit ratings, the importance of credit quality and regulation in Ohio, and how a positive outcome in this proceeding can further the Company's credit quality; and (4) discussed the role of equity investors.

Q79. PLEASE EVALUATE MS. CANNELL'S AND MR. DEMAY'S TESTIMONIES.

A79. The testimonies of Ms. Cannell and Mr. DeMay provide no insight into what is the impact of this proceeding on the financial integrity of Duke Energy Ohio. Both testimonies are very general in nature, provide no empirical analysis, and lack detail. In this regard, neither witness provides any analysis of financial data to support their claims. Likewise, neither witness cites to any credit rating agency report or investment company reports that detail the impact of the Company's generating assets on the Company's credit quality, financial integrity, and/or attractiveness as an equity investment. In other words, the testimonies of both witnesses are speculative and provide no concrete evidence regarding the impact of this proceeding on the financial integrity of Duke Energy Ohio. Finally, neither witness

even mentions Dr. Vander Weide's testimony and therefore, neither provides any support whatsoever for Dr. Vander Weide's 11.15% ROE recommendation.

B. Dr. Vander Weide's 11.15% ROE Recommendation

Q80. PLEASE REVIEW DR. VANDER WEIDE'S RETURN ON EQUITY APPROACHES.

A80. Dr. Vander Weide estimates an equity cost rate for Duke Energy Ohio using the results for two proxy groups and employs DCF, RP, and CAPM equity cost rate approaches. He employs a proxy group of twenty-seven electric utility companies and eleven gas pipeline companies. Dr. Vander Weide claims that power generators are the appropriate proxy for the generating assets of the Company. However, he cannot use a proxy group of independent power generators because (1) none exist and (2) the ones that do are bankrupt or in financial peril. Therefore, in addition to the proxy group of electric utilities, he has employed a proxy group of gas pipelines since they are subject to both regulated and open market competition.

Q81. PLEASE SUMMARIZE DR. VANDER WEIDE'S EQUITY COST RATE RESULTS.

A81. Dr. Vander Weide's equity cost rate estimates for Duke Energy Ohio are summarized in Panel A of page 1 of Exhibit JRW-9. Dr. Vander Weide's estimates an equity cost rate is in the range of 10.2% to 12.6%. Based on these results, he

concludes that the 11.15% is a conservative ROE for the generating assets of Duke Energy Ohio.

Q82. PLEASE DISCUSS YOUR CONCERNS WITH DR. VANDER WEIDE'S REQUESTED EQUITY COST RATE.

A82. Dr. Vander Weide's requested return on common equity is too high primarily due to: (1) the use of the gas pipeline group as a proxy group; (2) an excessive adjustment to the dividend yield in his DCF approach; (3) an inflated growth rate in his DCF approach; (4) excessive base interest rates and market risk premiums in his RP and CAPM approaches; and (5) unwarranted flotation cost adjustments to his equity cost rate results.

1. Gas Pipeline Proxy Group

Q83. WHY HAS DR. VANDER WEIDE USED THE GAS PIPELINE PROXY GROUP?

A83. Dr. Vander Weide states the generating assets of Duke Energy Ohio is the appropriate entity for estimating a required rate of return on equity. He argues that the risk level of these are high and hence, in addition to using a proxy group of electric utilities, he employed a proxy group of gas pipelines, since gas pipelines are subject to both regulated and open market competition.

Q84. HAS DR. VANDER WEIDE PERFORMED ANY EMPIRICAL STUDIES TO JUSTIFY THE USE OF THE GAS PIPELINE PROXY GROUP?

A84. No.

Q85. DO YOU BELEVE THAT THESE GAS PIPELINE COMPANIES ARE AN APPROPRIATE PROXY FOR DUKE ENERGY OHIO?

A85. No. As I have previously stated, the financial integrity consideration and the return on equity and cost of capital determination must be based on the Duke Energy Ohio as a whole, and not on the generation assets of Duke Energy Ohio. These generation assets have not been separated from the Company, and Duke Energy Ohio is asking that traditional cost-based rate making be applied to these assets.

Q86. DO YOU HAVE ANY OTHER ISSUES WITH THE GROUP?

A86. Yes. First of all, these companies are all Master Limited Partnerships ("MLPs") which have restrictions on raising and distributing capital. As such, they represent a different business entity than the Company. Second, and more importantly, these equity cost rate results for these companies are highly variable. In Schedule 2 of his testimony, Dr. Vander Weide presents the DCF results for the pipelines. His reported equity cost rate of 12.6% is the average of the results for only seven of these companies. He has omitted the DCF results for four companies, or 36% of his pipeline group. The results for his four omitted companies are 21.8%, 33.3%, 22.6%, and 1.2%. Including the unlikely results of

these four companies results in an equity cost rate of 15.2%. Overall, the high variability of the DCF equity cost rate results suggests that they are very poor proxies in this proceeding.

2. DCF Approach

Q87. PLEASE SUMMARIZE DR. VANDER WEIDE'S DCF ESTIMATES.

A87. On pages 20-30 and in Schedules 2 and 3 of his testimony, Dr. Vander Weide develops an equity cost rate by applying a DCF model to his groups of electric utility and gas pipeline companies. In the traditional DCF approach, the equity cost rate is the sum of the dividend yield and expected growth. Dr. Vander Weide adjusts the spot dividend yield to reflect the quarterly payment of dividends. Dr. Vander Weide uses one measure of DCF expected growth - the projected EPS growth rate. He averages the EPS growth rate forecasts from (1) Wall Street analysts as provided by I/B/E/S and (2) *Value Line*. He also includes a flotation cost adjustment of five percent. Dr. Vander Weide's DCF results are provided in Panel B of page 1 of Exhibit JRW-9. Based on these figures, Dr. Vander Weide claims that the DCF equity cost rate for the electric utility and gas pipeline companies are 10.6% and 12.6%, respectively.

Q88. WHAT ARE THE ERRORS IN DR. VANDER WEIDE'S DCF ANALYSES?

A88. There are four errors: (1) the use of the gas pipeline group, which was previously discussed; (2) the quarterly dividend yield adjustment is excessive; (3) the projected DCF growth rate is based entirely on overly optimistic and upwardly-biased EPS growth rate estimates of Wall Street analysts and *Value Line;* and (4) the flotation cost adjustment is inappropriate. The proxy group issue was addressed above. The other issues are discussed below.

a. DCF Dividend Yield Adjustment

Q89. PLEASE DISCUSS THE ADJUSTMENT TO THE DIVIDEND YIELD TO REFLECT THE QUARTERLY PAYMENT OF DIVIDENDS.

A89. In Appendix 2 of his testimony, Dr. Vander Weide discusses the adjustments he makes to his spot dividend yields to account for the quarterly payment of dividends. This includes an adjustment to reflect the time value of money. The quarterly timing adjustment is in error and results in an overstated equity cost rate. First, as above, the appropriate dividend yield adjustment for growth in the DCF model is the expected dividend for the next quarter multiplied by four. The quarterly adjustment procedure is inconsistent with this approach.

Second, Dr. Vander Weide's approach presumes that investors require additional compensation during the coming year because their dividends are paid out quarterly instead of being paid all in a lump sum. Therefore, he compounds each

dividend to the end of the year using the long-term growth rate as the compounding factor. The error in this logic and approach is that the investor receives the money from each quarterly dividend and has the option to reinvest it as he or she chooses. This reinvestment generates its own compounding, but it is outside of the dividend payments of the issuing company. Dr. Vander Weide's approach serves to duplicate this compounding process, thereby inflating the return to the investor. Finally, the notion that an adjustment is required to reflect the quarterly timing issue is refuted in a study by Richard Bower of Dartmouth College.

Bower acknowledges the timing issue and downward bias addressed by Dr. Vander Weide. However, he demonstrates that this does not result in a biased required rate of return. He provides the following assessment:[27]

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

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

b. DCF Growth Rate

Q90. PLEASE REVIEW DR. VANDER WEIDE'S DCF GROWTH RATE.

A90. Dr. Vander Weide DCF growth rate is the average of the projected EPS growth rate forecasts: (1) Wall Street analysts as compiled by I/B/E/S; and (2) *Value Line*. Dr. Vander Weide employs DCF growth rates of 5.8% for the electric utility group and 5.7% for the gas pipeline group.

Q91. PLEASE DISCUSS THE ERROR IN DR. VANDER WEIDE'S DCF GROWTH RATE.

A91. The primary problem with the DCF growth rate is that Dr. Vander Weide has relied exclusively on the EPS growth rate forecasts of Wall Street analysts and *Value Line*.

Q92. WHY IS IT ERRONEOUS TO RELY EXCLUSIVELY ON THE EPS FORECASTS OF WALL STREET ANALYSTS IN ARRIVING AT A DCF GROWTH RATE?

A92. There are several issues with using the EPS growth rate forecasts of Wall Street analysts and *Value Line* as DCF growth rates. First, the appropriate growth rate in the DCF model is the dividend growth rate, not the earnings growth rate. Therefore, in my opinion, consideration must be given to other indicators of growth, including prospective dividend growth, internal growth, as well as projected earnings growth. Second, and most significantly, it is well-known that

the long-term EPS growth rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased. As discussed in Appendix B, this has been demonstrated in a number of academic studies over the years. In addition, I demonstrate that *Value Line*'s EPS growth rate forecasts are consistently too high. Hence, using these growth rates as a DCF growth rate will provide an overstated equity cost rate.

Q93. PLEASE DISCUSS DR. VANDER WEIDE'S RELIANCE ON THE PROJECTED GROWTH RATES OF WALL STREET ANALYSTS AND VALUE LINE.

A93. It seems highly unlikely that investors today would rely excessively on the EPS growth rate forecasts of Wall Street analysts and ignore other growth rate measure in arriving at expected growth. As I previously indicated, the appropriate growth rate in the DCF model is the dividend growth rate, not the earnings growth rate. Hence, consideration must be given to other indicators of growth, including historic prospective dividend growth, internal growth, as well as projected earnings growth. In addition, a recent study by Lacina, Lee, and Xu (2011) has shown that analysts' long-term earnings growth rate forecasts are not more accurate at forecasting future earnings than naïve random walk forecasts of future earnings.[28] As such, the weight give to analysts' projected EPS growth rate should be limited. And finally, and most significantly, it is well-known that the

[28] M. Lacina, B. Lee and Z. Xu, *Advances in Business and Management Forecasting (Vol. 8)*, Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101.

long-term EPS growth rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased. Hence, using these growth rates as a DCF growth rate produces an overstated equity cost rate. A recent study by Easton and Sommers (2007) found that optimism in analysts' growth rate forecasts leads to an upward bias in estimates of the cost of equity capital of almost 3.0 percentage points.[29] These issues are addressed in more detail in Appendix B.

Q94. DR. VANDER WEIDE HAS DEFENDED THE USE OF ANALYSTS' EPS FORECASTS IN HIS DCF MODEL BY CITING A STUDY HE PUBLISHED WITH DR. WILLARD CARLETON. PLEASE DISCUSS DR. VANDER WEIDE'S STUDY.

A94. Dr. Vander Weide cites the study on page 25 of his testimony. In the study, Dr. Vander Weide performs a linear regression of a company's stock price to earnings ratio (P/E) on the dividend yield payout ratio (D/E), alternative measures of growth (g), and three measures of risk (beta, covariance, r-squared, and the standard deviation of analysts' growth rate projections). He performed the study for three one-year periods – 1981-1982, and 1983 – and used a sample of approximately 65 companies. His results indicated that regressions measuring growth as analysts' forecasted EPS growth were more statistically significant that those using various historic measures of growth. Consequently, he concluded that analysts' growth rates are superior measures of expected growth.

[29] Easton, P., & Sommers, G. (2007). Effect of analysts' optimism on estimates of the expected rate of return implied by earnings forecasts. *Journal of Accounting Research*, 45(5), 983–1015.

Q95. PLEASE CRITIQUE DR. VANDER WEIDE'S STUDY.

A95. Before highlighting the errors in the study, it is important to note that the study was published more twenty years ago, used a sample of only sixty five companies, and evaluated a three-year time period (1981-83) that was over twenty-five years ago. Since that time, many more exhaustive studies have been performed using significantly larger data bases and, from these studies, much has been learned about Wall Street analysts and their stock recommendations and earnings forecasts. Nonetheless, there are several errors that invalidate the results of the study.

Q96. PLEASE DESCRIBE THE ERRORS IN DR. VANDER WEIDE'S STUDY.

A96. The primary error in the study is that his regression model is misspecified. As a result, he cannot conclude whether one growth rate measure is better than the other. The misspecification results from the fact that Dr. Vander Weide did not actually employ a modified version of the DCF model. Instead, he used a "linear approximation." He used the approximation so that he did not have to measure k, investors' required return, directly, but instead he used some proxy variables for risk. The error in this approach is there can be an interaction between growth (g) and investors' required return (k) which could lead him to conclude that one growth rate measure is superior to others. Furthermore, due to this problem, analysts' EPS forecasts could be upwardly biased and still appear to provide better measures of expected growth.

There are other errors in the study as well that further invalidate the results. Dr. Vander Weide does not use both historic and analysts' projections growth rate measures in the same regression to assess if both historic and forecasts should be used together to measure expected growth. In addition, he did not perform any tests to determine if the difference between historic and projected growth measures is statistically significant. Without such tests, he cannot make any conclusions about the superiority of one measure versus the other.

c. Flotation Costs

Q97. PLEASE DISCUSS DR. VANDER WEIDE'S ADJUSTMENT FOR FLOTATION COSTS.

A97. Dr. Vander Weide claims that an upward adjustment to the equity cost rate is necessary for flotation costs. This adjustment factor is erroneous for several reasons. First, the Company has not identified any actual flotation costs for the Company. Therefore, the Company is requesting annual revenues in the form of a higher return on equity for flotation costs that have not been identified. Second, it is commonly argued that a flotation cost adjustment (such as that used by the Company) is necessary to prevent the dilution of the existing shareholders. In this case, a flotation cost adjustment is justified by reference to bonds and the manner in which issuance costs are recovered by including the amortization of bond flotation costs in annual financing costs. However, this is incorrect for several reasons:

(1) If an equity flotation cost adjustment is similar to a debt flotation cost adjustment, the fact that the market-to-book ratios for electric utility companies are over 1.0X actually suggests that there should be a flotation cost reduction (and not increase) to the equity cost rate. This is because when (a) a bond is issued at a price in excess of face or book value, and (b) the difference between market price and the book value is greater than the flotation or issuance costs, the cost of that debt is lower than the coupon rate of the debt. The amount by which market values of electric utility companies are in excess of book values is much greater than flotation costs. Hence, if common stock flotation costs were exactly like bond flotation costs, and one was making an explicit flotation cost adjustment to the cost of common equity, the adjustment would be downward;

(2) If a flotation cost adjustment is needed to prevent dilution of existing stockholders' investment, then the reduction of the book value of stockholder investment associated with flotation costs can occur only when a company's stock is selling at a market price at/or below its book value. As noted above, electric utility companies are selling at market prices well in excess of book value. Hence, when new shares are sold,

existing shareholders realize an increase in the book value per share of their investment, not a decrease;

(3) Flotation costs consist primarily of the underwriting spread or fee and not out-of-pocket expenses. On a per share basis, the underwriting spread is the difference between the price the investment banker receives from investors and the price the investment banker pays to the company. Hence, these are not expenses that must be recovered through the regulatory process. Furthermore, the underwriting spread is known to the investors who are buying the new issue of stock, who are well aware of the difference between the price they are paying to buy the stock and the price that the Company is receiving. The offering price which they pay is what matters when investors decide to buy a stock based on its expected return and risk prospects. Therefore, the Company is not entitled to an adjustment to the allowed return to account for those costs; and

(4) Flotation costs, in the form of the underwriting spread, are a form of a transaction cost in the market. They represent the difference between the price paid by investors and the amount received by the issuing company. Whereas the Company believes that it should be compensated for these transactions

costs, they have not accounted for other market transaction costs in determining a cost of equity for the Company. Most notably, brokerage fees that investors pay when they buy shares in the open market are another market transaction cost. Brokerage fees increase the effective stock price paid by investors to buy shares. If the Company had included these brokerage fees or transaction costs in their DCF analysis, the higher effective stock prices paid for stocks would lead to lower dividend yields and equity cost rates. This would result in a downward adjustment to their DCF equity cost rate.

3. Risk Premium ("RP") Approach

Q98. PLEASE REVIEW DR. VANDER WEIDE'S RP ANALYSES.

A98. In Schedules 4, 5, 6, and 7, Dr. Vander Weide develops an equity cost rate using expected (ex ante) and historical RP models. Dr. Vander Weide's RP results are provided in Panels C and D of page 2 of Exhibit JRW-9**.** He reports RP equity cost rates of 11.20% using the expected return approach and 10.8% using the historical RP approach.

In his expected RP approach, Dr. Vander Weide computes an expected stock return by applying the DCF model to the S&P utilities and the S&P 500 and uses the EPS growth rate forecasts of Wall Street analysts as his growth rate. He then subtracts

the yield on 'A' rated utility bonds. In his historic RP model, Dr. Vander Weide's computes a historical risk premium as the difference in the arithmetic mean stock and bond returns. The stock returns are computed for different time periods for several different indexes, including S&P and Moody's electric utility indexes as well as the S&P 500.

Q99. WHAT ARE THE ERRORS IN DR. VANDER WEIDE'S RP ANALYSES?

A99. The errors in Dr. Vander Weide's RP equity cost rate approaches include: (1) an inflated base interest rate; (2) an excessive risk premium which is based on the historical relationship between stock and bond returns; and (3) the inclusion of a flotation cost adjustment of 0.24%. The flotation cost issue has already been addressed. The other two issues are discussed below.

Q100. PLEASE DISCUSS THE BASE YIELD OF DR. VANDER WEIDE'S RISK PREMIUM ANALYSIS.

A100. The base yield in Dr. Vander Weide's RP analysis is the projected yield on 'A' rated utility bonds. There are two issues with his projected 6.50% 'A' rated utility bond yield. First, the yield is above current market rates. As shown on Page 1 of Exhibit JRW-3, the current yield on long-term, 'A' rated public utility bonds is about 4.25%. As such, his base interest rate is vastly overstated. Second, Vander Weide's base yield is erroneous and inflates the required return on equity in two ways. First, long-term bonds are subject to interest rate risk, a risk which does not affect common stockholders since dividend payments (unlike bond interest

payments) are not fixed but tend to increase over time. Second, the base yield in Dr. Vander Weide's risk premium study is subject to credit risk since it is not default risk-free like an obligation of the U.S. Treasury. As a result, its yield-to-maturity includes a premium for default risk and therefore is above its expected return. Hence using such a bond's yield-to-maturity as a base yield results in an overstatement of investors' return expectations.

