COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:	)	
	)	
APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR AN ADJUSTMENT OF RATES	)	CASE NO. 2015-00418
	)	

DIRECT TESTIMONY OF

J. RANDALL WOOLRIDGE, PH.D.

RE: COST OF CAPITAL

ON BEHALF OF

OFFICE OF THE ATTORNEY GENERAL
FOR THE COMMONWEALTH OF KENTUCKY

AND

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT

May 9, 2016

Case No. 2015-00418

Direct Testimony of J. Randall Woolridge, Ph. D.

TABLE OF CONTENTS

LIST OF EXHIBITS

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

A. My name is J. Randall Woolridge, and my business address is 120 Haymaker Circle, 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 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, and related business experience is provided in Appendix A.

I. SUBJECT OF TESTIMONY AND SUMMARY OF RECOMMENDATIONS

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

A. I have been asked by the Office of the Attorney General for the Commonwealth of Kentucky ("AG") and by the Lexington-Fayette Urban County Government ("LFUCG") to provide an opinion as to the overall fair rate of return or cost of capital for Kentucky-American Water Company ("KAWC" or "Company") and to evaluate KAWC's rate of return testimony in this proceeding.

Q. WHAT IS A "RATE OF RETURN"?

A. The rate of return is the overall cost of capital for a business. It includes the different sources of capital for a company, primarily debt and common stock, and the returns that investors' require to invest in these sources of capital.

Q. HOW DO YOU COMPUTE A UTILITY'S OVERALL RATE OF RETURN OR COST OF CAPITAL?

A. A company's overall rate of return or cost of capital is computed using: (1) the capital structure ratios (i.e., the ratios of short-term debt, long-term debt, preferred stock and common equity); (2) the cost rates for short-term debt, long-term debt, and preferred stock; and (3) the equity cost rate, otherwise known as the Return on Equity ("ROE").

Q. WHAT IS A UTILITY'S ROE INTENDED TO REFLECT?

A. The ROE is most simply described as the allowed rate of profit for a regulated company. In a competitive market, a company's profit level is determined by a variety of factors, including the state of the economy, the degree of competition a company faces, the ease of entry into its markets, the existence of substitute or complementary products/services, the company's cost structure, the impact of technological changes, and the supply and demand for its services and/or products. For a regulated monopoly, the regulator determines the level of profit available to the utility. The United States Supreme Court established the guiding principles for an appropriate level of profitability for regulated public utilities in two cases: (1) *Bluefield* and (2) *Hope*.[1] In those cases, the Court recognized that the fair rate of return on equity should be: (1) comparable to returns investors expect to earn on other investments of similar risk; (2) sufficient to assure confidence in the company's financial integrity; and (3) adequate to maintain and support the company's credit and to attract capital.

[1] *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944) ("*Hope*") and *Bluefield Water Works and Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923) ("*Bluefield*").

Thus, the appropriate ROE for a regulated utility requires determining the market-based cost of capital. The market-based cost of capital for a regulated firm represents the return investors could expect from other investments, while assuming no more and no less risk. The purpose of all of the economic models and formulas in cost of capital testimony (including those presented later in my testimony) is to estimate, using market data of similar-risk firms, and the rate of return equity investors require for that risk-class of firms in order to set an appropriate ROE for a regulated firm.

Q. PLEASE OUTLINE YOUR TESTIMONY.

A. First, I review the Company's and AG/LFUCG's rate of return or cost of capital recommendations and review the primary areas of contention between the Company's rate of return position and the AG/LFUCG's rate of return position. Second, I provide an assessment of capital costs in today's capital markets. Third, I discuss my proxy groups of water utility and gas distribution companies for estimating the cost of capital for the Company. Fourth, I present my recommendations for the Company's capital structure and debt cost rate. Fifth, I discuss the concept of the cost of equity capital, and then estimate the equity cost rate for the Company. Finally, I critique the Company's rate of return analysis and testimony of its witness Dr. James Vander Weide. I have included a table of contents which provides a more detailed outline.

Q. PLEASE REVIEW THE COMPANY'S PROPOSED RATE OF RETURN.

A. The Company's rate of return testimony is offered by Mr. Scott W. Rungren and Dr. James H. Vander Weide. Mr. Rungren provides a recommended capital structure, senior capital cost rates, and overall rate of return. Dr. Vander Weide provides a recommended return on equity. The Company has proposed a capital structure of 1.492% short-term debt, 50.585% long-term debt, 0.563% preferred stock, and 47.360 common equity. The Company has recommended a short-term debt, long-term debt and preferred stock cost rates of 1.369%, 6.050%, and 8.520%. Dr. Vander Weide has recommended a common equity cost rate of 10.75%. The Company's overall proposed rate of return is 8.22%.

Q. WHAT ARE YOUR RECOMMENDATIONS REGARDING THE APPROPRIATE RATE OF RETURN FOR THE COMPANY?

A. I have employed the Company's proposed capital structure. I have adjusted the Company's short-term and long-term debt cost rates to reflect current market interest rates. I have applied the Discounted Cash Flow Model ("DCF") and the Capital Asset Pricing Model ("CAPM") to two proxy groups of publicly-held water utility ("Water Proxy Group") and gas distribution companies ("Gas Proxy Group"). My analysis indicates an equity cost rate in the range of 8.0% to 8.5%. Within this range, since I primarily rely on the DCF model, I have used 8.50% as my equity cost rate for KAWC. I provide evidence in my testimony that this recommendation is consistent with the authorized ROEs for water companies. My overall rate of return or cost of capital for the Company is 7.13% as summarized in Exhibit JRW-1.

Q. PLEASE PROVIDE AN OVERVIEW OF THE PRIMARY ISSUES REGARDING RATE OF RETURN IN THIS PROCEEDING?

A. The Company's proposed rate of return is inflated due to overstated debt and equity cost rates. Mr. Rungren's short-term debt cost rate is excessive because he has used a projected London Interbank Offered Rate ("LIBOR") rate that is well above current market rates. In his long-term debt cost rate, Mr. Rungren has employed a projected interest rate on a pro forma financing that is also above current market interest rates.

Dr. James A. Vander Weide provides the Company's equity cost rate. Dr. Vander Weide's estimated common equity cost rate is in the range of 9.5% to 11.2%. Within this range, the Company has requested an equity cost rate of 10.75%. We have both used DCF and CAPM approaches in estimating an equity cost rate for the Company. Dr. Vander Weide has also used a Risk Premium ("RP") approach to estimate an equity cost rate for KAWC. Dr. Vander Weide has applied these approaches to proxy groups of water utilities and gas distribution companies.

In terms of the DCF approach, the two major areas of disagreement are (1) the appropriate adjustment to the DCF dividend yield and (2) most significantly, the estimation of the expected growth rate. With respect to the dividend yield adjustment, Dr. Vander Weide has made an inappropriate adjustment to reflect the quarterly payment of dividends. For a DCF growth rate, Dr. Vander Weide has relied exclusively on the forecasted earnings per share ("EPS") growth rates of Wall Street analysts and *Value Line*. I provide empirical evidence from studies that demonstrate the long-term earnings growth rates of Wall Street analysts are overly optimistic and

upwardly-biased. Consequently, in developing a DCF growth rate, I have reviewed both historic and projected growth rate measures and have evaluated growth in dividends, book value, and earnings per share.

The RP and CAPM approaches require an estimate of the base interest rate and the market or equity risk premium. In both approaches, Dr. Vander Weide's base interest rate is above current market rates. However, the major area of disagreement involves our significantly different views on the alternative approaches to measuring the market risk premium as well as the magnitude of equity risk premium. Dr. Vander Weide's market risk premiums are excessive and do not reflect current market fundamentals. As I highlight in my testimony, there are three procedures for estimating a market risk premium – historic returns, surveys, and expected return models. Dr. Vander Weide uses a historical market risk premium which is based on historic stock and bond returns. He also calculates an expected market risk premium in which he applies the DCF approach to the S&P 500 and public utility stocks. I provide evidence that risk premiums based on historic stock and bond returns are subject to empirical errors which result in upwardly biased measures of expected market risk premiums. I also demonstrate that Dr. Vander Weide's projected market risk premium, which uses analysts' EPS growth rate projections, includes unrealistic assumptions regarding future economic and earnings growth and stock returns. In addition, Dr. Vander Weide makes unwarranted adjustments to his equity cost rate estimates for flotation costs and company size that inflate his equity cost rate estimates.

In the end, the most significant areas of disagreement in measuring KAWC's cost of capital are: (1) the appropriate short-term and long-term debt cost rates; (2) the exclusive use of the earnings per share growth rates of Wall Street analysts and *Value Line* to measure expected DCF growth; (3) the base interest rate in the CAPM and RP approaches; (4) the measurement and magnitude of the market risk premium used in CAPM and RP approaches; and (5) whether or not equity cost rate adjustments are needed to account for flotation costs.

II. CAPITAL COSTS IN TODAY'S MARKETS

Q. WHY ARE CAPITAL MARKET CONDITIONS AND THE OUTLOOK FOR INTEREST RATES AND CAPITAL COSTS IMPORTANT IN THIS CASE?[2]

A. As discussed above, a company's rate of return is its overall cost of capital. Capital costs, including the cost of debt and equity financing, are established in capital markets and reflect investors' return requirements on alternative investments based on risk and capital market conditions. These capital market conditions are a function of investors' expectations concerning many factors, including economic growth, inflation, government monetary and fiscal policies, and international developments, among others. In the wake of the financial crisis, much of the focus in the capital markets has been on the interaction of economic growth, interest rates, and the actions of the Federal Reserve or ("Fed").

[2] A historic perspective on historic interest rates and capital costs is provided in Appendix B.

Q. PLEASE DISCUSS YOUR VIEWS ON CAPITAL COSTS IN TODAY'S MARKETS?

A. In the last couple of years, with the end of the Fed's Quantitative Easing III ("QEIII"), program as well as in anticipation of the Fed's December 16th decision to raise the Federal Funds rate, there have been forecasts of higher long-term interest rates. However, these forecasts have proven to be wrong. For example, after the announcement of the end of QEIII program, all the economists in Bloomberg's interest rate survey forecasted interest rates would increase in 2014, and 100% of the economists were wrong. According to the *Market Watch* article:[3]

> The survey of economists' yield projections is generally skewed toward rising rates — only a few times since early 2009 have a majority of respondents to the Bloomberg survey thought rates would fall. But the unanimity of the rising rate forecasts in the spring was a stark reminder of how one-sided market views can become. It also teaches us that economists can be universally wrong.

