KENTUCKY-AMERICAN WATER COMPANY

CASE NO. 2008-00427

DIRECT TESTIMONY

OF

STEPHEN G. HILL

PUBLIC VERSION (REDACTED)

ON BEHALF OF

THE

ATTORNEY GENERAL
OF THE
COMMONWEALTH OF KENTUCKY

FEBRUARY 23, 2009

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INTRODUCTION / SUMMARY

Q. PLEASE STATE YOUR NAME, OCCUPATION AND ADDRESS.

A. My name is Stephen G. Hill. I am self-employed as a financial consultant, and principal of Hill Associates, a consulting firm specializing in financial and economic issues in regulated industries. My business address is P.O. Box 587, Hurricane, West Virginia, 25526 (e-mail: sghill@compuserve.com).

Q. BRIEFLY, WHAT IS YOUR EDUCATIONAL BACKGROUND?

A. After graduating with a Bachelor of Science degree in Chemical Engineering from Auburn University in Auburn, Alabama, I was awarded a scholarship to attend Tulane Graduate School of Business Administration at Tulane University in New Orleans, Louisiana. There I received a Master's Degree in Business Administration. I have been awarded the professional designation "Certified Rate of Return Analyst" by the Society of Utility and Regulatory Financial Analysts. This designation is based upon education, experience and the successful completion of a comprehensive examination. I have also been on the Board of Directors of that national organization for several years. A more detailed account of my educational background and occupational experience appears in Appendix A.

Q. HAVE YOU TESTIFIED BEFORE THIS OR OTHER REGULATORY COMMISSIONS?

A. In the twenty-five years that I have been an expert cost of capital witness I have not testified in this jurisdiction. However, I have testified on cost of capital, corporate finance and capital market issues in more than 250 regulatory proceedings before the following regulatory bodies: the West Virginia Public Service Commission, the Pennsylvania Public Utilities Commission, the Oklahoma State Corporation Commission, the Public Utilities Commission of the State of California, the Texas Public Utilities Commission, the Maryland Public Service Commission, the Public Utilities Commission of the State of

Minnesota, the Ohio Public Utilities Commission, the Insurance Commissioner of the State of Texas, the North Carolina Insurance Commissioner, the Rhode Island Public Utilities Commission, the City Council of Austin, Texas, the Texas Railroad Commission, the Arizona Corporation Commission, the South Carolina Public Service Commission, the Public Utilities Commission of the State of Hawaii, the New Mexico Corporation Commission, the State of Washington Utilities and Transportation Commission, the Georgia Public Service Commission, the Public Service Commission of Utah, the Illinois Commerce Commission, the Kansas Corporation Commission, the Indiana Utility Regulatory Commission, the Virginia Corporation Commission, the Montana Public Service Commission, the Public Service Commission of the State of Maine, the Public Service Commission of Wisconsin, the Vermont Public Service Board, the Federal Communications Commission and the Federal Energy Regulatory Commission. I have also testified before the West Virginia Air Pollution Control Commission regarding appropriate pollution control technology and its financial impact on the company under review and have been an advisor to the Arizona Corporation Commission on matters of utility finance.

Q. ON BEHALF OF WHOM ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am testifying on behalf of the Attorney General of the Commonwealth of Kentucky (AG).

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. In this testimony, I present the results of studies I have performed related to the appropriate return on equity and overall cost of capital to be used in the determination of rates for the water utility operations of Kentucky-American Water Company (Kentucky-American, KAW, the Company), a subsidiary of American Water Works Company, Inc. (AWK, the Parent).

Q. HAVE YOU PREPARED AN EXHIBIT IN SUPPORT OF YOUR TESTIMONY?

A. Yes, Exhibit_(SGH-1) consists of 11 Schedules and provides the analytical support for the

conclusions reached regarding the cost of common equity, capital structure and overall cost of capital for Kentucky-American presented in the body of the testimony. This Exhibit was prepared by me and is correct to the best of my knowledge and belief. Also, I have provided four Appendices ("A" through "D"), which contain additional detail regarding certain aspects of my narrative testimony in this proceeding.

Q. PLEASE SUMMARIZE YOUR TESTIMONY AND FINDINGS CONCERNING THE RATE OF RETURN THAT SHOULD BE UTILIZED IN SETTING RATES FOR KENTUCKY-AMERICAN'S WATER UTILITY OPERATIONS IN THIS PROCEEDING.

A. My testimony is organized into four sections. First, I review the current economic environment in which my equity return estimate is made. Second, I review the capital structure requested by Kentucky-American for ratemaking purposes in comparison to capital structures employed by the Company historically, as well as capital structures prevalent in the water utility industry. From that review, I develop a capital structure appropriate for ratemaking purposes. Third, I evaluate the cost of equity capital for similar-risk utility operations using Discounted Cash Flow (DCF), Capital Asset Pricing Model (CAPM), Modified Earnings-Price Ratio (MEPR), and Market-to-Book Ratio (MTB) analyses. Fourth, I discuss the shortcomings of the cost of equity capital testimony provided by Company witness, Dr. James Vander Weide.

I have estimated the equity capital cost of the Company's water utility operations to fall in a range of 9.00% to 9.50%. Within that range, I estimate the Company's cost of equity to be 9.50%—above the mid-point of a reasonable range of equity costs due to Kentucky-American's higher financial risk.

Applying that 9.50% equity capital cost to the capital structure requested by the Company containing approximately 42.3% common equity, 1.9% preferred stock, 45.4% long-term debt and 10.4% short-term debt, produces an overall cost of capital of 7.549% (Exhibit_(SGH-1), Schedule 11). That overall cost of capital affords the Company an

opportunity to achieve a pre-tax interest coverage level of 3.06 times. That level of pre-tax interest coverage exceeds the actual pre-tax interest coverage of approximately 2.0x o 2.5x achieved by Kentucky American in 2007 and 2008, according to the Company's Exhibit 31 (monthly earnings reports) filed in this proceeding. Therefore, the capital structure and overall return I recommend is sufficient to support the Company's financial position and fulfills the requirement of providing the Company the opportunity to earn a return which is commensurate with the risk of the operation while maintaining the Company's ability to attract capital.

Q. WHY SHOULD THE COST OF CAPITAL SERVE AS A BASIS FOR THE PROPER ALLOWED RATE OF RETURN FOR A REGULATED FIRM?

A. The Supreme Court of the United States has established, as a guide to assessing an appropriate level of profitability for regulated operations, that investors in such firms are to be given an opportunity to earn returns that are sufficient to attract capital and are comparable to returns investors would expect in the unregulated sector for assuming the same degree of risk. The Bluefield and Hope cases provide the seminal decisions [Bluefield Water Works v. PSC, 262 US 679 (1923); FPC v. Hope Natural Gas Company, 320 US 591 (1944)]. These criteria were restated in the Permian Basin Area Rate Cases, 390 US 747 (1968). However, the Court also makes quite clear in Hope that regulation does not guarantee profitability and, in Permian Basin, that, while investor interests (profitability) are certainly pertinent to setting adequate rates, those interests do not exhaust the relevant considerations.

As a starting point in the rate-setting process, then, the cost of capital of a regulated firm represents the return investors could expect from other investments, while assuming no more and no less risk. Since financial theory holds that investors will not provide capital for a particular investment unless that investment is expected to yield the opportunity cost of capital, the correspondence of the cost of capital with the Court's guidelines for appropriate earnings is clear.

Q. THE COST OF EQUITY CAPITAL IS MOST OFTEN ESTIMATED USING A COMPLEX ARRAY OF ECONOMIC MODELS AND ALGABRAIC FORMULAS. IS THERE A SIMPLE WAY TO UNDERSTAND THE CONCEPT OF THE COST OF EQUITY CAPITAL?

A. Yes. In a regulated rate setting context such as this, the cost of equity capital can be most easily understood as the rate of profit that should be allowed for the regulated firm. A firm's profit is the amount of money that remains from its revenues after a firm has paid all of its costs—operating costs (commodity supply costs, depreciation, equipment maintenance costs, salaries, fees, taxes, retirement obligations), as well as income taxes and interest costs. That dollar amount of profit, divided by the amount of common equity capital used to finance the firm's regulated assets produces a percentage rate of return on equity. If, for example, the profit earned by a utility is $10/year and investors have provided $100 of equity capital, the firm's return on equity (ROE) is 10%.

The purpose of all of the economic models and formulas in cost of capital testimony is to estimate, using market data of similar-risk firms, the percentage rate of return investors require for that risk-class of firms—in this case, water utility operations. If the profit included in the rates, as a percent of the firm's equity capital, is set equal to the cost of equity capital (the investors' required return), the utility, under efficient management, will be able to attract the capital necessary to maintain the firm's financial integrity and the interests of investors and ratepayers will be balanced, as called for in the U.S. Supreme Court cases cited above.

Simply put, the amount of profit the utility should be allowed the opportunity to earn as a percentage of the total equity investment should be equal to the cost of equity capital.

I. ECONOMIC ENVIRONMENT

Q. WHY IS IT IMPORTANT TO REVIEW THE ECONOMIC ENVIRONMENT IN WHICH AN EQUITY COST ESTIMATE IS MADE?

A. The cost of equity capital is an expectational, or *ex ante*, concept. In seeking to estimate the cost of equity capital of a firm, it is necessary to gauge investor expectations with regard to the relative risk and return of that firm, as well as that for the particular risk-class of investments in which that firm resides. Because this exercise is, necessarily, based on understanding and accurately assessing investor expectations, a review of the larger economic environment within which the investor makes his or her decision is most important. Investor expectations regarding the strength of the U.S. economy, the direction of interest rates and the level of inflation (factors that are determinative of capital costs) are key building blocks in the investment decision. Those factors should be reviewed by the analyst and the regulatory body in order to assess accurately investors' required return—the cost of equity capital to the regulated firm.

Q. WHAT ARE THE INDICATIONS WITH REGARD TO THE COST OF CAPITAL IN THE CURRENT ECONOMIC ENVIRONMENT?

A. In the tumultuous economic environment that has existed since the end of the third quarter of 2008, the signals with regard to the cost of capital, unsurprisingly, appear to be mixed. Examining the changes in U.S. Treasury and corporate interest rates since illustrates the difficulty of discerning long-term capital cost movements in this environment.

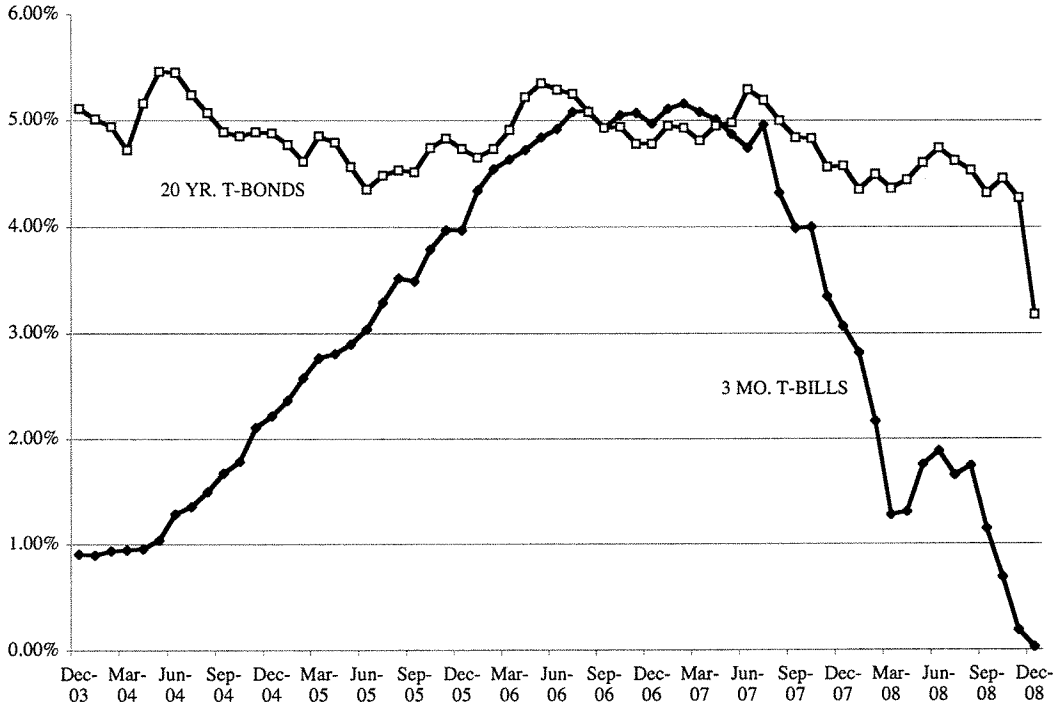
First, the level of long-term fixed-income capital costs represented by U.S. Treasury bonds, which have been relatively moderate for several years, have recently declined to new lows. As shown in Chart I, although there were wide fluctuations in *short-term* interest rate levels over the past five years as the Federal Reserve Board (the Fed) raised and lowered the Federal Funds rate to slow down and encourage (respectively) economic growth, long-term interest rates stayed in the range of 4.5% to 5.5% over most of that time, with a slow

downward trend. However, as a result of the recent economic downturn, market re-alignment, and investors' preference for safe investments, long-term Treasury bond yields have fallen well below the lower end of that historical range. According to the Federal Reserve Statistical Release H.15, the average 20-year T-Bond yield in December 2008 was 3.18%, and, for the week ending January 16, 2009, the average was only 3.23%.[1]

Those current data also indicate that the Fed has recently lowered short-term interest rates to near zero to attempt to lessen the impact of the pending recession and, concurrently, investors have bid up the prices and lowered long-term interest rates on Treasuries, accepting lower long-term returns. As a result, fundamental long-term capital costs represented by 20-year Treasury bonds have decreased following the recent financial crisis.

Chart I

Recent Interest Rate Changes



Data from Federal Reserve Statistical Release H.15

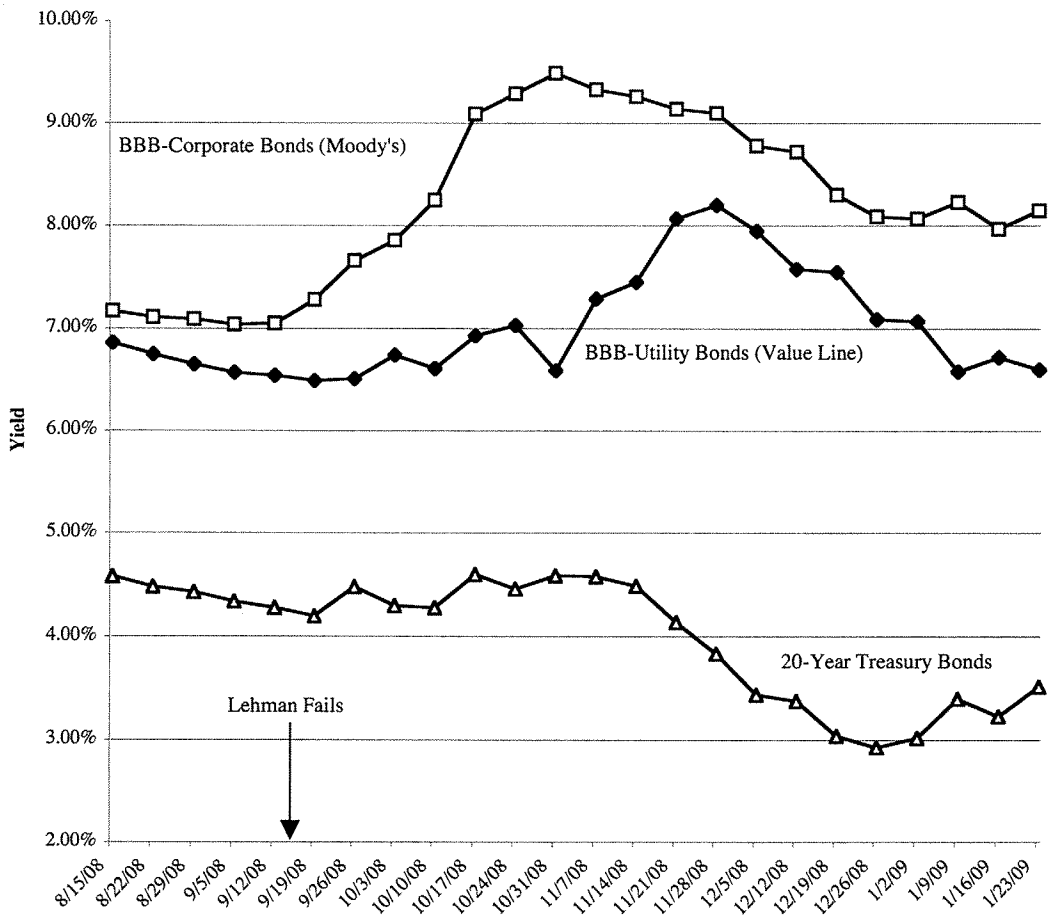
[1] http://www.federalreserve.gov/Releases/H15/Current/, January 21, 2009.