Q101. DR. VANDER WEIDE EMPLOYS A DCF-BASED EX ANTE RISK PREMIUM APPROACH. PLEASE DISCUSS THE ERRORS IN THIS APPROACH.

A101. Dr. Vander Weide computes a DCF-based equity risk premium. Dr. Vander Weide estimates an expected return using the DCF model and subtracts a concurrent measure of interest rates. He computes the expected return in this RP approach by applying the DCF model to a group of electric utility companies on a monthly basis over the 1999-2012 time periods. He employs the EPS growth rate forecasts of Wall Street analysts as the DCF growth rate. To compute the RP, he then subtracts the yield on 'A' rated utility bonds.

The primary error in this approach is that he uses the EPS growth rate forecasts of Wall Street analysts as the one and only measure of growth in the DCF model. This issue was addressed above and in Appendix B. As I have discussed, analysts' EPS growth rate forecasts are highly inaccurate estimates of future earnings (a random walk model performs just as well), and are overly optimistic

and upwardly-biased measures of actual future EPS growth for companies in general as well as for utilities. As a result, Dr. Vander Weide's ex-ante risk premium is overstated because his expected return measure is inflated.

Q102. PLEASE REVIEW DR. VANDER WEIDE'S EX POST OR HISTORIC RP STUDY.

A102. Dr. Vander Weide performs an ex-post or historical RP study that appears in Schedules 5 and 6 of his testimony. This study involves an assessment of the historical differences between S&P Public Utility Index and the S&P 500 stock returns and public utility bond returns over various time periods between the years 1937-2012. From the results of his study, he concludes that an appropriate risk premium is 3.80% using S&P public utility stock returns and 4.3% using S&P 500 stock returns.

Q103. PLEASE ADDRESS THE ISSUES INVOLVED IN USING HISTORICAL STOCK AND BOND RETURNS TO COMPUTE A FORWARD-LOOKING OR EX ANTE RISK PREMIUM.

A103. As previously discussed, it is common to compute a market risk premium as the difference between historic stock and bond returns. However, this approach can produce differing results depending on several factors, including the measure of central tendency used, the time period evaluated, and the stock and bond market index employed. In addition, there are a myriad of empirical problems in the approach, which result in historical market returns producing inflated estimates of expected risk premiums. Among the errors are the U.S. stock market survivorship bias (the "Peso Problem"), the company survivorship bias (only successful companies survive – poor companies do not survive), and unattainable return bias (the Ibbotson procedure presumes monthly portfolio rebalancing). These issues are discussed in Appendix D of this testimony.

4. CAPM Approach

Q104. PLEASE DISCUSS DR. VANDER WEIDE'S CAPM.

A104. In Schedules 8, 9, and 10 of his testimony, Dr. Vander Weide develops an equity cost rate using the CAPM. In Schedule 8 he employs a historical market risk premium and in Schedule 10 he uses an expected market risk premium. Dr. Vander Weide's CAPM results are provided in Panels E and F of page 1 of Exhibit JRW-9**.** He reports CAPM equity cost rates of 10.2% and 10.7% using the historical

CAPM and the expected CAPM for the electric utility group. For the gas pipeline group, Dr. Vander Weide reports CAPM equity cost rates of 11.0% and 11.6% using the historical CAPM and the expected CAPM. He includes a flotation cost adjustment of 0.24% in each.

Dr. Vander Weide uses a risk-free interest rate of 5.11%[30] in each CAPM and betas from *Value Line*. His historical CAPM uses the Ibbotson return data and the market risk premium is calculated as the difference between the arithmetic mean stock return and the bond income return over the 1926-2011 period. Dr. Vander Weide develops his expected market risk premium for his CAPM of 7.4%[31] in Schedule 10 by applying the DCF model to the companies in the S&P 500. Dr. Vander Weide estimates an expected market return of 12.5% using an adjusted dividend yield of 2.2% and an expected DCF growth rate of 10.3%.

Q105. WHAT ARE THE ERRORS IN DR. VANDER WEIDE'S CAPM ANALYSIS?

A105. First, Dr. Vander Weide has ignored the results of his CAPM analyses. In addition, there are several flaws with Dr. Vander Weide's CAPM: (1) his risk-free rate of 5.1%; (2) the historic and expected market risk premiums; and (3) the flotation cost adjustment.

[30] In the current rate case pending before the Commission, the PUCO Staff recommends a risk-free interest rate of 2.255%. See Staff Report of Case No. 12-1682-EL-AIR at 16.(January 4, 2013).

[31] Ibid. In the current rate case pending before the Commission, the PUCO Staff recommends an equity risk premium of 5.7%.

a. Risk-Free Interest Rate

Q106. PLEASE DISCUSS DR. VANDER WEIDE'S RISK-FREE RATE OF INTEREST IN HIS CAPM.

A106. Dr. Vander Weide uses a risk-free rate of interest of 5.1% in his CAPM. This figure represents the average projected rate on twenty-year Treasury bonds by *Value Line* and EIA. Such a forecast is excessive given current interest rates and recent statement from the Federal Reserve Board. The current rate on twenty-year Treasury bonds, as of March 17, 2013, is only 3.21%. For example, in the recent Duke rate cases, the PUCO Staff used 2.255. In this case, I used a risk-free interest rate of 4.00%. In addition, as noted early in this testimony, the Federal Reserve Board has indicated that it will keep interest rates low for the foreseeable future. As such, Dr. Vander Weide's risk-free interest rate is overstated.

b. Market Risk Premium

Q107. PLEASE ADDRESS THE PROBLEMS WITH DR. VANDER WEIDE'S HISTORIC CAPM.

A107. Dr. Vander Weide historical CAPM uses an equity risk premium of 6.6% which is based on the difference between the arithmetic mean stock and bond income returns over the 1926-2011 period. The errors associated with computing an expected equity risk premium using historical stock and bond returns are addressed in Appendix D of this testimony. In short, there are a myriad of

empirical problems, which result in historical market returns producing inflated estimates of expected risk premiums. Among the errors are the U.S. stock market survivorship bias (the 'Peso Problem'), the company survivorship bias (only successful companies survive – poor companies do not survive), and unattainable return bias (the Ibbotson procedure presumes monthly portfolio rebalancing). In addition, in this case, Dr. Vander Weide has compounded the error by using the bond income return and not the actual bond return. By omitting the price change component of the bond return, he has magnified the historic risk premium by not matching the returns on stock with the actual returns on bonds.

Q108. PLEASE REVIEW THE ERRORS IN DR. VANDER WEIDE'S MARKET RISK PREMIUM IN HIS EXPECTED CAPM APPROACH.

A108. Dr. Vander Weide develops an expected market risk premium for his CAPM of 7.4% in Schedule 10 of his testimony by applying the DCF model to the S&P 500. Dr. Vander Weide estimates an expected market return of 12.5% using a dividend yield of 2.2% and an expected DCF growth rate of 10.3%. The expected DCF growth rate for the S&P 500 is the average of the expected EPS growth rates from I/B/E/S. This is the primary error in this approach. As previously discussed, the expected EPS growth rates of Wall Street analysts are upwardly biased. In addition, as explained below, Dr. Vander Weide's projected EPS growth rate of 10.3% is inconsistent with economic and earnings growth in the U.S.

Q109. BEYOND YOUR PREVIOUS DISCUSSION OF THE UPWARD BIAS IN WALL STREET ANALYSTS' AND VALUE LINE'S EPS GROWTH RATE FORECASTS, WHAT OTHER EVIDENCE CAN YOU PROVIDE THAT THE DR. VANDER WEIDE'S S&P 500 GROWTH RATE IS EXCESSIVE?

A109. A long-term EPS growth rate of 10.3% is not consistent with historic as well as projected economic and earnings growth in the U.S for several reasons: (1) long-term EPS and economic growth, as measured by GDP, is about 2/3rds of Dr. Vander Weide's projected EPS growth rate of 10.3%; (2) more recent trends in GDP growth, as well as projections of GDP growth, suggest slower economic and earnings growth in the future; and (3) over time, EPS growth tends to lag behind GDP growth.

The long-term economic, earnings, and dividend growth rate in the U.S. has only been in the 5% to 7% range. I performed a study of the growth in nominal GDP, S&P 500 stock price appreciation, and S&P 500 EPS and DPS growth since 1960. The results are provided on page 1 of Exhibit JRW-10, and a summary is given in the table below.

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

Nominal GDP	**6.74%**
S&P 500 Stock Price	**6.35%**
S&P 500 EPS	**6.96%**
S&P 500 DPS	**5.39%**
Average	**6.36%**

The results are presented graphically on page 2 of Exhibit JRW-10. In sum, the historical long-run growth rates for GDP, S&P EPS, and S&P DPS are in the 5% to 7% range. By comparison, Dr. Vander Weide's long-run growth rate projection of 10.3% is vastly overstated. These estimates suggest that companies in the U.S. would be expected to: (1) increase their growth rate of EPS by over 50% in the future and (2) maintain that growth indefinitely in an economy that is expected to grow at about one-half of his projected growth rates.

Q110. DO MORE RECENT DATA SUGGEST THAT THE U.S. ECONOMY GROWTH IS FASTER OR SLOWER THAN THE LONG-TERM DATA?

A110. The more recent trends suggest lower future economic growth than the long-term historic GDP growth. The historic GDP growth rates for 10-, 20-, 30-, 40- and 50-years are presented in Panel A of page 3 of Exhibit JRW-10. These figures clearly suggest that nominal GDP growth in recent decades has slowed and that a figure in the range of 4.0% to 5.0% is more appropriate today for the U.S. economy. These figures indicate that Dr. Vander Weide long-term growth EPS growth rate of 10.3% is even more inflated.

Q111. WHAT LEVEL OF GDP GROWTH IS FORECASTED BY ECONOMISTS AND VARIOUS GOVERNMENT AGENCIES?

A111. There are several forecasts of annual GDP growth that are available from economists and government agencies. These are listed in Panel B of page 3 of Exhibit JRW-10. The mean 10-year nominal GDP growth forecast (as of February

2013) by economists in the recent Survey of Professional Forecasters is 4.8%. The Energy Information Administration (EIA), in its projections used in preparing Annual Energy Outlook, forecasts long-term GDP growth of 4.5% for the period 2011-2040. The Congressional Budget Office, in its forecasts for the period 2013 to 2023, projects a nominal GDP growth rate of 4.6%. As such, projections of nominal GDP growth provide additional evidence that Dr. Vander Weide's long-term EPS growth rate of 10.3% is highly overstated.

Q112. PLEASE HIGHLIGHT THE RECENT RESEARCH ON THE LINK BETWEEN ECONOMIC AND EARNINGS GROWTH AND EQUITY RETURNS.

A112. Brad Cornell of the California Institute of Technology recently published a study on GDP growth, earnings growth, and equity returns. He finds that long-term EPS growth in the U.S. is directly related GDP growth, with GDP growth providing an upward limit on EPS growth. In addition, he finds that long-term stock returns are determined by long-term earnings growth. He concludes with the following observations:[32]

> The long-run performance of equity investments is fundamentally linked to growth in earnings. Earnings growth, in turn, depends on growth in real GDP. This article demonstrates that both theoretical research and empirical research in development economics suggest

[32] Bradford Cornell, "Economic Growth and Equity Investing," *Financial Analysts Journal* (January-February, 2010), p. 63.

> relatively strict limits on future growth. In particular, real GDP growth in excess of 3 percent in the long run is highly unlikely in the developed world. In light of ongoing dilution in earnings per share, this finding implies that investors should anticipate real returns on U.S. common stocks to average no more than about 4–5 percent in real terms.

Given current inflation in the 2% to 3% range, the results imply nominal expected stock market returns in the 7% to 8% range. As such, Dr. Vander Weide's projected earnings growth rates and implied expected stock market returns and equity risk premiums are not indicative of the realities of the U.S. economy and stock market. As such, his expected CAPM equity cost rate is significantly overstated.

Q***113. PLEASE PROVIDE A SUMMARY ASSESSMENT OF DR. VANDER WEIDE'S MARKET RISK PREMIUMS.***

A113. Dr. Vander Weide's historical and expected market risk premiums are inflated due to errors and bias in his studies. Investment banks, consulting firms, and CFOs use the equity risk premium concept every day in making financing, investment, and valuation decisions. I have provided the results of recent surveys of CFOs, financial forecasters, analysts, and companies, and their equity risk premium estimates are in the 4% to 5% range and not in the 6% to 9% range. On this issue, the opinions of these market participants are especially relevant. They deal with capital markets on

an ongoing basis since they must continually assess and evaluate capital costs for their companies. They are well aware of the historical equity risk premium results as published by Ibbotson Associates as well as Wall Street analysts' EPS growth rate projections. Nonetheless, the CFOs in the March, 2013 *CFO Magazine* – Duke University Survey of almost 350 CFOs shows an expected market risk premium of 4.1% over the next ten years. In addition, surveys conducted in 2012 by Fernandez indicates that financial analysts and companies are using equity risk premiums of 5.0% to 5.5%. As such, using these real world equity risk premiums, the appropriate equity cost rate for a public utility should be in the 8.0% to 9.0% range and not in the 11.0% range.

Q114. DOES THIS CONCLUDE YOUR TESTIMONY?

A114. Yes.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the Direct Testimony of J. Randall Woolridge, Ph.D. was served on the persons stated below via electronic transmission this 26th day of March 2013.

/s/Maureen R. Grady
Maureen R. Grady
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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. He has taught Finance courses including corporation finance, commercial and investment banking, and investments at the undergraduate, graduate, and executive MBA levels.

Professor Woolridge's research has centered on empirical issues in corporation finance and financial markets. 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*, *Barron's*, *Wall Street Journal*, *Business Week*, *Investors' Business Daily*, *USA Today*, and other publications. In addition, Dr. Woolridge has appeared as a guest to discuss the implications of his research on CNN's *Money Line*, CNBC's *Morning Call* and *Business Today*, and Bloomberg's *Morning Call.*

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

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

Over the past twenty-five years Dr. Woolridge has prepared testimony and/or provided consultation services in regulatory rate cases in the rate of return area in following states: Alaska, Arizona, California, Colorado, Connecticut, Delaware, Florida, Hawaii, Indiana, Kansas, Kentucky, Massachusetts, Missouri, Nebraska, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, South Carolina, Texas, Utah, Vermont, Washington, and Washington, D.C. He has also prepared testimony which was submitted to the Federal Energy Regulatory Commission.

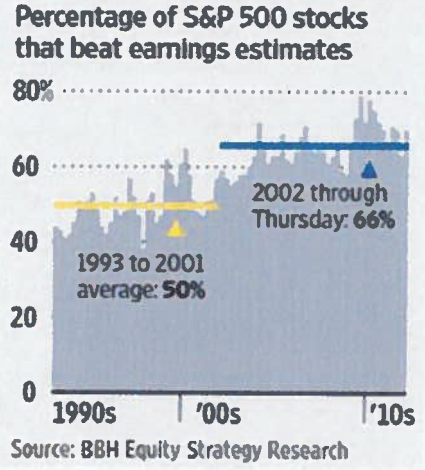
Appendix B
The Research on Analysts' Long-Term EPS Growth Rate Forecasts

Most of the attention given the accuracy of analysts' EPS forecasts comes from media coverage of company's quarterly earnings announcements. When companies' announced earnings beat Wall Street's EPS estimates ("a positive surprise"), their stock prices usually go up. When a company's EPS figure misses or is below Wall Street's forecasted EPS ("A negative surprise"), their stock price usually declines, sometimes precipitously so. Wall Street's estimate is the consensus forecast for quarterly EPS made by analysts who follow the stock as of the announcement date. And so Wall Street's estimate is the consensus EPS made in the days leading up to the EPS announcement.

In recent years, it has become more common for companies to beat Wall Street's quarterly EPS estimate. A recent *Wall Street Journal* article summarized the results for the first quarter of 2012: "While this "positive surprise ratio" of 70% is above the 20 year average of 58% and also higher than last quarter's tally, it is just middling since the current bull market began in 2009. In the past decade, the ratio only dipped below 60% during the financial crisis. Look before 2002, though, and 70% would have been literally off the chart. From 1993 through 2001, about half of companies had positive surprises.[1] Figure 1 below provides the record for companies beating Wall Street's EPS estimate on a quarterly basis over the past twenty years.

[1] Spencer Jakab, "Earnings Surprises Lose Punch," *Wall Street Journal* (May 7, 2012), p. C1.

Figure 1
Percent of Companies Beating Wall Street's Quarterly Estimates



A. RESEARCH ON THE ACCURACY OF ANALYSTS' NEAR-TERM EPS ESTIMATES

There is a long history of studies that evaluate how well analysts forecast near-term EPS estimates and long-term EPS growth rates. Most of these studies have evaluated the accuracy of earnings forecasts for the current quarter or year. Many of the early studies indicated that analysts make overly optimistic EPS earnings forecasts for quarter-to-quarter EPS (Stickel (1990); Brown (1997); Chopra (1998)).[2] More recent studies have shown that the optimistic bias tends to be larger for longer-term forecasts and smaller for forecasts made nearer to the EPS announcement date. Richardson, Teoh, and Wysocki (2004) report that the upward bias in earnings growth rates declines in the quarters leading up to the

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

earnings announcement date.[3] They call this result the "walk-down to beatable analyst forecasts." They hypothesize that the walk-down might be driven by the "earning-guidance game," in which analysts give optimistic forecasts at the start of a fiscal year, then revise their estimates downwards until the firm can beat the forecasts at the earnings announcement date.

However, two regulatory developments over the past decade have potentially impacted analysts' EPS growth rate estimates. First, Regulation Fair Disclosure ("Reg FD") was introduced by the Securities and Exchange Commission ("SEC") in October of 2000. Reg FD prohibits private communication between analysts and management so as to level the information playing field in the markets. With Reg FD, analysts are less dependent on gaining access to management to obtain information and therefore, are not as likely to make optimistic forecasts to gain access to management. Second, the conflict of interest within investment firms with investment banking and analyst operations was addressed in the Global Analysts Research Settlements ("GARS"). GARS, as agreed upon on April 23, 2003, between the SEC, NASD, NYSE and ten of the largest U.S. investment firms, includes a number of regulations that were introduced to prevent investment bankers from pressuring analysts to provide favorable projections.

