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Witnesses: B. Villadsen



An *EDISON INTERNATIONAL*® Company

(U 338-E)

2022 Cost of Capital

Testimony of Dr. Bente Villadsen on SCE's Return on Equity and Cost of Capital Mechanism

Before the
Public Utilities Commission of the State of California

Rosemead, California
August 23, 2021

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BEFORE THE
PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

DIRECT TESTIMONY OF DR. BENTE VILLADSEN

3 **I. INTRODUCTION AND PURPOSE**

4 **Q1. Please state your name, occupation and business address for the record.**

5 A1. My name is Bente Villadsen and I am a Principal of The Brattle Group, whose business
6 address is One Beacon Street, Suite 2600, Boston, Massachusetts, 02108.

7 **Q2. Briefly describe your present responsibilities at The Brattle Group.**

8 A2. As a Principal it is my responsibility to research and direct research into the utility
9 industry as it pertains to cost of capital and related issues. It is also my responsibility to
10 consult on utility industry issues and testify on utility industry matters. Among my other
11 duties is the supervision and training of staff and ensuring that work products are of high
12 quality and accurate.

13 **Q3. Briefly describe your educational and professional qualifications.**

14 A3. I have more than 20 years of experience working with regulated utilities on cost of capital
15 and related matters. My practice focuses on cost of capital, regulatory finance, and
16 accounting issues. I am the co-author of the text, "Risk and Return for Regulated
17 Industries"¹ and a frequent speaker on regulatory finance at conferences or webinars. I
18 have testified or filed expert reports on cost of capital in Alaska, Arizona, California,
19 Hawaii, Illinois, New Mexico, New York, Ohio, Oregon, and Washington, as well as
20 before the Bonneville Power Administration, Federal Energy Regulatory Commission,
21 the Surface Transportation Board, the Alberta Utilities Commission, and the Ontario

¹ Bente Villadsen, Michael J. Vilbert, Dan Harris, A. Lawrence Kolbe, "Risk and Return for Regulated Industries," Academic Press, 2017.

1 Energy Board. I have provided white papers on cost of capital to the Australian Energy
2 Regulator, British Columbia Utilities Commission, and the Canadian Transportation
3 Agency as well as to European and Australian regulators on cost of capital. I have
4 testified or filed testimony on regulatory accounting issues before the Federal Energy
5 Regulatory Commission (“FERC”), the Regulatory Commission of Alaska, the Michigan
6 Public Service Commission, and the Texas Public Utility Commission as well as in
7 international and U.S. arbitrations and regularly provide advice to utilities on regulatory
8 matters as well as risk management.

9 I hold a Ph.D. from Yale University and a BS/MS from University of Aarhus, Denmark.
10 Appendix A contains more information on my professional qualifications as well as a list
11 of my prior testimonies and publications.

12 **Q4. What is the purpose of your testimony in this proceeding?**

13 A4. I am sponsoring Exhibits SCE-02. Specifically, Southern California Edison Company
14 (“SCE” or the “Company”) has asked me to (1) discuss the reasons why the return on
15 common equity (“ROE”) adjustment provided for within the Cost of Capital Mechanism
16 (“CCM”) does not capture changes in the cost of equity that have occurred during the
17 COVID-19 pandemic and why it is inappropriate to use the adjustment in 2021 and (2)
18 estimate the cost of equity that the Public Utilities Commission of the State of California
19 (“Commission”) should allow SCE an opportunity to earn on the equity-financed portion
20 of its regulated utility rate base.

21 **Q5. Was this material prepared by you or under your supervision?**

22 A5. Yes. It was.

23 **Q6. Insofar as this material is factual in nature, do you believe it to be correct?**

24 A6. Yes, I do.

1 **Q7. Insofar as this material is in the nature of opinion or judgment, does it represent**
2 **your best judgment?**

3 A7. Yes, it does.

4 **II. SUMMARY OF CONCLUSIONS**

5 **Q8. What do you address in this testimony?**

6 A8. First, I address the CCM and the extraordinary circumstances that have impacted utilities
7 and SCE differently than the market in general. Second, I calculate the cost of equity
8 that SCE appropriately should be allowed an opportunity to earn.

9 **Q9. What are your key conclusions?**

10 A9. Following an analysis on market conditions during the past 16 months or so as well as an
11 implementation of standard cost of equity methods, I conclude as follows:

- 12 • Financial markets have experienced extraordinary events during the COVID-19
13 pandemic in the form of severe market volatility (including extreme stock index and
14 price movements), high market risk premia, a historically high level of federal stimulus,
15 and near-record low interest rates. These events have impacted the cost of equity for
16 all companies.
- 17 • Utilities have, unlike in past financial crises, been impacted to a larger degree than the
18 market in general. This has manifested itself in demonstratively higher systematic risk
19 for utilities than in the past, so that the cost of equity all else equal is higher.
- 20 • SCE has been impacted to a larger degree than the average electric utility in my proxy
21 group through a lower Price / Earnings ratio and a higher beta.
- 22 • As a result of the above, I find that the conditions for filing a cost of equity application
23 are met from a financial economics perspective. Specifically, the extraordinary events
24 of the past 16 months have materially impacted the cost of capital and affected not only
25 the utility industry but also SCE differently than the market.
- 26 • I determine the return on equity investors currently require using the following
27 approach: I select a proxy group of electric utilities as well as a second proxy group of
28 highly regulated natural gas and water utilities and estimate the cost of equity using the
29 Capital Asset Pricing Model, the Empirical Capital Asset Pricing Model, two versions
30 of the Discounted Cash Flow model, and two versions of the risk premium model.

