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| APPLICATION OF SOUTHWESTERN ELECTRIC POWER COMPANY FOR AUTHORITY TO CHANGE RATES | § § § | BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS |

# DIRECT TESTIMONY AND EXHIBITS

# OF

# J. RANDALL WOOLRIDGE, Ph. D.

## ON BEHALF OF

## CITIES ADVOCATING REASONABLE DEREGULATION

**March 31, 2021**

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DIRECT TESTIMONY AND EXHIBITS OF J. RANDALL WOOLRIDGE, Ph. D.

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| **APPLICATION OF SOUTHWESTERN ELECTRIC POWER COMPANY FOR AUTHORITY TO CHANGE RATES** | **§** | **BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS** |

**DIRECT TESTIMONY AND EXHIBITS OF J. RANDALL WOOLRIDGE, Ph. D**

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

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

## I. SUBJECT OF TESTIMONY AND SUMMARY OF RECOMMENDATIONS

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

A. I have been asked by the Cities Advocating Reasonable Deregulation ("CARD") to provide an opinion as to the overall fair rate of return or cost of capital for the regulated electric utility services of Southwestern Electric Power Company ("SWEPCO" or the "Company") and to evaluate SWEPCO's rate of return testimony in this proceeding.

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

A. First, I present my cost of equity recommendation for SWEPCO and the primary areas of contention between SWEPCO's rate of return position and my position. Second, I discuss the selection of a proxy group of electric utility companies for estimating the market cost of equity for SWEPCO. Third, I discuss the capital structure of the Company. Fourth, I provide a brief overview of the concept of the cost of equity capital and estimate the equity cost rate for SWEPCO. Finally, I critique the Company's rate-of-return analysis and testimony.

## A. Overview

**Q. WHAT COMPRISES A UTILITY'S "RATE OF RETURN"?**

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

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

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

(1) comparable to returns investors expect to earn on investments with similar risk;

(2) sufficient to assure confidence in the company's financial integrity; and

(3) adequate to maintain the company's credit and to attract capital.

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

[1] *Bluefield Water Works and Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679, 43 S. Ct. 675, 67 L. Ed. 1176 (1923) ("Bluefield").

[2] *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591, 64 S. Ct. 281, 88 L. Ed. 333 (1944) ("Hope").

data of similar-risk firms, the rate of return equity investors require for that risk-class of firms in order to set an appropriate ROE for a regulated firm.

### B. Summary of Positions

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

A. SWEPCO witness Ms. Renee V. Hawkins has proposed a capital structure of 50.63% long-term debt, and 49.37% common equity.[3] The Company has recommended a long-term debt cost rate of 4.18%. SWEPCO witness Mr. Dylan W. D'Ascendis has recommended a common equity cost rate of 10.35% for SWEPCO. SWEPCO's overall rate of return request is 7.22%.[4] This recommendation is summarized in Table 1.

**Table 1**
**SWEPCO Rate of Return Recommendation**

| Capital Source | Capitalization Ratios | Cost Rate | Weighted Cost Rate |
|---|---|---|---|
| **Long-Term Debt** | **50.63%** | **4.18%** | **2.11%** |
| **Common Equity** | **49.37%** | **10.35%** | **5.11%** |
| **Total Capital** | **100.00%** | | **7.22%** |

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

A. I have reviewed the Company's proposed capital structure and overall cost of capital. Since equity is more expensive than debt, ratepayers pay more when a company's capital structure leans toward the equity side. At first glance, a roughly 50/50 split is not necessarily, in and of itself, unreasonable in terms of debt and equity. However, there are several factors that suggest there are issues with SWEPCO's proposed capitalization:

(1) The median common equity ratios of the Electric and D'Ascendis Proxy Groups (46.2% and 47.7%) are below that proposed by SWEPCO;

[3] *See* Direct Testimony of Renee V. Hawkins at Native Page 3 / Bates Page 820.

[4] *See* Direct Testimony of Dylan W. D'Ascendis at Native Page 5 / Bates Page 712.

(2) The Company has maintained a capital structure with less common equity than in its proposed capital structure because it has consistently used short-term debt; and

(3) The Company's proposed capital structure includes a common equity ratio that is much higher than that of its parent company, American Electric Power ("AEP").

Hence, SWEPCO's proposed capitalization has more equity -- and less financial risk -- than it has maintained in the past; than the average current capitalizations of electric utilities; and the capitalization of its parent company. Nonetheless, I am adopting the Company's proposed capital structure, but I recommend that the Commission take into account this capital structure is advantageous to SWEPCO when setting its ROE.

I have applied the Discounted Cash Flow Model ("DCF") and the Capital Asset Pricing Model ("CAPM") to a proxy group of publicly-held electric utility companies ("Electric Proxy Group") as well as to Mr. D'Ascendis' proxy group ("D'Ascendis Proxy Group"). My analyses indicate that an equity cost rate in the range of 7.60%-9.15% is appropriate at this time. Since I rely primarily on the DCF approach, and given the recent rise in interest rates, I am recommending a ROE in the upper end of the range, 9.00%, for SWEPCO.

Given my recommended capitalization ratios, debt cost rate, and the 9.00% ROE, my rate of return or cost of capital recommendation for the Company is 6.56% and is summarized in Table 2 and Exhibit JRW-1.

**Table 2**
**CARD Rate of Return Recommendation**

| Capital Source | Capitalization Ratios | Cost Rate | Weighted Cost Rate |
|---|---|---|---|
| **Long-Term Debt** | **50.63%** | **4.18%** | **2.11%** |
| **Common Equity** | **49.37%** | **9.00%** | **4.44%** |
| **Total Capital** | **100.00%** | | **6.56%** |

**Q. IS 9.00% YOUR RATE OF RETURN RECOMMENDATION FOR SWEPCO?**

A. Yes. I believe that this figure reflects the current market cost of equity capital. However, crucial to my recommendation, is that at SWEPCO's proposed capital

structure with a common equity ratio of 49.37%, SWEPCO will have a little less financial risk than the companies in the proxy groups, underscoring the conservative character of my recommended ROE of 9.00%.

### C. Primary Rate of Return Issues in this Case

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

A. The primary issues related to the Company's rate of return include the following:

**1. Capital Market Conditions** – Mr. D'Ascendis' analyses, ROE results, and recommendations are based on assumptions of higher interest rates and capital costs. However, despite the recent rise in rates, interest rates and capital costs remain at historically low levels. In 2019, interest rates fell due to slow economic growth and low inflation. Interest rates fell even further to record low levels in 2020 due to the impact of the novel coronavirus on the world's population and economy. The benchmark 30-year Treasury yield has rebounded since mid-2020, but it is in the 2.25% range.

**2. Capital Structure** – As I have just noted, SWEPCO's proposed capital structure favors shareholders at the expense of ratepayers. But I have adopted the proposed capital structure, with the caveat that it includes a little more equity than used by electric utilities in the proxy groups.

**3. DCF Equity Cost Rate** - The DCF Equity Cost Rate is estimated by summing the stock's dividend yield and investors' expected long-run growth rate in dividends paid per share. There are two issues with Mr. D'Ascendis' DCF study: (1) First and foremost, he gives very little, if any, weight to his DCF results. His mean DCF result for his proxy group is 8.63%, yet he concludes that SWEPCO's cost of equity is in the range of 10.32% to 11.43%; and (2) he relies exclusively on the overly optimistic and upwardly biased growth-rate forecasts for earnings per share ("EPS") put forth by Wall Street analysts and *Value Line*.

I also have used a traditional constant-growth DCF model. In developing a growth rate for my DCF model for the proxy group, I have reviewed thirteen growth-rate measures including historic and projected growth-rate measures and have evaluated growth in dividends, book value, and earnings per share. I give primary weight to analysts' projected EPS growth rates.

**3. Risk Premium Approach** – The equity cost rate using the risk-premium model is the sum of the base interest-rate yield plus a risk premium. With respect to the market-risk premium, Mr. D'Ascendis has employed six different approaches to estimate the market-risk premium: (1) in three of his methods he uses historical stock and bond return data; and (2) the other three of his approaches he bases his market-risk premium on projected stock-market returns. As I show in my critique of the Company's rate-of-return analysis, there are a number of empirical issues with using historical stock and bond returns to estimate an expected market risk premium.

In addition, Mr. D'Ascendis' projected market returns are based on highly unrealistic assumptions about future earnings and economic growth and the resulting stock returns. On this point, he makes the assumption that the companies in the S&P 500 can grow their earnings, on average, at 12.45%, which is nearly triple the long-term projected growth rate of the economy as measured by GDP.

**4. CAPM Approach** - The CAPM approach requires an estimate of the risk-free interest rate, the beta, and the market or equity risk premium. There are two primary issues with Mr. D'Ascendis' CAPM analyses: (1) he has used a non-traditional CAPM approach, the empirical CAPM (ECAPM), as an equity-cost-rate approach; and (2) more significantly, his market-risk premium of 10.92% uses the same six approaches he used in his Risk-Premium approach I noted above. The 10.92% market-risk premium is much higher than published market-risk premiums, and is premised on highly unrealistic assumptions of future earnings growth and stock-market returns.

**5. Equity Cost Rate Models Applied to Non-Price Regulated Companies** - Mr. D'Ascendis also estimates an equity cost rate by applying his equity-cost-rate approaches and methodologies to a group of "comparable risk" non-price regulated

companies. As I note in the rebuttal section of this testimony, these companies are not truly comparable to SWEPCO and Mr. D'Ascendis' analyses are based on the same flawed approach summarized above.

**6. Other Issues** - Mr. D'Ascendis concludes that his equity-cost-rate studies suggest a ROE range of 9.85% to 10.96%. He then also considers three other factors in order to arrive at his 10.35% ROE recommendation. These factors include: (1) SWEPCO's size; (2) SWEPCO's credit ratings relative to his proxy group; and (3) flotation costs. He increases his equity-cost-rate range by 20 basis points to account for size and 27 basis points to account for credit ratings. He makes no specific adjustment for flotation costs. As I discuss in my testimony, a small-size premium is not appropriate for regulated public utilities and the credit ratings do not justify an equity-cost-rate-risk adjustment.

## II. CAPITAL MARKET CONDITIONS AND AUTHORIZED ROES

### A. Capital Market Conditions

**Q. PLEASE PROVIDE A SUMMARY OF THE UTILITY CAPITAL MARKET INDICATORS IN EXHIBIT JRW-3.**

A. Page 1 of Exhibit JRW-2 shows the yields on A-rated public-utility bonds. These yields have gradually declined in the past decade from 7.5% to the 3.0% range. They have increased since the middle of 2020 to the 3.5% range. Page 2 of Exhibit JRW-2 shows the average dividend yield for publicly-held electric utilities. These yields declined over the past decade, bottoming out at 3.1% in 2019. They increased to 3.6% in 2020. The average earned ROE and market-to-book ratio for publicly-held electric utilities is shown on page 3 of Exhibit JRW-2. The average earned ROE has been in the 9.0% to 10.0% range over the past five years. The average market-to-book ratio increased over the decade, peaking at 2.0X in 2019, and declined to 1.75X in 2020.

**Q. PLEASE REVIEW THE FINANCIAL MARKETS IN 2020.**

A. The financial markets began the year 2020 in good form – stock prices rose about five percent in the first six weeks of the year and interest rates declined. Then came weeks of chaos. In the middle of February 2020, the spread of the novel coronavirus went

global and the virus became a major risk factor for the world's population and global economy. From mid-February until the third week of March, the S&P 500 declined 35 percent and investors fled to low-risk financial assets, most notably long-term Treasury bonds. The yield on the benchmark 30-year Treasury bond declined from 2.0 percent and traded as low as 1.25 percent, an all-time low. Furthermore, the day-to-day volatility of prices in financial markets was at extremes. The VIX, which is the Chicago Board Options Exchange ("CBOE") volatility index and is known as Wall Street's Fear Index, increased from 15 and traded over 50, a level which has not been seen since the financial crisis in 2008.

In response, the federal government took unprecedented fiscal and monetary actions to support the economy and financial markets. Congress passed and President Trump signed a $2 trillion stimulus relief package to help American families and businesses, the biggest economic rescue package in modern American history. The package granted households relief in the form of stimulus checks sent directly to most Americans, expanded unemployment benefits, expanded paid sick leave, provided temporary student-debt relief and more. The Federal Reserve lowered the target range for its benchmark federal-funds rate to the current range of 0% to 0.25%, which target range it expects to maintain until the economy has recovered. In addition, the Federal Reserve implemented a broad range of unprecedented programs to support financial market liquidity and economic stability. These included financial asset purchases and the creation of credit facilities to support households, businesses, and state and local governments.

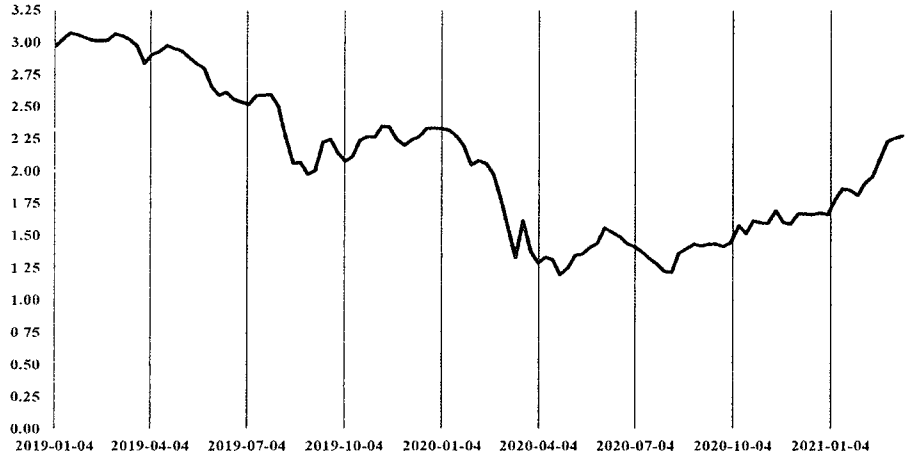
In 2021, President Biden signed a second $1.9 trillion COVID-19 stimulus plan which include $1,400 checks for individuals, billions to help schools and colleges reopen, funding for vaccine distribution, and many other financial resources to help the U.S. recover from the pandemic.

**Q. PLEASE REVIEW THE IMPACT OF THE ECONOMY ON INTEREST RATES.**

A. Figure 2 shows 30-year Treasury yields over the past two years (2019-21). These yields were in the 3.0% range at the end of 2018, and declined to the 2.25% range in 2019,

due primarily to slow economic growth and low inflation. As noted, in 2020, with the advent of the COVID-19 pandemic in February, 30-year Treasury yields declined to record low levels, declining about 100 basis points to the 1.25% range. They began their recovery in the summer of 2020 and have increased approximately to the 2.25% range in 2021. Despite their recovery, these rates are still at historically low levels.

**Figure 2**
**30-Year Treasury Yields**

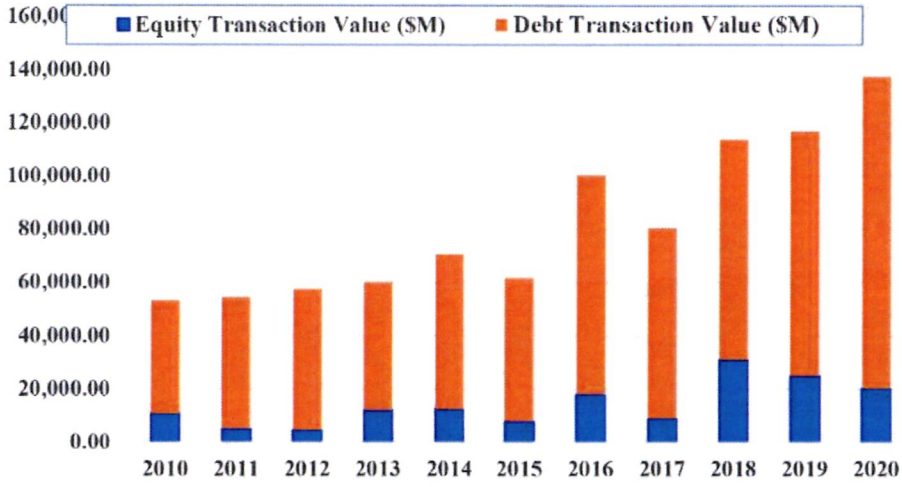



Data Source: https://fred.stlouisfed.org/series/DGS30

**Q. HAVE UTILITIES TAKEN ADVANTAGE OF THE LOWER BOND YIELDS TO RAISE CAPITAL?**

A. Yes. Figure 3 shows the annual amounts of debt- and equity-capital raised by public utility companies over the past decade. Electric utility and gas distribution companies have taken advantage of the low interest rate and capital cost environment of recent years and raised record amounts of capital in the markets. In fact, in each of the last three years, public utilities have raised a total of over $100 billion in debt and equity.

**Figure 3**
**Debt and Equity Capital Raised by Public Utilities**
**2010-20**



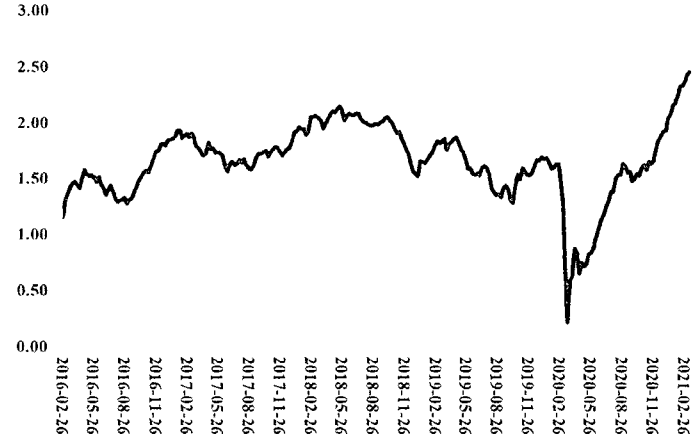

Source: S&P Global Market Intelligence, S&P Cap IQ, 2020.

**Q. PLEASE DISCUSS THE INCREASE IN INTEREST RATES IN RECENT MONTHS.**

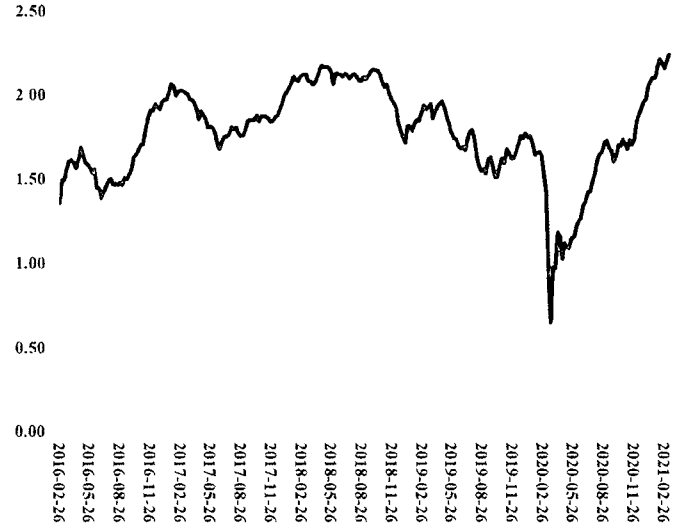
A. As noted, with the economy improving and the passage of the second COVID-19 stimulus plan, interest rates increased about 100 basis points since mid-2020. The increase in rates reflect the prospect that expanded economic growth could lead to higher inflation. Investors' inflation expectation can be seen by looking at the difference between yields on ordinary Treasuries and the yields on inflation-protected Treasuries, known as Treasury Inflation-Protected Securities ("TIPS"). Panel A of Figure 4 shows the expected inflation rate over the next five years. Panel A of Figure 4 shows a noticeable increase over the past year, with an expected inflation rate of 2.45% over the next five years. Panels B and C of Figure 4 show the expected inflation rate over the next ten and thirty years. The expected inflation rates over the next ten and thirty years are 2.24% and 2.18%. When the expected inflation rate is higher over five years than over ten and thirty years, as is the case now, it is known as a bond-market inversion and it reflects that, despite a short-term expectation of higher inflation, the long-term inflation rate is still just above 2.0%.[5]

[5] Paul J. Davies – "Rare Bond-Market Inversion Signals Short-Lived Boost to Inflation," *Wall Street Journal*, February 25, 2021.

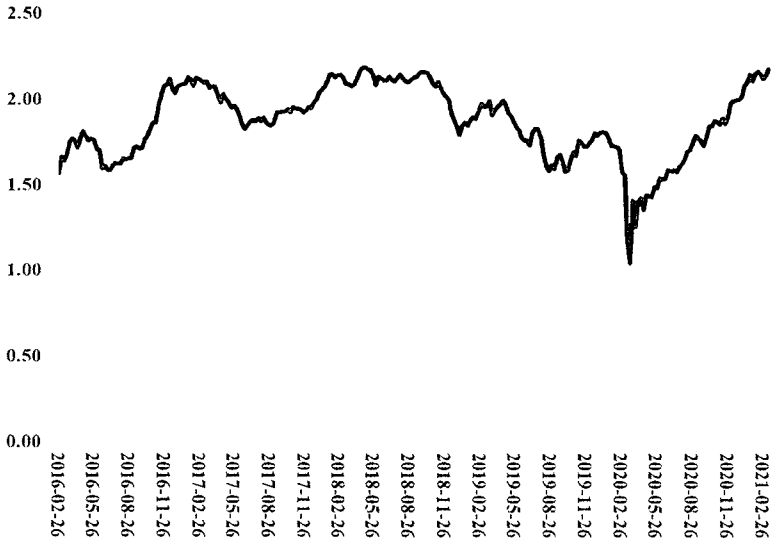
**Figure 4**
**Panel A**
**5-Year Treasury Yields Minus 5-Year Treasury TIPs**




**Panel B**
**10-Year Treasury Yields Minus 10-Year Treasury TIPs**



**Panel C**
**30-Year Treasury Yields Minus 30-Year Treasury TIPs**




Date Source: https://fred.stlouisfed.org/

**Q. HOW HAS THE CHANGE IN INTEREST RATES OVER THE PAST YEAR IMPACTED CAPITAL COSTS FOR UTILITIES?**

A. As discussed below, with COVID-19 and the record low interest rates in 2020, authorized ROEs for utilities also reached record low levels in 2020. However, whereas interest rates declined by about 100 basis points in 2020, authorized ROEs only declined by about 25 basis points. Therefore, utility ROEs never declined to the extent that interest rates declined in 2020.

