BEFORE THE ARIZONA CORPORATION COMMISSION

ROBERT "BOB" BURNS
    Chairman
BOYD DUNN
    Commissioner
SANDRA D. KENNEDY
    Commissioner
JUSTIN OLSON
    Commissioner
LEA MÁRQUEZ PETERSON
    Commissioner

IN THE MATTER OF THE APPLICATION OF) ARIZONA PUBLIC SERVICE COMPANY FOR) A HEARING TO DETERMINE THE FAIR) VALUE OF THE UTILITY PROPERTY OF) THE COMPANY FOR RATEMAKING) PURPOSES, TO FIX A JUST AND) REASONABLE RATE OF RETURN) THEREON, TO APPROVE RATE SCHEDULES) <u>DESIGNED TO DEVELOP SUCH RETURN.</u>)	DOCKET NO. E-01345A-19-0236

DIRECT

TESTIMONY

OF

DAVID C. PARCELL

ON BEHALF OF

UTILITIES DIVISION

ARIZONA CORPORATION COMMISSION

OCTOBER 2, 2020

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Mr. David C. Parcell's Direct Testimony provides an estimate of the Cost of Capital ("COC") for Arizona Public Service Company ("APS" or "Company"). His COC recommendation is as follows:

	Percent	Cost	Return	
Long-Term Debt	45.33%	4.10%	1.86%	
Common Equity	54.67%	9.3-9.5%	5.08-5.19%	
Total	100.00%		6.94-7.05%	(7.00% Midpoint)

Mr. Parcell uses APS's test year, ending June 30, 2019, values of capital structure and cost of debt. These are the same figures as proposed by APS.

The primary difference between Mr. Parcell's COC recommendation and the recommendation of APS's COC witness, Ms. Ann E. Bulkley, is the Cost of Common Equity or Cost of Equity ("ROE"). Mr. Parcell recommends a ROE of 9.3 percent to 9.5 percent (9.4 percent mid-point) whereas Ms. Bulkley recommends a 10.15 percent ROE (range of 10.0 percent to 10.5 percent).

Mr. Parcell's ROE recommendation is based upon his application of the following four ROE models. The respective model results are:

	Range	Midpoint
Discounted Cash Flow ("DCF")	8.7-9.3%	9.0%
Capital Asset Pricing Model ("CAPM")	6.4-6.6%	6.5%
Comparable Earnings ("CE")	9.0-10.0%	9.5%
Risk Premium ("RP")	8.3-9.1%	8.7%

Mr. Parcell's 9.3 percent to 9.5 percent ROE recommendation reflects the results of his DCF and CE analyses, and is supported by the results of his RP analyses. His recommendation does not directly incorporate the CAPM results, which are lower; however, the CAPM results are an appropriate indicator of the continuing decline in the COCs, including the ROE.

Mr. Parcell's testimony also demonstrates that Ms. Bulkley's ROE analyses overstate the ROE for electric utilities, including APS. Several of her analyses are shown to contain an upward bias to the ROE at the current time.

Mr. Parcell also provides a calculation of the Fair Value Rate Base Rate of Return ("FVROR"). He provides two options for determining the Fair Value Rate Base Increment ("FVRB") for APS: 1) a zero percent return on the FVRB increment (5.03 percent FVROR) consistent with financial standards, and 2), an appropriate alternative methodology, as applied to FVRB, of a 0.30 percent return on the FVRB increment (which is the average of the zero percent

option and 0.60 percent Real Risk Free Rate), which results in a 5.11 percent FVROR. Mr. Parcell proposes use of the second methodology in order to comply with his understanding of the fair value standard that is mandated in Arizona, and which is utilized by Staff Witness Mr. Ralph Smith to develop the FVROR for APS.

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1 **INTRODUCTION**

2 **Q.   Please state your name, occupation, and business address.**

3 A.   My name is David C. Parcell. I am a Principal and Senior Economist of Technical

4   Associates, Inc. My address is 2218 Worchester Road, Midlothian, Virginia 23113.

5

6 **Q.   Please summarize your educational background and professional experience.**

7 A.   I hold Bachelor of the Arts ("B.A.") (1969) and Master of Arts ("M.A.") (1970) degrees in

8   economics from Virginia Polytechnic Institute and State University (Virginia Tech) and a

9   Master of Business Administration ("M.B.A.") (1985) from Virginia Commonwealth

10   University. I have been a consulting economist with Technical Associates since 1970. I

11   have provided Cost of Capital ("COC") testimony in public utility ratemaking proceedings

12   dating back to 1972 and I have previously filed testimony and/or testified in over 580 utility

13   proceedings before about 50 regulatory agencies in the United States and Canada. I have

14   previously filed testimony before this Commission in proceedings involving most of the

15   major utilities serving Arizona, including APS. Appendix I provides a more complete

16   description of my education and relevant work experience.

17

18 **Q.   What is the purpose of your testimony in this proceeding?**

19 A.   I have been retained by the Arizona Corporation Commission ("Commission") Utilities

20   Division Staff ("Staff") to evaluate the COC requested by Arizona Public Service Company

21   ("APS" or "Company") in its rate application filed on October 31, 2019. I have performed

22   independent studies and I am making recommendations of the current COC for APS. In

23   addition, since APS is a subsidiary of Pinnacle West Capital Corp. ("Pinnacle West") I have

24   also evaluated this entity in my analyses.

25

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1   **Q.**   **Did APS file COC testimony that you are responding to?**

2   **A.**   Yes. APS filed COC testimony by Ms. Ann E. Bulkley, which requests a return on equity

3   ("ROE") of 10.15 percent and a COC of 7.41 percent.

4

5   **Q.**   **Have you prepared an exhibit in support of your testimony?**

6   **A.**   Yes. In addition to Appendix I, identified above, I have prepared Exhibit No.___(DCP-1),

7   which is comprised of 13 schedules, identified as Schedule 1 through Schedule 13. The

8   information contained in these schedules is correct to the best of my knowledge and belief.

9

10   **RECOMMENDATIONS AND SUMMARY**

11   **Q.**   **What are your COC recommendations in this proceeding?**

12   **A.**   My overall COC recommendations for APS are shown on Schedule 1 and can be

13   summarized as follows:

14

Item	Percent	Cost		Weighted Cost	
Long-Term Debt	45.33%	4.10%		1.86%	
Common Equity	54.67%	9.3% 9.4% 9.5%	5.08%	5.14%	5.19%
Total	100.0%		6.94%	7.00%	7.05%

15

16   As noted above, APS's application requests a COC of 7.41 percent and a ROE of 10.15

17   percent. In my testimony, I demonstrate that these requests are excessive and over-state the

18   Company's ROE and COC.

19

20   **Q.**   **Please summarize your analyses and conclusions.**

21   **A.**   This proceeding is concerned with APS's regulated electric operations in Arizona. My

22   analyses concern the Company's COC.

23

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1 The first step in performing my COC analyses is to develop the appropriate capital structure.

2 APS proposes use of a capital structure comprised of 54.67 percent common equity and

3 45.33 percent debt,[1] which is stated to be the Company's adjusted capital structure ratios as

4 of the test year period ending June 30, 2019. I also employ APS's June 30, 2019, capital

5 structure ratios.

6

7 The second step in a COC calculation is to determine the embedded cost rate of debt. APS

8 proposes use of a 4.10 percent cost of long-term debt, which is the actual cost rate as of June

9 30, 2019.[2] I have accepted the Company's cost of debt.

10

11 The third step in the COC calculation is to estimate the ROE. I employ four recognized

12 methodologies to estimate APS's ROE, each of which I apply to two groups of publicly-

13 traded proxy electric utilities and/or utility holding companies. These four methodologies

14 and my findings are:

15

Methodology	Range
Discounted Cash Flow ("DCF")	8.7%-9.3% (9.0% mid-point)
Capital Asset Pricing Model ("CAPM")	6.4%-6.6% (6.5% mid-point)
Comparable Earnings ("CE")	9.0%-10.0% (9.5% mid-point)
Risk Premium ("RP")	8.3%-9.1% (8.7% mid-point)

16

17 Based upon these findings, I conclude that APS's ROE is within a range of 9.3 percent to

18 9.5 percent, which is based upon the results for the DCF analyses and the CE analyses, and

19 is supported by the results of the RP analyses. I specifically recommend a 9.4 percent ROE

20 for APS.

21

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[1] Schedule D-1 of Company Filing.
[2] Id.

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1   **ECONOMIC/LEGAL PRINCIPLES AND METHODOLOGIES**

2   **Q.   What are the primary economic and legal principles that establish the standards for**

3   **determining a fair rate of return for a regulated utility?**

4   A.   Public utility rates are normally established in a manner designed to allow the recovery of

5   their costs, including capital costs. This is frequently referred to as "cost of service"

6   ratemaking. Rates for regulated public utilities traditionally have been primarily established

7   using the "rate base – rate of return" concept. Under this method, utilities are allowed to

8   recover a level of operating expenses, taxes, and depreciation deemed reasonable for rate-

9   setting purposes, and are granted an opportunity to earn a fair rate of return on the assets

10   utilized (i.e., rate base) in providing service to their customers.

11

12   The rate base is derived from the asset side of the utility's balance sheet as a dollar amount

13   and the rate of return is developed form the liabilities/owners' equity side of the balance

14   sheet as a percentage. Thus, the revenue impact of the COC is derived by multiplying the

15   rate base by the rate of return, including income taxes.

16

17   The rate of return is developed from the COC, which is estimated by weighting the capital

18   structure components (i.e. debt, preferred stock, and common equity) by their percentages

19   in the capital structure and multiplying these values by their cost rates. This is also known

20   as the Weighted COC ("WCOC").

21

22   Technically, "fair rate of return" is a legal and accounting concept that refers to an *ex post*

23   (after the fact) earned return on an asset base, while the COC is an economic and financial

24   concept which refers to an *ex ante* (before the fact) expected, or required, return on a capital

25   base. In regulatory proceedings, however, the two terms are often used interchangeably,

26   and I have equated the two concepts in my testimony.

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1   From an economic standpoint, a fair rate of return is normally interpreted to mean that an

2   efficient and economically managed utility will be able to maintain its financial integrity,

3   attract capital, and establish comparable returns for similar risk investments. These

4   concepts are derived from economic and financial theory and are generally implemented

5   using financial models and economic concepts.

6

7   Although I am not a lawyer and I do not offer a legal opinion, my testimony is based on my

8   understanding that two United States ("U.S.") Supreme Court decisions provide the

9   controlling standards for a fair rate of return. The first decision is *Bluefield Water Works*

10   *and Improvement Co. v. Public Serv. Comm'n of West Virginia*, 262 U.S. 679 (1923). In

11   this decision, the Court stated:

12

13   > The annual rate that will constitute just compensation depends upon
14   > many circumstances and must be determined by the exercise of fair
15   > and enlightened judgment, having regard to all relevant facts. A
16   > public utility is entitled to such rates as will permit it to earn a return
17   > on the value of the property which it employs for the convenience
18   > of the public equal to that generally being made at the same time and
19   > in the same general part of the country on investments in other
20   > business undertakings which are attended by corresponding risks
21   > and uncertainties; but it has no constitutional right to profits such as
22   > are realized or anticipated in highly profitable enterprises or
23   > speculative ventures. The return should be reasonably sufficient to
24   > assure confidence in the financial soundness of the utility, and
25   > should be adequate, under efficient and economical management, to
26   > maintain and support its credit and enable it to raise the money
27   > necessary for the proper discharge of its public duties. A rate of
28   > return may be reasonable at one time, and become too high or too
29   > low by changes affecting opportunities for investment, the money
30   > market, and business conditions generally.

31

32   It is generally understood that the *Bluefield* decision established the following standards for

33   a fair rate of return: comparable earnings, financial integrity, and capital attraction. It also

34   noted that required returns change over time, and there is an underlying assumption that the

35   utility be operated efficiently.

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1   The second decision is *Federal Power Comm'n v. Hope Natural Gas Co.*, 320 U.S. 591

2   (1942). In that decision, the Court stated:

4   The rate-making process under the [Natural Gas] Act, i.e., the fixing
5   of 'just and reasonable' rates, involves a balancing of the investor
6   and consumer interests . . . From the investor or company point of
7   view it is important that there be enough revenue not only for
8   operating expenses but also for the capital costs of the business.
9   These include service on the debt and dividends on the stock. By
10   this standard the return to the equity owner should be commensurate
11   with returns on investments in other enterprises having
12   corresponding risks. That return, moreover, should be sufficient to
13   assure confidence in the financial integrity of the enterprise, so as to
14   maintain its credit and to attract capital.

16   The three economic and financial parameters in the *Bluefield* and *Hope* decisions –

17   comparable earnings, financial integrity, and capital attraction – reflect the economic

18   criteria encompassed in the "opportunity cost" principle of economics. The opportunity

19   cost principle provides that a utility and its investors should be afforded an opportunity (not

20   a guarantee) to earn a return commensurate with returns they could expect to achieve on

21   investments of similar risk. The opportunity cost principle is consistent with the

22   fundamental premise on which regulation rests, namely, that it is intended to act as a

23   surrogate for competition.

25   I understand that because Arizona is a "Fair Value" state, *Hope* and *Bluefield* do not set

26   forth the legal requirements applicable to determining fair rate of return in Arizona. In

27   *Simms v. Round Valley Light & Power Company*, 294 P.2d 378 (1956), the Arizona

28   Supreme Court took exception to application of the following principle in Arizona since the

29   Constitution mandates consideration of fair value:

31   "In the Hope case the court, in testing the reasonableness of rates
32   fixed by the Federal Power Commission under the Natural Gas Act,
33   15 U.S.C.A. Section 717 et seq., after holding that Congress had
34   provided no formula by which just and reasonable rates were to be

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1 determined, ruled that it was the final result reached and not the
2 method used in reaching the result that was controlling and that it
3 was unimportant to 'determine the various permissible ways in
4 which any rate base on which the return is computed might be
5 arrived at'."
6

7 My testimony does not advocate that the Commission ignore the *Simms* holding in this

8 regard, or the fair value of APS' property, which it is required to consider under Article 15,

9 Section of the Arizona Constitution. Rather, I find the *Hope* and *Bluefield* decisions can be

10 helpful in their discussion of comparable earnings, financial integrity and capital attraction.

11 I note that APS' COC witness, Ms. Ann E. Bulkley, also cites the *Hope* and *Bluefield*

12 decisions as a proper consideration in estimating APS' COC.[3]

13

14 **Q.** **Is APS requesting a "fair value" increment to this proceeding?**

15 A. Yes, it is. APS witness Ms. Bulkley recommends a 1.00 percent Fair Value Increment

16 ("FVI") to be included as part of the Company's Fair Value Rate of Return ("FVROR").[4]

17

18 **Q.** **How can the *Bluefield* and *Hope* parameters be employed to estimate the COC for a**

19 **utility?**

20 A. Neither the courts nor economic/financial theory has developed exact and mechanical

21 procedures for precisely determining the COC. This is the case because the COC is an

22 opportunity cost and is prospective-looking, which dictates that it must be estimated.

23 However, there are several useful models that can be employed to assist in estimating the

24 ROE, which is the capital structure item that is the most difficult to determine. These

25 include the DCF, CAPM, CE and RP methods. Each of these methodologies will be

26 described in more detail later in my testimony.

27

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[3] Ms. Bulkley's Direct Testimony at 4: 23-25 and 5: 1-2.
[4] Id. at 3: 17-20.

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1   **GENERAL ECONOMIC CONDITIONS**

2   **Q.   Are economic and financial conditions important in determining the COC for a public**

3   **utility?**

4   A.   Yes. The COCs for both fixed-cost (debt and preferred stock) components and common

5   equity are determined in part by current and prospective economic and financial conditions.

6   At any given time, each of the following factors has an influence on the COC:
7

8   •   The level of economic activity (*i.e.*, growth rate of the economy);
9   •   The stage of the business cycle (*i.e.*, recession, expansion, or transition);
10   •   The level of inflation;
11   •   The level and trend of interest rates; and,
12   •   Current and expected economic conditions.
13

14   My understanding is that this position is consistent with the *Bluefield* decision, which noted

15   "[a] rate of return may be reasonable at one time and become too high or too low by changes

16   affecting opportunities for investment, the money market, and business conditions

17   generally."[5]

18

19   **Q.   What indicators of economic and financial activity did you evaluate in your analyses?**

20   A.   I examined several sets of economic statistics from 1975 to the present. I chose this time

21   period because it permits the evaluation of economic conditions over four full business

22   cycles, plus the current cycle, allowing for an assessment of changes in long-term trends.

23   Consideration of economic/financial conditions over a relatively long period of time allows

24   me to assess how such conditions have impacted the level and trends of the COCs. This

25   period also approximates the beginning and continuation of active rate case activities by

26   public utilities that generally began in the mid-1970s.

27

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[5] *Bluefield*, 262 U.S. at 693.

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1   A business cycle is commonly defined as a complete period of expansion (recovery and

2   growth) and contraction (recession). A full business cycle is a useful and convenient period

3   over which to measure levels and trends in long-term capital costs because it incorporates

4   the cyclical (*i.e.*, stage of business cycle) influences and, thus, permits a comparison of

5   structural (or long-term) trends.

6

7   Q.   **Please describe the time frames of the four prior business cycles and the current cycle.**

8   A.   The four prior complete cycles and current cycle cover the following periods:

9

Business Cycle	Expansion Cycle	Contraction Period
1975-1982	Mar. 1975-July 1981	Aug. 1981-Oct. 1982
1982-1991	Nov. 1982-July 1990	Aug. 1990-Mar. 1991
1991-2001	Mar. 1991-Mar. 2001	Apr. 2001-Nov. 2001
2001-2009	Nov. 2001-Nov. 2007	Dec. 2007-June 2009
Current	July 2000-Feb. 2020	Mar. 2020-

Source: The National Bureau of Economic Research, "U.S. Business Cycle
Expansions and Contractions."[6]

10

11 Q.   **Do you have any general observations concerning the recent trends in economic**

12   **conditions and their impact on capital costs over this broad period?**

13 A.   Yes, I do. From the early 1980s until the end of 2007, the U.S. economy enjoyed general

14   prosperity and stability. This period was characterized by longer economic expansions,

15   relatively tame contractions, low and declining inflation, and declining interest rates and

16   other capital costs.

17

18   However, in 2008 and 2009, the economy declined significantly, initially as a result of the

19   2007 collapse of the "sub-prime" mortgage market and the related liquidity crisis in the

20   financial sector of the economy. Subsequently, this financial crisis intensified with a more

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[6] http://www.nber.org/cycles/cyclesmain.html.

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1 broad-based decline, initially based on a substantial increase in petroleum prices and a

2 dramatic decline in the U.S. financial sector of the economy.