- 1 • The models are estimated using SCE’s requested capital structure including 52 percent
2 equity as well as using the capital structure that incorporate SCE’s debt equivalence,
3 which results in an equity percentage of 50.56 percent. As recognized by the
4 Commission, it is important to consider debt equivalence when determining the return
5 on equity that SCE should be allowed an opportunity to earn. This results in a calculated
6 range of approximately 9.5 percent to 10.75 percent for electric utilities, prior to any
7 company- or jurisdiction-specific adjustments, as summarized in Table 1 below.²

Table 1: Summary Ranges for the Required ROE for Electric Utilities

	Low End	High End
CAPM / ECAPM	9.75%	11.75%
DCF	9.00%	10.50%
Risk Premium	9.80%	9.90%
Range	9.50%	10.75%

- 8 • Assessing SCE’s specific business risk, I find that SCE is of higher risk than the
9 average proxy company and therefore recommend it be granted an authorized ROE at
10 the upper end of the range provided above. Specifically, I find that SCE’s requested
11 authorized ROE of 10.53 percent is reasonable.
- 12 • The recommendation that SCE be allowed an ROE in the upper end of the range
13 calculated for electric utilities is based on SCE’s above average business risks
14 including: SCE’s very large balance in deferral accounts, the Company’s exposure to
15 wildfire risk, implementation risks associated with AB 1054, and SCE’s below average
16 credit metrics.

17 **Q10. How is the remainder of your testimony organized?**

18 A10. Section IV explains how the CCM works, the original rationale for the mechanism, and
19 what extraordinary circumstances have led to the CCM’s ROE adjustment being
20 inappropriate to use to determine the 2022 allowed ROE. Specifically, it explains the
21 impact of COVID-19 on the financial market, utilities, and especially Southern California
22 Edison. Section IV formally defines the cost of capital and explains the techniques for
23 estimating it in the context of utility rate regulation. Section V discusses conditions and

² Table 1 does not consider the results from the model that uses a version of the After-Tax Weighted Average method to consider capital structure differences in the CAPM / ECAPM as the Commission in the past has favored the Hamada method. Results from the ATWACC method indicate a higher upper bound for the CAPM / ECAPM.

1 trends in capital markets and their impact on the cost of capital. Section VI explains my
2 analyses and presents the results. Finally, Section VII discusses SCE’s business risk
3 characteristics,³ unique risks facing California-based electric utilities, and other
4 company-specific circumstances relevant to my recommended ROE range. Finally,
5 Section VIII provide my conclusions including the recommended range for the
6 authorized ROE and the reasons for the recommendation.

7 **III. THE COST OF CAPITAL MECHANISM**

8 **A. BACKGROUND**

9 **Q11. Please explain the Cost of Capital Mechanism and the Commission’s criteria for**
10 **when the utilities may file a cost of capital application.**

11 A11. The Commission in 2008 adopted the Cost of Capital Mechanism (“CCM”) to adjust the
12 allowed cost of equity up or down if the yield on Moody’s Baa (for BBB rated utilities)
13 utility bonds increase or decrease by more than 100 basis points. The allowed ROE is
14 changed by 50 percent of the increase or decrease.⁴

15 The 2008 CCM decision noted the relationship between utility bond rates and the cost of
16 equity and also observed that authorized ROEs historically have been updated only by a
17 fraction of the change in forecasted interest rates.⁵ In establishing the CCM, the
18 Commission recognized the relationship between the cost of equity and the cost of debt
19 in a typical economic environment.

20 Importantly, the Commission also acknowledged there are circumstances when the CCM
21 may fail to capture the required ROE, so that the ROE adjustment is not appropriate.
22 Specifically, the Commission stated:

³ The business risk of a stock refers to the risk shareholders would bear if the company has no debt. Such risks are idiosyncratic to SCE. The testimony also touches upon asymmetric risk, which are risks that impose a downside risk but no corresponding upside risk.

⁴ Public Utilities Commission of California, Decision Establishing a Multi-Year Cost of Capital Mechanism for the Major Energy Utilities, Decision 08-05-035, May 29, 2008 (“CCM Decision”), Section 5.6.

⁵ CCM Decision, p. 14.

1 *While streamlining the cost of capital process, the utilities have a right to*
2 *file a cost of capital application outside of the CCM process upon an*
3 *extraordinary or catastrophic event that materially impacts their respective*
4 *cost of capital and/or capital structure and affects them differently than the*
5 *overall financial markets.⁶*

6 Thus, if extraordinary circumstances arise so that (i) the cost of capital is materially
7 affected and (ii) the effect differs from that of the overall market, a cost of capital
8 determination through a full application as provided for in the CCM. is warranted. The
9 remainder of this section addresses the effects identified in (i) and (ii) above.

10 The Commission in December 2019 allowed SCE an opportunity to earn 10.30 percent
11 return on equity and also continued the previously authorized cost of capital mechanism
12 through the 2020 test year cycle.⁷ If the CCM ROE adjustment was to apply, then, if the
13 12-month average of the Moody's Baa utility bond yield as of the end of September has
14 changed by more than 100 basis points, the allowed ROE is adjusted up or down by half
15 of the change in the utility bond yield.

16 **B. CIRCUMSTANCES THAT HAVE MATERIALLY AFFECTED THE COST OF CAPITAL**

17 **Q12. Have there been extraordinary events since SCE's cost of capital was last**
18 **determined in 2019?**

19 A12. Yes. Since March of 2020 capital markets experienced unprecedented levels of
20 uncertainty due to the impacts of the COVID-19 pandemic on the global economy.
21 Following the formal pandemic declaration by the World Health Organization in March
22 2020, governments around the world sought to limit the health and economic impacts
23 from the outbreak. States, including California,⁸ issued stay-at-home orders and major
24 portions of the U.S. economy shut down. This also led to a significant rise in

⁶ CCM Decision, p. 16.

⁷ Public Utilities Commission of California, Decision 19-12-056, December 19, 2019, Section 5.5 and Section 7, pp. 40, 44-45.

⁸ Executive Department, State of California, Executive Order N-33-20, March 19, 2020, <https://www.gov.ca.gov/wp-content/uploads/2020/03/3.19.20-attested-EO-N-33-20-COVID-19-HEALTH-ORDER.pdf>.