Because the market for U.S. Treasury securities has remained liquid, it is reasonable to believe that the recent low yields (approximately 3%) on long-term Treasuries are representative of investors' current risk-free return expectations. Therefore, this fundamental building block of capital costs (the risk-free rate) provides an indication that in the current economic environment, capital costs are lower.

However, declining yields has not been the case with corporate bonds over the past few months. Following the demise of Lehman Brothers and the devolution of the financial community in the U.S. and abroad due to enormous debt obligations related to mortgage-back securities and credit default swaps—even with the promise of government support of the successor financial institutions—there was a lack of liquidity in that sector of the market. The banks and investment brokerage firms were holding on to capital in order to shore up their own balance sheets rather than re-injecting those monies into the financial system through lending (buying corporate debt). As a result, even though the Fed was driving down short-term Treasury rates to provide additional liquidity for the economy in general, that liquidity was not reaching the corporate bond market and, with a lack of capital supply, corporate bond yields increased, as shown in Chart II, below.

Chart II

Financial Crisis: Bond Yield Changes



Following the failure of Lehman Brothers, as the full extent of the debt overhang in the financial industry became known, BBB-rated corporate bond yields began to increase, even as long-term Treasury yields remained relatively steady at about 4.5%. According to Value Line *Selection & Opinion* (weekly editions from 8/15/08 through the most recent available, 1/23/09), BBB-rated utility bond yields rose as well, but not to the extent of corporate bonds due, it is reasonable to believe, to the lower risk of utilities. As the economic malaise has continued, some liquidity has been restored to the bond markets,

causing both corporate and utility bond yields to decline from their recent highs. Most recently, according to Value Line, utility bond yields have declined to about 6.5%—approximating their "pre-crisis" levels. That has not yet occurred with corporate yields reported by Moody's, although those yields are also declining. Also, long-term Treasury bond yields have begun to increase from their lowest point established at the end of 2008. On balance, then, the fixed-income data available in the market indicates that while there were technical difficulties in the corporate bond market that drove up yields for a period of time, it does not appear to be a long-term phenomenon and is, therefore, unlikely to represent investors' long-term expectations. Those data also indicate that investors' required return for a risk-free investment remains quite low by historical standards—around 3%. Therefore, the bond yield data available in the market place indicates that fundamental capital costs have declined as a result of the current economic environment.

With regard to other broad indicators of the cost of capital—dividend yields and growth rates—the data show that there has not been much of a change in the cost of equity capital during the recent economic downturn. AUS Utility Reports, in its January 2009 publication, indicates that gas and water utility dividend yields increased, on average, 60 basis points between August 2008 and December 2008, with water utilities showing a smaller change (i.e., the market prices of water utilities declined relatively less than the prices of gas utilities).

Table I.

Dividend Yield Differences

	August '08	January '09	Change
Gas Utilities	3.00%	3.80%	0.80%
Water Utilities	3.00%	3.40%	0.40%
		Average	0.60%

Also, in January 2009 IBES (an investor service that polls sell-side analysts for their

earnings per share growth rate projections) indicates that the five-year earnings growth rate projections for gas and water utilities have declined by an average of approximately 100 basis points.[2] While, as I discuss in more detail subsequently, earnings growth rate projections are not reliable as a sole indicator of long-term sustainable growth necessary for a reliable DCF estimate of the cost of equity capital, these dividend yield and growth rate data provide, at least, support for the notion that the cost of capital has not substantially increased as a result of the on-going financial crisis. In fact, those DCF-based data along with the fixed-income (bond yield) data discussed above, lend credence to the notion that investors' return expectations have been tempered somewhat by the recent events in the financial markets and the cost of equity capital is likely to be similar to or somewhat lower than it was at mid-year 2008.

Q. WHAT IS THE CURRENT EXPECTATION WITH REGARD TO THE ECONOMY AND INTEREST RATES?

A. As Value Line notes in its most recent Quarterly Review the current expectation is that the economy will show negative growth through mid-year 2009.[3] However, once the economy begins to improve, increasing inflation pressures with energy, food and commodities indicate that the next interest rate move by the Fed will be toward tightening credit (i.e., increasing interest rates).

> **Economic Growth:** As noted, the economy faltered in the third quarter, with GDP easing by 0.3%. A larger GDP decline, perhaps 3.0%, is likely in the current quarter. We think the downturn will continue in the first quarter of 2009, with GDP dropping by 2.0%, or more, before here is a smaller falloff in growth in the second quarter. We think a selective recovery will evolve later next year [chart omitted].
>
> **Inflation**: Inflation resurfaced as a serious problem earlier this year [2008], after more than a decade in which pricing pressures has been successfully held at bay. The principal contributor to the earlier alarming rise in prices was a surge

[2] IBES Utility Long-Term Growth Rate Report, January 2009, pp. 40, 42.
[3] From my reading of the economic media, this appears to be an optimistic forecast.

> in oil quotations, with a barrel of crude soaring past $147 early in the summer. Thereafter, things turned around dramatically, as a downturn in global growth brought the price of oil and other commodities down sharply, taking care , at least for now, of any lingering inflation problem. In fact, consumer prices, which largely had held within a 2%-3% bond during the past decade, and had risen by 4.3% and 5.0%, respectively, in the first and second quarters of this year, have started to ease. Indeed, inflation could be back to within the Federal Reserve's 1%-2% comfort zone by next year [chart omitted]. Talk of deflation is also being heard, although we do not think such a scenario is ahead, at lease for any length of time.
>
> **Interest Rates**: Three months ago, a shallow and relatively brief business contraction was the general forecast. The Federal Reserve, which had cut the federal funds rate from 5.25% to 2.00% in less than a year, appeared likely to be on hold until 2009 when, presumably, a reviving U.S. economy would prompt the Fed to reverse course and start raising interest rates. In the interim, though, the ballooning credit crisis and the failure and the near-demise of a number of financial institutions, encouraged by the Fed to take more aggressive steps, including voting for back-to-back reductions in interest rates. As of this writing, the federal funds rate is down to 1.00%. We believe another half point cut is possible later this year. [Chart omitted]. (The Value Line Investment Survey, *Selection & Opinion*, November 21, 2008, pp. 3829-3830.)

In that most recent Quarterly Economic Review cited above, Value Line projects long-term Treasury bond rates will average 4.2% in 2009 and 4.5% through 2010. The most recent Value Line economic forecast was published in November 2008. A more recent forecast by Blue Chip Financial Forecasts (a service that polls 50 leading economists), published January 1, 2009, indicates lower long-term Treasury bond yields in 2009 and 2010—3.2% and 3.9%, respectively. As noted above, the recent 20-year T-bond yield in January, according to the Federal Reserve is 3.2% (Federal Reserve Statistical Release H.15, January 21, 2009). Therefore, the indicated expectation with regard to long-term interest rates is that they could move somewhat higher in the future as the economy (hopefully) recovers.

II. CAPITAL STRUCTURE

Q. WITH WHAT CAPITAL STRUCTURE DOES THE COMPANY REQUEST RATES BE SET IN THIS PROCEEDING?

A. Exhibit MAM-3, attached to Mr. Miller's Direct Testimony presents Kentucky-American's requested ratemaking capital structure. The Company has filed its rate request based on a projected capital structure consisting of 42.309% common equity, 1.946% preferred stock, 45.408% long-term debt and 10.377% short-term debt. That ratemaking capital structure is based on the Company's 13-month average capital structure projected at May 30, 2010.

Q. IS THE COMPANY'S REQUESTED CAPITAL STRUCTURE SIMILAR TO THE MANNER IN WHICH KENTUCKY-AMERICAN HAS BEEN CAPITALIZED RECENTLY?

A. Yes. According to data from the Company's Response to AG Data Request No. 1-126, the ratemaking capital structure ratios are similar to those actually employed, on average, over the past two years by Kentucky-American. As shown in page 1 of Schedule 1 attached to this testimony, Kentucky-American was capitalized over the most recent eight quarters with an average capital structure that consisted of approximately 44.4% common equity, 0.8% preferred stock, and 42.4% total debt, and 12.3% short-term debt. Therefore, the Company's requested ratemaking capital structure contains slightly less equity (common and preferred) and more debt (long- and short-term) that actually used, on average, historically, but is quite similar to that actually employed. For that reason, as well as the fact that the capital structure is generally similar to that currently employed in the water utility industry, the requested capital structure ratios are reasonable for ratemaking purposes.

Q. HOW DOES KENTUCKY-AMERICAN'S REGULATORY CAPITAL STRUCTURE COMPARE TO THAT UTILIZED IN THE WATER UTILITY INDUSTRY TODAY?

A. Kentucky-American's ratemaking capital structure contains somewhat lower equity levels than is employed, on average, in the utility industry today. As shown on page 2 of Schedule 1 attached to my testimony, the average common equity ratio of the water utility industry is 47%, and the middle-value, or median, is 45%. Kentucky-American's requested ratemaking common equity ratio of about 43% of total capital, contains less slightly less equity and more debt than the similar-risk water utility sample group that I have used to estimate the cost of capital in this proceeding. For that reason, Kentucky-American's financial risk should be considered to be slightly higher than that of the sample group and the appropriate equity return should be in the upper portion of a reasonable range for those companies.

Q. WHAT CAPITAL STRUCTURE AND EMBEDDED CAPTIAL COST RATES DO YOU USE TO DETERMINE THE OVERALL COST OF CAPITAL IN THIS PROCEEDING?

A. As shown on page 3 of Schedule 1, I recommend the Commission use the Company's requested capital structure to estimate the cost of capital. For purposes of calculating an overall cost of capital, at this time, I will also use the cost rates for preferred stock and long-term debt included in Mr. Miller's Direct Testimony, Exhibit MAM-3. However, there have been changes in projected interest rates since the Company filed its testimony, which would tend to lower its projected cost rate of short-term debt.

The Company estimates its short-term debt costs at 3.850%, based on a Federal Funds rate forecast of 2.8% in 2009. According to the January 1, 2009, edition of Blue Chip Financial Forecast, the projected Federal Funds rate for 2009 averages about 0.3% and is expected to reach only 1.1% by 2010. Moreover, at page 30 of a January 16, 2009 S.E.C. Form S-1 filing, American Water Capital Corporation (the source of Kentucky-American's short-term debt) stated:

> "As of January 15, 2009, the average interest rate on our overnight commercial paper was 1.3% and the average interest rate on short term borrowings under the credit facility was 0.7%."

If a projected Federal Funds rate of 1.0% for 2009 (higher than actual current expectations) were used in the estimation of short-term debt costs shown on Mr. Miller's MAM-5, p. 3, the projected cost of short-term debt would be 2.05%. For purposes of analysis in this case, and to be conservative, I will use a projected short-term debt cost rate of 2.5%.

Q. DOES THIS CONCLUDE YOUR DISCUSSION OF CAPITAL STRUCTURE?

A. Yes, it does.

III. METHODS OF EQUITY COST EVALUATION

A. DISCOUNTED CASH FLOW MODEL

Q. PLEASE DESCRIBE THE DISCOUNTED CASH FLOW (DCF) MODEL YOU USED TO ARRIVE AT AN ESTIMATE OF THE COST RATE OF COMMON EQUITY CAPITAL FOR KENTUCKY-AMERICAN IN THIS PROCEEDING.

A. The DCF model relies on the equivalence of the market price of the stock (P) with the present value of the cash flows investors expect from the stock, and assumes that the discount rate equals the cost of capital. The total return to the investor, which equals the required return and the cost of equity capital according to this theory, is the sum of the dividend yield and the expected growth rate in the dividend.

The theory is represented by the equation,

$$k = D/P + g, \qquad (1)$$

where "k" is the equity capitalization rate (cost of equity, required return), "D/P" is the dividend yield (dividend divided by the stock price) and "g" is the expected sustainable growth rate.

Q. WHAT GROWTH RATE (g) DID YOU ADOPT IN DEVELOPING YOUR DCF COST OF COMMON EQUITY FOR THE COMPANY IN THIS PROCEEDING?

A. The growth rate variable in the traditional DCF model is quantified, theoretically, as the dividend growth rate investors expect to continue into the indefinite future. The DCF model is actually derived by 1) considering the dividend a growing perpetuity, that is, a payment to the stockholder which grows at a constant rate indefinitely, and 2) calculating the present value (the current stock price) of that perpetuity. The model also assumes that the company whose equity cost is to be measured exists in a steady state environment, i.e., the payout ratio and the expected return are constant and the earnings, dividends, book value and stock price all grow at the same rate, forever.

While that assumption sounds unrealistic because, in the short term, growth rates in those parameters can be quite different, over the long term it has proven to be true. According to Value Line's published year-by-year retrospective of the Dow Jones Industrials from 1920 through 2005, the average earnings, dividend and book value growth rates over that time period were 5.3%, 4.9% and 5.2%.[4] For utilities, over the long term, those growth rates in earnings, dividends and book value are even closer. Moody's Public Utility Manual reports that between 1947 and 1999 (Moody's ceased publication of it's Utility Manual in 2001) that average growth in earnings, dividend and book value growth of Moody's Electric Utilities was 3.34%, 3.22% and 3.66%, respectively.

However, even though over the long-term the DCF's fundamental assumptions are proven to be sound, as with all mathematical models of real-world phenomena, the DCF theory does not exactly "track" reality in the shorter term. Payout ratios and expected equity returns as well as earnings and dividend growth rates do change over time. Therefore, in order to properly apply the DCF model to any real-world situation and, in this case, to find the long-term sustainable growth rate called for in the DCF theory, it is essential to understand the determinants of long-run expected dividend growth.

[4] www.valueline.com, Dow Jones Long Term Chart (PDF)

Q. CAN YOU PROVIDE AN EXAMPLE TO ILLUSTRATE THE DETERMINANTS OF LONG-RUN EXPECTED DIVIDEND GROWTH?

A. Yes, in Appendix B, I provide an example of the determinants of a sustainable growth rate on which to base a reliable DCF estimate. In addition, in Appendix B, I show how reliance on earnings or dividend growth rates alone, absent an examination of the underlying determinants of long-run dividend growth, can produce inaccurate DCF results.

Q. DID YOU USE A SUSTAINABLE GROWTH RATE APPROACH TO DEVELOP AN ESTIMATE OF THE EXPECTED GROWTH RATE FOR THE DCF MODEL?

A. While I have calculated both the historical and projected sustainable growth rate for a sample of utility firms with similar-risk operations, I have not relied solely on that type of growth rate analysis. To estimate an appropriate DCF growth rate, I have also utilized published data regarding both historical and, where available, projected growth rates in earnings, dividends, and book value for the sample group of utility companies. Through an examination of all of those data, which are available to and used by investors, I estimate investors' long-term internal growth rate expectations. To that long-term growth rate estimate, I add any additional growth that is attributable to investors' expectations regarding the on-going sale of stock for each of the companies under review.