Two other financial publications have produced studies on how economists consistently predict higher interest rates yet they have been wrong. The first publication, entitled "How Interest Rates Keep Making People on Wall Street Look Like Fools," evaluated economists' forecasts for the yield on ten-year Treasury bonds at the beginning of the year for the last ten years.[4] The results demonstrated that

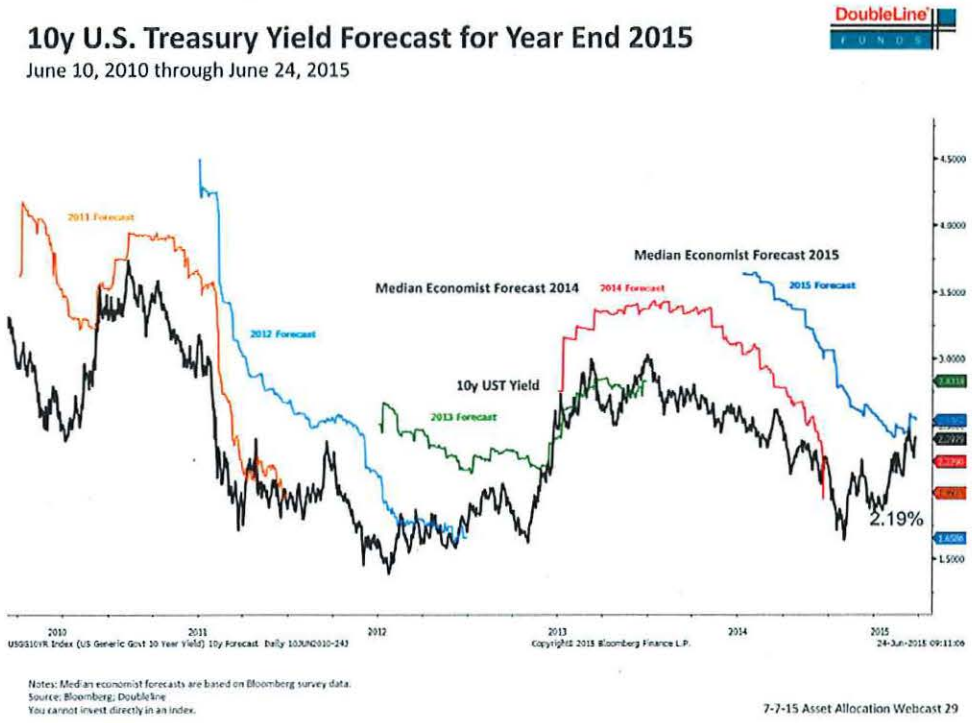
[3] Ben Eisen, "Yes, 100% of economists were dead wrong about yields, *Market Watch*," October 22, 2014. Perhaps reflecting this fact, *Bloomberg* reported that the Federal Reserve Bank of New York has stopped using the interest rate estimates of professional forecasters in the Bank's interest rate model due to the unreliability of those forecasters' interest rate forecasts. See Susanne Walker and Liz Capo McCormick, "Unstoppable $100 Trillion Bond Market Renders Models Useless," *Bloomberg.com* (June 2, 2014). http://www.bloomberg.com/news/2014-06-01/the-unstoppable-100-trillion-bond-market-renders-models-useless.html.

[4] Joe Weisenthal, "How Interest Rates Keep Making People on Wall Street Look Like Fools," Bloomberg.com, March 16, 2015. http://www.bloomberg.com/news/articles/2015-03-16/how-interest-rates-keep-making-people-on-wall-street-look-like-fools.

economists consistently predict that interest rates will go higher, and interest rates have not fulfilled the predictions.

The second study tracked economists' forecasts for the yield on ten-year Treasury bonds on an ongoing basis from 2010 until 2015.[5] The results of this study, which was entitled "Interest Rate Forecasters are Shockingly Wrong Almost All of the Time," are shown in Figure 1 and demonstrate how economists continually forecast that interest rates are going up, and they do not.

Figure 1: Economists' Forecasts of the Ten-Year Treasury Yield 2010-2015



Source: Akin Oyedele, "Interest Rate Forecasters are Shockingly Wrong Almost All of the Time," *Business Insider*, July 18, 2015. http://www.businessinsider.com/interest-rate-forecasts-are-wrong-most-of-the-time.

[5] Akin Oyedele, "Interest Rate Forecasters are Shockingly Wrong Almost All of the Time," *Business Insider*, July 18, 2015. http://www.businessinsider.com/interest-rate-forecasts-are-wrong-most-of-the-time-2015-7.

Q. PLEASE REVIEW THE FEDERAL RESERVE'S DECISION TO RAISE THE FEDERAL FUNDS RATE IN DECEMBER OF 2015.

A. On December 16th, 2015, the Fed decided to increase the target rate for Federal Funds to ¼ - ½ percent. In the release, the Federal Open Market Committee ("FOMC") included the following observations:[6]

> The Committee currently expects that, with gradual adjustments in the stance of monetary policy, economic activity will continue to expand at a moderate pace and labor market indicators will continue to strengthen. Overall, taking into account domestic and international developments, the Committee sees the risks to the outlook for both economic activity and the labor market as balanced. Inflation is expected to rise to 2 percent over the medium term as the transitory effects of declines in energy and import prices dissipate and the labor market strengthens further. The Committee continues to monitor inflation developments closely.

The increase comes after the range was kept in the 0.0 to ¼ percent range for over five years in order to spur economic growth in the wake of the financial crisis. The increase in the Federal Funds rate was almost two years after the end of QEIII, the Federal's Reserve's bond buying program. The Federal Reserve has been cautious in its approach to scaling its monetary intervention, and has paid close attention to a number of economic variables, including GDP growth, retail sales, consumer confidence, unemployment, the housing market, and inflation. While the Fed has cited improvements in many areas of the economy, it has expressed concern with the low inflation rate – below the Fed's target of 2.0%.

[6] Board of Governors of the Federal Reserve System, *FOMC Statement* (Dec. 16, 2015).

Q. WHAT IS THE FEDERAL FUNDS RATE?

A. The Federal Funds rate is set by the Federal Reserve and is the borrowing rate applicable to the most creditworthy financial institutions when they borrow and lend funds overnight to each other.[7] Therefore, these are not long-term interest rates.

Q. HOW DID LONG-TERM INTEREST RATES REACT TO THE FEDERAL RESERVE'S DECISION TO INCREASE THE FEDERAL FUND RATE?

A. The yields on long-term Treasury bonds decreased. The FOMC's decision to increase the Federal Funds rate range from 0.0%-0.25% to 0.25%-0.50% was highly anticipated in the markets. Nonetheless, as shown in Figure 2, at the 2:00 PM announcement of the increase in the Federal Funds rate, the yield on 30-Year U.S. Treasury bonds actually decreased.

Figure 2: Intra-Day Thirty-Year Treasury Yields
December 16, 2015
Source: www.Yahoo.com

[7] http://www.investopedia.com/terms/f/federalfundsrate.asp

Q. WHAT HAS FEDERAL RESERVE POLICY BEEN SINCE THE DECEMBER 16TH DECISION?

A. Due to continued slow economic growth and low inflation, on March 16, 2016 the FOMC elected to maintain the target range for the federal funds rate at 1/4 to 1/2 percent. The Committee made the following comments:[8]

> The Committee currently expects that, with gradual adjustments in the stance of monetary policy, economic activity will expand at a moderate pace and labor market indicators will continue to strengthen. However, global economic and financial developments continue to pose risks. Inflation is expected to remain low in the near term, in part because of earlier declines in energy prices, but to rise to 2 percent over the medium term as the transitory effects of declines in energy and import prices dissipate and the labor market strengthens further.

Q. DID THE FEDERAL RESERVE CONTINUE THIS POLICY IN ITS APRIL 27TH MEETING?

A. Yes. After the meeting, The FOMC issued a similar press release, with the following conclusion: [9]

> Against this backdrop, the Committee decided to maintain the target range for the Federal Funds rate at 1/4 to 1/2 percent. The stance of monetary policy remains accommodative, thereby supporting further improvement in labor market conditions and a return to 2 percent inflation.

Q. HOW HAVE LONG-TERM TREASURY YIELDS REACTED TO THE ECONOMIC NEWS?

A. Since the FOMC increased the Federal Funds rate in December, long-term Treasury rates have declined, and now are in the 2.70% range. This is primarily due to continued slow economic growth and low inflation.

---

[8] Board of Governors of the Federal Reserve System, *FOMC Statement* (March. 16, 2016).

[9] Board of Governors of the Federal Reserve System, *FOMC Statement* (April 27, 2016).

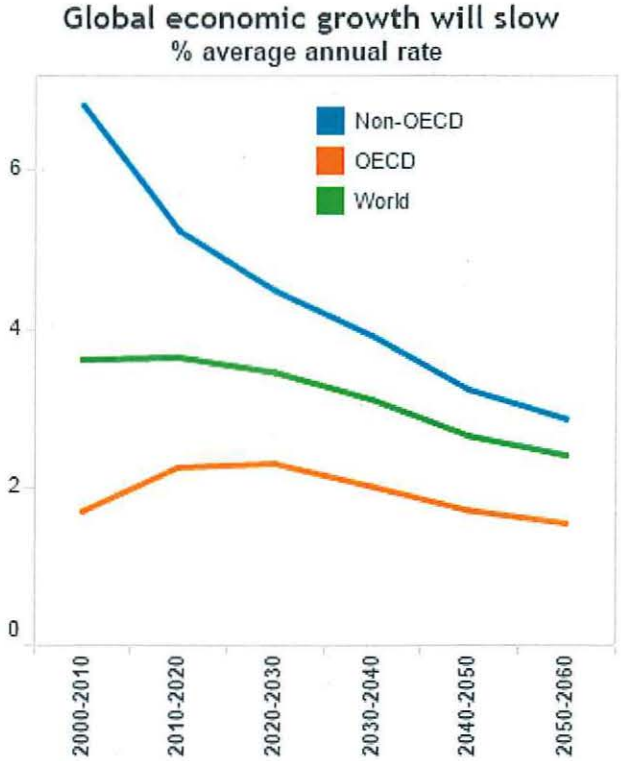
Q. HOW WILL INTEREST RATES AND COST OF CAPITAL BE AFFECTED IN THE LONG TERM?

A. In the long run, the key drivers of economic growth measured in nominal dollars are population growth, the advancement and diffusion of science and technology, and currency inflation. Although we experienced rapid economic growth during the "post-war" period (the 63 years that separated the end of World War II and the 2008 financial crisis), the post-war period is not necessarily reflective of expected future growth. It was marked by a near-trebling of global population, from under 2.5 billion to approximately 6.7 billion. Over the succeeding 63 years, according to U.N. projections, the global population will grow considerably more slowly, reaching approximately 10.3 billion in 2070. With population growth slowing, life expectancies lengthening, and post-war "baby boomers" reaching retirement age, median ages in developed-economy nations have risen and continue to rise. The postwar period was also marked by rapid catch-up growth as Europe, Japan, and China recovered from successive devastations and as regions such as India and China deployed and leapfrogged technologies that had been developed over a much longer period in earlier-industrialized nations. That period of rapid catch-up growth is coming to an end. For example, although China remains one of the world's fastest-growing regions, its growth is now widely expected to slow substantially. This convergence of projected growth in the former "second world" and "third world" towards the slower growth of the nations that have long been considered "first world"

is illustrated in this "key findings" chart published by the Organization for Economic Co-operation and Development:[10]

Figure 3: Projected Global Growth

Global growth will slow from 3.6% in 2010-2020 to 2.4% in 2050-2060 and will be increasingly driven by innovation and investment in skills.