1 unemployment with over 76 million people filing initial unemployment claims since
2 March 21, 2020.⁹

3 To mitigate the economic impact, the U.S. Federal Reserve cut its policy rate to a target
4 range of zero to 0.25 percent and announced “unlimited” quantitative easing and
5 emergency liquidity programs.¹⁰ The U.S. also passed the \$2.1 trillion CARES Act,
6 which provided direct aid to people and businesses and which also bolstered
7 unemployment benefits. Despite these efforts, the U.S. economy contracted substantially
8 and in February 2020 the U.S. entered a recession.¹¹ In the 1st and 2nd Quarter of 2020,
9 real GDP decreased by an annualized rate of 5.0 percent and 31.4 percent, respectively.¹²
10 The recession was officially over by April 2020 – making it the shortest recession in
11 history.¹³

12 In the second half of 2020, economic conditions began to improve as the economy began
13 to reopen, although many businesses operated at reduced capacity to comply with social
14 distancing guidelines. By the 3rd and 4th Quarter, real GDP increased by an annualized
15 rate of 33.4 percent and 4.3 percent, respectively.¹⁴ Despite this rebound in the 3rd and

⁹ U.S. Department of Labor, Unemployment Insurance Weekly Claims Data, accessed April 1, 2021, <https://oui.doleta.gov/unemploy/claims.asp>.

¹⁰ U.S. Federal Reserve, “Federal Reserve Announces Extensive New Measures to Support the Economy,” Press Release, March 23, 2020.

¹¹ National Bureau of Economic Research, “Determination of the February 2020 Peak in US Economic Activity,” June 8, 2020, accessed September 21, 2020, <https://www.nber.org/cycles/june2020.html>.

¹² Bureau of Economic Analysis, “Gross Domestic Product, (Third Estimate); Corporate Profits, (Revised), and GDP by Industry, Second Quarter 2020”, U.S. Department of Commerce, September 30, 2020. Accessed April 13, 2020, <https://www.bea.gov/news/2020/gross-domestic-product-third-estimate-corporate-profits-revised-and-gdp-industry-annual>.

¹³ National Bureau of Economic Research, “Determination of the February 2020 Peak in US Economic Activity,” June 8, 2020, accessed September 21, 2020, <https://www.nber.org/cycles/june2020.html>.

¹⁴ Bureau of Economic Analysis, “Gross Domestic Product, (Third Estimate), GDP by Industry, and Corporate Profits, Fourth Quarter and Year End”, U.S. Department of Commerce, March 25, 2021. Accessed April 1, 2021, <https://www.bea.gov/news/2021/gross-domestic-product-third-estimate-gdp-industry-and-corporate-profits-4th-quarter-and>.

1 4th Quarters, real annual GDP for 2020 declined by 3.5 percent.¹⁵ The Federal Reserve
2 has remained cautious about the pace and extent of the ongoing recovery. In the April
3 2021 Federal Open Market Committee (“FOMC”) Press Conference, Federal Reserve
4 Chair Powell noted that economic indicators have improved recently but reiterated that
5 “economic recovery remains uneven and far from complete.”¹⁶ In the July 2021 meeting
6 of the FOCM, the FOCM concluded¹⁷

7 *The sectors most adversely affected by the pandemic have shown*
8 *improvement but have not fully recovered. Inflation has risen, largely*
9 *reflecting transitory factors.*

10 **And**

11 *The path of the economy continues to depend on the course of the virus.*

12 Mr. Powell’s April speech noted that the Federal Reserve has continued to keep interest
13 rates near zero (0 to 0.25 percent) and that it would maintain its sizable asset purchases,¹⁸
14 adding that these market support measures are necessary to ensure that the monetary
15 policy continues to deliver “powerful support to the economy until the recovery is
16 complete.”¹⁹ Projections from the FOMC continue to indicate that policy rates will
17 remain at current levels through at least 2023.²⁰ These policy rates will likely continue
18 to exert downward pressure on interest rates over the near to medium term.

19 From a fiscal policy perspective, since January 2021, several government assistance
20 programs were passed to stimulate the U.S. economy. In early March, the Government

¹⁵ *Ibid.*

¹⁶ Board of Governors of the Federal Reserve System, “Transcript of Chair Powell’s Press Conference,” April 28, 2021, <https://www.federalreserve.gov/mediacenter/files/FOMCpresconf20210428.pdf>.

¹⁷ Federal Reserve Press Release, July 28, 2021.

¹⁸ *Ibid.* The July 2021 meeting of the FOCM maintained this target. Source: Federal Reserve Press Release, July 28, 2021.

¹⁹ *Ibid.*

²⁰ U.S. Federal Reserve, “March 17, 2021: FOMC Projections materials, accessible version,” March 17, 2021, <https://www.federalreserve.gov/monetarypolicy/fomcprojtabl20210317.htm>. See also, Federal Reserve Press Release, July 28, 2021.

1 passed a \$1.9 trillion American Rescue Plan, which provided direct economic impact
2 payments and extended unemployment benefits.²¹ More recently, the U.S. Senate passed
3 a \$1.2 trillion infrastructure bill, which intends to provide funds for infrastructure
4 (including energy) and other items.²² Other programs, such as the Paycheck Protection
5 Program, continued to disburse aid to businesses. This infusion of cash into the economy
6 has created concerns about inflation, albeit the Federal Reserve expects the inflation to
7 be transitory.²³ Nevertheless, the Consumer Price Index, a common measure of inflation,
8 increased by 5.4 percent from June 2020 to June 2021, which is the largest 12-month
9 increase since September 2008.²⁴ Similarly, preliminary data shows the consumer price
10 index increased 5.4 percent over the last 12 months when July is included.²⁵ These
11 figures have caused Larry Summers²⁶ to warn that “inflation is here” and that a soft
12 landing of the inflation is unprecedented.²⁷ At the same time, the Federal Reserve Board
13 in its July meeting stated that “the Committee will aim to achieve inflation moderately
14 above 2 percent for some time so that inflation averages 2 percent over time ...”²⁸ Thus,

²¹ Alan Fram, “Congress Oks \$1.9T virus relief bill in win for Biden, Dems,” *Associated Press*, March 11, 2021, accessed May 24, 2021, <https://apnews.com/article/joe-biden-bills-legislation-coronavirus-pandemic-7eb383e58c8fcf50f6f586b6d5cfc523>.

²² See, for example, [Massive Bipartisan Infrastructure Bill Includes Billions in Funding and Process Improvements for Energy and Infrastructure | Publications | Kirkland & Ellis LLP](#)

²³ Federal Reserve Press Release, July 28, 2021.