Q. WHY HAVE YOU USED THE TECHNIQUE OF ANALYZING THE MARKET DATA OF SEVERAL COMPANIES?

A. I have used the "similar sample group" approach to cost of capital analysis because it yields a more accurate determination of the cost of equity capital than does the analysis of the data of one individual company. Any form of analysis, in which the result is an estimate, such as growth in the DCF model, is subject to measurement error, i.e., error induced by the measurement of a particular parameter or by variations in the estimate of the technique chosen. When the technique is applied to only one observation (e.g., estimating the DCF growth rate for a single company) the estimate is referred to, statistically, as having "zero

degrees of freedom." This means, simply, that there is no way of knowing if any observed change in the growth rate estimate is due to measurement error or to an actual change in the cost of capital. The degrees of freedom can be increased and exposure to measurement error reduced by applying any given estimation technique to a sample of companies rather than one single company. Therefore, by analyzing a group of firms with similar characteristics, the estimated value (the growth rate and the resultant cost of capital) is more likely to equal the "true" value for that type of operation.

Q. HOW WERE THE FIRMS SELECTED FOR YOUR ANALYSIS?

A. In selecting a sample of water utility firms to analyze, I screened all the water utilities followed by Value Line, because that investor service, in addition to providing a wealth of historical data, provides projected information for some of those companies, which is important in gauging investor expectations. Because there are so few publicly-traded water utility companies followed by Value Line, I included all of those companies in my sample group, except for two. I excluded Southwest Water because only 45% of its earnings were from regulated water utility operations and because it has recently cut its dividend due to accounting-related reporting problems. I also excluded Sun Hydraulics because that firm sells water-related equipment, but not regulated water service. The water utility companies selected for analysis as most similar in risk to Kentucky-American are: American States Water (AWR), American Water Works. (AWK), Aqua America (WTR), California Water. (CWT), Connecticut Water Services (CTWS), Middlesex Water (MSEX), Pennichuck Water (PNNW), SJW Corp. (SJW), and York Water Company (YORW). According to the January 2009 edition of A.U.S. Utility Reports, the water companies selected for analysis, on average, receive 90% of revenues from regulated water utility operations.

Because the water utility sample is relatively small and because some of the companies included in that sample do not have projected information, in order to assist in determining an appropriate range of equity costs for water utilities, I have elected to analyze a group of gas distributors in addition to the water utilities noted above. In so doing,

however, it is important to recognize that gas distributors have traditionally been considered to be riskier operations than water utilities. For example in the Corporate Ratings Criteria published by Standard & Poor's bond rating service, that investor services commented on the relative competitive risk of gas and water utilities as follows:

> Gas Utility Competition
> Similarly, gas utilities are analyzed with regard to their competitive standing in the three major areas of demand: residential, commercial and industrial. Although regulated as holders of monopoly power, natural gas utilities have for some time been actively competing for energy market share with fuel oil, electricity, coal, solar, wood, etc. the long-term staying power of market demand for natural gas cannot be taken for granted....
> Water Utility Competition
> As the last true utility monopoly, water utilities face very little competition and there is currently no challenge to the continuation of franchise areas. The only exceptions have been cases where investor-owned water companies have been subject to condemnation and municipalization because of poor service or political motivations." (Standard & Poor's, "Corporate Ratings Criteria," p. 30, 1996)

Therefore, my use of gas distribution operations as a proxy for water utility operations should be considered conservative, in that it would tend to produce a cost of equity estimate that overstates to some degree the cost of equity of a pure water utility such as Kentucky-American.

In selecting a sample of gas distribution firms to analyze, I screened all the gas distribution firms followed by Value Line. I selected companies from that group that had a continuous financial history and had at least 60% of operating revenues generated by gas distribution operations. In addition, I eliminated companies that were in the process of merging or being acquired or companies that had omitted dividends. The data for the sample group regarding the percent of revenues generated by gas distribution operations were obtained from the Value Line Investment Survey, *Ratings and Reports*, December 12, 2008 and A.U.S. Utility Reports, January 2009.

The companies included in the gas distribution sample group are AGL Resources (ATG), NICOR (GAS), NiSource (NI), Northwest Natural Gas (NWN), Piedmont Natural Gas (PNY), South Jersey Industries (SJI), Southwest Gas (SWX), WGL Holdings (WGL), and Chesapeake Utilities Group (CPK). AUS Utility Reports indicates that this group of gas utilities derives 74% of its revenues from gas operations, indicating that a greater percentage of revenues is derived from riskier, unregulated operations than for the water utility sample group. Again, the gas distributors should be considered to have somewhat greater investment risk than the water utility sample group.

Q. HOW HAVE YOU CALCULATED THE DCF GROWTH RATES FOR THE SAMPLE OF COMPARABLE COMPANIES?

A. Schedule 2 pages 1 through 6, shows the retention ratios, equity returns, sustainable growth rates, book values per share and number of shares outstanding for the comparable water companies for the past five years. Also included in the information presented in Schedule 2 are Value Line's projected 2008, 2009 and 2011-2013 values for equity return, retention ratio, book value growth rates and number of shares outstanding.

In evaluating these data, I first calculate the five-year average sustainable growth rate, which is the product of the earned return on equity (r) and the ratio of earnings retained within the firm (b). For example, Schedule 2, page 1, shows that the five-year average sustainable growth rate for Aqua America (WTR) is 4.04%. The simple five-year average sustainable growth value is used as a benchmark against which I measure the company's most recent growth rate trends. Recent growth rate trends are more investor influencing than are simple historical averages. Continuing to focus on WTR, we see that sustainable growth began the period at about 3.94% and ended at 3.14%, indicating a slowing growth rate trend. By the 2011-2013 period, however, Value Line projects WTR's sustainable growth will reach a level that is somewhat above the recent five-year average—4.40%. These forward-looking data indicate that investors expect WTR to grow at a rate similar to but slightly higher than the growth rate that has existed, on average, over the past five years.

At this point I should note that, while the five-year projections are given consideration in estimating a proper growth rate because they are available to and are used by investors, they are not given sole consideration. Without reviewing all the data available to investors, both projected and historic, sole reliance on projected information may be misleading. Value Line readily acknowledges to its subscribers the subjectivity necessarily present in estimates of the future:

> "We have greater confidence in our year-ahead ranking system, which is based on proven price and earnings momentum, than in 3- to 5-year projections." (Value Line Investment Survey, Selection and Opinion, June 7, 1991, p.854).

Another factor investors consider is that WTR's book value growth is expected to increase at a 5.0% level over the next five years, after increasing at a 10.5% rate historically. This information also indicates declining growth and would tend to moderate growth rate expectations, but the projected book value growth is higher than the projected sustainable growth rate. Also, as shown on Schedule 3, page 2, WTR's dividend growth rate, which was 7.5% historically, is expected to decline to 5.5% in the future—another indication of moderating growth.

Earnings growth rate data available from Value Line also indicate that investors can expect a relatively lower growth rate in the future (6%), compared to that which has existed over the past five years (7%). IBES and Zack's (investor advisory services that poll institutional analysts for growth earnings rate projections) also project earnings growth rates for WTR—7% and 8%, respectively—over the next five years, that are substantially higher than projected sustainable growth.

WTR's projected sustainable growth is expected to approach 4.5%, dividend, earings and book value growth is expected to decline, but to levels that exceed 4.5%. The average of Value Line's projected earnings, dividends and book value growth for this company is 5.50%. A long-term sustainable growth rate of 5.75% is a reasonable

expectation for WTR.

Q. IS THE INTERNAL (b x r) GROWTH RATE THE FINAL GROWTH RATE YOU USE IN YOUR DCF ANALYSIS?

A. No. An investor's sustainable growth rate analysis does not end upon the determination of an internal growth rate from earnings retention. Investor expectations regarding growth from external sources (sales of stock) must also be considered and examined. For WTR page 1 of Schedule 2 shows that the number of outstanding shares increased at a 1.96% rate over the most recent five-year period. However, Value Line expects the number of shares outstanding to increase at a slower rate through the 2011-2013 period, bringing the share growth rate to a 0.83% rate by that time. An expectation of share growth of 1% is reasonable for this company.

Because WTR is currently trading at a market price that is greater than book value, issuing additional shares will increase investors' growth rate expectations. Multiplying the expected growth rate in shares outstanding by (1-(Book Value/Market Value))[5] increases the investor-expected growth rate for WTR by 0.62%. Therefore, the combined internal and external growth rate for WTR is 6.37% (5.75% internal growth and 0.62% external growth).

I have included the details of my growth rate analyses for WTR as an example of the methodology I use in determining the DCF growth rate for each company in the water industry sample. A description of the growth rate analyses of each of the companies included in my sample groups is set out in Appendix C. Schedule 3, pages 1 and 3 of Exhibit_(SGH-1) attached to this testimony shows the internal, external and resultant overall growth rates for the water and gas utility companies analyzed.

[5] This is Gordon's formula for "v" the accretion rate related to new stock issues. B=book value, M=market value. (Gordon, M.J., The Cost of Capital to a Public Utility, MSU Public Utilities Studies, East Lansing, Michigan, 1974, pp., 30–33)

Q. HAVE YOU CHECKED THE REASONABLENESS OF YOUR GROWTH RATE ESTIMATES AGAINST OTHER, PUBLICLY AVAILABLE, GROWTH RATE DATA?

A. Yes. Pages 2 and 4 of Schedule 3 shows the results of my DCF growth rate analysis as well as 5-year historic and projected earnings, dividends and book value growth rates from Value Line, earnings growth rate projections from IBES, the average of Value Line and IBES growth rates and the 5-year historical compound growth rates for earnings, dividends and book value for each company under study.

As shown on page 2 of Schedule 3, my DCF growth rate estimate for all the water utility companies included in my analysis is 6.26%. This figure exceeds Value Line's projected average growth rate in earnings, dividends and book value for those same companies (5.67%) and is well above the five-year historical average earnings, dividend and book value growth rate reported by Value Line for those companies (3.48%). My growth rate estimate for the water companies under review is below the analysts' earnings growth rate projections—7.48% and 9.3% (IBES and Zack's, respectively). Also, my growth rate estimate is well above the projected dividend growth rate of the sample companies, 4.17%.

My DCF growth rate estimate for all the gas distribution utility companies included in my analysis is 5.13%, shown on page 4 of Schedule 3. This figure exceeds Value Line's projected average growth rate in earnings, dividends and book value for those same companies (4.15%) and is also above the five-year historical average earnings, dividend and book value growth rate reported for those companies (4.46%). My growth rate estimate for the gas companies under review is bracketed by the analysts' earnings growth rate projections—4.80% and 6.4% (IBES and Zack's, respectively).

Q. SOME ANALYSTS RELY EXCLUSIVELY ON ANALYSTS' EARNINGS PROJECTIONS AS THE GROWTH RATE IN THE DCF; YOU HAVE NOT DONE SO. CAN YOU EXPLAIN WHY?

A. In my view, earnings growth rate projections are widely available, are used by investors and therefore deserve consideration in an informed, accurate assessment of the investor expected

growth rate to be included in a DCF model. I do not believe, however, that projected earnings growth rates should be used as the *only* source of a DCF growth estimate as Company witness Vander Weide has done in this case. In other words, projected earnings growth rates are influential in, but not solely determinative of, investor expectations.

First, it is important to realize that, as I discuss in Appendix B, projected earnings growth rates may over or understate the growth that can be sustained over time by the companies under review. This is important because long-term sustainable growth is required in an accurate DCF assessment of the cost of equity capital. The efficacy of projected earnings growth rates in any specific DCF analysis can only be determined through a study of the underlying fundamentals of growth—something that those who rely exclusively on analysts' earnings growth rate projections fail to do.

Second, the studies that support the use of analysts' earnings projections measure the ability of analysts estimates to predict stock prices versus simple historical averages of other parameters. In that sort of simplistic comparison, analysts' projections perform better. However, I am aware of no cost of capital analyst that relies exclusively on historical average growth rates, nor is it reasonable to believe that any astute investor would do so. Therefore, while studies do indicate that analysts' earnings growth estimates are better indicators of stock prices than are simple historical averages of other growth rate parameters, those studies do not provide any basis for exclusive reliance on earnings growth projections in a DCF analysis.

Third, the sell-side institutional analysts that are polled by IBES and similar services offer relatively "rosy" expectations for the stock they follow—even when the analyst's actual expectations for the stock are not so sanguine. Simply put, some analysts overstate growth expectations to make the stocks they want to sell look more attractive. Although claims are often made that the opinions of sell-side analysts are not affected by the profits made by the other parts of the business that actually trade those securities, the "Cinderella effect" (analysts' overstating stock expectations) is not a new phenomenon, and is

recognized in academia. As the authors of a widely-used finance textbook note regarding the use of projected earnings growth rates in a DCF analysis:

> Estimates of this kind are only as good as the long-term forecasts on which they are based. For example, several studies have observed that security analysts are subject to behavioral biases and their forecasts tend to be over-optimistic [footnote omitted]. If so, such DCF estimates of the cost of equity should be regarded as upper estimates of the true figure. [footnote omitted]. *See, for example,* A. Dugar and S. Nathan, "The Effect of Investment Banking Relationships on Financial Analysts' Earnings Investment Recommendations." (*Contemporary Accounting Research* 12 (1995), pp. 131-160. Brealey, Meyers, Allen, Principles of Corporate Finance, 8th Ed., McGraw-Hill Irwin, Boston, MA, (2006), p. 67.)

This concern regarding investors' use of analysts' growth estimates is also underscored by an investor's service sponsored by the *Wall Street Journal*:

> "You should be careful when looking at analyst recommendations for several reasons. First of all, many analysts suffer from a conflict of interest between the firm that employs them and the company whose stock they track. Often times, an analyst will be responsible for issuing reports on a company that is a current or potential client of their employer (usually an investment bank). Since they know that their employer would like to keep the client's business, the analyst may be tempted to issue a rosier outlook for the stock than what it really deserves." (Investorguide.com, "University," Analysts and Earnings Estimates, www.investorguide.com/igustockanalyst.html)

Q. DOES THIS CONCLUDE THE GROWTH RATE PORTION OF YOUR DCF ANALYSIS?

A. Yes, it does.

Q. HOW HAVE YOU CALCULATED THE DIVIDEND YIELDS?

A. I have estimated the next quarterly dividend payment of each firm analyzed and annualized

them for use in determining the dividend yield. If the quarterly dividend of any company was expected to be raised in the next quarter (2nd quarter 2009), I increased the current quarterly dividend by (1+g). Because many of the companies had recently increased dividends or were not expected to increase dividends at all during 2009, for the utility companies in the sample groups, a dividend adjustment was necessary only for American States Water, California Water, SJW Corp., AGL Resources, Piedmont Natural Gas, Southwest Gas and WGL Holdings.

The next quarter annualized dividends were divided by a recent daily closing average stock price to obtain the DCF dividend yields. I use the most recent six-week period to determine an average stock price in a DCF cost of equity determination because I believe that period of time is long enough to avoid daily fluctuations and recent enough so that the stock price captured during the study period is representative of current investor expectations.

Schedule 4 contains the market prices, annualized dividends and dividend yields of the utility companies under study. Page 1 of Schedule 4 indicates that the average dividend yield for the sample group of water companies is 3.48%. The year-ahead dividend yield projection for the water utility sample group published by Value Line is 3.41% (Value Line, *Summary & Index*, January 23, 2009). By that measure, my dividend yield calculation is representative of investor expectations. For the gas distributors, page 2 of Schedule 4 shows an average dividend yield of 4.75%. That estimate also comports with Value Line's current year-ahead dividend yield projection for those companies—4.70%.