3

4 This decline has been described as the worst financial crisis since the Great Depression of

5 the 1930s and has been referred to as the "Great Recession." Beginning in 2008, the U.S.

6 and other governments implemented unprecedented policies to attempt to correct or

7 minimize the scope and effects of this recession. Some of these policies are still in effect.

8 At the current time, the U.S. economy has entered a new and possibly significant recession.[7]

9 This is largely the result of the Coronavirus Disease 2019 ("COVID-19" or "Novel

10 Coronavirus") pandemic and the result that the economic and financial consequences of this

11 serious health crisis has created a recession as nations, including the U.S., have instituted

12 significant travel, social, and commercial restrictions designed to slow the spread of

13 COVID-19. Beginning in March and lasting into June of 2020, much of the world and U.S.

14 were in "lock down" as a significant portion of both businesses and governments have

15 operated under restrictive conditions in some instances and have remained closed in other

16 instances. In addition, the U.S. federal government has instituted a multi-trillion-dollar

17 stimulus program (i.e., CARES Act) to aid businesses and individuals during this crisis and

18 the Federal Reserve System ("Federal Reserve") has implemented several financial

19 measures to help maintain the country's financial system.

20

21 Q. **Please describe recent and current economic and financial conditions and their impact**

22   **on the COCs.**

23 A. One impact of the Great Recession, as well as the COVID-19 pandemic and its related

24   economic/financial consequences, has been a reduction in actual and expected investment

25   returns and a corresponding reduction in capital costs. This decline is evidenced by a

---

[7] The National Bureau of Economic Research has recently officially declared that the U.S. economy is in a recession. https://finance.yahoo.com/news/US-economy-officially-in-recession-nber-16522613.html.

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1   decline in both short-term and long-term interest rates and the expectations of investors and

2   is reflected in COC model results (such as DCF, CAPM, CE and RP). Regulatory agencies

3   throughout the U.S. have recognized the decline in capital costs by authorizing lower ROEs

4   for regulated utilities in each of the last several years.[8]

5

6   Schedule 2 shows several sets of relevant economic and financial statistics for the cited time

7   periods. Page 1 contains general macroeconomic statistics, page 2 shows interest rates, and

8   page 3 contains equity market statistics.

9

10   Page 1 shows that in 2007, the economy stalled and subsequently entered a significant

11   decline, as indicated by the lower growth rate in real (*i.e.*, adjusted for inflation) Gross

12   Domestic Product ("GDP"), lower levels of industrial production, and an increase in the

13   unemployment rate. This recession lasted until mid-2009, making it a longer-than-normal,

14   as well as a much deeper, recession. Since then, economic growth has been somewhat

15   erratic, and the economy has grown more slowly than in prior expansions. On the other

16   hand, the recent business cycle achieved the longest period of any expansion in recent

17   financial history. As stated above, due to the COVID-19 pandemic, the recent expansion

18   has ended and a recession has resulted. It is apparent that GDP declined by five percent in

19   the first quarter of 2020 and over 30 percent in the second quarter, and the unemployment

20   rate has significantly increased due to the COVID-19 pandemic and state/federal actions to

21   prevent the spread of this disease.

22

23   Page 1 also shows the rate of inflation. As reflected in the Consumer Price Index ("CPI"),

24   inflation rose significantly during the 1975 through 1982 business cycle and reached double-

25   digit levels in 1979 through 1980. The rate of inflation has declined substantially since

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[8] Regulatory Research Associates, "Regulatory Focus." April 11, 2019.

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1   1981. Since 2008, the CPI has been three percent or lower on an annual basis, with 2014

2   and 2015 growth below one percent, 2016 and 2017 growth at 2.1 percent, 2018 growth at

3   1.9 percent, and 2019 growth at 2.3 percent. It is thus apparent that the rate of inflation has

4   generally been declining over the past several business cycles. Recent and current levels of

5   inflation are at the lowest levels of the past 35 years, which is reflective of lower capital

6   costs.[9]

7

8   Q.   **What have been the trends in interest rates over the four prior business cycles and at**

9   **the current time?**

10 A.   Page 2 shows several series of interest rates. Both short-term and long-term rates rose

11   sharply to record levels in 1975 through 1982, when the inflation rate was high. Interest

12   rates have declined substantially in conjunction with the corresponding declines in inflation

13   since the early 1980s.

14

15   From 2008 to late 2015, the Federal Reserve maintained the Federal Funds rate (*i.e.*, short-

16   term interest rate) at 0.25 percent, a then all-time low. Following much anticipation, the

17   Federal Reserve subsequently raised the Federal Funds rate on nine occasions between

18   December 2015 and December 2018.[10] In July, September, and October 2019, on the other

19   hand, the Federal Reserve began reducing the Federal Funds rate by 0.25 percent on three

20   separate occasions. An emergency rate cut of 0.50 percent occurred in early March 2020,

21   followed by further reductions in mid-March to a range of zero percent to 0.25 percent as

22   an economic stimulus in response to the COVID-19 pandemic. The Federal Reserve also

23   purchased U.S. Treasury securities to stimulate the economy following the Great

---

[9] The rate of inflation is one component of interest rate expectations of investors, who generally expect to receive a return in excess of the rate of inflation. Thus, a lower rate of inflation has a downward impact on interest rates and other capital costs.

[10] The Federal Funds increases took place in December 2015, December 2016, March 2017, June 2017, December 2017, March 2018, June 2018, September 2018, and December 2018. Subsequent reduction took place in July 2019, September 2019, October 2019, and March 2020 (twice).

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1   Recession[11] and has recently begun doing so again as part of the COVID-19 financial

2   situation.

3

4   As seen on page 2, since 2011, both U.S. and public utility bond yields have declined to

5   their lowest levels in the past four business cycles and in more than 35 years. Even with the

6   2016 through 2019 "tapering" and eventual ending of the Federal Reserve's Quantitative

7   Easing ("QE") program, as well as the Federal Reserve's raising of the Federal Funds rate

8   (prior to again lowering this rate several times), interest rates have remained relatively low.

9   Both government and utility long-term lending rates remain near historically low levels,

10   again reflective of lower capital costs. In addition, current interest rates for many utilities

11   are lower than historic (embedded) cost rates. This is also true for APS as its cost of debt

12   was 5.13 percent at the time of its last rate case and is 4.10 percent currently.[12]

13

14   Since the COVID-19 pandemic began in February of 2020, both long-term and short-term

15   interest rates have declined and remained at historic lows. The Federal Reserve has

16   established a "near zero" level of short-term interest rates and there is no expectation that

17   this will end in the near-term.[13] The Federal Reserve has also re-implemented its Great

18   Recession policy of simulative easing as it has purchased U.S. Treasury securities and has

19   also injected substantial liquidity into the economy. As shown on Schedule 2, page 2, the

20   yields on 10-year U.S. Treasury bonds is currently less than one percent, the lowest level

21   by far since at least the mid-1970s.

---

[11] This is referred to as Quantitative Easing ("QE"), which was comprised of three "rounds" during the Great Recession. In "round" 3, known as QE3, the Federal Reserve initially purchased some $85 billion of U.S. Treasury Securities per month in order to stimulate the economy. The Federal Reserve eventually "tapered" its purchase of U.S. Treasury securities through October 2014, at which time QE ended. The Federal Reserve restarted this program in mid-March 2020 in response to economic conditions resulting from the COVID-19 outbreak.

[12] December 31, 2015 test year.

[13] On June 10, 2020, the Federal Reserves announced its intention to maintain "zero" short-term rates until at least 2022 and also to maintain its purchases of long-term Treasury securities (QE). On September 16, 2020, the Federal Reserve further announced its intention to maintain short-term interest rates at "near zero" percent until the economy has recovered to a "full recovery" level, which could be at least until 2023.

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1   **Q.**   **What does Schedule 2 show for trends of common share prices?**

2   A.   Page 3 shows several series of common stock prices and ratios. These indicate that stock

3   prices were essentially stagnant during the high inflation/high interest rate environment of

4   the late 1970s and early 1980s. The 1983 to 1991 business cycle and the more recent cycles

5   witnessed a significant upward trend in stock prices. The beginning of the Great Recession

6   saw stock prices decline precipitously as stock prices in 2008 and early 2009 were down

7   significantly from peak 2007 levels, reflecting the financial/economic crisis. Beginning in

8   the second quarter of 2009, prices recovered substantially and ultimately reached and

9   exceeded the levels achieved prior to the "crash."

10

11   On the other hand, recent equity markets have been somewhat volatile. As an example of

12   this, the end of 2018 witnessed significant declines in stock prices, with many indexes

13   declining more than 20 percent (*i.e.*, a "bear" market). Following this, stock indices

14   recovered with many indices reaching record high levels in 2019 and early 2020. Since the

15   latter days of February 2020, on the other hand, stock prices have been extremely volatile

16   and dramatically declined in March in response to the COVID-19 pandemic and

17   corresponding uncertainty in the financial markets regarding the economic consequences of

18   governmental, commercial and social measures designed to limit the spread of the virus.

19   Since April, stock prices have recovered somewhat from the dramatic declines that took

20   place.

21

22   **Q.**   **What conclusions do you draw from your discussion of economic and financial**

23   **conditions?**

24   A.   Recent economic and financial circumstances have differed from any that have prevailed

25   since at least the 1930s. Concurrent with the Great Recession, there was a decline in capital

26   costs and returns which significantly reduced the values of most retirement accounts,

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1   investment portfolios, and other assets. One significant aspect of this has been a decline in

2   investor expectations of returns even with the return of stock prices to levels achieved prior

3   to the "crash."[14] This is evidenced by: (1) lower interest rates on bank deposits; (2) lower

4   interest rates on U.S. Treasury and utility bonds; and (3) lower authorized returns on equity

5   by regulatory commissions. Finally, as noted above, utility bond interest rates are currently

6   at levels well below those prevailing prior to the financial crisis of late 2008 to early 2009

7   and remain near the lowest levels in the past 35 years and are also generally lower than the

8   embedded cost rates for most utilities, including APS.   Finally, current economic

9   conditions, resulting from "shut-downs" of many large and small businesses in response to

10 the COVID-19 pandemic, are resulting in lower profit levels, equity returns and interest

11 rates.

12

13 **Q.   How do these economic/financial conditions impact the determination of a return on**

14 **equity for regulated utilities?**

15 A.   The COCs for regulated utilities have declined in recent years. In addition, the results of

16 the traditional ROE models (*i.e.*, DCF, CAPM, CE and RP) are lower than was the case

17 prior to the Great Recession. As a result, it is not surprising that the average ROEs

18 authorized by state regulatory agencies have declined and continued to remain relatively

19 low, as follows:[15]

20

Year	Electric		Natural Gas	
	Average	Median	Average	Median
2007	10.32%	10.23%	10.22%	10.20%
2008	10.37%	10.30%	10.39%	10.45%
2009	10.52%	10.50%	10.22%	10.26%
2010	10.29%	10.26%	10.15%	10.10%
2011	10.19%	10.14%	9.91%	10.05%
2012	10.02%	10.00%	9.93%	10.00%

---

[14] *See e.g.*, Vanguard News & Perspectives. "Stabilization, Not Stagnation: Expect Modest Returns," March 30, 2017, www.personal.vanguard.com/us/insights/artical/infographic-stabilization-032017.
[15] Regulatory Research Associates, "Regulatory Focus," January 31, 2019, General Rate Cases. 2019 and 2020 figures calculated by Mr. Parcell using data provided in Company testimonies. 2020 figures reflect eight months of data.

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2013	9.82%	9.82%	9.68%	9.72%
2014	9.76%	9.75%	9.78%	9.78%
2015	9.60%	9.53%	9.60%	9.68%
2016	9.60%	9.60%	9.53%	9.50%
2017	9.68%	9.60%	9.73%	9.60%
2018	9.55%	9.57%	9.60%	9.60%
2019	9.78%	9.70%	9.72%	9.72%
2020	9.53%	9.54%	9.44%	9.42%

APS'S OPERATIONS AND RISKS

Q. **Please summarize APS and its operations.**

A. APS provides electric utility generation, transmission and distribution service to 1.3 million customers in Arizona. It is the largest electric utility in Arizona. APS provides either retail or wholesale electric service to most of the State of Arizona, with the major exceptions of about one-half of the Phoenix metropolitan area, the Tucson metropolitan area and Mohave County in northwestern Arizona.[16] APS is a subsidiary of Pinnacle West (formerly named AZP Group). Essentially all of Pinnacle West's revenues and earnings are derived from APS.

Q. **Please describe Pinnacle West.**

A. Pinnacle West is a holding company. As noted above, APS provides most of Pinnacle West's revenues and earnings. In addition to APS, Pinnacle West's subsidiaries are:[17]

El Dorado – owns debt investments and minority interests in several energy-related investments and Arizona community-based ventures.

Bright Canyon Energy ("BCE") – formed in 2014 to focus on "new growth opportunities" in the electric energy industry, such as independent transmission and wind farms.

4C Acquisition ("4CA") – holds a note receivable from NTEC

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[16] Pinnacle West Capital and Public Service Co. of Arizona, 2019 Form 10-K, page 3.
[17] Id, page 26.

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1   Q.   **What are the current bond ratings of APS?**

2   A.   The present bond ratings (corporate/issuer) of APS are as follows:

3

Rating Agency	Senior Unsec.	Issuer
Moody's	A2	A2
Standard & Poor's	A-	A-
Fitch	A	A-

Source: Response to Staff 2.42.

4

5   This indicates that each of APS' ratings are in the single-A category.

6

7   Q.   **What have been the recent trends in APS' ratings?**

8   A.   This is shown on Schedule 3. As this indicates, APS's ratings have increased several times

9   (i.e., from mid/low triple B to mid/low single-A) over the past several years. They have

10   remained in the single-A category since 2015. Schedule 3 also indicates that APS's ratings

11   are slightly higher than those of Pinnacle West.

12

13 Q.   **How do the bond ratings of APS compare to other electric utilities?**

14 A.   As I indicated in a previous answer, APS has single A bond ratings on its issuer credit. Of

15   the 37 electric utilities covered by Value Line (Standard Edition), the following Moody's

16   and Standard & Poor's ("S&P") issuer credit ratings currently exist:

17

Moody's Ratings	Number of Companies	S&P Rating	Number of Companies
A1	1	AA-	1
A3	2	A-	13
Baa1	14	BBB+	15
Baa2	16	BBB	7
Baa3	4	BBB-	1

18

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1   This comparison indicates that APS's ratings (A2 by Moody's and A- by S&P) are above

2   the most common rating categories of most electric utilities. This is indicative of a lower

3   financial risk for APS.

4

5   I further note that APS has a higher Moody's ratings than any of the proxy electric

6   companies I use to estimate the ROE for APS and has a S&P rating that is superior to most

7   of the proxy companies, as indicated in Schedule 6.

8

9   Q.   **Why are bond ratings important to public utilities?**

10   A.   Bond ratings are important to public utilities since these provide a "standard" for assessing

11   the relative financial strength of the utilities. A utility with a "higher" bond rating is

12   generally deemed more financially sound and can sell its debt securities at a lower cost

13   (interest rate) than another utility with a lower debt rating. This is important for the public

14   utility industry since external capital is regularly being issued to finance capital projects.

15

16   Q.   **What factors are generally considered by rating agencies in developing public utility**

17   **bond ratings?**

18   A.   Moody's, for example, employs a "weighting" standard for determining utility ratings. The

19   factors considered by Moody's include: Regulatory Framework, Ability to Recover Costs,

20   Diversification, Financial Strength, and Financial Metrics. It is apparent that these are all

21   risk factors that also impact the risk of common equity for public utilities. As a result, the

22   same factors impact both the equity risk and the debt risk for utilities and, thus, bond ratings

23   can be considered an equity risk indicator for utilities.

24

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1   **CAPITAL STRUCTURE AND COST OF DEBT**

2   **Q.**   **What is the importance of determining a proper capital structure in a regulatory**

3   **framework?**

4   A.   A utility's capital structure is important because the concept of rate base – rate of return

5   regulation requires the capital structure to be utilized in estimating the total COC. Within

6   this framework, it is proper to ascertain whether the utility's capital structure is appropriate

7   relative to its level of business risk and relative to other utilities.

8

9   As discussed in Section III of my testimony, the purpose of determining the proper capital

10   structure for a utility is to ascertain its capital costs. The rate base – rate of return concept

11   recognizes the assets employed in providing utility services and provides for a return on

12   these assets by identifying the liabilities and common equity (and their cost rates) used to

13   finance the assets. In this process, the rate base is derived from the asset side of the balance

14   sheet and the COC is derived from the liabilities/owners' equity side of the balance sheet.

15   The inherent assumption in this procedure is that the dollar values of the capital structure

16   and the rate base are approximately equal and the former is utilized to finance the latter.

17

18   The common equity ratio (i.e., the percentage of common equity in the capital structure) is

19   the capital structure item which normally receives the most attention. This is the case

20   because common equity: (1) usually commands the highest cost rate; (2) generates

21   associated income tax liabilities; and (3) causes the most controversy since its cost cannot

22   be precisely determined.

23

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1 Q.   **What are the historic capital structure ratios of APS and Pinnacle West?**

2 A.   I have examined the historic capital structure ratios of APS and Pinnacle West. These are

3   shown on Schedule 4. Page 1 shows the ratios for APS. I have summarized below the

4   common equity ratios for APS for the last five years. These are seen to be as follows:

5

	APS	
Year	Incl. S-T Debt	Excl. S-T Debt
2015	55.9%	58.4%
2016	54.1%	55.0%
2017	53.5%	53.9%
2018	54.7%	57.5%
2019	53.1%	54.9%

6

7   This indicates that APS' equity ratios have been in the range of 53 percent to 56 percent

8   (including short-term debt) and 54 percent to 58 percent (excluding short-term debt).

9

10   Page 2 shows Pinnacle West's equity ratios over the past five years:

11

	Pinnacle West	
Year	Incl. S-T Debt	Excl. S-T Debt
2015	54.5%	57.0%
2016	52.6%	54.4%
2017	50.2%	51.1%
2018	50.0%	53.0%
2019	48.6%	52.9%

12

13   The equity ratios of Pinnacle West are seen to be lower than those of APS.

14

15 Q.   **How do APS' actual capital structures compare to those of investor-owned electric**

16   **utilities?**

17 A.   Schedule 5 shows the common equity ratios (excluding short-term debt in capitalization)

18   for the groups of proxy electric utilities used in developing my ROE models and related

19   conclusions. These are:

20

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	Period	Average	Median
Parcell Proxy Group	2015-2019	51.7%	52.4%
	2023-2025	49.6%	49.5%
Bulkley Proxy Group	2015-2019	46.6%	47.5%
	2023-2025	46.5%	46.8%

Q. **How do your proxy groups companies' common equity ratios compare to APS' common equity ratio?**

A. The common equity ratios of APS have been 54 percent or greater over the past five years, as is shown on Schedule 4. The Company's requested common equity ratio in this proceeding is 54.67 percent.