²⁴ U.S. Bureau of Labor Statistics, “TED: The Economics Daily,” July 15, 2021. “Consumer Price Index up 4.2% from April 2020 to April 2021,” May 19, 2021, accessed May 24, 2021, <https://www.bls.gov/opub/ted/2021/consumer-price-index-up-4-2-percent-from-april-2020-to-april-2021.htm>.

²⁵ U.S. Bureau of Labor Statistics, “Economic Press Release: Consumer Price Index Summary,” August 11, 2021.

²⁶ Larry Summers is an economist and a former Secretary of the Treasury (Clinton), Chair of the National Economic Counsel (Obama), Chief Economist at the World Bank, and President of Harvard.

²⁷ [Former Treasury Secretary On Consumer Prices, Inflation, U.S. Role In Global Pandemic Efforts | Here & Now \(wbur.org\)](#), <https://www.wbur.org/hereandnow/2021/08/11/larry-summers-inflation-prices>.

²⁸ Federal Reserve Press Release, July 28, 2021. [Federal Reserve Board - Minutes of the Federal Open Market Committee, July 27-28, 2021](#)

1 there is some disagreement as to the magnitude and persistence of the price increases
2 currently experienced.

3 However, rising inflation has introduced new uncertainties to the financial markets and
4 points to an increase in the return required by investors to hold risky assets. With the
5 risk of inflation increasing, there is an increased risk that the authorized as well as any
6 currently calculated ROE will be downward biased over the upcoming period.

7 Finally, although substantial progress has been made on distributing the COVID-19
8 vaccine, the length and extent of the economic impacts from the COVID-19 pandemic
9 are unknown and the impacts are expected to persist for some time even as expanded
10 vaccination reduces the risk of spread of COVID-19 and social distancing measures in
11 the US are reduced. In addition, substantial risk remains due to the emergence of the so-
12 called Delta variant. As the Federal Reserve pointed out, “[t]he path of the economy
13 continues to depend on the course of the virus.”²⁹

14 **Q13. Is there quantitative evidence that the prevailing interest rate, which has declined**
15 **since the last rate proceeding, is driven by the Federal Reserve Bank’s monetary**
16 **policy?**

17 A13. Yes. First, the Federal Reserve’s monetary policy action reduced the federal funds target
18 rate for inter-bank overnight lending to near-zero percent specifically to support the
19 economy as the pandemic took hold. In addition, the Federal Reserve’s Quantitative
20 Easing (“QE”), which is a type of unconventional monetary policy tool that involves the
21 Federal Reserve’s purchases of long-term Treasuries and other long-term bonds,
22 provided additional necessary monetary policy support. Several scholarly articles show
23 that QE significantly reduced interest rates below what would have prevailed absent
24 QE.³⁰ By using a robust methodology termed “event study,” these studies measure the

²⁹ *Ibid.*

³⁰ See the following research papers:

1 financial market impact of an unexpected event compared to a baseline, and in this case
2 calculate the impact of the Fed’s QE announcements on financial markets, and bond
3 yields in particular. Studies show that QE has been a potent unconventional monetary
4 policy tool in lowering all nominal interest rates³¹ including interest rates on Treasuries,
5 agencies, corporate bonds, and Mortgage Backed Securities (“MBSs”), but with
6 magnitudes that differed across bond types, across maturities.³² During the COVID-19
7 pandemic, research shows that the first QE announcements on March 15, 2020 and March
8 23, 2020 had a -21 bps and -16 bps statistically significant one-day impact on the US 10-
9 year Treasury yield on the subsequent trading day, compared to a baseline where no QE
10 policy was implemented.³³ Similar effects have been observed for the QEs enacted after
11 the 2008 financial crisis, *e.g.*, -36 bps after the Federal Reserve’s QE1 announcement on
12 11/25/2008, and -14 and -16 bps after the QE2 announcements on 08/10/2010 and
13 09/21/2010.³⁴ This monetary policy has persisted into 2021, where as recently as in the

Krishnamurthy and Vissing-Jorgensen (2011). “The Effects of Quantitative Easing on Interest Rates: Channels and Implications for Policy” <https://www.brookings.edu/bpea-articles/the-effects-of-quantitative-easing-on-interest-rates-channels-and-implications-for-policy/> (“Krishnamurthy & Vissing-Jorgensen (2011)”).

Gagnon, Raskin, Remache, and Sack (2011). “Large-Scale Asset Purchases by the Federal Reserve: Did They Work?” https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr441.pdf (“Cagnon et al. (2011)”).

Rebucci, Hartley, and Jimenez (2021). “An Event Study of COVID-19 Central Bank Quantitative Easing in Advanced and Emerging Economies”. https://www.nber.org/system/files/working_papers/w27339/w27339.pdf (“Rebucci et al. (2021)”).

Sever, Goel, Drakopoulos, and Papageorgiou (2020) “Effects of Emerging Market Asset Purchase Program Announcements on Financial Markets During the COVID-19 Pandemic”. <https://www.imf.org/en/Publications/WP/Issues/2020/12/18/Effects-of-Emerging-Market-Asset-Purchase-Program-Announcements-on-Financial-Markets-During-49967> (Sever et al. (2020)”).

Haddad, Moreira, and Muir (2021). “When Selling Becomes Viral: Disruptions in Debt Markets in the COVID-19 Crisis and the Fed’s Response”. <https://academic.oup.com/rfs/advance-article/doi/10.1093/rfs/hhaa145/6123759> (“Haddad et al. (2021)”).

³¹ See Cagnon et al. (2011).

³² See Krishnamurthy & Vissing-Jorgensen (2011).

³³ See Rebucci et al. (2021).

³⁴ See Krishnamurthy & Vissing-Jorgensen (2011).