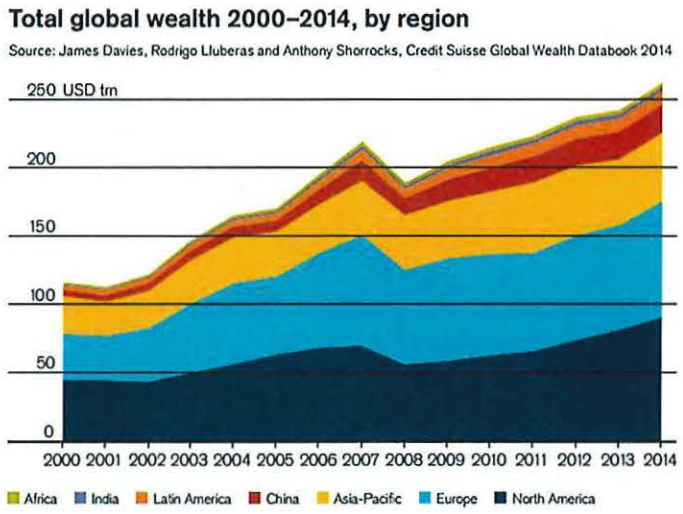
As to dollar inflation, it has declined to far below the level it reached in the 1970s. The Federal Reserve targets a 2% inflation rate, but inflation has been below the Fed's target rate for over three years due to a number of factors, including slow global economic growth, slack in the economy, and declining energy and commodity prices. The slow pace of inflation is also reflected in the decline in forecasts of future inflation. The Energy Information Administration's ("EIA") annual Energy Outlook

[10] See http://www.oecd.org/eco/outlook/lookingto2060.htm.

includes in its nominal GDP growth projection a long-term inflation component, which the EIA projects at only 1.8% per year for its forecast period through 2040.[11]

All of this translates into slowed growth in annual economic production and income, even when measured in nominal rather than real dollars. Meanwhile, the stored wealth that is available to fund investments has continued to rise. According to the most recent release of the Credit Suisse global wealth report, global wealth has more than doubled since the turn of this century, notwithstanding the temporary setback following the 2008 financial crisis:

Figure 4: Global Wealth – 2000-2014



These long-term trends mean that overall, and relative to what had been the post-war norm, the world now has more wealth chasing fewer opportunities for investment rewards. Ben Bernanke, the former Chairman of the Federal Reserve, called this phenomenon a "global savings glut."[12] Like any other liquid market,

[11] See EIA Annual Energy Outlook 2014, Table 20 (available at http://www.eia.gov/forecasts/aeo/tables_ref.cfm).

[12] Ben S. Bernanke, *The Global Saving Glut and the U.S. Current Account Deficit* (Mar. 10, 2005), available at http://www.federalreserve.gov/boarddocs/speeches/2005/200503102/.

capital markets are subject to the law of supply and demand. With a large supply of capital available for investment and relatively scarce demand for investment capital, it should be no surprise to see the cost of investment capital decline and therefore interest rates could remain low.

Q. ON THE ISSUE ON THE FEDERAL RESERVE AND LONG-TERM INTEREST RATES, PLEASE HIGHLIGHT FORMER FEDERAL RESERVE CHAIRMAN BENJAMIN BERNANKE'S RECENT TAKE ON THE LOW INTEREST RATES IN THE U.S.

A. Mr. Bernanke addressed the issue of the continuing low interest rates in his weekly Brookings Blog. Bernanke indicated that the focus should be on real and not nominal interest rates and noted that, in the long term, these rates are not determined by the Federal Reserve:[13]

> If you asked the person in the street, "Why are interest rates so low?", he or she would likely answer that the Fed is keeping them low. That's true only in a very narrow sense. The Fed does, of course, set the benchmark nominal short-term interest rate. The Fed's policies are also the primary determinant of inflation and inflation expectations over the longer term, and inflation trends affect interest rates, as the figure above shows. But what matters most for the economy is the real, or inflation-adjusted, interest rate (the market, or nominal, interest rate minus the inflation rate). The real interest rate is most relevant for capital investment decisions, for example. The Fed's ability to affect real rates of return, especially longer-term real rates, is transitory and limited. Except in the short run, real interest rates are determined by a wide range of economic factors, including prospects for economic growth—not by the Fed.

[13] Ben S. Bernanke, "Why are Interest Rates So Low," Weekly Blog, Brookings, March 30, 2015. http://www.brookings.edu/blogs/ben-bernanke/posts/2015/03/30-why-interest-rates-so-low.

Bernanke also addressed the issue about whether low-interest rates are a short-term aberration or a long-term trend:[14]

> Low interest rates are not a short-term aberration, but part of a long-term trend. As the figure below shows, ten-year government bond yields in the United States were relatively low in the 1960s, rose to a peak above 15 percent in 1981, and have been declining ever since. That pattern is partly explained by the rise and fall of inflation, also shown in the figure. All else equal, investors demand higher yields when inflation is high to compensate them for the declining purchasing power of the dollars with which they expect to be repaid. But yields on inflation-protected bonds are also very low today; the real or inflation-adjusted return on lending to the U.S. government for five years is currently about minus 0.1 percent.

Figure 5: Interest Rates and Inflation
1960-Present

Source: Federal Reserve Board, BLS.

BROOKINGS

[14] Ibid.

Q. PLEASE PROVIDE THE COMMISSION WITH YOUR OPINION REGARDING THE FUTURE OUTLOOK FOR INTEREST RATES AND CAPITAL COSTS.

A. I believe that U.S. Treasuries offer an attractive yield relative to those of other major governments around the world, which will attract capital to the U.S. and keep U.S. interest rates down. There are several factors driving this conclusion.

First, the economy has been growing for over five years, and, as noted above, the Federal Reserve continues to see slow economic growth and low inflation. The labor market has improved, with unemployment now down to 5.0%.

Second, interest rates remain at historically low levels and are likely to remain low. There are two factors driving the continued lower interest rates: (1) inflationary expectations in the U.S. remain low and remain below the FOMC's target of 2.0%; and (2) global economic growth – including Europe where growth is stagnant and China where growth is slowing significantly. As a result, while the yields on long-term U.S. Treasury bonds are low by historic standards, these yields are well above the government bond yields in Germany, Japan, and the United Kingdom. Thus, U.S. Treasuries offer an attractive yield relative to those of other major governments around the world, thereby attracting capital to the U.S. and keeping U.S. interest rates down.

Q. WHAT DO YOU RECOMMEND THE COMMISSION DO REGARDING THE FORECASTS OF HIGHER INTEREST RATES AND CAPITAL COSTS?

A. I suggest that the Commission set an equity cost rate based on current market cost rate

indicators and not speculate on the future direction of interest rates. As the above studies indicate, economists are always predicting that interest rates are going up, and yet they are almost always wrong. Obviously, investors are well aware of the consistently wrong forecasts of higher interest rates, and therefore place little weight on such forecasts. Investors would not be buying long-term Treasury bonds or utility stocks at their current yields if they expected interest rates to suddenly increase, thereby producing higher yields and negative returns. For example, consider a utility that pays a dividend of $2.00 with a stock price of $50.00. The current dividend yield is 4.0%. If interest rates and required utility yields increase, the price of the utility stock would decline. In the example above, if higher return requirements led the dividend yield to increase from 4.0% to 5.0% in the next year, the stock price would have to decline to $40, which would be a -20% return on the stock. Obviously, investors would not buy the utility stock with an expected return of -20% due to higher dividend yield requirements.

In sum, forecasting prices and rates that are determined in the financial markets, such as interest rates, the stock market, and gold prices, appears to be impossible to accurately do. For interest rates, I have never seen a study that suggests one forecasting service is better than others or that interest rate forecasts are better than just assuming the current interest rate will be the rate in the future. As discussed above, investors would not be buying long-term Treasury bonds or utility stocks at their current yields if they expected interest rates to suddenly increase, thereby producing higher yields and negative returns.

III. PROXY GROUP SELECTION

Q. PLEASE DESCRIBE YOUR APPROACH TO DEVELOPING A FAIR RATE OF RETURN RECOMMENDATION FOR KAWC.

A. To develop a fair rate of return recommendation for KAWC, I have evaluated the return requirements of investors on the common stock of a proxy group of publicly-held water utility companies ("Water Proxy Group") and a proxy group of publicly-held gas distribution companies ("Gas Proxy Group").

Q. WHY HAVE YOU EMPLOYED THE RESULTS FOR A PROXY GROUP OF GAS DISTRIBUTION COMPANIES IN YOUR TESTIMONY?

A. I have included an analysis of the results for the Gas Proxy Group in my testimony. I have included these results for two reasons. First, the financial data needed to perform a DCF analysis for the Water Proxy Group is limited. Analysts' coverage of the water companies is sparse. On the other hand, there is better data available for the Gas Proxy Group to perform a DCF equity cost rate study. Second, the return requirements of investors on gas companies should be similar to that of water companies. Both industries are capital intensive and heavily regulated and provide for the distribution and delivery of an essential commodity whose service rates and rates of return are set by state regulatory commissions.

Q. PLEASE DESCRIBE YOUR TWO PROXY GROUPS.

A. My Water Proxy Group consists of eight water utility companies that are covered by the

Value Line Investment Survey and *AUS Utility Reports*. These companies include American States Water Company, American Water Works Company, Aqua America, Inc., California Water Service Group, Connecticut Water Service, Inc., Middlesex Water Company, SJW Corporation, and York Water Company. A summary of financial statistics for the companies in this group are listed in Exhibit JRW-4. The median operating revenues and net plant for the Water Proxy Group are $381.9M and $1,032.0M, respectively.[15] The group receives 96% of revenues from regulated water operations, has an 'A' bond rating, a common equity ratio of 53.9%, and an earned return on common equity of 10.4%.

My Gas Proxy Group consists of eight natural gas distribution companies. These companies are listed as a Natural Gas Distribution, Transmission, and/or Integrated Gas Companies in *AUS Utility Reports* and/or as a Natural Gas Utility in the Standard Edition of the *Value Line Investment Survey*. As shown on page 1 of Exhibit JRW-4, the companies include Atmos Energy Corporation, Chesapeake Utilities Corporation, Laclede Group, New Jersey Resources Corp., Northwest Natural Gas Company, Piedmont Natural Gas Company, South Jersey Industries, Southwest Gas, and WGL Holdings. Summary financial statistics for the proxy group are listed on page 1 of Exhibit JRW-4. The median operating revenues and net plant for the Gas Proxy Group are $2,191.2M and $2,619.5M, respectively. The group receives 59% of revenues from regulated gas operations, has an A3 Moody's bond rating and an A- bond rating from Standard & Poor's, a current common equity ratio of 47.9%, and an earned return on common equity of 10.2%.

[15] 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.

Q. PLEASE COMPARE THE RISKINESS OF THE TWO GROUPS.

A. While there are a number of risk measures, I believe that credit ratings provide the best measure of risk. The parent company of KAWC, American Water Works, has an A issuer credit rating from S&P. This is in line with the average rating of the Water Proxy Group. The average S&P rating for the Gas Proxy Group is A-, which is one notch below the Water Proxy Group.

On page 2 of Exhibit JRW-4, I have assessed the riskiness of the two groups using five different risk measures published by *Value Line*. These measures include Beta, Safety, Financial Strength, Earnings Predictability, and Stock Price Stability. The Water Proxy Group is less risky on two measures (Beta and Stock Price Stability). Three of the five risk measures (Safety, Financial Strength, and Earnings Predictability) suggest that the Gas Proxy Group is a little less risky than the Water Proxy Group. Regardless, the magnitude of the differences in the risk metrics is not large.

Overall, since I believe that credit ratings provide the best measure of risk, I conclude that the Water Proxy Group is a little less risky than the Gas Proxy Group.

IV. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

Q. WHAT CAPITAL STRUCTURE RATIOS HAVE BEEN PROPOSED BY THE COMPANY?

A. Mr. Rungren provides KAWC's proposed capital structure which is a 13-month average. As shown in Panel A of page 1 of Exhibit JRW-5, the Company has proposed a capital structure of 1.492% short-term debt, 50.585% long-term debt, 0.563% preferred stock, and 47.360% common equity. The Company has recommended a short-term debt, long-term debt and preferred stock cost rates of 1.369%, 6.050%, and 8.520%.

Q. ARE YOU EMPLOYING KAWC'S PROPOSED CAPITAL STRUCTURE IN DETERMINING YOUR OVERALL RATE OF RETURN?

A. Yes.

Q. WHAT SENIOR CAPITAL COST RATES ARE YOU EMPLOYING?

A. The Company's proposed short-term debt cost rate is based on a projected 1-month LIBOR rate. As shown in Panel A of page 2 of Exhibit JRW-5, the current LIBOR rates for periods up to one year range from 0.38% to 1.22%. Based on these figures, I will use a short-term debt cost rate of 1.0%. This figure is at the high end of the range of LIBOR rates, and provides for an increase in the LIBOR rate over the next year.