Q. **What conclusions can we draw from these relative common equity ratios?**

A. The equity ratios for the two proxy groups are somewhat lower than those of APS. This is also indicative of lower financial risk for APS relative to the proxy companies.

Q. **What have been the average common equity ratios adopted by U.S. State Regulatory Agencies in recent years?**

A. Over the past several years, the average common equity ratios cited in U.S. state regulatory electric and gas rate proceedings have been:[18]

	Electric	Gas
2012	50.69%	51.13%
2013	49.25%	50.60%
2014	50.28%	51.11%
2015	49.54%	49.93%
2016	48.91%	50.06%
2017	48.90%	49.88%
2018	48.95%	50.09%
2019	46.89%	51.35%

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[18] S&P, RRA, "Regulatory Focus", January 31, 2019. 2020 figures calculated by Mr. Parcell from data provided in company testimonies.

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1   These are also lower than those of APS' common equity ratios. It is noteworthy, on the

2   other hand, that these equity ratios reflect a combination of approved capital structures,

3   some of which include short-term debt and some of which exclude short-term debt.

4

5 Q.   **What capital structure is APS requesting?**

6 A.   APS is proposing the following capital structure ratios, which reflect values for the test

7   period ending June 30, 2019:

8
9   Long-Term Debt   45.33 percent
10   Common Equity   54.67 percent
11

12 Q.   **What capital structure do you use to develop APS' COC in this proceeding?**

13 A.   I also use the Company's proposed test period capital structure.

14

15 Q.   **What is the cost rate of debt in the Company's application?**

16 A.   APS' filing requests a cost of long-term debt of 4.10 percent. This is the Company's cost

17   rate for the June 30, 2019 period. I propose use of this cost rate in my COC analyses.

18

19 Q.   **Can the ROE be determined with the same degree of precision as the cost of debt?**

20 A.   No. The cost rates of debt are largely determined by interest payments, issue prices, and

21   related expenses. The ROE, on the other hand, cannot be precisely quantified, primarily

22   because this cost is an opportunity cost. As mentioned previously, there are several models

23   that can be employed to estimate the ROE. Four of the primary methods – DCF, CAPM,

24   CE and RP – are developed in the following sections of my testimony.

25

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1 **SELECTION OF PROXY GROUPS**

2 **Q. How have you estimated the ROE for APS?**

3 A. APS is not publicly traded. Consequently, it is not possible to directly apply ROE models

4 to this entity. Pinnacle West is publicly traded, so it is possible to apply ROE models to this

5 entity. However, it is generally preferred to analyze groups of comparison or "proxy"

6 companies as a substitute for APS to determine its ROE.

7

8 I have examined two such groups for comparison of APS. I selected one group of electric

9 utilities using the criteria listed on Schedule 6. These criteria are as follows:

10
11 (1)   Market "cap" of $1 billion to $20 billion;
12 (2)   Common equity ratio 40 percent to 60 percent;
13 (3)   Value Line Safety of 1 or 2;
14 (4)   Moody's and S&P's bond ratings of A or BBB; and
15 (5)   Currently pays dividends, and has not reduced dividends in past five years.
16

17 Second, I have conducted studies of the ROE for the electric utilities proxy group that was

18 selected by APS witness Ms. Bulkley.

19

20 I note that APS and Pinnacle West have superior credit measures, in the form of credit

21 ratings and Value Line Safety and Financial Strength, in comparison to both my proxy group

22 and Ms. Bulkley's proxy group. Clearly, APS and Pinnacle West are low-risk utilities in

23 comparison to the proxy groups.

24

25 **Q. Please explain why you are using two proxy groups in your ROE analyses.**

26 A. It has long been my practice to develop my own independently determined proxy group and

27 to also conduct ROE analyses on the utility witness' proxy group. My conclusions and

28 recommendations, in turn, are based upon the results of both proxy groups.

29

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1   **DCF ANALYSIS**

2   **Q.   What are the theory and methodological basis of the DCF model?**

3   A.   The DCF model is one of the oldest and most commonly used models for estimating the

4   ROE for public utilities.

5

6   The DCF model is based on the "dividend discount model" of financial theory, which

7   maintains that the value (price) of any security or commodity is the discounted present value

8   of all future cash flows.

9

10   The most common variant of the DCF model assumes that dividends are expected to grow

11   at a constant rate (the "Constant Growth" or "Gordon DCF model"). In this framework, the

12   ROE is derived from the following formula:

13

14                              $$K = \frac{D}{P} + g$$

15   where: P = current price
16   D = current dividend rate
17   K = discount rate (COC)
18   g = constant rate of expected growth
19

20   This formula essentially recognizes that the return expected or required by investors is

21   comprised of two factors: the dividend yield (current income) and expected growth in

22   dividends (future income).

23

24   **Q.   Please explain how you employ the DCF model.**

25   A.   I use the Constant Growth DCF model. In doing so, I combine the current dividend yield

26   for each of the proxy utility stocks described in the previous section with several indicators

27   of expected dividend growth.

28

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1   **Q.**   **How did you derive the dividend yield component of the DCF equation?**

2   A.   Several methods can be used to calculate the dividend yield component. These methods

3   generally differ in the manner in which the dividend rate is employed (i.e., current versus

4   future dividends or annual versus quarterly compounding variant). I used a quarterly

5   version of the dividend yield, which is expressed as follows:

6

7

$$Yield = \frac{D_0(1 + 0.5g)}{P_0}$$

8

9   This dividend yield component recognizes the timing of dividend payments and dividend

10   increases. The P_0 in my yield calculation is the average of the high and low stock price for

11   each proxy company for the most recent three-month time period (June to August 2020).

12   The D_0 is the current annualized dividend rate for each proxy company.

13

14   **Q.**   **How do you estimate the dividend growth component of the DCF equation?**

15   A.   The DCF model's dividend growth rate component is usually the most crucial and

16   controversial element involved in using this methodology. The objective of estimating the

17   dividend growth component is to reflect the growth expected by investors that is embodied

18   in the price (and yield) of a company's stock. As such, it is important to recognize that

19   individual investors have different expectations and consider alternative indicators in

20   deriving their expectations. This is evidenced by the fact that every investment decision

21   resulting in the purchase of a particular stock is matched by another investment decision to

22   sell that stock.

23

24   A wide array of indicators exists for estimating investors' growth expectations. As a result,

25   it is evident that investors do not always use one single indicator of growth. It, therefore, is

26   necessary to consider alternative dividend growth indicators in deriving the growth

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1   component of the DCF model. I have considered five indicators of growth in my DCF

2   analyses. These are:

4   1.   Years 2015 to 2019 (five-year average) earnings retention, or fundamental growth
5   (per Value Line);

7   2.   Five-year average of historic growth in Earnings per Share ("EPS"), Dividends per
8   Share ("DPS"), and Book Value per Share ("BVPS") (per Value Line);

10   3.   Years 2020, 2021 and 2023 to 2025 projections of earnings retention growth (per
11   Value Line);

13   4.   Years 2017 through 2019 to 2023 through 2025 projections of EPS, DPS, and BVPS
14   (per Value Line); and

16   5.   Five-year projections of EPS growth (per First Call, Value Line and Zacks).[19]

18   I believe this combination of growth indicators is a representative and appropriate set with

19   which to begin the process of estimating investor expectations of dividend growth for the

20   groups of proxy companies. I also believe that these growth indicators reflect the types of

21   information that investors consider in making their investment decisions. As I indicated

22   previously, investors have an array of information available to them, all of which would be

23   expected to have some impact on their decision-making process.

24

25   Q.   Please describe your DCF calculations.

26   A.   Schedule 7 presents my DCF analyses. Page 1 shows the calculation of the "raw" (i.e., prior

27   to adjustment for growth) dividend yield for each proxy company. Pages 2, 3 and 4 show

28   the growth rates for the groups of proxy companies. Page 5 shows the DCF calculations,

29   which are presented on several bases: mean, median, low and high values. These results

30   can be summarized as follows:

---

[19] I have historically used only the First Call EPS growth rate estimates in my DCF analyses. In this proceeding, I am
adding the Value Line and Zack's EPS growth rate estimates in order to give consideration to more EPS growth rate
estimates. I note that APS witness Ms. Bulkley also uses these three sources of EPS growth rate projections in her
DCF analyses.

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	Mean	Median	Mean Low[20]	Mean High[21]	Median Low[22]	Median High[23]
Parcell Proxy Group	7.6%	7.7%	6.6%	8.7%	6.7%	9.0%
Bulkley Proxy Group	8.3%	8.0%	7.4%	9.2%	7.5%	9.3%

Q. **How do the DCF results for your proxy group compare with the DCF results for APS witness Ms. Bulkley's proxy group?**

A. APS witness Ms. Bulkley's proxy group DCF results are also shown on Schedule 7 for comparative purposes. The results for her proxy group are slightly higher than those for my proxy group. I note that this is not surprising since, as is shown on Schedule 6, several of her proxy companies have lower equity ratios (i.e., higher financial risk) and lower Safety ratings than those for both Pinnacle West/APS and my proxy group.

I note that the individual DCF calculations shown on Schedule 7 should not be interpreted to reflect the expected COC for individual companies in the proxy groups; rather, the individual values shown should be interpreted as alternative information considered by investors.

Q. **What do you conclude from your DCF analyses?**

A. The DCF rates for the proxy groups fall into a wide range between 6.6 percent and 9.3 percent. The highest DCF rates are 8.7 percent to 9.3 percent. I believe a range of 8.7 percent to 9.3 percent (9.0 percent mid-point) represents the DCF-derived ROE for the proxy groups

---

[20] Using only the lowest average growth rate.
[21] Using only the highest average growth rate.
[22] Using the lowest median growth rate.
[23] Using only the highest median growth rate.

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1   This range includes the highest portion of the DCF range and exceeds the low and

2   mean/median DCF rates. My recommendation focuses on the highest of the DCF results to

3   incorporate my recognition that these results are relatively lower than historic DCF results.

4   As a result, my recommendation should be considered conservative.

5

6   Q.   **Does Ms. Bulkley also perform DCF analyses in her testimony?**

7   A.   Yes. Ms. Bulkley cites DCF results in her testimony with a broad range of 8.09 percent to

8   10.40 percent.[24]

9

10 Q.   **What are your disagreements with Ms. Bulkley's Constant Growth DCF analyses?**

11 A.   Ms. Bulkley's Constant Growth DCF analyses are based on 30-day, 90-day, and 180-day

12   average stock prices for the periods ending July 31, 2019, annualized dividends per share

13   as of July 31, 2019, and the average of Value Line, Yahoo Finance and Zack's EPS

14   projections. Her DCF analyses are applied to her proxy group of fourteen electric utility

15   holding companies.

16

17   Ms. Bulkley's Constant Growth DCF analyses are shown on her Attachment AEB-2DR. It

18   is apparent from a review of her exhibit that her "Low DCF ROE" for each proxy company

19   reflects the dividend yield and the lowest of the three growth rates she considers. Her "Mean

20   DCF ROE" considers the average of all three growth rates and her "High DCF ROE" only

21   considers the highest growth rate for each company. Stated differently, the "High DCF"

22   result considers only the highest of the three growth rates for each individual company and

23   ignores the other two growth rates for that company. Thus, the "Mean High DCF" result

24   for one proxy company may reflect only the Zacks EPS Growth, while the "Mean High

25   DCF" result for another proxy company may reflect only the Value Line growth result. It

[24] Ms. Bulkley's Direct Testimony at 62: Figure 15.

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1   is apparent from Ms. Bulkley's testimony that only Ms. Bulkley's "High" DCF Constant

2   Growth results are as high as her 10.15 percent ROE conclusions.[25]

3

4   Q.   **Is it appropriate to focus on the highest growth rate, on a company-to company basis,**

5   **to determine the ROE for an electric utility such as APS?**

6   A.   No. It is neither realistic nor appropriate to focus on a single growth rate for each proxy

7   company in a DCF context, especially when one "cherry picks" the highest growth rate for

8   each company from among the different growth rate indicators that reflect the highest

9   growth rate for each company.

10

11   Q.   **Are there any other problems with Ms. Bulkley's Constant Growth DCF analyses?**

12   A.   Yes. Even though Ms. Bulkley purports to examine three alternative growth rates in her

13   Constant Growth DCF analyses, in reality, all of the three focuses on a single statistic:

14   analysts' EPS forecasts. I believe it is improper to focus exclusively on a single source of

15   growth in a DCF context.

16

17   Q.   **Why is it improper to rely exclusively on EPS forecasts in a DCF analysis?**

18   A.   There are several reasons why it is not appropriate to rely exclusively on analysts' forecasts

19   in a DCF context:

20

21   First, it is not realistic to believe that investors rely exclusively on a single factor,
22   such as analysts' EPS forecasts, in making their investment decisions. Investors
23   have an abundance of available information to assist them in evaluating stocks; EPS
24   forecasts are only one of many such statistics.
25

26   Second, Value Line – one of Ms. Bulkley's sources of EPS projections – publishes
27   both historic and forecasted data, as well as ratios, for a large array of financial
28   indicators for publicly-traded companies. Presumably, all types of information are
29   published for the consideration of its subscribers/investors. Yet Ms. Bulkley
30   primarily considers only one factor, the forecast version of EPS, in her analyses.

---

[25] Ms. Bulkley's Direct Testimony at 62: Figure 15.

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1   Third, the vast majority of information available to investors, by both individual
2   companies in the form of annual reports and offering circulars, and by investment
3   publications such as Value Line, is historic data. It is neither realistic nor logical to
4   maintain the investors only consider projected (estimated) data to the exclusion of
5   historic (actual) data.
6

7   Fourth, the experience over the past several years should be a clear signal to
8   investors that analysts cannot accurately predict EPS levels. Few, if any, analysts
9   predicted the decline in security prices in the tech market crash of 2000-2002, as
10 well as the financial crisis of 2008 and 2009.[26] Thus, relying exclusively on
11 forecasted EPS levels, while ignoring historic EPS levels and other indicators,
12 cannot and will not produce accurate results.
13

14 In summary, investors are now very much aware of recent inabilities of security analysts to

15 accurately predict EPS growth. These problems clearly call into question the exclusive

16 reliance on analysts' forecasts of EPS as the only source of growth in a DCF context. As a

17 result, the landscape has changed in recent years and investors have ample reasons to doubt

18 the reliability of such forecasts at the present time. In light of the above, it is problematic

19 to rely exclusively on such forecasts in determining the ROE for APS.

20

21 Q.   **Are you aware of any recent analyses and comments on the accuracy of analysts'**

22   **forecasts?**

23 A.   Yes, I am. A 2010 study by McKinsey & Company, titled, "Equity Analysts: Still Too

24   Bullish"[27] concludes that "after almost a decade of stricter regulation, analysts' earnings

25   forecasts continue to be excessively optimistic." The significance of this study, as well as

26   the points I raised previously, is that investors should be hesitant to rely exclusively on

27   analysts' forecasts in making investment decisions.

28

---

[26] As demonstration of this, see "Security Analysts and their Recommendations", (http://thismatter.com/money/ stocks/valuation/security-analysts.htm).
[27] McKinsey & Company, McKinsey on Finance "Equity Analysts: Still Too Bullish", No. 35, Spring 2010.

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1 Q. **Has the U.S. Securities and Exchange Commission ("SEC") issued any reports that**

2 **address the exclusive reliance on analysts' recommendations?**

3 A. Yes. In a 2010 "Investor Alert: Analyzing Analyst Recommendations" the SEC[28] made the

4 following statement:

6 > As a general matter, investors should not rely solely on an analyst's
7 > recommendation when deciding whether to buy, hold, or sell a
8 > stock. Instead, they should also do their own research – such as
9 > reading the prospectus for new companies or for public companies,
10 > the quarterly and annual reports filed with the SEC – to confirm
11 > whether a particular investment is appropriate for them in light of
12 > their individual financial circumstances.

14 This SEC "Investor Alert" also cites the potential conflicts of interest that analysts face.

15 This "Investor Alert" thus also calls into question the exclusive reliance on analysts'

16 forecasts, as proposed by Ms. Bulkley.

18 **CAPM ANALYSIS**

19 Q. **Please describe the theory and methodological basis of the CAPM.**

20 A. CAPM was developed in the 1960s and 1970s as an extension of Modern Portfolio Theory

21 ("MPT"), which studies the relationships among risk, diversification, and expected returns.

22 The CAPM describes and measures the relationship between a security's investment risk

23 and its market rate of return.

25 Q. **How is the CAPM derived?**

26 A. The general form of the CAPM is:

28 $$K = R_f + \beta(R_m - R_f)$$

29 where: K = ROE
30 R_f = risk free rate

---

[28] http://www.sec.gov/investor/pubs/Analysts.htm.

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1   R_m = return on market

2   β = beta

3   R_m-R_f = market RP

4

5   The CAPM is a variant of the RP method. I believe the CAPM is generally superior to the

6   simple RP method because the CAPM specifically recognizes the risk of a particular

7   company or industry (i.e., beta), whereas the simple RP method assumes the same ROE for

8   all companies exhibiting similar bond ratings or other characteristics.

9

10   **Q.**   **What do you use for the risk-free rate?**

11   A.   The first input of the CAPM is the risk-free rate (R_f). The risk-free rate reflects the level of

12   return that can be achieved without accepting any risk.

13

14   In CAPM applications, the risk-free rate is generally recognized by use of U.S. Treasury

15   securities. Two general types of U.S. Treasury securities are often utilized as the R_f

16   component, short-term U.S. Treasury bills and long-term U.S. Treasury bonds.

17   I have performed CAPM calculations using the same three-month average yields (i.e., June

18   through August 2020) for 20-year U.S. Treasury bonds. I use the yields on long-term

19   Treasury bonds since this matches the long-term perspective of ROE analyses. Over this

20   three-month period, these bonds had an average yield of 1.17 percent.

21

22   **Q.**   **What is beta and what betas do you employ in your CAPM?**

23   A.   Beta is a measure of the relative volatility (and thus risk) of a particular stock in relation to

24   the overall market. Betas less than 1.0 are considered less risky than the market, whereas

25   betas greater than one are riskier. Utility stocks traditionally have had betas below one. I

26   utilize the most recent Value Line betas for each company in the proxy groups.

27

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1 **Q.** **How do you estimate the market RP component?**

2 **A.** The market RP component (R_m-R_f) represents the investor-expected premium of common

3 stocks over the risk-free rate, or long-term government bonds. For the purpose of estimating

4 the market RP, I considered alternative measures of returns of the S&P 500 (a broad-based

5 group of large U.S. companies) and 20-year U.S. Treasury bonds (i.e., same timeframe as

6 employed in Duff & Phelps source used to develop RPs).