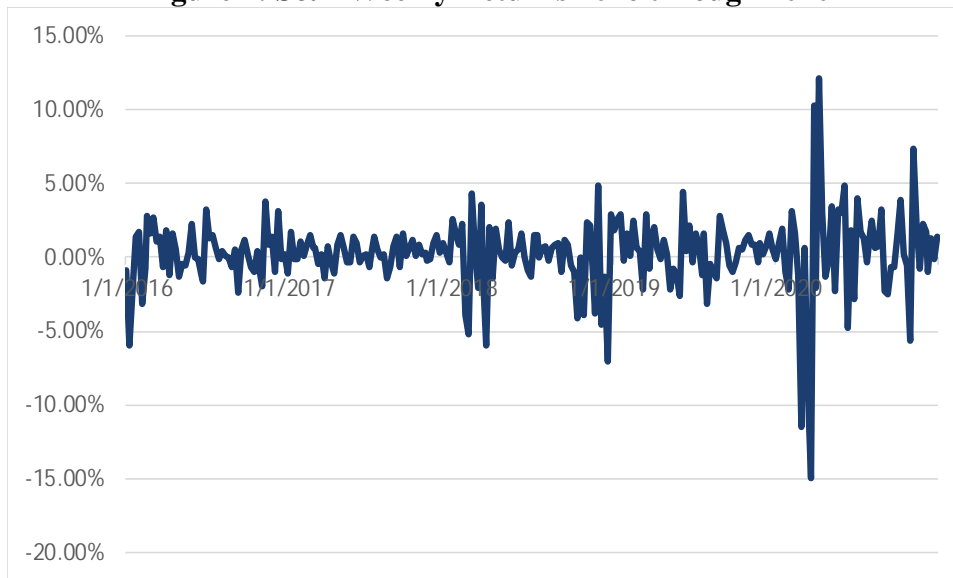
1 July 2021 meeting of the Federal Reserve Board of Governors, the Federal Reserve
2 confirmed that it would continue to increase its holding of treasury securities and
3 mortgage-backed securities.³⁵ It is clear that absent intervention by the Federal Reserve
4 Bank, prevailing interest rates would not be as low. Further, absent these monetary
5 policy actions, it is unlikely that the interest rates would have declined enough to meet
6 the 100 basis points trigger for the CCM ROE adjustment.

7 **Q14. Have the extraordinary events from March 2020 to today impacted the cost of**
8 **capital?**

9 A14. Yes. As Figure 1 below shows, stock market returns were much more volatile in 2020
10 than during any other recent year. The standard deviation of the S&P 500 during 2020
11 was about 4.75 percent for an annualized volatility of about 31 percent, while the same
12 measure was only about 12 percent during the 2016-2019 period. The long-term average
13 is approximately 20 percent per year.

³⁵ Federal Reserve, Press Release, July 28, 2021. [Federal Reserve Board - Minutes of the Federal Open Market Committee, July 27-28, 2021](#)

Figure 1: S&P Weekly Returns 2016 through 2020



1 At the same time, both the historical and the forward-looking measure of the market risk
2 premium –the return over and above the risk-free rate investors require to hold equities
3 instead of government bonds – has increased.
4 Specifically, at the time of the last cost of capital proceeding, the historical Market Risk
5 Premium (“MRP”) as calculated by Duff & Phelps was 7.07 percent;³⁶ today, Duff &
6 Phelps calculates the historical MRP at 7.25 percent.³⁷ At the time of the last cost of
7 capital proceeding, Bloomberg estimated the forward-looking MRP at 7.7 percent.³⁸ As
8 of the end of May, 2021, Bloomberg has estimated the forward-looking MRP at 8.5
9 percent.³⁹ This increase in the systematic risk (beta) has a non-trivial impact on the cost
10 of equity investors expect. Of particular interest is the dramatic increase in early 2020
11 shown in Figure 2 below.

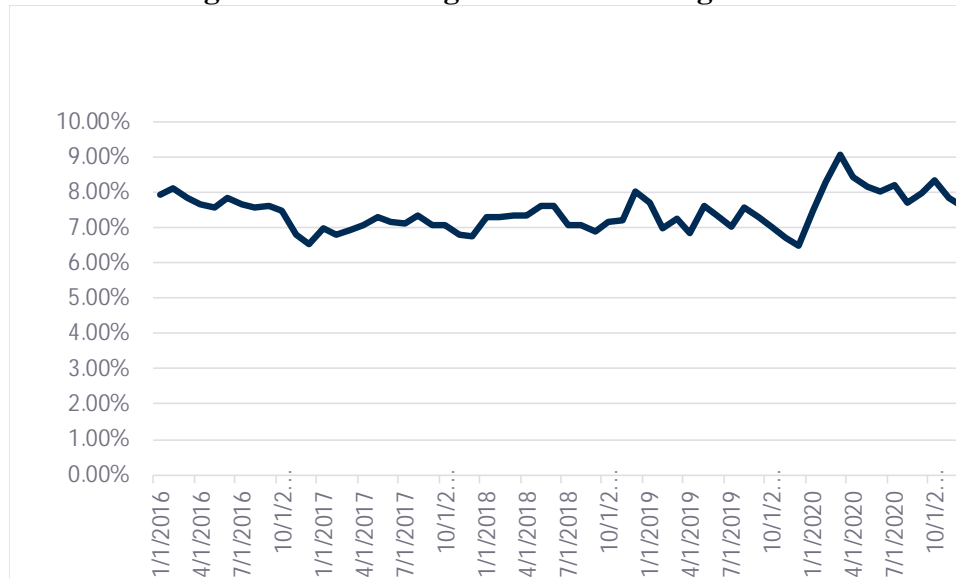
³⁶ Villadsen Direct Testimony in Application A.19-04-014 pp. 20-21 or Duff & Phelps, *Ibbotson SBBi 2018 Valuation Yearbook* 10-21.

³⁷ Duff & Phelps, *Ibbotson SBBi 2021 Valuation Yearbook* 10-21.

³⁸ Villadsen Direct in Application A.19-04-014, p. 23 or Average of Bloomberg forecasted MRP (relative to 20-year Treasury Bonds) for the U.S. from January 2009 - November 2018. Bloomberg as of 11/30/2018.

³⁹ Bloomberg as of May 28, 2021 (the last trading day of the month).

Figure 2: Bloomberg MRP 2015 through 2020



1 Figure 2 shows that the premium investors required to invest in equity instead of risk-
2 free government bonds (e.g., the 10-year Treasury bond) increased substantially in early
3 2020. Although the Bloomberg MRP has since levelled off, it remains high compared to
4 earlier periods (including the time of SCE’s last ROE determination).