I have used a long-term debt cost rate of 6.02%. This is computed in Panel B of page 2 of Exhibit JRW-5. I have adjusted the rate on the proposed note to be issued on 6/15/16. The Company used a rate of 4.70% which was based on a projected long-term Treasury rate of 3.25% plus a credit spread of 1.45%. Given the errors in interest rate forecasts discussed above, I am using the current long-term Treasury yields of 2.60%. With the Company's credit spread of 1.45%, I have used a rate on the proposed bond issue of 4.05% (2.60% + 1.45%). This yields an overall long-term debt cost rate of 6.02% for KAWC.

Q. ARE YOU ADOPTING THE COMPANY'S RECOMMENDED PREFERRED STOCK COST RATE?

A. Yes.

V. THE COST OF COMMON EQUITY CAPITAL

A. Overview

Q. GIVE US AN OVERVIEW OF THE COST OF CAPITAL AS IT IS RELEVANT TO THIS CASE.

A. The total cost of operating a business includes the cost of capital. The cost of common equity capital is the expected return on a company's or "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 a company or 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 are 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 must equal the book value of the firm's securities.

In the real world, 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, described this essential relationship between the return on equity, the cost of equity, and the market-to-book ratio in the following manner:[16]

> 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 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.

[16] James M. McTaggart, "The Ultimate Poison Pill: Closing the Value Gap," *Commentary* (Spring 1986), p.3.

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

A. 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 the economic benefit to society from avoiding duplication of these services, some public utilities are monopolies. Because of the lack of competition and the essential nature of their services, it is not appropriate to permit monopoly utilities to set their own prices. Thus, regulation seeks to establish prices that are fair to consumers and, at the same time, sufficient to meet the operating and capital costs of the utility (i.e., provide an adequate return on capital to attract investors).

Q. IS THERE A RELATIONSHIP BETWEEN ROE AND MARKET-TO-BOOK RATIOS?

A. Yes. This relationship is discussed in a classic Harvard Business School case study entitled "Note on Value Drivers." On page 2 of that case study, the author describes the relationship very succinctly:[17]

> 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*

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

Q. DID YOU ASSES SUCH A RELATIONSHIP IN THIS CASE?

A. Yes. To assess the relationship by industry, as suggested above, I performed a regression study between estimated ROE and market-to-book ratios using natural gas distribution, electric utility, and water utility companies. I used all companies in these three industries that are covered by *Value Line* and have estimated ROE and market-to-book ratio data. The results are presented in Panels A-C of Exhibit JRW-6. The average R-squares for the electric, gas, and water companies are 0.78, 0.63, and 0.49, respectively.[18] R-square measures the degree of correlation between two variables (in this case, estimated ROE and market-to-book ratios), and R-squares closer to 1.0 indicate a stronger correlation. The R-squares in this case demonstrate a strong positive relationship between ROEs and market-to-book ratios for public utilities.

Q. ARE THERE INDICATORS OF THE COST OF EQUITY CAPITAL FOR PUBLIC UTILITIES?

A. Yes, there are several indicators of the cost of equity capital for utilities. These indicators include interest rates, dividend yields, and the earned ROEs relative to market-to-book ratios.

Q. PLEASE DISCUSS THESE INDICATORS.

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

A. Exhibit JRW-7 provides indicators of public utility equity cost rates over the past decade.

Page 1 shows the yields on long-term A-rated public utility bonds. These yields decreased from 2000 until 2003, and then hovered in the 5.50%-6.50% range from mid-2003 until mid-2008. These yields spiked up to the 7.75% range with the onset of the Great Recession financial crisis, and remained high and volatile until early 2009. These yields declined to below 4.0% in mid-2013, and then increased with interest rates in general to the 4.85% range as of late 2013. They subsequently declined to below 4.0% in the first quarter of 2015, but have increased and are currently about 4.4%.

Page 2 provides the dividend yields for water utility and gas distribution companies over the past decade. The dividend yields for water utilities declined from the 4.0% range in the year 2000, to 2.7% in 2006. These yields increased to over 3.5% in 2009, and have since declined to the 2.5% range in 2015. The dividend yields for gas distribution companies, which were about 5.0% in 2000, have declined and are now about 3.0%.

Average earned returns on common equity and market-to-book ratios for the water and gas groups are shown on page 3 of Exhibit JRW-7. Earned returns on common equity for water companies declined from about 10.0% in the year 2000 to about 8.0% in 2012. They have since rebounded to the 10.0% range as of 2015. For gas companies, earned ROEs have been in the 10.0% range over the past five years. The average market-to-book ratios for the water companies have consistently been in the 1.80X to 2.0X range in recent years, while the average market-to-book ratios for

the gas companies have been in the 1.60X to 1.80X range in recent years. As discussed above, this indicates that the earned ROEs for water and gas companies, which are in the 10.0% area, are above investors' required rate of return.

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

A. 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.

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

A. 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-8 provides an assessment of investment risk for 97 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.* The study shows that the investment risk of utilities is very low. The average betas for electric, water, and gas utility companies are 0.74, 0.73, and 0.80, respectively. As such, the cost of equity for utilities is among the lowest of all industries in the U.S.

Q. WHAT IS THE COST OF EQUITY CAPITAL?

A. 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 requirement of the stockholder should be commensurate with the return requirement 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 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.

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

A. 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.

Q. HOW DID YOU ESTIMATE THE COST OF EQUITY CAPITAL FOR THE COMPANY?

A. I rely primarily on the discounted cash flow ("DCF") model to estimate the cost of equity capital. Given the investment valuation process and the relative stability of the utility business, I believe that the DCF model provides the best measure of equity cost rates for public utilities. I have also performed a capital asset pricing model ("CAPM") study; however, 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.

B. DCF Analysis

Q. PLEASE DESCRIBE THE TRADITIONAL DCF MODEL.

A. According to the traditional 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.

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

A. 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-9, Page 1 of 2. 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 maturity (or 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 an 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 ROEs. At that time, its earnings growth rate, payout ratio, and ROE 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.

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

A. 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 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:

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

This in known as the constant-growth DCF model.

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

A. 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.

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

A. 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 the expected growth rate). The dividend yield can be measured precisely at any point in time; however, it 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.

Q. WHAT DIVIDEND YIELDS HAVE YOU REVIEWED IN MAKING YOUR ANALYSIS?

A. I have calculated the dividend yields for the companies in the proxy group using the current annual dividend and the 30-day, 90-day, and 180-day average stock prices. These dividend yields are provided in Panel A of page 2 of Exhibit JRW-10. For the Water Proxy Group, the median dividend yields using the 30-day, 90-day, and 180-day average stock prices range from 2.3% to 2.6%. I will use the average of the medians, 2.4%, as the dividend yield for the Water Proxy Group. The dividend yields

for the Gas Proxy Group are shown in Panel B of page 2 of Exhibit JRW-10. The median dividend yields range from 2.8% to 3.2% using the 30-day, 90-day, and 180-day average stock prices. I am using the average of the medians, 3.0%, as the dividend yield for the Gas Proxy Group.

Q. PLEASE DISCUSS THE APPROPRIATENESS OF ADJUSTING THE SPOT DIVIDEND YIELD.

A. The spot or current dividend yield is the current quarterly dividend, multiplied by four (to make it an annual dividend), and divided by the current stock price. The dividend yields discussed above use the current annual dividend of the proxy companies and different measures of their stock price (30, 90, and 180 days averages). The dividend yield in the constant-growth DCF model is based not on the current annual dividend, but on the dividend to be paid 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.[19]

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

[19] *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).

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.

Q. GIVEN THIS DISCUSSION, WHAT ADJUSTMENT FACTOR DO YOU USE FOR YOUR DIVIDEND YIELD?

A. I adjust the dividend yield by one-half (1/2) of the expected growth so as to reflect growth over the coming year. The DCF equity cost rate ("K") is computed as:

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

Q. WHAT IS THE GROWTH RATE COMPONENT OF THE DCF MODEL?

A. 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.

Q. WHAT GROWTH DATA HAVE YOU REVIEWED FOR THE PROXY GROUPS?

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

Q. WHY DO YOU OBSERVE HISTORIC DATA?

A. Most of the financial information provided to investors on internet sites such as Yahoo and in publications such as *Value Line*, such as financial statements, earnings, and dividend data, is historic. Therefore, historic data is readily available to investors and provide investors an indication of how companies have performed and grown in the past. If the data were not relevant and of value for investing purposes, it would not be provided.

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

A. 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.

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

A. 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 identity of the 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 forecast 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. Zacks estimates are also available on other websites, such as msn.money (http://money.msn.com).

Q. PLEASE PROVIDE AN EXAMPLE OF THESE EPS FORECASTS.

A. The following example provides the EPS forecasts compiled by Reuters for American Water Works (stock symbol "AWK"). The figures are provided on page 2 of Exhibit JRW-9. Line one shows that eleven analysts have provided EPS estimates for the quarter ending June 30, 2016. The mean, high and low estimates are $0.74, $0.79, and $0.65, respectively. The second line shows the quarterly EPS estimates for the quarter ending September 30, 2016 of $1.02 (mean), $1.08 (high), and $0.92 (low). Line three shows the annual EPS estimates for the fiscal year ending December 2016 of $2.82 (mean), $2.85 (high), and $2.75 (low). Line four shows the annual EPS estimates for the fiscal year ending December 2017 of $3.04 (mean), $3.10 (high), and $2.95 (low). The quarterly and annual EPS forecasts in lines 1-4 are expressed in dollars and cents. As in the AWK 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 AWK, three analysts have provided a long-term EPS growth rate forecast, with mean, high, and low growth rates of 7.60%, 8.20%, and 7.00%.

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

A. 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.

Q. WHY DO YOU NOT RELY EXCLUSIVELY ON THE EPS FORECASTS OF WALL STREET ANALYSTS IN ARRIVING AT A DCF GROWTH RATE FOR THE PROXY GROUP?

A. 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, in the constant-growth DCF model, 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.[20]

[20] M. Lacina, B. Lee & Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D.

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.[21] 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 the cost of equity capital of almost 3.0 percentage points.[22]

Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101.

[21] The studies that demonstrate analysts' long-term EPS forecasts are overly-optimistic and upwardly biased include: 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); 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);* K. Chan, L., Karceski, J., & Lakonishok, J., "The Level and Persistence of Growth Rates," *Journal of Finance* pp. 643–684, (2003); 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; and Marc H. Goedhart, Rishi Raj, and Abhishek Saxena, "Equity Analysts, Still Too Bullish," *McKinsey on Finance*, pp. 14-17, (Spring 2010).

[22] 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).

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

A. 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.

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

A. According to the DCF model, the equity cost rate is a function of the dividend yield and expected growth rate. Because 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.

Q. WHAT IS THE HISTORICAL GROWTH OF THE COMPANIES IN THE PROXY GROUPS, AS PROVIDED BY *VALUE LINE?*

A. Page 3 of Exhibit JRW-10 provides the 5- and 10-year historical growth rates for EPS, DPS, and BVPS for the companies in the three proxy groups, as published in the *Value Line Investment Survey.* The median historical growth measures for EPS, DPS, and BVPS for the Water Proxy Group, as provided in Panel A, range from 2.5% to 10.5%, with an average of the medians of 5.6%. For the Gas Proxy Group, as shown in Panel B of page 3 of Exhibit JRW-10, the historical growth measures in EPS, DPS, and BVPS, as measured by the medians, range from 3.3% to 6.5%, with an average of the medians of 4.9%.