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

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

The previously cited *Wall Street Journal* article acknowledged the impact of the new regulatory rules in explaining the recent results:[4] " What changed? One potential reason is the tightening of rules governing analyst contacts with management. Analysts now must rely on publicly available guidance or, gasp, figure things out by themselves. That puts companies, with an incentive to set the bar low so that earnings are received positively, in the driver's seat. While that makes managers look good short-term, there is no lasting benefit for buy-and-hold investors."

These comments on the impact of regulatory developments on the accuracy of short-term EPS estimates was addressed in a study by Hovakimian and Saenyasiri (2010).[5] The authors investigate analysts' forecasts of annual earnings for the following time periods: (1) the time prior to Reg FD (1984-2000); (2) the time period after Reg FD but prior to GARS (2000-2002);[6] and (3) the time period after GARS (2002-2006). For the pre-Reg FD period, Hovakimian and Saenyasiri find that analysts generally make overly optimistic forecasts of annual earnings. The forecast bias is higher for early forecasts and steadily declines in the months leading up to the earnings announcement. The results are similar for the time period after Reg FD but prior to GARS. However, the bias is lower in the later forecasts (the forecasts made just prior to the announcement).

[4] Spencer Jakab, "Earnings Surprises Lose Punch," *Wall Street Journal* (May 7, 2012), p. C1.

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

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

For the time period after GARS, the average forecasts declined significantly, but a positive bias remains. In sum, Hovakimian and Saenyasiri find that: (1) analysts make overly optimistic short-term forecasts of annual earnings; (2) Reg FD had no effect on this bias; and (3) GARS did result in a significant reduction in the bias, but analysts' short-term forecasts of annual earnings still have a small positive bias.

B. RESEARCH ON THE ACCURACY OF ANALYSTS' LONG-TERM EPS GROWTH RATE FORECASTS

There have been very few studies regarding the accuracy of analysts' long-term EPS growth rate forecasts. Cragg and Malkiel (1968) studied analysts' long-term EPS growth rate forecasts made in 1962 and 1963 by five brokerage houses for 185 firms. They concluded that analysts' long-term earnings growth forecasts are on the whole no more accurate than naive forecasts based on past earnings growth. Harris (1999) evaluated the accuracy of analysts' long-term EPS forecasts over the 1982-1997 time-period using a sample of 7,002 firm-year observations.[7] He concluded the following: (1) the accuracy of analysts' long-term EPS forecasts is very low; (2) a superior long-run method to forecast long-term EPS growth is to assume that all companies will have an earnings growth rate equal to historic GDP growth; and (3) analysts' long-term EPS forecasts are significantly upwardly biased, with forecasted earnings growth exceeding actual earnings growth by seven percent per annum. Subsequent studies by DeChow, P., A. Hutton, and R. Sloan (2000), and Chan, Karceski, and Lakonishok (2003) also

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

conclude that analysts' long-term EPS growth rate forecasts are overly optimistic and upwardly biased.[8] The Chan, Karceski, and Lakonishok (2003) study evaluated the accuracy of analysts' long-term EPS growth rate forecasts over the 1982-98 time period. They reported a median IBES growth forecast of 14.5%, versus a median realized five-year growth rate of about 9%. They also found the IBES forecasts of EPS beyond two years are not accurate. They concluded the following: "Over long horizons, however, there is little forecastability in earnings, and analysts' estimates tend to be overly optimistic."

Lacina, Lee, and Xu (2011) evaluated the accuracy of analysts' long-term earnings growth rate forecasts over the 1983-2003 time period.[9] The study included 27,081 firm year observations, and compared the accuracy of analysts' EPS forecasts to those produced by two naïve forecasting models: (1) a random walk model ("RW") where the long-term EPS (t+5) is simply equal to last year's EPS figure (t-1); (2) a RW model with drift ("RWGDP"), where the drift or growth rate is GDP growth for period t-1. In this model, long-term EPS (t+5) is simply equal to last year's EPS figure (t-1) times (1 + GDP growth (t-1)). The authors conclude that that using the RW model to forecast EPS in the next 3-5 years proved to be just as accurate as using the EPS estimates from analysts' long-term earnings growth rate forecasts. They find that the RWGDP model performs

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

[9] M. Lacina, B. Lee and Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101

better than the pure RW model, and that both models perform as well as analysts in forecasting long-term EPS. They also discover an optimistic bias in analysts' long-term EPS forecasts. In the authors' opinion, these results indicate that analysts' long-term earnings growth rate forecasts should be used with caution as inputs for valuation and cost of capital purposes.

C. ISSUES REGARDING THE SUPERIORITY OF ANALYSTS' EPS FORECASTS OVER HISTORIC AND TIME-SERIES ESTIMATES OF LONG-TERM EPS GROWTH

As highlighted by the classic study by Brown and Rozeff (1976) and the other studies that followed, analysts' forecasts of quarterly earnings estimates are superior to the estimates derived from historic and time-series analyses.[10] This is often attributed to the information and timing advantage that analysts have over historic and time-series analyses. These studies relate to analysts' forecasts of quarterly and/or annual forecasts, and not to long-term EPS growth rate forecasts. The previously cited studies by Harris (1999), Chan, Karceski, and Lakonishok (2003), and Lacina, Lee, and Xu (2011) all conclude that analysts' forecasts are no better than time-series models and historic growth rates in forecasting long-term EPS. Harris (1999) and Lacina, Lee, and Xu (2011) concluded that historic GDP growth was superior to analysts' forecasts for long run earnings growth. These overall results are similar to the findings by Bradshaw, Drake, Myers, and Myers (2009) that discovered that time-series estimates of annual earnings are

[10] L. Brown and M. Rozeff, "The Superiority of Analyst Forecasts as Measures of Expectations: Evidence from Earnings," *The Journal of Finance* 33 (1): pp. 1-16 (1976).

more accurate over longer horizons than analysts' forecasts of earnings. As the authors state, "These findings suggest an incomplete and misleading generalization about the superiority of analysts' forecasts over even simple time-series-based earnings forecasts."[11]

D. STUDY OF THE ACCURACY OF ANALYSTS' LONG-TERM EARNINGS GROWTH RATES

To evaluate the accuracy of analysts' EPS forecasts, I have compared actual 3-5 year EPS growth rates with forecasted EPS growth rates on a quarterly basis over the past 20 years for all companies covered by the I/B/E/S data base. In Panel A of page 1 of Exhibit JRW-B1, I show the average analysts' forecasted 3-5 year EPS growth rate with the average actual 3-5 year EPS growth rate for the past twenty years.

The following example shows how the results can be interpreted. For the 3-5 year period prior to the first quarter of 1999, analysts had projected an EPS growth rate of 15.13%, but companies only generated an average annual EPS growth rate over the 3-5 years of 9.37%. This projected EPS growth rate figure represented the average projected growth rate for over 1,510 companies, with an average of 4.88 analysts' forecasts per company. For the entire twenty-year period of the study, for each quarter there were on average 5.6 analysts' EPS projections for 1,281 companies. Overall, my findings indicate that forecast errors for long-term estimates are predominantly positive, which indicates an upward bias in growth rate estimates. The mean and median forecast errors over the

[11] M. Bradshaw, M. Drake, J. Myers, and L. Myers, "A Re-examination of Analysts' Superiority Over Time-Series Forecasts," Workings paper, (1999), http://ssrn.com/abstract=1528987.

observation period are 143.06% and 75.08%, respectively. The forecasting errors are negative for only eleven of the eighty quarterly time periods: five consecutive quarters starting at the end of 1995 and six consecutive quarters starting in 2006. As shown in Panel A of page 1 of Exhibit JRW-B1, the quarters with negative forecast errors were for the 3-5 year periods following earnings declines associated with the 1991 and 2001 economic recessions in the U.S. Thus, there is evidence of a persistent upward bias in long-term EPS growth forecasts.

The average 3-5 year EPS growth rate projections for all companies provided in the I/B/E/S database on a quarterly basis from 1988 to 2008 are shown in Panel B of page 1 of Exhibit JRW-B1. In this graph, no comparison to actual EPS growth rates is made, and hence, there is no follow-up period. Therefore, since companies are not lost from the sample due to a lack of follow-up EPS data, these results are for a larger sample of firms. The average projected growth rate increased to the 18.0% range in 2006, and have since decreased to about 14.0%.

The upward bias in analysts' long-term EPS growth rate forecasts appears to be known in the markets. Page 2 of Exhibit JRW-B1 provides an article published in the *Wall Street Journal*, dated March 21, 2008, that discusses the upward bias in analysts' EPS growth rate forecasts.[12] In addition, a recent *Bloomberg Businessweek* article also highlighted the upward bias in analysts' EPS forecasts, citing a study by

[12] Andrew Edwards, "Study Suggests Bias in Analysts' Rosy Forecasts," *Wall Street Journal* (March 21, 2008), p. C6.

McKinsey Associates. This article is provided on pages 3 and 4 of Exhibit JRW-B1. The article concludes with the following:[13]

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

E. REGULATORY DEVELOPMENTS AND THE ACCURACY OF ANALYSTS' LONG-TERM EARNINGS GROWTH RATES FORECASTS

Whereas Hovakimian and Saenyasiri evaluated the impact of regulations on analysts' short-term EPS estimates, there is little research on the impact of Reg FD and GARS on the long-term EPS forecasts of Wall Street analysts. My study with Patrick Cusatis did find that the long-term EPS growth rate forecasts of analysts did not decline significantly and have continued to be overly-optimistic in the post Reg FD and GARS period.[14] Analysts' long-term EPS growth rate forecasts before and after GARS are about two times the level of historic GDP growth. These observations are supported by a *Wall Street Journal* article entitled "Analysts Still Coming Up Rosy – Over-Optimism on Growth Rates is Rampant – and the Estimates Help to Buoy the Market's Valuation." The following quote provides insight into the continuing bias in analysts' forecasts:

> Hope springs eternal, says Mark Donovan, who manages Boston Partners Large Cap Value Fund. "You would have thought that, given what happened in the last three years,

[13] Roben Farzad, 'For Analysts, Things are Always Looking Up,' *Bloomberg Businessweek* (June 14, 2010), pp. 39-40.
[14] P. Cusatis and J. R. Woolridge, "The Accuracy of Analysts' Long-Term EPS Growth Rate Forecasts," Working Paper, (July 2008).

> people would have given up the ghost. But in large measure they have not.
>
> These overly optimistic growth estimates also show that, even with all the regulatory focus on too-bullish analysts allegedly influenced by their firms' investment-banking relationships, a lot of things haven't changed. Research remains rosy and many believe it always will.[15]

These observations are echoed in a recent McKinsey study entitled "Equity Analysts: Still too Bullish" which involved a study of the accuracy on analysts long-term EPS growth rate forecasts. The authors conclude that after a decade of stricter regulation, analysts' long-term earnings forecasts continue to be excessively optimistic. They made the following observation (emphasis added): [16]

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

[15] Ken Brown, "Analysts Still Coming Up Rosy – Over-Optimism on Growth Rates is Rampant – and the Estimates Help to Buoy the Market's Valuation," *Wall Street Journal*, p. C1, (January 27, 2003).
[16] Marc H. Goedhart, Rishi Raj, and Abhishek Saxena, "Equity Analysts, Still Too Bullish," *McKinsey on Finance*, pp. 14-17, (Spring 2010).

instances, both during the earnings recovery following a recession. On average, analysts' forecasts have been almost 100 percent too high.

F. ANALYSTS' LONG-TERM EPS GROWTH RATE FORECASTS FOR UTILITY COMPANIES

To evaluate whether analysts' EPS growth rate forecasts are upwardly biased for utility companies, I conducted a study similar to the one described above using a group of electric utility and gas distribution companies. The results are shown on Panels A and B of page 5 of Exhibit JRW-B1. The projected EPS growth rates for electric utilities have been in the 4% to 6% range over the last twenty years, with the recent figures approximately 5%. As shown, the achieved EPS growth rates have been volatile and on average, below the projected growth rates. Over the entire period, the average quarterly 3-5 year projected and actual EPS growth rates are 4.59% and 2.90%, respectively.

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

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

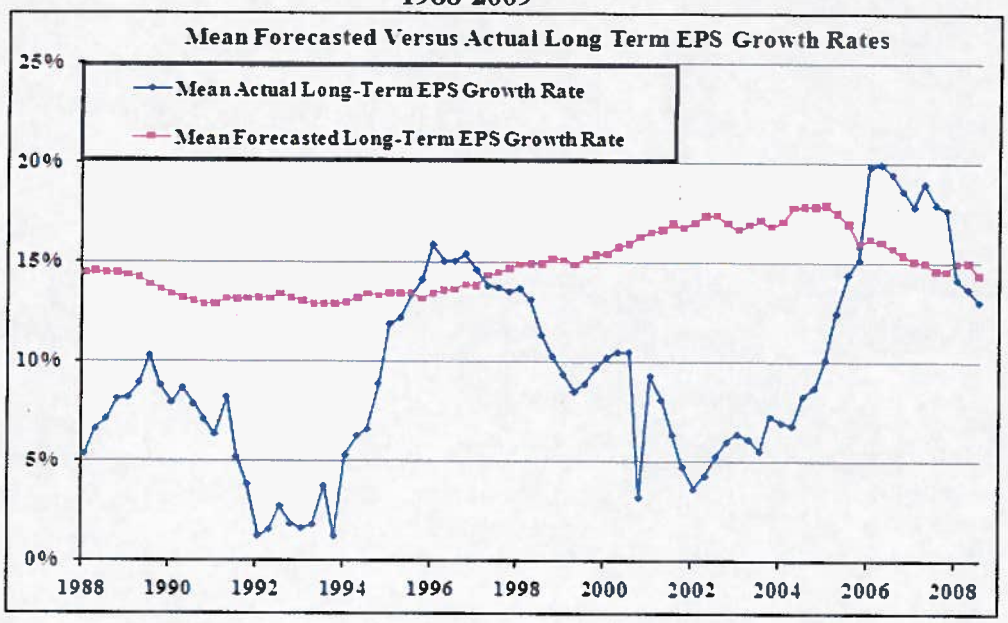
G. *VALUE LINE*'S LONG-TERM EPS GROWTH RATE FORECASTS

To assess *Value Line*'s earnings growth rate forecasts, I used the *Value Line Investment Analyzer*. The results are summarized in Panel A of Page 6 of Exhibit JRW-B1. I initially filtered the database and found that *Value Line* has 3-5 year EPS growth rate forecasts for 2,333 firms. The average projected EPS growth rate was 14.70%. This is high given that the average historical EPS growth rate in the U.S. is about 7%. A major factor seems to be that *Value Line* only predicts negative EPS growth for 43 companies. This is less than two percent of the companies covered by *Value Line*. Given the ups and downs of corporate earnings, this is unreasonable.

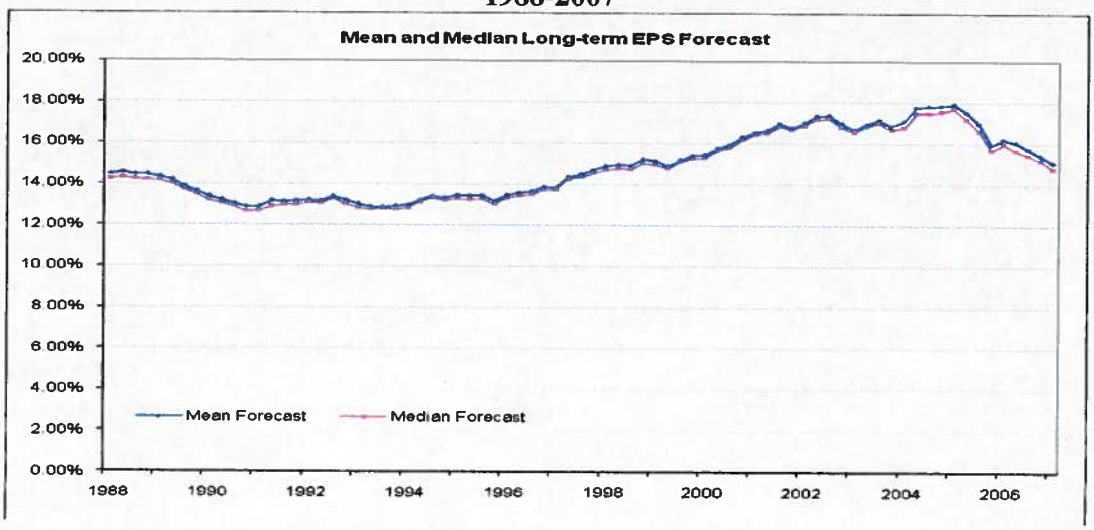
To put this figure in perspective, I screened the *Value Line* companies to see what percent of companies covered by *Value Line* had experienced negative EPS growth rates over the past five years. *Value Line* reported a five-year historic growth rate for 2,219 companies. The results are shown in Panel B of page 6 of Exhibit JRW-B1 and indicate that the average 5-year historic growth rate was 3.90%, and *Value Line* reported negative historic growth for 844 firms which represents 38.0% of these companies.

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

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



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



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

THE WALL STREET JOURNAL.