Q. WHAT IS YOUR COST OF EQUITY CAPITAL ESTIMATE FOR THE UTILITY COMPANIES, UTILIZING THE DCF MODEL?

A. Schedule 5, page 1 shows that the average DCF cost of equity capital for the group of water utilities is 9.74%. Page 2 of Schedule 5 shows the average DCF for the gas utility sample group is 9.88%.

Q. HAVE YOU ALSO PERFORMED A MULTI-STAGE DCF ANALYSIS IN THIS PROCEEDING?

A. Yes. While I do not normally employ a multi-stage DCF analysis in my estimation of the cost of equity capital because I believe it is unnecessary, in the substantial uncertainty of the current market environment, it seems reasonable to provide additional estimates of the cost of equity. A multi-stage DCF analysis is based on the same theory as the single-stage DCF, but selects particular growth rates for an initial growth stage and a final, long-term growth rate stage, rather than estimating one long-term sustainable growth rate.[6]

In my experience, the multi-stage DCF analysis used most often in rate proceedings is one that uses analysts' earnings growth rate estimates as the first stage and a projected Gross Domestic Product nominal growth rate (based on the assumption that it is reasonable to assume that, over time, all firms will grow at a rate similar to that of the general economy). There are problems with both of those assumptions that tend to cause that type of multi-stage DCF to overstate the cost of equity. First, as I noted above, analysts' earnings growth rates tend to overstate actual growth rate results. That problem is less of a concern in a multi-stage DCF because any overstatement of long-term sustainable growth has less impact on the outcome than assuming analyst earnings growth estimates will continue indefinitely (the operative assumption in a single-stage, traditional DCF). Second, historical evidence indicates that utilities grow at a rate below that of the general economy.[7]

Setting aside those concerns, Schedule 6 shows a multi-stage DCF analysis for all of the companies in my water and gas utility sample groups for which earnings projections were available. Averaging Value Line, IBES and Zack's earnings projections for each company provided the first stage growth rate. Using the 2009 dividend for each of those companies shown in my Schedule 4 as the first year dividend, I increased those annual dividends by one plus the average projected earnings growth rate for each company to

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[6] In some instances, analysts will insert a third growth rate stage in the calculation in which the initial growth rate is changed gradually to the final growth rate—a "transition" stage. This adjustment makes little difference in the outcome of the model.

[7] Mergent Public Utility Manual, 2002; GDP data from St. Louis Federal Reserve.

determine the cash flows to the investor for the first five years.

Then for the second, long-term period I increased the dividend in each year by one plus the projected growth in Gross Domestic Product. The Congressional Budget Office's January 2009 expectation for long-term GDP growth is 4.2%. That is the growth rate used for the second stage of the multi-stage DCF model, shown in Schedule 6.

Then, using the current stock price of each company along with the projected cash flows just described, I employed an Internal Rate of Return function to calculate the discount rate that would equate the current stock price of each company with its future cash flows. The result of that analysis is an average multi-stage DCF estimate of 8.63%. The multi-stage DCF result for the water companies was 8.10% and for the gas distributors, was 9.04%. Given the fact that this is a relatively conservative analysis, these results indicate that my standard DCF results may be overstated.

B. CAPITAL ASSET PRICING MODEL

Q. PLEASE DESCRIBE THE CAPITAL ASSET PRICING MODEL (CAPM) YOU USED TO ARRIVE AT AN ESTIMATE FOR THE COST RATE OF KENTUCKY-AMERICAN'S EQUITY CAPITAL.

A. The CAPM states that the expected rate of return on a security is determined by a risk-free rate of return plus a risk premium, which is proportional to the non-diversifiable (systematic) risk of a security. Systematic risk refers to the risk associated with movements in the macro-economy (the economic "system") and, thus, cannot be eliminated through diversification by holding a portfolio of securities. The beta coefficient (β) is a statistical measure that attempts to quantify the non-diversifiable risk of the return on a particular security against the returns inherent in general stock market fluctuations. The formula is expressed as follows:

$$k = r_f + \beta(r_m - r_f), \qquad (2)$$

where "k" is the cost of equity capital of an individual security, "r_f" is the risk-free rate of return, "β" is the beta coefficient, "r_m" is the average market return and "$r_m - r_f$" is the market risk premium. The CAPM is used in my analysis, not as a primary cost of equity analysis, but as a check of the DCF cost of equity estimate. Although I believe the CAPM can be useful in testing the reasonableness of a cost of capital estimate, certain theoretical shortcomings of this model (when applied in cost of capital analysis) reduce its usefulness.

Q. CAN YOU EXPLAIN WHY THE CAPM ANALYSIS SHOULD NOT BE USED AS A PRIMARY ESTIMATE OF THE COST OF EQUITY CAPITAL?

A. Yes. The reasons why the CAPM should be used in cost of capital analysis carefully are set out below. It is important to understand that my caution with regard to the use of the CAPM in a cost of equity capital analysis does not indicate that the model is not a useful description of the capital markets. Rather, my caution recognizes that in the practical application of the CAPM to cost of capital analysis there are problems that can cause the results of that type of analysis to be less reliable than other, more widely accepted models such as the DCF.

There has been much comment in the financial literature regarding the strength of the assumptions that underlie the CAPM and the inability to substantiate those assumptions through empirical analysis. Also, there are problems with the key CAPM risk measure, beta, that indicate that the CAPM analysis is not a reliable primary indicator of equity capital costs.

Cost of capital analysis is a decidedly forward-looking, or *ex-ante*, concept. Beta is not. The measurement of beta is derived with historical, or *ex-post*, information. Therefore, the beta of a particular company, because it is usually derived with five years of historical data, is slow to change to current (i.e., forward-looking) conditions, and some price abnormality that may have happened four years ago could substantially affect beta while, currently, being of little actual concern to investors. Moreover, this same shortcoming, which assumes that past results mirror investor expectations for the future plagues the market risk

premium in an ex-post, or historically-oriented CAPM.

Q. WHAT VALUE HAVE YOU CHOSEN FOR A RISK-FREE RATE OF RETURN IN YOUR CAPM ANALYSIS?

A. As the CAPM is designed, the risk-free rate is that rate of return investors can realize with certainty. The nearest analog in the investment spectrum is the 13-week U. S. Treasury Bill. However, T-Bills can be heavily influenced by Federal Reserve policy, as they have been over the past three years. While longer-term Treasury bonds have equivalent default risk to T-Bills, those longer-term government securities carry maturity risk that the T-Bills do not have. When investors tie up their money for longer periods of time, as they do when purchasing a long-term Treasury, they must be compensated for future investment opportunities forgone as well as the potential for future changes in inflation. Investors are compensated for this increased investment risk by receiving a higher yield on T-Bonds. However, when T-Bills and T-Bonds exhibit a "normal" (historical average) spread of about 1.5% to 2%, the results of a CAPM analysis that matches a higher market risk premium with lower T-Bill yields or a lower market risk premium with higher T-Bond yields, are very similar.

As I noted in my previous discussion of the macro-economy, in an attempt to fend off a recession and to inject liquidity into the financial system, the Fed has acted vigorously since August of 2007 to lower short-term interest rates. Over the most recent six-week period, T-Bills have produced an average yield of only 0.05%. During that time period Treasury Bonds have been priced to yield 2.81% (data from Value Line *Selection & Opinion*, six most recent weekly editions (12/19/08-1/23/09)). As I noted in Section I of this testimony, according to the Federal Reserve Statistical Release H.15, long-term T-Bonds have been yielding approximately 3.2% most recently. Therefore, for purposes of analysis in this proceeding I will use 3.0% as the long-term risk-free rate.

Q. DO YOU BELIEVE THE USE OF A LONG-TERM TREASURY BOND RATE IS APPROPRIATE IN THE CAPM?

A. In the current economic environment, with short-term Treasury Bills yielding a near zero return, the use of a long-term Treasury bond would provide a more accurate indication of the risk-free return investors require and produces a more accurate estimate of investors' cost of equity. Therefore, in this testimony, I will present the CAPM cost of equity results using only long-term Treasury bond yields. With that measure of the risk-free rate, I use the corresponding measure of the market risk premium.

Q. WHAT MARKET RISK PREMIUM HAVE YOU USED IN YOUR CAPM ANALYSIS?

A. The market risk premium is the difference between the return investors expect on stocks and the return they expect on a risk-free rate of return like a U.S. Treasury bond. The "traditional" view, supported primarily by the earned return data over the past 80 years published by Morningstar (formerly Ibbotson), is based on the historical difference between the returns on stocks and the returns on bonds. That view assumes that the returns actually earned by investors over a long period of time are representative of the returns they expect to earn in the future.

For example, the Morningstar data show that investors have earned a return of 12.3% on stocks and 5.8% on long-term Treasury bonds since 1926.[8] Therefore, based on those historical data, it is assumed that investors will require a risk premium in the future of 6.5% above the long-term risk-free rate to invest in stocks [12.3% - 5.8% = 6.5%]. With a current long-term T-Bond yield of approximately 3.0%, that assumption indicates an investor expectation of a 9.5% return for the stock market in general [3.0% + 6.5% = 9.5%]. However, current research indicates that there are aspects of the Morningstar historical data set that, when examined, point not only to lower historical risk premiums than those reported by Morningstar, but also expected risk premiums that are much lower.

[8] Morningstar, SBBI Valuation Edition, 2007 Yearbook, p. 28.

Q. HAS THE RESEARCH YOU MENTION FOUND ITS WAY INTO TODAY'S FINANCE TEXTBOOKS?

A. Yes. In the 2006 edition of their widely-used finance textbook, Brealey, and Meyers [9] discuss the findings of many different recent studies regarding the market risk premium. Importantly, in prior editions of their textbooks Brealey, et al, cited the Morningstar historical data, now they do not. Instead they cite the risk premium work of Dimson, Staunton and Marsh, authors of "Triumph of the Optimists," in which they review a longer-term data set that that used by Morningstar and conclude that market risk premiums expected in the future are below historical averages.[10]

The textbook authors conclude, based on a review of the recent evidence regarding the market risk premium, that a reasonable range of arithmetic equity premiums above short-term Treasury Bills is 5% to 8%.[11] Because, the long-term historical difference in the return between T-Bonds and T-Bills has been 1.2%, Brealey and Meyers' textbook indicates a long-term market risk premium relative to T-Bonds ranging from 3.8% to 6.8% [5% - 1.2% = 3.8%; 8% - 1.2% = 6.8%].[12] The mid-point of that 3.8% to 6.8% reasonable risk premium range is 5.3%. Although 5.3% is higher than other risk premium estimates, that average market risk premium added to a current T-Bond yield of 3%, would produce a current equity return expectation for U.S. equities of 8.3%. Because utility stocks are less risky than the market as a whole, an appropriate return on equity for utilities would be lower, according to CAPM theory.

Q. WHAT HAVE YOU CHOSEN AS THE MARKET RISK PREMIUM FOR THE CAPM ANALYSIS?

A. In their 2007 edition of Stocks, Bonds, Bills and Inflation, Morningstar indicates that the

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[9] Brealey, R., Meyers, S., Allen, F., Principles of Corporate Finance, 8th Edition, McGraw-Hill, Irwin, Boston MA, 2006.

[10] Dimson, E., Staunton, M., March, P., Triumph Of The Optimists, 101 Years of Global Investment Returns, Princeton University Press, Princeton, NJ, 2002.

[11] Op cit, p. 154.

[12] Op cit, pp. 149, 222.

average market risk premium between stocks and T-Bills over the 1926–2006 time period is 6.5% (based on an arithmetic average), and 5.0% (based on a geometric average). I have, in prior testimony, used these values as an estimate of the market risk premium in the CAPM analysis.

As I have noted above, recent research in the field of financial economics has shown that the market risk premium data published by Morningstar overstates investor-expected market risk premiums. Current textbooks (Brealey & Meyers) indicate that the long-term arithmetic average market risk premium ranges from 3.8% to 6.8%—reaching much lower levels than the Morningstar data indicates. The mid-point of Brealey & Meyer's long-term risk premium range is 5.3%, which falls within the 5% to 6.5% range published by Morningstar. For purposes of determining the CAPM cost of equity in this proceeding I will use the mid-point of the long-term risk premium range set out in the most recent Brealey & Meyer's text—5.3%, as well as the Morningstar market risk premiums to develop a range of CAPM equity cost estimates.

Q. WHAT VALUES HAVE YOU CHOSEN FOR THE BETA COEFFICIENTS IN THE CAPM ANALYSIS?

A. Value Line reports beta coefficients for all the stocks it follows. Value Line's beta is derived from a regression analysis between weekly percentage changes in the market price of a stock and weekly percentage changes in the New York Stock Exchange Composite Index over a period of five years. The average beta coefficient of the sample of water companies is 0.84 and the average beta for the gas companies is 0.72.

Q. WHAT IS YOUR RECOMMENDED COST OF EQUITY CAPITAL FOR THE SAMPLES OF WATER AND GAS COMPANIES USING THE CAPITAL ASSET PRICING MODEL ANALYSIS?

A. Schedule 7, page 1 shows that the average Value Line beta coefficient for the group of water companies under study is 0.84. The mid-point of the range of market risk premiums

published by Brealey and Meyers of 5.3% would, upon the adoption of a 0.84 beta, become a sample group premium of 4.44% (0.84 x 5.3%). That non-specific risk premium added to the recent average T-Bond rate of 3.0% yields a common equity cost rate estimate of 7.44%. Using the historical average market risk premiums published by Morningstar (6.5%) the resulting CAPM equity cost estimate for the water companies would be 8.44%.

Page 2 of Schedule 7 shows CAPM equity cost estimates for the gas utilities, based on Brealey & Meyer's mid-point market risk premium and Morningstar's arithmetic average market risk premium, are 6.7% and 7.7%, respectively. The CAPM results for both sample groups are substantially below the standard DCF results, previously derived, and indicate that the cost of equity capital is below that indicated by the DCF results.

C. MODIFIED EARNINGS-PRICE RATIO ANALYSIS

Q. PLEASE DESCRIBE THE MODIFIED EARNINGS-PRICE RATIO (MEPR) ANALYSIS OF THE COST OF COMMON EQUITY CAPITAL.

A. The earnings-price ratio is the expected earnings per share divided by the current market price. In cost of capital analysis, the earnings-price ratio alone (which is one portion of this MEPR analysis) can be useful in a corroborative sense, since it can be a good indicator of the proper range of equity costs when the market price of a stock is near its book value. When the market price of a stock is *above* its book value, the earnings-price ratio *understates* the cost of equity capital. Schedule 8 contains mathematical proof for this concept. The opposite is also true, i.e.; the earnings-price ratio *overstates* the cost of equity capital when the market price of a stock is *below* book value.

Under current market conditions, the utilities under study have an average market-to-book ratio of 1.87 (water) and 1.58 (gas) and, therefore, the average earnings-price ratio alone will understate the cost of equity for the sample groups. However, I do not use the earnings-price ratio alone as an indicator of equity capital cost rates. Because of the relationship among the earnings-price ratio, the market-to-book ratio and the investor-

expected return on equity described mathematically in Schedule 8, I have modified the earnings-price ratio analysis by including projected equity returns for the companies under study. It is that modified analysis that I will use to assist in estimating an appropriate range of equity capital costs in this proceeding.

Q. PLEASE EXPLAIN THE RELATIONSHIP AMONG THE EARNINGS-PRICE RATIO, THE EXPECTED RETURN ON EQUITY, AND THE MARKET-TO-BOOK RATIO.

A. When the expected return (ROE) approximates the cost of equity, the market price of the utility approximates its book value and the earnings-price ratio provides an accurate estimate of the cost of equity. As the investor-expected return on equity for a utility (ROE) begins to exceed the investor-required return (the cost of equity capital), the market price of the firm will tend to exceed its book value. As explained above, when the market price exceeds book value, the earnings-price ratio understates the cost of equity capital. Therefore, when the expected equity return (ROE) exceeds the cost of equity capital, the earnings-price ratio will understate that cost rate.