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

A. *Value Line's* projections of EPS, DPS, and BVPS growth for the companies in the proxy groups are shown on page 4 of Exhibit JRW-10. As stated above, due to the presence of outliers, the medians are used in the analysis. For the Water Proxy Group, as shown in Panel A of page 4 of Exhibit JRW-10, the medians range from 4.0% to 6.5%, with an average of the medians of 5.5%. The range of the medians for the Gas Proxy Group, shown in Panel B of page 4 of Exhibit JRW-10, is from 4.5% to 5.8%, with an average of the medians of 5.0%.

Also provided on page 4 of Exhibit JRW-10 are the prospective sustainable growth rates for the companies in the two proxy groups 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 Water and Gas Proxy Groups, the median prospective sustainable growth rates are 4.3% and 4.9%, respectively.

Q. WHAT IS YOUR ASSESSMENT OF GROWTH FOR THE PROXY GROUPS AS MEASURED BY ANALYSTS' FORECASTS OF EXPECTED 5-YEAR EPS GROWTH?

A. 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 for the companies are provided in the proxy groups on page 5 of Exhibit JRW-10. I have reported both the mean and median growth rates for the groups.

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 for each company. The mean/median of analysts' projected EPS growth rates for the Water and Gas Proxy Groups are 6.6%/5.5% and 5.3%/5.3%, respectively.[23]

Q. WHAT WAS YOUR ANALYSIS OF THE HISTORICAL AND PROSPECTIVE GROWTH OF THE PROXY GROUPS?

A. Page 6 of Exhibit JRW-10 shows the summary DCF growth rate indicators for the proxy groups.

The historical growth rate indicators for my Water Proxy Group imply a baseline growth rate of 5.6%. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 5.5%, and *Value Line*'s projected sustainable growth rate is 4.3%. The projected EPS growth rates of Wall Street analysts for the Water Proxy Group are 6.6% and 5.5% as measured by the mean and median growth rates. The overall range for the projected growth rate indicators (ignoring historical growth) is 4.3% to 6.6%. Giving primary weight to the projected EPS growth rate of Wall Street analysts, I believe that the appropriate projected growth rate range is 6.0%. This growth rate figure is clearly in the upper end of the range of historic and projected growth rates for the Water Proxy Group.

[23] Given variation in the measures of central tendency of analysts' projected EPS growth rates proxy groups, I have considered both the means and medians figures in the growth rate analysis.

For the Gas Proxy Group, the historical growth rate indicators indicate a growth rate of 4.9%. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 5.0%, and *Value Line*'s projected sustainable growth rate is 4.9%. The projected EPS growth rates of Wall Street analysts are 5.3% and 5.3% as measured by the mean and median growth rates. The overall range for the projected growth rate indicators is 4.9% to 5.3%. Again giving primary weight to the projected EPS growth rate of Wall Street analysts, I believe that the appropriate projected growth rate range is 5.0% to 5.3%. Given this range, I will use 5.25% as the DCF growth rate for the Gas Proxy Group. This growth rate figure is clearly in the upper end of the range of historic and projected growth rates for the Gas Proxy Group.

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

A. My DCF-derived equity cost rates for the groups are summarized on page 1 of Exhibit JRW-10 and in Table 1 below.

Table 1: DCF-derived Equity Cost Rate

	Dividend Yield	1 + ½ Growth Adjustment	DCF Growth Rate	Equity Cost Rate
Water Proxy Group	**2.40%**	**1.03000**	**6.00%**	**8.50%**
Gas Proxy Group	**3.00%**	**1.02625**	**5.25%**	**8.30%**

The result for my Water Proxy Group is the 2.40% dividend yield, times the one and one-half growth adjustment of 1.0300, plus the DCF growth rate of 6.00%,

which results in an equity cost rate of 8.50%. The result for the Gas Proxy Group is 8.30% which includes a dividend yield of 3.00%, an adjustment factor of 1.02625, and a DCF growth rate of 5.25%.

C. Capital Asset Pricing Model

Q. YOU MENTIONED THERE WERE MULTIPLE WAYS OF ASSESSING THE RISK PREMIUM. PLEASE DISCUSS THE CAPM AS A FORM OF THE RISK PREMIUM APPROACH.

A. The CAPM is a form of the risk premium model. 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 U.S. 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 U.S. 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.

Q. DID YOU PERFORM A CAPM STUDY?

A. Yes. Exhibit JRW-11 provides the summary results for my CAPM study. The CAPM approach requires an estimate of the risk-free interest rate, beta, and the market or risk premium. Page 1 shows the results, and the following pages contain the supporting data.

Q. PLEASE DISCUSS THE RISK-FREE INTEREST RATE.

A. The base interest rate in the CAPM is the risk-free interest rate. 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.

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

A. As shown on page 2 of Exhibit JRW-11, the yield on 30-year U.S. Treasury bonds has been in the 2.5% to 4.0% range over the 2013–2016 time period. The 30-year Treasury yield is currently in the lower end of this range. Given the recent range of yields and the possibility of higher interest rates, I use 4.0% as the risk-free rate, or R_f, in my CAPM.

Q. WHAT BETAS ARE YOU EMPLOYING IN YOUR CAPM?

A. As mentioned above, the second element of the CAPM is Beta (ß). Beta is a gauge of the systematic risk of a stock and it measures the volatility of a stock relative to the overall market. 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-11, the slope of the regression line is the stock's ß. A steeper line indicates that 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 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 groups, I am using the betas for the companies as provided in the *Value Line Investment Survey*. As shown on page 3 of Exhibit JRW-11, the median betas for the companies in the Water and Gas Proxy Groups are 0.73 and 0.80, respectively.

Q. PLEASE DISCUSS THE MARKET RISK PREMIUM ("MRP").

A. The third element of the CAPM is the MRP. The MRP 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 MRP 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 MRP is easy to define conceptually, it is difficult to measure because it requires an estimate of the expected return on the market - $E(R_m)$. As is discussed below, there are different ways to measure $E(R_m)$, and studies have come up with significantly different magnitudes for

$E(R_m)$. As Merton Miller, the 1990 Nobel Prize winner in economics indicated, $E(R_m)$ is very difficult to measure and is one of the great mysteries in finance.[24]

Q. ARE THERE ALTERNATIVE APPROACHES TO ESTIMATING THE MRP?

A. Yes. Page 4 of Exhibit JRW-11 highlights the primary approaches to, and issues in, estimating the expected MRP. The traditional way to measure the MRP 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 range of 5% to 7% 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 as discussed later in my testimony. The general theme of

[24] Merton Miller, "The History of Finance: An Eyewitness Account," *Journal of Applied Corporate Finance*, 2000, P. 3.

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.[25]

In addition, there are a number of surveys of financial professionals regarding the MRP. There have also 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 stocks and bonds. Usually, about 500 CFOs participate in the survey.[26] 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*.[27] This survey of professional economists has been published for almost fifty years. In addition, Pablo Fernandez conducts annual surveys of financial analysts and companies regarding the equity risk premiums they use in their investment and financial decision-making.[28]

---

[25] Rajnish Mehra & Edward C. Prescott, "The Equity Premium: A Puzzle," *Journal of Monetary Economics*, 145 (1985).

[26] *See* DUKE/CFO MAGAZINE GLOBAL BUSINESS OUTLOOK SURVEY, www.cfosurvey.org March, 2016).

[27] Federal Reserve Bank of Philadelphia, *Survey of Professional Forecasters* (Feb. 12, 2016). 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.

[28] Pablo Fernandez, Alberto Ortiz and Isabel Fernandez Acín, "Discount Rate (Risk-Free Rate and Market Risk Premium), used for 41 countries in 2015: a survey," April 23, 2015.

Q. PLEASE PROVIDE A SUMMARY OF THE MRP STUDIES.

A. Derrig and Orr (2003), Fernandez (2007), and Song (2007) have completed the most comprehensive reviews to date of the research on the MRP.[29] Derrig and Orr's study evaluated the various approaches to estimating MRPs, as well as the issues with the alternative approaches and summarized the findings of the published research on the MRP. Fernandez examined four alternative measures of the MRP – historical, expected, required, and implied. He also reviewed the major studies of the MRP and presented the summary MRP results. Song provides an annotated bibliography and highlights the alternative approaches to estimating the MRP.

Page 5 of Exhibit JRW-11 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 MRP. In developing page 5 of Exhibit JRW-11, I have categorized the studies as discussed on page 4 of Exhibit JRW-11. I have also included the results of studies of the "Building Blocks" approach to estimating the equity risk premium. The Building Blocks approach is a hybrid approach employing elements of both historical and *ex ante* models.

Q. WHY ARE PAGES 5 AND 6 OF EXHIBIT JRW-11 IMPORTANT?

A. Page 5 of JRW-11 provides a summary of the results of the MRP studies that I have reviewed. These include the results of: (1) the various studies of the historical risk premium, (2) *ex ante* MRP studies, (3) MRP surveys of CFOs, financial forecasters,

[29] *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).

analysts, companies and academics, and (4) the Building Blocks approach to the MRP. There are results reported for over thirty studies, and the median MRP is 4.63%.

The studies cited on page 5 of Exhibit JRW-11 include every MRP study and survey I could identify that was published over the past decade and that provided an MRP estimate. Most of these studies were published prior to the financial crisis. 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 were not estimating an MRP as of a specific point in time (e.g., the year 2001). To assess the effect of the earlier studies on the MRP, I have reconstructed page 5 of Exhibit JRW-11 on page 6 of Exhibit JRW-11; however, I have eliminated all studies dated before January 2, 2010. The median for this subset of studies is 5.10%.

Q. GIVEN THESE RESULTS, WHAT MRP ARE YOU USING IN YOUR CAPM?

A. Much of the data indicates that the market risk premium is in the 4.0% to 6.0% range. Several recent studies (such as Damodaran, Duff and Phelps, American Appraisers, Duarte and Rosa), and the CFO Survey have suggested an increase in the market risk premium. Therefore, I will use 5.5%, which is in the upper end of the range, as the market risk premium or MRP.

Q. IS YOUR MRP CONSISTENT WITH THE MRPS USED BY CFOS?

A. Yes. In the March 2016 CFO survey conducted by *CFO Magazine* and Duke University, which included over 500 responses, the expected 10-year MRP was 4.62%.[30]

Q. IS YOUR MRP CONSISTENT WITH THE MRPS OF PROFESSIONAL FORECASTERS?

A. Yes. The financial forecasters in the previously referenced Federal Reserve Bank of Philadelphia survey projected both stock and bond returns. In the February 2016 survey, the median long-term expected stock and bond returns were 5.34% and 3.44%, respectively. This provides an *ex ante* MRP of 1.90% (5.34%-3.44%).

Q. IS YOUR MRP CONSISTENT WITH THE MRPS OF FINANCIAL ANALYSTS AND COMPANIES?

A. Yes. Pablo Fernandez published the results of his 2015 survey of academics, financial analysts, and companies.[31] This survey included over 4,000 responses. The median MRP employed by U.S. analysts and companies was 5.5%.

Q. SO YOUR MRP IS CONSISTENT WITH PROFESSIONAL FORECASTS AND SURVEYS?

A. Yes.

---

[30] *Id.* p. 67.
[31] *Ibid.* p. 3.

Q. BASED ON YOUR CAPM ANALYSIS, WHAT EQUITY COST RATE IS INDICATED?

A. The results of my CAPM study for the proxy groups are summarized on page 1 of Exhibit JRW-11 and in Table 2 below.

Table 2: CAPM-derived Equity Cost Rate

$$K = (R_f) + ß * [E(R_m) - (R_f)]$$

	Risk-Free Rate	Beta	Equity Risk Premium	Equity Cost Rate
Water Proxy Group	**4.0%**	**0.73**	**5.5%**	**8.00%**
Gas Proxy Group	**4.0%**	**0.80**	**5.5%**	**8.40%**

For the Water Proxy Group, the risk-free rate of 4.0% plus the product of the beta of 0.73 times the equity risk premium of 5.5% results in an 8.0% equity cost rate. For the Gas Proxy Group, the risk-free rate of 4.0% plus the product of the beta of 0.80 times the equity risk premium of 5.5% results in an 8.40% equity cost rate.