7

8 First, I compared the actual annual returns on equity of the S&P 500 with the actual annual

9 income returns of U.S. Treasury bonds. Schedule 8 shows the ROE for the S&P 500 group

10 for the period 1978 to 2019 (all available years reported by S&P). This schedule also

11 indicates the annual yields on 20-year U.S. Treasury bonds and the annual differentials (i.e.,

12 RPs) between the S&P 500 and U.S. Treasury 20-year bonds. Based upon these returns, I

13 conclude that the RP from this analysis is 7.4 percent.

14

15 I next considered the total returns (i.e., dividends/interest plus capital gains/losses) for the

16 S&P 500 group as well as for long-term government bonds, as tabulated by Duff & Phelps

17 (formerly Morningstar/Ibbotson), using both arithmetic and geometric means. I considered

18 the total returns for the entire 1926 to 2019 period reported by this source, which are as

19 follows:

20

	S&P 500	L-T Gov't Bonds	Risk Premium
Arithmetic	12.1%	6.0%	6.1%
Geometric	10.2%	5.5%	4.7%

21

22 I conclude from this analysis that the expected RP is about 6.1 percent (i.e. average of all

23 three RPs: 7.4 percent from Schedule 8, 6.1 percent arithmetic, and 4.7 percent geometric

24 from Duff & Phelps). I believe that a combination of arithmetic and geometric means is

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1   appropriate since investors have access to both types of means[29] and presumably, both types

2   are reflected in investment decisions and thus, stock prices and the ROE.

3

4   **Q.   What are your CAPM results?**

5   A.   Schedule 9 shows my CAPM calculations for my proxy group, as well as those for Ms.

6   Bulkley's proxy group. The results are:

7

	Mean	Median
Parcell Proxy Group	6.6%	6.4%
Bulkley Proxy Group	6.6%	6.5%

8

9   **Q.   What is your conclusion concerning the CAPM ROE?**

10 A.   The CAPM results collectively indicate a ROE of 6.4 percent to 6.6 percent for the groups

11 of proxy utilities. I conclude that an appropriate CAPM ROE estimation for APS is 6.4

12 percent to 6.6 percent.

13

14 **Q.   How do your CAPM results compare to the CAPM results of Ms. Bulkley?**

15 A.   Ms. Bulkley's testimony reaches CAPM conclusions of 9.54 percent to 10.42 percent.[30]

16 These greatly exceed the CAPM results my testimony supports.

17

18 **Q.   Do you have any comments concerning Ms. Bulkley's CAPM analyses?**

19 A.   Yes, I do. I disagree with Ms. Bulkley's use of projected interest rates as her risk-free rate

20 CAPM component. I also disagree with her RP estimates.

21

---

[29] For example, Value Line uses compound (i.e., geometric) growth rates in its projection. In addition, mutual funds report growth rates on a compound basis.

[30] Ms. Bulkley's Direct Testimony at 62: Figure 15.

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1 Q. **Why is it not proper to use projected interest rates as the risk-free rate?**

2 A. It is proper to use the current (i.e., actual) yield as the risk-free rate in a CAPM context.

3 This is the case since the current yield is known and measurable and reflects investors'

4 current collective assessment of all capital market conditions. Prospective interest rates, in

5 contrast, are not measurable and not achievable. For example, if the current yield on 20-

6 year U.S. Treasury Bonds is 2.0 percent, this reflects the rate that investors can actually

7 receive on their investment. Investors cannot receive a prospective yield on their

8 investments since such a yield is not actual but rather speculative.

9

10 Use of the current risk-free rate in a CAPM context is similar to using the current yield in a

11 DCF context. Analysts do not use prospective stock prices as the basis for the dividend

12 yield in a DCF analysis, as use of prospective stock prices is speculative. Use of current

13 stock prices is appropriate, which Ms. Bulkley's testimony recognized. Likewise, current

14 levels of interest rates reflect all current information (i.e., the efficient market hypothesis)

15 and should be used as the risk-free rate in the CAPM.

16

17 It should be noted that Ms. Bulkley's use of projected long-term (30-Year Treasury Bonds)

18 interest rates (i.e., 3.60 percent) greatly exceed the current level of long-term bonds, which

19 are barely above 1.0 percent. In addition, her proposed 3.60 percent projection exceeds the

20 level of Treasury bonds even prior to the COVID-19 pandemic

21

22 Q. **What are your concerns with Ms. Bulkley's market RP component?**

23 A. Ms. Bulkley computes her market RP by calculating a constant growth DCF for the S&P

24 500 companies (using EPS forecasts as the growth component) of 13.90 percent and

25 comparing this to current yields on 30-year U.S. Treasury securities. I have previously

26 indicated that her DCF methodology over-states the COC. In addition, her use of U.S.

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1   Treasury securities as the baseline for the market RP is improper at this time due to the

2   effects of the Federal Reserve's QE on U.S. Treasury yields, which I describe in more detail

3   above.

4

5   **CE ANALYSIS**

6   **Q.   Please describe the basis of the CE methodology.**

7   A.   The CE method is derived from the "corresponding risk" concept discussed in the *Bluefield*

8   and *Hope* cases. This method is thus based upon the economic concept of opportunity cost.

9   As previously noted, the ROE is an opportunity cost: the prospective return available to

10   investors from alternative investments of similar risk.

11

12   The CE method is designed to measure the returns expected to be earned on the original

13   cost book value of similar risk enterprises. Thus, it provides a direct measure of the fair

14   return, since it translates into practice the competitive principle upon which regulation rests.

15

16   The CE method normally examines the experienced and/or projected return on book

17   common equity. The logic for examining returns on book equity follows from the use of

18   Original Cost Rate Base ("OCRB") regulation for public utilities, which uses a utility's

19   book common equity to determine the COC. This COC is, in turn, used as the fair rate of

20   return which is then applied (multiplied) to the book value of rate base to establish the dollar

21   level of capital costs to be recovered by the utility. This technique is thus consistent with

22   the rate base - rate of return methodology used to set utility rates.

23

24   **Q.   How do you apply the CE methodology in your analysis of APS' ROE?**

25   A.   I apply the CE methodology by examining realized ROEs for the groups of proxy utilities,

26   as well as unregulated companies. My CE analysis also uses prospective returns and thus

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1   is not backward looking. I evaluate investor acceptance of these returns by reference to the

2   resulting Market-to-Book Ratios ("M/Bs"). In this manner, it is possible to assess the degree

3   to which a given level of return equates to the COC. It is generally recognized for utilities

4   that an M/B of greater than one (i.e., 100 percent) reflects a situation where a company is

5   able to attract new equity capital without dilution (i.e., above book value). As a result, one

6   objective of a fair ROE is the maintenance of stock prices at or above book value. There is

7   no regulatory obligation to set rates designed to maintain an M/B significantly above one.

8

9   I further note that my CE analysis is based upon market data (through the use of M/Bs) and

10   is thus essentially a market test. Given that public utilities have their rates set based upon

11   the book value of their assets (i.e., rate base) and capital structure (i.e., COC), when a

12   utility's stock price exceeds its book value (i.e., M/B greater than one) this indicates that

13   investors consider its current and prospective earnings as adequate. As a result, my CE

14   analysis is not subject to the criticisms occasionally made by some who maintain that past

15   earned returns do not represent the COC.

16

17   Q.   **What time periods do you examine in your CE analysis?**

18   A.   My CE analysis considers the experienced ROEs of the proxy groups of utilities for the

19   period 2002 through 2019 (i.e., the last 18 years). The CE analysis requires that I examine

20   a relatively long period of time in order to determine trends in earnings over at least a full

21   business cycle. Further, in estimating a fair level of return for a future period, it is important

22   to examine earnings over a diverse period of time in order to avoid any undue influence

23   from unusual or abnormal conditions that may occur in a single year or shorter period.

24   Therefore, in forming my judgment of the current ROE, I focused on two periods: 2009

25   through 2019 (the current business cycle) and 2002 through 2008 (the most recent business

26   cycle). I have also considered projected ROEs for 2020, 2021 and 2023 through 2025.

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1 **Q.   Please describe your CE analysis.**

2 A.   Schedule 10 and Schedule 11 contain summaries of experienced ROEs and M/Bs for three

3   groups of companies, while Schedule 12 presents a risk comparison of utilities versus

4   unregulated firms.

5

6   Schedule 10 shows the ROEs and M/Bs for the groups of proxy utilities. These can be

7   summarized as follows:

8

	Parcell Proxy Group	Bulkley Proxy Group
Historic ROE		
Mean	9.2-9.3%	10.0-12.1%
Median	9.2-9.3%	9.7-11.6%
Historic M/B		
Mean	140-159%	165-183%
Median	145-154%	161-164%
Prospective ROE		
Mean	8.8-9.5%	9.9-10.6%
Median	8.8-9.3%	10.0-10.5%

9

10   These results indicate that, for my proxy group, historic ROEs of 9.2 percent to 9.3 percent

11   have been adequate to produce M/Bs of 140 percent to 159 percent. The ROEs and M/Bs

12   for Ms. Bulkley's group are higher. Furthermore, projected returns on equity for 2020, 2021

13   and 2023 through 2025 are within a range of 8.8 percent to 9.5 percent for my utility group,

14   again with Ms. Bulkley's proxy group showing higher results. These relate to 2019 M/Bs

15   of 197 percent or greater.

16

17 **Q.   Do you also review the earnings of unregulated firms?**

18 A.   Yes. As an alternative, I also examine the S&P's 500 Composite group. This is a well-

19   recognized group of firms that is widely utilized in the investment community and is

20   indicative of the competitive sector of the economy. Schedule 11 presents the earned ROEs

21   and M/Bs for the S&P 500 group over the past 18 years (i.e., 2002 through 2019). As this

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1   schedule indicates, over the two business cycle periods, this group's average ROEs ranged

2   from 12.4 percent to 13.8 percent, with average M/Bs ranging between 256 percent and 275

3   percent.

4

5   Q.   **How can the above information be used to estimate APS' ROE?**

6   A.   The recent ROEs of the proxy utilities and S&P 500 group can be viewed as an indication

7   of the level of return realized and expected in the regulated and competitive sectors of the

8   economy. In order to apply these returns to the ROE for the proxy utilities, however, it is

9   necessary to compare the risk levels of the utilities and the competitive companies. I do this

10   in Schedule 12, which compares several risk indicators for the S&P 500 group and the utility

11   groups. The information in this exhibit indicates that the S&P 500 group is riskier than the

12   utility proxy groups.

13

14   Q.   **What ROE is indicated by your CE analysis?**

15   A.   Based on recent ROEs and M/Bs, my CE analysis indicates that the ROE for the proxy

16   utilities is no more than nine percent to 10 percent (9.5 percent mid-point). Recent ROEs

17   of 9.2 percent to 9.3 percent have resulted in M/Bs of 140 percent and over. Prospective

18   ROEs of 8.8 percent to 9.5 percent have been accompanied by M/Bs about 200 percent and

19   greater. As a result, it is apparent that authorized returns below this level would continue

20   to result in M/Bs of well above 100 percent. As I indicated earlier, the fact that M/Bs

21   substantially exceed 100 percent indicates that historic and prospective ROEs of 9.0 percent

22   reflect earning levels that are well above the actual ROE for those regulated companies. I

23   also note that a company whose stock sells above book value can attract capital in a way

24   that enhances the book value of existing stockholders, thus creating a favorable environment

25   for financial integrity. Finally, I note that my 9.0 percent to 10.0 percent CE

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1   recommendation generally reflects the actual and prospective ROEs for my proxy group. I

2   have made no adjustments to these return levels to reflect the high M/Bs.

3

4 Q.   **Please describe Ms. Bulkley's Expected Earnings Approach and your response to this**

5   **approach.**

6 A.   Ms. Buckley's Expected Earnings Approach simply examines the Value Line projected

7   ROEs for her proxy group for the period 2022 through 2024, which are then "adjusted" for

8   her perception that Value Line's ROE projections use "common shares outstanding at the

9   end of the period, as opposed to average shares outstanding over the period."[31] It is apparent

10   that the 2022 through 2024 median and average ROEs, as reported by Value Line, was 10.81

11   percent to 11.15 percent.[32]

12

13   I note that more current estimates of the ROE for her proxy group by Value Line, as shown

14   in my Schedule 10, are much lower, at 10.6 percent average and 10.5 percent median. In

15   addition, the schedule shows the projected ROEs for 2020 and 2021 are even lower, being

16   9.9 percent to 10.5 percent.

17

18   In addition, Ms. Bulkley's Expected Earnings Approach fails to take into consideration the

19   M/Bs of her proxy group, which are currently over 200 percent (i.e., market price is double

20   book value).[33] As I indicate in my earlier testimony, it is proper to consider the M/B when

21   viewing ROEs of the proxy groups.

22

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[31] Bulkley Direct Testimony at 54:8-15.
[32] Id.
[33] Id.

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1   **RP ANALYSES**

2   **Q.   What are your responses to Ms. Bulkley's bond yield plus RP analysis?**

3   A.   Ms. Bulkley's RP approach compares the allowed ROEs for electric utilities and 30-Year

4   U.S. Government Bond yields over the period 1992 to July 2019. She applies a regression

5   result to various projected levels of 30-year U.S. Treasury Bonds and correspondingly

6   arrives at her 9.75 percent to 10.20 percent conclusion.[34]

7

8   Ms. Bulkley's bond yield plus RP analysis suffers from the same deficiencies as her market

9   RP and CAPM analyses. This is demonstrated by the fact that of the quarterly average

10   electric decisions since 2012 that were used in part to develop her RP[35], none had an average

11   awarded ROE as high as her 10.15 percent ROE recommendation.

12

13   In addition, Ms. Bulkley's bond yield plus RP analysis improperly uses U.S. Treasury bond

14   yields to develop the risk premium. As I indicated previously, the past several years have

15   seen the yields on U.S. Treasury bonds being downwardly impacted by the actions of the

16   Federal Reserve to offset the effects of the Great Recession and the COVID-19 pandemic.

17   For the purposes of a risk premium for public utilities, it is more appropriate to use the yields

18   on public utility bonds as the standard for determining the risk premium.

19

20   **Q.   Have you performed an independent RP analysis in order to avoid the deficiencies in**

21   **Ms. Bulkley's RP analyses?**

22   A.   Yes, I have. As noted above, Ms. Bulkley's RP analyses consider the authorized ROEs of

23   electric utilities dating back to 1992. As I have indicated in my testimony, this period has

24   experienced significant declines in interest rates, which is another component of this RP

25   analysis. Ms. Bulkley attempts to "correct" for changes in interest rates by performing a

[34] Ms. Bulkley's Direct Testimony at 52: 1-8.
[35] Ms. Bulkley's Direct Testimony at Attachment AEB-7DR.

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1 regression analysis that considers only the perceived relationship between authorized ROEs,

2 interest rates, and the resulting period RPs. Such an analysis does not recognize any other

3 changes in RPs, such as increased use of regulatory mechanisms (i.e., decoupling, cost

4 recovery mechanisms, etc.). As a result, her regression analysis does not properly capture

5 the current relationship between authorized ROEs and interest rates, as demonstrated above

6 by the fact that her regression-suggested RP and resulting ROEs is not consistent with the

7 recent level of authorized ROEs.

8

9 I have accordingly performed a RP analysis that focuses on the most recent five-year period

10 of authorized ROEs and single-A (i.e., APS's rating category) utility bond yields. My

11 analysis, by focusing on the current time period, as well as using the yields on public utility

12 bonds, is not subject to the deficiencies in Ms. Bulkley's RP analyses.

13

14 Q. **Please describe your RP analysis.**

15 A. I have compared the authorized ROEs of electric utilities that were decided in the period

16 2014 to 2019 (first half of year), the most recent complete five-year period for which

17 complete annual data is available. These are shown on Schedule 13.

18

19 Also shown on Schedule 13 are the levels of single-A utility bonds, with corresponding

20 "lags" (between the level of interest rates and the respective commission decisions) of:

21
22   No months,
23   3 months,
24   6 months,
25   9 months, and
26   12 months.
27

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1   The purpose of showing the lags is to recognize that authorized ROEs often reflect test

2   period and/or hearing period financial conditions that are not simultaneous with the date of

3   the respective commission's final decision establishing the authorized ROEs.

4

5   The data in Schedule 13 shows the quarterly average authorized ROEs for electric utilities,

6   along with several lagged interest rates, as well as the resulting RPs associated with the first

7   two sets of figures.

8

9   Q.   **What are the results of your calculations?**

10 A.   As shown on Schedule 13, the annual and five-year RPs are as follows:

11

Year	Avg ROE	Risk Premiums
2014	9.95%	5.36-5.67%
2015	9.68%	5.41-5.68%
2016	9.69%	5.44-5.76%
2017	9.82%	5.77-5.89%
2018	9.68%	5.43-5.72%
2019	9.65%	5.29-5.54%
2014-2019 5-Year Avg	9.76%	5.62-5.67%

12

13 The most recent year (2019) generally shows RPs of about 5.3 percent to 5.5 percent,

14 whereas the five-year period generally shows RPs of about 5.6 percent to 5.7 percent.

15

16 I conclude that a reasonable current RP estimate for electric utilities is a range of 5.4 percent

17 to 5.7 percent, over the prevailing level of single-A utility bond yields.

18

19 Q.   **What is the appropriate RP ROE at the present time?**

20 A.   I focus on the level of single-A bond yields over two three-month periods. As is shown on

21 Schedule 2, over the three-month period June through August 2020, the average yield is

22 2.85 percent. Combining this 2.85 percent single-A bond yield with a RP range of 5.4

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1   percent to 5.7 percent, the resulting RP-derived ROE is currently a range of 8.25 percent to

2   8.55 percent.

3

4   I have also considered the three-month period averages for November 2019 to January 2020,

5   which is the period preceding the COVID-19 pandemic. Use of this period is not impacted

6   by the lower level of interest rates resulting from the Federal Reserve's simulative monetary

7   policies and the resulting decline in interest rates. Over this period, the average yield on A-

8   rated utility bonds was 3.37 percent. Combining this with the RP range results in a RP-

9   derived ROE of 8.77 percent to 9.07 percent.

10

11   I conclude from this that the proper RP derived ROE for APS is within a range of 8.3 percent

12   to 9.1 percent.