5 The results in Figure 1 and Figure 2 are confirmed by equity analysts, who have reported
6 signs of investor caution. For example, at the end of 2020, Morgan Stanley stated:

7 *Twenty-Twenty has been extraordinary for a lot of reasons. The global*
8 *pandemic created a major health challenge and an unprecedented economic*
9 *shock, there was plenty of political uncertainty, and the stock market’s*
10 *results were surprising to many.*⁴⁰

11 **Q15. What conclusions do you draw from the discussion above?**

12 A15. The COVID-19 pandemic clearly was an extraordinary event that had a profound impact
13 on U.S. capital markets as well as the cost of capital. In the next section, I address the
14 impact on the utility industry and SCE.

⁴⁰ Morgan Stanley, “WACC and Vol: Valuation for Companies with Real Options,” December 21, 2020.

1 **C. UTILITY AND SCE-SPECIFIC IMPACTS**

2 **Q16. Has the COVID-19 pandemic had a specific impact on utilities?**

3 A16. Yes. Unlike in prior financial distress periods, in March 2020, utility stocks fell almost
4 as much as the market in general. In addition, the S&P Utility Index did not recover as
5 quickly or fully as did the S&P 500. Figure 3 below, which shows the development in
6 the stock price of the S&P 500, S&P's Utility Index, and Edison International ("EIX")
7 stock price, illustrates this impact. The chart indexes all stock prices to 100 as of March
8 2, 2020 — right before the COVID-19 pandemic. Somewhat unexpectedly, the volatility
9 of the S&P Utility Index exceeded that of the S&P 500 during the early days of the
10 COVID-19 pandemic. For example, from January 2020 through May 2020, the volatility
11 of the utility index was 56.0 percent; in contrast, the volatility of the S&P 500 was lower
12 at 48.9 percent over the same period.⁴¹

⁴¹ Bente Villadsen et al., "Global Impacts and Implications of COVID-19 on Utility Finance," Brattle Group, June 2020, p. 22.

Figure 3: S&P 500 Index, Utility Index and EIX Stock Performance



1 Q17. How has Edison International’s stock performed in comparison to the utility
2 industry?

3 A17. Figure 3 above shows that Edison International saw approximately the same decline in
4 its stock price as did the market in general and other utilities in early 2020. However,
5 unlike the S&P 500, which has since increased substantially, and the Utility Index, which
6 is close to its pre-COVID-19 level, Edison International’s stock price remains down in a
7 non-trivial amount. Similarly, other indicators, as discussed below, show a larger impact
8 on Edison International than on the Utility Index or electric utilities more broadly. This
9 notion is confirmed by equity analysts, who value EIX at a discount relative to peers in
10 the industry.⁴²

⁴² See, for example, Evercore ISI, “Edison International,” April 27, 2021. For additional details, see Figure IV-3 in the Company’s Testimony.

1 **Q18. Are there other changes in the electric utility industry that have had a direct impact**
2 **on the cost of equity?**

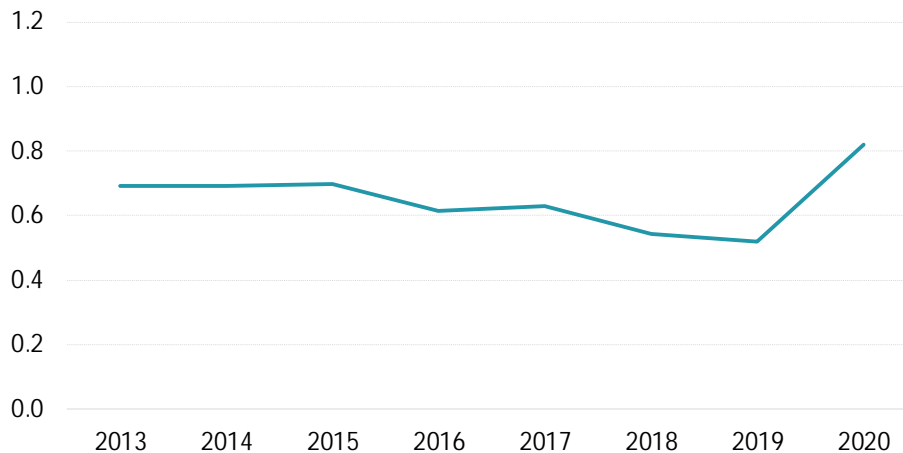
3 A18. Yes. The relative risk of electric utilities such as SCE (or its parent EIX)⁴³ has increased
4 as demonstrated by the substantial increase in the systematic risk (measured by beta) with
5 electric utilities moving closer to exhibiting risks similar to the market in general as
6 shown in Figure 4 and Figure 5 below. Consequently, the traditional relationship
7 between government bond rates and equity return has changed, and, as a result, the CCM
8 ROE adjustment may not adequately measure changes in investors' required return on
9 equity. Figure 4 shows the traditional measure of systematic risk in the form of the
10 average Value Line beta for electric utilities from 2013 to today. Today's beta of
11 approximately 0.89 is higher than in the past.⁴⁴ At the time of the last cost of capital
12 proceeding for California's electric utilities, in which the CCM was continued, the
13 average electric beta was well below current levels at approximately 0.57.⁴⁵ This
14 difference is material because a higher beta, all else equal, will lead to a higher cost of
15 equity regardless of the yield on Baa or government bonds. Specifically, at a market risk
16 premium of 7.25 percent, the risk premium investors require to hold electric utility stock
17 today is 2.32 percent higher than at the time of the last cost of capital proceeding. Put
18 differently, the risk premium over and above the yield on risk-free bonds has increased.
19 The change in the risk-free rate therefore cannot necessarily be used to justify a change
20 in the cost of equity because the other factors that influence the cost of equity (*e.g.*, beta
21 and market risk premia) have moved in a direction that increases the cost of equity. This
22 change has occurred since the last cost of capital proceeding and since the CCM was last
23 continued.

⁴³ SCE is the vast majority of EIX's activities. Per EIX's 2020 10-K SCE contributes more than 90 percent of EIX income and assets.

⁴⁴ Value Line as of May 31, 2021.

⁴⁵ Value Line as of December 31, 2018, as reported in Application 19-01-014, Exhibit SCE-02 (Villadsen Direct), Figure 11, p. 35.