**Q. PLEASE SUMMARIZE YOUR ASSESSMENT OF THE CURRENT CAPITAL MARKET SITUATION.**

A. The U.S. economy, which declined nearly twenty percent in the first half of 2020, rebounded significantly in the second half of 2020, resulting in a 3.5% GDP decline for the year. The U.S. unemployment rate peaked in the second quarter of 2020 at about 15% and is now back to 6.5%. The stock market began its recovery in the third week of March of 2020. And despite the ongoing spread of COVID-19 and an economic crisis created by the virus that included record unemployment, the S&P 500 has come back strong and is now back at record levels. The 30-year Treasury yield, which dropped to record low levels and has come back to its pre-COVID levels. And the

markets "fear index," the VIX, which topped out over 50, is now near its long-time average of 20.[6]

### B. Authorized ROEs

**Q. PLEASE DISCUSS THE TREND IN AUTHORIZED ROES FOR ELECTRIC AND GAS COMPANIES.**

A. In Figure 5, I have graphed the quarterly authorized ROEs for electric and gas companies from 2000 to 2020. Over the years, as interest rates have come down, authorized ROEs for electric utility and gas distribution companies have slowly declined to reflect a low capital-cost environment. In 2020, authorized ROEs for utilities hit an all-time low. On an annual basis, the average authorized ROEs for electric utilities have declined from an average of 10.01% in 2012; 9.8% in 2013; 9.76% in 2014; 9.58% in 2015; 9.60% in 2016; 9.68% in 2017; 9.58% in 2018; 9.65% in of 2019; and 9.39% in 2020, according to Regulatory Research Associates.[7]

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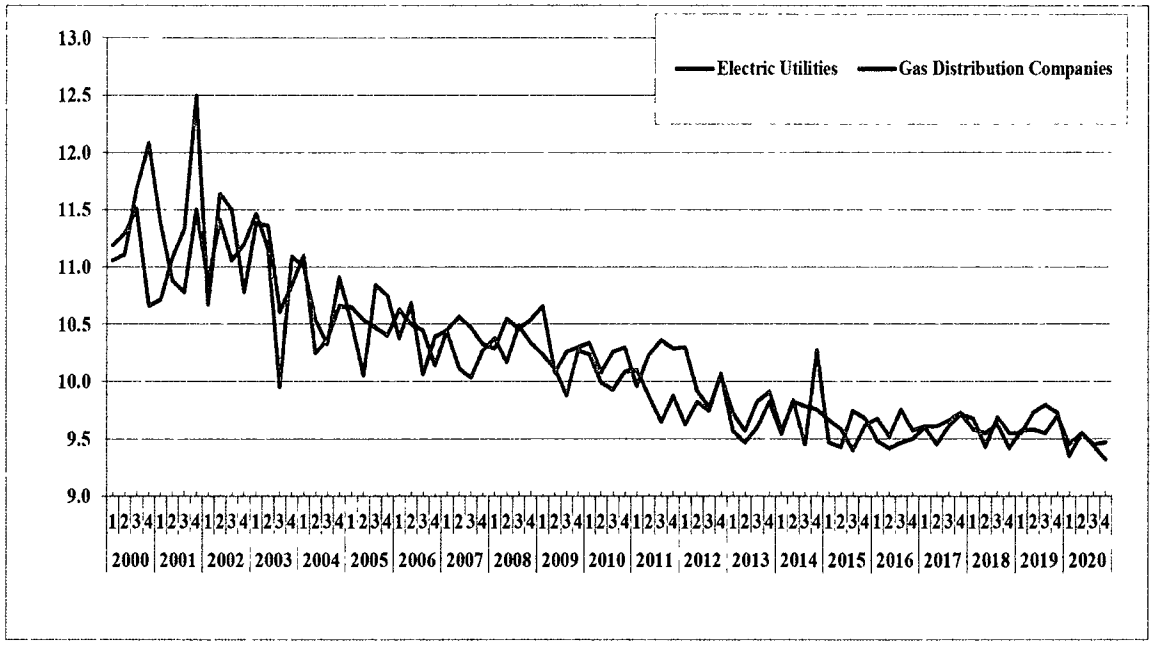
[6] The Chicago Board Options Exchange Volatility Index, or **VIX**, is a real-time market index representing the market's expectations for volatility over the coming 30 days. Investors use the VIX to measure the level of risk, fear, or stress in the market when making investment decisions.

[7] S&P Global Market Intelligence, RRA *Regulatory Focus*, 2021.

**Figure 5**
**Authorized ROEs for Electric Utility and Gas Distribution Companies**
**2000-2020**




**Q. PLEASE REVIEW THE COMMISSION'S COST OF CAPITAL DETERMINATIONS IN SWEPCO'S MOST RECENT RATE CASE.**

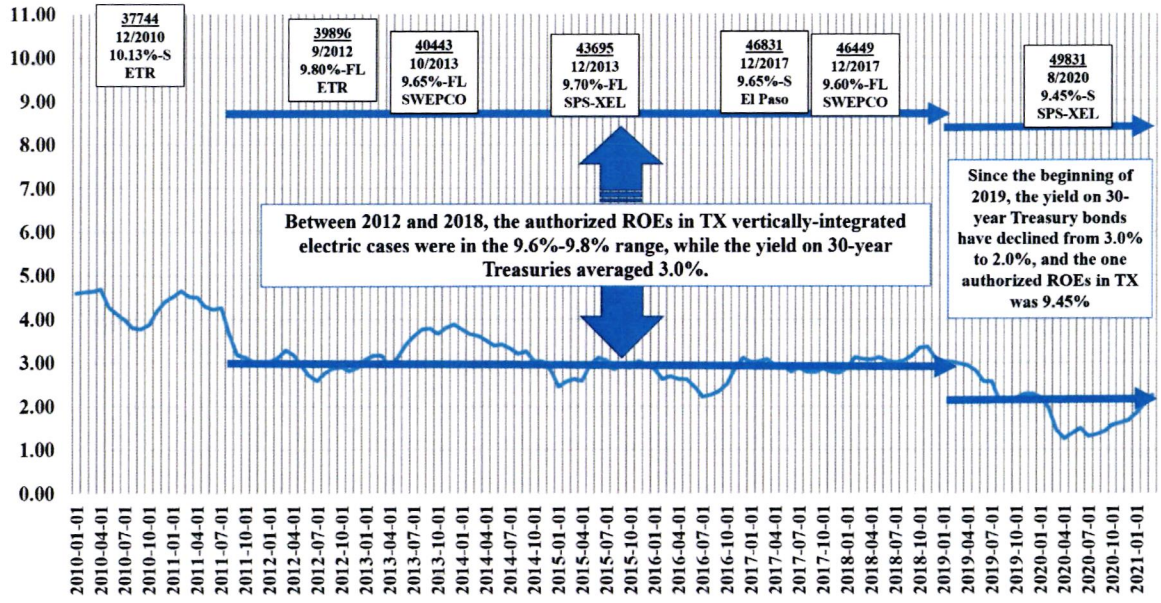
A. On December 14, 2017, in PUC Docket No. 46449, the Commission approved a ROE of 9.60% for SWEPCO with a capital structure that included a common equity ratio of 48.46% in a fully-litigated case.

**Q. PLEASE REVIEW THE AUTHORIZED ROES IN TEXAS RELATIVE TO 30-YEAR TREASURY YIELDS.**

A. In Figure 6, I show: (1) the authorized ROEs in Texas for vertically-integrated electric utilities; and (2) 30-year Treasury yields, since 2010.

Between 2013 and 2018, the authorized ROEs in Texas were in the 9.6% – 9.8% range, while the 30-year Treasury yield averaged 3.0%. Since that time, the yields on 30-year Treasury yields have declined, traded at all-time lows, and now are in the 2.25% range. There has been only one ROE determination over that time in Texas since 2018. In 2020, in PUC Docket No. 49831, the Commission approved a settlement with a ROE of 9.45% for Southwestern Public Service Company ("SPS").

**Figure 6**
**30-Year Treasury Yields and Texas Vertically-Integrated Authorized ROEs**
**2010-2021**




**Q. PLEASE REVIEW THE AUTHORIZED ROES FOR VERTIALLY-INTEGRATED ELECTRIC UTILITIES IN TEXAS RELATIVE TO ELECTRIC DISTRIBUTION AND TRANSMISSION UTILITIES.**

A. In Table 3, I show the authorized ROEs and common equity ratios for all electric utility cases (vertically-integrated, distribution, and transmission) with a ROE determination over the 2010-20 time period. There are several things that stand out in the Table:

(1) The authorized ROEs have declined from over 10.0% a decade ago to 9.40% in 2020;

(2) The authorized ROEs for vertically-integrated, distribution, and transmission electric utilities are very similar. Looking at cases with similar order dates, such as SPS and AEP Texas in 2020, there may be a small premium of five basis point or so for vertically-integrated electric utilities; and

(3) The average authorized common equity ratios are lower for distribution and transmission electrics (40.0% to 45.0%)) than those for vertically-integrated electrics (50.0% range).

**Table 3**
**Texas Authorized ROEs for Electric Utility Companies**
**2010-20**

| Company | TKR | Service | Type | Date | Docket | Decision Type | ROE | Common Equity Ratio |
|---|---|---|---|---|---|---|---|---|
| Entergy Texas Inc. | ETR | Electric | Vertically Integrated | 12/1/2010 | D-37744 | Settled | 10.13 | NA |
| Texas-New Mexico Power Co. | PNM | Electric | Distribution | 1/20/2011 | D-38480 | Settled | 10.13 | 45.00 |
| CenterPoint Energy Houston | CNP | Electric | Distribution | 2/3/2011 | D-38339 | Fully Litigated | 10.00 | 45.00 |
| Oncor Electric Delivery Co. | SRE | Electric | Distribution | 8/19/2011 | D-38929 | Settled | 10.25 | 40.00 |
| Entergy Texas Inc. | ETR | Electric | Vertically Integrated | 9/13/2012 | D-39896 | Fully Litigated | 9.80 | 49.92 |
| Lone Star Transmission LLC | NEE | Electric | Transmission | 10/12/2012 | D-40020 | Settled | 9.60 | 45.00 |
| Cross Texas Transmission | | Electric | Transmission | 1/16/2013 | D-40604 | Settled | 9.60 | 40.00 |
| Wind Energy Transmission Texas | | Electric | Transmission | 1/16/2013 | D-40606 | Settled | 9.60 | 40.00 |
| Southwestern Electric Power Co | AEP | Electric | Vertically Integrated | 10/3/2013 | D-40443 | Fully Litigated | 9.65 | 49.10 |
| Lone Star Transmission LLC | NEE | Electric | Transmission | 9/11/2014 | D-42469 | Settled | 9.60 | 45.00 |
| Cross Texas Transmission | | Electric | Transmission | 5/1/2015 | D-43950 | Settled | 9.60 | 40.00 |
| Wind Energy Transmission Texas | | Electric | Transmission | 9/25/2015 | D-44746 | Settled | 9.60 | 40.00 |
| Southwestern Public Service Co | XEL | Electric | Vertically Integrated | 12/17/2015 | D-43695 | Fully Litigated | 9.70 | 51.00 |
| Electric Transmission Texas | | Electric | Transmission | 1/12/2017 | D-46817 | Settled | 9.60 | 40.00 |
| Oncor Electric Delivery Co. | SRE | Electric | Distribution | 9/28/2017 | D-46957 | Settled | 9.80 | 42.50 |
| El Paso Electric Co. | | Electric | Vertically Integrated | 12/14/2017 | D-46831 | Settled | 9.65 | 48.35 |
| Southwestern Electric Power Co | AEP | Electric | Vertically Integrated | 12/14/2017 | D-46449 | Fully Litigated | 9.60 | 48.46 |
| Texas-New Mexico Power Co. | PNM | Electric | Distribution | 12/20/2018 | D-48401 | Settled | 9.65 | 45.00 |
| CenterPoint Energy Houston | CNP | Electric | Distribution | 2/14/2020 | D-49421 | Settled | 9.40 | 42.50 |
| AEP Texas Inc. | AEP | Electric | Distribution | 2/27/2020 | D-49494 | Settled | 9.40 | 42.50 |
| Southwestern Public Service Co | XEL | Electric | Vertically Integrated | 8/27/2020 | D-49831 | Settled | 9.45 | 54.62 |

## III. PROXY GROUP SELECTION

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

A. To develop a fair rate-of-return recommendation for the Company, I have evaluated the return requirements of investors on the common stock of a proxy group of publicly-held utility companies.

**Q. WHAT PROXY GROUPS HAVE YOU USED?**

A. I have used my Electric Proxy Group and Mr. D'Ascendis' group.

**Q. PLEASE DISCUSS THE ELECTRIC PROXY GROUP.**

A. The Electric Proxy Group includes twenty-seven companies. Summary financial statistics for the proxy group are listed in Panel A of page 1 of Exhibit JRW-3.[8] The median operating revenues among members of the Electric Proxy Group are $6,680.0 million and the median net-plant value is $25,728.1. On average, the group receives

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

83% of its revenues from regulated electric operations; has BBB+/Baa1 issuer credit ratings from S&P and Moody's respectively; has a current common equity ratio of 47.0%; and has an earned return on common equity of 8.56%.

**Q. PLEASE DESCRIBE MR. D'ASCENDIS' PROXY GROUP OF ELECTRIC UTILITY COMPANIES.**

A. The D'Ascendis Proxy Group consists of thirteen electric utility companies. Summary financial statistics for the proxy group are listed on Panel B of page 1 of Exhibit JRW-3. The median operating revenues and net plant among members of the D'Ascendis Proxy Group are $3,416.0 million and $14,336.0 million, respectively. On average the group receives 87% of revenues from regulated electric operations; has an average BBB+ issuer credit rating from S&P and an average Baa1 long-term rating from Moody's; has a current common equity ratio of 47.7%; and has an earned return on common equity of 7.8%.

**Q. HOW DOES THE INVESTMENT RISK OF SWEPCO COMPARE TO THAT OF THE PROXY GROUPS?**

A. I believe that bond ratings provide a good assessment of the investment risk of a company. Page 1 of Exhibit JRW-3 also shows S&P and Moody's issuer credit ratings for the companies in the two groups. The average S&P and Moody's ratings for the two groups are BBB+ and Baa1. SWEPCO's issuer credit rating is A- according to S&P and Baa2 according to Moody's. As such, SWEPCO's S&P rating is one notch above the average of the two proxy groups, and SWEPCO's Moody's rating is one notch below the average of the two proxy groups. On balance, I believe that this comparison suggests that SWEPCO investment risk level is similar to the average of the two proxy groups.

**Q. HOW DOES THE INVESTMENT RISK OF THE TWO GROUPS COMPARE BASED ON THE VARIOUS RISK METRICS PUBLISHED BY *VALUE LINE*?**

A. On page 2 of Exhibit JRW-3, I have assessed the riskiness of the three proxy groups using five different accepted risk measures. These measures include Beta, Financial Strength, Safety, Earnings Predictability, and Stock Price Stability. These risk measures suggest that the two proxy groups are similar in risk. The comparisons of the risk measures include Beta (0.87 vs. 0.88), Financial Strength (A vs. A), Safety (1.8 vs.

2.0), Earnings Predictability (83 vs. 83), and Stock Price Stability (89 vs. 92). On balance, these measures suggest that these two proxy groups are very low risk relative to the overall stock market and are similar in risk to each other.

## IV. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

**Q. PLEASE DESCRIBE SWEPCO'S PROPOSED CAPITAL STRUCTURE AND SENIOR CAPITAL COST RATES.**

A. SWEPCO has proposed a capital structure of 0.00% short-term debt, 50.63% long-term debt, and 49.37% common equity. The Company has recommended a long-term debt cost rate of 4.18%.

**Q. IS THIS CONSISITENT WITH THE CAPITAL STRUCTURE MAINTAINED BY THE COMPANY IN ITS LAST RATE CASE?**

A. Yes and no. In its last rate case (PUC Docket No. 46449), the Commission approved a capital structure with a common equity ratio of 48.46%. As shown on page 3 of Exhibit JRW-4, SWEPCO has maintained a capital structure with a common equity ratio of 48.46%, excluding short-term debt. However, the Company has used short-term debt in a significant way to finance operations in recent years. Since its last rate case, including short-term debt, the Company has average capitalization ratios of 5.38% short-term debt, 48.42% long-term debt, and 45.80% common equity. In this case, the Company has proposed issuing $135 million in long-term debt before the end of the test year to replace the short-term debt.

**Q. WHAT ARE THE COMMON EQUITY RATIOS IN THE CAPITALIZATIONS OF THE TWO PROXY GROUPS?**

A. As shown in Exhibit JRW-3, the average common equity ratio of the Electric Proxy Group is 47.0% and for the D'Ascendis Proxy Group, the average common equity ratio is 47.7%. This indicates that the Company's proposed capitalization of 49.37% has a higher common equity ratio than the two proxy groups.

**Q. IS IT APPROPRIATE TO USE THE COMMON EQUITY RATIOS OF THE PARENT HOLDING COMPANIES OR SUBSIDIARY OPERATING UTILITIES FOR COMPARISON PURPOSES WITH SWEPCO'S PROPOSED CAPITALIZATION?**

A. Yes. It is appropriate to use the common equity ratios of the utility holding companies because the *holding companies* are publicly-traded and their stocks are used in the cost—of-equity capital studies. The equities of the *operating utilities* are not publicly-traded and hence their stocks cannot be used to compute the cost-of-equity capital for SWEPCO.

**Q. IS IT APPROPRIATE TO INCLUDE SHORT-TERM DEBT IN THE CAPITALIZATION IN COMPARING THE COMMON EQUITY RATIOS OF THE HOLDING COMPANIES WITH SWEPCO'S PROPOSED CAPITALIZATION?**

A. Yes; short-term debt, like long-term debt, has a higher claim on the assets and earnings of the company and requires timely payment of interest and repayment of principal. Thus, in comparing the common-equity ratios of the holding companies with SWEPCO's recommendation, it is appropriate to include short-term debt when computing the holding company common-equity ratios. Additionally, the financial risk of a company is based on total debt, which includes both short-term and long-term debt.

**Q. HOW DOES SWEPCO'S PROPOSED CAPITAL STRUCTURE RATIOS COMPARE TO ITS RECENT CAPITALIZATION RATIOS AS WELL AS TO THOSE OF ITS PARENT, AEP?**

A. Panels B and C of page 1 of Exhibit JRW-4 provide SWEPCO's and AEP's average quarterly capitalization ratios with short-term debt (Panel B) and without short-term debt (Panel C) over the 2018-20 time period. The quarterly data are provided on page 2 of Exhibit JRW-4. The Company's and AEP's respective average common-equity ratios *with* short-term debt were 45.8% and 40.18%, and without short-term debt, respectively, were 48.46% and 44.47%.

**Q. PLEASE DISCUSS THE ISSUE OF PUBLIC UTILITY HOLDING COMPANIES SUCH AS AEP USING DEBT TO FINANCE THE EQUITY IN SUBSIDIARIES SUCH AS SWEPCO.**

A. Moody's published an article on the use of low-cost, debt financing by public utility holding companies to increase their ROEs. The summary observations included the

following about how these holding companies use "leverage" and how an increase in leverage at the parent holding company can "hurt the credit profiles of its regulated subsidiaries":

> U.S. utilities use leverage at the holding-company level to invest in other businesses, make acquisitions and earn higher returns on equity. In some cases, an increase in leverage at the parent can hurt the credit profiles of its regulated subsidiaries.[9]

This financial strategy has traditionally been known as "double leverage." Noting that "double leverage" results in a consolidated debt-to-capitalization ratio that is higher at the parent than at the subsidiary because of the additional debt at the parent," Moody's defined double leverage as follows:

> Double leverage is a financial strategy whereby the parent raises debt but downstreams the proceeds to its operating subsidiary, likely in the form of an equity investment. Therefore, the subsidiary's operations are financed by debt raised at the subsidiary level and by debt financed at the holding-company level. In this way, the subsidiary's equity is leveraged twice, once with the subsidiary debt and once with the holding-company debt. In a simple operating-company / holding-company structure, this practice results in a consolidated debt-to-capitalization ratio that is higher at the parent than at the subsidiary because of the additional debt at the parent.[10]

Moody's goes on to discuss the potential risk "down the road" to utilities of this financing corporate strategy if regulators were to ascribe the debt at the parent level to the subsidiaries or adjust the authorized return on capital:

> **"Double leverage" drives returns for some utilities but could pose risks down the road.** The use of double leverage, a long-standing practice whereby a holding company takes on debt and downstreams the proceeds to an operating subsidiary as equity, could pose risks down the road if regulators were to ascribe the debt

[9] Moody's Investors' Service, "High Leverage at the Parent Often Hurts the Whole Family," May 11, 2015, p. 1.

[10] *Id.* at p. 5.

at the parent level to the subsidiaries or adjust the authorized return on capital.[11]

**Q. PLEASE DISCUSS THE SIGNIFICANCE OF THE AMOUNT OF EQUITY THAT IS INCLUDED IN A UTILITY'S CAPITAL STRUCTURE.**

A. A utility's decision as to the amount of equity capital it will incorporate into its capital structure involves fundamental trade-offs relating to the amount of financial risk the firm carries, the overall revenue requirements its customers are required to bear through the rates they pay, and the return on equity that investors will require.

**Q. PLEASE DISCUSS A UTILITY'S DECISION TO USE DEBT VERSUS EQUITY TO MEET ITS CAPITAL NEEDS.**

A. Utilities satisfy their capital needs through a mix of equity and debt. Because equity capital is more expensive than debt, the issuance of debt enables a utility to raise more capital for a given commitment of dollars than it could raise with just equity. Debt is, therefore, a means of "leveraging" capital dollars. However, as the amount of debt in the capital structure increases, financial risk increases and the risk of the utility, as perceived by equity investors, also increases. Significantly, for this case, the converse is also true. As the amount of debt in the capital structure decreases, the financial risk decreases. The required return on equity capital is a function of the amount of overall risk that investors perceive, including financial risk in the form of debt.

**Q. CAN THE IMPACT OF A UTILTY'S AWARDED ROE BE DETERMINED WITHOUT REFERENCE TO THAT UTILITY'S CAPITAL STRUCTURE?**

A. No. A high equity component can amplify the overall impact of a relatively low ROE while a low equity component can mitigate the overall impact of a relatively high ROE.

For example, suppose an electric utility has an authorized ROE and common equity ratio of 10.0% and 50.0%. Financially, the same utility would be at about the same point with authorized ROE of 9.0% but with a common equity ratio of 55.0%.

[11] *Id.* at p. 1.

**Q. IS THERE ALSO A DIRECT CORRELATION BETWEEN THE AMOUNT OF EQUITY IN A COMPANY'S CAPITAL STRUCTURE AND THE REVENUE REQUIREMENTS THAT CUSTOMERS ARE CALLED ON TO BEAR?**

A. Yes. Just as there is a direct correlation between the utility's authorized return on equity and the utility's revenue requirements (the higher the return, the greater the revenue requirement), there is a direct correlation between the amount of equity in the capital structure and the revenue requirements that customers are called on to bear. As the equity ratio increases, the utility's revenue requirement increases and the rates paid by customers increase. If the proportion of equity is too high, rates will be higher than they need to be. For this reason, the utility's management should pursue a capital acquisition strategy that results in the proper balance in the capital structure.

**Q. CAN A REGULATED UTILITY SAFELY TAKE ON MORE DEBT THAN A NON-REGULATED COMPANY?**

A. Yes. Due to regulation and the essential nature of its output, a regulated utility is exposed to less business risk than other companies that are not regulated. This means that a utility can reasonably carry relatively more debt in its capital structure than can most unregulated companies. Thus, a utility should take appropriate advantage of its lower business risk to employ cheaper debt capital at a level that will benefit its customers through lower revenue requirements.

**Q. GIVEN THAT SWEPCO HAS PROPOSED AN EQUITY RATIO THAT IS HIGHER THAN (1) THE AVERAGE COMMON EQUITY RATIO OF OTHER ELECTRIC UTILITY COMPANIES, AND (2) THE COMMON EQUITY RATIO OF ITS PARENT COMPANY, AEP, WHAT SHOULD THE COMMISSION DO IN THIS RATEMAKING PROCEEDING?**

A. When a regulated utility's actual capital structure contains a high equity ratio, the options are: (1) to impute a more reasonable capital structure that is comparable to the average of the proxy group used to determine the cost of equity and to reflect the imputed capital structure in revenue requirements; or (2) to recognize the downward impact that an unusually high equity ratio will have on the financial risk of a utility and authorize a common equity-cost rate lower than that of the proxy group.