13

14   **ROE RECOMMENDATIONS**

15   Q.   **Please summarize the results of your four ROE analyses.**

16   A.   My four ROE analyses produced the following:

17

	Mid-Point	Range
DCF	9.0%	8.7-9.3%
CAPM	6.5%	6.4-6.6%
CE	9.5%	9.0-10.0%
RP	8.7%	8.3-9.1%

18

19   These results indicate an overall broad range of 6.4 percent to 10.0 percent, which focuses

20   on the respective individual model results. Using mid-point values, the range is 6.5 percent

21   to 9.5 percent. I recommend a ROE range of 9.3 percent to 9.5 percent for APS (mid-point

22   of 9.4 percent). This range includes the upper end of my DCF results, the mid-point of my

23   CE results, and is supported by my RP results. My specific ROE recommendation is 9.4

24   percent.

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1 Q. **It appears that your CAPM results are less than your DCF, CE and RP results. Does**

2 **this imply that the CAPM results should not be considered in determining the ROE**

3 **for APS?**

4 A. No. It is apparent that the CAPM results are less than the DCF and CE results. There are

5 two reasons for the lower CAPM results. First, RPs are lower currently than was the case

6 in prior years. This is the result of lower equity returns that have been experienced over the

7 past several years. This is also reflective of a decline in investor expectations of equity

8 returns and RPs. Second, the level of interest rates on U.S. Treasury bonds (i.e., the risk-

9 free rate) has been lower in recent years. This is partially the result of the actions of the

10 Federal Reserve to stimulate the economy. This also impacts investor expectations of

11 returns in a negative fashion. I note that, initially, investors may have believed that the

12 decline in Treasury yields was a temporary factor that would soon be replaced by a rise in

13 interest rates. However, this has not been the case, as interest rates have remained low and

14 continued to decline for the past nine-plus years. As a result, it cannot be maintained that

15 low interest rates (and low CAPM results) are temporary and do not reflect investor

16 expectations. Investors have now experienced nearly a 10-year period of low and declining

17 interest rates, such that these are the "new norm." Consequently, even though the CAPM

18 results have not been given weight in developing my recommended ROE range, they should

19 be considered as one factor in determining where, within the recommended range, the ROE

20 for APS should fall. Therefore, I recommend that APS's ROE be set at no higher than the

21 mid-point of the ROE range for the proxy companies.

22

23 **TOTAL COC**

24 Q. **What is the total COC for APS?**

25 A. Schedule 1 reflects the total COC for APS using my proposed capital structure and

26 embedded cost of debt, as well as my ROE recommendations. The resulting COC is a range

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1   of 6.94 percent to 7.05 percent. With my 9.4 percent ROE, my COC recommendation is

2   7.00 percent.

3

4   **COMMENTS ON COMPANY TESTIMONY**

5   **Q.   On pages 54 through 60 of her direct testimony, Ms. Bulkley cites several "additional**

6   **factors that must be taken into consideration when determining where the Company's**

7   **ROE falls within the range of analytical results." Do you have any responses to this**

8   **assertion?**

9   A.   Yes, I do. Ms. Bulkley has identified several "factors" that she maintains create more risk

10 for APS relative to her proxy utilities. These include:

11

12   1)   Regulatory risk assessments;
13   2)   APS's capital expenditures plan; and,
14   3)   Generation risk.
15

16 However, each of these factors is considered by the rating agencies in their assignment of

17 credit ratings to APS, thus Ms. Bulkley's consideration of these factors is redundant. As

18 indicated previously, APS has higher Moody's and S&P credit ratings, reflecting lower risk,

19 compared to the typical electric utility, including Ms. Bulkley's proxy group. In addition,

20 Pinnacle West has superior Value Line Safety and Financial Strength ratings than the proxy

21 groups. Stated differently, APS is perceived to have lower total risks than the typical electric

22 utility, including Ms. Bulkley's proxy group, in spite of the existence of Ms. Bulkley's risk

23 "factors." This is particularly notable in light the fact that Ms. Bulkley's risk "factors" are

24 common across the industry and are not unique to APS. The risk "factors" are already

25 "baked into the cake". Consequently, there is no justification for providing APS a higher

26 ROE relative to that of other similar natural gas utilities.

27

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1 **FAIR VALUE RATE BASE ("FVRB") COC**

2 **Q. What is your understanding of APS' position on the issue of FVRB and related COC**

3 **implications?**

4 A. It is my understanding that APS is requesting that a 5.62 percent COC be applied to its

5 FVRB. This 5.62 percent return incorporates a 1.00 percent cost rate of the "FVI" as well

6 as a 10.15 percent ROE.[36]

7

8 **Q. What is your understanding of the Commission's procedure for utilizing the FVRB in**

9 **setting utility rates?**

10 A. My "non-legal understanding" is that the Commission must consider the fair value of a

11 utility's assets in setting rates. However, I do not agree that this implies that the Company's

12 COC must be applied to the FVRB.

13

14 **Q. Are you aware that in 2008 the Commission conducted a "remand" hearing on the**

15 **issue of regulatory treatment of FVRB for Chaparral City Water Company**

16 **("Chaparral City")?**

17 A. Yes, I am. In January of 2008, the Commission conducted a public hearing in response to

18 a remand by the Arizona Court of Appeals decision[37] involving Chaparral City (Docket No.

19 W-02113A-04-0616) which affirmed in part, vacated, and remanded Decision No. 68176 to

20 the Commission for further proceedings. The purpose of this hearing was to determine the

21 appropriate COC to be applied to the utility's FVRB. The Commission's Decision No.

22 70441 (July 28, 2018) in the remand proceeding (Docket No. W-02113A-04-0616)

23 established a FVROR by subtracting the inflation rate from the ROE.

24

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[36] Bulkley Direct Testimony at 3: 17-20.
[37] 1-CA-CC 05-0002, Memorandum Decision dated February 13, 2007.

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1 **Q.   What is your understanding of the use of FVRB in Arizona?**

2 A.   My "non-legal understanding" is based in part on the 2007 Arizona Court of Appeals

3   decision in the Chaparral City case in which the Court states that it agreed with the

4   Commission that "the COC analysis" is geared to concepts of original cost measures of rate

5   base, not fair value measures of rate base. . ." The decision goes on to make the following

6   statement: "If the Commission determines that the COC analysis is not the appropriate

7   methodology to determine the rate of return to be applied to the FVRB, the Commission has

8   the discretion to determine the appropriate methodology." It is correspondingly the purpose

9   of this section of my testimony to recommend an "appropriate methodology" for use in

10   conjunction with the FVRB.

11

12 **Q.   Do you have any observations based upon your own experience in COC determination,**

13   **as to whether a COC developed for application to an original cost rate base ("OCRB")**

14   **is consistent with a FVRB?**

15 A.   Yes, I do. It is my professional experience, based upon nearly 50 years of providing COC

16   testimony, that the concept of COC is designed to apply to an OCRB. This is the case since

17   the COC is derived from the liabilities/owners' equity side of a utility's balance sheet using

18   the book values of the capital structure components. The COC, once determined, is then

19   applied to (i.e., multiplied by) the rate base, which is derived from the asset side of the

20   balance sheet (i.e., OCRB). From a financial perspective, the rationale for this relationship

21   is that the rate base is financed by the capitalization. Under this relationship, a provision is

22   provided for investors (both lenders and owners) to receive a return on their invested capital.

23   Such a relationship is meaningful as long as the COC is applied to the original cost (i.e.,

24   book value) rate base, because there is a matching of rate base and capitalization.

25

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1   When the concept of FVRB is incorporated, however, this link between rate base and capital

2   structure is broken. The amount of FVRB that exceeds OCRB is not financed with investor-

3   supplied funds and, indeed, is not financed at all. As a result, a customary COC analysis

4   cannot be automatically applied to the FVRB since there is no financial link between the

5   two concepts. In my "non-legal" opinion, both the Commission and Court of Appeals have

6   also recognized this lack of compatibility between a customary WCOC analysis and FVRB.

7

8   Q.   **Why is it important that there be a link between the concepts of rate base and COC?**

9   A.   This link is important since financial theory indicates that investors should be provided an

10   opportunity to earn a return on the capital they provided to the utility. Since the capital

11   finances the rate base (in an original cost world), the link between COC and rate base

12   satisfies this financial objective.

13

14   Q.   **Based on your experience as a COC witness over the past 50 years, do you have a**

15   **suggestion as to how to account for the use of a FVRB in setting rates for APS?**

16   A.   Yes, I do. Since the increment between the FVRB and OCRB is not financed with investor-

17   supplied funds, it is logical and appropriate, from a financial standpoint, to assume that this

18   increment has no financing cost. As a result, the COC, through the capital structure, can be

19   modified to account for a level of cost-free capital in an equal dollar amount to the increment

20   of FVRB over the OCRB. Such a procedure would still provide for a return being earned

21   on all investor-supplied funds and would thus be consistent with financial standards.

22

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1   **Q.**   **From a sound financial and economic standpoint, is it necessary to provide a return**

2   **on the Fair Value increment?**

3   **A.**   No. My first proposal for a FVROR incorporates a zero percent return on the FVRB

4   Increment, consistent with financial standards. As shown below, this results in a 5.03

5   percent FVROR.

6

Item	Percent[38]	Cost	Fair Value Return
Long-term Debt	32.58%	4.10%	1.34%
Common Equity	39.30%	9.40%	3.69%
FVRB Increment	28.12%	0.00%	0.00%
Total FVRB Capital	100.00%		5.03%

7

8   Applying this 5.03 percent to the FVRB provides for a return on all investor-supplied capital

9   and is, therefore, an appropriate rate to apply to the FVRB from a financial and economic

10   standpoint. However, this methodology does not provide a specific return increment to the

11   utility's FVRB increment, in recognition of the fair value standard in Arizona.

12

13   **Q.**   **Have you developed an alternative method that complies with Arizona's fair value**

14   **standard?**

15   **A.**   Yes, I have. Under the fair value standard in Arizona there should be a specific return

16   (greater than zero) applied to the FVRB Increment (above the OCRB), I have provided such

17   a procedure. Use of this methodology provides a positive return to the FVRB increment, in

18   connection with the Arizona fair value standard.

19

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[38] As developed in Testimony of Commission Staff witness Ralph Smith.

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1   **Q.**   **Why is it necessary to add a return on only the portion of FVRB that exceeds the**

2   **OCRB?**

3   A.   The WCOC authorized by the Commission has already provided for a full ROE return and

4   cost of debt on the portions of equity and debt capital that are supporting the OCRB portion

5   of the FVRB. As a result, there is no need to provide any additional return on the portions

6   of FVRB supported by common equity and debt.

7

8   Stated differently, both the cost of debt and the return on common equity (i.e., capital stock,

9   paid-in capital, and retained earnings – the investment of common shareholders) are already

10   provided for in a traditional WCOC. Only the portion of the FVRB that exceeds OCRB

11   (FVI) needs to have a specific return identified in order to reflect a return component on

12   that FVI.

13

14   **Q.**   **What is the proper cost rate to apply to the FVI?**

15   A.   As I indicated previously, from a financial perspective, it should not be necessary to provide

16   for any return on the FVI since this is not investor-supplied capital. However, I recognize

17   that the Commission must evaluate this issue from both a financial and a legal perspective.

18   I am aware that APS may claim that the concept of fair value carries with it the notion that

19   investors should receive some benefit when fair value is greater than original cost and

20   should suffer some detriment when fair value is less than original cost. It is possible that

21   the Commission may determine that Arizona's fair value provision, which is somewhat

22   unique, is not inconsistent with these concepts. Legally, the Commission has some

23   discretion in determining the return to be applied to the FV Increment.

24

25   Nonetheless, the idea that the Company should receive some benefit from the FVI does not

26   mean that one should automatically apply to the FVRB a WCOC developed by reference to

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1   OCRB. If it is determined that it is desirable to provide an additional (non-zero) return on

2   the FVI, the proper return should be no larger than the real (i.e., after inflation is removed)

3   risk-free rate of return.

4

5   Q.   **What is the risk-free return?**

6   A.   The risk-free return is, in financial terms, the return on an investment that carries little or no

7   risk. Risk-free investments are universally defined as U.S. Treasury Securities, with short-

8   term maturities usually being used as the risk-free rate. During 2019 (i.e., last complete

9   calendar year and period prior to COVID-19 impact) various maturities of U.S. Treasury

10 securities yielded from about 2.1 percent (short-term) to about 2.6 percent (long-term).

11 Over the past several months, various maturities of U.S. Treasury securities have yielded

12 from about 0.1 percent to 1.5 percent (short-term) to 1.3 percent to 2.2 percent (long-term)

13 in nominal terms. Current yields are about 0.1 percent (short-term) and 1.4 percent (long-

14 term).[39] I also note that 2021 forecasts of U.S. Treasury securities are about 0.2 percent

15 (short-term) to 1.9 percent (long-term).[40] As a result, I use 2.6 percent as the nominal risk-

16 free rate (i.e., the highest of the above interest rates).

17

18 Q.   **What is the "real" risk-free rate?**

19 A.   The concept of real risk-free rates involves the removal of the rate of inflation from the

20 nominal risk-free rate. In 2019, the rate of inflation, as measured by the CPI, was about 2.3

21 percent. Forecasts of the CPI for 2021 are about 2.0 percent. As a result, I propose to use

22 2.0 percent inflation rate for computing the real risk-free rate, which is computed as follows:
23
24
25   Nominal Risk-Free Rate   2.6%
26   Less: Inflation Rate   2.0%
27   Equals: Real Risk-Free Rate   0.6%

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[39] Council of Economic Advisors, "Economic Indicators."
[40] July 1, 2020 Blue Chip Financial Forecasts.

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1   Q.   **Please explain why APS's FVROR should consider the real risk-free rate, as opposed**

2   **to the nominal risk-free rate.**

3   A.   The investors of APS are already receiving an inflation factor due to the inclusion of

4   inflation in the FVRB Increment.   Specifically, the FVI incorporates inflation by

5   considering the current value of assets, which reflect, in part, past inflation. It would be

6   double-counting to also include the inflation components in the return to be applied to the

7   FVI.

8

9   Q.   **What return on the FVI do you recommend in your alternative FVROR methodology?**

10   A.   My alternative FVROR proposal incorporates a return on the FVI with a maximum value

11   of 0.6 percent, as developed above. However, I wish to emphasize that this 0.6 percent

12   value is the maximum value that could be applied to the FVRB Increment. In reality, any

13   value between zero percent and 0.6 percent could be used as the cost rate on the FVI. As I

14   stated above, this FVI return is in addition to the return that the Company's investors already

15   earn on their investment in the Company. In this sense, an above-zero cost rate for the FVI

16   represents a bonus to the Company that would have to find its justification in policy

17   considerations instead of in pure economic or financial principles; for that reason, the

18   selection of an appropriate cost rate within this range should fall to the Commission's

19   discretion. I would propose the mid-point of this range, or 0.3 percent.

20

21   Q.   **What is the resulting impact of your alternative methodology in this proceeding?**

22   A.   I am proposing the following modified FVROR for APS:

23

Capital Item	Percent	Cost	Fair Value Return
Long-term Debt	32.58%	4.10%	1.34%
Common Equity	39.30%	9.40%	3.69%
FVRB Increment	28.12%	0.30%	0.08%
Total	100.00%		5.11%

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1   As shown in the above table, this alternative methodology provides for a non-zero return on

2   the FVI of APS and provides for an overall FVROR of 5.11 percent on the FVRB.

3

4   Q. **What is your understanding of how your alternative methodology will be used in the**

5   **development of Staff's revenue requirement recommendations?**

6   A. As I indicated above, I have developed two FVROR calculations – Option 1 that includes a

7   zero percent return on the FVRB increment (5.03 percent FVROR), and Option 2 that

8   includes a 0.30 percent return on the FVRB increment (5.11 percent FVROR). The Staff

9   revenue requirement, as developed in the Direct Testimony of Staff Witness Mr. Ralph

10   Smith, calculates FVROR based on the second option. The FVROR for Option 2 is 5.11

11   percent, which matches the mid-point of my ROE range and my specific ROE

12   recommendation.

13

14 Q. **Does this conclude your direct testimony?**

15 A. Yes, it does.

PROXY COMPANIES
DIVIDEND YIELD

COMPANY	Qtr DPS	June - August 2020 DPS	HIGH	LOW	MID-POINT	YIELD
Parcell Proxy Group						
Alliant Energy Corp	$0.380	$1.52	$55.60	$46.15	$50.88	2.99%
Ameren Corp	$0.495	$1.98	$83.96	$67.14	$75.55	2.62%
Avista	$0.405	$1.62	$40.84	$33.34	$37.09	4.37%
Black Hills Corp	$0.535	$2.14	$63.42	$52.36	$57.89	3.70%
Evergy, Inc.	$0.505	$2.02	$65.43	$49.81	$57.62	3.51%
Hawaiian Electric Industries	$0.330	$1.32	$40.76	$33.94	$37.35	3.53%
IDACORP	$0.670	$2.68	$96.19	$84.14	$90.17	2.97%
Northwestern Corp	$0.600	$2.40	$64.17	$50.87	$57.52	4.17%
OGE Energy	$0.388	$1.55	$34.91	$29.22	$32.07	4.83%
Otter Tail Corp	$0.370	$1.48	$44.61	$36.63	$40.62	3.64%
Pinnacle West Capitral	$0.783	$3.13	$83.43	$69.96	$76.70	4.08%
Portland General Electric	$0.385	$1.54	$48.73	$36.00	$42.37	3.64%
Average						**3.67%**
Bulkley Proxy Group						
ALLETE, Inc.	$0.618	$2.47	$64.90	$51.60	$58.25	4.24%
Ameren Corp	$0.495	$1.98	$83.96	$67.14	$75.55	2.62%
American Electric Power Corp	$0.700	$2.80	$89.93	$77.15	$83.54	3.35%
DTE Energy Co.	$1.013	$4.05	$121.47	$102.19	$111.83	3.62%
Duke Energy Corp.	$0.965	$3.86	$92.20	$77.58	$84.89	4.55%
Evergy	$0.505	$2.02	$65.43	$49.81	$57.62	3.51%
Exelon	$0.383	$1.53	$41.96	$34.49	$38.23	4.01%
FirstEnergy Corp	$0.390	$1.56	$44.10	$22.85	$33.48	4.66%
OGE Energy Corp.	$0.388	$1.55	$34.91	$29.22	$32.07	4.83%
Otter Tail Corp	$0.370	$1.48	$44.61	$36.63	$40.62	3.64%
PNM Resources, Inc.	$0.308	$1.23	$45.70	$36.93	$41.32	2.98%
PPL Corp	$0.415	$1.66	$30.94	$24.20	$27.57	6.02%
Southern Co.	$0.640	$2.56	$60.47	$50.40	$55.44	4.62%
Xcel Energy, Inc.	$0.430	$1.72	$73.00	$61.58	$67.29	2.56%
Average						**3.94%**

Average of daily closing stock prices.