Also, in situations where the expected equity return is below what investors require, market prices fall below book value. Further, when market-to-book ratios are below 1.0, the earnings-price ratio overstates the cost of equity capital. Thus, the expected rate of return on equity and the earnings-price ratio tend to move in a countervailing fashion around a central locus, which is the cost of equity capital. Therefore, the average of the expected book return and the earnings price ratio provides a reasonable estimate of the cost of equity capital.

These relationships represent general rather than precisely quantifiable tendencies but are useful in corroborating other cost of capital methodologies. The Federal Energy Regulatory Commission, in its generic rate of return hearings, found this technique useful and indicated that under the circumstances of market-to-book ratios exceeding unity, the cost of equity is bounded above by the expected equity return and below by the earnings-price ratio (e.g., 50 Fed Reg, 1985, p. 21822; 51 Fed Reg, 1986, pp. 361, 362; 37 FERC ¶ 61,287). The mid-point of these two parameters, therefore, produces an estimate of the cost

of equity capital which, when market-to-book ratios are different from unity, is far more accurate than the earnings-price ratio alone.

Q. IS THERE THEORETICAL SUPPORT FOR THE USE OF AN EARNINGS-PRICE RATIO IN CONJUNCTION WITH AN EXPECTED RETURN ON EQUITY AS AN INDICATOR OF THE COST OF EQUITY CAPITAL?

A. Elton and Gruber, Modern Portfolio Theory and Investment Analysis (New York University, Wiley & Sons, New York, 1995, pp. 401-404) provide support for reliance on the modified earnings price ratio analysis.

The Elton and Gruber text posits the following formula,

$$k = (1-b)E/(1-cb)P, \text{ where} \qquad (3)$$

"k" is the cost of equity capital, "b" is the retention ratio, "E" is earnings, "P" is market price and "c" is the ratio of the expected return on equity to the cost of equity capital (ROE/k). This formula shows that when ROE = k, "c" equals 1.0 and the cost of equity capital equals the earnings-price ratio. Moreover, in that case, ROE is greater than "k" (as it is in today's market), "c" is greater than 1.0 and the earnings-price ratio will understate the cost of equity. Also, the more that ROE exceeds "k" the more the earnings price ratio will understate "k." In other words, those two parameters, the earnings-price ratio and the expected return on equity (ROE), orbit around the cost of equity capital with the cost of equity as the locus, and fluctuate so that their mid-point approximates the cost of equity capital.

Assuming an industry average retention ratio of about 30% (i.e., 70% of earnings are paid out as dividends), the stochastic relationship between the expected return (ROE) and the earnings price ratio can be determined from Equation (ii), above, as shown in Table II below. Most importantly, Equation (3) shows that the average of the EPR and ROE (which is my MEPR analysis) will approximate "k", the cost of equity capital.

Table II.

SUPPORT FOR THE MODIFIED EARNINGS PRICE RAITO ANALYSIS

Cost of Equity	Retention Ratio	ROE	ROE/k	Earnings Price Ratio	M.E.P.R. (ROE+EPR)/2
[1]	[2]	[3]	[4]=[3]/[1]	[5]	[6]=([3]+[5])/2
10.00%	35.00%	13.00%	1.3	8.38%	10.69%
10.00%	35.00%	12.00%	1.2	8.92%	10.46%
10.00%	35.00%	11.00%	1.1	9.46%	10.23%
10.00%	35.00%	10.00%	1.0	10.00%	10.00%
10.00%	35.00%	9.00%	0.9	10.54%	9.77%
10.00%	35.00%	8.00%	0.8	11.08%	9.54%
10.00%	35.00%	7.00%	0.7	11.62%	9.31%

[5] From Equation (3): $E/P = k(1-cb)/(1-b)$

As the data in Table II shows, the average of the expected return (ROE) and the earnings price ratio (EPR) produces an MEPR estimate of the cost of common equity capital of sufficient accuracy to serve as a check of other analyses, which is how I use the model in my testimony.

Q. WHAT ARE THE RESULTS OF YOUR EARNINGS-PRICE RATIO ANALYSIS OF THE COST OF EQUITY FOR THE SAMPLE GROUP?

A. Schedule 9 shows the IBES projected 2009 per share earnings for each of the firms in the sample groups. Recent average market prices (the same market prices used in my DCF analysis), and Value Line's projected return on equity for 2009 and 2011-2013 for each of the companies are also shown.

The average earnings-price ratio for the water sample group, 5.38%, is below the cost of equity for those companies due to the fact that their average market-to-book ratio is currently above unity (average water utility M/B = 1.87). The sample water companies' 2009 expected book equity return averages only 8.88%. For the water sample group, then, the mid-point of the earnings-price ratio and the current equity return is 7.13%.

Schedule 9, page 1 also shows that the average expected book equity return for the water utilities over the next three- to five-year period increases slightly to 10.38%. The midpoint of the long-term projected return on book equity (10.38%) and the current earnings-price ratio (5.38%) is 7.88%. That longer-term analysis provides another forward-looking estimate of the equity capital cost rate of water utility firms. Both of those results, like the CAPM results, are well below the cost of equity estimate provided by the DCF.

For the gas companies, the current earnings-price ratio is 7.73% and the average 2009 and 2011-2013 equity returns are projected to be 11.06% and 11.88%. Therefore, for those companies the MEPR results, 9.40% (near-term) and 9.80% (long-term) tend to agree with the DCF results derived previously and indicate that the cost of equity of the gas distributors is higher than that of the water utility companies.

D. MARKET-TO-BOOK RATIO ANALYSIS

Q. PLEASE DESCRIBE YOUR MARKET-TO-BOOK (MTB) ANALYSIS OF THE COST OF COMMON EQUITY CAPITAL FOR THE SAMPLE GROUPS.

A. This technique of analysis is a derivative of the DCF model that attempts to adjust the capital cost derived with regard to inequalities that might exist in the market-to-book ratio. This method is derived algebraically from the DCF model and, therefore, cannot be considered a strictly independent check of that method. However, the MTB analysis is useful in a corroborative sense. The MTB seeks to determine the cost of equity using market-determined parameters in a format different from that employed in the DCF analysis. In the DCF analysis, the available data is "smoothed" to identify investors' long-term sustainable expectations. The MTB analysis, while based on the DCF theory, relies instead on point-in-time data projected one year and five years into the future and, thus, offers a practical corroborative check on the traditional DCF. The MTB formula is derived as follows:

Solving for "P" from Equation (1), the standard DCF model, we have

$$P = D/(k-g). \qquad (4)$$

But the dividend (D) is equal to the earnings (E) times the earnings payout ratio, or one minus the retention ratio (b), or

$$D = E(1-b). \qquad (5)$$

Substituting Equation (5) into Equation (4), we have

$$P = \frac{E(1-b)}{k-g} . \qquad (6)$$

The earnings (E) are equal to the return on equity (r) times the book value of that equity (B). Making that substitution into Equation (6), we have

$$P = \frac{rB(1-b)}{k-g} . \qquad (7)$$

Dividing both sides of Equation (7) by the book value (B) and noting from Equation (iii) in Appendix B that g = br+sv,

$$\frac{P}{B} = \frac{r(1-b)}{k-br-sv} . \qquad (8)$$

Finally, solving Equation (8) for the cost of equity capital (k) yields the MTB formula:

$$k = \frac{r(1-b)}{P/B} + br + sv. \qquad (9)$$

Equation (9) indicates that the cost of equity capital equals the expected return on equity

multiplied by the payout ratio, divided by the market-to-book ratio plus growth. Schedule 10 shows the results of applying Equation (9) to the defined parameters for the water utility firms in the comparable sample. For the water utility sample group, page 1 of Schedule 10 utilizes next year (2007 and 2008) data for the MTB analysis while page 2 utilizes Value Line's 2011-2013 projections.

The MTB cost of equity for the sample of water utility firms, recognizing a current average market-to-book ratio of 1.56 is 9.35% using the current year data and 9.79% using projected three- to five-year data. The average of those point-in-time estimates is below my DCF equity cost estimate for water utilities.

For the gas distributors in my sample group the MTB analysis, shown on pages 3 and 4 of Schedule 10, indicates a near-term result of 9.80% and a long-term result of 9.53%. The average of those MTB results for the gas distributors (9.66%) is also below my DCF results for that group (9.88%).

E. SUMMARY

Q. PLEASE SUMMARIZE THE RESULTS OF YOUR EQUITY CAPITAL COST ANALYSES FOR THE SAMPLE GROUPS OF WATER UTILITY COMPANIES AND GAS DISTRIBUTION COMPANIES.

A. My analysis of the cost of common equity capital for the sample groups of water and gas distribution utility companies is summarized in the table on the next page.

Table III

Equity Cost Estimates

METHOD	Water Utility Companies	Gas Distribution Companies
DCF	9.74%	9.88%
Mulit-DCF	8.10%	9.04%
CAPM	7.19%/8.44%	6.58%/7.66%
MEPR	7.13%/7.88%	9.40%/9.80%
MTB	9.35%/9.79%	9.53%/9.80%

For the water utility sample group, the DCF results are 9.74%. However, the multi-stage DCF results, using the Congressional Budget Office's projected growth in GDP as the final long-term growth rate indicates a much lower cost of equity. In addition, the corroborating cost of equity analyses (MEPR, MTB, and CAPM)[13], also indicate that the DCF result is overstated. Averaging the lowest and highest results of all the corroborative analyses for the water companies produces an equity cost range of 7.89% to 8.70%, with a mid-point of 8.30%. Even the highest end of the corroborative methods, 8.70%, is roughly 100 basis points below the DCF result, indicating that the DCF result for the water companies is overstated.

For the gas distributors, the DCF result is slightly higher than the water companies—9.88%. The results of the multi-stage DCF are below the standard DCF estimate but not to the degree as the difference in the water company DCF results. With regard to the corroborative analyses, the average of the high and low CAPM, MEPR and MTB results for the gas utilities ranges from 8.50% to 9.09%, with a mid-point of 8.80%. For these utilities the high end of the corroborative results, 9.09% is in closer agreement with my standard DCF result indicating that while that result, too, is overstated, it is to a

[13] I do not include the multi-stage DCF result in the calculation of corroborative analyses because it is a cost of capital methodology I do not normally use in my analysis.

lesser degree than my DCF result for the water companies.

While the results of these analyses are widely dispersed due to the unusual nature of the current economic environment, they indicate that the cost of equity capital for the utility sample groups lies below the standard DCF results for those companies. Moreover, while the CAPM results, especially at the low end, are unlikely to represent investor equity return expectations, they are informative, are based on widely-accepted theory and observable risk-free rates of return, and provide an indication that the current cost of equity is lower than that represented by the DCF. Reviewing the results cited above, it is my opinion that the current cost of equity for the sample groups of utilities studied ranges from 9.0% to 9.75%. Within that range, my cost of equity analysis also indicates that an appropriate equity cost estimate for gas utilities would be in the upper portion of that range and water utilities would be in the lower portion of the 9.0% to 9.75% range. For example, as I noted above, the mid-point of the range of corroborative cost of equity results for the water companies (8.28%) is roughly 50 basis points below the mid-point of the range of those same analyses for the gas companies. Therefore, within a 9.0% to 9.75% range, an equity cost estimate for water companies would range from 9.0% to 9.50%.

Q. WHAT HAVE YOU DETERMINED TO BE A REASONABLE POINT-ESTIMATE FOR KENTUCKY-AMERICAN WITHIN A THE RANGE FOR SIMILAR-RISK FIRMS?

A. Because the capital structure I recommend for ratesetting purposes contains less common equity and more debt than average for the sample group, Kentucky-American, prospectively will have somewhat higher financial risk than the sample group and should be awarded an equity return above the mid-point of a reasonable range. Therefore, an equity return of 9.50%, above the 9.25% mid-point of a reasonable range of equity cost for similar-risk firms, would be reasonable for ratemaking purposes in this proceeding.

Q. IS THERE INDEPENDENT EVIDENCE IN THE RECORD IN THIS PROCEEDING THAT CONFIRMS THE REASONABLNESS OF YOUR EQUITY COST ESTIMATE FOR KENTUCKY-AMERICAN?

A. Yes. In response to AG-DR-1-133, the Company provided the return it expects to earn on its own equity investments—the equity investments in its retirement portfolio. On its investment in the S&P 500 (which comprises more than half of its equity investment portfolio) the Company projects that it will earn an **begin confidential** XXXX **end confidential** return. On its total equity portfolio, which includes international equities and "small cap" companies, the Company projects a long-term return expectation of **begin confidential** XXXX **end confidential**. By that measure, based on the Company's own long-term equity return expectations, my recommended return on equity for Kentucky-American, 9.5%, is conservative.

Q. DOES YOUR 9.50% EQUITY COST ESTIMATE INCLUDE AN INCREMENT FOR FLOTATION COSTS?

A. No, it does not.

Q. CAN YOU PLEASE EXPLAIN WHY AN EXPLICIT ADJUSTMENT TO THE COST OF EQUITY CAPITAL FOR FLOTATION COSTS IS UNNECESSARY?

A. An explicit upward adjustment to the market-based DCF results to "account for" flotation costs is unnecessary for several reasons. First, it is often said that flotation costs associated with common stock issues are exactly like flotation costs associated with bonds. That is not a correct statement because bonds have a fixed cost and common stock does not. Moreover, even if it were true, the current relationship between the water utility sample group's stock price and its book value would indicate a flotation cost reduction to the market-based cost of equity, not an increase.

When a bond is issued at a price that exceeds its face (book) value, and that difference between market price and the book value is greater than the flotation costs

incurred during the issuance, the embedded cost of that debt (the cost to the company) is *lower* than the coupon rate of that debt.

In the current economic environment for the water utility common stocks studied to determine the cost of equity in this proceeding, those stocks are selling at a market price well above book value. (Exhibit__(SGH-1), Schedule 3, pp. 1 and 3) The difference between the market price of water utility stocks and book value dwarfs any issuance expense the companies might incur. If common equity flotation costs were exactly like flotation costs with bonds and if an explicit adjustment to the cost of common equity were, therefore necessary, then the adjustment should be downward, not upward.

Second, flotation cost adjustments are usually predicated on the prevention of the dilution of stockholder investment. However, the reduction of the book value of stockholder investment due to issuance expenses can occur only when the utility's stock is selling at a market price at or below its book value. As noted, the companies under review are selling at a substantial premium to book value. Therefore, every time a new share of that stock is sold, existing shareholders realize an *increase* in the per share book value of their investment. No dilution occurs, even without any explicit flotation cost allowance.

Third, the vast majority of the issuance expenses incurred in any public stock offering are "underwriter's fees" or "discounts". Underwriter's discounts are not out-of-pocket expenses for the issuing company. On a per share basis, they represent only the difference between the price the underwriter receives from the public and the price the utility receives from the underwriter for its stock. As a result, underwriter's fees are not an expense incurred by the issuing utility and recovery of such "costs" should not be included in rates.

In addition, the amount of the underwriter's fees are prominently displayed on the front page of every stock offering prospectus and, as a result, the investors who participate in those offerings (e.g., brokerage firms) are quite aware that a portion of the price they pay does not go to the company but goes, instead, to the underwriters. By electing to buy the stock with that understanding, those investors have effectively accounted for those issuance costs in their risk-return framework by paying the offering price. Therefore, they do not

need any additional adjustments to the allowed return of the regulated firm to "account" for those costs.

Fourth, my DCF growth rate analysis includes an upward adjustment to equity capital costs which accounts for investor expectations regarding stock sales at market prices in excess of book value, and any further explicit adjustment for issuance expenses related to increases in stock outstanding is unnecessary.