Study Suggests Bias in Analysts' Rosy Forecasts

By ANDREW EDWARDS
March 21, 2008; Page C6

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

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

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

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

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

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

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

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

Write to Andrew Edwards at andrew.edwards@dowjones.com

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

Bloomberg Businessweek

For Analysts, Things Are Always Looking Up

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

By Roben Farzad

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

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

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

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

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

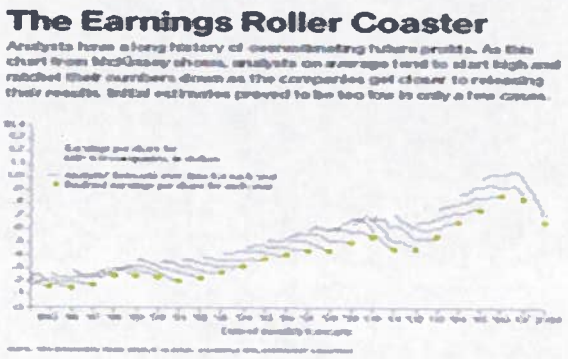
While a few analysts, like Meredith Whitney, have made their names on bearish calls, most are chronically bullish. Part of the problem is that despite all the reforms they remain too aligned with the companies they cover. "Analysts still need to get the bulk of their information from companies, which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

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

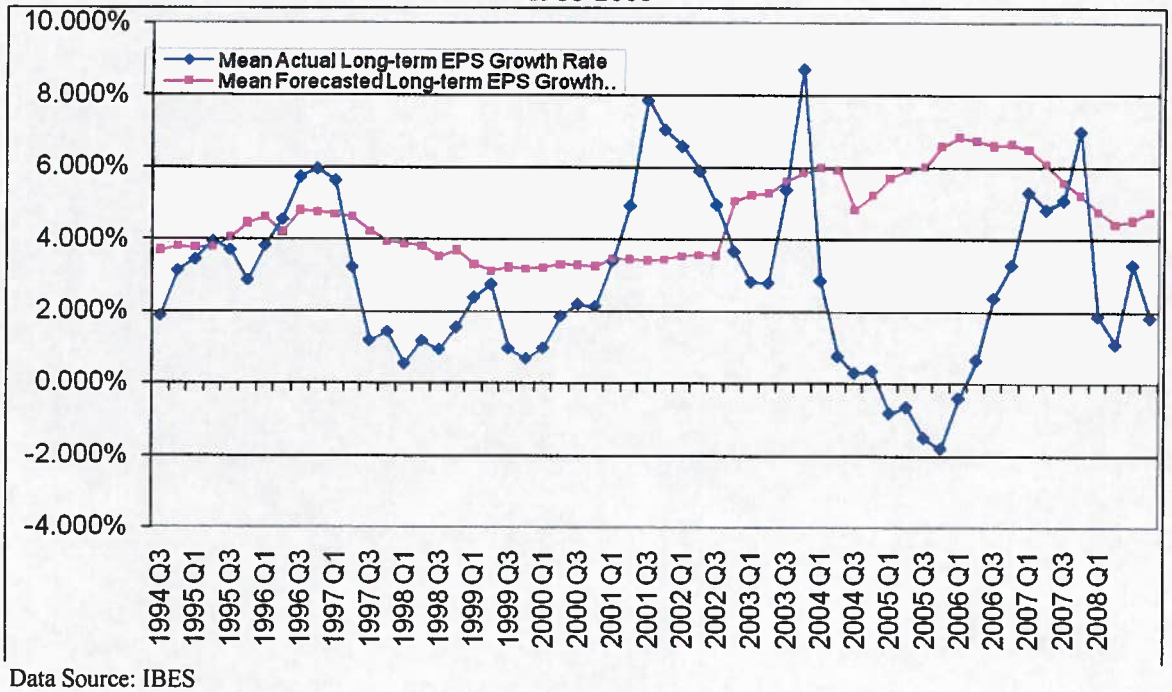
As realities hit home, "It's only natural that analysts will have to revise down their views," says Todd Salamone, senior vice-president at Schaeffer's Investment Research. The market may be making its own downward adjustment, as the S&P 500 has already fallen 14 percent from its high in April. If precedent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

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

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

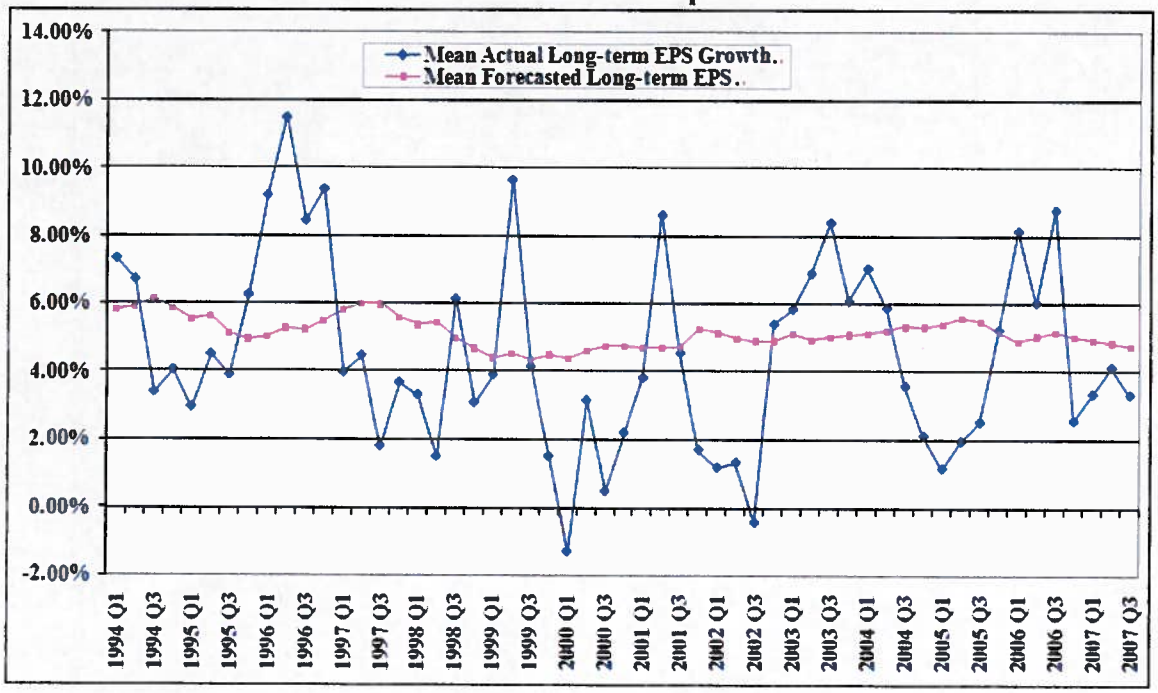


Panel A
Long-Term Forecasted Versus Actual EPS Growth Rates
Electric Utility Companies
1988-2008



Data Source: IBES

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



Panel A
Value Line 3-5 year EPS Growth Rate Forecasts

	Average Projected EPS Growth rate	Number of Negative EPS Growth Projections	Percent of Negative EPS Growth Projections
2,333 Companies	14.70%	43	1.80%

Value Line Investment Survey, June, 2012

Panel B
Historical Five-Year EPS Growth Rates for Value Line Companies

	Average Historical EPS Growth rate	Number with Negative Historical EPS Growth	Percent with Negative Historical EPS Growth
2,219 Companies	3.90%	844	38.00%

Value Line Investment Survey, June, 2012

Appendix C
Building Blocks Equity Risk Premium

A. THE BUILDING BLOCKS MODEL

Ibbotson and Chen (2003) evaluate the ex post historical mean stock and bond returns in what is called the Building Blocks approach.[1] They use 75 years of data and relate the compounded historical returns to the different fundamental variables employed by different researchers in building ex ante expected equity risk premiums. Among the variables included were inflation, real EPS and DPS growth, ROE and book value growth, and price-earnings ("P/E") ratios. By relating the fundamental factors to the ex post historical returns, the methodology bridges the gap between the ex post and ex ante equity risk premiums. Ilmanen (2003) illustrates this approach using the geometric returns and five fundamental variables – inflation ("CPI"), dividend yield ("D/P"), real earnings growth ("RG"), repricing gains ("PEGAIN") and return interaction/reinvestment ("INT").[2] This is shown on page 1 of Exhibit JRW-C1. The first column breaks the 1926-2000 geometric mean stock return of 10.7% into the different return components demanded by investors: the historical U.S. Treasury bond return (5.2%), the excess equity return (5.2%), and a small interaction term (0.3%). This 10.7% annual stock return over the 1926-2000 period can then be broken down into the following fundamental elements: inflation (3.1%), dividend yield (4.3%), real earnings growth (1.8%), repricing gains (1.3%) associated with higher P/E ratios, and a small interaction term (0.2%).

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

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

The third column in the graph on page 1 of Exhibit JRW-C1 shows current inputs to estimate an ex ante expected market return. These inputs include the following:

CPI – To assess expected inflation, I have employed expectations of the short-term and long-term inflation rate. Long term inflation forecasts are available in the Federal Reserve Bank of Philadelphia's publication entitled *Survey of Professional Forecasters*. While this survey is published quarterly, only the first quarter survey includes long-term forecasts of gross domestic product ("GDP") growth, inflation, and market returns. In the first quarter 2013 survey, published on February 15, 2013, the median long-term (10-year) expected inflation rate as measured by the CPI was 2.30% (see Panel A of page 2 of Exhibit JRW-C1).

The University of Michigan's Survey Research Center surveys consumers on their short-term (one-year) inflation expectations on a monthly basis. As shown on page 3 of Exhibit JRW-C1, the current short-term expected inflation rate is 3.1%.

As a measure of expected inflation, I will use the average of the long-term (2.3%) and short-term (3.3%) inflation rate measures, or 2.75%.

D/P – As shown on page 4 of Exhibit JRW-C1, the dividend yield on the S&P 500 has fluctuated from 1.0% to almost 3.5% over the past decade. Ibbotson and Chen (2003) report that the long-term average dividend yield of the S&P 500 is 4.3%. As of March, 2013, the indicated S&P 500 dividend yield was 2.1%. I will use this figure in my ex ante risk premium analysis.

RG – To measure expected real growth in earnings, I use the historical real earnings growth rate S&P 500 and the expected real GDP growth rate. The S&P 500 was created in 1960 and includes 500 companies which come from ten different sectors of the economy. On page 5 of Exhibit JRW-C1, real EPS growth is computed using the CPI as a measure of inflation. The real growth figure over 1960-2011 period for the S&P 500 is 2.8%.

The second input for expected real earnings growth is expected real GDP growth. The rationale is that over the long-term, corporate profits have averaged 5.50% of U.S. GDP.[3] Expected GDP growth, according to the Federal Reserve Bank of Philadelphia's *Survey of Professional Forecasters,* is 2.5% (see Panel B of page 2 of Exhibit JRW-C1).

Given these results, I will use 2.65%, for real earnings growth.

PEGAIN – PEGAIN is the repricing gain associated with an increase in the P/E ratio. It accounted for 1.3% of the 10.7% annual stock return in the 1926-2000 period. In estimating an ex ante expected stock market return, one issue is whether investors expect P/E ratios to increase from their current levels. The P/E ratios for the S&P 500 over the past 25 years are shown on page 4 of Exhibit JRW-C1. The run-up and eventual peak in P/Es in the year 2000 is very evident in the chart. The average P/E declined until late 2006, and then increased to higher high levels, primarily due to the decline in EPS as a result of the financial crisis and the recession. As of March, 2013, the average P/E for the S&P 500 was 14X, which is in line with the historic average. Since the current figure is near the

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

historic average, a PEGAIN would not be appropriate in estimating an ex ante expected stock market return.

Expected Return form Building Blocks Approach - The current expected market return is represented by the last column on the right in the graph entitled "Decomposing Equity Market Returns: The Building Blocks Methodology" set forth on page 1 of Exhibit JRW-C1. As shown, the expected market return of 7.60% is composed of 2.75% expected inflation, 2.10% dividend yield, and 2.65% real earnings growth rate.

This expected return of 7.50% is consistent other expected return forecasts.

1. In the first quarter 2013 *Survey of Financial Forecasters*, published on February 15, 2013 by the Federal Reserve Bank of Philadelphia, the median long-term expected return on the S&P 500 was 6.13% (see Panel D of page 2 of Exhibit JRW-C1).
2. John Graham and Campbell Harvey of Duke University conduct a quarterly survey of corporate CFOs. The survey is a joint project of Duke University and *CFO Magazine.* In the March 2013 survey, the mean expected return on the S&P 500 over the next ten years was 6.13%.[4]

B. THE BUILDING BLOCKS EQUITY RISK PREMIUM

[4] The survey results are available at www.cfosurvey.org.

Appendix C
Building Blocks Equity Risk Premium

The current 30-year U.S. Treasury yield is 3.10%. This ex ante equity risk premium is simply the expected market return from the Building Blocks methodology minus this risk-free rate:

Ex Ante Equity Risk Premium = 7.5% - 3.10% = 4.40%

This is only one estimate of the equity risk premium. As shown on page 6 of Exhibit JRW-11, I am also using the results of other studies and surveys to determine an equity risk premium for my CAPM.

Exhibit JRW-C1

Decomposing Equity Market Returns
The Building Blocks Methodology

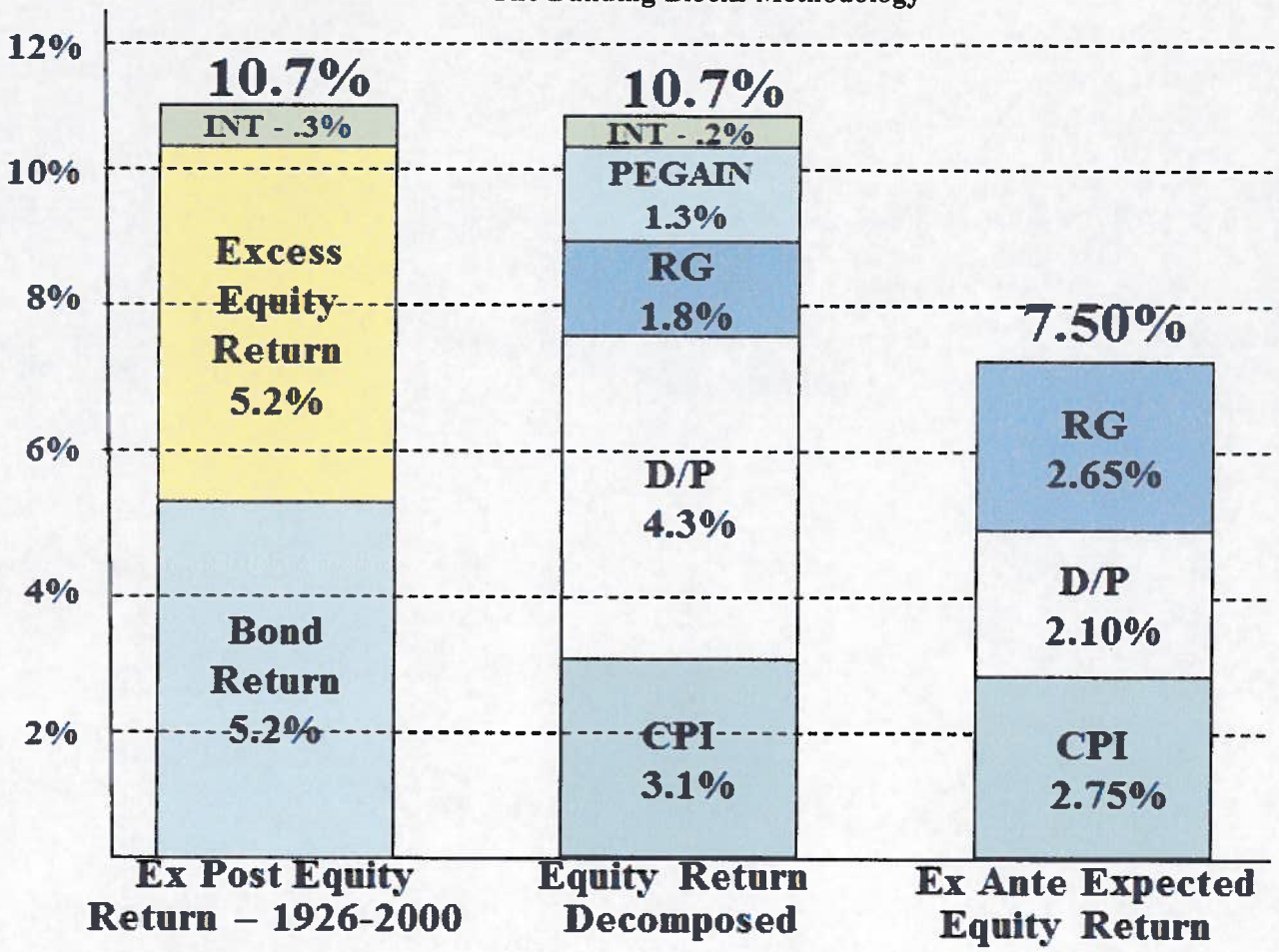


Exhibit JRW-C1

2013 Survey of Professional Forecasters
Philadelphia Federal Reserve Bank
Long-Term Forecasts

Table Seven
LONG-TERM (10 YEAR) FORECASTS

Panel A

SERIES: CPI INFLATION RATE	
STATISTIC	
MINIMUM	0.97
LOWER QUARTILE	2.05
MEDIAN	2.30
UPPER QUARTILE	2.60
MAXIMUM	3.50
MEAN	2.33
STD. DEV.	0.45
N	39
MISSING	7

Panel B

SERIES: REAL GDP GROWTH RATE	
STATISTIC	
MINIMUM	1.90
LOWER QUARTILE	2.50
MEDIAN	2.64
UPPER QUARTILE	2.90
MAXIMUM	3.75
MEAN	2.67
STD. DEV.	0.41
N	37
MISSING	8

Panel C

SERIES: PRODUCTIVITY GROWTH	
STATISTIC	
MINIMUM	0.90
LOWER QUARTILE	1.50
MEDIAN	1.80
UPPER QUARTILE	2.20
MAXIMUM	3.00
MEAN	1.86
STD. DEV.	0.51
N	30.00
MISSING	16

Panel D

SERIES: STOCK RETURNS (S&P 500)	
STATISTIC	
MINIMUM	4.00
LOWER QUARTILE	5.05
MEDIAN	6.13
UPPER QUARTILE	6.95
MAXIMUM	10.00
MEAN	6.15
STD. DEV.	1.58
N	24
MISSING	22

Panel E

SERIES: BOND RETURNS (10-YEAR)	
STATISTIC	
MINIMUM	1.90
LOWER QUARTILE	2.75
MEDIAN	3.83
UPPER QUARTILE	4.30
MAXIMUM	7.00
MEAN	3.70
STD. DEV.	1.32
N	26.00
MISSING	20

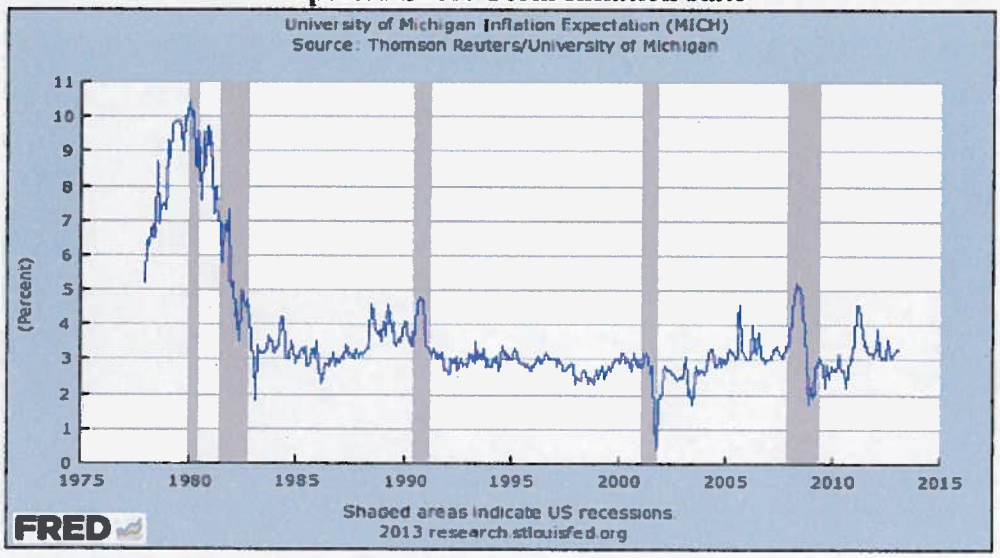
Panel F

SERIES: BILL RETURNS (3-MONTH)	
STATISTIC	
MINIMUM	0.50
LOWER QUARTILE	1.80
MEDIAN	2.40
UPPER QUARTILE	2.85
MAXIMUM	4.25
MEAN	2.46
STD. DEV.	0.98
N	25
MISSING	21

Source: Philadelphia Federal Researve Bank, Survey of Professional Forecasters, February 15, 2013.