Source: Yahoo! Finance.

PROXY COMPANIES
RETENTION GROWTH RATES

COMPANY	2015	2016	2017	2018	2019	Average	2020	2021	2023-25	Average
Parcell Proxy Group	.									
Alliant Energy Corp	3.6%	2.8%	4.0%	4.4%	4.2%	3.8%	4.0%	3.5%	3.5%	3.7%
Ameren Corp	2.5%	3.3%	3.4%	4.8%	4.4%	3.7%	4.0%	4.0%	4.5%	4.2%
Avista	2.3%	3.0%	1.9%	2.2%	4.9%	2.9%	0.5%	1.0%	1.5%	1.0%
Black Hills Corp	3.8%	3.3%	5.3%	3.9%	3.8%	4.0%	3.5%	3.5%	3.0%	3.3%
Evergy, Inc.				0.6%	2.4%	1.5%	1.5%	2.0%	2.0%	1.8%
Hawaiian Electric Industries	1.5%	6.3%	2.1%	3.1%	3.4%	3.3%	1.5%	2.5%	2.5%	2.2%
IDACORP	4.8%	4.3%	4.4%	4.4%	4.2%	4.4%	3.5%	3.5%	3.5%	3.5%
Northwestern Corp	3.0%	4.1%	3.4%	3.2%	3.1%	3.4%	2.0%	2.5%	2.0%	2.2%
OGE Energy	4.0%	3.3%	3.5%	3.8%	3.6%	3.6%	3.0%	3.0%	3.0%	3.0%
Otter Tail Corp	2.0%	2.1%	3.3%	4.0%	4.0%	3.1%	3.0%	3.0%	3.5%	3.2%
Pinnacle West Captiral	3.9%	3.5%	4.2%	3.9%	3.8%	3.9%	3.0%	3.0%	3.0%	3.0%
Portland General Electric	3.3%	3.5%	3.6%	3.5%	3.1%	3.4%	2.5%	3.0%	3.0%	2.8%
Average						**3.4%**				**2.8%**
Bulkley Proxy Group										
ALLETE, Inc.	3.6%	2.8%	2.4%	2.7%	2.3%	2.8%	1.5%	2.0%	2.5%	2.0%
Ameren Corp	2.5%	3.3%	3.4%	4.8%	4.4%	3.7%	4.0%	4.0%	4.5%	4.2%
American Electric Power Corp	3.9%	5.5%	3.2%	3.5%	3.4%	3.9%	3.5%	3.5%	3.5%	3.5%
DTE Energy Co.	3.4%	3.7%	4.6%	4.9%	4.1%	4.1%	3.5%	3.5%	4.0%	3.7%
Duke Energy Corp.	1.5%	0.6%	1.2%	1.0%	2.4%	1.3%	2.0%	2.0%	2.5%	2.2%
Evergy				0.6%	2.4%	1.5%	1.5%	2.0%	2.0%	1.8%
Exelon	4.5%	1.9%	4.7%	2.2%	4.7%	3.6%	3.5%	4.0%	4.0%	3.8%
FirstEnergy Corp	1.9%	4.5%	14.6%	0.0%	2.5%	4.7%	3.0%	8.0%	6.0%	5.7%
OGE Energy Corp.	4.0%	3.3%	3.5%	3.8%	3.6%	3.6%	3.0%	3.0%	3.0%	3.0%
Otter Tail Corp	2.0%	2.1%	3.3%	4.0%	4.0%	3.1%	3.0%	3.0%	3.5%	3.2%
PNM Resources, Inc.	3.3%	2.8%	4.5%	2.9%	5.4%	3.8%	2.5%	4.0%	4.5%	3.7%
PPL Corp	6.0%	8.8%	3.5%	6.0%	4.3%	5.7%	4.0%	4.0%	4.0%	4.0%
Southern Co.	3.1%	2.5%	3.9%	2.6%	2.8%	3.0%	2.5%	2.5%	3.0%	2.7%
Xcel Energy, Inc.	4.3%	4.0%	3.9%	4.3%	4.4%	4.2%	3.5%	4.0%	4.0%	3.8%
Average						**3.5%**				**3.4%**

Note that Evergy, Inc. was formed in 2018 from merger of Great Plains Energy and Westar Energy; thus, no prior figures are available.

Source: Value Line Investment Survey.

PROXY COMPANIES
PER SHARE GROWTH RATES

COMPANY	5-Year Historic Growth Rates				Est'd '17-'19 to '23-'25 Growth Rates			
	EPS	DPS	BVPS	Average	EPS	DPS	BVPS	Average
Parcell Proxy Group								
Alliant Energy Corp	5.0%	7.0%	5.0%	5.7%	6.5%	5.5%	7.5%	6.5%
Ameren Corp	6.5%	3.0%	2.5%	4.0%	6.0%	5.0%	5.5%	5.5%
Avista	7.0%	4.0%	4.5%	5.2%	1.0%	4.0%	2.5%	2.5%
Black Hills Corp	7.0%	5.0%	4.0%	5.3%	3.5%	6.0%	4.5%	4.7%
Evergy, Inc.					3.0%	5.5%	2.0%	3.5%
Hawaiian Electric Industries	2.0%	0.0%	3.5%	1.8%	1.5%	2.0%	3.5%	2.3%
IDACORP	4.0%	9.0%	5.0%	6.0%	3.5%	6.5%	3.5%	4.5%
Northwestern Corp	6.0%	7.5%	7.0%	6.8%	1.5%	4.0%	3.0%	2.8%
OGE Energy	2.0%	10.0%	5.5%	5.8%	3.0%	6.0%	1.0%	3.3%
Otter Tail Corp	9.0%	2.5%	4.5%	5.3%	3.5%	5.0%	4.0%	4.2%
Pinnacle West Capitral	5.0%	3.5%	4.0%	4.2%	4.0%	5.5%	3.5%	4.3%
Portland General Electric	4.0%	5.5%	3.5%	4.3%	4.0%	5.5%	3.0%	4.2%
Average				**5.0%**				**4.0%**
Bulkley Proxy Group								
ALLETE, Inc.	4.0%	3.5%	5.0%	4.2%	5.5%	4.5%	3.5%	4.5%
Ameren Corp	6.5%	3.0%	2.5%	4.0%	6.0%	5.0%	5.5%	5.5%
American Electric Power Corp	4.0%	5.5%	3.0%	4.2%	5.0%	5.5%	4.5%	5.0%
DTE Energy Co.	7.5%	7.0%	5.0%	6.5%	5.0%	6.5%	5.5%	5.7%
Duke Energy Corp.	2.5%	3.0%	1.0%	2.2%	5.0%	2.5%	2.5%	3.3%
Evergy					3.0%	5.5%	2.0%	3.5%
Exelon	4.5%	-3.0%	4.0%	5.3%	5.0%	5.5%	4.0%	4.8%
FirstEnergy Corp	0.0%	-2.0%	-17.5%	neg	8.5%	3.0%	10.0%	7.2%
OGE Energy Corp.	2.0%	10.0%	5.5%	5.8%	3.0%	6.0%	1.0%	3.3%
Otter Tail Corp	9.0%	2.5%	4.5%	5.3%	3.5%	5.0%	4.0%	4.2%
PNM Resources, Inc.	7.0%	10.0%	0.0%	5.7%	6.0%	5.5%	5.5%	5.7%
PPL Corp	-1.0%	2.0%	-3.5%	neg	2.5%	2.0%	4.5%	3.0%
Southern Co.	3.0%	3.5%	3.0%	3.2%	3.0%	3.0%	3.5%	3.2%
Xcel Energy, Inc.	5.0%	6.5%	4.5%	5.3%	6.0%	6.0%	5.0%	5.7%
Average				**4.7%**				**4.6%**

Average

Source: Value Line Investment Survey.

PROXY COMPANIES
EPS GROWTH RATE FORECASTS

Company	First Call	Zacks	Value Line	Average
Parcell Proxy Group				
Alliant Energy Corp	5.30%	5.54%	6.5%	5.78%
Ameren Corp	5.85%	6.78%	6.0%	6.21%
Avista	5.90%	5.18%	1.0%	4.03%
Black Hills Corp	4.69%	5.76%	3.5%	4.65%
Evergy, Inc.	6.80%	6.41%	3.0%	5.40%
Hawaiian Electric Industries	3.30%	1.67%	1.5%	2.16%
IDACORP	2.60%	2.63%	3.5%	2.91%
Northwestern Corp	3.80%	3.39%	1.5%	2.90%
OGE Energy	2.40%	3.69%	3.0%	3.03%
Otter Tail Corp	9.00%	na	3.5%	6.25%
Pinnacle West Capital	3.75%	4.70%	4.0%	4.15%
Portland General Electric	4.30%	5.00%	4.0%	4.43%
Average				4.32%
Bulkley Proxy Group				
ALLETE, Inc.	7.00%	na	5.5%	6.25%
Ameren Corp	5.85%	6.78%	6.0%	6.21%
American Electric Power Corp	5.63%	5.59%	5.0%	5.41%
DTE Energy Co.	5.95%	5.67%	5.0%	5.54%
Duke Energy Corp.	2.75%	4.27%	5.0%	4.01%
Evergy	6.80%	6.41%	3.0%	5.40%
Exelon	neg	4.00%	5.0%	4.50%
FirstEnergy Corp	neg	na	8.5%	8.50%
OGE Energy Corp.	2.40%	3.69%	3.0%	3.03%
Otter Tail Corp	9.00%	na	3.5%	6.25%
PNM Resources, Inc.	4.95%	4.87%	6.0%	5.27%
PPL Corp	neg	na	2.5%	2.50%
Southern Co.	4.55%	4.00%	3.0%	3.85%
Xcel Energy, Inc.	6.10%	5.93%	6.0%	6.01%
Average				5.20%

Sources: Yahoo Finance, Zacks, Value Line.

PROXY COMPANIES
DCF COST RATES

COMPANY	ADJUSTED YIELD	HISTORIC RETENTION GROWTH	PROSPECTIVE RETENTION GROWTH	HISTORIC PER SHARE GROWTH	PROSPECTIVE PER SHARE GROWTH	PROSPECTIVE EPS GROWTH	AVERAGE GROWTH	DCF RATES
Parcell Proxy Group								
Alliant Energy Corp	3.06%	3.8%	3.7%	5.7%	6.5%	5.78%	5.1%	8.1%
Ameren Corp	2.68%	3.7%	4.2%	4.0%	5.5%	6.21%	4.7%	7.4%
Avista	4.44%	2.9%	1.0%	5.2%	2.5%	4.03%	3.1%	7.5%
Black Hills Corp	3.78%	4.0%	3.3%	5.3%	4.7%	4.65%	4.4%	8.2%
Evergy, Inc.	3.56%	1.5%	1.8%		3.5%	5.40%	3.1%	6.6%
Hawaiian Electric Industries	3.58%	3.3%	2.2%	1.8%	2.3%	2.16%	2.4%	5.9%
IDACORP	3.04%	4.4%	3.5%	6.0%	4.5%	2.91%	4.3%	7.3%
Northwestern Corp	4.25%	3.4%	2.2%	6.8%	2.8%	2.90%	3.6%	7.9%
OGE Energy	4.92%	3.6%	3.0%	5.8%	3.3%	3.03%	3.8%	8.7%
Otter Tail Corp	3.72%	3.1%	3.2%	5.3%	4.2%	6.25%	4.4%	8.1%
Pinnacle West Capitral	4.16%	3.9%	3.0%	4.2%	4.3%	4.15%	3.9%	8.1%
Portland General Electric	3.70%	3.4%	2.8%	4.3%	4.2%	4.43%	3.8%	7.5%
Mean	3.7%	3.4%	2.8%	5.0%	4.0%	4.3%	3.9%	**7.6%**
Median	3.7%	3.5%	3.0%	5.3%	4.2%	4.3%	3.9%	**7.7%**
Composite - Mean		7.1%	**6.6%**	**8.7%**	7.8%	8.1%	7.6%	
Composite - Median		7.2%	**6.7%**	**9.0%**	7.9%	8.0%	7.6%	
Bulkley Proxy Group								
ALLETE, Inc.	4.32%	2.8%	2.0%	4.2%	4.5%	6.25%	3.9%	8.3%
Ameren Corp	2.68%	3.7%	4.2%	4.0%	5.5%	6.21%	4.7%	7.4%
American Electric Power Corp	3.43%	3.9%	3.5%	4.2%	5.0%	5.41%	4.4%	7.8%
DTE Energy Co.	3.72%	4.1%	3.7%	6.5%	5.7%	5.54%	5.1%	8.8%
Duke Energy Corp.	4.61%	1.3%	2.2%	2.2%	3.3%	4.01%	2.6%	7.2%
Evergy	3.56%	1.5%	1.8%		3.5%	5.40%	3.1%	6.6%
Exelon	4.10%	3.6%	3.8%	5.3%	4.8%	4.50%	4.4%	8.5%
FirstEnergy Corp	4.81%	4.7%	5.7%	neg	7.2%	8.50%	6.5%	11.3%
OGE Energy Corp.	4.92%	3.6%	3.0%	5.8%	3.3%	3.03%	3.8%	8.7%
Otter Tail Corp	3.72%	3.1%	3.2%	5.3%	4.2%	6.25%	4.4%	8.1%
PNM Resources, Inc.	3.05%	3.8%	3.7%	5.7%	5.7%	5.27%	4.8%	7.9%
PPL Corp	6.14%	5.7%	4.0%	neg	3.0%	2.50%	3.8%	9.9%
Southern Co.	4.69%	3.0%	2.7%	3.2%	3.2%	3.85%	3.2%	7.9%
Xcel Energy, Inc.	2.62%	4.2%	3.8%	5.3%	5.7%	6.01%	5.0%	7.6%
Mean	4.0%	3.5%	3.4%	4.7%	4.6%	5.2%	4.3%	**8.3%**
Median	3.9%	3.7%	3.6%	5.3%	4.7%	5.4%	4.4%	**8.0%**
Composite - Mean		7.5%	**7.4%**	**8.7%**	8.6%	**9.2%**	8.3%	
Composite - Median		7.6%	**7.5%**	**9.2%**	8.6%	**9.3%**	8.3%	

Note: negative values not used in calculations.

Sources: Prior pages of this schedule.

STANDARD & POOR'S 500 COMPOSITE
20-YEAR U.S. TREASURY BOND YIELDS
RISK PREMIUMS

Year	EPS	BVPS	ROE	20-YEAR T-BOND YIELD	RISK PREMIUM
1977		$79.07			
1978	$12.33	$85.35	15.00%	7.90%	7.10%
1979	$14.86	$94.27	16.55%	8.86%	7.69%
1980	$14.82	$102.48	15.06%	9.97%	5.09%
1981	$15.36	$109.43	14.50%	11.55%	2.95%
1982	$12.64	$112.46	11.39%	13.50%	-2.11%
1983	$14.03	$116.93	12.23%	10.38%	1.85%
1984	$16.64	$122.47	13.90%	11.74%	2.16%
1985	$14.61	$125.20	11.80%	11.25%	0.55%
1986	$14.48	$126.82	11.49%	8.98%	2.51%
1987	$17.50	$134.07	13.42%	7.92%	5.50%
1988	$23.75	$141.32	17.25%	8.97%	8.28%
1989	$22.87	$147.26	15.85%	8.81%	7.04%
1990	$21.73	$153.01	14.47%	8.19%	6.28%
1991	$16.29	$158.85	10.45%	8.22%	2.23%
1992	$18.86	$149.74	12.22%	7.26%	4.96%
1993	$21.89	$180.88	13.24%	7.17%	6.07%
1994	$30.60	$193.04	16.37%	6.59%	9.78%
1995	$33.96	$216.51	16.58%	7.60%	8.98%
1996	$38.73	$237.08	17.08%	6.18%	10.90%
1997	$39.72	$249.52	16.33%	6.64%	9.69%
1998	$37.71	$266.40	14.62%	5.83%	8.79%
1999	$48.17	$290.68	17.29%	5.57%	11.72%
2000	$50.00	$325.80	16.22%	6.50%	9.72%
2001	$24.70	$338.37	7.44%	5.53%	1.91%
2002	$27.59	$321.72	8.36%	5.59%	2.77%
2003	$48.73	$367.17	14.15%	4.80%	9.35%
2004	$58.55	$414.75	14.98%	5.02%	9.96%
2005	$69.93	$453.06	16.12%	4.69%	11.43%
2006	$81.51	$504.39	17.03%	4.68%	12.35%
2007	$66.17	$529.59	12.80%	4.86%	7.94%
2008	$14.88	$451.37	3.03%	4.45%	-1.42%
2009	$50.97	$513.58	10.56%	3.47%	7.09%
2010	$77.35	$579.14	14.16%	4.25%	9.91%
2011	$86.95	$613.14	14.59%	3.82%	10.77%
2012	$86.51	$666.97	13.52%	2.46%	11.06%
2013	$100.20	$715.84	14.49%	2.88%	11.61%
2014	$102.31	$726.96	14.18%	3.41%	10.77%
2015	$88.43	$740.29	12.05%	2.47%	9.58%
2016	$95.48	$768.98	12.65%	2.30%	10.35%
2017	$110.98	$826.52	13.91%	2.67%	11.24%
2018	$134.66	$851.62	16.05%	2.82%	13.23%
2019	$140.09	$914.49	15.86%	2.55%	13.31%
Average					7.40%

Source: Standard & Poor's, Duff & Phelps.

PROXY COMPANIES
CAPM COST RATES

COMPANY	RISK-FREE RATE	BETA	RISK PREMIUM	CAPM RATES
Parcell Proxy Group				
Alliant Energy Corp	1.17%	0.80	6.10%	6.0%
Ameren Corp	1.17%	0.80	6.10%	6.0%
Avista	1.17%	0.95	6.10%	7.0%
Black Hills Corp	1.17%	1.00	6.10%	7.3%
Evergy, Inc.	1.17%	1.05	6.10%	7.6%
Hawaiian Electric Industries	1.17%	0.80	6.10%	6.0%
IDACORP	1.17%	0.80	6.10%	6.0%
Northwestern Corp	1.17%	0.90	6.10%	6.7%
OGE Energy	1.17%	1.05	6.10%	7.6%
Otter Tail Corp	1.17%	0.85	6.10%	6.4%
Pinnacle West Capitral	1.17%	0.85	6.10%	6.4%
Portland General Electric	1.17%	0.85	6.10%	6.4%
Mean				**6.6%**
Median				**6.4%**
Bulkley Proxy Group				
ALLETE, Inc.	1.17%	0.85	6.10%	6.4%
Ameren Corp	1.17%	0.80	6.10%	6.0%
American Electric Power Corp	1.17%	0.75	6.10%	5.7%
DTE Energy Co.	1.17%	0.90	6.10%	6.7%
Duke Energy Corp.	1.17%	0.85	6.10%	6.4%
Evergy	1.17%	1.05	6.10%	7.6%
Exelon	1.17%	0.95	6.10%	7.0%
FirstEnergy Corp	1.17%	0.85	6.10%	6.4%
OGE Energy Corp.	1.17%	1.05	6.10%	7.6%
Otter Tail Corp	1.17%	0.85	6.10%	6.4%
PNM Resources, Inc.	1.17%	0.90	6.10%	6.7%
PPL Corp	1.17%	1.10	6.10%	7.9%
Southern Co.	1.17%	0.90	6.10%	6.7%
Xcel Energy, Inc.	1.17%	0.75	6.10%	5.7%
Mean				**6.6%**
Median				**6.5%**

Sources: Value Line Investment Survey, Standard & Poor's, Federal Reserve.