Fifth, research has shown that a specific adjustment for issuance expenses is unnecessary[14]. There are other transaction costs which, when properly considered, eliminate the need for an explicit issuance expense adjustment to equity capital costs. The transaction cost that is improperly ignored by the advocates of issuance expense adjustments is brokerage fees. Issuance expenses occur with an initial issue of stock in a primary market offering. Brokerage fees occur in the much larger secondary market where pre-existing shares are traded daily. Brokerage fees tend to increase the price of the stock to the investor to levels above that reported in the Wall Street Journal, i.e., the market price analysts use in a DCF analysis. Therefore, if brokerage fees were included in a DCF cost of capital estimate they would raise the effective market price, lower the dividend yield and lower the investors' required return. If one considers transaction costs that, supposedly, raise the required return (issuance expenses), then a symmetrical treatment would require that costs that lower the required return (brokerage fees) should also be considered. As shown by the research noted above, those transaction costs essentially offset each other and no specific equity capital cost adjustment is warranted.

Q. WHAT IS THE OVERALL COST OF CAPITAL FOR KENTUCKY-AMERICAN'S WATER UTILITY OPERATIONS, BASED ON AN ALLOWED EQUITY RETURN OF 9.50%?

A. Schedule 11 attached to my testimony shows that an equity return of 9.50%, operating

[14] "A Note on Transaction Costs and the Cost of Common Equity for a Public Utility," Habr, D., National Regulatory Research Institute Quarterly Bulletin, January 1988, pp. 95-103.

through a ratemaking capital structure of 42.309% common equity, 1.946% preferred stock, 45.408% long-term debt and 10.377% short-term debt, and the Company's projected embedded capital cost rates for preferred stock and long-term debt, produces an overall return of 7.549% for Kentucky-American. Schedule 11 also shows that a 7.549% overall cost of capital affords the Company an opportunity to achieve a pre-tax interest coverage level of 3.06 times. That level of pre-tax interest coverage afforded by my recommended overall return exceeds the actual pre-tax interest coverage of approximately 2.0x o 2.5x actually achieved by Kentucky American in 2007 and 2008, according to the Company's Exhibit 31 (monthly earnings reports) filed in this proceeding. Therefore, the equity return I recommend fulfills the legal requirement of Hope and Bluefield of providing the Company the opportunity to earn a return which is commensurate with the risk of the operation and serves to support and maintain the Company's financial integrity and its ability to attract capital.

Q. MR. HILL, YOU BEGAN YOUR DISCUSSION OF THE COST OF EQUITY CAPITAL EQUATING THE COST OF EQUITY CAPITAL AND THE PROFIT THAT SHOULD BE ALLOWED THE REGULATED FIRM. BASED ON THE COMPANY'S REQUESTED RATE BASE, HOW MUCH PROFIT WOULD YOUR RECOMMENDATION ALLOW KENTUCKY-AMERICAN TO REALIZE EACH YEAR?

A. Based on the Company's requested rate base of $305.544 Million, and a ratemaking equity ratio of 42.309%, my recommended return on equity (9.50%) would afford the Company an opportunity to earn a profit, after meeting all operating expenses, of $12.28 Million annually. [$305.544 Million x 42.309% x 9.50%] The Company's requested return on equity in this proceeding, 11.50%, would provide an opportunity for KAW to earn an annual profit of $14.87 Million. In my view, the return on equity I recommend and the annual profit it would allow the Company to earn provides an appropriate balance between the interests of Kentucky-American's investors and its customers. The annual level of

profit implied in the Company's rate of return request in this proceeding, approximately $2.5 Million greater, would unnecessarily enrich the Company's stockholder—American Water Works—at ratepayer expense.

Q. DOES THIS CONCLUDE YOUR DETERMINATION OF THE COST OF EQUITY CAPITAL, MR. HILL?

A. Yes, it does.

IV. COMMENTS ON COMPANY COST OF CAPITAL TESTIMONY

Q. WHAT ASPECTS OF DR. VANDER WEIDE'S TESTIMONY WILL YOU ADDRESS?

A. I will address each cost of capital analysis presented by Company witness Vander Weide, describing the shortcomings in each and underscoring the reasonableness of my position on that issue in this proceeding. This portion of my testimony will include discussions of the application of the Discounted Cash Flow (DCF), Capital Asset Pricing Model (CAPM), and additional risk premium equity cost estimation techniques by Dr. Vander Weide.

However, at the outset of this portion of my testimony I will discuss Dr. Vander Weide's position regarding the appropriate capital structure to be considered in determining the cost of equity capital in a rate base/rate of return rate proceeding such as this. Although, in this proceeding, Dr. Vander Weide has not recommended a specific upward adjustment to the cost of equity because of supposed risk differences between the market-value capital structures of his sample group and the book-value capital structure of KAW, he provides the groundwork for such an adjustment and couches his 11.5% equity return recommendation as conservative because he elects not to make such an upward adjustment.

In other utility rate cases, Dr. Vander Weide has made upward adjustments to the cost of equity related to market-value capital structures. For example in his testimony before the Missouri Public Service Commission on behalf of AmerenUE in Case No. ER-

2007-0002, Dr. Vander Weide recommended a 70 basis point upward adjustment to the cost of equity related solely to differences between market-value and book-value capital structures.

Therefore, even though the Company has made no explicit adjustment in this proceeding related to market-value capital structures, it has provided the logical basis for doing so through Dr. Vander Weide's testimony. The deficiencies in that logic should be brought to the Commission's attention in order that the Company will not be able to build a position in the future on flawed but un-rebutted testimony provided in this proceeding. Reliance on market–value capital structures is unorthodox in regulation, is based on improper application of long-standing capital structure theory and, if employed in determining the allowed return in a regulatory setting such as this, would require consumers to provide returns higher than the cost of capital and unnecessarily increase rates. Those higher rates, if allowed, would work to increase market-to-book ratios and call for even higher adjustments to allowed returns in the future, creating an unending and quite unnecessary upward spiral in allowed returns.

A. MARKET-VALUE CAPITAL STRUCTURES

Q. JUST TO BE CLEAR, WHEN YOU USE THE TERMS "BOOK-VALUE CAPITAL STRUCTURES" AND "MARKET-VALUE CAPITAL STRUCTURES," WHAT DO YOU MEAN?

A. Book-value capital structures represent the actual mix of capital used by the firm and are calculated based on the dollar amount of each form of capital (common equity, preferred stock, and long-term) appearing on the books (the balance sheet) of the firm. The market-value capital structure is a percentage mix of capital in which the amounts of capital are measured based on their market value.

The market value of common equity capital is the total dollar amount of equity measured on a market value basis. It is calculated as the number of shares outstanding times

the current market price per share. The market value of debt is more difficult to calculate. If the prevailing interest rates are lower (higher) than the coupon rate of a firm's debt, the market value of that debt will be higher (lower) than the face amount. That is, the market value of a thousand-dollar 7% bond will be higher than $1000 if the prevailing interest rate for that type of security is lower than 7%, and vice versa. However, unless current interest rates are very different from embedded debt costs, the fair value of a firm's debt will approximate its book value. It appears that Dr. Vander Weide has assumed that the market value of the debt of his sample companies is equal to its book value, and the "market-value" capital structures he references are a hybrid mix of market and book value.

Q. CAN YOU PROVIDE A BRIEF EXPLANATION OF DR. VANDER WEIDE'S MARKET-VALUE CAPITAL STRUCTURE LOGIC?

A. Dr. Vander Weide's position is that investors rely on market value capital structures, and a cost of equity estimate (from DCF, CAPM, etc.) relates to the financial risks inherent in those market-value capital structures. He testifies that if the cost of equity is applied to a utility book value capital structure that has less equity and more debt (and, therefore he believes, more financial risk) than contained in the market-value capital structures of the sample companies, the equity return will not be sufficient to satisfy investors, i.e., it will be too low. As noted above, while he elects not make an upward adjustment to the cost of equity in this proceeding, he has done so in other jurisdictions, based on the same logic.

Q. WHEN THERE ARE DIFFERENCES IN MARKET-VALUE AND BOOK-VALUE CAPITAL STRUCTURES FOR A FIRM OR A TYPE OF FIRM ARE THERE DIFFERENCS IN FINANCIAL RISK?

A. No—that is a key assumption in Dr. Vander Weide's logic, and it is a fundamental flaw. Dr. Vander Weide is making a theoretically improper comparison between market-value capital structures and book-value capital structures in order to claim that a financial risk difference exists. There is no theoretical support for that position. While it is meaningful to

compare one market-value capital structure to another market-value capital structure or one book-value capital structure to another, comparing the market-value capitalization to the book value capitalization of the same firm or type of firms simply does not have theoretical meaning.

When utility common equity market prices are above book value, the capital structure measured with market values will have a higher equity percentage and a lower debt percentage than the capital structure measured with book value. That does not signify any difference whatsoever in financial risk. In its focus on market-value capital structures, the Company is claiming that one firm or type of firm can have two levels of financial risk. This is not possible.

Q. WHY IS IT IMPOSSIBLE FOR ONE TYPE OF COMPANY TO HAVE TWO LEVELS OF FINANCIAL RISK?

A. There can be no "difference" in financial risk for one company or one type of company at one point in time, regardless of the relationship between market price and book value. Yet, that is a basis for the Company's focus on market-value capital structure.

Financial risk, by definition, is a function of the degree to which interest payments impact the volatility of a firm's income stream. As the dollar amount of interest expense increases relative to the operating income available to pay debt service, the volatility of the net income available to stockholders increases. That increase in the volatility of the return creates more risk for the stockholders. It is the additional interest expense that causes the increase in the volatility of the income available to stockholders. This is a standard description of financial risk found in textbooks.[15]

In other words, true financial risk is a function of the amount of fixed charges or debt expense incurred by the firm and the impact of those fixed charges on the variability of the income available to the stockholder. Therefore, when the actual amount of borrowed

[15] See, for example, Brigham, E. F., Intermediate Financial Management, 5th Ed, 1996, Dryden Press, Fort Worth TX, pp. 361-364.

funds increases, causing the dollar amount of fixed charges to increase, financial risk increases. On that issue, all parties would agree.

Market-value capital structure and book-value capital structure are simply different ways to measure the amount of debt leverage in the capitalization of a company. One measure uses the market value of the capital and one use the book values of the capital. However, there is no difference in the actual fixed charges incurred by a firm whether one measures the capital ratios with market values or book values. The genesis of financial risk—the actual interest expense—does not change. Because of that fact, one company (or group of companies) at one point in time cannot have two levels of financial risk, no matter how the capital structure ratios are measured. That is because the amount of fixed charges (the actual debt costs) does not change. Differences between market-value and book-value capital structure cannot, therefore, reflect differences in financial risk for one company or group of companies at any one point in time. Therefore, Dr. Vander Weide's position that an upward adjustment to the cost of equity capital is related to financial risk differences that exist between market-value and book-value capital structures is incorrect.

Q. YOU NOTED PREVIOUSLY THAT THE USE OF MARKET-VALUE CAPITAL STRUCTURES INSTEAD OF BOOK-VALUE CAPITAL STRUCTURES RESULTS IN HIGHER COST OF CAPITAL ESTIMATES, CORRECT?

A. Yes. In today's market environment, with utility stock prices well in excess of book values, market-value capital structures will have common equity ratios that exceed book-value capital structures. Because equity capital is about twice as expensive as debt capital on a pre-tax (ratemaking) basis, the use of market-value capital structures in a regulated setting substantially increases the estimate of cost of capital to be applied to a book value rate base.

Q. CAN YOU PROVIDE A SIMPLE EXAMPLE TO SHOW HOW THE USE OF MARKET-VALUE CAPITAL STRUCTURES WOULD RESULT IN HIGHER ALLOWED RETURNS THAN TRADITIONAL RATEMAKING METHODS?

A. Yes. Let's assume a regulated utility has a book-value capital structure consisting of 50% equity and 50% debt. Also assume that the cost of equity is known to be 10% and the debt cost is 6%. In that instance, under long-accepted standard ratemaking techniques, the overall cost of capital to be applied to the utility's rate base is 8.0%.

Table IV

Book-value Capital Structure

Capital	Percent	Cost Rate	Wt. Cost
Equity	50%	10%	5.00%
Debt	50%	6%	3.00%
Total	100%		8.00%

Let's also assume that the market price of our example utility is twice its book value. For simplicity of exposition, we will also assume that the market price of our utility's debt equals it's the book value of that debt. Given those assumptions, the market value of the equity of our utility is twice the market value of its debt, and the market-value capital structure would consist of 67% common equity and 33% debt. Using a market-value capital structure to determine the overall cost of capital, using the same capital costs, would produce an overall cost of capital of 8.68%.

Table V

Market-value Capital Structure

Capital	Percent	Cost Rate	Wt. Cost
Equity	67%	10%	6.70%
Debt	33%	6%	1.98%
Total	100%		8.68%

In jurisdictions in which he elects to make an upward adjustment to his recommended return on equity, Company witness Vander Weide would recommend in this instance that the use of an overall return based on the market-value capital structure of 8.68% to set rates. If that 8.68% overall cost of capital is used to set rates, the allowed return on book equity increases from 10% (the cost of equity capital that would have been allowed under traditional ratemaking practices) to 11.36%, as shown in the Table below.

Table VI

Market-value Overall Return Applied to Book-value Capital Structure

Capital	Percent	Cost Rate	Wt. Cost
Equity	50%	11.36%	5.68%
Debt	50%	6.00%	3.00%
Total	100%		**8.68%**

As this example shows, the use of a market-value capital structure in rate base/rate of return regulation becomes a means by which utilities can be allowed equity returns (11.36%) that exceed cost of equity capital (10%). Allowing equity returns that exceed the return investors require (the cost of capital) runs counter to ratemaking standards of Hope and Bluefield, would be economically inefficient, and will cause an unnecessary transfer of wealth from ratepayers to stockholders.

Q. HAS DR. VANDER WEIDE CONSISTENTLY USED MARKET-VALUE CAPITAL STRUCTURES IN HIS DETERMINATION OF THE APPROPRIATE OVERALL RETURN TO BE ALLOWED UTILITIES IN RATE BASE/RATE OF RETURN PROCEEDINGS SUCH AS THIS?

A. No. Dr. Vander Weide has testified on the subject of the cost of equity for several decades and prior to 2004 he applied cost of equity estimates determined by DCF, CAPM and Risk

Premium analyses directly to utility book-value capital structures. Since 2004, as he explained in the deposition cited below, he has elected to use market-value capital structures (which is referenced in the cite below as a "leverage adjustment").