Exhibit JRW-C1

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

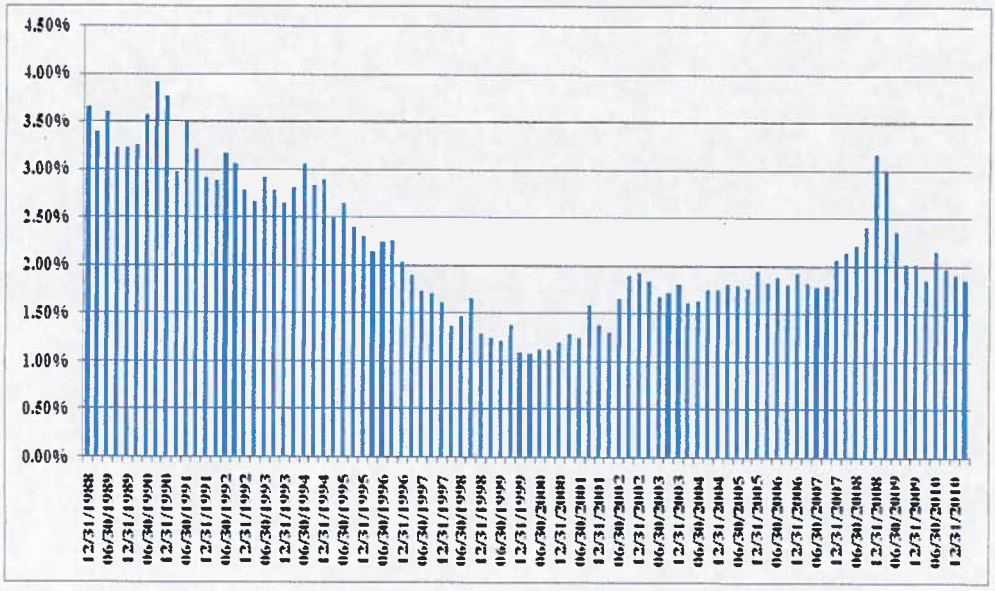


Data Source: http://research.stlouisfed.org/fred2/series/MICH?cid=98

Exhibit JRW-C1

Decomposing Equity Market Returns
The Building Blocks Methodology

S&P 500 Dividend Yield



S&P 500 P/E Ratio

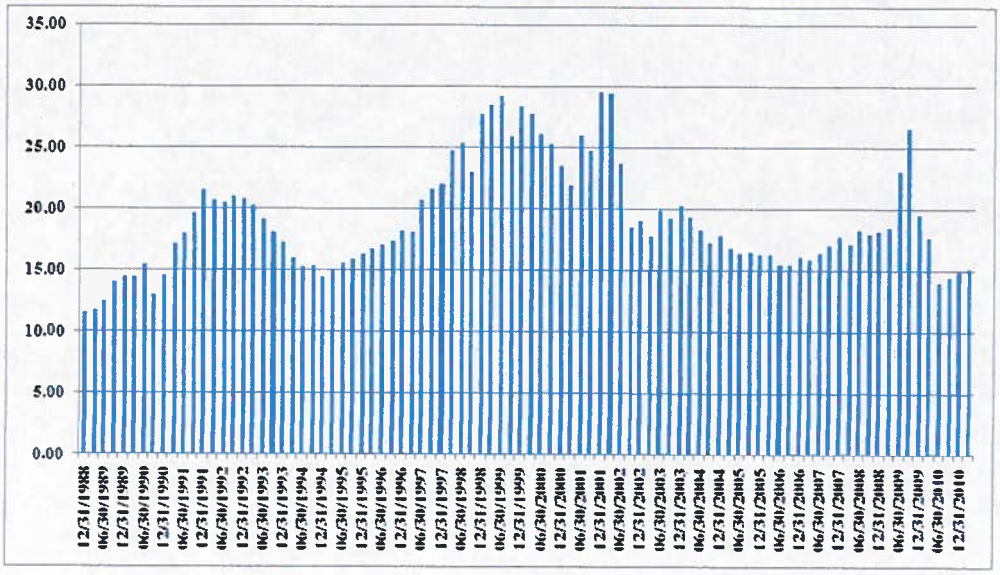


Exhibit JRW-C1

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	
2005	68.32	3.42	6.60	10.35	
2006	81.96	2.54	6.77	12.11	
2007	87.51	4.08	7.04	12.43	
2008	65.39	0.09	7.05	9.28	
2009	59.65	2.72	7.24	8.24	10-Year
2010	83.66	1.50	7.35	11.39	2.46%
2011	97.05	2.96	7.57	12.83	
Data Source: http://pages.stern.nyu.edu/~adamodar/				Real EPS Growth	**2.8%**

Appendix D
The Use of Historical Returns to Measure an Expected Risk Premium

It is quite common for analysts to estimate an equity or market risk premium as the difference between historical stock and bond returns. However, using the historical relationship between stock and bond returns to measure an ex ante equity risk premium can produce an inflated measure of the true market or equity risk premium. The equity risk premium is based on expectations of the future. When past market conditions vary significantly from the present, historic data does not provide a realistic or accurate barometer of expectations of the future. More significantly, there are a number of empirical issues that can result in historical returns being poor measures of the expected risk premium.

There are a number of issues in using historic returns over long time periods to estimate expected equity risk premiums. These issues include:

(A) Biased historical bond returns

(B) Use of the arithmetic versus the geometric mean return

(C) The large error in measuring the equity risk premium using historical returns

(D) Unattainable and biased historical stock returns

(E) Company Survivorship bias

(F) The "Peso Problem" - U.S. stock market survivorship bias

These issues will be addressed in order.

A. Biased Historical Bond Returns

An essential assumption of this approach is that over long periods of time,

investors' expectations are realized. However, the experienced returns of bondholders in the past invalidate this critical assumption. Historic bond returns are biased downward as a measure of expectancy because of capital losses suffered by bondholders in the past. As such, risk premiums derived from this data are biased upwards.

B. The Arithmetic versus the Geometric Mean Return

The measure of investment return has a significant effect on the interpretation of the risk premium results. When analyzing a single security price series over time (i.e., a time series), the best measure of investment performance is the geometric mean return. Using the arithmetic mean overstates the return experienced by investors. In a study entitled "Risk and Return on Equity: The Use and Misuse of Historical Estimates," Carleton and Lakonishok make the following observation: "The geometric mean measures the changes in wealth over more than one period on a buy and hold (with dividends invested) strategy."[1] When a historic stock and bond return study covers more than one period (and he assumes that dividends are reinvested), he should be employing the geometric mean and not the arithmetic mean.

To demonstrate the upward bias of the arithmetic mean, consider the following example. Assume that you have a stock (that pays no dividend) that is

[1] Willard T. Carleton and Josef Lakonishok, "Risk and Return on Equity: The Use and Misuse of Historical Estimates," *Financial Analysts Journal*, pp. 38-47, (January-February, 1985).

selling for $100 today, increases to $200 in one year, and then falls back to $100 in two years. The table below shows the prices and returns.

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

The arithmetic mean return is simply (100% + (-50%))/2 = 25% per year. The geometric mean return is $((2 * .50)^{(1/2)}) - 1 = 0\%$ per year. Therefore, the arithmetic mean return suggests that your stock has appreciated at an annual rate of 25%, while the geometric mean return indicates an annual return of 0%. Since after two years, your stock is still only worth $100, the geometric mean return is the appropriate return measure. For this reason, when stock returns and earnings growth rates are reported in the financial press, they are generally reported using the geometric mean. This is because of the upward bias of the arithmetic mean. As further evidence of the appropriate mean return measure, the SEC requires equity mutual funds to report historic return performance using geometric mean and not arithmetic mean returns.[2] Therefore, the historic arithmetic mean return measures are biased and should be disregarded.

Nonetheless, in measuring historic returns to develop an expected equity risk premium, finance texts will often recommend the use of an arithmetic mean return as a measure of central tendency. A common justification for using the arithmetic mean return is that since annual stock returns are not serially correlated, the best measure of a return for next year is the arithmetic mean of past

[2] SEC, Form N-1A.

returns. On the other hand, Damodaran suggests that such an estimate is not appropriate in estimating an equity risk premium:[3]

> "There are, however, strong arguments that can be made for the use of geometric averages. First, empirical studies seem to indicate that returns on stocks are negatively correlated over long periods of time. Consequently, the arithmetic average return is likely to overstate the premium. Second, while asset pricing models may be single period models, the use of these models to get expected returns over long periods (such as five or ten years) suggests that the estimation period may be much longer than a year. In this context, the argument for geometric average premiums becomes stronger."

C. The Error in Measuring Equity Risk Premiums with Historic Data

Measuring the equity risk premium using historical stock and bond returns is subject to a substantial forecasting error. For example, the arithmetic mean long-term equity risk premium of approximately 6.5% has a standard deviation of over 20.0%. This may be interpreted in the following way with respect to the historical distribution of the long-term equity risk premium using a standard normal distribution and a 95%, +/- 2 standard deviation confidence interval: We can say, with a 95% degree of confidence, that the true equity risk premium is between -34.7% and +47.7%. As such, the historical equity risk premium is measured with a substantial amount of error.

D. Unattainable and Biased Historic Stock Returns

Returns developed using Ibbotson's methodology are computed on stock indexes and therefore: (1) cannot be reflective of expectations because these returns

[3]Aswath. Damodaran, "A New "Risky" World Order: Unstable Risk Premiums - Implications for Practice" NUU Working Paper, 2010, p. 25.

are unattainable to investors and (2) produce biased results. This methodology assumes: (1) monthly portfolio rebalancing and (2) reinvestment of interest and dividends. Monthly portfolio rebalancing presumes that investors rebalance their portfolios at the end of each month in order to have an equal dollar amount invested in each security at the beginning of each month. The assumption generates high transaction costs and thereby renders these returns unattainable to investors. In addition, an academic study demonstrates that the monthly portfolio rebalancing assumption produces biased estimates of stock returns.[4]

Transaction costs themselves provide another bias in historic versus expected returns. In the past, the observed stock returns were not the realized returns of investors, due to the much higher transaction costs of previous decades. These higher transaction costs are reflected through the higher commissions on stock trades and the lack of low cost mutual funds like index funds.

E. Company Survivorship Bias

Using historic data to estimate an equity risk premium suffers from company survivorship bias. Company survivorship bias results when using returns from indexes like the S&P 500. The S&P 500 includes only companies that have survived. The fact that returns of firms that did not perform well were dropped from these indexes is not reflected. Therefore, these stock returns are

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

upwardly biased because they only reflect the returns from more successful companies.

F. The "Peso Problem" - U.S. Stock Market Survivorship Bias

The use of historic return data also suffers from the so-called "Peso Problem," which is also known as U.S. stock market survivorship bias. The "peso problem" issue was first highlighted by the Nobel laureate, Milton Friedman, and gets its name from conditions related to the Mexican peso market in the early 1970s. This issue involves the fact that past stock market returns were higher than were expected at the time because despite war, depression and other social, political, and economic events, the U.S. economy survived and did not suffer hyperinflation, invasion and/or the calamities of other countries. As such, highly improbable events, which may or may not occur in the future, are factored into stock prices, leading to seemingly low valuations. Higher than expected stock returns are then earned when these events do not subsequently occur. Therefore, the "peso problem" indicates that historic stock returns are overstated as measures of expected returns because the U.S. markets have not experienced the disruptions of other major markets around the world.

F. One of the Biggest Mistakes in Teaching Finance

Jay Ritter, a Professor of Finance at the University of Florida, identified the use of historical stock and bond return data to estimate a forward-looking

equity risk premium as one of the "Biggest Mistakes" taught by the finance profession.[5] His argument is based on the theory behind the equity risk premium, the excessive results produced by historical returns, and the previously-discussed errors such as survivorship bias in historical data.

[5] Jay Ritter, "The Biggest Mistakes We Teach," *Journal of Financial Research* (Summer 2002).

Exhibit JRW-1

Duke Energy Ohio, Inc.
Cost of Capital

Cost of Capital with 4.11% Return

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	46.84%	4.11%	1.93%
Common Equity	53.16%	4.11%	2.18%
Total Capital	100.00%		4.11%

Cost of Capital with 8.75% Return

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	46.84%	4.11%	1.93%
Common Equity	53.16%	8.75%	4.65%
Total Capital	100.00%		6.58%

Exhibit JRW-2

Interest Rate Assumptions of Dr. Avera in AEP-Ohio Case

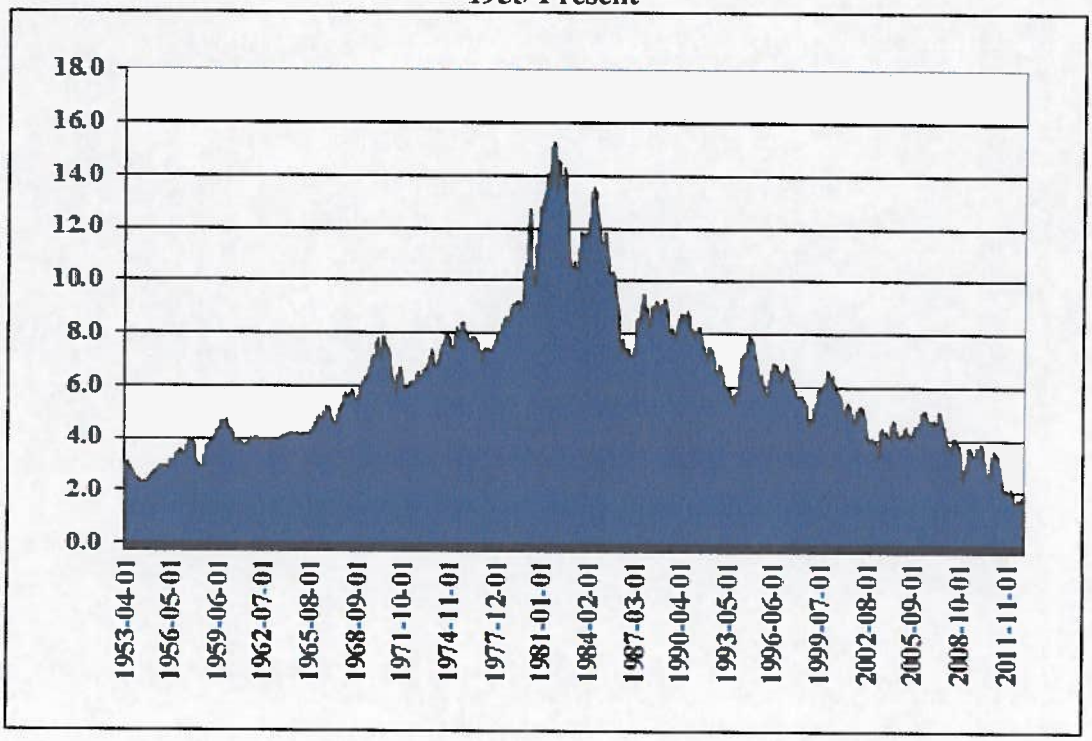
TABLE WEA-1
INTEREST RATE TRENDS

	2012	2013	2014	2015	Current (a)
30-Yr. Treasury					
Value Line (b)	4.7%	5.5%	5.8%	--	4.0%
IHS Global Insight (c)	3.8%	5.0%	5.1%	6.0%	4.0%
Blue Chip (d)	4.8%	5.2%	5.4%	5.5%	4.0%
AAA Corporate					
Value Line (b)	5.6%	6.0%	6.5%	--	4.8%
IHS Global Insight (c)	4.7%	6.0%	6.2%	6.8%	4.8%
Blue Chip (d)	5.4%	5.8%	6.1%	6.3%	4.8%
S&P (e)	6.7%	7.7%	7.6%	--	4.8%
AA Utility					
IHS Global Insight (c)	5.0%	6.2%	6.4%	7.2%	5.0%
EIA (f)	5.5%	6.4%	7.0%	7.4%	5.0%

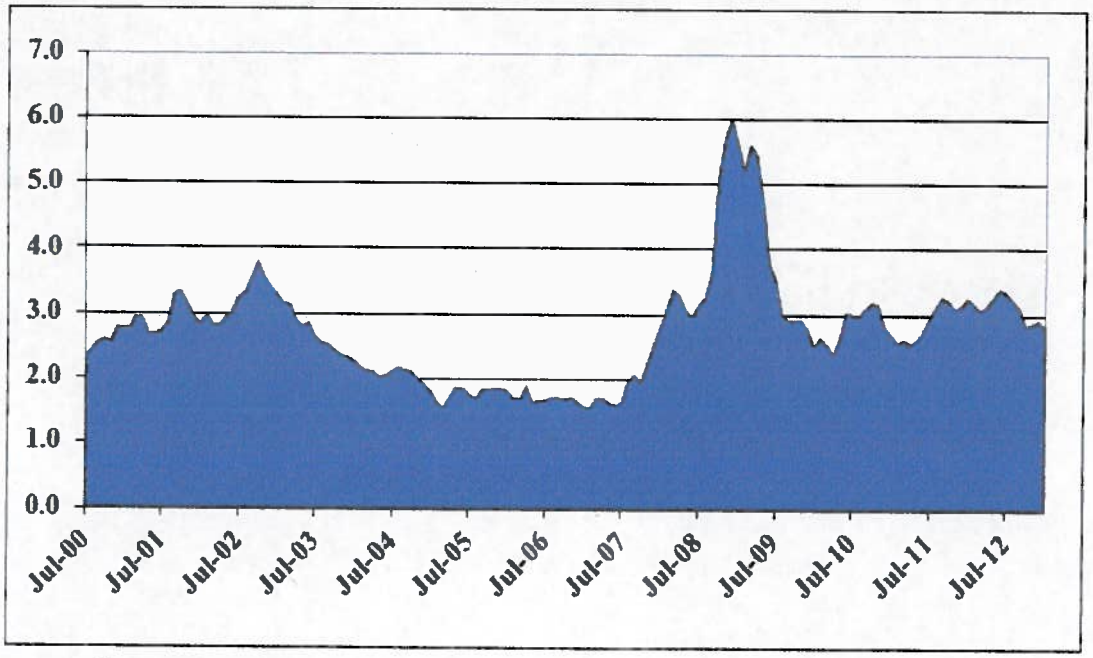
Testimony of Dr. William E. Avera on behalf of Columbus Southern Power Company and Ohio Power Company. Case Nos. 11-0351-EL-AIR and 11-0352-EL-AIR, March 14, 201, page 17.