20-year Treasury Bonds	
Month	Rate
June 2020	1.27%
July 2020	1.09%
Aug 2020	1.14%
Average	1.17%

PROXY COMPANIES
RATES OF RETURN ON AVERAGE COMMON EQUITY

COMPANY	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2002-2008 Average	2009-2019 Average	2020	2021	2023-25
Parcell Proxy Group																							
Alliant Energy Corp	5.7%	9.1%	8.5%	10.3%	9.4%	11.5%	10.2%	7.5%	10.8%	10.4%	11.1%	11.4%	11.5%	10.6%	9.9%	11.4%	11.7%	11.5%	9.2%	10.7%	10.5%	10.0%	10.5%
Ameren Corp	10.8%	12.2%	10.0%	10.3%	8.5%	9.3%	8.8%	8.4%	8.5%	7.6%	8.0%	7.7%	8.8%	8.5%	9.3%	9.4%	10.9%	10.5%	10.0%	8.9%	9.5%	9.5%	10.0%
Avista	4.5%	6.7%	4.6%	5.8%	8.8%	4.1%	7.6%	8.4%	8.5%	8.6%	6.4%	8.7%	8.1%	7.8%	8.6%	7.5%	7.8%	10.6%	6.0%	8.3%	6.0%	7.0%	7.5%
Black Hills Corp	12.1%	NA	NA	NA	NA	NA	NA	NA	5.9%	3.6%	7.1%	9.1%	9.6%	9.5%	8.0%	10.9%	10.2%	9.4%	8.5%	8.4%	8.5%	8.5%	9.0%
Energy, Inc.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.2%	NA	NA	7.0%	7.5%	8.0%
Hawaiian Electric Industries	11.9%	11.1%	9.3%	9.7%	9.3%	7.1%	7.0%	5.9%	7.7%	10.5%	10.4%	10.1%	9.5%	8.5%	12.4%	8.6%	9.5%	9.8%	9.4%	9.2%	8.0%	9.0%	8.5%
IDACORP	7.1%	4.2%	8.2%	7.3%	9.4%	6.9%	8.0%	9.3%	9.8%	10.9%	9.0%	9.5%	10.3%	9.0%	10.0%	9.4%	9.1%	9.6%	7.3%	9.8%	8.0%	9.0%	9.5%
Northwestern Corp	NA	13.2%	NA	12.5%	15.0%	14.7%	13.0%	12.9%	13.5%	14.0%	13.2%	13.2%	12.5%	10.3%	10.0%	10.5%	10.8%	11.0%	13.2%	12.0%	11.5%	12.0%	12.5%
OGE Energy	11.1%	12.0%	12.7%	11.6%	10.4%	10.4%	5.9%	3.7%	2.1%	2.7%	6.9%	9.4%	10.3%	9.9%	9.7%	10.7%	11.4%	11.5%	10.9%	8.0%	10.0%	10.5%	11.0%
Otter Tail Corp	16.2%	12.0%	10.8%	11.6%	9.2%	8.5%	6.1%	6.8%	9.3%	8.7%	9.8%	9.9%	9.2%	9.7%	9.4%	10.1%	9.9%	10.1%	7.9%	9.4%	9.5%	10.0%	10.0%
Pinnacle West Capital	8.6%	8.3%	8.2%	6.7%	5.9%	11.5%	6.5%	6.2%	8.0%	9.0%	8.3%	7.7%	9.1%	8.2%	8.3%	8.6%	8.6%	8.4%	8.2%	8.2%	8.0%	8.5%	9.0%
Portland General Electric	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Average	9.7%	9.5%	8.9%	9.3%	9.3%	9.3%	7.5%	7.9%	8.5%	8.6%	9.1%	9.7%	9.9%	9.2%	9.6%	9.7%	10.0%	9.9%	9.2%	9.3%	8.8%	9.0%	9.5%
Median	10.8%	9.1%	8.5%	9.7%	9.3%	9.3%	7.6%	8.4%	8.5%	9.0%	9.3%	9.5%	9.6%	9.5%	9.4%	9.6%	9.9%	10.0%	9.2%	9.3%	8.8%	8.6%	9.3%
Bulkley Proxy Group																							
ALLETE, Inc.	NA	NA	NA	12.0%	13.2%	13.4%	11.4%	7.3%	8.2%	9.5%	8.7%	8.4%	8.6%	9.4%	8.3%	8.0%	8.2%	7.8%	12.5%	8.4%	6.5%	7.5%	8.0%
Ameren Corp	10.8%	12.2%	10.0%	10.3%	8.5%	9.3%	8.8%	8.4%	8.5%	7.6%	8.0%	7.7%	8.8%	8.5%	9.3%	9.4%	10.9%	10.5%	10.0%	8.9%	9.5%	9.5%	10.0%
American Electric Power Corp	12.3%	12.4%	12.7%	11.9%	12.2%	11.7%	11.6%	11.0%	9.3%	10.7%	9.7%	9.9%	9.0%	10.1%	11.8%	10.0%	10.3%	10.4%	12.1%	10.3%	10.5%	10.5%	10.5%
DTE Energy Co.	13.7%	9.7%	8.1%	10.2%	7.5%	7.7%	7.5%	8.7%	9.6%	9.1%	9.2%	8.6%	11.1%	9.3%	9.7%	11.1%	11.3%	10.8%	9.2%	9.9%	10.0%	10.5%	10.5%
Duke Energy Corp.	8.9%	0.6%	8.6%	9.5%	4.8%	6.4%	6.1%	6.8%	8.0%	8.1%	6.8%	6.8%	7.1%	7.1%	6.4%	7.1%	6.9%	7.2%	6.4%	7.2%	7.5%	8.0%	8.5%
Energy	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.0%	8.0%	9.4%	6.4%	9.4%	6.6%	9.3%	NA	NA	8.0%	7.5%	8.0%
Exelon	19.4%	19.7%	20.3%	23.0%	24.5%	26.7%	25.5%	23.9%	19.5%	17.8%	8.2%	9.6%	2.8%	6.8%	9.7%	23.8%	6.6%	9.3%	22.7%	11.6%	8.0%	8.5%	9.0%
FirstEnergy Corp	10.4%	6.0%	10.8%	10.5%	13.6%	14.6%	15.5%	12.0%	11.6%	6.3%	6.8%	9.6%	12.5%	10.3%	10.0%	10.5%	10.8%	11.0%	11.6%	10.5%	14.5%	19.0%	15.5%
OGE Energy Corp.	11.1%	13.2%	12.7%	12.5%	15.0%	14.7%	13.0%	12.9%	13.5%	14.0%	13.2%	13.2%	12.5%	10.3%	10.0%	10.7%	11.4%	11.5%	13.2%	12.0%	11.5%	12.0%	12.5%
Otter Tail Corp	15.2%	12.0%	10.8%	11.6%	15.0%	14.7%	13.0%	3.7%	2.1%	2.7%	6.9%	9.4%	10.3%	9.9%	9.7%	10.7%	11.4%	11.5%	10.9%	8.0%	10.0%	10.5%	11.0%
PNM Resources, Inc.	6.3%	6.7%	7.9%	8.6%	8.4%	18.7%	0.5%	3.1%	4.8%	5.8%	6.6%	6.9%	6.7%	6.9%	7.0%	9.1%	7.8%	10.8%	6.0%	6.9%	7.5%	9.0%	9.5%
PPL Corp	23.6%	23.1%	18.3%	16.8%	18.4%	18.7%	17.2%	8.5%	14.5%	14.6%	14.2%	12.6%	11.8%	13.5%	19.1%	14.0%	16.3%	14.3%	19.4%	13.9%	13.5%	13.0%	12.5%
Southern Co.	15.7%	15.6%	15.2%	15.0%	14.2%	14.5%	13.5%	13.2%	12.6%	12.9%	12.9%	12.7%	12.8%	12.7%	11.9%	13.1%	12.5%	12.7%	14.6%	12.7%	12.0%	12.0%	12.5%
Xcel Energy, Inc.	2.8%	10.0%	9.8%	9.1%	9.8%	9.3%	9.7%	9.5%	9.5%	10.1%	10.4%	10.2%	10.3%	10.2%	10.4%	10.4%	10.7%	10.8%	8.6%	10.2%	10.0%	10.0%	10.5%
Average	12.5%	11.8%	12.1%	12.4%	12.3%	12.4%	11.2%	9.9%	10.1%	9.9%	9.4%	9.6%	9.3%	9.5%	10.0%	11.3%	10.4%	10.7%	12.1%	10.0%	9.9%	10.5%	10.6%
Median	11.7%	12.1%	10.8%	11.6%	12.2%	11.7%	11.4%	8.7%	9.5%	9.5%	8.7%	9.4%	9.9%	9.4%	9.7%	10.4%	10.8%	10.8%	11.6%	9.7%	10.0%	10.3%	10.5%

NA – Not available. Value Line does not report for this company in the indicated years.

Note – blanks in average column indicates that annual data is not available for all years of the indicated period.

Source: Calculations made from data contained in Value Line Investment Survey.

PROXY COMPANIES
MARKET TO BOOK RATIOS

COMPANY	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2002-2008 Average	2009-2019 Average
Parcell Proxy Group																				
Alliant Energy Corp	110%	97%	120%	131%	155%	173%	131%	103%	131%	147%	161%	169%	197%	196%	214%	235%	223%	237%	131%	183%
Ameren Corp	163%	162%	161%	172%	164%	159%	122%	83%	81%	92%	106%	125%	152%	149%	165%	196%	202%	225%	158%	143%
Avista	85%	94%	111%	115%	135%	127%	110%	94%	106%	119%	123%	125%	143%	141%	158%	174%	178%	160%	111%	138%
Black Hills Corp	143%	134%	134%	165%	153%	164%	124%	77%	108%	109%	121%	161%	181%	152%	186%	207%	174%	191%	145%	152%
Evergy, Inc.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	159%		159%
Hawaiian Electric Industries	153%	151%	179%	181%	192%	166%	166%	113%	140%	150%	164%	156%	167%	175%	169%	184%	181%	203%	170%	164%
IDACORP	134%	112%	125%	122%	139%	132%	104%	94%	113%	119%	123%	136%	159%	158%	177%	203%	199%	212%	124%	154%
Northwestern Corp	NA	NA	NA	NA	160%	147%	109%	105%	122%	138%	146%	159%	174%	167%	171%	169%	154%	170%	139%	152%
OGE Energy	147%	154%	178%	187%	205%	197%	145%	139%	180%	197%	204%	231%	228%	184%	170%	192%	181%	206%	173%	192%
Otter Tail Corp	245%	209%	185%	183%	178%	200%	167%	108%	120%	123%	152%	196%	196%	186%	207%	244%	253%	274%	195%	187%
Pinnacle West Capital	116%	114%	130%	130%	129%	127%	100%	90%	113%	125%	141%	153%	158%	160%	172%	191%	182%	191%	121%	152%
Portland General Electric	NA	NA	NA	NA	153%	140%	101%	83%	97%	109%	117%	131%	145%	148%	155%	173%	162%	179%	131%	136%
Average	144%	136%	147%	154%	160%	157%	125%	99%	119%	130%	142%	158%	173%	165%	177%	197%	190%	201%	140%	159%
Median	143%	134%	134%	165%	155%	159%	122%	94%	113%	123%	141%	156%	167%	160%	171%	192%	181%	197%	145%	154%
Bulkley Proxy Group																				
ALLETE, Inc.	NA	NA	NA	212%	219%	195%	156%	113%	127%	138%	136%	152%	151%	146%	153%	182%	181%	190%	158%	152%
Ameren Corp	163%	162%	161%	172%	164%	159%	122%	83%	81%	92%	106%	125%	152%	149%	165%	198%	202%	225%	158%	143%
American Electric Power Corp	138%	124%	155%	165%	161%	190%	145%	112%	118%	128%	134%	145%	162%	166%	178%	193%	190%	215%	154%	158%
DTE Energy Co.	145%	142%	132%	140%	134%	143%	101%	91%	116%	121%	137%	153%	170%	173%	180%	207%	197%	207%	134%	159%
Duke Energy Corp.	171%	106%	139%	157%	153%	102%	102%	90%	101%	115%	120%	120%	133%	135%	136%	142%	136%	148%	133%	125%
Evergy	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	159%		159%
Exelon	191%	227%	280%	356%	401%	481%	415%	271%	169%	200%	154%	125%	124%	117%	114%	129%	132%	146%	336%	153%
FirstEnergy Corp	131%	132%	154%	169%	195%	230%	221%	161%	145%	138%	145%	127%	118%	120%	152%	275%	315%	328%	176%	184%
OGE Energy Corp.	147%	154%	178%	187%	205%	197%	145%	139%	180%	197%	204%	231%	228%	184%	170%	192%	181%	206%	173%	192%
Otter Tail Corp	245%	209%	185%	183%	178%	200%	167%	108%	120%	123%	152%	196%	196%	186%	207%	244%	253%	274%	195%	187%
PNM Resources, Inc.	95%	93%	124%	147%	134%	125%	72%	50%	68%	86%	100%	109%	127%	129%	156%	187%	186%	219%	113%	129%
PPL Corp	253%	239%	230%	259%	261%	316%	288%	209%	180%	152%	155%	164%	168%	187%	246%	236%	182%	194%	264%	188%
Southern Co.	230%	233%	227%	238%	229%	230%	211%	182%	186%	208%	218%	209%	211%	212%	211%	205%	192%	215%	228%	204%
Xcel Energy, Inc.	113%	113%	132%	139%	150%	154%	127%	121%	135%	143%	156%	157%	165%	171%	189%	208%	206%	232%	133%	171%
Average	169%	161%	175%	194%	199%	209%	175%	133%	133%	142%	147%	155%	162%	160%	174%	200%	196%	211%	183%	165%
Median	155%	148%	158%	172%	178%	195%	145%	113%	127%	138%	145%	152%	162%	166%	170%	198%	190%	211%	164%	161%

NA – Not available. Value Line does not report for this company in the inicated years.

Note -- blanks in average column indicates that annual data is not available for all years of the indicated period.

Source: Calculations made from data contained in Value Line Investment Survey.

STANDARD & POOR'S 500 COMPOSITE
RETURNS AND MARKET-TO-BOOK RATIOS
2002 - 2019

YEAR	RETURN ON AVERAGE EQUITY	MARKET-TO BOOK RATIO
2002	8.4%	295%
2003	14.2%	278%
2004	15.0%	291%
2005	16.1%	278%
2006	17.0%	277%
2007	12.8%	284%
2008	3.0%	224%
2009	10.6%	187%
2010	14.2%	208%
2011	14.6%	207%
2012	13.5%	214%
2013	14.5%	237%
2014	14.2%	268%
2015	12.1%	273%
2016	12.7%	271%
2017	13.9%	310%
2018	16.1%	316%
2019	15.9%	322%
Averages:		
2002-2008	12.4%	275%
2009-2019	13.8%	256%

Source: Standard & Poor's.

Exhibit No.___(DCP-1)
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Page 1 of 2

RISK INDICATORS

COMPANY	VALUE LINE SAFETY	VALUE LINE BETA	VALUE LINE FINANCIAL STRENGTH	
Parcell Proxy Group				
Alliant Energy Corp	2	0.80	A	4.00
Ameren Corp	2	0.80	A	4.00
Avista	2	0.95	B++	3.67
Black Hills Corp	2	1.00	A	4.00
Evergy, Inc.	2	1.05	B++	3.67
Hawaiian Electric Industries	2	0.80	A	4.00
IDACORP	2	0.80	A	4.00
Northwestern Corp	2	0.90	B++	3.67
OGE Energy	2	1.05	A	4.00
Otter Tail Corp	2	0.85	A	4.00
Pinnacle West Capitral	1	0.85	A+	4.33
Portland General Electric	2	0.85	B++	3.67
	1.9	0.89	A	3.92
Bulkley Proxy Group				
ALLETE, Inc.	2	0.85	A	4.00
Ameren Corp	2	0.80	A	4.00
American Electric Power Corp	1	0.75	A+	4.33
DTE Energy Co.	2	0.90	B++	3.67
Duke Energy Corp.	2	0.85	A	4.00
Evergy	2	1.05	B++	3.67
Exelon	3	0.95	B+	3.33
FirstEnergy Corp	3	0.85	B+	3.33
OGE Energy Corp.	2	1.05	A	4.00
Otter Tail Corp	2	0.85	A	4.00
PNM Resources, Inc.	3	0.90	B+	3.33
PPL Corp	2	1.10	B++	3.67
Southern Co.	2	0.90	A	4.00
Xcel Energy, Inc.	1	0.75	A+	4.33
Average	2.1	0.90	A/B++	3.83

Source: Value Line Investment Survey.

Exhibit No.___(DCP-1)
Schedule 12
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RISK INDICATORS

GROUP	VALUE LINE SAFETY	VALUE LINE BETA	VALUE LINE FIN STR
S & P's 500 Composite	2.7	1.05	B++
Parcell Proxy Group	1.9	0.89	A
Bulkley Proxy Group	2.1	0.90	A/B++

Source: Value Line Investment Survey.

Definitions:

Safety rankings are in a range of 1 to 5, with 1 representing the highest safety or lowest risk.

Beta reflects the variability of a particular stock, relative to the market as a whole. A stock with a beta of 1.0 moves in concert with the market, a stock with a beta below 1.0 is less variable than the market, and a stock with a beta above 1.0 is more variable than the market.

Financial strengths range from C to A++, with the latter representing the highest level.

Common stock rankings range from D to A+, with the later representing the highest level.