D. Equity Cost Rate Summary

Q. PLEASE SUMMARIZE YOUR EQUITY COST RATE STUDY.

A. The results for my DCF and CAPM analyses for the proxy groups of water utility and gas distribution are indicated in Table 3.

Table 3: DCF and CAPM-derived Equity Cost Rates

	DCF	CAPM
Water Proxy Group	**8.5%**	**8.0%**
Gas Proxy Group	**8.3%**	**8.4%**

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

A. Given these results, I conclude that the appropriate equity cost rate for the Water and Gas Proxy Groups is in the 8.0% to 8.5% range. However, since I give greater weight to the DCF model, I am using an equity cost rate in the upper end of this range. Therefore, I conclude that the appropriate equity cost rate is 8.5%.

Q. WHY DO YOU BELIEVE THAT THE DCF RESULTS FOR THE GAS PROXY GROUP PROVIDE A BENCHMARK AS TO THE EQUITY COST RATE FOR WATER COMPANIES?

A. I do believe that the equity cost rate results for the gas companies provide an indicator as to the appropriate equity cost rate for water companies. As noted above, the data for the Water Proxy Group are limited. In particular, there are very few analysts who cover the water companies. In addition, as I highlight in my testimony, it is well known that the long-term projected EPS growth rates of Wall Street analysts are overly optimistic and upwardly biased. As a result, the DCF equity cost rate for the Water Proxy Group is dependent on the projected EPS growth rates of a few Wall Street analysts who have a tendency to be optimistic in their forecasts.

Q. PLEASE INDICATE WHY AN 8.50% RETURN ON EQUITY IS APPROPRIATE FOR THE COMPANY AT THIS TIME.

A. There are a number of reasons why an 8.50% return on equity is appropriate and fair for the Company in this case:

1. I have employed the Company's proposed capital structure;

2. As shown in Exhibits JRW-2 and JRW-3, capital costs for utilities, as indicated by long-term bond yields, are still at historically low levels. In addition, given low inflationary expectations and slow global economic growth, interest rates are likely to remain at low levels for some time.

3. As shown in Exhibit JRW-8, the water utility industry is among the lowest risk industries in the U.S. as measured by beta. As such, the cost of equity capital for this industry is amongst the lowest in the U.S., according to the CAPM.

4. The investment risk of the Company, as indicated by the Company's S&P and Moody's issuer credit ratings of A and A3, is in line with the average issuer credit ratings of the Water and Gas Proxy Groups. These credit ratings are also above the average S&P and Moody's issuer credit ratings for electric utilities.

Q. DO YOU BELIEVE THAT YOUR 8.50% RECOMMENDATION IS CONSISTENT WITH THE AUTHORIZED RETURNS ON EQUITY FOR WATER COMPANIES?

A. Yes. Page 1 of Exhibit JRW-12 provides the most recent authorized ROEs for the publicly-traded water companies as reported by *AUS Utilities Reports*. The range of the authorized ROEs is 9.43% to 10.0%, and the average is 9.65%. Given that a number of these reported authorized ROEs are dated, and the lower capital costs indicated by the lower yields on utility bonds (see page 1 of Exhibit JRW-3), I believe that my 8.50% ROE recommendation is consistent with the reported authorized ROEs for water companies.

Q. PLEASE DISCUSS YOUR STUDY OF EARNED VERSUS AUTHORIZED ROES FOR WATER COMPANIES.

A. Page 2 of Exhibit JRW-12 provides the results of my study of the authorized and earned ROEs for publicly-traded water utility companies and their associated market-to-book ratios over the past decade. Panel A provides the annual data, and the data are presented graphically on Panel B. The average authorized ROE was 10.45% in 2002, and has consistently declined over the past ten years. As of 2015, this figure was 9.69%. Earned ROEs declined from 10.40% in 2006 to 8.00% in 2011. They have since increased and the average was 9.90% as of 2015.

Q. HAVE THESE RETURNS BEEN ADEQUATE TO MEET INVESTOR RETURN REQUIREMENTS?

A. Yes. I have also provided the average annual market-to-book ratios for publicly-traded water utility companies as well as the authorized and earned ROEs on page 2 of Exhibit JRW-12. The annual market-to-book ratio was 2.30X in 2006. This average declined to 1.70X in 2010, and have since increased to the 2.0X range as of 2015. Overall, the market-to-book ratios for publicly-traded water utility companies indicate that the earned ROEs have been more than adequate to meet investors' return requirements. It is also noteworthy that the market-to-book ratios for publicly-traded water utility companies have been above the market-to-book ratios for gas distribution and electric utility companies.

Q. WHAT OTHER BENCHMARKS PROVIDE AN INDICATION OF THE REASONABLENESS OF YOUR 8.5% ROE RECOMMENDATION FOR THE COMPANY?

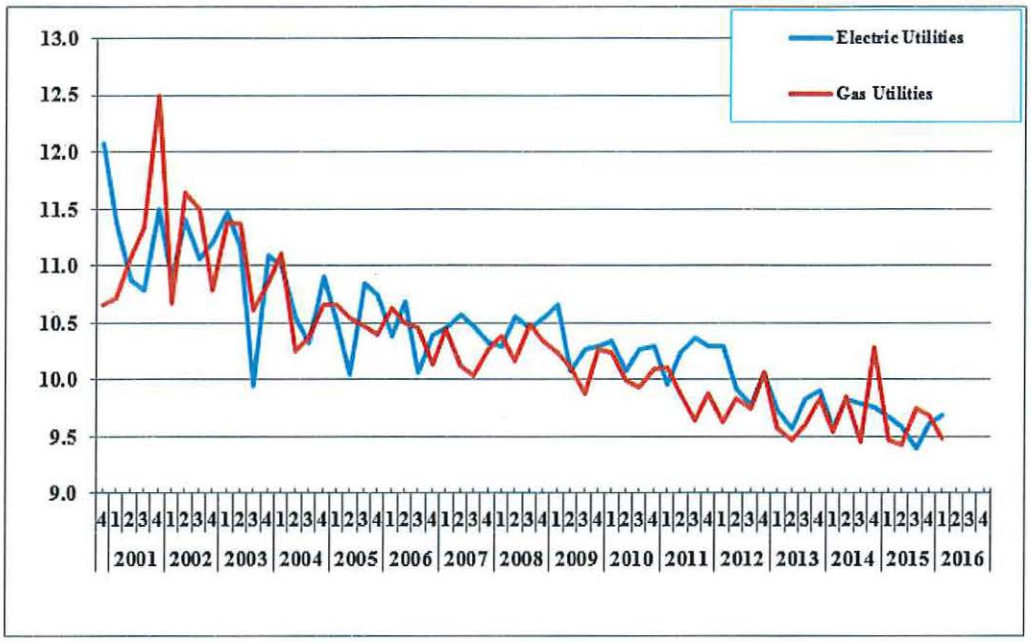
A. I believe that the authorized ROEs for electric utility and gas distribution companies provide another benchmark as to the appropriate ROE for water companies such as KAWC. But, I do believe that water companies, as indicated by their S&P and Moody's issuer credit ratings, are less risky than electric utilities and a little less risky than gas distribution companies.

Q. PLEASE DISCUSS THE AUTHORIZED ROES FOR ELECTRIC UTILITY AND GAS DISTRIBUTION COMPANIES.

A. Like water companies, the authorized ROEs for electric utilities and gas distribution companies have declined. The authorized ROEs for electric utilities have declined from 10.01% in 2012, to 9.8% in 2013, 9.76% in 2014, 9.58% in 2015, and 9.68% in the first quarter of 2016, according to Regulatory Research Associates.[32] The authorized ROEs for gas distribution companies have declined from 9.94% in 2012, 9.68% in 2013, 9.78% in 2014, 9.60%in 2015, and 9.48% in the first quarter of 2016.

[32] These figures exclude the Virginia cases that include ROE generation riders of up to 200 basis points.

Authorized ROEs for Electric Utility and Gas Distribution Companies
2000-2016



While my recommendation is below these figures, these authorized ROEs have lagged behind capital market cost rates in my opinion because: (1) some states like Wisconsin have refused to authorize ROEs below 10.0%; and (2) rate case decisions are a lagged reflection of capital market cost rates. However, there is no doubt that the trend has been towards lower ROEs, and the norm now is below ten percent. Hence, I believe that my recommended ROE reflects our present historically low capital cost rates, and these low capital cost rates are slowly being recognized by state utility commissions.

Q. DO YOU BELIEVE THAT THERE ANY RECENT PUBLICATIONS THAT ARE RELEVANT TO YOUR PROPOSED ROE?

A. Yes. Moody's recently published an article on utility earned and authorized ROEs and credit quality which I believe is very relevant to my recommendation.

Q. PLEASE DISCUSS YOUR RECOMMENDATION IN LIGHT OF THE MOODY'S PUBLICATION.

A. In the article, Moody's recognizes that authorized ROEs for electric and gas companies are declining due to lower interest rates.[33]

> The credit profiles of US regulated utilities will remain intact over the next few years despite our expectation that regulators will continue to trim the sector's profitability by lowering its authorized returns on equity (ROE). Persistently low interest rates and a comprehensive suite of cost recovery mechanisms ensure a low business risk profile for utilities, prompting regulators to scrutinize their profitability, which is defined as the ratio of net income to

[33] Moody's Investors Service, "Lower Authorized Equity Returns Will Not Hurt Near-Term Credit Profiles," March 10, 2015.

> book equity. We view cash flow measures as a more important rating driver than authorized ROEs, and we note that regulators can lower authorized ROEs without hurting cash flow, for instance by targeting depreciation, or through special rate structures.

Moody's indicates that with the lower authorized ROEs, electric and gas companies are earning ROEs of 9.0% to 10.0%, but this is not impairing their credit profiles and is not deterring them from raising record amounts of capital. With respect to authorized ROEs, Moody's recognizes that utilities and regulatory commissions are having trouble justifying higher ROEs in the face of lower interest rates and cost recovery mechanisms.[34]

> Robust cost recovery mechanisms will help ensure that US regulated utilities' credit quality remains intact over the next few years. As a result, falling authorized ROEs are not a material credit driver at this time, but rather reflect regulators' struggle to justify the cost of capital gap between the industry's authorized ROEs and persistently low interest rates. We also see utilities struggling to defend this gap, while at the same time recovering the vast majority of their costs and investments through a variety of rate mechanisms.

Overall, this article establishes that lower authorized ROEs are unlikely to hurt the financial integrity of utilities or their ability to attract capital.

Q. DO YOU BELIEVE THAT YOUR 8.50% MEETS *HOPE* AND *BLUEFIELD* STANDARDS?

A. Yes. As previously noted, according to the *Hope* and *Bluefield* decisions, returns on capital should be: (1) comparable to returns investors expect to earn on other investments of similar risk; (2) sufficient to assure confidence in the company's

[34] *Ibid.* p. 2.

financial integrity; and (3) adequate to maintain and support the company's credit and to attract capital. While my recommendation is below the average authorized ROEs for water utility companies, it reflects the downward trend in authorized ROEs of water utility companies and other utilities. As is highlighted in the Moody's publication cited above that states, despite authorized and earned ROEs in the 9.0% - 10.0% range, the credit quality of utilities has not been impaired and utilities are raising about $50 billion per year in capital.[35]

Q. FINALLY, DOES THE SMALL SIZE OF KAWC SUGGEST THAT THE COMPANY IS RISKIER?

A. No, not necessarily. Standard & Poor's released a report and addressed the issue of water company size and risk. The Standard & Poor's publication indicated the following.[36]

> Our criteria revision reflects our view that for general obligation ratings, a small and/or rural issuer does not necessarily have what we consider weaker credit quality than a larger or more-urban issuer. Although we assess these factors in our credit analysis for some revenue bond ratings, we believe many municipal systems still exhibit, in our view, strong and stable credit quality despite size or location constraints. While we believe that smaller or rural utility systems may not necessarily benefit from the economies of scale that can lead to more-efficient operations or lower costs, in our view, they can still have affordable rates, even in places with less-than-favorable household income and wealth levels.