Figure 4
Average Value Line Beta for the Electric Utility Proxy Group over Time



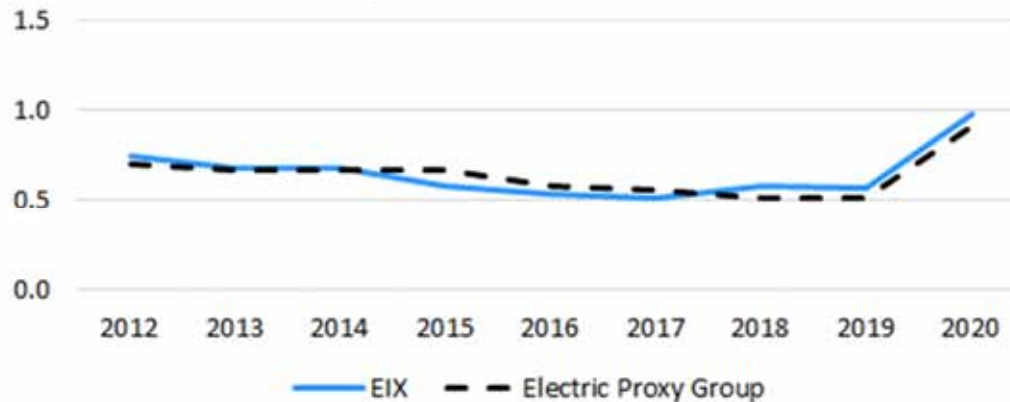
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Looking to a more recent measure of systematic risk, Figure 5 shows rolling two-year average betas for the sample of proxy group of electric utilities used to estimate the cost of equity (shown in Figure 15).⁴⁶ The most recent measure is 0.91. Importantly, the rolling *two-year* beta for EIX is slightly higher than the sample average, all else equal, indicating non-diversifiable risk drivers have contributed to an increased systematic risk for the Company.⁴⁷ Figure 4 and Figure 5 are clear indications that the systematic risk of the industry has increased.

⁴⁶ Each beta in Figure 5 is calculated as the using weekly data from the prior 104 weeks. The estimate as of year-end 2020 thus uses data for 2019 and 2020 to calculate the beta estimate.

⁴⁷ EIX's Value Line beta was 0.95 as of April 23, 2021 (the most recent available as of May 31, 2021), while the sample average was 0.90 (see Figure 15).

Figure 5
Rolling Two Year Betas⁴⁸ over Time



1 **Q19. What conclusions do you draw from the discussion above regarding beta?**

2 A19. Because the utility-specific risk premium is the multiple of the market risk premium and
3 the utility beta, the dramatic increase in beta combined with an increase in the market
4 risk premium has resulted in a substantially higher utility-specific risk premium. Put
5 simply, the return over and above the risk-free rate that utility investors require has
6 increased and it has increased by more than the risk-free rate has declined since the last
7 cost of capital proceeding for California's electric utilities.

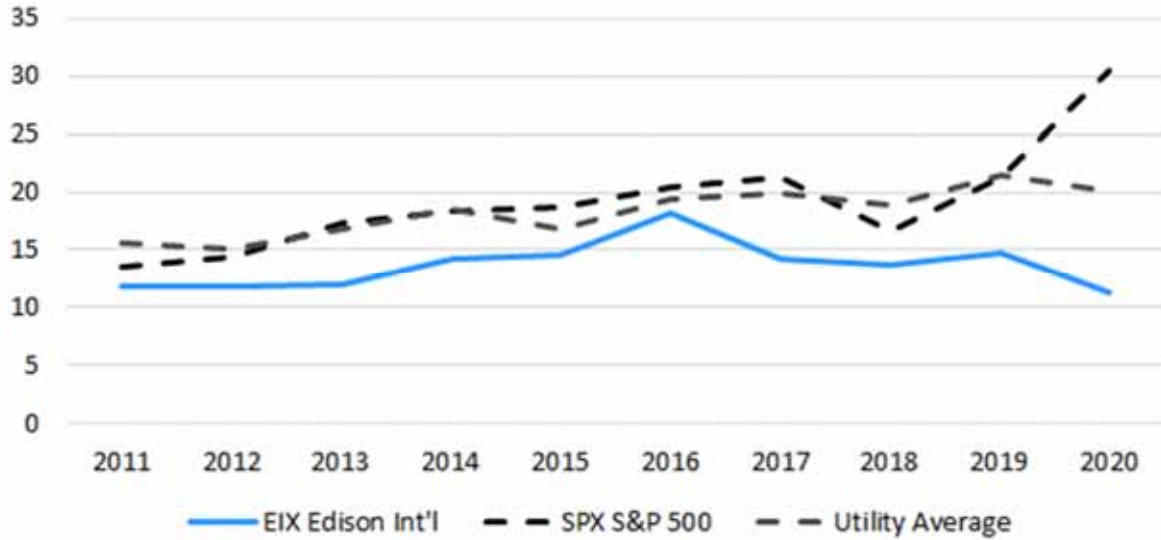
8 **Q20. Are there other measures that indicate that the utility industry or SCE has been**
9 **affected differently than the broader market?**

10 A20. Yes. Looking at key valuation metrics, I note that that the Price-to-Earnings ("P/E")
11 Ratio for the Electric Proxy Group which is currently at 20x earnings, has diverged
12 significantly from the broader market (proxied by S&P 500 Index) —trending lower
13 since the pandemic. Notably, EIX's P/E Ratio has deviated much more starkly from the
14 market than the proxy group of electric utilities and is trading at just over 12x earnings,
15 as shown below in Figure 6. In contrast, the proxy group of electric utilities is trading
16 on average around 20x earnings. The company continues to have significant cost-

⁴⁸ Rolling 2-year weekly betas calculated per the Value Line method.