**Q. PLEASE ELABORATE ON THIS "DOWNWARD IMPACT."**

A. As I stated earlier, there is a direct correlation between the amount of debt in a utility's capital structure and the financial risk that an equity investor will associate with that utility. A relatively lower proportion of debt translates into a lower required return on equity, all other things being equal. Stated differently, a utility should not be permitted to "have it both ways." Specifically, a utility cannot propose to maintain an unusually high equity ratio and not expect to have the resulting lower risk reflected in its authorized return on equity. The fundamental relationship between lower risk and the appropriate authorized return should not be ignored.

**Q. WHAT CAPITAL STRUCTURE ARE YOU RECOMMENDING FOR SWEPCO IN YOUR RATE OF RETURN RECOMMENDATION?**

A. As noted above, the Company has proposed a capital structure with a 49.37% common equity, and this capital structure includes more equity capital and less financial leverage than the capital structures of other electric utility companies. Nonetheless, I do not believe that it is unreasonable, and so I am adopting the Company's proposed capital structure and senior capital cost rates. However, in setting a ROE for SWEPCO, the Commission should recognize that the Company's proposed capital structure includes a common equity ratio that is larger than other electric utility companies.

**Q. ARE YOU ALSO ADOPTING THE COMPANY'S PROPOSED LONG-TERM DEBT COST RATE?**

A. Yes, I am also adopting the Company's proposed long-term debt cost rate of 4.18%.

## V. THE COST OF COMMON EQUITY CAPITAL

### A. Overview

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

A. In a competitive industry, the return on a firm's common equity capital is determined through the competitive market for its goods and services. Due to the capital requirements needed to provide utility services and the economic benefit to society from avoiding duplication of these services and the construction of utility-infrastructure facilities, most public utilities are monopolies. Because of the lack of competition and

the essential nature of their services, it is not appropriate to permit monopoly utilities to set their own prices. Indeed, this principle is expressly stated in the Public Utility Regulatory Act ("PURA"):

> PURA § 11.002 (b). Public utilities traditionally are by definition monopolies in the areas they serve. As a result, the normal forces of competition that regulate prices in a free enterprise society do not operate. Public agencies regulate utility rates, operations, and services as a substitute for competition.[12]

Thus, regulation seeks to establish prices that are fair to consumers and, at the same time, sufficient to meet the operating and capital costs of the utility, *i.e.*, provide an adequate return on capital to attract investors.

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

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

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

[12] Texas Utilities Code § 11.002(b).

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

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

> Fundamentally, the value of a company is determined by the cash flow it generates over time for its owners, and the minimum acceptable rate of return required by capital investors. This "cost of equity capital" is used to discount the expected equity cash flow, converting it to a present value. The cash flow is, in turn, produced by the interaction of a company's return on equity and the annual rate of equity growth. High return on equity (ROE) companies in low-growth markets, such as Kellogg, are prodigious generators of cash flow, while low ROE companies in high-growth markets, such as Texas Instruments, barely generate enough cash flow to finance growth.
>
> A company's ROE over time, relative to its cost of equity, also determines whether it is worth more or less than its book value. If its ROE is consistently greater than the cost of equity capital (the investor's minimum acceptable return), the business is economically profitable and its market value will exceed book value. If, however, the business earns an ROE consistently less than its cost of equity, it is economically unprofitable and its market value will be less than book value. [13]

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

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

**Q. PLEASE PROVIDE ADDITIONAL INSIGHTS INTO THE RELATIONSHIP BETWEEN ROE AND MARKET-TO-BOOK RATIOS.**

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

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

| *Profitability* | *Value* |
|---|---|
| *If ROE > K* | *then Market/Book > 1* |
| *If ROE = K* | *then Market/Book =1* |
| *If ROE < K* | *then Market/Book< 1*[14] |

To assess the relationship by industry, as suggested above, I performed a regression study between estimated ROE and market-to-book ratios using natural gas distribution and electric utility companies. I used all companies in these two industries that are covered by *Value Line* and have estimated ROE and market-to-book ratio data. The results are presented on page 1 of Exhibit JRW-5. The average R-square is 0.50.[15] This demonstrates the strong positive relationship between ROEs and market-to-book ratios for public utilities. Given that the market-to-book ratios have been above 1.0 for

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

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

a number of years, this also demonstrates that utilities have been earning ROEs above the cost-of-equity capital for many years.

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

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

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

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

Page 2 of Exhibit JRW-5 provides an assessment of investment risk for 94 industries as measured by beta, which, according to modern capital market theory, is the only relevant measure of investment risk. These betas come from the *Value Line Investment Survey*. The study shows that the investment risk of utilities is low compared to other industries. The average betas for electric, gas, and water utility companies are 0.89, 0.89, and 0.79, respectively.[16] As such, the cost of equity for utilities is the lowest of all industries in the U.S., based on modern capital market theory.

[16] The beta for the *Value Line* electric utilities is the simple average of *Value Line*'s Electric East (0.89), Central

**Q. WHAT IS THE COST OF COMMON EQUITY CAPITAL?**

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

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

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

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

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

A. Primarily, I rely on the DCF model to estimate the cost-of-equity capital. Given the investment-valuation process and the relative stability of the utility business, the DCF model provides the best measure of equity-cost rates for public utilities. I have also performed an analysis using the capital asset pricing model ("CAPM"); however, I give

(0.89), and West (0.90) group betas.

these results less weight because I believe that risk-premium studies, of which the CAPM is one form, provide a less reliable indication of equity-cost rates for public utilities.

**Q. PLEASE EXPLAIN WHY YOU BELIEVE THAT THE CAPM PROVIDES A LESS RELIABLE INDICATOR OF EQUITY COST RATES?**

A. I believe that the CAPM provides a less reliable measure of a utility's equity-cost rate because it requires an estimate of the market-risk premium. As discussed below, there is a wide variation in estimates of the market-risk premium found in studies by academics and investment firms as well as in surveys of market professionals.

### B. Discounted Cash Flow (DCF) Approach

**Q. PLEASE DESCRIBE THE THEORY BEHIND THE TRADITIONAL DCF MODEL.**

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

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

where P is the current stock price, $D_1$, $D_2$, $D_n$ are the dividends in (respectively) year 1, 2, and in the future years n, and k is the cost of common equity.

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

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

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

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

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

In using the 3-stage model to estimate a firm's cost-of-equity capital, dividends are projected into the future using the different growth rates in the alternative stages, and then the equity-cost rate is the discount rate that equates the present value of the future dividends to the current stock price.

**Q. PLEASE BRIEFLY EXPLAIN THE CONCEPT OF "PRESENT VALUE."**

A. Present value is the concept that an amount of money today is worth more than that same amount in the future. In other words, money received in the future is not worth

as much as an equal amount received today. Present value tells an investor how much he or she would need in today's dollars to earn a specific amount in the future.

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

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

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

where P is the current stock price, $D_1$ represents the expected dividend over the coming year, k is investor's required return on equity, and g is the expected growth rate of dividends. This is known as the constant-growth version of the DCF model. To use the constant-growth DCF model to estimate a firm's cost of equity, one solves for "k" in the above expression to obtain the following:

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

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

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

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

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

**Q. WHAT DIVIDEND YIELDS HAVE YOU REVIEWED?**

A. I have calculated the dividend yields for the companies in the proxy group using the current annual dividend and the 30-day, 90-day, and 180-day average stock prices. These dividend yields are provided in Panels A and B of page 2 of Exhibit JRW-7. I have shown the mean and median dividend yields using 30-day, 90-day, and 180-day average stock prices. For the Electric Proxy Group, the mean and median dividend yields using the 30-day, 90-day, and 180-day average stock prices range from 3.7% to 3.9%. Hence, I am using 3.80%, as the dividend yield for the Electric Proxy Group. The dividend yields for the D'Ascendis Proxy Group are shown in Panel B of page 2 of Exhibit JRW-7. The mean and median dividend yields range from 3.8% to 4.0% using the 30-day and 90-day average stock prices. Given this range, I am using 3.90% as the dividend yield for the D'Ascendis Proxy Group.

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

A. According to the traditional DCF model, the dividend yield term relates the dividend paid over the coming period to the current stock price. As indicated by Professor Myron Gordon, who is commonly associated with the development of the DCF model for popular use, this is obtained by: (1) multiplying the expected dividend over the coming quarter by 4, and (2) dividing this dividend by the current stock price to

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

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

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

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

$$K = \left[\left(\frac{D}{P}\right) \times (1 + 0.5g)\right] + g$$

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

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

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

A. I have analyzed a number of measures of growth for companies in the proxy groups. I reviewed *Value Line's* historical and projected growth rate estimates for earnings per share ("EPS"), dividends per share ("DPS"), and book value per share ("BVPS"). In addition, I utilized the average EPS growth-rate forecasts of Wall Street analysts as

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

provided by Yahoo, Zacks and S&P Cap IQ. These services solicit five-year earnings growth-rate projections from securities analysts and compile and publish the means and medians of these forecasts. Finally, I also assessed prospective growth as measured by prospective earnings retention rates and earned returns on common equity.

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

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

**Q. PLEASE DEFINE AND EXPLAIN THE RELEVANCE OF INTERNAL GROWTH.**

A. A company's internal (or "organic") growth occurs when a business expands its own operations rather than relying on takeovers and mergers. It can come about through various means, for example, increasing existing production capacity through investment in new capital and technology, or development and launch of new products.

Internally generated growth is a function of the percentage of earnings retained within the firm (the earnings retention rate) and the rate of return earned on those earnings (the return on equity). The internal growth rate is computed as the retention rate times the return on equity. Internal growth is significant in determining long-run earnings and, therefore, dividends. Investors recognize the importance of internally-generated

growth and pay premiums for stocks of companies that retain earnings and earn high returns on internal investments.

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

A. Analysts' EPS forecasts for companies are collected and published by several different investment information services, including Institutional Brokers Estimate System ("I/B/E/S"), Bloomberg, FactSet, S&P Cap IQ, Zacks, First Call, and Reuters, among others. Thompson Reuters publishes analysts' EPS forecasts under different product names, including I/B/E/S, First Call, and Reuters. Bloomberg, FactSet, S&P Cap IQ, and Zacks each publish their own set of analysts' EPS forecasts for companies. These services do not reveal (1) the analysts who are solicited for forecasts; or (2) the identity of the analysts who actually provide the EPS forecasts that are used in the compilations published by the services. I/B/E/S, Bloomberg, FactSet, S&P Cap IQ, and First Call are fee-based services. These services usually provide detailed reports and other data in addition to analysts' EPS forecasts. In contrast, Thompson Reuters and Zacks provide limited EPS forecast data free-of-charge on the Internet. Yahoo finance (http://finance.yahoo.com) lists Thompson Reuters as the source of its summary EPS forecasts. Zacks (www.zacks.com) publishes its summary forecasts on its website. Zacks estimates are also available on other websites, such as MSN.money (http://money.msn.com).

**Q. ARE YOU RELYING EXCLUSIVELY ON THE EPS FORECASTS OF WALL STREET ANALYSTS IN ARRIVING AT A DCF GROWTH RATE FOR THE PROXY GROUP?**

A. No. There are several issues with using the EPS growth rate forecasts of Wall Street analysts as DCF growth rates. First, the appropriate growth rate in the DCF model is the dividend growth rate, not the earnings growth rate. Nonetheless, over the very long term, dividend and earnings will have to grow at a similar growth rate. Therefore, consideration must be given to other indicators of growth, including prospective dividend growth, internal growth, as well as projected earnings growth. Second, a study by Lacina, Lee, and Xu (2011) has shown that analysts' three-to-five year EPS growth-rate forecasts are not more accurate at forecasting future earnings than naïve

random walk forecasts of future earnings.[18] Employing data over a twenty-year period, these authors demonstrate that using the most recent year's actual EPS figure to forecast EPS in the next 3-5 years proved to be just as accurate as using the EPS estimates from analysts' three-to-five year EPS growth-rate forecasts. In the authors' opinion, these results indicate that analysts' long-term earnings growth-rate forecasts should be used with caution as inputs for valuation and cost-of-capital purposes. Finally, and most significantly, it is well known that the long-term EPS growth-rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased. This has been demonstrated in a number of academic studies over the years.[19] Hence, using these growth rates as a DCF growth rate will provide an overstated equity cost rate. On this issue, a study by Easton and Sommers (2007) found that optimism in analysts' growth rate forecasts leads to an upward bias in estimates of the cost of equity capital of almost 3.0 percentage points.[20]

**Q. ARE ANALYSTS' PROJECTED EPS GROWTH RATES FOR ELECTRIC UTILITIES LIKEWISE OVERLY OPTIMISTIC AND UPWARDLY BIASED?**

A. Yes. I have completed a study of the accuracy of analysts' EPS growth rates for electric utilities over the 1985-2019 time period. In the study, I used the utilities listed in the East, West, and Central Electric Utilities sectors by *Value Line*. I collected the three-to-five year projected EPS growth rate from I/B/E/S for each utility, and compared that growth rate to the utility's actual subsequent three-to-five year EPS growth rate. As shown in Figure 7, the mean forecasted EPS growth rate (depicted in the red line in

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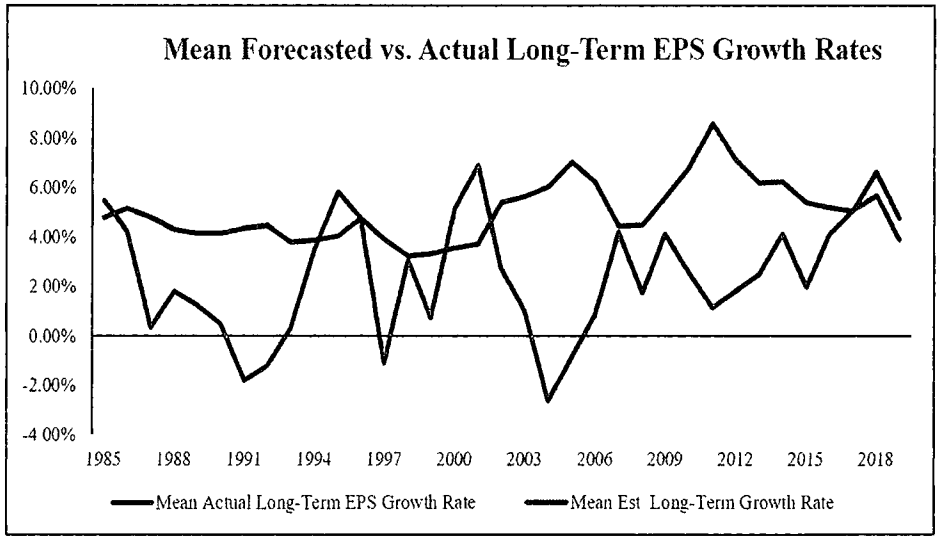
[18] M. Lacina, B. Lee & Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101.

[19] The studies that demonstrate analysts' long-term EPS forecasts are overly-optimistic and upwardly biased include: R.D. Harris, "The Accuracy, Bias, and Efficiency of Analysts' Long Run Earnings Growth Forecasts," *Journal of Business Finance & Accounting*, pp. 725-55 (June/July 1999); P. DeChow, A. Hutton, and R. Sloan, "The Relation Between Analysts' Forecasts of Long-Term Earnings Growth and Stock Price Performance Following Equity Offerings," *Contemporary Accounting Research* (2000); K. Chan, L., Karceski, J., & Lakonishok, J., "The Level and Persistence of Growth Rates," *Journal of Finance,* pp. 643–684, (2003); M. Lacina, B. Lee, and Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101; and Marc H. Goedhart, Rishi Raj, and Abhishek Saxena, "Equity Analysts, Still Too Bullish," *McKinsey on Finance*, pp. 14-17, (Spring 2010).

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

Figure 7) is consistently greater than the achieved actual EPS growth rate over the time period, with the exception of 1994-96 and 2000-2002. Over the entire period, the mean forecasted EPS growth rate is over 200 basis points above the actual EPS growth rate. As such, the projected EPS growth rates for electric utilities are overly-optimistic and upwardly-based.

**Figure 7**
**Mean Forecasted vs. Actual Long-Term EPS Growth Rates**
**Electric Utilities**
**1985-2019**




Data Source: S&P Global Market Intelligence, Capital IQ, I/B/E/S, 2021.

**Q. ARE THE PROJECTED EPS GROWTH RATES OF *VALUE LINE* ALSO OVERLY OPTIMISTIC AND UPWARDLY BIASED?**

A. Yes. A study by Szakmary, Conover, and Lancaster (2008) evaluated the accuracy of *Value Line*'s three-to-five-year EPS growth rate forecasts using companies in the Dow Jones Industrial Average over a thirty-year time period and found these forecasted EPS growth rates to be significantly higher than the EPS growth rates that these companies subsequently achieved.[21]

Szakmary, Conover, and Lancaster (SCL) studied the predicted versus the projected stock returns, sales, profit margins, and earnings per share made by *Value Line* over

[21] Szakmary, A., Conover, C., & Lancaster, C. (2008), "An Examination of *Value Line*'s Long-Term Projections," *Journal of Banking & Finance*, May 2008, pp. 820-833.

the 1969 to 2001 time period. *Value Line* projects variables from a three-year base period (e.g., 2012-2014) to a future three-year projected period (e.g., 2016-18). SCL used the sixty-five stocks included in the Dow Jones Indexes (30 Industrials, 20 Transports and 15 Utilities). SCL found that the projected annual stock returns for the Dow Jones stocks were "incredibly overoptimistic" and of no predictive value. The mean annual stock return of 20% for the Dow Jones' stocks *Value Line*'s forecasts was nearly double the realized annual stock return. The authors also found that *Value Line*'s forecasts of earnings per share and profit margins were termed "strikingly overoptimistic." *Value Line*'s forecasts of annual sales were higher than achieved levels, but not statistically significant. SCL concluded that the overly-optimistic projected annual stock returns were attributable to *Value Line*'s upwardly-biased forecasts of earnings per share and profit margins

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

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

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

A. According to the DCF model, the equity cost rate is a function of the dividend yield and expected growth rate. Because I believe that investors are aware of the upward bias in analysts' long-term EPS growth-rate forecasts, stock prices reflect the bias. But the DCF growth rate needs to be adjusted downward from the projected EPS growth rate to reflect the upward bias in the DCF model.

**Q. PLEASE DISCUSS THE HISTORICAL GROWTH OF THE COMPANIES IN THE PROXY GROUPS, AS PROVIDED BY *VALUE LINE.***

A. Page 3 of Exhibit JRW-7 provides the 5- and 10- year historical growth rates for EPS, DPS, and BVPS for the companies in the two proxy groups, as published in the *Value Line Investment Survey.* The median historical growth measures for EPS, DPS, and BVPS for the Electric Proxy Group, as provided in Panel A, range from 4.0% to 5.5%, with an average of the medians of 4.8%. For the D'Ascendis Proxy Group, as shown in Panel B of page 3 of Exhibit JRW-7, the historical growth measures in EPS, DPS,

and BVPS, as measured by the medians, range from 4.0% to 5.5%, with an average of the medians of 4.4%.

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

A. *Value Line's* projections of EPS, DPS, and BVPS growth for the companies in the proxy groups are shown on page 4 of Exhibit JRW-7. As stated above, due to the presence of outliers, the medians are used in the analysis. For the Electric Proxy Group, as shown in Panel A of page 4 of Exhibit JRW-7, the medians range from 4.0% to 5.5%, with an average of the medians of 5.0%. The range of the medians for the D'Ascendis Proxy Group, shown in Panel B of page 4 of Exhibit JRW-7, is from 4.0% to 4.4%, with an average of the medians of 4.8%.

Also provided on page 4 of Exhibit JRW-7 are the prospective sustainable growth rates for the companies in the two proxy groups as measured by *Value Line*'s average projected retention rate and return on shareholders' equity. As noted above, sustainable growth is a significant and a primary driver of long-run earnings growth. For the Electric Proxy Group and D'Ascendis Proxy Group, the median prospective sustainable growth rates are 3.7% and 3.9%, respectively.

**Q. PLEASE ASSESS GROWTH FOR THE PROXY GROUPS AS MEASURED BY ANALYSTS' FORECASTS OF EXPECTED THREE-TO-FIVE YEAR EPS GROWTH.**

A. Yahoo, Zacks, and S&P Cap IQ collect, summarize, and publish Wall Street analysts' three-to-five year EPS growth-rate forecasts for the companies in the proxy groups. These forecasts are provided for the companies in the proxy groups on page 5 of Exhibit JRW-7. I have reported both the mean and median growth rates for the groups. Since there is considerable overlap in analyst coverage between the three services, and not all of the companies have forecasts from the different services, I have averaged the expected five-year EPS growth rates from the three services for each company to arrive at an expected EPS growth rate for each company. The mean/median of analysts' projected

EPS growth rates for the Electric and D'Ascendis Proxy Groups are 5.5%/5.8% and 5.4%/5.3%, respectively.[22]

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

A. Page 6 of Exhibit JRW-7 shows the summary DCF growth rate indicators for the proxy groups.

The historical growth rate indicators for my Electric Proxy Group imply a baseline growth rate of 4.4%. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 5.0%, and *Value Line*'s projected sustainable growth rate is 3.7%. The projected EPS growth rates of Wall Street analysts for the Electric Proxy Group are 5.5% and 5.8% as measured by the mean and median growth rates. The overall range for the projected growth-rate indicators (ignoring historical growth) is 3.7% to 5.8%. Giving primary weight to the projected EPS growth rate of Wall Street analysts, but recognizing the upward bias nature of these forecasts, I believe that the appropriate projected growth rate is in the 5.0% to 5.5% ranges. I will use the midpoint of this range, 5.25%, as my DCF growth rate. This growth rate figure is in the upper end of the range of historic and projected growth rates for the Electric Proxy Group.

For the D'Ascendis Proxy Group, the historical growth rate indicators suggest a growth rate of 4.4%. The average of the projected EPS, DPS, and BVPS growth rates from *Value Line* is 4.8%, and *Value Line*'s projected sustainable growth rate is 3.9%. The projected EPS growth rates of Wall Street analysts are 5.4% and 5.5% as measured by the mean and median growth rates. The overall range for the projected growth rate indicators is 3.9% to 5.4%. Again, giving primary weight to the projected EPS growth rate of Wall Street analysts, but recognizing the upward bias nature of these forecasts, I believe that the appropriate DCF growth rate is 5.00%. Similar to the Electric Proxy Group, this growth rate figure is in the upper end of the range of historic and projected growth rates for the D'Ascendis Proxy Group.

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

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

A. My DCF-derived equity cost rates for the groups are summarized on page 1 of Exhibit JRW-7 and in Table 4 below.

**Table 4**
**DCF-Derived Equity Cost Rate/ROE**

| | Dividend Yield | 1 + ½ Growth Adjustment | DCF Growth Rate | Equity Cost Rate |
|---|---|---|---|---|
| **Electric Proxy Group** | **3.80%** | **1.02625** | **5.25%** | **9.15%** |
| **D'Ascendis Proxy Group** | **3.90%** | **1.02625** | **5.00%** | **9.00%** |

The result for the Electric Proxy Group is the 3.80% dividend yield, times the one and one-half growth adjustment of 1.02625, plus the DCF growth rate of 5.25%, which results in an equity cost rate of 9.15%. The result for the D'Ascendis Proxy Group is 9.00%, which includes a dividend yield of 3.90%, an adjustment factor of 1.0250, and a DCF growth rate of 5.00%.