[35] Ibid. p. 2.
[36] Standard & Poor's, "26 Waste Water and Sewer Issuers are Upgraded on Revised Criteria," January 12, 2009.

VI. CRITIQUE OF KAWC'S RATE OF RETURN TESTIMONY

Q. PLEASE SUMMARIZE KAWC'S RATE OF RETURN REQUEST FOR KAWC.

A. KAWC's cost of capital recommendation is provided on page 1 of Exhibit JRW-13. The Company has proposed a capital structure of 1.492% short-term debt, 50.585% long-term debt, 0.563% preferred stock, and 47.360% common equity. The Company has recommended a short-term debt, long-term debt and preferred stock cost rates of 1.369%, 6.050%, and 8.520%.

Q. WHAT ISSUES DO YOU HAVE WITH THE COMPANY'S COST OF CAPITAL POSITION?

A. I have issues with the Company's short-term and long-term debt cost rates, and most significantly, the equity cost rate. The debt cost rates were previously discussed. I will focus below on Dr. Vander Weide's equity cost rate of 10.75%.

Q. PLEASE REVIEW DR. VANDER WEIDE'S EQUITY COST RATE APPROACHES.

A. Dr. Vander Weide estimates an equity cost rate for KAWC using the results for two proxy groups and employs DCF, RP, and CAPM equity cost rate approaches.

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

A. Dr. Vander Weide's equity cost rate estimates for KAWC are summarized in Panel A of page 2 of Exhibit JRW-13. Based on these figures, he concludes that the appropriate equity cost rate is in the range of 9.5% to 11.2%. The Company has used 10.75% as an equity cost rate in its rate filing.

Q. PLEASE DISCUSS YOUR ISSUES WITH DR. VANDER WEIDE'S REQUESTED EQUITY COST RATE.

A. Dr. Vander Weide's requested return on common equity is too high primarily due to: (1) the inclusion of Consolidated Water Company in his water group, and the inclusion of UGI in his gas group; (2) an excessive adjustment to the dividend yield in his DCF approach; (3) an inflated growth rate in his DCF approach; (4) the use of market-value weights in his DCF equity cost rate analysis; (5) excessive base interest rates and market risk premiums in his RP and CAPM approaches; and (6); unwarranted flotation cost and size adjustments to his equity cost rate results.

A. Proxy Groups

Q. PLEASE REVIEW DR. VANDER WEIDE'S WATER GROUP.

A. Dr. Vander Weide has used a group of nine water companies and a proxy group of seven gas distribution companies. The differences in our proxy groups are: (1) I have excluded Consolidated Water Company from my Water Proxy Group; and (2) Dr. Vander Weide has included UGI Corp. and has excluded Chesapeake utilities in/from his gas group.

Q. WHY DO YOU BELIEVE THAT DR. VANDER WEIDE HAS ERRED INCLUDING CONSOLIDATED WATER IN HIS WATER GROUP?

A. While *Value Line* includes Consolidated Water in its Water Utilities group, the company is clearly not a typical regulated water utility. Consolidated Water is headquartered in the Cayman Islands and operates on several islands in the Caribbean. *Value Line* describes the company's business as:[37]

> Consolidated Water Co. Ltd. develops and operates seawater desalination plants and water distribution systems in areas where naturally occurring supplies of potable water are scarce or nonexistent. Its desalination process involves reverse osmosis tech. It provides water in the Cayman Islands, Belize, the Bahamas, the British Virgin Islands, and Bali.
>
> Consolidated Water's risk profile is higher than regulated water companies.

This is demonstrated by its *Value Line* risk metrics relative to the Water Proxy Group. On all of the metrics, Consolidated Water's measures indicate it is riskier than the average of the Water Proxy Group. These measures include Beta (0.85 vs. 0.73), Safety (3.0 vs. 2.6), Financial Strength (B+ vs. B++), Earnings Predictability (50 vs. 77) and Stock Price Stability (30 vs. 93). Therefore, the risk measures clearly indicate Consolidate Water is riskier than the proxy group and should not be included in the water group because the company has a higher cost of equity capital.

Q. WHY DO YOU BELIEVE THAT DR. VANDER WEIDE HAS ERRED INCLUDING UGI CORPORATION IN HIS GAS GROUP?

A. While *Value Line* includes UGI Corporation in its Natural Gas Utilities group, the

[37] Consolidated Water Company, *Value Line Investment Survey,* April 15, 2016.

company is clearly not a typical regulated gas distribution company. Only fourteen percent of UGI revenues are from regulated gas distribution. *Value Line* describes the company's business as:[38]

> UGI Corp. operates six business segments: AmeriGas Propane (accounted for 21.7% of net income in 2015), UGI International (18.8%), Gas Utility (41.2%), Midstream & Marketing (38.8%), and Corp. & Other -21%. UGI Utilities distributes natural gas and electricity to over 617,000 customers mainly in Pennsylvania; 27%-owned AmeriGas Partners is the largest U.S. propane marketer, serving about 1.3 million users in 50 states.

UGI Corporation's risk profile is higher than regulated gas distribution companies. This is demonstrated by its *Value Line* risk metrics relative to the Gas Proxy Group. On all of the metrics, UGI Corporation's measures indicate it is riskier than the average of the Gas Proxy Group. These measures include Beta (0.95 vs. 0.76), Safety (2.0 vs. 1.6), Financial Strength (B++ vs. A), Earnings Predictability (75 vs. 83) and Stock Price Stability (85 vs. 92). Therefore, the risk measures indicate UGI Corporation is riskier than the proxy group and should not be included in the gas group because the company has a higher cost of equity capital.

B. DCF Approach

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

A. On pages 16-31 of his testimony and in Schedules 1 and 2 of Exhibit No. _(JVW-1), Dr. Vander Weide develops an equity cost rate by applying a DCF model to his groups of water and gas 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

[38] UGI Corporation, *Value Line Investment Survey,* March 4, 2016.

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 2 of Exhibit JRW-13. Based on these figures, Dr. Vander Weide claims that the DCF equity cost rate for the water and gas groups are in the 9.5% to 10.1%, respectively.

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

A. There are five errors: (1) the composition of the proxy companies, which inflates his DCF estimates; (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;* (4) the market-value weighting of the DCF equity cost rate results; and (5) the flotation cost adjustment is inappropriate. These issues are discussed below.

1. Proxy Group Bias

Q. WHAT IS THE DCF EQUITY COST IMPACT OF INCLUDING CONSOLIDATED WATER AND UGI CORPORATION IN THE PROXY GROUPS?

A. As indicated above, Consolidated Water and UGI Corporation are riskier than the averages of the proxy groups and therefore have higher equity cost rates. This is evident from the DCF results. Consolidated Water and UGI Corporation have DCF equity cost

rates of 12.9% and 11.0%, the highest equity cost in each of the two groups. Removing these two DCF equity cost rates from the proxy groups results in an average DCF ROE of 8.9% for the water group and 9.63% for the gas group.

2. DCF Dividend Yield Adjustment

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

A. Dr. Vander Weide uses DCF dividend yields of 3.24% for the water group and 4.04% for the gas group. 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 discussed 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:[39]

> ... 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.

He also makes the following observation on the issue:

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

3. DCF Growth Rate

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

A. Dr. Vander Weide's 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.

---

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

Vander Weide employs DCF growth rates of 6.26% for the water group and 6.06% for the gas group.

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

A. First, as discussed below, the market-value weighting of the results gives excessive weight to several observations. Second, 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*.

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

A. 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. This has been demonstrated in a number of academic studies over the years. In addition, I discuss why it is inappropriate to combine *Value Line*'s EPS growth rate forecasts with those of I/B/E/S. Hence, using these growth rates as a DCF growth

rate will provide an overstated equity cost rate.

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

A. 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 growth 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.[40] As such, the weight given to analysts' projected EPS growth rate should be limited. And 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. 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.[41] These issues were previously discussed.

[40] 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.
[41] 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.

Q. 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.

A. Dr. Vander Weide cites the study on page 23 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 four 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 sixty-five 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.

Q. PLEASE CRITIQUE DR. VANDER WEIDE'S STUDY.[42]

A. Before highlighting the errors in the study, it is important to note that the study was published more than twenty-five years ago, used a sample of only sixty-five companies, and evaluated a three-year time period (1981-83) that was over thirty 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

[42] On page 24 of his testimony, Dr. Vander Weide cites a 2003 updated version of the study. However, this study is not published in a refereed journal and the data and results cannot be verified. Nonetheless, the updated study contains the same methodological errors addressed here as the original study.

Wall Street analysts and their stock recommendations and earnings forecasts. Nonetheless, there are several errors that invalidate the results of the study.

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

A. 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.

Q. WHY IS IT INAPPROPRIATE TO COMBINE I/B/E/S PROJECTED GROWTH RATES WITH THOSE FROM *VALUE LINE*?

A. In his DCF approach, Dr. Vander Weide averages the EPS growth rates provided by I/B/E/S and *Value Line*. The issue is that these two sources measure growth from two different time periods. I/B/E/S growth rates are the average three to five year EPS growth rate forecasts of Wall Street analysts from the current time period. *Value Line*, on the other hand, measures growth from a based earnings period – which is 2012 to 2014 in Dr. Vander Weide's case – to a projected future time period – 2018-2020. Hence, the *Value Line* EPS growth rate figure does not measure growth from today, but from a period going back three years. Therefore, these growth rates are for much different time periods and therefore can produce much different growth rates. In addition, since the *Value Line* growth rates are from a base period that goes back three years, these are not consistent with dividends and stock prices from today. In other words, the dividend yield is measured using today' dividend and stock price, while the growth rate component goes back for three years. This can result in a distortion of the expected growth rate and DCF equity cost rate.

4. Market-Value Weighting of DCF Results

Q. PLEASE DISCUSS DR. VANDER WEIDE'S MARKET-VALUE WEIGHTING OF HIS DCF RESULTS.

A. In Schedules 1 and 2 of Exhibit No. __(JVW-1), Dr. Vander Weide weights the DCF results for each of his water and gas proxy companies by the market capitalization of the

companies in computing his average DCF result for each proxy group. This approach gives more weight to the equity cost rate results for the larger companies and less weight to the cost rate results for the smaller companies.

Q. WHAT ARE THE PROBLEMS WITH THIS APPROACH?

A. There are several issues. First, this gives more weight to the DCF results for the larger companies. KAWC is a relatively small water company with operating revenues of about $100.0 million. But this approach gives very little weight to the DCF results for small companies. For his water group, the market-value weighting gives much more weight to the DCF results for larger water companies. The simple average DCF ROEs with this weighting are 9.3% for the water group and 9.8% for the gas group, even including Consolidated Water and UGI.

5. Flotation Costs

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

A. 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 water 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 water 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, water 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.

C. Risk Premium ("RP") Approach

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

A. In Schedules 3, 4, 5. and 6 of Exhibit No. __(JVW-1), 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-13. He reports RP equity cost rates of 11.20% using the expected return approach and 10.65% 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 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.

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

A. 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 0.15%. The flotation cost issue has already been addressed. The other two issues are discussed below.

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

A. 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 6.27% 'A' rated utility bond yield. First, the yield is well 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 4.2%. 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.