Exhibit JRW-3

Panel A
Ten-Year Treasury Yields
1953-Present

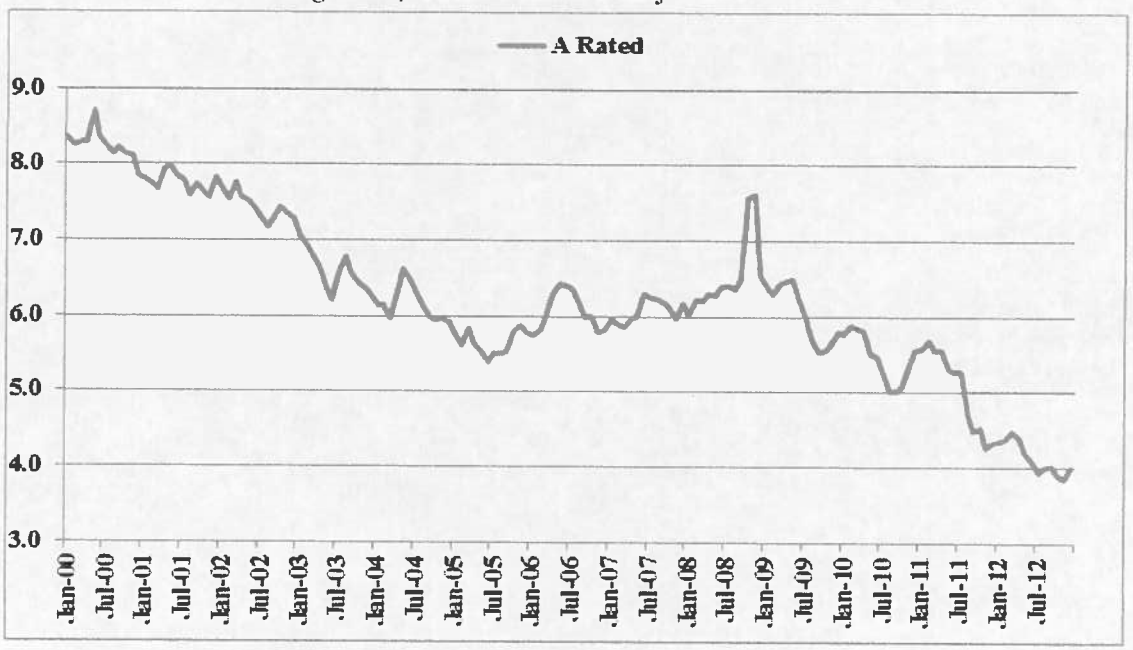


Panel B
Long-Term Moody's Baa Yields Minus Ten-Year Treasury Yields
2000-Present



Source: Federal Reserve Bank of St. Louis, FRED Database.

Exhibit JRW-3
Panel A
Long-Term, A-Rated Public Utility Yields



Panel B
Long-Term, A-Rated Public Utility Yields minus -Twenty-Year Treasury Yields

Source: Mergent Bond Record

Exhibit JRW-4
Duke Energy Ohio, Inc.
Summary Financial Statistics

Electric Proxy Group

Company	Operating Revenue ($mil)	Percent Elec Revenue	Percent Gas Revenue	Net Plant ($mil)	Market Cap ($mil)	S&P Bond Rating	Moody's Bond Rating	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio	Return on Equity	Market to Book Ratio
ALLETE, Inc. (NYSE-ALE)	944.4	90		2,239.9	1.8	A-	A2	3.7	MN, WI	53.3	7.9	1.57
Alliant Energy Corporation (NYSE-LNT)	3,222.8	81	12	7,384.6	5.3	A-	A2/A3	3.6	WS,IA,IL,MN	51.2	9.6	1.63
CenterPoint Energy (NYSE-CNP)	7,459.0	33	44	13,337.0	8.7	BBB+	Baa1/Baa2	2.6	AR,LA,MS,OK,TX,MN	30.1	9.5	2.05
CMS Energy Corporation (NYSE-CMS)	6,203.0	64	32	11,190.0	6.9	BBB/BBB-	Baa2	2.6	MI	30.1	11.4	2.15
Dominion Resources, Inc. (NYSE-D)	13,134.0	53	12	31,523.0	32.0	A	Baa1	3.8	VA,NC	36.0	9.9	2.71
DTE Energy Company (NYSE-DTE)	8,653.0	60	16	14,404.0	11.1	A	A2	3.5	MI	48.4	9.5	1.51
Duke Energy Corporation (NYSE-DUK)	17,297.0	77	3	69,031.0	48.5	A-	A3	3.2	NC,SC,FL,OH,KY	50.8	5.1	1.19
FirstEnergy Corporation (ASE-FE)	16,161.0	52		31,441.0	17.2	BBB	Baa2	2.7	OH,PANJ,WV,MD,NY	41.8	8.0	1.28
Great Plains Energy Incorporated (NYSE-GXP)	2,315.8	100		7,270.3	3.1	BBB/BBB-	Baa1/Baa2	2.3	MO,KS	47.6	6.2	1.02
Hawaiian Electric Industries, Inc. (NYSE-HE)	3,387.9	92		3,506.5	2.7	BBB-	Baa2	4.2	HI	47.8	10.1	1.65
Integrys Energy Group (NYSE-TEG)	4,152.9	31	40	5,473.0	4.4	A-	A2/A3	4.1	WI,IL,MN,MI	54.5	8.3	1.44
Nextera Energy (NYSE-NEE)	14,746.0	69		47,693.0	30.8	A	Aa3	3.5	FL	37.6	13.9	1.94
Northeast Utilities (NYSE-NU)	5,657.9	85	8	16,303.8	13.0	A-	A3	2.7	CT,NH,MA	50.6	7.0	1.42
NorthWestern Corporation (NYSE-NWE)	1,070.3	75	25	2,435.6	1.6	A-	A2	2.2	MT,SD,NE	43.5	11.0	1.69
OGE Energy Corp. (NYSE-OGE)	3,694.3	57	12	8,097.8	5.9	BBB	Baa1	4.3	OK,AR	43.7	13.3	2.13
Otter Tail Corporation (NDQ-OTTR)	1,002.2	34		1,057.9	1.0	BBB-/BB+	Baa2	4.4	MN,ND,SD	54.9	NM	1.89
Pepco Holdings, Inc. (NYSE-POM)	5,181.0	80	4	8,600.0	4.6	A-/BBB+	Baa1/Baa2	2.5	MD,VA,DE,NJ,DC	45.1	5.9	1.04
Pinnacle West Capital Corp. (NYSE-PNW)	3,276.6	100		10,071.8	6.0	BBB+	Baa1	3.9	AZ	53.3	9.3	1.49
PNM Resources, Inc. (NYSE-PNM)	1,367.5	98		3,691.7	1.8	BBB	Baa1/Baa2	2.8	NM,TX	46.5	12.9	1.07
SCANA Corporation (NYSE-SCG)	4,088.0	58	20	10,597.0	6.4	BBB+	Baa1/Baa2	3.2	SC,NC,GA	42.5	10.4	1.56
SEMPRA Energy (NYSE-SRE)	9,580.0	33	43	24,990.0	18.5	A/A-	A2	3.6	CA	43.5	8.8	1.85
Southern Company (NYSE-SO)	16,530.0	91		47,274.0	38.9	A	A2/A3	4.8	GA,FL,AL,MS	48.7	11.8	2.01
TECO Energy, Inc. (NYSE-TE)	3,127.2	63	13	5,936.0	3.7	BBB+	A3	3.2	FL	42.3	9.7	1.61
Vectren Corporation (NYSE-VVC)	2,216.1	27	33	3,111.1	2.7	A/A-	A2	3.7	IN,OH	44.2	11.0	1.79
Westar Energy, Inc. (NYSE-WR)	2,223.9	100		7,181.2	4.0	BBB+	A3	3.1	KS	46.5	9.0	1.38
Wisconsin Energy Corporation (NYSE-WEC)	4,288.4	75	22	10,438.8	9.3	A-/BBB+	A2/A3	3.9	WI	45.0	13.8	2.21
Xcel Energy Inc. (NYSE-XEL)	10,145.5	84	15	23,401.6	13.8	A-	A3	3.1	MN,WI,ND,SD,MI	44.0	10.5	1.56
Mean	6,338.0	69	21	15,840.1	11.2	A-BBB+	A3	3.4		45.3	9.8	1.66
Median	4,152.9	75	16	10,071.8	6.0	A-BBB+	A3	3.5		45.1	9.7	1.61

Data Source: *AUS Utility Reports*, March, 2013; Pre-Tax Interest Coverage and Primary Service Territory are from *Value Line Investment Survey*, 2013.

Exhibit JRW-4
Duke Energy Ohio, Inc.
***Value Line* Risk Metrics**

Electric Proxy Group

Company	Beta	Safety Rank	Financial Strength	Earnings Predictability	Price Stability
ALLETE	2	0.70	A	80	95
Alliant Energy	2	0.70	A	75	100
CenterPoint Energy	2	0.80	B++	75	95
CMS Energy Corp.	3	0.75	B+	45	95
Dominion Resources	2	0.65	B++	70	100
DTE Energy	2	0.75	B++	75	100
Duke Energy	2	0.60	A	75	100
FirstEnergy Corp.	3	0.75	B+	75	90
G't Plains Energy	3	0.75	B+	70	90
Hawaiian Elec.	2	0.70	B++	70	90
Integrys Energy	2	0.90	B++	45	75
NextEra Energy	2	0.70	A	85	100
Northeast Utilities	2	0.70	B++	60	100
Northwestern Corp	3	0.70	B+	90	100
OGE Energy	2	0.75	A	95	95
Otter Tail Corp.	3	0.90	B+	60	75
Pepco Holdings	3	0.75	B	70	95
Pinnacle West Capital	2	0.70	B++	65	100
PNM Resources	3	0.95	B	15	70
SCANA Corp.	2	0.65	B++	100	100
Sempra Energy	2	0.80	A	90	95
Southern Co.	1	0.55	A	100	100
TECO Energy	2	0.85	B++	75	90
Vectren Corp.	2	0.70	A	90	95
Westar Energy	2	0.70	B++	80	100
Wisconsin Energy	1	0.60	A	95	100
Xcel Energy Inc.	2	0.60	B++	100	100
Mean	2	0.73	B++	75	94

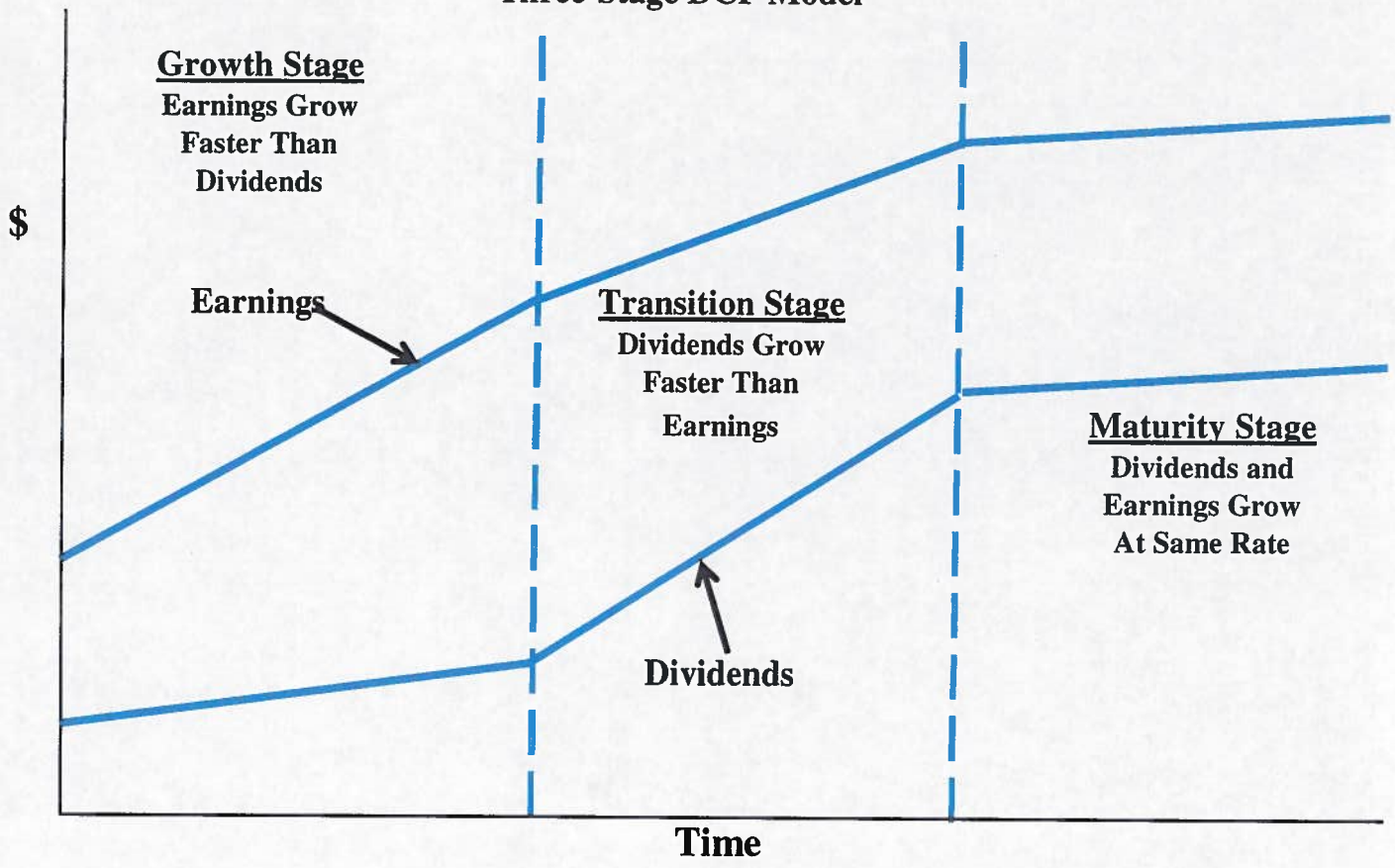
Exhibit JRW-5

Industry Average Betas

Industry Name	No.	Beta	Industry Name	No.	Beta	Industry Name	No.	Beta
Public/Private Equity	11	2.18	Natural Gas (Div.)	29	1.33	IT Services	60	1.06
Advertising	31	2.02	Financial Svcs. (Div.)	225	1.31	Retail Building Supply	8	1.04
Furn/Home Furnishings	35	1.81	Toiletries/Cosmetics	15	1.30	Computer Software	184	1.04
Heavy Truck & Equip	21	1.80	Apparel	57	1.30	Med Supp Non-Invasiv	146	1.03
Semiconductor Equip	12	1.79	Computers/Peripherals	87	1.30	Biotechnology	158	1.03
Retail (Hardlines)	75	1.77	Retail Store	37	1.29	E-Commerce	57	1.03
Newspaper	13	1.76	Chemical (Specialty)	70	1.28	Telecom. Equipment	99	1.02
Hotel/Gaming	51	1.74	Precision Instrument	77	1.28	Pipeline MLPs	27	0.98
Auto Parts	51	1.70	Wireless Networking	57	1.27	Telecom. Services	74	0.98
Steel	32	1.68	Restaurant	63	1.27	Oil/Gas Distribution	13	0.96
Entertainment	77	1.63	Shoe	19	1.25	Utility (Foreign)	4	0.96
Metal Fabricating	24	1.59	Publishing	24	1.25	Industrial Services	137	0.93
Automotive	12	1.59	Trucking	36	1.24	Bank (Midwest)	45	0.93
Insurance (Life)	30	1.58	Human Resources	23	1.24	Reinsurance	13	0.93
Oilfield Svcs/Equip.	93	1.55	Entertainment Tech	40	1.23	Food Processing	112	0.91
Coal	20	1.53	Engineering & Const	25	1.22	Medical Services	122	0.91
Chemical (Diversified)	31	1.51	Air Transport	36	1.21	Insurance (Prop/Cas.)	49	0.91
Building Materials	45	1.50	Machinery	100	1.20	Beverage	34	0.88
Semiconductor	141	1.50	Securities Brokerage	28	1.20	Telecom. Utility	25	0.88
R.E.I.T.	5	1.47	Petroleum (Integrated)	20	1.18	Tobacco	11	0.85
Homebuilding	23	1.45	Healthcare Information	25	1.17	Med Supp Invasive	83	0.85
Recreation	56	1.45	Packaging & Container	26	1.16	Educational Services	34	0.83
Railroad	12	1.44	Precious Metals	84	1.15	Environmental	82	0.81
Retail (Softlines)	47	1.44	Diversified Co.	107	1.14	Bank	426	0.77
Maritime	52	1.40	Funeral Services	6	1.14	Electric Util. (Central)	21	0.75
Office Equip/Supplies	24	1.38	Property Management	31	1.13	Electric Utility (West)	14	0.75
Cable TV	21	1.37	Pharmacy Services	19	1.12	Retail/Wholesale Food	30	0.75
Retail Automotive	20	1.37	Drug	279	1.12	Thrift	148	0.71
Chemical (Basic)	16	1.36	Aerospace/Defense	64	1.10	Electric Utility (East)	21	0.70
Paper/Forest Products	32	1.36	Foreign Electronics	9	1.09	Natural Gas Utility	22	0.66
Power	93	1.35	Internet	186	1.09	Water Utility	11	0.66
Petroleum (Producing)	176	1.34	Information Services	27	1.07	Total Market	5891	1.15
Electrical Equipment	68	1.33	Household Products	26	1.07			
Metals & Mining (Div.)	73	1.33	Electronics	139	1.07			