### C. Capital Asset Pricing Model ("CAPM")

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

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

$$k = R_f + RP$$

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

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

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

Where:

- *K* represents the estimated rate of return on the stock;
- $E(R_m)$ represents the expected rate of return on the overall stock market. Frequently, the S&P 500 is used as a proxy for the "market";
- $(R_f)$ represents the risk-free rate of interest;
- $[E(R_m) - (R_f)]$ represents the expected equity or market risk premium—the excess rate of return that an investor expects to receive above the risk-free rate for investing in risky stocks; and
- *Beta*—(ß) is a measure of the systematic risk of an asset.

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

**Q. PLEASE DISCUSS EXHIBIT JRW-8.**

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

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

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

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

A. As shown on page 2 of Exhibit JRW-8, the yield on 30-year U.S. Treasury bonds has been in the 1.25 percent to 4.75 percent range over the 2010–2021 time period. The current 30-year Treasury yield is near the middle of this range. Given the recent range of yields, I have chosen to use a yield toward the middle of the range as my risk-free interest rate. Therefore, I am using 2.50 percent as the risk-free rate, or $R_f$, in my CAPM. This rate is consistent with Duff & Phelps, who are also using 2.50 percent (see page 7 of Exhibit JRW-8).[23]

**Q. DOES YOUR 2.50 PERCENT RISK-FREE INTEREST RATE TAKE INTO CONSIDERATION FORECASTS OF HIGHER INTEREST RATES?**

A. No; it does not. As I stated before, forecasts of higher interest rates have been notoriously wrong for a decade. My 2.50 percent risk-free interest rate takes into account the range of interest rates in the past and effectively synchronizes the risk-free rate with the market-risk premium. The risk-free rate and the market-risk premium are interrelated in that the market-risk premium is developed in relation to the risk-free rate. As discussed below, my market-risk premium is based on the results of many studies and surveys that have been published over time. Therefore, my risk-free interest rate of 2.50 percent is effectively a normalized risk-free rate of interest.

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

A. Beta (ß) is a measure of the systematic risk of a stock. The market, usually taken to be the S&P 500, has a beta of 1.0. The beta of a stock with the same price movement as the market also has a beta of 1.0. A stock with price movement greater than that of the market, such as a technology stock, is riskier than the market and has a beta greater than 1.0. A stock with below-average price movement, such as that of a regulated public utility, is less risky than the market and has a beta less than 1.0. Estimating a stock's beta involves running a linear regression of a stock's return on the market return.[24]

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[23] Duff & Phelps, *Cost of Capital Research Center* (2020), https://www.duffandphelps.com/insights/publications/cost-of-capital.

[24] Regression models describe the relationship between variables by fitting a line to the observed data. Linear

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

Several online investment information services, such as Yahoo and Reuters, provide estimates of stock betas. Usually these services report different betas for the same stock. The differences are usually due to: (1) the time period over which ß is measured; and (2) any adjustments that are made to reflect the fact that betas tend to regress to 1.0 over time.

**Q. PLEASE DISCUSS THE RECENT CHANGE IN BETAS.**

A. I have traditionally used the betas as provided in the *Value Line Investment Survey*. As discussed above, the betas for utilities recently increased significantly as a result of the volatility of utility stocks during the stock-market meltdown associated with the novel coronavirus in March. Utility betas as measured by *Value Line* have been in the 0.55 to 0.70 range for the past 10 years. But utility stocks were much more volatile relative to the market in March and April of 2020, and this resulted in an increase of above 0.30 to the average utility beta.

*Value Line* defines their computation of beta as:[25]

> Beta - A relative measure of the historical sensitivity of a stock's price to overall fluctuations in the New York Stock Exchange Composite Index. A Beta of 1.50 indicates a stock tends to rise (or fall) 50% more than the New York Stock Exchange Composite Index. The "Beta coefficient" is derived from a regression analysis of the relationship between weekly percent-age changes in the price of a stock and weekly percentage changes in the NYSE Index over a period of five years. In the case of shorter price histories, a smaller time period is used, but two years is the minimum. The Betas are adjusted for their long-term tendency to converge toward 1.00.

regression models use a straight line, while logistic and nonlinear regression models use a curved line. Regression allows one to estimate how a dependent variable changes as the independent variable(s) change.

[25] *Value Line* (2020) www.valueline.com.

> Value Line then adjusts these Betas to account for their long-term tendency to converge toward 1.00.

However, there are several issues with *Value Line* betas:

1. *Value Line* betas are computed using weekly returns, and the volatility of utility stocks during March 2020 was impacted by using weekly and not monthly returns. Yahoo Finance uses five years of monthly returns to compute betas, and Yahoo Finance's betas for utilities are lower than *Value Line*'s.

2. *Value Line* betas are computed using the New York Stock Exchange Index as the market. While about 3,000 stocks trade on the NYSE, most technology stocks are traded on the NASDAQ or over-the-counter market and not the NYSE. Technology stocks, which make up about 25 percent of the S&P 500, tend to be more volatile. If they were traded on the NYSE, they would increase the volatility of the measure of the market and thereby lower utility betas.

3. Major vendors of CAPM betas such as Merrill Lynch, *Value Line*, and Bloomberg publish adjusted betas. The so-called Blume adjustment cited by *Value Line* adjusts betas calculated using historical-returns data to reflect the tendency of stock betas to regress toward 1.0 over time, which means that the Betas of typical low beta stocks tend to increase toward 1.0, and the betas of typical high beta stocks tend to decrease toward 1.0.[26]

The Blume adjustment procedure is calculated as follows:

$$\text{Regressed Beta} = .67 * (\text{Observed Beta}) + 0.33$$

For example, suppose a company has an observed past beta of 0.50. The regressed (Blume-adjusted) beta would be:

$$\text{Regressed Beta} = .67 * (0.50) + 0.33 = 0.67$$

[26] M. Blume, *On the Assessment of Risk*, J. OF FIN (Mar. 1971).

Blume offered two reasons for betas to regress toward 1.0. First, he suggested it may be a by-product of management's efforts to keep the level of firm's systematic risk close to that of the market. He also speculated that it results from management's efforts to diversify through investment projects.

However, there is an issue with using regressed betas for utilities. Specifically, a study by Michelfelder and Theodossiou investigated whether regressed Betas are appropriate for utilities.[27] Conceptually, Michelfelder and Theodossiou suggested that utilities are different from unregulated companies in several areas, which may result in betas not regressing toward 1.0:[28]

> Being natural monopolies in their own geographic areas, public utilities have more influence on the prices of their product (gas and electricity) than other firms. The rate setting process provides public utilities with the opportunity to adjust prices of gas and electricity to recover the rising costs of fuel and other materials used in the transmission and distribution of electricity and gas.[29]

To test for a regression toward 1.0, the authors used monthly holding-period total returns for 57 publicly traded U.S. public utilities for the period from January 1962 to December 2007 using 60, 84, 96, and 108 monthly returns over five different non-lapping periods. They also used alternative time periods and obtained similar results. From their analysis of the data, the authors concluded that "public utility betas do not have a tendency to converge to 1".[30]

> Major vendors of CAPM Betas such as Merrill Lynch, Value Line, and Bloomberg distribute Blume adjusted betas to investors. We have shown empirically that public utility betas do not have a tendency to converge to 1. Short-term Betas of public utilities follow

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[27] Richard A. Michelfelder and Panayiotis Theodossiou, *Public Utility Beta Adjustment and Biased Costs of Capital in Public Utility Rate Proceedings*, THE ELECTRICITY J., (Nov. 2013).

[28] *Id.* at 61.

[29] *Id.*

[30] *Id.*

a cyclical pattern with recent downward trends, then upward structural breaks with long-term betas following a downward trend.

The authors concluded that utility betas converge to 0.59 as opposed to 1.0. The implication is that using regressed betas such as those from *Value Line* will result in an inflated expected return using the CAPM for utilities.

**Q. GIVEN THIS DISCUSSION, WHAT BETAS ARE YOU USING IN YOUR CAPM?**

A. As shown on page 3 of Exhibit JRW-9, the median *Value Line* beta for the Electric and D'Ascendis Proxy Groups are 0.85 and 0.90. At present, I will continue to use *Value Line* betas in my CAPM, which I believe is a conservative approach.

**Q. PLEASE DISCUSS THE MARKET-RISK PREMIUM.**

A. The market-risk premium is equal to the expected return on the stock market (e.g., the expected return on the S&P 500, $E(R_m)$ minus the risk-free rate of interest ($R_f$)). The market-risk premium is the difference in the expected total return between investing in equities and investing in "safe" fixed-income assets, such as long-term government bonds. However, while the market-risk premium is easy to define conceptually, it is difficult to measure because it requires an estimate of the expected return on the market - $E(R_m)$. As I discuss below, there are different ways to measure $E(R_m)$, and studies have been developed with significantly different magnitudes for $E(R_m)$. As Merton Miller, the 1990 Nobel Prize winner in economics indicated, $E(R_m)$ it is very difficult to measure and is one of the great mysteries in finance.[31]

**Q. PLEASE DISCUSS THE ALTERNATIVE APPROACHES TO ESTIMATING THE MARKET-RISK PREMIUM.**

A. Page 4 of Exhibit JRW-8 highlights the primary approaches to, and issues in, estimating the expected market-risk premium. The traditional way to measure the market-risk premium was to use the difference between historical average stock and bond returns. In this case, historical stock and bond returns, also called *ex post* returns, were used as the measures of the market's expected return (known as the *ex ante* or forward-looking

[31] Merton Miller, *The History of Finance: An Eyewitness Account*, J. OF APPLIED CORP. FIN., 3 (2000).

expected return). This type of historical evaluation of stock and bond returns is often called the "Ibbotson approach" after Professor Roger Ibbotson, who popularized this method of using historical financial market returns as measures of expected returns. However, this historical evaluation of returns can be a problem because: (1) *ex post* returns are not the same as *ex ante* expectations; (2) market-risk premiums can change over time, increasing when investors become more risk-averse and decreasing when investors become less risk-averse; and (3) market conditions can change such that *ex post* historical returns are poor estimates of *ex ante* expectations.

The use of historical returns as market expectations has been criticized in numerous academic studies, which I discuss later. The general theme of these studies is that the large equity risk premium discovered in historical stock and bond returns cannot be justified by the fundamental data. These studies, which fall under the category "*Ex Ante* Models and Market Data," compute *ex ante* expected returns using market data to arrive at an expected equity risk premium. These studies have also been called "Puzzle Research" after the famous study by Mehra and Prescott in which the authors first questioned the magnitude of historical equity risk premiums relative to fundamentals.[32]

In addition, there are a number of surveys of financial professionals regarding the market-risk premium, as well as several published surveys of academics on the equity risk premium. Duke University has published a CFO Survey on a quarterly basis for over 10 years.[33] Questions regarding expected stock and bond returns are also included in the Federal Reserve Bank of Philadelphia's annual survey of financial forecasters, which is published as the *Survey of Professional Forecasters*.[34] This survey of professional economists has been published for almost 50 years. In addition, Pablo

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

[33] DUKE UNIVERSITY, *The CFO Survey* (2020) https://www.richmondfed.org/cfosurvey.

[34] FEDERAL RESERVE BANK OF PHILADELPHIA, *Survey of Professional Forecasters* (Feb. 2020), https://www.philadelphiafed.org/-/media/research-and-data/real-time-center/survey-of-professional-forecasters/2019/spfq119.pdf?la=en. The Survey of Professional Forecasters was formerly conducted by the American Statistical Association (ASA) and the National Bureau of Economic Research (NBER) and was known as the ASA/NBER survey. The survey, which began in 1968, is conducted each quarter. The Federal Reserve Bank of Philadelphia, in cooperation with the NBER, assumed responsibility for the survey in June 1990.

Fernandez conducts annual surveys of financial analysts and companies regarding the equity risk premiums used in their investment and financial decision making.[35]

**Q. PLEASE PROVIDE A SUMMARY OF THE MARKET RISK PREMIUM STUDIES.**

A. Derrig and Orr, Fernandez, and Song completed the most comprehensive reviews of the research on the market risk premium.[36] Derrig and Orr's study evaluated the various approaches to estimating market-risk premiums, discussed the issues with the alternative approaches, and summarized the findings of the published research on the market risk premium.

Fernandez examined four alternative measures of the market-risk premium – historical, expected, required, and implied. He also reviewed the major studies of the market-risk premium and presented the summary market-risk premium results.

Song provided an annotated bibliography and highlighted the alternative approaches to estimating the market risk premium.

Page 5 of Exhibit JRW-8 provides a summary of the results of the primary risk-premium studies reviewed by Derrig and Orr, as well as other more recent studies of the market risk premium.

In developing page 5 of Exhibit JRW-8, I have categorized the types of studies as discussed on page 4 of Exhibit JRW-8. I have also included the results of studies of the "Building Blocks" approach to estimating the equity risk premium. The Building Blocks approach is a hybrid approach employing elements of both historical and *ex ante* models.

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[35] Pablo Fernandez, Eduardo Apellániz, & Javier Acín, SURVEY: MARKET RISK PREMIUM AND RISK-FREE RATE USED FOR 81 COUNTRIES IN 2020 (Mar. 25, 2020), IESE Business School Working Paper No. WP-1244-E, Available at SSRN: https://ssrn.com/abstract=3560869 or http://dx.doi.org/10.35139/ssrn.3560869 .

[36] *See* Richard Derrig & Elisha Orr, EQUITY RISK PREMIUM: EXPECTATIONS GREAT AND SMALL, Working Paper (version 3.0), Automobile Insurers Bureau of Massachusetts, (Aug. 28, 2003); Pablo Fernandez, EQUITY PREMIUM: HISTORICAL, EXPECTED, REQUIRED, AND IMPLIED, IESE Business School Working Paper (2007); Zhiyi Song, THE EQUITY RISK PREMIUM: AN ANNOTATED BIBLIOGRAPHY, CFA Institute (2007).

**Q. PLEASE DISCUSS PAGE 5 OF EXHIBIT JRW-8.**

A. Page 5 of Exhibit JRW-8 provides a summary of the results of the market risk-premium studies that I have reviewed. These include the results of: (1) the various studies of the historical risk premium, (2) *ex ante* market risk-premium studies, (3) market risk-premium surveys of CFOs, financial forecasters, analysts, companies and academics, and (4) the Building Blocks approach to the market risk premium. There are results reported for over 30 studies, and the median market-risk premium of these studies is 4.83 percent.

**Q. PLEASE HIGHLIGHT THE RESULTS OF MORE RECENT RISK-PREMIUM STUDIES AND SURVEYS.**

A. The studies cited on page 5 of Exhibit JRW-8 include every market risk-premium study and survey I could identify that was published over the past 15 years and that provided a market risk-premium estimate. Many of these studies were published prior to the financial crisis that began in 2008. In addition, some of these studies were published in the early 2000s at the market peak. It should be noted that many of these studies (as indicated) used data over long periods of time (as long as 50 years of data) and so were not estimating a market-risk premium as of a specific point in time (e.g., the year 2001). To assess the effect of the earlier studies on the market-risk premium, I have reconstructed page 5 of Exhibit JRW-8 on page 6 of Exhibit JRW-8; however, I have eliminated all studies dated before January 2, 2010. The median market-risk-premium estimate for this subset of studies is 5.13 percent.

**Q. PLEASE SUMMARIZE THE MARKET RISK PREMIUM STUDIES AND SURVEYS.**

A. As noted above, there are three approaches to estimating the market-risk premium – historic stock and bond returns, *ex ante* or expected returns models, and surveys. The studies on page 6 of Exhibit JRW-8 can be summarized in the following manners:

**Historic Stock and Bond Returns** - Historic stock and bond returns suggest a market-risk premium in the 4.40 percent to 6.43 percent range, depending on whether one uses arithmetic or geometric mean returns.

**Ex Ante Models** - Market risk-premium studies that use expected or ex ante return models indicate a market-risk premium in the range of 5.24 percent to 6.75 percent.

**Surveys** – Market-risk premiums developed from surveys of analysts, companies, financial professionals, and academics are lower, with a range from 3.36 percent to 5.70 percent.

**Q. PLEASE HIGHLIGHT THE *EX ANTE* MARKET RISK-PREMIUM STUDIES AND SURVEYS THAT YOU BELIEVE ARE MOST TIMELY AND RELEVANT.**

A. I will highlight several studies/surveys.

Pablo Fernandez conducts annual surveys of financial analysts and companies regarding the equity risk premiums used in their investment and financial decision-making.[37] His survey results are included on pages 5 and 6 of Exhibit JRW-8. The results of his 2020 survey of academics, financial analysts, and companies, which included 4,000 responses, indicated a mean market-risk premium employed by U.S. analysts and companies of 5.6 percent.[38] His estimated market-risk premium for the U.S. has been in the 5.00 percent to 5.60 percent range in recent years.

Professor Aswath Damodaran of New York University, a leading expert on valuation and the market-risk premium, provides a monthly updated market-risk premium based on projected S&P 500 EPS and stock-price level and long-term interest rates. His estimated market-risk premium, shown graphically in Figure 8, below, for the past 20 years, has primarily been in the range of 5.0 percent to 6.0 percent since 2010. As of March 2021, his estimate of the implied market-risk premium was 4.63 percent.[39]

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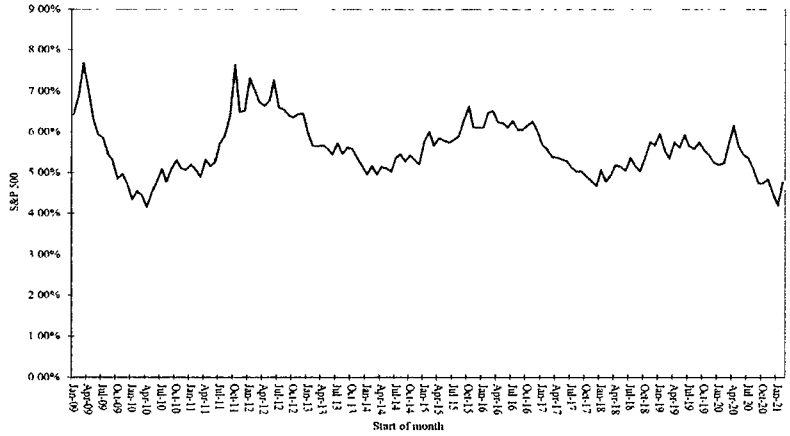
[37] Pablo Fernandez, Vitaly Pershin, and Isabel Fernandez Acín, A Survey: MARKET RISK PREMIUM AND RISK-FREE RATE USED FOR 81 COUNTRIES IN 2020, IESE Business School (Apr. 2020).

[38] *Id.* at 3.

[39] Aswath Damodaran, *Damodaran Online*, N.Y. UNIVERSITY. http://pages.stern.nyu.edu/~adamodar/.

**Figure 8**
**Damodaran Market Risk Premium**

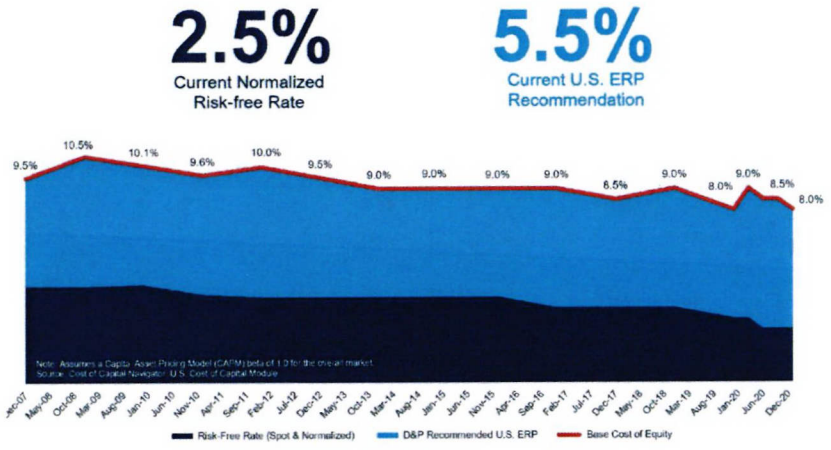



Source: Aswath Damodaran, Damodaran Online, N.Y. UNIVERSITY, http://pages.stern.nyu.edu/~adamodar/ (last visited March 9, 2021).

Duff & Phelps, an investment advisory firm, provides recommendations for the normalized risk-free interest rate and market-risk premiums to be used in calculating the cost-of-capital data. Its recommendations over the 2008–2020 time periods are shown on page 7 of Exhibit JRW-8 and are shown graphically in Figure 9. Over the past decade, Duff & Phelps' recommended normalized risk-free interest rates have been in the 2.50 percent to 4.00 percent and market-risk premiums have been in the 5.0 percent to 6.0 percent range. In early 2020, in the wake of the novel coronavirus in 2020, Duff & Phelps decreased its recommended normalized risk-free interest rate from 3.0 percent to 2.50 percent and increased its market-risk premium from 5.00 percent to 6.00 percent. Subsequently, on December 9, 2020, Duff & Phelps reduced its recommended market-risk premium to 5.50%.[40]

[40] https://www.duffandphelps.com/insights/publications/cost-of-capital/duff-and-phelps-recommended-us-equity-risk-premium-decreased-december-2020.

**Figure 9**
**Duff & Phelps**
**Normalized Risk-Free Rate and Market-Risk Premium Recommendations**
**2007-2021**




Source: https://www.duffandphelps.com/insights/publications/cost-of-capital

**Q. GIVEN THESE RESULTS, WHAT MARKET RISK PREMIUM ARE YOU USING IN YOUR CAPM?**

A. The studies on page 6 of Exhibit JRW-8, and more importantly, the more timely and relevant studies just cited, suggest that the appropriate market-risk premium in the U.S. is in the 4.0 percent to 6.0 percent range. I will use an expected market-risk premium of 6.00 percent, which is the upper end of the range, as the market-risk premium. I gave most weight to the market risk-premium estimates of Duff & Phelps, KPMG, the Fernandez survey, and Damodaran. This is a conservatively high estimate of the market-risk premium considering the many studies and surveys of the market-risk premium.

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

A. The results of my CAPM study for the proxy groups are summarized on page 1 of Exhibit JRW-8 and in Table 5 below.

**Table 5**
**CAPM-Derived Equity Cost Rate/ROE**
$K = (R_f) + ß * [E(R_m) - (R_f)]$

| | Risk-Free Rate | Beta | Equity Risk Premium | Equity Cost Rate |
|---|---|---|---|---|
| **Electric Proxy Group** | **2.50%** | **0.85** | **6.0%** | **7.6%** |
| **D'Ascendis Proxy Group** | **2.50%** | **0.85** | **6.0%** | **7.6%** |

For the Electric Proxy Group, the risk-free rate of 2.50% plus the product of the beta of 0.85 times the equity risk premium of 6.0% results in a 7.6% equity cost rate. For the D'Ascendis Proxy Group, the risk-free rate of 2.50%, a beta of 0.85, and a market risk premium of 6.0% yields a 7.6% equity cost rate.

### D. Equity Cost Rate Summary

**Q. PLEASE SUMMARIZE THE RESULTS OF YOUR EQUITY COST RATE STUDIES.**

A. My DCF analyses for the Electric Proxy Group indicates an equity-cost rate of 8.95%, and for the D'Ascendis Proxy Group an equity cost rate of 9.05%. The CAPM equity cost rates for the Electric and D'Ascendis are 7.60% and 7.90% respectively.