RISK PREMIUM OF AUTHORIZED RETURNS ON EQUITY OF ELECTRIC UITILITIES OVER YIELDS OF A-RATED PUBLIC UTILITY BONDS

Period	Avg. Auth. ROE 1/	Quarterly Average A-rated utility bond yields with lag of:					Risk Premium over A-rated utility bond yields with lag of:				
		0 Qtr	1 Qtr	2 Qtr	3 Qtr	4 Qtr	0 Qtr	1 Qtr	2 Qtr	3 Qtr	4 Qtr
2014 1Q	9.86%	4.56%	4.76%	4.74%	4.23%	4.18%	5.30%	5.10%	5.12%	5.63%	5.68%
2014 2Q	10.10%	4.32%	4.56%	4.76%	4.74%	4.23%	5.78%	5.54%	5.34%	5.36%	5.87%
2014 3Q	9.90%	4.20%	4.32%	4.56%	4.76%	4.74%	5.70%	5.58%	5.34%	5.14%	5.16%
2014 4Q	9.94%	4.03%	4.20%	4.32%	4.56%	4.76%	5.91%	5.74%	5.62%	5.38%	5.18%
2014 Avg	9.95%	4.28%	4.46%	4.59%	4.57%	4.48%	5.67%	5.49%	5.36%	5.38%	5.47%
2015 1Q	9.64%	3.66%	4.03%	4.20%	4.32%	4.56%	5.98%	5.61%	5.44%	5.32%	5.08%
2015 2Q	9.83%	4.10%	3.66%	4.03%	4.20%	4.32%	5.73%	6.17%	5.80%	5.63%	5.51%
2015 3Q	9.40%	4.35%	4.10%	3.66%	4.03%	4.20%	5.05%	5.30%	5.74%	5.37%	5.20%
2015 4Q	9.86%	4.35%	4.35%	4.10%	3.66%	4.03%	5.51%	5.51%	5.76%	6.20%	5.83%
2015 Avg	9.68%	4.12%	4.04%	4.00%	4.05%	4.28%	5.57%	5.65%	5.68%	5.63%	5.41%
2016 1Q	9.70%	4.18%	4.35%	4.35%	4.10%	3.66%	5.52%	5.35%	5.35%	5.60%	6.04%
2016 2Q	9.48%	3.90%	4.18%	4.35%	4.35%	4.10%	5.58%	5.30%	5.13%	5.13%	5.38%
2016 3Q	9.74%	3.61%	3.90%	4.18%	4.35%	4.35%	6.13%	5.84%	5.56%	5.39%	5.39%
2016 4Q	9.83%	4.04%	3.61%	3.90%	4.18%	4.35%	5.79%	6.22%	5.93%	5.65%	5.48%
2016 Avg	9.69%	3.93%	4.01%	4.19%	4.24%	4.12%	5.76%	5.68%	5.49%	5.44%	5.57%
2017 1Q	9.72%	4.18%	4.04%	3.61%	3.90%	4.18%	5.54%	5.68%	6.11%	5.82%	5.54%
2017 2Q	9.64%	4.06%	4.18%	4.04%	3.61%	3.90%	5.58%	5.46%	5.60%	6.03%	5.74%
2017 3Q	10.00%	3.91%	4.06%	4.18%	4.04%	3.61%	6.09%	5.94%	5.82%	5.96%	6.39%
2017 4Q	9.91%	3.84%	3.91%	4.06%	4.18%	4.04%	6.07%	6.00%	5.85%	5.73%	5.87%
2017 Avg	9.82%	4.00%	4.05%	3.97%	3.93%	3.93%	5.82%	5.77%	5.85%	5.88%	5.89%
2018 1Q	9.69%	4.03%	3.84%	3.91%	4.06%	4.18%	5.66%	5.85%	5.78%	5.63%	5.51%
2018 2Q	9.75%	4.24%	4.03%	3.84%	3.91%	4.06%	5.51%	5.72%	5.91%	5.84%	5.69%
2018 3Q	9.69%	4.28%	4.24%	4.03%	3.84%	3.91%	5.41%	5.45%	5.66%	5.85%	5.78%
2018 4Q	9.60%	4.45%	4.28%	4.24%	4.03%	3.84%	5.15%	5.32%	5.36%	5.57%	5.76%
2018 Avg	9.68%	4.25%	4.10%	4.00%	3.96%	4.00%	5.43%	5.58%	5.68%	5.72%	5.68%
2019 1Q	9.72%	4.25%	4.45%	4.28%	4.24%	4.03%	5.47%	5.27%	5.44%	5.48%	5.69%
2019 2Q	9.58%	3.96%	4.25%	4.45%	4.28%	4.24%	5.62%	5.33%	5.13%	5.30%	5.34%
2019 Avg	9.65%	4.11%	4.35%	4.37%	4.26%	4.13%	5.54%	5.30%	5.29%	5.39%	5.52%
2014-2019 Average	9.76%	4.10%	4.13%	4.14%	4.13%	4.12%	5.67%	5.63%	5.62%	5.64%	5.64%

1/ Quarterly authorized ROEs as contained in Ms. Bulkley's testimony, Attachment AEB-7DR, page 2.

AVERAGE MONTHLY YIELDS ON A-RATED PUBLIC UTILITY BONDS

| Period | Month 1 | Month 2 | Month 3 | Average | Quarterly Averages with Lags of: | | | | |
					0 Qtr	1 Qtr	2 Qtr	3 Qtr	4 Qtr
2013 1Q	4.15%	4.18%	4.20%	4.18%					
2013 2Q	4.00%	4.17%	4.53%	4.23%					
2013 3Q	4.68%	4.73%	4.80%	4.74%					
2013 4Q	4.70%	4.77%	4.81%	4.76%					
2014 1Q	4.63%	4.53%	4.51%	4.56%	4.56%	4.76%	4.74%	4.23%	4.18%
2014 2Q	4.41%	4.26%	4.29%	4.32%	4.32%	4.56%	4.76%	4.74%	4.23%
2014 3Q	4.23%	4.13%	4.24%	4.20%	4.20%	4.32%	4.56%	4.76%	4.74%
2014 4Q	4.06%	4.09%	3.95%	4.03%	4.03%	4.20%	4.32%	4.56%	4.76%
2015 1Q	3.58%	3.67%	3.74%	3.66%	3.66%	4.03%	4.20%	4.32%	4.56%
2015 2Q	3.75%	4.17%	4.39%	4.10%	4.10%	3.66%	4.03%	4.20%	4.32%
2015 3Q	4.40%	4.25%	4.39%	4.35%	4.35%	4.10%	3.66%	4.03%	4.20%
2015 4Q	4.29%	4.40%	4.35%	4.35%	4.35%	4.35%	4.10%	3.66%	4.03%
2016 1Q	4.27%	4.11%	4.16%	4.18%	4.18%	4.35%	4.35%	4.10%	3.66%
2016 2Q	4.00%	3.93%	3.78%	3.90%	3.90%	4.18%	4.35%	4.35%	4.10%
2016 3Q	3.57%	3.59%	3.66%	3.61%	3.61%	3.90%	4.18%	4.35%	4.35%
2016 4Q	3.77%	4.08%	4.27%	4.04%	4.04%	3.61%	3.90%	4.18%	4.35%
2017 1Q	4.14%	4.18%	4.23%	4.18%	4.18%	4.04%	3.61%	3.90%	4.18%
2017 2Q	4.12%	4.12%	3.94%	4.06%	4.06%	4.18%	4.04%	3.61%	3.90%
2017 3Q	3.99%	3.86%	3.87%	3.91%	3.91%	4.06%	4.18%	4.04%	3.61%
2017 4Q	3.91%	3.83%	3.79%	3.84%	3.84%	3.91%	4.06%	4.18%	4.04%
2018 1Q	3.86%	4.09%	4.13%	4.03%	4.03%	3.84%	3.91%	4.06%	4.18%
2018 2Q	4.17%	4.28%	4.27%	4.24%	4.24%	4.03%	3.84%	3.91%	4.06%
2018 3Q	4.27%	4.26%	4.32%	4.28%	4.28%	4.24%	4.03%	3.84%	3.91%
2018 4Q	4.45%	4.52%	4.37%	4.45%	4.45%	4.28%	4.24%	4.03%	3.84%
2019 1Q	4.35%	4.25%	4.16%	4.25%	4.25%	4.45%	4.28%	4.24%	4.03%
2019 2Q	4.08%	3.98%	3.82%	3.96%	3.96%	4.25%	4.45%	4.28%	4.24%

Source: Mergent Bond Record.

Appendix I

BACKGROUND AND EXPERIENCE PROFILE
DAVID C. PARCELL, MBA, CRRA
PRINCIPAL/SENIOR ECONOMIST

EDUCATION

1985	M.B.A., Virginia Commonwealth University
1970	M.A., Economics, Virginia Polytechnic Institute and State University, (Virginia Tech)
1969	B.A., Economics, Virginia Polytechnic Institute and State University, (Virginia Tech)

POSITIONS

Present	Principal, Technical Associates, Inc.
2007-2016	President, Technical Associates, Inc.
1995-2007	Executive Vice President and Senior Economist, Technical Associates, Inc.
1993-1995	Vice President and Senior Economist, C. W. Amos of Virginia
1972-1993	Vice President and Senior Economist, Technical Associates, Inc.
1969-1972	Research Economist, Technical Associates, Inc.
1968-1969	Research Associate, Department of Economics, Virginia Polytechnic Institute and State University

ACADEMIC HONORS

Omicron Delta Epsilon - Honor Society in Economics
Beta Gamma Sigma - National Scholastic Honor Society of Business Administration
Alpha Iota Delta - National Decision Sciences Honorary Society
Phi Kappa Phi - Scholastic Honor Society

PROFESSIONAL DESIGNATIONS

Certified Rate of Return Analyst - Founding Member

RELEVANT EXPERIENCE

Financial Economics -- Advised and assisted many Virginia banks and savings and loan associations on organizational and regulatory matters. Testified approximately 25 times before the Virginia State Corporation Commission and the Regional Administrator of National Banks on matters related to branching and organization for banks, savings and loan associations, and consumer finance companies. Advised financial institutions on interest rate structure and loan maturity. Testified before Virginia State Corporation Commission on maximum rates for consumer finance companies.

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Testified before several committees and subcommittees of Virginia General Assembly on numerous banking matters.

Clients have included First National Bank of Rocky Mount, Patrick Henry National Bank, Peoples Bank of Danville, Blue Ridge Bank, Bank of Essex, and Signet Bank.

Published articles in law reviews and other periodicals on structure and regulation of banking/financial services industry.

Utility Economics -- Performed numerous financial studies of regulated public utilities. Testified in over 580 cases before some fifty state and federal regulatory agencies in the United States and Canada.

Prepared numerous rate of return studies incorporating cost of equity determination based on DCF, CAPM, comparable earnings and other models. Developed procedures for identifying differential risk characteristics by nuclear construction and other factors.

Conducted studies with respect to cost of service and indexing for determining utility rates, the development of annual review procedures for regulatory control of utilities, fuel and power plant cost recovery adjustment clauses, power supply agreements among affiliates, utility franchise fees, and use of short-term debt in capital structure.

Presented expert testimony before federal regulatory agencies Federal Energy Regulatory Commission, Federal Power Commission, and National Energy Board (Canada), state regulatory agencies in Alabama, Alaska, Arizona, Arkansas, California, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Kansas, Kentucky, Maine, Maryland, Mississippi, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, North Carolina, Ohio, Oklahoma, Ontario (Canada), Pennsylvania, Rhode Island, South Carolina, Texas, Utah, Vermont, Virginia, West Virginia, Washington, Wisconsin, U.S. Virgin Islands, and Yukon Territory (Canada).

Published articles in law reviews and other periodicals on the theory and purpose of regulation and other regulatory subjects.

Clients served include state regulatory agencies in Alaska, Arizona, Arkansas, Delaware, Georgia, Mississippi, Missouri, New Hampshire, New Mexico, North Carolina, Ontario (Canada), South Carolina, U.S. Virgin Islands, Virginia and Washington; consumer advocates and attorneys general in Alabama, Alaska, Arizona, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Kansas, Kentucky, Maryland, Nevada, New Jersey, New Mexico, Ohio, Oklahoma, Pennsylvania, South Carolina, Texas, Utah, Vermont, Virginia, and West Virginia; federal agencies including Defense Communications Agency, the Department of Energy, Department of the Navy, and General Services Administration; and various organizations such as Bath Iron Works, Illinois

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Citizens' Utility Board, Illinois Governor's Office of Consumer Services, Illinois Small Business Utility Advocate, Wisconsin's Environmental Decade, Wisconsin's Citizens Utility Board, Old Dominion Electric Cooperative, and industrial customers.

Insurance Economics -- Conducted analyses of the relationship between the investment income earned by insurance companies on their portfolios and the premiums charged for insurance. Analyzed impact of diversification on financial strength of Blue Cross/Blue Shield Plans in Virginia.

Conducted studies of profitability and cost of capital for property/casualty insurance industry. Evaluated risk of and required return on surplus for various lines of insurance business.

Presented expert testimony before Virginia State Corporation Commission concerning cost of capital and expected gains from investment portfolio. Testified before insurance bureaus of Maine, Massachusetts, New Jersey, North Carolina, Rhode Island, South Carolina and Vermont concerning cost of equity for insurance companies.

Prepared cost of capital and investment income return analyses for numerous insurance companies concerning several lines of insurance business. Analyses used by Virginia Bureau of Insurance for purposes of setting rates.

Special Studies -- Conducted analyses which evaluated the financial and economic implications of legislative and administrative changes. Subject matter of analyses include returnable bottles, retail beer sales, wine sales regulations, taxi-cab taxation, and bank regulation. Testified before several Virginia General Assembly subcommittees.

Testified before Virginia ABC Commission concerning economic impact of mixed beverage license.
Clients include Virginia Beer Wholesalers, Wine Institute, Virginia Retail Merchants Association, and Virginia Taxicab Association.

Franchise, Merger & Anti-Trust Economics -- Conducted studies on competitive impact on market structures due to joint ventures, mergers, franchising and other business restructuring. Analyzed the costs and benefits to parties involved in mergers. Testified in federal courts and before banking and other regulatory bodies concerning the structure and performance of markets, as well as on the impact of restrictive practices.

Clients served include Dominion Bankshares, asphalt contractors, and law firms.

Transportation Economics -- Conducted cost of capital studies to assess profitability of oil pipelines, trucks, taxicabs and railroads. Analyses have been presented before the Federal Energy Regulatory Commission and Alaska Pipeline Commission in rate proceedings. Served as a consultant to the Rail Services Planning Office on the reorganization of rail services in the U.S.

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<u>Economic Loss Analyses</u> -- Testified in federal courts, state courts, and other adjudicative forums regarding the economic loss sustained through personal and business injury whether due to bodily harm, discrimination, non-performance, or anticompetitive practices. Testified on economic loss to a commercial bank resulting from publication of adverse information concerning solvency. Testimony has been presented on behalf of private individuals and business firms.

MEMBERSHIPS

American Economic Association
Virginia Association of Economists
Richmond Society of Financial Analysts
Financial Analysts Federation
Society of Utility and Regulatory Financial Analysts
      Board of Directors   1992-2000
      Secretary/Treasurer   1994-1998
      President   1998-2000

RESEARCH ACTIVITY

Books and Major Research Reports

"Stock Price As An Indicator of Performance," Master of Arts Thesis, Virginia Tech, 1970

"Revision of the Property and Casualty Insurance Ratemaking Process Under Prior Approval in the Commonwealth of Virginia," prepared for the Bureau of Insurance of the Virginia State Corporation Commission, with Charles Schotta and Michael J. Ileo, 1971

"An analysis of the Virginia Consumer Finance Industry to Determine the Need for Restructuring the Rate and Size Ceilings on Small Loans in Virginia and the Process by which They are Governed," prepared for the Virginia Consumer Finance Association, with Michael J. Ileo, 1973

<u>State Banks and the State Corporation Commission: A Historical Review</u>, Technical Associates, Inc., 1974

"A Study of the Implications of the Sale of Wine by the Virginia Department of Alcoholic Beverage Control", prepared for the Virginia Wine Wholesalers Association, Virginia Retail Merchants Association, Virginia Food Dealers Association, Virginia Association of Chain Drugstores, Southland Corporation, and the Wine Institute, 1983.

"Performance and Diversification of the Blue Cross/Blue Shield Plans in Virginia: An Operational Review", prepared for the Bureau of Insurance of the Virginia State Corporation Commission, with Michael J. Ileo and Alexander F. Skirpan, 1988.

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The Cost of Capital - A Practitioners' Guide, Society of Utility and Regulatory Financial Analysts, 2020 (previous editions in 1991, 1992, 1993, 1994, 1995 1994 and 2010).

Papers Presented and Articles Published

"The Differential Effect of Bank Structure on the Transmission of Open Market Operations," Western Economic Association Meeting, with Charles Schotta, 1971

"The Economic Objectives of Regulation: The Trend in Virginia," (with Michael J. Ileo), William and Mary Law Review, Vol. 14, No. 2, 1973

"Evolution of the Virginia Banking Structure, 1962-1974: The Effects of the Buck-Holland Bill", (with Michael J. Ileo), William and Mary Law Review, Vol. 16, No. 3, 1975

"Banking Structure and Statewide Branching: The Potential for Virginia", William and Mary Law Review, Vol. 18, No. 1, 1976

"Bank Expansion and Electronic Banking: Virginia Banking Structure Changes Past, Present, and Future," William and Mary Business Review," Vol. 1, No. 2, 1976

"Electronic Banking - Wave of the Future?" (with James R. Marchand), Journal of Management and Business Consulting, Vol. 1, No. 1, 1976

"The Pricing of Electricity" (with James R. Marchand), Journal of Management and Business Consulting, Vol. 1, No. 2, 1976

"The Public Interest - Bank and Savings and Loan Expansion in Virginia" (with Richard D. Rogers), University of Richmond Law Review, Vol. 11, No. 3, 1977

"When Is It In the 'Public Interest' to Authorize a New Bank?", University of Richmond Law Review, Vol. 13, No. 3, 1979

"Banking Deregulation and Its Implications on the Virginia Banking Structure," William and Mary Business Review, Vol. 5, No. 1, 1983

"The Impact of Reciprocal Interstate Banking Statutes on The Performance of Virginia Bank Stocks", with William B. Harrison, Virginia Social Science Journal, Vol. 23, 1988

"The Financial Performance of New Banks in Virginia", Virginia Social Science Journal,

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Vol. 24, 1989

"Identifying and Managing Community Bank Performance After Deregulation", with William B. Harrison, <u>Journal of Managerial Issues</u>, Vol. II, No. 2, Summer 1990

"The Flotation Cost Adjustment To Utility Cost of Common Equity - Theory, Measurement and Implementation," presented at Twenty-Fifth Financial Forum, National Society of Rate of Return Analysts, Philadelphia, Pennsylvania, April 28, 1993.

Biography of Myon Edison Bristow, <u>Dictionary of Virginia Biography</u>, Volume 2, 2001.