Source: Damodaran Online 2012 - http://pages.stern.nyu.edu/~adamodar/

Exhibit JRW-6
Three-Stage DCF Model



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

Exhibit JRW-7

Duke Energy Ohio, Inc.
Discounted Cash Flow Analysis

Electric Proxy Group

Dividend Yield*	4.05%
Adjustment Factor (1 + 1/2g)	1.02375
Adjusted Dividend Yield	4.15%
Growth Rate**	4.75%
Equity Cost Rate	8.9%

* Page 2 of Attachment JRW-7

** Based on data provided on pages 3, 4, 5, and 6 of Attachment JRW-7

Exhibit JRW-7

Duke Energy Ohio, Inc.
Monthly Dividend Yields

Electric Proxy Group

Company	Oct	Nov	Dec	Jan	Feb	Mar	Mean
ALLETE, Inc. (NYSE-ALE)	4.4%	4.4%	4.8%	4.5%	4.2%	4.1%	4.4%
Alliant Energy Corporation (NYSE-LNT)	4.1%	4.0%	4.1%	4.0%	3.9%	3.9%	4.0%
CenterPoint Energy (NYSE-CNP)	3.9%	3.7%	4.2%	4.1%	4.1%	4.0%	4.0%
CMS Energy Corporation (NYSE-CMS)	4.2%	4.0%	4.1%	3.9%	3.9%	3.9%	4.0%
Dominion Resources, Inc. (NYSE-D)	4.0%	4.0%	4.2%	4.1%	4.0%	3.8%	4.0%
DTE Energy Company (NYSE-DTE)	4.2%	4.0%	4.2%	4.1%	4.0%	3.8%	4.1%
Duke Energy Corporation (NYSE-DUK)	4.8%	4.7%	5.0%	4.7%	4.6%	4.4%	4.7%
FirstEnergy Corporation (ASE-FE)	5.0%	4.8%	5.3%	5.3%	5.6%	5.4%	5.2%
Great Plains Energy Incorporated (NYSE-GXP)	3.8%	3.7%	4.2%	4.2%	4.2%	3.9%	4.0%
Hawaiian Electric Industries, Inc. (NYSE-HE)	4.6%	4.7%	5.1%	4.8%	4.8%	4.5%	4.8%
Integrys Energy Group (NYSE-TEG)	5.2%	4.9%	5.1%	5.0%	5.0%	4.8%	5.0%
Nextera Energy (NYSE-NEE)	3.5%	3.3%	3.5%	3.4%	3.4%	3.3%	3.4%
Northeast Utilities (NYSE-NU)	3.7%	3.5%	3.5%	3.5%	3.5%	3.3%	3.5%
NorthWestern Corporation (NYSE-NWE)	4.0%	4.1%	4.4%	4.2%	4.1%	3.8%	4.1%
OGE Energy Corp. (NYSE-OGE)	2.9%	2.7%	2.8%	2.8%	2.9%	2.8%	2.8%
Otter Tail Corporation (NDQ-OTTR)	5.0%	4.9%	5.1%	4.8%	4.6%	4.2%	4.8%
Pepco Holdings, Inc. (NYSE-POM)	5.7%	5.5%	5.7%	5.5%	5.7%	5.4%	5.6%
Pinnacle West Capital Corp. (NYSE-PNW)	4.0%	3.9%	4.4%	4.2%	4.2%	4.0%	4.1%
PNM Resources, Inc. (NYSE-PNM)	2.8%	2.6%	2.9%	2.8%	2.8%	2.6%	2.8%
SCANA Corporation (NYSE-SCG)	4.1%	4.0%	4.4%	4.3%	4.3%	4.1%	4.2%
SEMPRA Energy (NYSE-SRE)	3.7%	3.5%	3.6%	3.3%	3.3%	3.1%	3.4%
Southern Company (NYSE-SO)	4.3%	4.2%	4.6%	4.6%	4.6%	4.4%	4.5%
TECO Energy, Inc. (NYSE-TE)	5.0%	4.9%	5.4%	5.2%	3.2%	5.1%	4.8%
Vectren Corporation (NYSE-VVC)	5.0%	4.7%	5.0%	4.7%	4.6%	4.3%	4.7%
Westar Energy, Inc. (NYSE-WR)	4.5%	4.4%	4.7%	4.6%	4.5%	4.2%	4.5%
Wisconsin Energy Corporation (NYSE-WEC)	3.3%	3.1%	3.3%	3.2%	3.2%	3.4%	3.3%
Xcel Energy Inc. (NYSE-XEL)	3.9%	3.8%	4.1%	4.0%	4.0%	3.8%	3.9%
Mean	4.2%	4.1%	4.4%	4.2%	4.1%	4.0%	4.2%
Median	4.1%	4.0%	4.4%	4.2%	4.1%	4.0%	4.1%

Source: AUS Utilities Report, Monthly issues.

Exhibit JRW-7

Duke Energy Ohio, Inc.
DCF Equity Cost Growth Rate Measures
Value Line Historic Growth Rates

Panel A
Electric Proxy Group

Company	*Value Line* Historic Growth					
	Past 10 Years			Past 5 Years		
	Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
ALLETE, Inc. (NYSE-ALE)				-2.5%	4.5%	5.5%
Alliant Energy Corporation (NYSE-LNT)	3.5%	-1.5%	2.0%	4.0%	8.0%	3.5%
CenterPoint Energy (NYSE-CNP)	-1.5%	-4.5%	-4.0%	3.0%	7.0%	13.5%
CMS Energy Corporation (NYSE-CMS)	-5.5%	-7.5%	-4.5%	8.5%		2.0%
Dominion Resources, Inc. (NYSE-D)	7.0%	3.5%	3.5%	6.5%	6.5%	3.5%
DTE Energy Company (NYSE-DTE)	2.0%	1.0%	4.0%	6.0%	2.0%	4.0%
Duke Energy Corporation (NYSE-DUK)				7.0%		-4.0%
FirstEnergy Corporation (ASE-FE)	0.5%	4.0%	3.0%	-2.0%	4.0%	1.5%
Great Plains Energy Incorporated (NYSE-GXP)	-3.0%	-6.5%	4.5%	-6.0%	-12.5%	5.0%
Hawaiian Electric Industries, Inc. (NYSE-HE)	-2.0%		2.0%	-3.0%		1.5%
Integrys Energy Group (NYSE-TEG)	2.0%	2.5%	5.5%	-0.5%	3.0%	0.5%
Nextera Energy (NYSE-NEE)	7.5%	6.5%	8.0%	11.0%	7.5%	9.0%
Northeast Utilities (NYSE-NU)		12.5%	3.0%	18.0%	8.5%	3.5%
NorthWestern Corporation (NYSE-NWE)					13.0%	2.0%
OGE Energy Corp. (NYSE-OGE)	6.0%	1.0%	6.0%	8.5%	2.0%	8.5%
Otter Tail Corporation (NDQ-OTTR)	-9.5%	1.5%	3.5%	-18.5%	0.5%	-1.0%
Pepco Holdings, Inc. (NYSE-POM)	-4.5%		0.5%	-4.5%	1.5%	0.5%
Pinnacle West Capital Corp. (NYSE-PNW)	-2.0%	4.0%	2.0%	1.0%	1.5%	
PNM Resources, Inc. (NYSE-PNM)	-7.5%	-0.5%	1.5%	-12.0%	-8.0%	-1.0%
SCANA Corporation (NYSE-SCG)	4.5%	4.5%	3.5%	2.0%	4.0%	4.5%
SEMPRA Energy (NYSE-SRE)	8.0%	3.5%	11.5%	2.5%	8.5%	9.5%
Southern Company (NYSE-SO)	3.0%	3.0%	3.5%	3.0%	4.0%	6.0%
TECO Energy, Inc. (NYSE-TE)	-5.0%	-4.5%	-2.0%	3.5%	1.5%	6.5%
Vectren Corporation (NYSE-VVC)	3.0%	3.0%	4.0%	1.0%	2.5%	3.0%
Westar Energy, Inc. (NYSE-WR)	16.0%			1.5%	5.0%	4.5%
Wisconsin Energy Corporation (NYSE-WEC)	9.5%	7.5%	7.0%	10.0%	17.0%	7.0%
Xcel Energy Inc. (NYSE-XEL)	-1.0%	-4.0%		4.5%	3.5%	4.5%
Mean	1.3%	1.4%	3.1%	2.0%	4.0%	4.0%
Median	2.0%	2.5%	3.5%	2.8%	4.0%	3.8%

Exhibit JRW-7

Duke Energy Ohio, Inc.
DCF Equity Cost Growth Rate Measures
***Value Line* Projected Growth Rates**

Panel A
Electric Proxy Group

Company	*Value Line* Projected Growth Est'd. '09-'11 to '15-'17			*Value Line* Sustainable Growth		
	Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Sustainable Growth
ALLETE, Inc. (NYSE-ALE)	7.0%	3.5%	4.0%	10.0%	39.0%	3.9%
Alliant Energy Corporation (NYSE-LNT)	4.5%	4.5%	4.0%	11.0%	37.0%	4.1%
CenterPoint Energy (NYSE-CNP)	4.0%	3.0%	5.5%	12.0%	39.0%	4.7%
CMS Energy Corporation (NYSE-CMS)	7.0%	10.0%	5.0%	13.0%	37.0%	4.8%
Dominion Resources, Inc. (NYSE-D)	5.5%	6.0%	3.5%	15.5%	31.0%	4.8%
DTE Energy Company (NYSE-DTE)	4.0%	4.5%	4.0%	9.0%	37.0%	3.3%
Duke Energy Corporation (NYSE-DUK)	4.5%	2.0%	3.5%	8.0%	35.0%	2.8%
FirstEnergy Corporation (ASE-FE)	2.0%	0.0%	3.5%	9.0%	32.0%	2.9%
Great Plains Energy Incorporated (NYSE-GXP)	6.5%	6.0%	2.5%	8.0%	38.0%	3.0%
Hawaiian Electric Industries, Inc. (NYSE-HE)	9.0%	2.0%	4.5%	10.0%	33.0%	3.3%
Integrys Energy Group (NYSE-TEG)	3.5%	0.5%	3.0%	9.0%	30.0%	2.7%
Nextera Energy (NYSE-NEE)	5.5%	8.5%	6.5%	12.5%	45.0%	5.6%
Northeast Utilities (NYSE-NU)	6.5%	8.5%	7.5%	9.5%	44.0%	4.2%
NorthWestern Corporation (NYSE-NWE)	5.0%	4.5%	4.5%	10.0%	39.0%	3.9%
OGE Energy Corp. (NYSE-OGE)	4.0%	5.0%	7.0%	11.0%	48.0%	5.3%
Otter Tail Corporation (NDQ-OTTR)	20.0%	1.5%	2.0%	10.5%	30.0%	3.2%
Pepco Holdings, Inc. (NYSE-POM)	6.0%	1.0%	1.5%	8.0%	31.0%	2.5%
Pinnacle West Capital Corp. (NYSE-PNW)	6.5%	3.0%	3.5%	10.0%	38.0%	3.8%
PNM Resources, Inc. (NYSE-PNM)	16.0%	12.0%	4.0%	8.5%	50.0%	4.3%
SCANA Corporation (NYSE-SCG)	4.5%	2.0%	5.0%	9.5%	45.0%	4.3%
SEMPRA Energy (NYSE-SRE)	4.5%	9.0%	5.0%	11.5%	54.0%	6.2%
Southern Company (NYSE-SO)	4.5%	4.0%	4.5%	12.5%	37.0%	4.6%
TECO Energy, Inc. (NYSE-TE)	3.5%	2.0%	2.5%	12.0%	35.0%	4.2%
Vectren Corporation (NYSE-VVC)	6.0%	2.5%	4.0%	11.0%	37.0%	4.1%
Westar Energy, Inc. (NYSE-WR)	5.0%	3.0%	4.0%	9.0%	43.0%	3.9%
Wisconsin Energy Corporation (NYSE-WEC)	6.5%	13.0%	3.5%	14.0%	33.0%	4.6%
Xcel Energy Inc. (NYSE-XEL)	6.0%	5.0%	4.5%	10.0%	40.0%	4.0%
Mean	6.2%	4.7%	4.2%	10.5%	38.4%	4.0%
Median	5.5%	4.0%	4.0%	10.0%	37.0%	4.1%
Average of Median Figures =		4.5%				4.1%

Data Source: *Value Line Investment Survey.*

Exhibit JRW-7

Duke Energy Ohio, Inc.
DCF Equity Cost Growth Rate Measures
Analysts Projected EPS Growth Rate Estimates

Panel A
Electric Proxy Group

Company	Yahoo	Reuters	Zacks	Mean
ALLETE, Inc. (NYSE-ALE)	6.0%	6.0%	5.0%	5.7%
Alliant Energy Corporation (NYSE-LNT)	5.8%	5.8%	6.4%	6.0%
CenterPoint Energy (NYSE-CNP)	4.9%	4.8%	5.7%	5.2%
CMS Energy Corporation (NYSE-CMS)	6.1%	6.1%	6.0%	6.0%
Dominion Resources, Inc. (NYSE-D)	7.3%	6.8%	4.6%	6.2%
DTE Energy Company (NYSE-DTE)	4.6%	4.6%	5.0%	4.7%
Duke Energy Corporation (NYSE-DUK)	4.0%	4.0%	4.1%	4.0%
FirstEnergy Corporation (ASE-FE)	4.6%	3.8%	4.0%	4.1%
Great Plains Energy Incorporated (NYSE-GXP)	6.4%	7.1%	6.4%	6.6%
Hawaiian Electric Industries, Inc. (NYSE-HE)	3.3%	4.2%	6.3%	4.6%
Integrys Energy Group (NYSE-TEG)	5.5%	5.5%	5.3%	5.4%
Nextera Energy (NYSE-NEE)	6.4%	5.9%	5.9%	6.1%
Northeast Utilities (NYSE-NU)	7.6%	7.2%	7.1%	7.3%
NorthWestern Corporation (NYSE-NWE)	5.0%	5.0%	5.3%	5.1%
OGE Energy Corp. (NYSE-OGE)	5.1%	5.1%	4.8%	5.0%
Otter Tail Corporation (NDQ-OTTR)	5.0%	5.0%	6.0%	5.3%
Pepco Holdings, Inc. (NYSE-POM)	4.5%	4.5%	4.8%	4.6%
Pinnacle West Capital Corp. (NYSE-PNW)	7.5%	7.5%	6.9%	7.3%
PNM Resources, Inc. (NYSE-PNM)	8.5%	8.5%	8.4%	8.5%
SCANA Corporation (NYSE-SCG)	4.7%	4.8%	4.8%	4.7%
SEMPRA Energy (NYSE-SRE)	5.7%	5.7%	1.6%	4.3%
Southern Company (NYSE-SO)	4.8%	5.0%	5.0%	4.9%
TECO Energy, Inc. (NYSE-TE)	3.2%	3.2%	1.7%	2.7%
Vectren Corporation (NYSE-VVC)	5.0%	5.0%	5.0%	5.0%
Westar Energy, Inc. (NYSE-WR)	6.5%	6.5%	6.4%	6.5%
Wisconsin Energy Corporation (NYSE-WEC)	5.4%	5.4%	5.5%	5.4%
Xcel Energy Inc. (NYSE-XEL)	5.0%	5.4%	4.7%	5.0%
Mean	5.5%	5.5%	5.3%	5.4%
Median	5.1%	5.4%	5.3%	5.2%

Exhibit JRW-7

Duke Energy Ohio, Inc.
DCF Growth Rate Indicators

DCF Growth Rate Indicators

Summary Growth Rates

Growth Rate Indicator	Electric Proxy Group
Historic *Value Line* Growth in EPS, DPS, and BVPS	3.1%
Projected *Value Line* Growth in EPS, DPS, and BVPS	4.5%
Sustainable Growth ROE * Retention Rate	4.1%
Projected EPS Growth from Yahoo, Zacks, and Reuters	5.2%
Average of Historic and Projected Growth Rates	4.2%
Average of Sustainable and Projected Growth Rates	4.6%

Exhibit JRW-8

Duke Energy Ohio, Inc.
Capital Asset Pricing Model

Electric Proxy Group

Risk-Free Interest Rate	**4.00%**
Beta*	**0.70**
Ex Ante Equity Risk Premium**	**5.00%**
CAPM Cost of Equity	**7.5%**