**Table 6**
**ROEs Derived from DCF and CAPM Models**

| | DCF | CAPM |
|---|---|---|
| **Electric Proxy Group** | **9.15%** | **7.60%** |
| **D'Ascendis Proxy Group** | **9.00%** | **7.60%** |

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

A. Given these results, I conclude that the appropriate equity-cost rate is in the range of 7.60% to 9.15% range for the companies in the Electric Proxy Group and in the D'Ascendis Proxy Group. However, since I rely primarily on the DCF model, I am using the upper end of the range as the equity-cost rate. Therefore, I conclude that the appropriate equity-cost rate is 9.0% for SWEPCO as estimated using the companies in the Electric and D'Ascendis Proxy Groups.

**Q. PLEASE INDICATE WHY YOUR EQUITY-COST RATE RECOMMENDATIONS ARE APPROPRIATE FOR SWEPCO.**

A. There are a number of reasons why an equity-cost rate of 9.00% is appropriate and fair for the Company in this case:

1. As shown in Exhibits JRW-5 (page 1), capital costs for utilities, as indicated by long-term, utility-bond yields, are still at historically low levels. In addition, given low inflationary expectations and slow global economic growth, interest rates are likely to remain at low levels for some time;

2. As shown in Exhibit JRW-5 (page 4), the electric utility industry are among the lowest risk industries in the U.S. as measured by beta. As such, the cost of equity capital for this industry is the lowest in the U.S., according to the CAPM;

3. While I have adopted the Company's proposed capital structure, it has a higher common equity ratio and lower financial risk than the averages of the three proxy groups;

4. The investment risk of SWEPCO is in line with the two proxy groups, as indicated by the Company's S&P issuer credit rating; and

5. My recommended equity-cost rate lies at the high end of the range of my ROE outcomes.

**Q. DO YOU BELIEVE THAT YOUR ROE RECOMMENDATION MEETS *HOPE* AND *BLUEFIELD* STANDARDS?**

A. Yes.

**Q. IN MARCH 2015 MOODY'S PUBLISHED AN ARTICLE ON UTILITY ROES AND CREDIT QUALITY. PLEASE DISCUSS YOUR RECOMMENDATION IN LIGHT OF A MOODY'S ARTICLE.**

A. Moody's March 2015 article recognized that authorized ROEs for electric and gas companies were declining due to lower interest rates. The article explains:[41]

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

> The credit profiles of US regulated utilities will remain intact over the next few years despite our expectation that regulators will continue to trim the sector's profitability by lowering its authorized returns on equity (ROE). Persistently low interest rates and a comprehensive suite of cost recovery mechanisms ensure a low business risk profile for utilities, prompting regulators to scrutinize their profitability, which is defined as the ratio of net income to book equity. We view cash flow measures as a more important rating driver than authorized ROEs, and we note that regulators can lower authorized ROEs without hurting cash flow, for instance by targeting depreciation, or through special rate structures.

Moody's stated that even with lower authorized ROEs, electric and gas companies were earning ROEs of 9.0% to 10.0%, their credit profiles were not being impaired and they were undeterred from raising record amounts of capital.

With respect to authorized ROEs, Moody's recognized that utilities and regulatory commissions were "struggling" to justify higher ROEs in the face of lower interest rates and risk-reducing, cost-recovery mechanisms:[42]

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

Overall, this article further supports the emerging belief that lower authorized ROEs were unlikely to hurt the financial integrity of utilities or their ability to attract capital.

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[42] *Id.*

## VI. CRITIQUE OF SWEPCO'S RATE OF RETURN TESTIMONY

**Q. PLEASE SUMMARIZE THE COMPANY'S PROPOSED RATE OF RETURN RECOMMENDATION.**

A. The Company's rate-of-return recommendation is summarized on page 1 of Exhibit JRW-9. The Company's overall proposed rate of return is 7.22%. The Company has proposed a capital structure of 49.63% long-term debt and 49.37% common equity. The Company has recommended a long-term, debt-cost rate of 4.18%. Mr. D'Ascendis has recommended a common equity-cost rate of 10.35%.

**Q. PLEASE REVIEW MR. D'ASCENDIS' EQUITY COST RATE APPROACHES AND RESULTS.**

A. Mr. D'Ascendis has developed a proxy group of electric utility companies and employs DCF, CAPM, utility risk premium, and expected-earnings equity-cost-rate approaches. Mr. D'Ascendis' equity-cost-rate estimates for SWEPCO are summarized on page 2 of Exhibit JRW-9. Based on these figures, he concludes that the appropriate equity-cost rate is 10.350% for SWEPCO's electric utility operations.

**Q. WHAT ARE THE PRIMARY ISSUES REGARDING RATE OF RETURN IN THIS PROCEEDING?**

A. The primary issues related to the Company's rate of return include the following:

**1. Capital Market Conditions** – Mr. D'Ascendis' analyses, ROE results, and recommendations are based on assumptions of higher interest rates and capital costs. However, despite the recent rise in rates, interest rates and capital costs remain at historically low levels. In 2019, interest rates fell due to slow economic growth and low inflation. Interest rates fell even further to record low levels in 2020 due to the impact of the novel coronavirus on the world's population and economy. The benchmark 30-year Treasury yield has rebounded since mid-2020, but it is in the 2.25% range.

**2. Capital Structure** – As I have just noted, SWEPCO's proposed capital structure favors shareholders at the expense of residential ratepayers. But I have adopted the proposed capital structure, with the caveat that it includes a little more equity than used by electric utilities in the proxy groups.

**3. DCF-Equity-Cost Rate** - The DCF-Equity-Cost Rate is estimated by summing the stock's dividend yield and investors' expected long-run growth rate in dividends paid per share. There two issues with Mr. D'Ascendis' DCF study: (1) First and foremost, he gives very little, if any, weight to his DCF results. His mean DCF result for his proxy group is 8.63%; and (2) he relies exclusively on Wall Street analysts' and *Value Line*'s forecasts of growth rates in earnings-per-share ("EPS"), which, as I noted above, present overly-optimistic and upwardly-biased results.

**3. Risk Premium Approach** – The equity-cost rate using the risk-premium model is the sum of the base interest-rate yield plus a risk premium. With respect to the market-risk premium, Mr. D'Ascendis has employed six different approaches to estimate the market-risk premium: (1) three methods use historical stock and bond return data; and (2) the other three approaches are based on projected stock-market returns. As I show in this section of my testimony, there are a number of empirical issues with using historical stock and bond returns to estimate an expected market-risk premium. In addition, Mr. D'Ascendis' projected market returns are based on highly unrealistic assumptions about future earnings and economic growth and the resulting stock returns. On this point, he makes the assumption that the companies in the S&P 500 can grow their earnings, on average, at 12.45% which is nearly triple the long-term projected growth rate of the economy as measured by GDP.

**4. CAPM Approach** - The CAPM approach requires an estimate of the risk-free interest rate, the beta, and the market- or equity-risk premium. There are two primary issues with Mr. D'Ascendis' CAPM analyses: (1) he has used a non-traditional CAPM approach, the empirical CAPM (ECAPM), as an equity cost-rate approach; and (2) most significantly, he relied on his market-risk premium of 10.92% using the same six approaches used in his Risk-Premium approach, as discussed above. The 10.92% market-risk premium is much higher than published market-risk premiums, and is developed using highly unrealistic assumptions of future earnings growth and stock-market returns.

**5. Equity Cost Rate Models Applied to Non-Price Regulated Companies** - Mr. D'Ascendis also estimates an equity-cost rate by applying his equity-cost rate approaches and methodologies to a group of "comparable risk" non-price-regulated companies. As I note in the rebuttal section of this testimony, these companies are not truly comparable to SWEPCO and the analyses are based on the same flawed approach summarized above.

**6. Other Issues** - Mr. D'Ascendis concludes that his equity cost-rate studies suggest a ROE range of 9.85% to 10.96%. He then also considers three other factors in order to arrive at his recommendation of a 10.35% ROE. These factors include: (1) SWEPCO's size; (2) SWEPCO's credit ratings relative to his proxy group; and (3) flotation costs. He increases his equity cost-rate range by 20 basis points to account for size and 27 basis points to account for credit ratings. He makes no specific adjustment for flotation costs. As I discuss in my testimony, a small-size premium is not appropriate for regulated public utilities and the credit ratings do not justify an equity cost-rate-risk adjustment.

### A. DCF Approach

**Q. PLEASE SUMMARIZE MR. D'ASCENDIS' DCF ESTIMATES.**

A. On pages 25-28 of his testimony and in his Schedule DWD-3, Mr. D'Ascendis develops an equity cost rate by applying the DCF model to his electric group. Mr. D'Ascendis' DCF results are summarized on page 2 of Exhibit JRW-9. In the traditional DCF approach, the equity cost rate is the sum of the dividend yield and expected growth. He reports both the mean and the midpoint of his DCF results. For the DCF growth rate, Mr. D'Ascendis uses four measures of projected EPS growth: the projected EPS growth of Wall Street analysts as compiled by Yahoo Finance, Zack's, *Value Line* and Bloomberg. The mean and median of his DCF results are 8.63% and 8.82%.

**Q. WHAT ARE THE ERRORS IN MR. D'ASCENDIS' DCF ANALYSES?**

A. There two issues with Mr. D'Ascendis' DCF study: (1) First and foremost, he gives very little, if any, weight to his DCF results. His mean DCF result for his proxy group is 8.63%; and (2) he relies exclusively on the overly-optimistic and upwardly-biased

earnings per share ("EPS"), growth-rate forecasts of Wall Street analysts and *Value Line*.

### 1. The Low Weight Given the DCF Results

**Q. HOW MUCH WEIGHT HAS MR. D'ASCENDIS GIVEN HIS DCF RESULTS IN ARRIVING AT AN EQUITY COST RATE FOR THE COMPANY?**

A. Apparently, very little, if any. The average of his mean constant-growth DCF equity cost rates is only 8.73%. Had he given these results any weight, he would have arrived at a much lower recommendation for his estimated cost of equity. He claims that the indicated range of equity cost rate was 9.85% to 10.96% (midpoint = 10.41%). This indicated range would have been 8.73% to 10.96% (midpoint = 9.85%).

### 2. Exclusive Reliance on Analysts' EPS Growth-Rate Forecasts

**Q. PLEASE REVIEW MR. D'ASCENDIS' DCF GROWTH RATE.**

A. In his constant-growth DCF model, Mr. D'Ascendis' DCF growth rate is the average of the projected EPS growth-rate forecasts of Wall Street analysts as compiled by Yahoo Finance, Zack's, *Value Line's* and Bloomberg.

**Q. WHAT IS THE EFFECT OF MR. D'ASCENDIS' EXCLUSIVE RELIANCE ON THE PROJECTED GROWTH RATES OF WALL STREET ANALYSTS AND *VALUE LINE*?**

A. Mr. D'Ascendis' reliance on the projected growth rates published by Wall Street analysts and *Value Line* inflates his estimates of growth rates. It seems highly unlikely that investors today would rely exclusively on the EPS growth-rate forecasts of Wall Street analysts and *Value Line* and ignore other growth-rate measures in arriving at their expected growth rates for equity investments. As I previously stated, the appropriate growth rate in the DCF model is the dividend growth rate rather than the earnings growth rate. Hence, consideration must be given to other indicators of growth, including historical prospective dividend growth, internal growth, as well as projected earnings growth. Due to the inaccuracy of analysts' long-term-earnings, growth-rate forecasts, the weight given to analysts' projected EPS growth rates should be limited. Finally, not only are those forecasts inaccurate but they also are overly optimistic and

upwardly biased.[43] Hence, using these growth rates as a DCF growth rate produces an overstated equity-cost rate.

### B. Risk-Premium Approach

**Q. PLEASE DISCUSS MR. D'ASCENDIS' RISK-PREMIUM ("RPM") APPROACH.**

A. On pages 28-41 of his testimony and in Schedule DWD-4, Mr. D'Ascendis develops an equity cost rate by using the RPM model. Mr. D'Ascendis reports a RPM equity cost rate of 10.54%. This figure is the average of his two risk-premium models: (1) a Predictive Risk-Premium Model ("PRPM") result of 10.27%; and (2) an Adjusted Total-Market Model ("ATMM") result of 10.80%. The PRPM uses a risk-free rate of 2.09%, and a risk premium of 8.24%. The ATMM uses an Aaa-rated projected utility bond yield of 3.03%, a credit-risk adjustment of 0.61%, and an equity risk premium of 7.02%. The equity risk premium of 7.02% is the average of 9.42%, 5.77%, and 5.88% which are the risk-premium studies summarized on pages 7-12 of Schedule DWD-4. The 9.42% equity risk premium is computed taking a Beta of 0.95 times the average of six different equity risk premium studies, 9.42%:

(1) 5.78% - Ibbotson historical stock-bond return study;

(2) 9.34% - a regression of the monthly returns of Ibbotson historical stocks and corporate bonds;

(3) 9.55% - Ibbotson historical stock-bond returns using his PRPM;

(4) 13.50% - using *Value Line*'s projected stock market return over the next five years minus the yield on Aaa corporate bond yields;

(5) 10.72% - applying the DCF model to the S&P 500 companies using *Value Line* projected EPS growth rates and subtracting the Aaa corporate bond yield; and

(6) 10.72% - applying the DCF model to the S&P 500 companies using Bloomberg projected EPS growth rates and subtracting the Aaa corporate bond yield.

[43] See discussion on pages 41-5 of this testimony and the references in footnotes 15-17.

**Q. WHAT IS THE PRIMARY ERROR IN MR. D'ASCENDIS' RPM ANALYSIS?**

A. The primary error is the magnitude of the risk premiums which are based on historical and projected stock- and bond-market returns.

### 1. Risk Premiums

**Q. PLEASE CRITIQUE MR. D'ASCENDIS' PRPM.**

A. Based on his PRPM approach, Mr. D'Ascendis estimates a risk premium based on historic stock and bond returns and his prediction of volatility. The inputs to the model are the historical returns on the common shares of each company in the proxy group minus the historical monthly yield on long-term U.S. Treasury securities for some undefined period. Using a generalized form of ARCH, known as GARCH, each electric company's projected equity risk premium was determined using statistical software.[44] His PRPM results for each company are provided in his Schedule DWD-4, page 2. The results indicate a wide range in equity cost rates ranging from a low of 7.62% for Ameren to a high of 13.38% for Entergy. The average of the mean and median estimates is 10.27%.

**Q. PLEASE ADDRESS THE PROBLEMS WITH MR. D'ASCENDIS' PRPM.**

A. There are two primary issues with Mr. D'Ascendis' PRPM. First, it is based on the historical relationship between stock and bond returns. The errors associated with computing an expected equity risk premium using historical stock and bond returns are addressed in detail below. In short, there are a myriad of empirical problems, which result in historical market returns producing inflated estimates of expected risk premiums.

Second, the PRPM model produces very high and variable equity cost-rate estimates. For example, the average beta used by Mr. D'Ascendis for electric utility companies is 0.85, which indicates these stocks are less volatile than the overall stock market. Yet, as I noted above, the variation in the PRPM equity cost rates for the electric companies

[44] ARCH stands for autoregressive, conditional, heteroskedasticity. It is a statistical approach to modelling the relationship between variables when volatility of the underlying data changes over time.

is 7.62% to 13.38%. These results and their wide range in variation make no sense for similar risk companies and hence do not provide reliable estimates of equity cost rates.

**Q. PLEASE IDENTIFY THE OTHER ERRORS IN THE RISK PREMIUMS IN MR. D'ASCENDIS' PRPM ANALYSIS AS WELL AS THE OTHER SIX RISK-PREMIUM STUDIES THAT HE CONDUCTS.**

A. There are two primary errors with Mr. D'Ascendis' PRPM and his six other risk-premium studies. (1) the PRPM and risk-premium studies (1) – (3) listed above are based on historic stock and bond returns/yields, and there are numerous well-known empirical issues with using historical returns to estimate a projected risk premium; and (2) risk-premium studies (4) – (6) develop risk premiums using projected stock-market returns. The primary issue with these latter three approaches is that the expected market returns are totally unrealistic and are based on excessive corporate earnings and economic growth rates.

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

A. As indicated, the PRPM and risk-premium studies (1)-(3) are based on historical stock and bond returns/yields. It is well-known and well-studied that using historical returns to measure an *ex ante* equity risk premium is erroneous and overstates the true market or equity risk premium.[45] This approach can produce differing results depending on several factors, including the measure of central tendency used, the time period evaluated, and the stock-market index employed. In addition, there are a myriad of empirical problems in the approach, which result in historical market returns producing inflated estimates of expected risk premiums. Among the errors are the U.S. stock market survivorship bias (the "Peso Problem"); the company survivorship bias (only successful companies survive – poor companies do not survive); the measurement of central tendency (the arithmetic versus geometric mean, where geometric means tend

[45] These issues are addressed in a number of studies, including: Aswath. Damodaran, "Equity Risk Premiums (ERP): Determinants, Estimation and Implications – The 2017 Edition" NYU Working Paper, 2017, pp. 30-44; See Richard Roll, "On Computing Mean Returns and the Small Firm Premium," *Journal of Financial Economics*, pp. 371-86, (1983); Jay Ritter, "The Biggest Mistakes We Teach," *Journal of Financial Research* (Summer 2002); Bradford Cornell, *The Equity Risk Premium* (New York, John Wiley & Sons),1999, pp. 36-78; and J. P. Morgan, "The Most Important Number in Finance," p. 6.

to better capture negative returns and thus investor loss); the historical time horizon used; the change in risk and required return over time; the downward bias in bond historical returns; and unattainable return bias (the return computation procedure presumes monthly portfolio rebalancing). The bottom line is that there are a number of empirical problems in using historical stock and bond returns to measure an expected equity risk premium.

**Q. WHAT SOURCE DID MR. D'ASCENDIS USE FOR HISTORICAL RETURNS IN HIS RISK-PREMIUM APPROACHES (1), (2), AND (3)?**

A. He says that he uses "Ibbotson" returns, but Ibbotson does not publish these returns anymore. These return series are now compiled and published by the investment advisory firm Duff & Phelps.

**Q. IS DUFF & PHELPS A RESPECTED FINANCIAL FIRM?**

A. Yes. Duff & Phelps is a global investments advisory firm with offices in twenty-eight countries and 3,500 employees.

**Q. WHAT IS DUFF & PHELPS' OPINION REGARDING THE USE OF HISTORICAL STOCK MARKET RETURNS TO ESTIMATE AN EQUITY RISK PREMIUM?**

A. In its Client Update on the equity risk premium, dated March 16, 2016, Duff & Phelps made the following statements regarding using historical returns to compute an equity risk premium ("ERP") (emphasis added):[46]

> In estimating the conditional ERP, valuation analysts cannot simply use the long-term historical ERP, without further analysis. A better alternative would be to examine approaches that are sensitive to the current economic conditions. As previously discussed, Duff & Phelps employs a multi-faceted analysis to estimate the conditional ERP that takes into account a broad range of economic information and multiple ERP estimation methodologies to arrive at its recommendation.

[46] Duff & Phelps, Client Alert, March 16, 2016, p. 37 (emphasis supplied).

**Q. DOES DUFF & PHELPS USE A HISTORIC STOCK MARKET RETURN FIGURE AS ITS RECOMMENDED EQUITY OR MARKET RISK PREMIUM?**

A. No.

**Q. WHAT DOES DUFF & PHELPS SAY ABOUT THE EXPECTED ERP AND HISTORICAL RETURNS?**

A. Duff & Phelps provides details about its perspective on historical returns versus its estimation of the ERP (emphasis added):[47]

> ERP is a forward-looking concept. It is an expectation as of the valuation date for which no market quotes are directly observable. While an analyst can observe premiums realized over time by referring to historical data (i.e., realized return approach or ex post approach), such realized premium data do not represent the ERP expected in prior periods, nor do they represent the current ERP estimate. Rather, realized premiums represent, at best, only a sample from prior periods of what may have then been the expected ERP. To the extent that realized premiums on the average equate to expected premiums in prior periods, such samples may be representative of current expectations. But to the extent that prior events that are not expected to recur caused realized returns to differ from prior expectations, such samples should be adjusted to remove the effects of these nonrecurring events. Such adjustments are needed to improve the predictive power of the sample.

**Q. DOES DUFF & PHELPS PUBLISH ITS RECOMMENDED ERP?**

A. Yes. In fact, on the same site (https://www.duffandphelps.com/) at which they sell their annual valuation handbook used by Mr. D'Ascendis, Duff & Phelps publishes its estimate of the equity- or market-risk premium. Duff & Phelps decreased its U.S. equity risk premium from 6.00% to 5.50%, as of December 9, 2020.[48] Page 7 of Exhibit JRW-8 of my testimony shows Duff & Phelps' equity-risk-premium recommendations. I find it puzzling that Mr. D'Ascendis would use the historical average annual stock

[47] Duff & Phelps, Client Alert, March 16, 2016, p. 35 (emphasis supplied).

[48] Duff & Phelps, "Duff & Phelps Recommended U.S. Equity Risk Premium Decreased from 6.0% to 5.5%, Effective December 9, 2020. Available at https://www.duffandphelps.com/insights/publications/cost-of-capital/duff-and-phelps-recommended-us-equity-risk-premium-decreased-december-2020.

return from the Duff & Phelps book and then ignore Duff & Phelps' recommendation as to the appropriate ERP.

**Q. DO YOU AGREE THAT THE U.S. EQUITY RISK PREMIUM OF 5.50% IS A REASONABLE AND WELL-SUPPORTED NUMBER IN THE CURRENT CAPITALIZATION CLIMATE?**

A. Yes.

**Q. PLEASE ASSESS MR. D'ASCENDIS' MARKET RISK PREMIUMS DERIVED FROM USING (1) *VALUE LINE*'S PROJECTED STOCK MARKET RETURN AND (2) BY APPLYING THE DCF MODEL TO THE S&P 500 AND USING *VALUE LINE* AND BLOOMBERG PROJECTED EPS GROWTH RATES.**

A. Mr. D'Ascendis develops three risk premiums using projected stock-market returns. In approach (4), he uses *Value Line*'s projected stock-market return over the next five years. In approaches (5) and (6), he calculates an expected market return by applying the DCF model to the S&P 500 using projected EPS growth rates from Bloomberg and from *Value Line*. As shown in Table 7, Mr. D'Ascendis uses expected stock-market returns of 16.53%, 13.66%, and 13.75% for the three approaches (Value Line Expected Return, Value Line DCF Expected Return, and Bloomberg DCF Expected Return) and the resulting risk premiums are 13.50%, 10.63%, and 10.72%. Assuming a dividend yield of 2.20% for the S&P 500 in 2020, the implied projected EPS growth rates for the three approaches are 14.33%, 11.46%, and 11.55%.