> "Q. Now, we also asked you a data request to indicate when you began doing this particular calculation and what cases, and you gave us four cases all in '04. Do you recall that, the Dominion Resources, the PG&E Company, Empire and Mid-America Energy?
> A. Right. Yes, I do recall that.
> Q. And prior to your filing testimony with this method in those cases, did you use another method?
> A. I didn't -- I did everything up to the fair rate of return the same. That is, I would do a DCF and a risk premium study, but I did not take the final step of saying that cost of equity determines why those risk -- why those DCF risk and premium studies be sufficient to allow the company to earn returns that are comparable to the returns investors expect of other companies of comparable risk, and, thus, be able to attract capital.
> And so it's only recently that I took the final step of asking, well, what is required in order to attract capital in the marketplace?
> Q. And could you explain to me why you recently changed your methodology for determining ROE and you just recently started performing this leverage adjustment that you just described?
> A. Yes. Because I didn't believe that just looking at the results of DCF and CAP-M and risk premium model would allow the companies to attract capital in the marketplace, because the marketplace looks at current interest rates and market value capital structures. Applying cost of DCF models and risk premium models and CAP-M models to the company's book value capital structures will be insufficient to allow the companies to attract capital in the marketplace.
> Q. So for the previous 30 years when you weren't utilizing this leverage adjustment, you were doing it incorrectly?
> A. I was doing it partially. I was correctly applying the DCF. I was correctly applying the risk premium and CAP-M. I did not take the final test, which I believe is necessary to allow the company to attract capital in the marketplace. I don't believe it's incorrect. It just wasn't complete.
> Q. So for 30 years you thought it was appropriate to recommend an incomplete DCF recommendation to public utility commissions?
> A. I viewed my assignment in those -- during that time as providing the results of cost-of-equity models, such as the DCF and the CAP-M and risk premium. I did not view my assignment as taking the further step of recommending the

rate of return that would allow a company to truly attract capital in the marketplace. I knew that it was incomplete, but I didn't view my assignment as taking that additional step.
Q. And when did your assignment change?
A. In the testimonies that I cited.
Q. And why did your assignment change?
A. Because I informed the companies that I was working with that if we did things in the way we always have, they would not be able to attract capital in the marketplace, and they agreed that I ought to take the additional step to make sure they could attract capital in the marketplace."
(Deposition of James Vander Weide, Case No. ER-2004-0570, Empire District Electric Company, November 12, 2004, pp. 79-81)

Q. DR. VANDER WEIDE INDICATES AT PAGE 8 OF HIS DIRECT THAT "ECONOMISTS MEASURE THE PERCENTAGES OF DEBT AND EQUITY IN A FIRM'S CAPITAL STRUCTURE BY FIRST CALCULATING THE MARKET VALUE OF THE FIRM'S DEBT AND THE MARKET VALUE OF ITS EQUITY." IS THIS A NEW THEORY THAT HAS JUST BEGUN TO BE IMPLEMENTED?

A. No. While it is certainly true that the capital structure theory in textbooks refers to market values, this has been the case since the 1950s. In the ensuing fifty years, regulated utility rates have been based on book-value capital structures and during that time utilities have been able to attract the capital necessary to provide the service required by the public. Moreover, during that time period Dr. Vander Weide has also applied equity costs directly to utility book values, as is the standard practice.

The use of a book-value capital structure to determine overall capital costs in traditional utility rate proceedings is a long-standing universal practice. Book-value capital structure has long been used to determine the capital costs associated with a depreciated original-cost rate base. Investors are aware of that regulatory practice and, through efficient markets, incorporate that understanding into the stock prices they provide for utility equities. Investors are also aware that capital structure data—whether obtained through the Securities and Exchange Commission, regulatory bodies such as FERC, company annual reports, bond rating agencies, or investor services available in hardcopy or on the internet—is

universally presented as book value, i.e., the capital values that appear on the books of the company. Book value is the appropriate capital structure measure to use in rate setting and equity capital costs determined in the market place do not have to be adjusted to account for differences between market-value and book value capital structures, as Dr. Vander Weide's testimony in this proceeding incorrectly suggests.

Q. YOU NOTED PREVIOUSLY THAT DR. VANDER WEIDE PRESENTED THIS MARKET-VALUE CAPITAL STRUCTURE LOGIC RECENTLY IN ANOTHER REGULATORY JURISDICTION. DID THAT COMMISISON ACCEPT THE ADJUSTMENT?

A. No. In its Report and Order in Docket No. ER-2007-0002, the Missouri Commission rejected Dr. Vander Weide's market-value risk adjustment. In that proceeding the utility (AmerenUE) had more than one cost of equity capital witness, both of whom recommended an adjustment for financial risk related to differences between the market-value capital structures of the sample companies and the book value capital structures of the applicant. The Commission stated:

> "In large part, the overly high return on equity recommendations put forward by AmerenUE's witnesses result from their inclusion of a large financial risk add-on premium, based on the allegedly greater financial risk resulting from the market value of common equity in AmerenUE's capital structure. The witnesses use this premium adjustment to increase McShane's return on equity recommendation by 100 basis points, and Vander Weide's by 70 basis points. But despite his advocacy of an adjustment to account for AmerenUE greater risk, Vander Weide acknowledged at the hearing the AmerenUE's risk is about average for the electric industry.
>
> In addition to the obvious incongruity of a large risk adjustment for a company with an average level of risk, the opposing experts convincingly explained that the proposed upward adjustment for financial risk was inappropriate for more technical reasons as well." Missouri Public Service Commission, Case No, ER-2007-0002, Report and Order, May 22, 2007, p. 40.

Q. HAVE OTHER COMMISSIONS RULED SIMILARLY REGARDING THE MARKET-VALUE/FINANCIAL RISK ISSUE?

A. Yes. In testimony in a telecommunications rate proceeding in Maine in 2006, Dr. Vander Weide provided cost of equity capital testimony, suggesting the use of market-value capital structures and an upward adjustment to the allowed return on equity to account for "risk" differences between market-value and book-value capital structures. Although the case was ultimately settled, the Hearing Examiner's Order rejected Dr. Vander Weide's use of market-value capital structures:

> "We cannot seriously consider adopting either of Dr. Vander Weide's recommendations in this proceeding for a number of reasons. With respect to the use of a market value capital structure, we, like Mr. Hill, are concerned about Dr. Vander Weide's relatively recent change of heart concerning the book value versus market value debate. More importantly, however, the investment community is well aware that utility rates are determined using book value capital structures and they are equally well aware that the LEC industry is still subject to traditional rate regulation in many areas of the country. Dr. Vander Weide made the suggestion that attraction of capital could become an issue if market value capital structures were not employed by regulatory commissions; however, he provided no evidence to support his hypothesis. Meanwhile, Mr. Hill did provide evidence showing that the LDC industry has had no difficulty attracting capital under traditional ratemaking (i.e. book value capital structures) methods.
>
> A final, compelling point made by Mr. Hill concerning the use of market value capital structures is that their use would undoubtedly produce higher earnings for a utility than book value capital structures. This would then lead to higher market valuations and therefore higher market-to-book ratios, followed by a continuous upward spiral in common equity ratios that would then be used in the next rate case. It would create a level of circularity in the ratemaking process that is unnecessary, given that Verizon Maine has made no showing that basing returns for utilities on book value capital structures has been detrimental to the attraction of capital on reasonable terms over a very long period, including the recent past."(Maine P.U.C. Docket No. 2005-155, Hearing Examiner's Order, May 9, 2007, pp. 61, 62)

Also, in response to a ratemaking proposal that considered market-value capital structures for a sister company of KAW—West Virginia American Water—the West Virginia Public Service Commission strongly rejected the use of market values to determine rates. That Commission saw a recommended adjustment to the cost of equity based on market values as an attempt to supplant original cost rate base regulation with fair value rate base regulation, which is illegal in that state.

> "Additional examples of the Company witness raising his sights above what a reasonable analysis produces can be found in the market value adjustments that he makes. His water group DCF analysis would be only 8.98%; however, he leverages this number up by 54 basis points, or .54%, to reflect the fact that stockholders pay market prices for stock and those market prices may exceed the book value of a utility's rate base. Thus, the Company asks us to effectively depart from our long-standing use of an original cost rate base. We could do this by simply applying the derived rate of return, before market price leveraging, to an inflated rate base that exceeds book value or, in the alternative chosen by the Company, we can continue to use original cost rate base and apply an inflated rate of return to that rate base." (W.V.P.S.C. Case No. 03-0353-W-42T, West Virginia-American Water Works, January 2, 2004, p. 18.)

Therefore, the use of market-value capital structures as a basis for ratemaking turns the concept of depreciated original cost ratemaking on its head. From an economic point of view, a market-value capital structure is more closely related to a "fair value" measure of the utility plant. A market-value capital structure is, by definition, the value the market puts on the capital invested in the firm, based on current market conditions and expectations. In that way, it can be said to represent the "fair value" of the company's utility investments in today's marketplace. As the West Virginia P.S.C. held, the use of market-value capital structures to determine the overall return that should be applied to book-value rate base is an attempt to avoid original cost rate base regulation. That Commission also rejected the adjustment.

Q. DOES THIS CONCLUDE YOUR DISCUSSION OF THE COMPANY'S REFERENCE TO MARKET-VALUE CAPITAL STRUCTURES?

A. Yes. The use of market-value capital structures to determine the overall cost of capital to be applied in rate base/rate of return proceedings is incorrect on both theoretical and logical grounds, diverges from long-standing utility practice, would unnecessarily inflate allowed returns above the cost of equity capital if implemented, and should be rejected by this Commission.

B. COMPANY COST OF EQUITY ANALYSIS

DISCOUNTED CASH FLOW

Q. WHAT COMMENTS DO YOU HAVE REGARDING THE DETAILS OF THE COMPANY'S DCF ANALYSES?

A. As shown in the footnote on in Schedule 1-1 attached to his Direct Testimony in this proceeding, Dr. Vander Weide uses the following DCF formula to estimate equity capital costs:

$$k = [d_1(1+k)^{.75} + d_2(1+k)^{.50} + d_3(1+k)^{.25} + d_4]/P_0 + g \qquad (10)$$

This particular version of the DCF model produces cost of equity results that are higher than the standard DCF model. Aside from the obvious mathematical complexity of this model, which requires an iterative solution and makes it doubtful that the average investor actually uses it, this version of the DCF model implicitly assumes that dividends increase every quarter. However, that is not the manner in which dividends are actually paid out by utilities. Usually, after dividends are raised, they are kept at a constant level for several quarters. It would be very unusual if any of the companies analyzed by the Company witness raised their dividend every quarter.

The rationale supporting a constantly increasing dividend is grounded on the ability of investors to reinvest those dividends every quarter in equivalent risk/return investments to earn the incremental "time value of money." That rationale may, or may not, represent the actual actions of investors. Regardless, it is not the ratepayers' responsibility to provide the investor the additional return he or she might receive by reinvesting the quarterly dividend.

In addition, the Company's logic is circular. If, for example, this Commission allowed a higher equity return based on that reinvestment logic, and the higher return translated into a larger dividend, the investor could then take the higher return (in the form of a larger dividend) and reinvest it — expecting a still higher return. Then, would it not be that higher return — drawn from reinvesting those larger dividends — that he or she really expects? Should rates not, therefore, be based on the expectation of compounding the new, larger dividend? The Company's compounding treatment, if taken literally, would have investors expecting, and regulators awarding, higher and higher rates of return to account for larger and larger dividends. The logic is circular, would lead to over-earning, and is without merit.

The Federal Energy Regulatory Commission (FERC), in its Generic Rate of Return rulemaking proceedings held during the 1980s and early 1990s, considered and rejected the use of a DCF model that compounds the quarterly dividend. The FERC held in Order 461 (37 FERC ¶61,287) that if the allowed return were determined using a DCF model that included the dividend compounding recommended by Dr. Vander Weide, the investors would be compensated twice, "--once by the utility [through the allowed rate of return] and once through the investors' reinvestment of the dividends in some other alterative investment."

Finally, for the water companies in Dr. Vander Weide's sample group for which Value Line projects a year-ahead dividend, that investors service projects a current year-ahead dividend yield of 3.26%, while Dr. Vander Weide's quarterly DCF method produces a dividend yield of 3.65%—38 basis points higher than investors expect. The fact that Dr. Vander Weide's quarterly dividend, which was calculated prior to the broad market decline

in July and August 2008, is greater than that currently projected by Value Line for those companies and underscores the overstated nature of his quarterly DCF analysis.

Q. WHAT GROWTH RATE DOES DR. VANDER WEIDE USE IN HIS DCF ANALYSES?

A. Dr. Vander Weide relies exclusively on earnings per share growth forecasts. I have previously discussed the shortcomings of relying exclusively on projected earnings growth rate forecasts and will not repeat that logic here.

As an illustration of the magnitude of the overstatement of the expected growth rate caused by exclusive reliance on projected earnings growth, the average growth rate used in the DCF analysis of Dr. Vander Weide's water utility sample group is 8.3%. As I have explained previously, the growth rate in a single-stage DCF is a long-term sustainable growth and, with the use of an 8.3% growth rate, Dr. Vander Weide is stating his belief that investors expect water utility earnings to grow 8.3% every year into the indefinite future—i.e., forever. Given the fact that the rate of GDP growth is projected to be 4.2%, the average growth in electric utility earnings pre share from 1947 through 1999 was 3.2% and the average growth in earnings for the Dow Jones Industrial Index from 1925 through 2005 was 5.3%, it is simply not reasonable to believe that investors would expect water utilities to grow forever at such an exaggerated rate. [16]

Finally on this point, as I have noted previously, DCF theory assumes that over the long term earnings, dividends and book value grow at the same rate, and the historical results support the reasonableness of that assumption. Currently, Value Line projects that the average earnings, dividends and book value for the three water companies in Dr. Vander Weide's sample group for which projected data are available will be 5.67%. While this is a high expectation, given the long-term GDP growth projections and historical experience cited above, it is fully 200 basis points below the DCF growth rate used by Dr. Vander

[16] GDP projection from current Congressional Budget Office, electric utility earnings per share growth from Moody's Public Utility Manual 2001, and the Dow Jones earning per share growth from Value Line, "A Long-Term Perspective, Dow Jones Industrial Average, 1920-2005.

Weide for those same companies. [7.87% - 5.67% = 2.20%] Dr. Vander Weide's exclusive reliance on projected earnings growth causes his DCF results to be overstated.

Q. ARE THERE OTHER ISSUES RELATED TO THE COMPANY'S DCF ANALYSES THAT YOU WISH TO BRING TO THE ATTENTION OF THE COMMISSION?

A. Yes. In reporting the results of his DCF analysis for his gas companies, Dr. Vander Weide has elected to weight those results based on the market valuation of the companies in that sample group.[17] For his gas companies, Dr. Vander Weide reports a market value-weighted average result of 11.1%. However, the simple arithmetic average of his DCF results is 10.6% and the middle value or median of his gas utility DCF results is 10.1%—well below the average he reports.

If we look more closely at Dr. Vander Weide's gas company sample group, we see that his decision to weight his results based on market value causes the weighted average result to overstate the actual central nature of those results. That is because the second and third largest companies have DCF results that are more than one standard deviations higher than the arithmetic average. Dr. Vander Weide's DCF methodology produces equity cost estimates of 12.9% and 13.5% for ONEOK and Equitable Corp., respectively, two of the largest companies in his sample group. Therefore, his market weighting works to overstate the central nature of his DCF results for his gas utility sample group.

In addition, Dr. Vander Weide did not screen the companies in his gas sample group to account for the amount of unregulated operations in those companies. One of the companies included in Dr. Vander Weide's gas company group is ONEOK, and the January 2009 edition of AUS Utility Reports indicates that regulated electric operations accounted for only 18% of ONEOK's revenues. Therefore, unregulated operations account for the vast majority of that firm's revenues indicating that that company would not provide reasonable proxy for KAW, which realizes all of its revenues from lower-risk regulated

[17] According to Dr. Vander Weide's response to AG-DR-1-143, he used a simple average for his water utility DCF results.

utility operations. Removing ONEOK from Dr. Vander Weide's sample group would result in a simple average DCF cost of equity of 10.39% and a median DCF of 10.05%. In sum, the earnings-growth based DCF result Dr. Vander Weide reports in his testimony for his gas companies, 11.1%, actually overstates the true central nature of those results, which 10% to 10.4%.

BOND YIELD-PLUS-RISK PREMIUM

Q. HOW HAS DR. VANDER WEIDE USED THE BOND YIELD PLUS RISK PREMIUM METHODOLOGY TO ESTIMATE THE COST OF EQUITY IN THIS PROCEEDING?