* See page 3 of Attachment JRW-8

** See pages 5 and 6 of Attachment JRW-8

Exhibit JRW-8

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

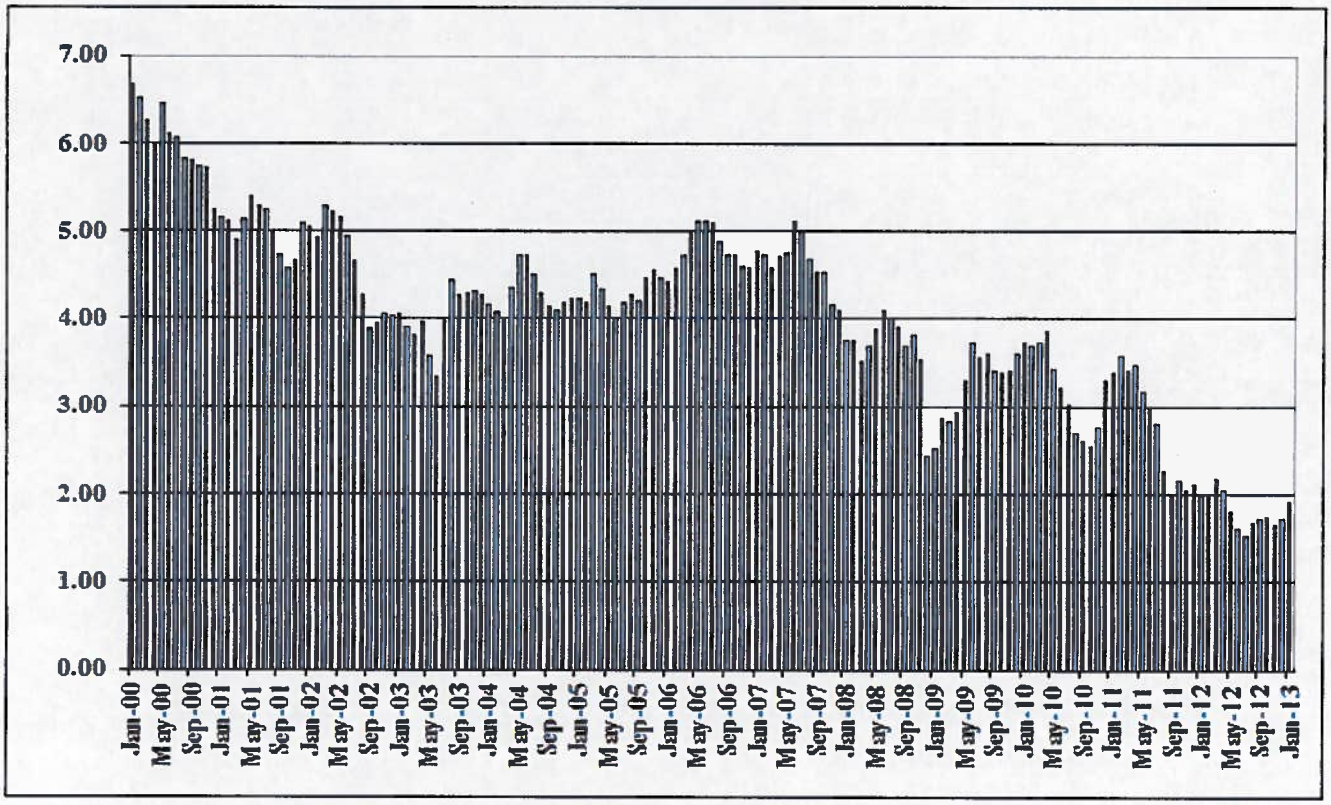
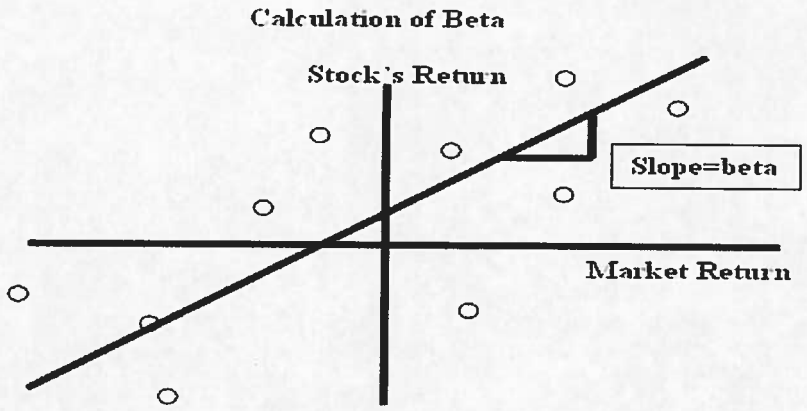


Exhibit JRW-8

Panel A
Betas



Electric Proxy Group

ALLETE	0.70
Alliant Energy	0.70
CenterPoint Energy	0.80
CMS Energy Corp.	0.75
Dominion Resources	0.65
DTE Energy	0.75
Duke Energy	0.60
FirstEnergy Corp.	0.75
G't Plains Energy	0.75
Hawaiian Elec.	0.70
Integrys Energy	0.90
NextEra Energy	0.70
Northeast Utilities	0.70
Northwestern Corp	0.70
OGE Energy	0.75
Otter Tail Corp.	0.90
Pepco Holdings	0.75
Pinnacle West Capital	0.70
PNM Resources	0.95
SCANA Corp.	0.65
Sempra Energy	0.80
Southern Co.	0.55
TECO Energy	0.85
Vectren Corp.	0.70
Westar Energy	0.70
Wisconsin Energy	0.60
Xcel Energy Inc.	0.60
Mean	0.73
Median	0.70

Data Source: *Value Line Investment Survey.*

Exhibit JRW-8
Risk Premium Approaches

	Historical Ex Post Returns	Surveys	Expected Return Models and Market Data
Means of Assessing The Market Risk Premium	Historical Average Stock Minus Bond Returns	Surveys of CFOs, Financial Forecasters, Companies, Analysts on Expected Returns and Market Risk Premiums	Use Market Prices and Market Fundamentals (such as Growth Rates) to Compute Expected Returns and Market Risk Premiums
Problems/Debated Issues	Time Variation in Required Returns, Measurement and Time Period Issues, and Biases such as Market and Company Survivorship Bias	Questions Regarding Survey Histories, Responses, and Representativeness Surveys may be Subject to Biases, such as Extrapolation	Assumptions Regarding Expectations, Especially Growth

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

Exhibit JRW-8

Duke Energy Ohio, Inc.
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	Median
Historical Risk Premium										
	Ibbotson	2013	1926-2012	Historical Stock Returns - Bond Returns	Arithmetic				5.70%	
					Geometric				4.10%	
	Bate	2008	1900-2007	Historical Stock Returns - Bond Returns	Geometric				4.50%	
	Shiller	2006	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				7.00%	
					Geometric				5.50%	
	Damodoran	2006	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				6.70%	
					Geometric				5.10%	
	Siegel	2005	1926-2005	Historical Stock Returns - Bond Returns	Arithmetic				6.10%	
					Geometric				4.60%	
	Dimson, Marsh, and Staunton	2006	1900-2005	Historical Stock Returns - Bond Returns	Arithmetic				5.50%	
	Goyal & Welch	2006	1872-2004	Historical Stock Returns - Bond Returns					4.77%	
	Median									5.50%
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%	
	Best & Byrne	2001								
	McKinsey	2002	1962-2002	Fundamental (P/E, D/P, & Earnings Growth)		3.50%	4.00%		3.75%	
	Siegel	2005	1802-2001	Historical Earnings Yield	Geometric				2.50%	
	Grabowski	2006	1926-2005	Historical and Projected		3.50%	6.00%	4.75%	4.75%	
	Maheu & McCurdy	2006	1885-2003	Historical Excess Returns, Structural Breaks,		4.02%	5.10%	4.56%	4.56%	
	Bostock	2004	1960-2002	Bond Yields, Credit Risk, and Income Volatility		3.90%	1.30%	2.60%	2.60%	
	Bakshi & Chen	2005	1982-1998	Fundamentals - Interest Rates					7.31%	
	Donaldson, Kamstra, & Kramer	2006	1952-2004	Fundamental, Dividend yld., Returns., & Volatility		3.00%	4.00%	3.50%	3.50%	
	Campbell	2008	1982-2007	Historical & Projections (D/P & Earnings Growth)		4.10%	5.40%		4.75%	
	Best & Byrne	2001	Projection	Fundamentals - Div Yld + Growth					2.00%	
	Fernandez	2007	Projection	Required Equity Risk Premium					4.00%	
	DeLong & Magin	2008	Projection	Earnings Yield - TIPS					3.22%	
	Damodoran	2013	Projection	Fundamentals - Implied from FCF to Equity Model					5.43%	
	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%	
			Projected for 75 Years		Geometric	1.50%	2.50%	2.00%	2.00%	
	Peter Diamond	2001	Projected for 75 Years	Fundamentals (D/P, GDP Growth)		3.00%	4.80%	3.90%	3.90%	
	John Shoven	2001	Projected for 75 Years	Fundamentals (D/P, P/E, GDP Growth)		3.00%	3.50%	3.25%	3.25%	
	Median									3.75%
Surveys										
	Survey of Financial Forecasters	2013	10-Year Projection	About 50 Financial Forecastsers					2.30%	
	Duke - CFO Magazine Survey	2012	10-Year Projection	Approximately 350 CFOs					4.10%	
	Welch - Academics	2008	30-Year Projection	Random Academics		5.00%	5.74%	5.37%	5.37%	
	Fernandez - Academics	2012	Long-Term	Survey of Academics					5.60%	
	Fernandez - Analysts	2012	Long-Term	Survey of Analysts					5.00%	
	Fernandez - Companies	2012	Long-Term	Survey of Companies					5.50%	
	Median									5.19%
Building Block										
	Ibbotson and Chen	2012	1926-2011	Historical Supply Model (D/P & Earnings Growth)	Arithmetic			5.99%	4.95%	
					Geometric			3.91%		
	Woolridge		2013	Current Supply Model (D/P & Earnings Growth)					4.40%	
	Median									4.68%
Mean										4.78%
Median										4.93%

Exhibit JRW-8

Duke Energy Ohio, Inc.
Capital Asset Pricing Model
Equity Risk Premium

Summary of 2010-13 Equity Risk Premium Studies

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	2013	1926-2012	Historical Stock Returns - Bond Returns	Arithmetic				5.70%	
					Geometric				4.10%	
	Median									4.90%
Ex Ante Models (Puzzle Research)										
	Damodoran	2013	Projection	Fundamentals - Implied from FCF to Equity Model					5.43%	
	Median									5.43%
Surveys										
	Survey of Financial Forecasters	2013	10-Year Projection	About 50 Financial Forecastsers					2.30%	
	Duke - CFO Magazine Survey	2012	10-Year Projection	Approximately 350 CFOs					4.10%	
	Fernandez - Academics	2012	Long-Term	Survey of Academics					5.60%	
	Fernandez - Analysts	2012	Long-Term	Survey of Analysts					5.00%	
	Fernandez - Companies	2012	Long-Term	Survey of Companies					5.50%	4.55%
Building Block										
	Ibbotson and Chen	2012	1926-2011	Historical Supply Model (D/P & Earnings Growth)	Arithmetic			5.99%	4.95%	
					Geometric			3.91%		
	Woolridge		2013	Current Supply Model (D/P & Earnings Growth)					4.40%	
	Median									4.68%
Mean										4.89%
Median										4.79%

Panel A

Summary of Dr. Vander Weide's Equity Cost Rate Approaches and Results

Approach	Electric Utilities	Pipeline Companies
DCF	10.60%	12.60%
Ex Ante Risk Premium	11.20%	
Ex Post Risk Premium	10.80%	
CAPM - Historical	10.20%	11.00%
CAPM - DCF Based	10.70%	11.60%
Average	10.70%	11.70%

Panel B

Summary of Dr. Vander Weide's DCF Results

	Electric Utilities	Pipeline Companies***
Average Adjusted Dividend Yield*	4.80%	6.90%
Growth**	5.80%	5.70%
DCF Result	10.60%	12.60%

* Includes adjustments for quarterly payments and flotation costs
** Expected EPS Growth from IBES and *Value Line*
*** Ignores DCF results for four companies

Panel C

Summary of Dr. Vander Weide's Ex Ante Risk Premium Results

	Electric Utilities	Pipeline Companies
Projected 'A' Rated PU Yield	6.50%	
Ex Ante Risk Premium*	4.64%	
Equity Cost Rate	11.20%	

Panel D

Summary of Dr. Vander Weide's Historical Risk Premium Results

	Electric Utilities	Pipeline Companies
Projected 'A' Rated PU Yield	6.50%	
Historic Risk Premium*	4.10%	
Equity Cost Rate	10.60%	
Flotation Cost Adjustment	0.24%	
Adjusted CAPM Result	10.80%	

* Midpoint of 3.8% and 4.3%

Panel E

Summary of Dr. Vander Weide's Historical CAPM Results

	Electric Utilities	Pipeline Companies
Risk-Free Rate	5.10%	5.10%
Beta	0.73	0.85
Equity Risk Premium	6.60%	6.60%
CAPM Result	9.92%	10.71%
Flotation Cost Adjustment	0.24%	0.24%
Adjusted CAPM Result	10.20%	11.00%

Panel F

Summary of Dr. Vander Weide's Expected CAPM Results

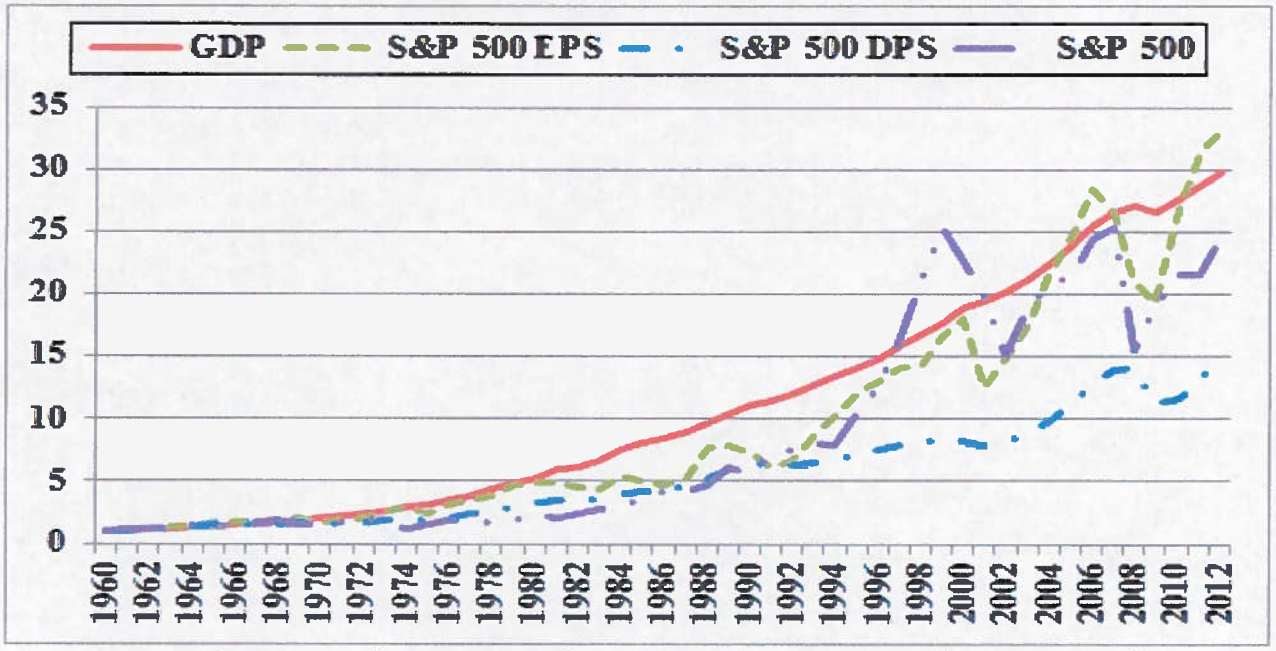
	Utility Proxy Group	Pipeline Companies
Risk-Free Rate	5.10%	5.10%
Beta	0.73	0.85
Equity Risk Premium	7.40%	7.40%
CAPM Result	10.50%	11.39%
Flotation Cost Adjustment	0.24%	0.24%
Adjusted CAPM Result	10.70%	11.60%

Growth Rates
GDP, S&P 500 Price, EPS, and DPS

	GDP	S&P 500	Earnings	Dividends	
1960	526.4	58.11	3.10	1.98	
1961	544.8	71.55	3.37	2.04	
1962	585.7	63.10	3.67	2.15	
1963	617.8	75.02	4.13	2.35	
1964	663.6	84.75	4.76	2.58	
1965	719.1	92.43	5.30	2.83	
1966	787.7	80.33	5.41	2.88	
1967	832.4	96.47	5.46	2.98	
1968	909.8	103.86	5.72	3.04	
1969	984.4	92.06	6.10	3.24	
1970	1038.3	92.15	5.51	3.19	
1971	1126.8	102.09	5.57	3.16	
1972	1237.9	118.05	6.17	3.19	
1973	1382.3	97.55	7.96	3.61	
1974	1499.5	68.56	9.35	3.72	
1975	1637.7	90.19	7.71	3.73	
1976	1824.6	107.46	9.75	4.22	
1977	2030.1	95.10	10.87	4.86	
1978	2293.8	96.11	11.64	5.18	
1979	2562.2	107.94	14.55	5.97	
1980	2788.1	135.76	14.99	6.44	
1981	3126.8	122.55	15.18	6.83	
1982	3253.2	140.64	13.82	6.93	
1983	3534.6	164.93	13.29	7.12	
1984	3930.9	167.24	16.84	7.83	
1985	4217.5	211.28	15.68	8.20	
1986	4460.1	242.17	14.43	8.19	
1987	4736.4	247.08	16.04	9.17	
1988	5100.4	277.72	24.12	10.22	
1989	5482.1	353.40	24.32	11.73	
1990	5800.5	330.22	22.65	12.35	
1991	5992.1	417.09	19.30	12.97	
1992	6342.3	435.71	20.87	12.64	
1993	6667.4	466.45	26.90	12.69	
1994	7085.2	459.27	31.75	13.36	
1995	7414.7	615.93	37.70	14.17	
1996	7838.5	740.74	40.63	14.89	
1997	8332.4	970.43	44.09	15.52	
1998	8793.5	1229.23	44.27	16.20	
1999	9353.5	1469.25	51.68	16.71	
2000	9951.5	1320.28	56.13	16.27	
2001	10286.2	1148.09	38.85	15.74	
2002	10642.3	879.82	46.04	16.08	
2003	11142.2	1111.91	54.69	17.88	
2004	11853.3	1211.92	67.68	19.41	
2005	12623.0	1248.29	76.45	22.38	
2006	13377.2	1418.30	87.72	25.05	
2007	14028.7	1468.36	82.54	27.73	
2008	14291.5	903.25	65.39	28.05	
2009	13973.7	1115.10	59.65	22.31	
2010	14498.9	1257.64	83.66	23.12	
2011	15075.7	1257.60	97.05	26.02	Average
2012	15681.5	1426.19	102.47	30.44	
Growth Rates	**6.74**	**6.35**	**6.96**	**5.39**	**6.36**

Data Sources: GDPA - http://research.stlouisfed.org/fred2/categories/106
S&P 500, EPS and DPS - http://pages.stern.nyu.edu/~adamodar/

Long-Term Growth of GDP, S&P 500, S&P 500 EPS, and S&P 500 DPS



	GDP	S&P 500	S&P 500 EPS	S&P 500 DPS
Growth Rates	6.74%	6.35%	6.96%	5.39%

Panel A
Historic GDP Growth Rates

10-Year Average	4.0%
20-Year Average	4.6%
30-Year Average	5.1%
40-Year Average	6.6%
50-Year Average	6.8%

Calculated from Page 1 of Exhibit JRW-14

Panel B
Projected GDP Growth Rates

	Time Frame	Projected Nominal GDP Growth Rate
Congressional Budget Office	2013-2023	4.6%
Survey of Financial Forecasters	Ten Year	4.8%
Energy Information Administration	2011-2040	4.5%

Sources:
http://www.cbo.gov/ftpdocs/120xx/doc12039/01-26_FY2013Outlook.pdf page XIII
http://www.eia.gov/forecasts/aeo/tables_ref.cfm Table 20
http://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/2013/survq113.cfm

Summary: Testimony Direct Testimony of J. Randall Woolridge, Ph.D. on Behalf of the Office of the Ohio Consumers' Counsel electronically filed by Patti Mallarnee on behalf of Grady, Maureen