**Table 7**
**Risk Premiums Derived from Expected Market Returns**
**Using *Value Line* and Bloomberg Projected EPS Growth Rate**

| | VL Exp. Ret. | VL DCF Exp. Ret. | BL DCF Exp. Ret. | Average |
|---|---|---|---|---|
| **Dividend Yield** | **2.20%** | **2.20%** | **2.20%** | **2.20%** |
| **+ Expected EPS Growth** | **14.33%** | **11.46%** | **11.55%** | **12.45%** |
| **= Expected Market Return** | **16.53%** | **13.66%** | **13.75%** | **14.65%** |
| **+ Risk-Free Rate** | **3.03%** | **3.03%** | **3.03%** | **3.03%** |
| **= Market Risk Premium** | **13.50%** | **10.63%** | **10.72%** | **11.62%** |

**Q. ARE MR. D'ASCENDIS' RISK PREMIUMS REFLECTIVE OF THE MARKET RISK PREMIUMS?**

A. No. Mr. D'Ascendis' market risk premiums shown in Table 7, computed using his expected market returns (average = 14.65%), minus the risk-free interest rate (3.03%), which produce an average market-risk premium for the three approaches of 11.62%. This figure is well in excess of market risk premiums (1) found in studies of the market risk premiums by leading academic scholars; (2) produced by analyses of historic stock and bond returns; and (3) found in surveys of financial professionals. Page 6 of Exhibit JRW-8 provides the results of over thirty (30) market risk-premiums studies from the past fifteen years. Historic stock and bond returns suggest a market-risk premium in the 4.4% to 6.83% range, depending on whether one uses arithmetic or geometric mean returns. There have been many studies using *ex ante* models, and their market-risk premiums results vary from as low as 4.75% to as high as 6.75%. Finally, the market-risk premiums developed from surveys of analysts, companies, financial professionals, and academics suggest lower market-risk premiums, in a range of between 3.36% to 5.70%. The bottom line is that there is no support in historic return data, surveys, academic studies, or reports for investment firms for a market-risk premium of 11.62%, which is the average of the market-risk premiums used by Mr. D'Ascendis. As discussed below, the reason is that they are based on unrealistic long-term, earnings-per-share growth rates,

**Q. PLEASE DIRECTLY ADDRESS MR. D'ASCENDIS' MARKET RISK PREMIUM DERIVED FROM USING *VALUE LINE*'S PROJECTED STOCK-MARKET RETURN.**

A. In approach (4), Mr. D'Ascendis develops a market-risk premium using *Value Line*'s projected stock-market return over the next three-to-five-years. In the previously cited study by Szakmary, Conover, and Lancaster (2008), the authors also evaluated the accuracy of *Value Line*'s three-to-five-year predicted annual stock return for the stock market over a thirty-year time period and found these predicted stock-market returns to be "extremely overoptimistic," well in excess of historic market returns, and were not significantly related to future realized returns.[49]

[49] Szakmary, A., Conover, C., & Lancaster, C. (2008). An Examination of *Value Line*'s Long-Term projections.

**Q. IN APPROACHES (5) AND (6), MR. MR. D'ASCENDIS USES ANALYSTS' EPS GROWTH-RATE FORECASTS IN APPLYING THE DCF MODEL TO THE S&P 500 USING DATA FROM *VALUE LINE* AND BLOOMBERG. PLEASE, ONCE AGAIN, ADDRESS THE ISSUES WITH ANALYSTS' EPS GROWTH-RATE FORECASTS.**

A. The key point is that Mr. D'Ascendis' market-risk-premium methodology is based entirely on the concept that analyst projections of companies' three-to-five EPS growth rates reflect investors' expected *long-term* EPS growth for those companies. However, this is erroneous given the research on these projections. As previously noted, numerous studies have shown that the long-term, EPS-growth-rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased.[50] Moreover, a 2011 study showed that analysts' forecasts of EPS growth over the next three-to-five years' earnings are no more accurate than their forecasts of the next single year's EPS growth.[51] The inaccuracy of analysts' growth-rate forecasts leads to an upward bias in equity cost estimates of approximately 300 basis points.[52]

**Q. HAVE CHANGES IN REGULATIONS IMPACTING WALL STREET ANALYSTS AND THEIR RESEARCH IMPACTED THE UPWARD BIAS IN THEIR THREE-TO-FIVE YEAR EPS GROWTH-RATE FORECASTS?**

A. No. A number of the studies I have cited here demonstrate that the upward bias has continued despite changes in regulations and reporting requirements over the past two decades. This observation is highlighted by a 2010 McKinsey study entitled "Equity Analysts: Still Too Bullish," which involved a study of the accuracy of analysts' long-term, EPS-growth-rate forecasts. The authors conclude that after a decade of stricter

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*Journal of Banking & Finance*, May 2008, pp. 820-833.

[50] Such studies include: R.D. Harris, "The Accuracy, Bias, and Efficiency of Analysts' Long Run Earnings Growth Forecasts," *Journal of Business Finance & Accounting*, pp. 725-55 (June/July 1999); P. DeChow, A. Hutton, and R. Sloan, "The Relation Between Analysts' Forecasts of Long-Term Earnings Growth and Stock Price Performance Following Equity Offerings," *Contemporary Accounting Research* (2000); K. Chan, L., Karceski, J., & Lakonishok, J., "The Level and Persistence of Growth Rates," *Journal of Finance,* pp. 643–684, (2003); M. Lacina, B. Lee, and Z. Xu, (2011), *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101.

[51] M. Lacina, B. Lee, & Z. Xu, (2011), *Advances in Business and Management Forecasting,* Vol. 8, Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101.

[52] Peter D. Easton & Gregory A. Sommers, "Effect of Analysts' Optimism on Estimates of the Expected Rate of Return Implied by Earnings Forecasts," 45, *Journal of Accounting Research*, pp. 983–1015 (2007).

regulation, analysts' long-term earnings forecasts continue to be excessively optimistic. They made the following observation:[53]

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

This is the same observation made in a *Bloomberg Businessweek* article.[54] The author concluded:

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

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[53] Marc H. Goedhart, Rishi Raj, and Abhishek Saxena, "Equity Analysts, Still Too Bullish," *McKinsey on Finance*, pp. 14-17, (Spring 2010) (emphasis added).

[54] Roben Farzad, "For Analysts, Things Are Always Looking Up," *Bloomberg Businessweek* (June 10, 2010), https://www.bloomberg.com/news/articles/2010-06-10/for-analysts-things-are-always-looking-up.

**Q. IS THERE OTHER EVIDENCE THAT INDICATES THAT MR. D'ASCENDIS' RISK PREMIUMS COMPUTED BY USING *VALUE LINE*'S PROJECTED STOCK-MARKET RETURN AND BY APPLYING THE DCF MODEL TO THE S&P 500 AND USING *VALUE LINE* AND BLOOMBERG PROJECTED EPS GROWTH RATES ARE EXCESSIVE?**

A. Beyond my previous discussion of the upwardly biased nature of analysts' projected EPS growth rates, the fact is that long-term EPS-growth rates of 14.33%, 11.46%, and 11.55% (average = 12.45%) are inconsistent with both historic and projected economic and earnings growth in the U.S for several reasons: (1) long-term EPS and economic growth is about one-half of Mr. D'Ascendis' projected EPS growth rates of 14.33%, 11.46%, and 11.55%; (2) as discussed below, long-term EPS and GDP growth are directly linked; and (3) more recent trends in GDP growth, as well as projections of GDP growth, suggest slower economic and earnings growth in the future.

**Long-Term Historic EPS and GDP Growth rates have been in the 6%-7% Range** - I performed a study of the growth in nominal GDP, S&P 500 stock-price appreciation, and S&P 500 EPS and DPS growth since 1960. The results are provided on page 1 of Exhibit JRW-10, and a summary is shown in Table 8.

**Table 8**
**GDP, S&P 500 Stock Price, EPS, and DPS Growth**
**1960-Present**

| | |
|---|---|
| **Nominal GDP** | **6.28** |
| **S&P 500 Stock Price** | **7.20** |
| **S&P 500 EPS** | **6.53** |
| **S&P 500 DPS** | **5.75** |
| **Average** | **6.44** |

The results show that the historical long-run growth rates for GDP, S&P EPS, and S&P DPS are in the 6% to 7% range. By comparison, the average EPS growth rate used by Mr. D'Ascendis, 12.45%, is an outlier. These estimates suggest that companies in the U.S. would be expected to increase their growth rate of EPS in the future by almost 100% and maintain that growth indefinitely in an economy that is expected to grow at about one-third of Mr. D'Ascendis' projected growth rates.

**There is a Direct Link Between Long-Term EPS and GDP Growth** - The results in Exhibit JRW-10 and Table 8 show that historically there has been a close link between long-term EPS and GDP growth rates. Brad Cornell of the California Institute of Technology published a study on GDP growth, earnings growth, and equity returns. He finds that long-term EPS growth in the U.S. is directly related to GDP growth, with GDP growth providing an upward limit on EPS growth. In addition, he finds that long-term stock returns are determined by long-term earnings growth and that "real GDP growth in excess of 3 percent in the long run is highly unlikely in the developed world":

> The long-run performance of equity investments is fundamentally linked to growth in earnings. Earnings growth, in turn, depends on growth in real GDP. This article demonstrates that both theoretical research and empirical research in development economics suggest relatively strict limits on future growth. In particular, real GDP growth in excess of 3 percent in the long run is highly unlikely in the developed world. In light of ongoing dilution in earnings per share, this finding implies that investors should anticipate real returns on U.S. common stocks to average no more than about 4–5 percent in real terms.[55]

**The Trend and Projections Indicate Slower GDP Growth in the Future** - The components of nominal GDP growth are real GDP growth and inflation. Page 3 of Exhibit JRW-10 shows the annual real GDP growth rate over the 1961 to 2020 time period. Real GDP growth has gradually declined from the 5.0% to 6.0% range in the 1960s to the 2.0% to 3.0% range during the most recent five-year period, with the exception of the year 2020 (-3.5%).

The second component of nominal GDP growth is inflation. Page 4 of Exhibit JRW-10 shows inflation as measured by the annual growth rate in the Consumer Price Index (CPI) over the 1961 to 2020 time period. The large increase in prices from the late 1960s to the early 1980s is readily evident. Equally evident is the rapid decline in inflation during the 1980s as inflation declined from above 10% to about 4%. Since

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

that time, inflation has gradually declined and has been in the 2.0% range or below over the past five years.

The graphs on pages 2, 3, and 4 of Exhibit JRW-10 provide clear evidence of the decline, in recent decades, in nominal GDP as well as its components, real GDP, and inflation. To gauge the magnitude of the decline in nominal GDP growth, Table 9 provides the compounded GDP growth rates for 10-, 20-, 30-, 40- and 50- years. Whereas the 50-year compounded GDP growth rate is 6.28%, there has been a monotonic and significant decline in nominal GDP growth over subsequent 10-year intervals. These figures strongly suggest that nominal GDP growth in recent decades has slowed and that a figure in the range of 4.0% to 5.0% is more appropriate today for the U.S. economy.

**Table 9**
**Historical Nominal GDP Growth Rates**

| | |
|---|---|
| **10-Year Average** | **3.40%** |
| **20-Year Average** | **3.63%** |
| **30-Year Average** | **4.27%** |
| **40-Year Average** | **5.10%** |
| **50-Year Average** | **6.12%** |

**Long-Term GDP Projections also Indicate Slower GDP Growth in the Future** - A lower GDP growth range is also consistent with long-term GDP forecasts. There are several forecasts of annual GDP growth that are available from economists and government agencies. These are listed in Panel B of on page 5 of Exhibit JRW-10. The mean 10-year nominal, GDP-growth forecast (as of March 2020) by economists in the recent *Survey of Financial Forecasters* is 4.30 percent.[56] The federal Energy Information Administration (EIA), in its projections used in preparing *Annual Energy Outlook,* forecasts long-term GDP growth of 4.2 percent for the period 2019–2050.[57] The Congressional Budget Office (CBO), in its forecasts for the period 2019 to 2029, projects a nominal GDP growth rate of 3.8 percent.[58] Finally, the Social

[56] https://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/.

[57] U.S. Energy Information Administration, *Annual Energy Outlook 2020*, Table: Macroeconomic Indicators.

[58] Congressional Budget Office, *The 2020 Long-Term Budget Outlook*, June 25, 2020.

Security Administration (SSA), in its Annual OASDI Report, provides a projection of nominal GDP from 2020–2095.[59] SSA's projected growth GDP growth rate over this period is 4.1 percent. Overall, these forecasts suggest long-term GDP growth rate in the 4.0–4.3 percent range.

The bottom line is that the trends and projections suggest a long-term GDP growth rate in the 4.0% to 4.5% range. As such, Mr. D'Ascendis' average projected EPS growth rate of 12.45% is almost three times projected GDP growth.

**Q. WHAT ARE THE FUNDAMENTAL FACTORS THAT HAVE LED TO THE DECLINE IN PROSPECTIVE GDP GROWTH?**

A. As addressed in a study by the consulting firm McKinsey & Co., two factors drive real GDP growth over time: (a) the number of workers in the economy (employment); and (2) the productivity of those workers (usually defined as output per hour).[60] According to McKinsey, real GDP growth over the past 50 years was driven by population and productivity growth which grew at compound annual rates of 1.7% and 1.8%, respectively.

However, global economic growth is projected to slow significantly in the years to come. The primary factor leading to the decline is slow growth in employment (working-age population), which results from slower population growth and longer life expectancy. McKinsey estimates that employment growth will slow to 0.3% over the next fifty years. They conclude that even if productivity remains at the rapid rate of the past fifty years of 1.8%, real GDP growth will fall by 40 percent to 2.1%.

**Q. OVER THE MEDIUM TO LONG RUN, IS S&P 500 EPS GROWTH LIKELY TO OUTPACE GDP GROWTH?**

A. No. Figure 10 shows the average annual growth rates for GDP and the S&P 500 EPS since 1960. The one very apparent difference between the two is that the S&P 500 EPS growth rates are much more volatile than the GDP growth rates, when compared using

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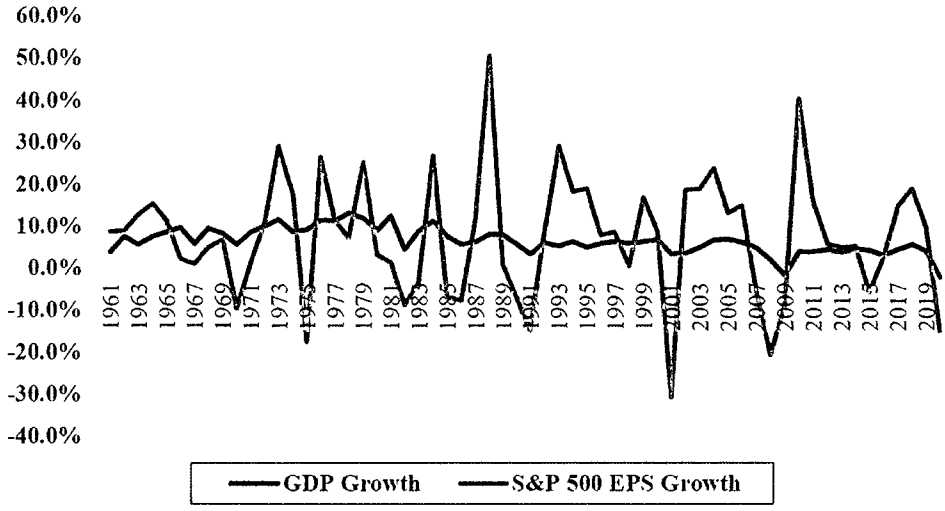
[59] Social Security Administration, *2020 Annual Report of the Board of Trustees of the Old-Age, Survivors, and Disability Insurance (OASDI) Program*, Table VI.G4, (July 1, 2020), The 4.1% growth rate is the growth in projected GDP from $22,341 trillion in 2020 to $450,425 trillion in 2095.

[60] McKinsey & Co., "Can Long-Term Growth be Saved?", McKinsey Global Institute, (Jan. 2015).

the relatively short, and somewhat arbitrary, annual conventions used in these data.[61] Volatility aside, however, it is clear that over the medium to long run, S&P 500 EPS growth does not outpace GDP growth.

**Figure 10**
**Average Annual Growth Rates**
**GDP and S&P 500 EPS**
**1960-2020**




Data Sources: GDPA - http://research.stlouisfed.org/fred2/series/GDPA/downloaddata.
S&P EPS - http://pages.stern.nyu.edu/~adamodar/

A fuller understanding of the relationship between GDP and S&P 500 EPS growth requires consideration of at least three factors, as follows.

**Corporate Profits are Constrained by GDP** – In a *Fortune* magazine article, Milton Friedman, the winner of the 1976 Nobel Prize in Economic Sciences, warned investors and others not to expect corporate-profit growth to sustainably exceed GDP growth, stating, "Beware of predictions that earnings can grow faster than the economy for long periods. When earnings are exceptionally high, they don't just keep

[61] Timing conventions such as years and quarters are needed for measurement and benchmarking but are somewhat arbitrary. In reality, economic growth and profit accrual occur on continuous bases. A 2014 study evaluated the timing relationship between corporate profits and nominal GDP growth. The authors found that aggregate accounting earnings growth is a leading indicator of the GDP growth with a quarter-ahead forecast horizon. *See* Yaniv Konchitchki and Panos N. Patatoukas, "Accounting Earnings and Gross Domestic Product," *Journal of Accounting and Economics* 57 (2014), pp. 76–88.

booming."[62] In that same article, Friedman also noted that profits must move back down to their traditional share of GDP. In Table 10, I show that the aggregate net income levels for the S&P 500 companies, using 2019 figures, represent 6.53% of nominal GDP.

**Table 10**
**S&P 500 Aggregate Net Income as a Percent of GDP**

| | $ Billion |
|---|---|
| **Aggregate Net Income for S&P 500** | **$1,399.46** |
| **2019 Nominal U.S. GDP** | **$21,427.10** |
| **Net Income/GDP (%)** | **6.53%** |

Data Sources: 2019 Net Income for S&P 500 companies – *Value Line* (March 3, 2020).
2019 Nominal GDP – Moody's - https://www.economy.com/united-states/nominal-gross-domestic-product.

**Short-Term Factors Impact S&P 500 EPS** – The growth rates in the S&P 500 EPS and GDP can diverge on a year-to-year basis due to short-term factors that impact S&P 500 EPS in a much greater way than GDP. As shown above, S&P EPS growth rates are much more volatile than GDP growth rates. The EPS growth for the S&P 500 companies has been influenced by low labor costs and interest rates, commodity prices, the recovery of different sectors such as the energy and financial sectors, the cut in corporate tax rates, etc. These short-term factors can make it appear that there is a disconnect between the economy and corporate profits.

**The Differences Between the S&P 500 EPS and GDP** – In the last two years, as the EPS for the S&P 500 has grown at a faster rate than U.S. nominal GDP, some have pointed to the differences between the S&P 500 and GDP.[63] These differences include: (a) corporate profits are about 2/3 manufacturing driven, while GDP is 2/3 services driven; (b) consumer discretionary spending accounts for a smaller share of

[62] Shaun Tully, "Corporate Profits Are Soaring. Here's Why It Can't Last," Fortune, (Dec. 7, 2017), http://fortune.com/2017/12/07/corporate-earnings-profit-boom-end/.

[63] *See* the following studies: Burt White and Jeff Buchbinder, "The S&P and GDP are not the Same Thing," LPL Financial, (Nov. 4, 2014), https://www.businessinsider.com/sp-is-not-gdp-2014-11: Matt Comer, "How Do We Have 18.4% Earnings Growth In A 2.58% GDP Economy?," Seeking Alpha, (Apr. 2018), https://seekingalpha.com/article/4164052-18_4-percent-earnings-growth-2_58-percent-gdp-economy; Shaun Tully, "How on Earth Can Profits Grow at 10% in a 2% Economy?," Fortune, (July 27, 2017), http://fortune.com/2017/07/27/profits-economic-growth/.

S&P 500 profits (15%) than of GDP (23%); (c) corporate profits are more international-trade driven, while exports minus imports tend to drag on GDP; and (d) S&P 500 EPS is affected not just by corporate profits but also by share buybacks on the positive side (fewer shares boost EPS), and by share dilution on the negative side (new shares dilute EPS). While these differences may seem significant, it must be remembered that the Income Approach to measure GDP includes corporate profits (in addition to employee compensation and taxes on production and imports) and therefore effectively accounts for the first three factors.[64]

The bottom line is that despite the intertemporal short-term differences between S&P 500 EPS and nominal GDP growth, the long-term link between corporate profits and GDP is inevitable.

**Q. PLEASE PROVIDE ADDITIONAL INSIGHTS INTO THE UNREASONABLENESS OF MR. D'ASCENDIS 12.45% AVERAGE PROJECTED S&P EPS GROWTH RATE IN LIGHT OF PROJECTED GDP GROWTH.**

A. Beyond my previous discussion, I have performed the following analysis of S&P 500 EPS and GDP growth in Table 11. Specifically, I started with the 2019 aggregate net income for the S&P 500 companies and 2019 nominal GDP for the U.S. As shown in Table 10, the aggregate profit for the S&P 500 companies represented 6.53% of nominal GDP in 2019. In Table 10, I then projected the aggregate net income level for the S&P 500 companies and GDP as of the year 2050. For the growth rate for the S&P 500 companies, I used Mr. D'Ascendis' average projected S&P 500 EPS growth rate of 12.45%. As a growth rate for nominal GDP, I used the average of the long-term projected GDP growth rates from SFF, CBO, SSA, and EIA (4.3%, 3.8%, 4.1%, and 4.0%, respectively), which is 4.09%. The projected 2050 level for the aggregate net income level for the S&P 500 companies is $19.1 trillion. Over the same period GDP is expected to grow to $74.3 trillion. As such, if the aggregate net income for the S&P 500 grows in accordance with the growth rate used by Mr. D'Ascendis, and if nominal

[64] The Income Approach to measuring GDP includes wages, salaries, and supplementary labor income, corporate profits, interest and miscellaneous investment income, farmers' incomes, and income from non-farm unincorporated businesses.

GDP grows at rates projected by major government agencies, the net income of the S&P 500 companies will represent growth from 6.53% of GDP in 2019 to 71.62% of GDP in 2050. It is totally unrealistic for the net income of the S&P 500 to become such a large component of GDP.

**Table 11**
**Projected S&P 500 Earnings and Nominal GDP**
**2019-2050**
**S&P 500 Aggregate Net Income as a Percent of GDP**

| | 2019 Value | Growth Rate | No. of Years | 2050 Value |
|---|---|---|---|---|
| **Aggregate Net Income for S&P 500** | **$1,399.46** | **12.45%** | **31** | **$ 53,174.54** |
| **2018 Nominal U.S. GDP** | **$21,427.10** | **4.09%** | **31** | **$ 74,240.80** |
| **Net Income/GDP (%)** | **6.53%** | | | **71.62%** |

Data Sources: 2019 Aggregate Net Income for S&P 500 companies – *Value Line* (March 3, 2020).
2019 Nominal GDP – Moody's - https://www.economy.com/united-states/nominal-gross-domestic-product.
S&P 500 EPS Growth Rate - Mr. D'Ascendis' average projected S&P 500 EPS growth rate of 12.45%.
Nominal GDP Growth Rate – The average of the long-term projected GDP growth rates from SFF, CBO, SSA, and EIA (4.3%, 3.8%, 4.0%, and 4.1%).

**Q. PLEASE PROVIDE A SUMMARY ANALYSIS ON GDP AND S&P 500 EPS GROWTH RATES.**

A. The long-term link between corporate profits and GDP is inevitable. The short-term differences in growth between the two indicate that corporate profits as a share of GDP tend to go far higher after periods where they are depressed, and then drop sharply after they have been hovering at historically high levels. In a famous 1999 *Fortune* article, Mr. Buffet made the following observation:[65]

> You know, someone once told me that New York has more lawyers than people. I think that's the same fellow who thinks profits will become larger than GDP. When you begin to expect the growth of a component factor to forever outpace that of the aggregate, you get into certain mathematical problems. In my opinion, you have to be wildly optimistic to believe that corporate profits as a percent of GDP can, for any sustained period, hold much above 6%.