A. Dr. Vander Weide has performed two bond yield plus risk premium methods: 1) the ex ante (forward-looking) method and 2) the ex post (historical) method. Dr. Vander Weide's ex ante risk premium analyzes the monthly DCF cost of equity for a group of gas utilities over a period of time and subtracts from that value the then-current yield on A-rated utility bonds to estimate an average risk premium. In the ex post risk premium, Dr. Vander Weide averages the historical differences in earned returns on utility stocks and bonds over time to determine a risk premium. In both cases the risk premium estimates are added to projected bond yields to provide estimates of the cost of equity.

Q. PRIOR TO DISCUSSING THE DETAILS OF EACH OF THOSE RISK PREMIUM ANALYSES, DO YOU HAVE ANY COMMENTS OF A GENERAL NATURE REGARDING RISK PREMIUM-TYPE ANALYSES?

A. Yes. A fundamental precept on which the risk premium methodology is based is that the higher risk of stocks over bonds requires an incrementally higher return for those stocks in order for investors to be compensated for assuming the higher risk. Although that is generally true, it is most important to realize that, given a current bond yield of about 6.5%

for BBB-rated utilities[18], an equity return of 8%, 10%, 13% or even 50% would fulfill the requirement of providing a "premium" over debt costs. The real issue with a risk premium analysis is determining that premium with any precision. It is not a directly observable phenomenon.

There are two other fundamental tenets upon which historical risk premium-type analyses are grounded which, when examined, indicate that that type of equity cost estimation methodology should not be given primary consideration in setting allowed rates of return. First, since risk premium analyses look backward in time, they assume "past is prologue." In other words, the investors' expectations for the future are assumed to mirror exactly the average results they have experienced in the past. As I have noted, current research indicates that such is not the case—investors' current return expectations are lower than what was achieved in the past.[19] Second, implicit in the use of an average historical return premium of equities over debt is the assumption that the risk premium is constant over time. Neither of these assumptions upon which the risk premium analysis rests is true.

The fact that the risk premium varies significantly from period to period is shown quite clearly in Dr. Vander Weide's Schedule 5, which shows the data on which his historical risk premium results are based. The utility common stock annual returns on which Company witness Vander Weide relies have ranged from +58% to -37%, while utility bond annual returns have ranged from +36% to –13%. Therefore, the assumption in the Risk Premium analysis that historical average results are constant is not true and does not provide a sound basis on which to estimate current equity capital cost rates.

The practical impact of the volatility of historical risk premium data is that, with the selection of any particular period over which to average the historical data, virtually any risk

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[18] See Chart II in Section I of this testimony.

[19] Dimson, March, Staunton, "Risk and Return in the 20th and 21st Centuries,"*Business Strategy Review*, 2000, Volume 11, Issue 2, pp. 1-18; Graham, J., Harvey, C., "The Equity Risk Premium in January 2007: Evidence from the Global CFO Outlook Survey," Duke University/CFO Magazine, http://www.cfosurvey.org; Fama, E., French, K., "The Equity Premium," *The Journal of Finance*, Vol. LVII, No. 2, April 2003, pp. 637-659.

premium result can be produced.[20] In addition, the use of historical earned return data to estimate current equity capital costs has been questioned in the financial literature:

> There are both conceptual and measurement problems with using I&S [Ibbotson and Sinquefield] data for purposes of estimating the cost of capital. Conceptually, there is no compelling reason to think that investors expect the same relative returns that were earned in the past. Indeed, evidence presented in the following sections indicates that relative expected returns should, and do, vary significantly over time. Empirically, the measured historic premium is sensitive both to the choice of estimation horizon and to the end points. These choices are essentially arbitrary, yet they can result in significant differences in the final outcome. ("The Risk Premium Approach to Measuring a Utility's Cost of Equity," Brigham, Shome and Vinson, Financial Management, Spring 1985, p. 34)
>
> **Other Methods**. Several other approaches have been used to estimate the cost of common equity. Two of these should be noted. First there is the risk premium method, which is based upon the premise that common equity carries a higher risk than debt. This approach is relatively straightforward: (1) determine the historic spread between the return on debt and the return on common equity, and (2) add this risk premium to the current debt yield to derive an approximation of current equity return requirements....
> Like other methods, however, there are a number of specific problems. Over what historic period of time should the spread be established? Does the spread between the return on debt and the return on equity remain constant over time and at all interest levels? Should the spread be expressed on a before- or after-tax basis to the investor? What debt instruments should be used (e.g., government securities versus corporate or utility bonds)? What equity securities should be used? How should the resulting return requirement be adjusted for the risk that corresponds to a given utility? In light of these problems, many use the risk premium approach as a subsidiary method to test the results of other approaches." (Phillips, C. F., The Regulation of Public Utilities, Public Utilities Reports, Arlington, VA, 1993, p. 399)

The type of data described in the quote above as both conceptually and empirically problematic forms the basis of Dr. Vander Weide's historical Bond Yield-Plus Risk

[20] Dr. Vander Weide recognizes, at page 35 of his Direct Testimony, that his risk premium results would be different if he used a different time period for the study.

Premium methodology.

Q. WHAT ARE YOUR COMMENTS REGARDING THE HISTORICAL RISK PREMIUM ANALYSES PRESENTED BY DR. VANDER WEIDE?

A. This form of the risk premium analysis measures the earned return on common stocks and subtracts from that the yield on long-term bonds to produce a risk premium. There have been fundamental changes in the nature of the relationship between stock returns and bond returns over the past sixty or seventy years. The data in Dr. Vander Weide's Schedule 5 indicate that from 1937 through 2007 the standard deviation of utility stock and bond returns was 16.7% and 11.1%, respectively. However, in more recent years (since 1967), stocks have actually become less volatile while bonds have become more volatile, showing wider swings in returns. Dr. Vander Weide's Schedule 5 data show that the standard deviation of utility stock and bond returns from 1965 forward was 15.1% and 13.5%, respectively. Those data indicate that the current relationship between the returns of bonds and stock is different than it has been over the longer time frame.

The table below, also taken from Dr. Vander Weide's Schedule 5 data, confirms that the return difference between utility bonds and stocks has declined from the long-term average levels reported by Dr. Vander Weide.

Table VII

Utility Risk Premium Trend

Years	Risk Premium
37-07	4.61%
67-07	2.64%
77-07	3.33%
87-07	2.36%

These data indicate that over the most recent 30 years, risk premiums between electric utility stock and bond returns have averaged about 2.5%-3.5% rather than the 4.6% Dr. Vander

Weide reports in his testimony. If current A-rated utility bond yields are 6.0%[21], these more recent data indicate that an apropriate return on common equity for utilities would be approximately 9.0% (6.5% + 3% = 9.0%), rather than the 11.1% result produced in the Dr. Vander Weide's analysis of the same data.

Also, Dr. Vander Weide provides other evidence in his testimony that underscores the shrinking nature of risk premiums. His Schedule 4 contains his analysis of the return difference between the S&P 500 Industrial stock index and A-rated bonds. That also begins in 1937. If we look at the total time period as well as the twenty, thirty and forty-year time periods cited above, the results confirm that more current risk premium are smaller. The table below shows the values for gas utility returns and bond returns extracted from Dr. Vander Weide's Schedule 4:

Table VIII

Risk Premium Declines

Years	Risk Premium
37-07	5.02%
67-07	2.52%
77-07	2.33%
87-07	1.95%

Finally, turning to the topic of reliability of the risk premium estimate, as I noted above, the average risk premium between utility stocks and bonds shown in Dr. Vander Weide's ex-post risk premium is 4.61%. The highest risk premium in any one year was almost 49% and the lowest was –37.5%. The standard deviation of Dr. Vander Weide's ex-post risk premium, therefore, is 14.7%. Establishing a two standard-deviation range around the 4.61% risk premium, indicates that the Commission can be relatively certain (with 95% confidence) that the risk premium used by investors (assuming investors' expectations are based exactly on past averages) will lie somewhere in between –24.8% and 34.0% [4.6%±(2 x 14.7%)]. Given the volatility of the historical risk premium information, this

[21] Value Line *Selection & Opinion*, January 23, 2009, p. 3737, indicates recent A-rated utility yields at 5.88%.

average risk premium is simply not helpful information in determining with any accuracy the current cost of equity capital.

Q. WHAT ARE YOUR COMMENTS REGARDING DR. VANDER WEIDE'S OTHER RISK PREMIUM ANALYSIS—THE EX ANTE OR FORWARD-LOOKING RISK PREMIUM?

A. Dr. Vander Weide's other bond yield-plus risk premium analysis is one that compares DCF equity cost estimates equity returns to annual average bond yields, examines the statistical relationship between bond yields and the risk premium and, using projected bond yields relies on that statistical relationship to estimate the cost of equity. There are also several problems with this analysis, some of which I have discussed previously and some of which I have not.

Dr. Vander Weide's ex-ante risk premium analysis is based on a DCF analysis of Moody's electric companies from 1998 through early 2008. Although this analysis is labled as forward-looking, it is based on historical data. The period selected for study by Dr. Vander Weide was a particularly volatile time for the utility industry, centered around perhaps one of the biggest corporate/energy trading frauds of all time (Enron), which precipitated the Western energy crisis. Using cost of equity estimates from that period (even assuming they were accurate) is of questionable value when those results are supposed to represent investors' current expectations. Also, I have previously discussed the problems with Dr. Vander Weide's DCF analyses such as dividend compounding and the mechanistic use of analysts' earnings growth rate projections—both of which tend to overstate the cost of equity capital. In this type of risk premium analysis, an overstated DCF estimate results in a risk premium and a cost of equity estimate that is too high to represent investors' current return expectations.

Dr. Vander Weide's use of a regression analysis between risk premiums and interest rates over his relatively short "ex-ante" study period (1998-2008), is logically inconsistent with other regression evidence provided in his testimony. At page 37 of his

Direct Testimony, Dr. Vander Weide examines the historical data in his ex-post risk premium analysis to determine if there has been any trend in the equity risk premium (purportedly to support the position that the long-term historical average is a reasonable representation of current expectations). He finds no trends in the risk premium, according to a statistical regression. However, in the much shorter period studied in his ex-ante risk premium he produces the opposite finding—a statistical relationship or trend that must be recognized. That logical inconsistence casts doubt on the reliability of Dr. Vander Weide's risk premium results.

Also, Dr. Vander Weide's electronic workpapers indicate that his original, simple linear regression of the A-rated bond yield on the ex-ante risk premium from his study period produced the following equation for the risk premium: 3.2% + 0.199(A-rated Bond Yield). A 6.0% A-rated bond yield, with that equation, would produce a risk premium of 4.4% [3.2% + 0.199(6.0%) = 4.39%], and a cost of equity estimate of 9.41% [4.4% + 6.0% = 10.4%].

However, Dr. Vander Weide adjusted his simple regression results using a multiple regression with a "lag risk premium" (the risk premium from the prior month), the actual bond yield, and a "lag bond yield"(the bond yield from the previous month) as independent variables. From that multiple regression, Dr. Vander Weide produces "adjusted" values for risk premium and bond yield and then undertakes another regression of those adjusted values. This process provides the equation that appears on page 3 of his Appendix 3 and that produces his 11.1% ex-ante equity cost estimate.

While Dr. Vander Weide's manipulation of his data is not unusual in statistical time-series analysis, of concern is the "r-squared"value, or the proportion of explained variation in the ultimate adjusted-value regression. The r-squared values with Dr. Vander Weide's regression of adjusted bond yield onto adjusted risk premium (the last step in his analysis) is only 3% for his gas sample. That means that the current bond yield explains only a very small percent of the fluctuation in the risk premium. Therefore, Dr. Vander Weide's statistical adjustments to account for changes in interest rates appear to be of little

explanatory value in estimating the current cost of equity capital.

CAPITAL ASSET PRICING MODEL

Q. DR. VANDER WEIDE PRESENTS A CAPITAL ASSET PRICING MODEL (CAPM) ANALYSIS IN THIS PROCEEDING, HAS HE CONSISTENTLY USED THAT MODEL IN ESTIMATING THE COST OF EQUITY?

A. No. My experience with Dr. Vander Weide's testimony is that he uses the CAPM infrequently. Also, in prior applications of the CAPM, Dr. Vander Weide used only the Ibbotson historical database as a source for his estimate of the market risk premium. He did not use a DCF of unregulated companies, as he does in this case, to provide a larger market risk premium estimate. In the instant proceeding, Dr. Vander Weide's DCF-based CAPM estimate is 200 basis points higher than his estimate based on the historical Ibbotson data set.

Q. YOU NOTED PREVIOUSLY THAT THE DCF-BASED CAPM ANALYSIS PRODUCED THE HIGHEST EQUITY COST ESTIMATE FOR DR. VANDER WEIDE, CORRECT?

A. Yes. As before in the DCF analyses of Dr. Vander Weide, the only parameter considered in determining the long-term sustainable growth required in the DCF is projected earnings growth. I have previously discussed the flaws in this approach, and have noted that it causes the results to be overstated and will not repeat that discussion here.

It is important to note that, using an earnings-only DCF analysis of the S&P 500, Dr. Vander Weide estimates a market risk premium of 9.37%. That market risk premium estimate is well above the long-term historical average market risk premium (differences in stock and bond earned return) of 6.5% published by Ibbotson associates. Moreover, there has been considerable recent research published regarding the historical market risk premium and whether or not historical average returns provide reasonable return

expectations for the future. The nearly universal conclusion is that current return expectations are lower, and maybe much lower, than they have been in the past.

That research shows, then, that if Ibbotson indicates that the return difference between stocks and bonds (the market risk premium) since 1926 has been about 6.5%, the market risk premium investors expect in the future will be below 6.5%. Dr. Vander Weide utilizes a market risk premiums (derived from an earnings-only DCF analyses of the S&P 500) that is substantially higher than historical averages. That higher risk premium results is unlikely to be representative of investors' forward-looking expectations and runs counter to the current expectation for smaller market risk premiums in the future set out in the current literature in financial economics.

Finally, as an additional measure of the overstatement of the Company's DCF-based CAPM it is worth noting that the Company cost of capital witness indicates that investor-expected return for the market proxied by the S&P 500 is 13.75%. However, the return the Company itself expects to earn on the S&P 500 as a portion of its retirement portfolio is **begin confidential** XXXX **end confidential.** [AG DR-1-133]

Q. IN APPLYING HIS CAPM ANALYSES, DR. VANDER WEIDE USES ONLY ARITHMETIC AVERAGES OF HISTORICAL DATA AND PROVIDES, IN HIS SCHEDULE 6, RATIONALE FOR THAT RELIANCE. WHAT ARE YOUR COMMENTS?

A. Historical return data can be averaged in two different ways—arithmetic averaging and geometric averaging. The arithmetic average takes the sum of the yearly returns and divides by the number of years. The geometric average measures the rate of return from the beginning of the period to the end of the period. When returns are volatile the arithmetic average is higher than the geometric average. The higher arithmetic average is the only one that Dr. Vander Weide has considered.

However, research has shown that there is negative autocorrelation in the historical return data, which means that periods of high returns are followed by periods of low returns

and vice versa. Given that fact, the arithmetic average, which assumes strict independence of the periodic returns, provides a misleading indication of the historical average. Therefore, consideration of only the higher arithmetic mean is improper. In Appendix D attached to this testimony, I provide a discussion of arithmetic and geometric means as well as the strengths and weaknesses of both. I recommend that both be used and there is support in the financial literature for the use of both measures of historical return differences.

Q. DO YOU HAVE ANY FINAL COMMENTS REGARDING DR. VANDER WEIDE'S CAPM ANALYSIS?

A. Yes. The long-term Treasury Bond yield used in Dr. Vander Weide's CAPM analyses was 4.53%. The current long-term T-Bond yield is approximately 3.0%. Therefore, even with the flaws in Dr. Vander Weide's traditional CAPM analysis described above, that same analysis, performed today would yield a result 150 basis points below the 11.4% he reports in his testimony, or 9.9%. [11.4% - 1.50% = 9.9%]

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY, MR. HILL?

A. Yes, it does.