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

A. 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 gas distribution companies on a monthly basis over the 1998-2015 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. 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.

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

A. Dr. Vander Weide performs an ex-post or historical RP study that appears in Schedules 4 and 5 of Exhibit__(JVW-1). This study involves an assessment of the historical differences between the S&P Public Utility Index and the S&P 500 stock returns and public utility bond returns over various time periods between the years 1937-2015. From the results of his study, he concludes that an appropriate risk premium is 3.9% using S&P public utility stock returns and 4.5% using S&P 500 stock returns.

Q. FIRST, HAS DR. VANDER WEIDE PROVIDED ANY EMPIRICAL EVIDENCE WHATSOEVER THAT THE S&P PUBLIC UTILITIES AND/OR THE S&P 500 COMPANIES ARE APPROPRIATE RISK PROXIES FOR WATER COMPANIES?

A. No. Dr. Vander Weide has provided no such evidence, and as I have previously indicated, water utilities are among the least risky companies in the U.S. Hence, since Dr. Vander Weide has provided no such evidence that these are appropriate proxies for water companies, the results of this study should be ignored.

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

A. As previously discussed, one way to measure a market risk premium is to compute 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), the measurement of central tendency (the arithmetic versus geometric mean), the historical time horizon used, the change in risk and required return over time, the downward bias in historical bond returns, and

unattainable return bias (the Ibbotson procedure presumes monthly portfolio rebalancing).[43] The bottom line is that there are a number of empirical problems in using historical stock and bond returns to measure an expected equity risk premium.

D. CAPM Approach

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

A. In Schedules 7 and 8 of Exhibit No. __(JVW-1), Dr. Vander Weide develops an equity cost rate using the CAPM. In Schedule 7 he employs a historical market risk premium and in Schedule 8 he uses an expected market risk premium. Dr. Vander Weide's CAPM results are provided in Panels E and F of page 2 of Exhibit JRW-13. He reports CAPM equity cost rates of 11.90% using the historical CAPM and 10.05% using the expected CAPM. He includes a flotation cost adjustment of 0.15% in each.

Dr. Vander Weide uses a risk-free interest rate of 4.24% in each CAPM and betas from *Value Line*. His historical CAPM uses the Ibbotson return data and the market risk premium of 7.0% is calculated as the difference between the arithmetic mean stock return and the bond income return over the 1926-2014 period. Dr. Vander Weide develops his expected market risk premium for his CAPM of 8.4% in Schedule 8 of Exhibit__JVW-1) by applying the DCF model to the companies in the S&P 500. Dr. Vander Weide estimates an expected market return of 12.0% using an adjusted dividend yield of 3.0% and an expected DCF growth rate of 9.0%.

[43]These issues are addressed in a number of studies, including: Aswath. Damodaran, "Equity Risk Premiums (ERP): Determinants, Estimation and Implications – The 2015 Edition" NYU Working Paper, 2015, pp. 32-5; See Richard Roll, "On Computing Mean Returns and the Small Firm Premium," *Journal of Financial Economics*, pp. 371-86, (1983); Jay Ritter, "The Biggest Mistakes We Teach," *Journal of Financial Research* (Summer 2002); Bradford Cornell, *The Equity Risk Premium* (New York, John Wiley & Sons),1999, pp. 36-78; and J. P. Morgan, "The Most Important Number in Finance," p. 6.

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

A. There are several flaws with Dr. Vander Weide's CAPM: (1) his risk-free rate of 4.24%; (2) the historic and expected market risk premiums; and (3) the flotation cost adjustment.

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

A. Dr. Vander Weide uses a risk-free rate of interest of 4.24% in his CAPM. This figure represents the average projected rate on twenty-year Treasury bonds by *Value Line* and EIA. The current rate on twenty-year Treasury bonds, as of May, 2016, is only about 2.25%. As such, Dr. Vander Weide's risk-free interest rate is overstated.

Q. PLEASE ADDRESS THE PROBLEMS WITH DR. VANDER WEIDE'S HISTORICAL CAPM.

A. Dr. Vander Weide historical CAPM uses an equity risk premium of 7.0% which is based on the difference between the arithmetic mean stock and bond income returns over the 1926-2014 period. The errors associated with computing an expected equity risk premium using historical stock and bond returns were addressed earlier in this testimony. In short, there are a myriad of empirical problems, which result in historical market returns producing inflated estimates of expected risk premiums. These were discussed above and include U.S. stock market survivorship bias, the company survivorship bias, and unattainable return bias. 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.

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

A. Dr. Vander Weide develops an expected market risk premium for his CAPM of 7.76% in Schedule 8 of Exhibit__JVW-1, by applying the DCF model to the S&P 500. Dr. Vander Weide estimates an expected market return of 12.0% using a dividend yield of 3.0% and an expected DCF growth rate of 9.0%. 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 overly optimistic and upwardly biased. In addition, as explained below, Dr. Vander Weide's projected EPS growth rate of 9.0% is inconsistent with economic and earnings growth in the U.S.

Q. 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 DR. VANDER WEIDE'S S&P 500 GROWTH RATE IS EXCESSIVE?

A. A long-term EPS growth rate of 9.0% 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 9.0%; (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-14, and a summary is given in the table below.

Table 4: GDP, S&P 500 Stock Price, EPS, and DPS Growth 1960-Present

Nominal GDP	**6.58%**
S&P 500 Stock Price	**6.69%**
S&P 500 EPS	**6.64%**
S&P 500 DPS	**5.76%**
Average	**6.42%**

The results are presented graphically on page 2 of Exhibit JRW-14. 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 9.0% is 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.

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

A. 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-14. 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's long-term EPS growth rate of 9.0% is even more inflated.

Table 5: Historic GDP Growth Rates

10-Year Average - 2005-2014	**3.28%**
20-Year Average - 1995-2014	**4.36%**
30-Year Average - 1985-2014	**4.87%**
40-Year Average - 1975-2014	**6.19%**
50-Year Average - 1965-2014	**6.65%**

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

A. 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-14. The mean 10-year nominal GDP growth forecast (as of February 2016) by economists in the recent *Survey of Professional Forecasters* is 4.4%. The Energy Information Administration ("EIA"), in its projections used in preparing *Annual Energy Outlook,*

forecasts long-term GDP growth of 4.2% for the period 2013-2040.[44] The Congressional Budget Office ("CBO"), in its forecasts for the period 2015 to 2040, projects a nominal GDP growth rate of 4.3%.[45] Finally, the Social Security Administration ("SSA"), in its Annual OASDI Report, provides a projection of nominal GDP from 2015-2090.[46] The projected growth GDP growth rate over this period is 4.5%. Overall, these projections suggest projected nominal GDP growth over an extended future time period is in the 4.50% range.

Q. WHY IS PROJECTED GDP GROWTH RELEVANT TO DR. VANDER WEIDE'S LONG-TERM PROJECTED EPS GROWTH RATE OF 9.0%?

A. Brad Cornell of the California Institute of Technology 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 to 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:[47]

> 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 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

[44]Energy Information Administration, A*nnual Energy Outlook,* http://www.cbo.gov/publication/49973.
[45]Congressional Budget Office, The *2015 Long-term Budget Outlook*, July 2015. https://www.cbo.gov/publication/50250.
[46] Social Security Administration, 2015 Annual Report of the Board of Trustees of the Old-Age, Survivors, and Disability Insurance (OASDI) Program. http://www.ssa.gov/oact/tr/2015/X1_trLOT.html
[47] Bradford Cornell, "Economic Growth and Equity Investing," *Financial Analysts Journal* (January- February, 2010), p. 63.

> 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% range, the results imply nominal expected stock market returns in the 7% to 8% range. As such, Dr. Vander Weide's projected earnings growth rate and implied expected stock market return and equity risk premium 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. PLEASE PROVIDE A SUMMARY ASSESSMENT OF DR. VANDER WEIDE'S MARKET RISK PREMIUMS.

A. 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 8% 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 2016 *CFO Magazine* – Duke University Survey of about 500 CFOs shows an expected market risk premium of 6.32% over the next ten years. In addition, surveys conducted in 2015 by Fernandez indicates that

financial analysts and companies are using equity risk premiums of 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 10.75% range.

Q. PLEASE EVALUATE DR. VANDER WEIDE'S OBSERVATION THAT THE CAPM UNDERSTATES THE EQUITY COST RATE DUE TO A COMPANY'S SIZE.

A. Dr. Vander Weide claims that an adjustment is required for the size of a company when using the CAPM to estimate an equity cost rate. This adjustment is based on the historical stock market returns studies as performed and published by Ibbotson Associates. This argument is erroneous for several reasons.

First, as previously discussed, there are numerous errors in using historical market returns to compute risk premiums. These errors provide inflated estimates of expected risk premiums. Among the errors are the well-known survivorship bias (only successful companies survive – poor companies do not survive) and unattainable return bias (the Ibbotson procedure presumes monthly portfolio rebalancing). The net result is that Ibbotson's size premiums are poor measures for any risk adjustment to account for the size of the Company.

Second, Professor Annie Wong has tested for a size premium in utilities and concluded that, unlike industrial stocks, utility stocks do not exhibit a significant size premium.[48] As explained by Professor Wong, there are several reasons why such a size premium would not be attributable to utilities. Utilities are regulated closely by state

[48] Annie Wong, "Utility Stocks and the Size Effect: An Empirical Analysis," *Journal of the Midwest Finance Association*, pp. 95-101, (1993).

and federal agencies and commissions and hence, their financial performance is monitored on an ongoing basis by both the state and federal governments. In addition, public utilities must gain approval from government entities for common financial transactions such as the sale of securities. Furthermore, unlike their industrial counterparts, accounting standards and reporting are fairly standardized for public utilities. Finally, a utility's earnings are predetermined to a certain degree through the ratemaking process in which performance is reviewed by state commissions and other interested parties. Overall, in terms of regulation, government oversight, performance review, accounting standards, and information disclosure, utilities are much different than industrials, which could account for the lack of a size premium.

Q. PLEASE DISCUSS THE RESEARCH ON THE SIZE PREMIUM IN ESTIMATING THE EQUITY COST RATE.

A. As noted, there are a number of errors in using historical market returns to compute risk premiums. With respect to the small firm premium, Richard Roll (1983) found that one-half of the historic return premium for small companies disappears once biases are eliminated and historic returns are properly computed. The error arises from the assumption of monthly portfolio rebalancing and the serial correlation in historic small firm returns.[49]

In a more recent paper, Ching-Chih Lu (2009) estimated the size premium over the long-run. Lu acknowledges that many studies have demonstrated that smaller

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

companies have historically earned higher stock market returns. However, Lu highlights that these studies rebalance the size portfolios on an annual basis. This means that at the end of each year the stocks are sorted based on size, split into deciles, and the returns are computed over the next year for each stock decile. This annual rebalancing creates the problem. Using a size premium in estimating a CAPM equity cost rate requires that a firm carry the extra size premium in its discount factor for an extended period of time, not just for one year, which is the presumption with annual rebalancing. Through an analysis of small firm stock returns for longer time periods (and without annual rebalancing), Lu finds that the size premium disappears within two years. Lu's conclusion with respect to the size premium is:[50]

> However, an analysis of the evolution of the size premium will show that it is inappropriate to attach a fixed amount of premium to the cost of equity of a firm simply because of its current market capitalization. For a small stock portfolio which does not rebalance since the day it was constructed, its annual return and the size premium are all declining over years instead of staying at a relatively stable level. This confirms that a small firm should not be expected to have a higher size premium going forward sheerly because it is small now.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

[50] Ching-Chih Lu, "The Size Premium in the Long Run," 2009 Working Paper, SSRN abstract no. 1368705.