[65] Carol Loomis, "Mr. Buffet on the Stock Market," *Fortune*, (Nov. 22, 1999), https://money.cnn.com/magazines/fortune/fortune_archive/1999/11/22/269071/.

In sum, Mr. D'Ascendis' average long-term S&P 500 EPS growth rate of 12.45% is grossly overstated and has little (if any) basis in economic reality. In the end, the big question remains whether corporate profits can grow faster than GDP. Jeremy Siegel, the renowned finance professor at the Wharton School of the University of Pennsylvania, believes that going forward, earnings per share can grow about half a point faster than nominal GDP, or about 5.0%, due to the big gains in the technology sector. But he also believes that sustained EPS growth matching analysts' near-term projections is absurd: "The idea of 8% or 10% or 12% growth is ridiculous. It will not happen."[66]

### C. CAPM Approach

**Q. PLEASE DISCUSS MR. D'ASCENDIS' CAPM.**

A. On pages 41-48 of his testimony and in Schedule DWD-5, Mr. D'Ascendis develops an equity cost rate by using the CAPM. Mr. D'Ascendis uses both the CAPM and the so-called empirical CAPM approaches ("ECAPM"). Mr. D'Ascendis' CAPM and ECAPM results provide a CAPM equity cost rate of 12.46%. Mr. D'Ascendis uses a projected rate of 2.09% for the long-term Treasury bond, mean/median betas from Bloomberg of 0.95, and a market-risk premium of 10.92%. The market risk premium is the average of six historical and projected market-risk premiums which were reviewed above.[67]

**Q. WHAT ARE THE ERRORS IN MR. D'ASCENDIS' CAPM ANALYSIS?**

A. There are two primary flaws with Mr. D'Ascendis' CAPM analyses: (1) the use of the so-called empirical CAPM ("ECAPM"); and (2) the market-risk premium of 10.92%. The highly overstated market-risk premium was discussed extensively above.

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[66] Shaun Tully, "Corporate Profits Are Soaring. Here's Why It Can't Last," *Fortune*, (Dec. 7, 2017), http://fortune.com/2017/12/07/corporate-earnings-profit-boom-end/.

[67] These include: (1) Ibbotson historical stock-bond return study; (2) a regression of the monthly returns of Ibbotson historical stocks and corporate bonds; (3) Ibbotson historical stock-bond returns using the PRPM; (4) *Value Line*'s projected stock market return over the next five years minus the yield on Aaa corporate bond yields; (5) applying the DCF model to the S&P 500 companies using Value Line projected EPS growth rates and subtracting the risk-free interest rate; and (6) applying the DCF model to the S&P 500 companies using Bloomberg projected EPS growth rates and subtracting the risk-free interest rate. The one difference is that the risk-free rate of 2.09% is the base yield.

### 1. ECAPM

**Q. WHAT ISSUES DO YOU HAVE WITH MR. D'ASCENDIS ECAPM?**

A. Mr. D'Ascendis has employed a variation of the CAPM which he calls the 'ECAPM.' The ECAPM attempts to model the well-known finding of tests of the CAPM that have indicated the Security Market Line ("SML") is not as steep as predicted by the CAPM. As such, the ECAPM is nothing more than an *ad hoc* version of the CAPM and has not been theoretically or empirically validated in refereed journals. The ECAPM provides for weights which are used to adjust the risk-free rate and market-risk premium in applying the ECAPM. Mr. D'Ascendis uses 0.25 and 0.75 factors to boost the equity risk premium measure, but provides no empirical justification for those figures.

Beyond the lack of any theoretical or empirical validation of the ECAPM, there is another error in Mr. D'Ascendis' ECAPM. I am not aware of any tests of the CAPM that use adjusted betas such as those used by Mr. D'Ascendis. Adjusted betas address the empirical issues with the CAPM by increasing the expected returns for low beta stocks and decreasing the returns for high beta stocks.

### 2. Market Risk Premium

**Q. PLEASE DISCUSS THE ISSUES WITH MR. D'ASCENDIS' CAPM MARKET RISK PREMIUM?**

A. Mr. D'Ascendis develops his CAPM market risk premium of 10.92% using the same six approaches employed in his Risk-Premium approach. As discussed extensively above, the 10.92% market-risk premium is much higher than published market-risk premiums, and is developed using highly unrealistic assumptions of future earnings growth and stock-market returns.

## D. Equity Cost Rate Models Applied to Non-Price Regulated Companies

**Q. PLEASE DISCUSS THE PROBLEM WITH MR. D'ASCENDIS' APPLICATION OF HIS EQUITY COST-RATE MODELS TO THE NON-PRICE REGULATED GROUP OF COMPANIES.**

A. At pages 48-51 of his testimony and in Schedule DWD-6 and DWD-7, Mr. D'Ascendis estimates an equity cost rate for the Company using a proxy group of forty-five, non-price regulated companies which he claims are comparable in risk to SWEPCO. This

group includes companies such as Apple, Hershey Foods, McCormick, Altria, and Northrop Grumman.

This approach is fundamentally flawed for two reasons. First, while many of these companies are large and successful, their lines of business are vastly different from the regulated electric utility business and they do not operate in a highly regulated environment. Second, the previously discussed upward bias in the EPS growth-rate forecasts of Wall Street analysts is particularly severe for non-utility companies and, therefore, the DCF equity cost rate estimates for this group are particularly overstated.

### E. Other Issues

**Q. WHAT OTHER FACTORS DOES MR. D'ASCENDIS CONSIDER IN ARRIVING AT HIS 10.35% ROE RECOMMENDATION?**

A. At page 51 of his testimony, Mr. D'Ascendis concludes that his equity cost-rate studies suggest a ROE range of 9.85% to 10.96%. He then also considers three other factors in order to arrive at his 10.35% ROE recommendation. These factors include: (1) SWEPCO's size; (2) SWEPCO's credit ratings relative to his proxy group; and (3) flotation costs. He increases his equity cost-rate range by 20 basis points to account for size and 27 basis points to account for credit ratings. He makes no specific adjustment for flotation costs. As I discuss in my testimony, a small-size premium is not appropriate for regulated public utilities and the credit ratings do not justify an equity cost rate risk adjustment.

#### 1. Size Adjustment

**Q. PLEASE DISCUSS MR. D'ASCENDIS' COMPANY-SIZE ADJUSTMENT.**

A. Mr. D'Ascendis includes a size adjustment of 0.20% to his ROE to account for the size of the Company. This adjustment is based on the historical stock-market-returns studies as performed by Duff & Phelps (formerly Morningstar and before that Ibbotson Associates). There are numerous errors in using historical market returns to compute risk premiums. These errors, which are discussed above, result in historic returns providing inflated estimates of expected risk premiums. Among the errors are *survivorship bias* (only successful companies survive – poor companies do not) and

*unattainable return bias* (the Ibbotson procedure presumes monthly portfolio rebalancing). The net result is that Ibbotson's size premiums are poor measures for risk adjustment to account for the size of a utility.

In addition, Professor Annie Wong has tested for a company-size premium in utilities and concluded that, unlike industrial stocks, utility stocks do not exhibit a significant company-size premium.[68] As explained by Professor Wong, there are several reasons why such a size premium would not be attributable to utilities. Utilities are regulated closely by state and federal agencies and commissions, and hence, their financial performance is monitored on an ongoing basis by the federal and/or state governments. In addition, public utilities must gain approval from government entities for common financial transactions such as the sale of securities (or the issuance of debt). Furthermore, unlike for their industrial counterparts, accounting standards and reporting are fairly standardized for public utilities. Finally, a utility's earnings are predetermined to a certain degree through the ratemaking process in which performance is reviewed by state commissions and other stakeholders. Overall, in terms of regulation, government oversight, performance review, accounting standards, and information disclosure, utilities are much different than industrials, which could account for the lack of a company-size premium.

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

A. As noted, there are errors in using historical market returns to compute risk premiums. With respect to the small-firm premium, Richard Roll (1983) found that one-half of the historic return premium for small companies disappears once biases are eliminated and historic returns are properly computed. The error arises from the assumption of monthly portfolio rebalancing and the serial correlation in historic small-firm returns.[69]

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

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

**Q. WHAT OTHER EVIDENCE CAN YOU PROVIDE REGARDING ISSUES RELATED TO THE SIZE PREMIUM?**

A. Clifford Ang, in his publication, "The Absence of a Size Effect Relevant to the Cost of Equity," tested for a company-size effect over the time period 1981-2016.[70] He used value-weighted, size-based decile returns obtained from French's Data Library, with the smallest size-based decile as a proxy for small stocks and the largest size-based decile as a proxy for large stocks. He found that small stocks underperformed large stocks by 12% over the period 1981 to 2016. He claims that this result is consistent with other studies that the size effect vanished in the 1980s. He concluded that "practitioners should abandon the practice of augmenting or modifying the CAPM Cost of Equity with a size premium":[71]

> My review of the evidence and analysis strongly suggests the proponents of the size effect are nowhere close to meeting their burden. I find that investors use the CAPM and do not demand compensation for size when setting their required rate of return, which directly contradicts the need to augment or modify the CAPM Cost of Equity with a size premium. I show that small stocks do not outperform large stocks, which calls into question the very premise of a size effect. I also find that studies finding a size effect suffer from the twin fatal flaws of lacking a theoretical basis and data mining, which are very difficult, if not impossible, to overcome. Given the above, practitioners should abandon the practice of augmenting or modifying the CAPM Cost of Equity with a size premium.

In addition, Professor Damodaran, the New York University valuation guru, provides a thorough analysis of the company-size effect, which he terms the small-firm or cap premium. Figure 11 traces the small-firm premium over the 1927-2014 time period.[72] Damodaran has studied the issue for years and makes a number of observations on the company-size premium or effect: (1) the effect has largely disappeared since 1980, which is the year the Banz article was published; (2) the small-firm premium tends to

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[70] Clifford Ang, "The Absence of a Size Effect Relevant to the Cost of Equity," June 9, 2017, available at https://ssrn.com/abstract=2984599

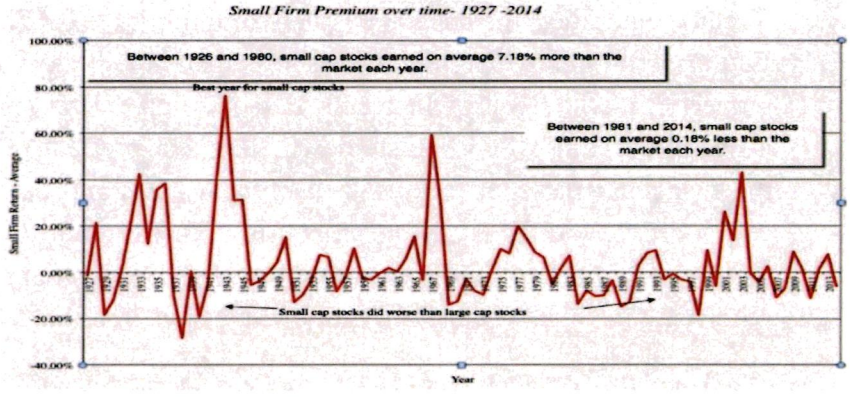
[71] *Id.* at p. 6.

[72] Damodaran – "The Small Cap Premium_ Where is the Beef," *Business Valuation Review*: Winter 2015, Vol. 34, No. 4, pp. 152-157, 2015.

come and go over time; (3) the small-firm premium tends to be associated with the January effect (small companies only earn abnormal returns in the first two weeks of January); (4) the small-cap premium seems to actually be a microcap premium, as it disappears when companies with market capitalizations below $5 million are removed; (5) Damodaran does not find a small-cap premium when he estimates a small-firm required return; and, (6) he has never used a small-cap premium when valuing small companies.

Professor Damodaran blames three factors for some analysts' continued use of a small-cap premium: (i) intuition (it *seems* smaller companies should be riskier), (ii) inertia (individuals and institutions are slow to change and to adopt new ideas); and (iii) bias (analysts prefer higher discount rates and lower valuations).

**Figure 11**
**The Small Firm Premium**
**1927-2014**




Source: Aswath Damodaran, "The Small Cap Premium - Where is the beef," *Business Valuation Review*: Winter 2015, Vol. 34, No. 4, pp. 152-157, 2015

### 2. Credit Risk Adjustment

**Q. WHAT IS THE BASIS OF D'ASCENDIS RISK ADJUSTMENT OF 0.27%?**

A. Mr. D'Ascendis includes a risk adjustment of 0.27% to account for what he claims is a credit-risk differential between SWEPCO and his proxy group. On page 5 of Schedule DWD-4, Mr. D'Ascendis provides the S&P and Moody's issuer credit ratings for his proxy companies. He claims that the average S&P and Moody's ratings for the proxy are BBB+ and A3. Since SWEPCO has a Baa2 Moody's rating, he claims that an

adjustment is necessary, computes the yield differential between A3 and Baa Moody's bonds, and arrives at his 0.27% credit-risk adjustment.

There are two errors in Mr. D'Ascendis' risk assessment. First, he computes the credit ratings for the operating subsidiaries of the proxy companies, and not the parent holding companies. The error is that the parent holding companies are the proxy group and not the operating subsidiary utility companies. The operating companies, like SWEPCO, do not have common stock outstanding and so they cannot be used to estimate an equity cost rate. Therefore, the correct comparison is between SWEPCO and the proxy holding companies, not the subsidiaries. As previously, noted, the average S&P and Moody's ratings for his proxy holding companies are BBB+ and Baa1. Second, he only compares the Moody's ratings, and ignores the S&P ratings. As such, he does not account for SWEPCO's higher S&P rating (A- vs. BBB+), which suggests that SWEPCO is less risky than the proxy group. As I noted earlier, SWEPCO's S&P rating is one notch above the average of the proxy group, and SWEPCO's Moody's rating is one notch below the average of the two proxy groups. On balance, I believe that this comparison suggests that SWEPCO's investment risk level is similar to the average of the proxy group and therefore no credit-risk adjustment is necessary.

### 3. Flotation Costs

**Q. PLEASE DISCUSS MR. D'ASCENDIS' CLAIM THAT ADJUSTMENT FOR FLOTATION COSTS IS JUSTIFIED.**

A. Mr. D'Ascendis argues that a flotation cost adjustment is appropriate for SWEPCO, but then elects not to include such an adjustment.

**Q. DO YOU AGREE THAT AN ADJUSTMENT FOR FLOTATION COSTS IS JUSTIFIED IN THIS CASE?**

A. No. First, as stated in SWEPCO's response to CARD's Request for Information ("RFI") No. 3-12, AEP has made no equity infusions into SWEPCO in the past five years. As a consequence, as indicated in SWEPCO's response to CARD RFI 3-24, SWEPCO cannot identify any flotation costs that have been paid by SWEPCO. As such, there is no need to consider flotation costs in arriving at an equity cost rate for SWEPCO.

## VII. SUMMARY AND CONCLUSIONS

**Q. DR. WOOLRIDGE, PLEASE SUMMARIZE YOUR TESTIMONY ON THE APPROPRIATE COST OF CAPITAL FOR ATMOS.**

A. I show that the Company's proposed capital structure includes a little more common equity ratio and lower financial risk than other electric utility companies. Nonetheless, I have adopted SWEPCO's proposed capital structure with a common equity ratio of 49.37%. To estimate an equity cost rate for the Company, I have applied the DCF and CAPM approaches to my proxy group of electric utility companies as well as Mr. D'Ascendis' proxy group. My analyses indicate that an equity cost rate in the range of 7.60%-9.15% is appropriate at this time. Since I rely primarily on the DCF approach, and given the recent rise in interest rates, I am recommending a ROE in the upper end of the range, 9.00%, for SWEPCO. Given my recommended capitalization ratios, senior capital cost rates, and the 9.00% ROE, my rate of return or cost of capital recommendation for the Company is 6.56% and is summarized in Table 2 and Exhibit JRW-1.

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

A. Yes.

SOAH DOCKET NO. 473-21-0538
PUC DOCKET NO. 51415

| | | |
|---|---|---|
| APPLICATION OF SOUTHWESTERN ELECTRIC POWER COMPANY FOR AUTHORITY TO CHANGE RATES | § § § | BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS |

# DIRECT TESTIMONY AND EXHIBITS

# OF

# J. RANDALL WOOLRIDGE, Ph. D.

## Exhibit JRW-1

**Southwestern Electric Power Company**

**Recommended Cost of Capital**

| Capital Source | Capitalization Ratios | Cost Rate | Weighted Cost Rate |
|---|---|---|---|
| Long-Term Debt | 50.63% | 4.18% | 2.11% |
| Common Equity | 49.37% | 9.00% | 4.44% |
| Total Capital | 100.00% | | 6.56% |

* Capital Structure Ratios are developed in Exhibit JRW-4.

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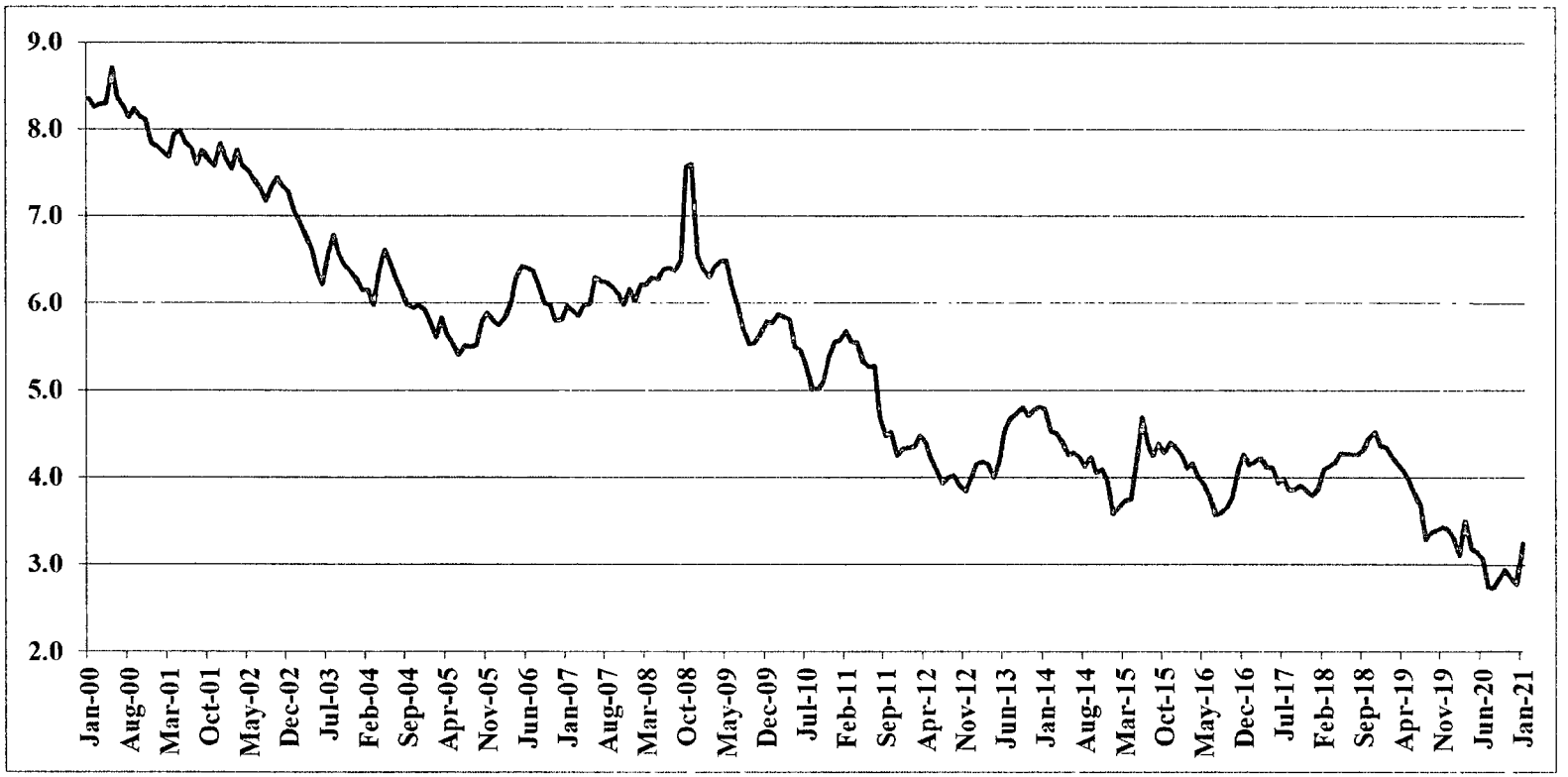
# DIRECT TESTIMONY AND EXHIBITS

# OF

# J. RANDALL WOOLRIDGE, Ph. D.

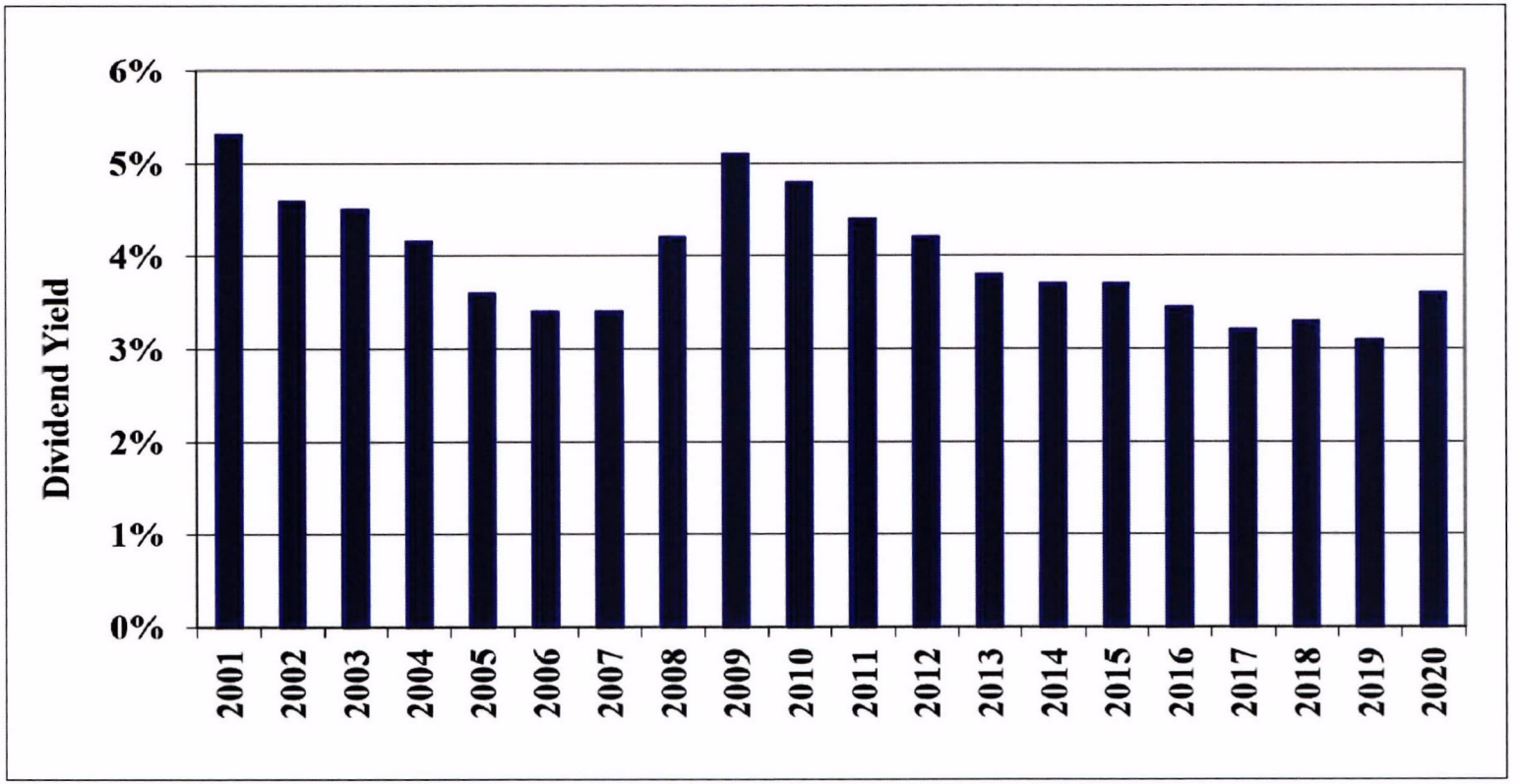
## Exhibit JRW-2

**Exhibit JRW-2**
**Long-Term 'A' Rated Public Utility Bonds**



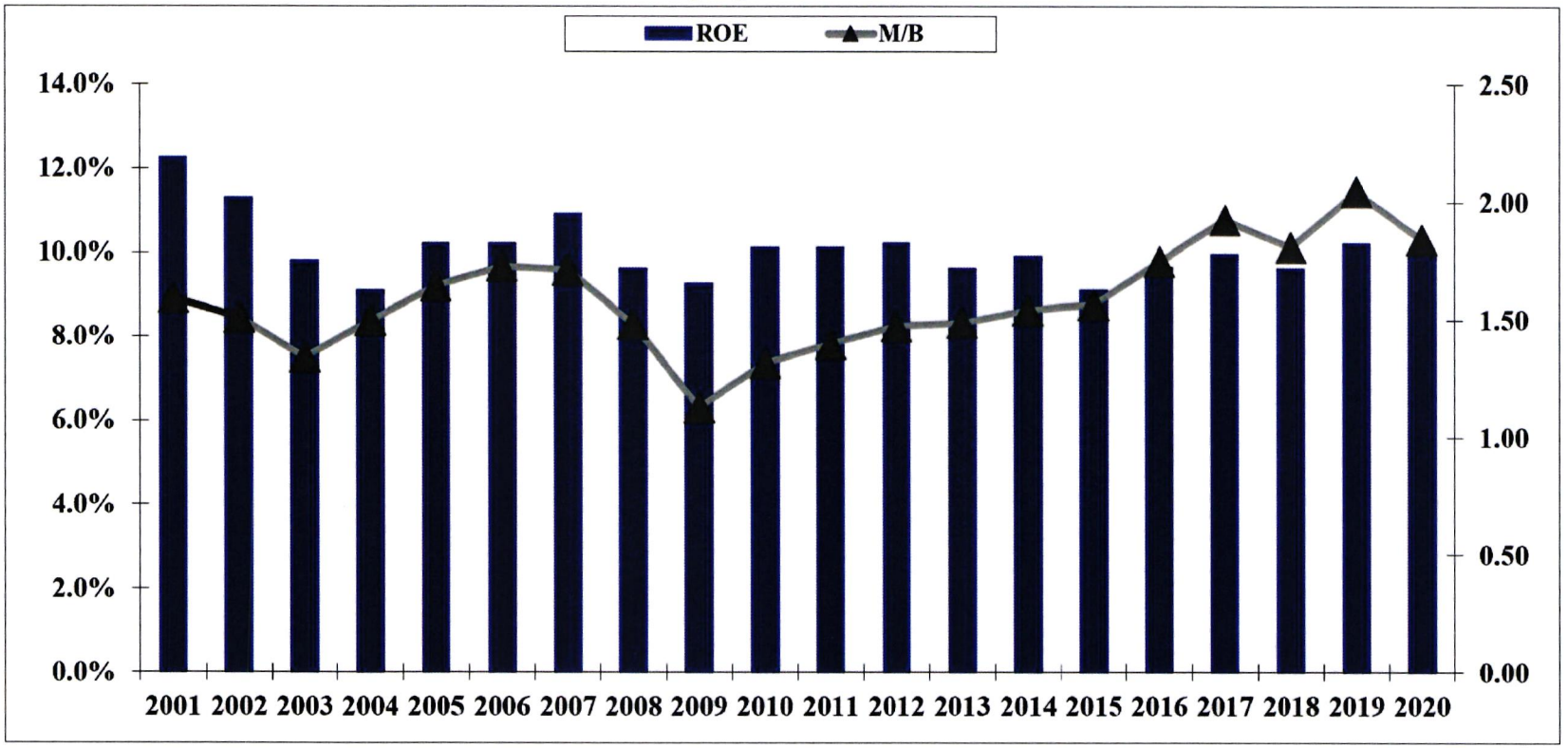

Data Source: Mergent Bond Record

**Electric Utility Average Dividend Yield**




**Data Source:** ***Value Line Investment Survey.***

**Electric Utility Average Return on Equity and Market-to-Book Ratios**




**Data Source:** ***Value Line Investment Survey.***

**SOAH DOCKET NO. 473-21-0538**
**PUC DOCKET NO. 51415**

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|---|---|---|
| **APPLICATION OF SOUTHWESTERN ELECTRIC POWER COMPANY FOR AUTHORITY TO CHANGE RATES** | **§** | **BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS** |

# DIRECT TESTIMONY AND EXHIBITS

# OF

# J. RANDALL WOOLRIDGE, Ph. D.

## Exhibit JRW-3

Summary Financial Statistics for Proxy Groups

Panel A
Electric Proxy Group

| Company | Operating Revenue ($mil) | Percent Reg Elec Revenue | Percent Reg Gas Revenue | Net Plant ($mil) | Market Cap ($mil) | S&P Issuer Credit Rating | Moody's Long Term Rating | Pre-Tax Interest Coverage | Primary Service Area | Common Equity Ratio | Return on Equity | Market to Book Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ALLETE, Inc. (NYSE:ALE) | 1,169.1 | 84% | 0% | 4,863.2 | 3,315.7 | BBB | Baa1 | 2.43 | MN, WI | 59.0% | 7.70 | 1.45 |
| Alliant Energy Corporation (NasdaqGS:LNT) | 3,416.0 | 85% | 11% | 14,336.0 | 12,091.7 | A- | Baa2 | 2.51 | WI,IA,IL,MN | 45.7% | 11.30 | 2.13 |
| Ameren Corporation (NYSE:AEE) | 5,540.0 | 80% | 13% | 26,807.0 | 18,459.5 | BBB+ | Baa1 | 3.38 | IL,MO | 44.7% | 10.20 | 2.07 |
| American Electric Power Company, Inc. (NasdaqGS:AE | 14,918.5 | 97% | 0% | 64,768.0 | 39,182.1 | A- | NR | 2.67 | 10 States | 41.5% | 11.00 | 1.91 |
| Avista Corporation (NYSE:AVA) | 1,321.9 | 64% | 22% | 5,130.3 | 2,972.8 | BBB | Baa2 | 2.24 | WA,OR,AK,ID | 49.1% | 6.53 | 1.46 |
| CMS Energy Corporation (NYSE:CMS) | 6,680.0 | 65% | 27% | 21,073.0 | 15,998.1 | BBB+ | NR | 2.63 | MI | 28.7% | 14.40 | 2.91 |
| Consolidated Edison, Inc. (NYSE:ED) | 12,246.0 | 71% | 19% | 47,395.0 | 23,387.2 | A- | Baa2 | 2.39 | NY,PA | 47.9% | 5.97 | 1.24 |
| Dominion Energy, Inc. (NYSE:D) | 14,172.0 | 75% | 17% | 58,412.0 | 56,282.6 | BBB+ | NR | 2.61 | VA,NC,SC,OH,WV,UT | 41.2% | 5.30 | 2.37 |
| Duke Energy Corporation (NYSE:DUK) | 23,453.0 | 91% | 7% | 106,854.0 | 68,049.8 | BBB+ | Baa1 | 2.52 | NC,OH,FL,SC,KY | 45.6% | 2.78 | 1.48 |
| Edison International (NYSE:EIX) | 13,578.0 | 100% | 0% | 48,796.0 | 21,884.6 | BBB | Baa3 | 2.79 | CA | 41.7% | 5.40 | 1.56 |
| Entergy Corporation (NYSE:ETR) | 10,113.6 | 91% | 0% | 39,196.1 | 17,868.8 | BBB+ | Baa2 | 2.18 | LA,AR,MS,TX | 34.0% | 13.10 | 1.64 |
| Evergy, Inc. (NYSE:EVRG) | 4,913.4 | 100% | 0% | 20,042.3 | 12,561.4 | A- | NR | 3.00 | KS,MO | 48.7% | 7.15 | 1.44 |
| Eversource Energy (NYSE:ES) | 8,904.4 | 80% | 14% | 30,937.7 | 27,666.7 | A- | Baa1 | 3.80 | CT,NH,MA | 47.4% | 9.03 | 1.97 |
| Hawaiian Electric Industries, Inc. (NYSE:HE) | 2,579.8 | 88% | 0% | 5,418.8 | 4,065.9 | BBB- | Baa2 | 3.40 | HI | 52.5% | 8.57 | 1.74 |
| IDACORP, Inc. (NYSE:IDA) | 1,350.7 | 100% | 0% | 4,709.5 | 4,549.3 | BBB | Baa1 | 3.01 | ID | 56.1% | 9.45 | 1.78 |
| MGE Energy, Inc. (NasdaqGS:MGEE) | 524.5 | 72% | 28% | 1,775.4 | 2,369.4 | AA | A1 | 5.24 | WI | 65.3% | 10.10 | 2.43 |
| NextEra Energy, Inc. (NYSE:NEE) | 17,997.0 | 73% | 0% | 91,803.0 | 138,563.1 | A- | Baa1 | 2.64 | FL | 46.5% | 7.94 | 3.79 |
| NorthWestern Corporation (NasdaqGS:NWE) | 1,198.7 | 78% | 22% | 4,952.9 | 3,083.0 | BBB | NR | 2.43 | MT,SD,NE | 47.3% | 7.54 | 1.48 |
| OGE Energy Corp. (NYSE:OGE) | 2,122.3 | 100% | 0% | 9,274.4 | 6,348.7 | BBB+ | NR | 3.25 | OK,AR | 51.0% | -4.47 | 1.75 |
| Otter Tail Corporation (NasdaqGS:OTTR) | 890.1 | 50% | 0% | 2,068.4 | 1,779.6 | BBB | Baa2 | 4.22 | MN,ND,SD | 58.2% | 11.60 | 2.04 |
| Pinnacle West Capital Corporation (NYSE:PNW) | 3,587.0 | 100% | 0% | 15,268.1 | 8,598.4 | A- | A3 | 3.41 | AZ | 47.2% | 9.95 | 1.53 |
| Portland General Electric Company (NYSE:POR) | 2,145.0 | 91% | 8% | 7,218.0 | 3,879.7 | BBB+ | A3 | 1.83 | OR | 47.5% | 5.96 | 1.48 |
| PPL Corporation (NYSE-PPL) | 7,607.0 | 91% | 8% | 38,979.0 | 21,226.0 | A- | Baa2 | 2.80 | PA,KY,UK | 44.5% | 11.05 | 2.27 |
| Sempra Energy (NYSE:SRE) | 11,370.0 | 56% | 44% | 40,546.0 | 36,059.8 | BBB+ | Baa2 | 2.52 | CA,TX | 49.2% | 10.10 | 1.78 |
| The Southern Company (NYSE:SO) | 20,375.0 | 83% | 14% | 89,016.0 | 61,653.2 | A- | NR | 2.85 | GA,FL,NJ,IL,VA,TN,MS | 38.4% | 11.20 | 2.20 |
| WEC Energy Group, Inc. (NYSE:WEC) | 7,241.7 | 82% | 17% | 25,728.1 | 26,647.9 | A- | Baa1 | 3.53 | WI,IL,MN,MI | 47.3% | 11.70 | 2.55 |
| Xcel Energy Inc. (NasdaqGS:XEL) | 11,526.0 | 85% | 14% | 44,129.0 | 32,984.8 | A- | Baa1 | 2.51 | MN,WI,ND,SD,MI | 42.6% | 10.60 | 2.26 |
| Mean | $7,812.6 | 83% | 11% | $32,203.6 | $24,871.5 | BBB+ | Baa1 | 2.92 | | 47.0% | 8.56 | 1.95 |
| Median | $6,680.0 | 84% | 8% | $25,728.1 | $17,868.8 | BBB+ | Baa1 | 2.6 | | 47.3% | 9.45 | 1.78 |

Data Source Company 2020 SEC 10-K filings, S&P Capital IQ, *Value Line Investment Survey*, 2021

Panel B
D'Ascendis Proxy Group

| Company | Operating Revenue ($mil) | Percent Reg Elec Revenue | Percent Reg Gas Revenue | Net Plant ($mil) | Market Cap ($mil) | S&P Issuer Credit Rating | Moody's Long Term Rating | Pre-Tax Interest Coverage | Primary Service Area | Common Equity Ratio | Return on Equity | Market to Book Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ALLETE, Inc. (NYSE:ALE) | $1,169.1 | 84% | 0% | $4,863.2 | $3,315.7 | BBB | Baa1 | 2.43 | MN, WI | 59.0% | 7.70 | 1.45 |
| Alliant Energy Corporation (NasdaqGS:LNT) | $3,416.0 | 85% | 11% | $14,336.0 | $12,091.7 | A- | Baa2 | 2.51 | WI,IA,IL,MN | 45.7% | 11.30 | 2.13 |
| Ameren Corporation (NYSE:AEE) | $5,540.0 | 80% | 13% | $26,807.0 | $18,459.5 | BBB+ | Baa1 | 3.38 | IL,MO | 44.7% | 10.20 | 2.07 |
| Duke Energy Corporation (NYSE:DUK) | $23,453.0 | 91% | 7% | $106,854.0 | $68,049.8 | BBB+ | Baa1 | 2.52x | NC,OH,FL,SC,KY | 45.6% | 2.78 | 1.48 |
| Edison International (NYSE:EIX) | $13,578.0 | 100% | 0% | $48,796.0 | $21,884.6 | BBB | Baa3 | 2.79x | CA | 41.7% | 5.40 | 1.56 |
| Entergy Corporation (NYSE:ETR) | $10,113.6 | 91% | 0% | $39,196.1 | $17,868.8 | BBB+ | Baa2 | 2.18x | LA,AR,MS,TX | 34.0% | 13.10 | 1.64 |
| IDACORP, Inc. (NYSE:IDA) | $1,350.7 | 100% | 0% | $4,709.5 | $4,549.3 | BBB | Baa1 | 3.01x | ID | 56.1% | 9.45 | 1.78 |
| NorthWestern Corporation (NasdaqGS:NWE) | $1,198.7 | 78% | 22% | $4,952.9 | $3,083.0 | BBB | NR | 2.43x | MT,SD,NE | 47.3% | 7.54 | 1.48 |
| OGE Energy Corp. (NYSE:OGE) | $2,122.3 | 100% | 0% | $9,274.4 | $6,348.7 | BBB+ | NR | 3.25x | OK,AR | 51.0% | -4.47 | 1.75 |
| Otter Tail Corporation (NasdaqGS:OTTR) | $890.1 | 50% | 0% | $2,068.4 | $1,779.6 | BBB | Baa2 | 4.22 | MN,ND,SD | 58.2% | 11.60 | 2.04 |
| Pinnacle West Capital Corporation (NYSE:PNW) | $3,587.0 | 100% | 0% | $15,268.1 | $8,598.4 | A- | A3 | 3.41 | AZ | 47.2% | 9.95 | 1.53 |
| Portland General Electric Company (NYSE:POR) | $2,145.0 | 91% | 8% | $7,218.0 | $3,879.7 | BBB+ | A3 | 1.83 | OR | 47.5% | 5.96 | 1.48 |
| Xcel Energy Inc. (NasdaqGS:XEL) | $11,526.0 | 85% | 14% | $44,129.0 | $32,984.8 | A- | Baa1 | 2.51 | MN,WI,ND,SD,MI | 42.6% | 10.60 | 2.26 |
| Mean | $6,160.7 | 87% | 6% | $25,267.1 | $15,607.2 | BBB+ | Baa1 | 2.81 | | 47.7% | 7.78 | 1.74 |
| Median | $3,416.0 | 91% | 0% | $14,336.0 | $8,598.4 | BBB+ | Baa1 | 2.52 | | 47.2% | 9.45 | 1.64 |

Data Source: Company 2020 SEC 10-K filings, S&P Capital IQ, *Value Line Investment Survey*, 2021

*Value Line* Risk Metrics for Proxy Groups

Panel A
Electric Proxy Group

| Company | Beta | Financial Strength | Safety | Earnings Predictability | Stock Price Stability |
|---|---|---|---|---|---|
| ALLETE, Inc. (NYSE-ALE) | 0.90 | A | 2 | 85 | 90 |
| Alliant Energy Corporation (NYSE-LNT) | 0.85 | A | 2 | 90 | 95 |
| Ameren Corporation (NYSE-AEE) | 0.80 | A | 2 | 90 | 100 |
| American Electric Power Co. (NYSE-AEP) | 0.75 | A+ | 1 | 95 | 100 |
| Avista Corporation (NYSE-AVA) | 0.95 | B++ | 2 | 60 | 70 |
| CMS Energy Corporation (NYSE-CMS) | 0.75 | B++ | 2 | 85 | 95 |
| Consolidated Edison, Inc. (NYSE-ED) | 0.75 | A+ | 1 | 100 | 85 |
| Dominion Energy Inc. (NYSE-D) | 0.80 | B++ | 2 | 45 | 90 |
| Duke Energy Corporation (NYSE-DUK) | 0.85 | A | 2 | 95 | 95 |
| Edison International (NYSE-EIX) | 0.95 | B+ | 3 | 5 | 75 |
| Entergy Corporation (NYSE-ETR) | 0.95 | B++ | 2 | 65 | 90 |
| Evergy, Inc. (NYSE-EVRG) | 0.95 | B++ | 2 | NMF | 65 |
| Eversource Energy (NYSE-ES) | 0.90 | A | 1 | 100 | 85 |
| Hawaiian Electric Industries (NYSE-HE) | 0.80 | A | 2 | 65 | 85 |
| IDACORP, Inc. (NYSE-IDA) | 0.80 | A | 2 | 100 | 100 |
| MGE Energy, Inc. (NYSE-MGEE) | 0.70 | A+ | 1 | 100 | 95 |
| NextEra Energy, Inc. (NYSE-NEE) | 0.90 | A+ | 1 | 80 | 95 |
| NorthWestern Corporation (NYSE-NWE) | 0.95 | B++ | 2 | 85 | 90 |
| OGE Energy Corp. (NYSE-OGE) | 1.05 | A | 2 | 90 | 80 |
| Otter Tail Corporation (NDQ-OTTR) | 0.85 | A | 2 | 90 | 100 |
| Pinnacle West Capital Corp. (NYSE-PNW) | 0.90 | A+ | 1 | 100 | 90 |
| Portland General Electric Company (NYSE-POR) | 0.85 | B++ | 3 | 90 | 90 |
| PPL Corporation (NYSE-PPL) | 1.10 | B++ | 2 | 75 | 80 |
| Sempra Energy (NYSE-SRE) | 1.00 | A | 2 | 75 | 90 |
| Southern Company (NYSE-SO) | 0.95 | A | 2 | 90 | 90 |
| WEC Energy Group (NYSE-WEC) | 0.80 | A+ | 1 | 95 | 85 |
| Xcel Energy Inc. (NYSE-XEL) | 0.80 | A+ | 1 | 100 | 95 |
| Mean | 0.87 | A | 1.8 | 83 | 89 |

Data Source: *Value Line Investment Survey*, 2021

Panel B
D'Ascendis Proxy Group

| Company | Beta | Financial Strength | Safety | Earnings Predictability | Stock Price Stability |
|---|---|---|---|---|---|
| ALLETE, Inc. (NYSE-ALE) | 0.90 | A | 2 | 85 | 90 |
| Alliant Energy Corporation (NYSE-LNT) | 0.85 | A | 2 | 90 | 95 |
| Ameren Corporation (NYSE-AEE) | 0.80 | A | 2 | 90 | 100 |
| Duke Energy Corporation (NYSE-DUK) | 0.85 | A | 2 | 95 | 95 |
| Edison International (NYSE-EIX) | 0.95 | B+ | 3 | 5 | 75 |
| Entergy Corporation (NYSE-ETR) | 0.95 | B++ | 2 | 65 | 90 |
| IDACORP, Inc. (NYSE-IDA) | 0.80 | A | 2 | 100 | 100 |
| NorthWestern Corporation (NYSE-NWE) | 0.95 | B++ | 2 | 85 | 90 |
| OGE Energy Corp. (NYSE-OGE) | 1.05 | A | 2 | 90 | 80 |
| Otter Tail Corporation (NDQ-OTTR) | 0.85 | A | 2 | 90 | 100 |
| Pinnacle West Capital Corp. (NYSE-PNW) | 0.90 | A+ | 1 | 100 | 90 |
| Portland General Electric Company (NYSE-POR) | 0.85 | B++ | 3 | 90 | 90 |
| Xcel Energy Inc. (NYSE-XEL) | 0.80 | A+ | 1 | 100 | 95 |
| Mean | 0.88 | A | 2.0 | 83 | 92 |

Data Source: Value Line Investment Survey, 2021.

## *Value Line* Risk Metrics for Proxy Groups

**Beta**

A relative measure of the historical sensitivity of a stock's price to overall fluctuations in the New York Stock Exchange Composite Index. A beta of 1.50 indicates a stock tends to rise (or fall) 50% more than the New York Stock Exchange Composite Index. The ''coefficient'' is derived from a regression analysis of the relationship between weekly percentage changes in the price of a stock and weekly percentage changes in the NYSE Index over a period of five years. In the case of shorter price histories, a smaller time period is used, but two years is the minimum. Betas are adjusted for their long-term tendency to converge toward 1.00.

**Financial Strength**

A relative measure of the companies reviewed by *Value Line* . The relative ratings range from A++ (strongest) down to C (weakest).

**Safety Rank**

A measurement of potential risk associated with individual common stocks. The Safety Rank is computed by averaging two other *Value Line* indexes the Price Stability Index and the Financial strength Rating. Safety Ranks range from 1 (Highest) to 5 (Lowest). Conservative investors should try to limit their purchases to equities ranked 1 (Highest) and 2 (Above Average) for Safety.

**Earnings Predictability**

A measure of the reliability of an earnings forecast. Earnings Predictability is based upon the stability of year-to-year comparisons, with recent years being weighted more heavily than earlier ones. The most reliable forecasts tend to be those with the highest rating (100); the least reliable, the lowest (5). The earnings stability is derived from the standard deviation of percentage changes in quarterly earnings over an eight-year period. Special adjustments are made for comparisons around zero and from plus to minus.

**Stock Price Stability**

A measure of the stability of a stock's price. It includes sensitivity to the market (see Beta as well as the stock's inherent volatility. *Value Line's* Stability ratings range from 1 (highest) to 5 (lowest).

Source: *Value Line Investment Analyzer* .

SOAH DOCKET NO. 473-21-0538
PUC DOCKET NO. 51415

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|---|---|---|
| APPLICATION OF SOUTHWESTERN ELECTRIC POWER COMPANY FOR AUTHORITY TO CHANGE RATES | § § § | BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS |

# DIRECT TESTIMONY AND EXHIBITS

# OF

# J. RANDALL WOOLRIDGE, Ph. D.

## Exhibit JRW-4