1 recovery uncertainty for wildfire related damages, potentially driving lower P/E
2 multiples compared to other companies in the electric utility sector.⁴⁹

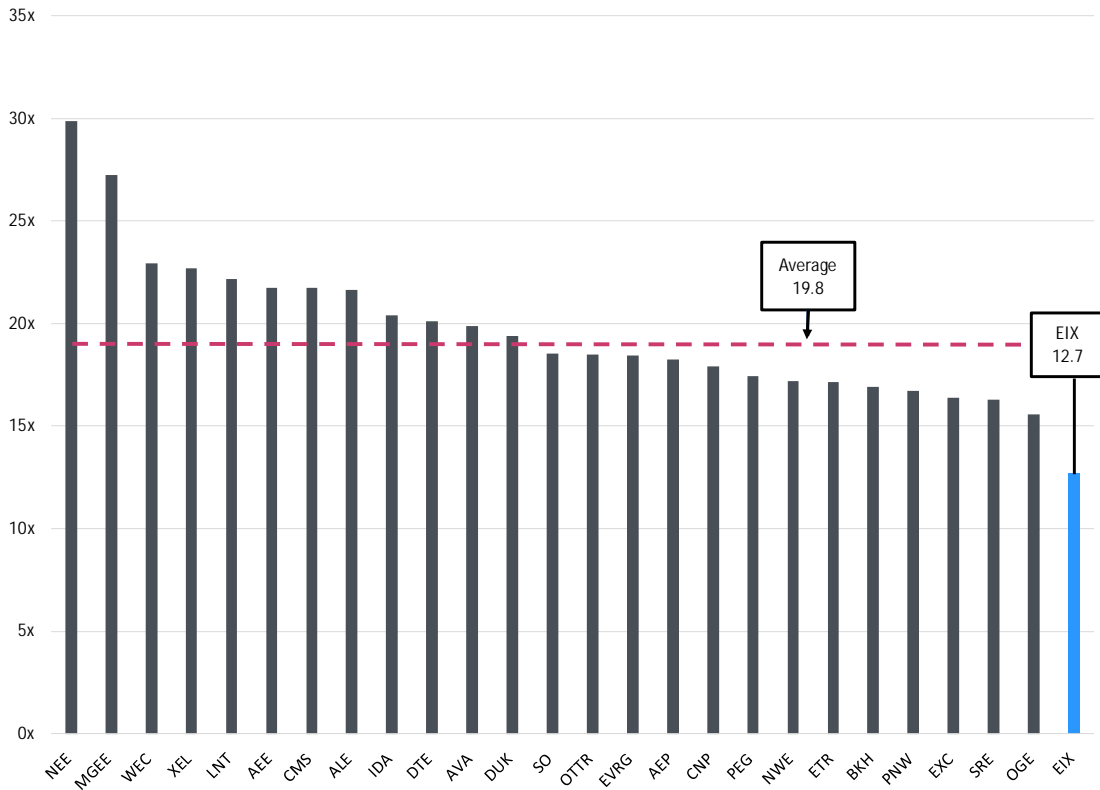
Figure 6
P/E Ratio over Time



3 The lower P/E Ratio for EIX relative to the proxy group is not driven by a few companies
4 as shown in Figure 7 below. EIX has recently experienced the lowest P/E ratio within
5 the Electric Proxy Group, with the most recent observation being well below the proxy
6 group average.
7

⁴⁹ A detailed discussion is found in the Company's Testimony, Section IV.C.

Figure 7: P/E Ratios for SCE and Proxy Electric Utilities as of June 30, 2021



Source: Bloomberg BEST estimates

1 Q21. Why does the lower P/E ratio matter in this proceeding?

2 A21. For two reasons. First, the fact that EIX has been impacted more and differently from
 3 both the broader market and the proxy group indicates that SCE has been affected
 4 “differently than the overall market.” Second, SCE is financing both its operations and
 5 its wildfire liabilities with debt and equity capital.”⁵⁰ Consequently, EIX’s earnings are
 6 undervalued relative to the industry and the lower P/E ratio all else equal means that (i)
 7 the Company needs to issue more shares than the average electric utility to attract a
 8 specific amount of capital and (ii) investors require a higher cost of equity to invest in

⁵⁰ *Value Line Investment Survey*, Edison International, April 23, 2021 reports that additional shares are expected to be issued in 2021.

1 EIX.⁵¹ Thus, the P/E ratio indicates that the cost of equity for EIX (and SCE, which is
2 the dominant part of EIX) is higher than that for the industry.

3 From a customer perspective, it is important that SCE continually has access to capital at
4 reasonable rates because the Company needs to fund replacement and new investments
5 that serve customers. Importantly, SCE competes with other utilities (and industries) for
6 investments and, should market liquidity become a concern, it is imperative that SCE still
7 has market access.

8 **Q22. Are there other factors that indicate the change in the risk-free rate and the CCM**
9 **adjustment mechanism may not capture the change in the required ROE for SCE?**

10 A22. Yes, the relationship between the yield on utility bonds and the forecasted MRP has
11 changed. For example, the spread between Bloomberg's forecasted MRP and the yield
12 on 10-year BBB rated utility bonds averaged 3.9 percent for the period January 1, 2019
13 through February 2020. For the period March 2020 through May 2021, the spread
14 averaged 5.8 percent for an increase of about 190 basis points. This indicates that the
15 relationship between the utility bond yield and the MRP changed during the COVID-19
16 pandemic. Specifically, the cost of equity increased relative to the cost of BBB rated
17 debt.

18 **D. IMPORTANCE OF SCE EQUITY**

19 **Q23. Why is the discussion above relevant to SCE, its investors and its customers?**

20 A23. SCE and its parent need to raise capital, including equity capital, and need to be able to
21 do so on reasonable terms. Not only is that a key tenet of the Supreme Court's *Hope* and
22 *Bluefield* decisions, it is also important to ensure SCE can continue to fund its operations,
23 including contributions to the California Wildfire Fund.⁵²

⁵¹ Recall that the stock price is the discounted sum of cash flows that accrue to investors, so all else equal a lower stock price leads to a higher discount rate (cost of capital).

⁵² www.cawildfirefunc.com.

1 The *Hope* and *Bluefield* decisions make clear that the return to the equity owner should
2 *be commensurate with returns on investments in other enterprises having corresponding*
3 *risks.* As investors compare investments across jurisdictions, companies, and industries,
4 it is necessary that SCE has an opportunity to earn a return that is comparable to that of
5 “similar risk” entities. The fact that SCE’s parent’s valuation has disconnected from
6 other electric utilities’ valuation is cause for concern. This is especially true as SCE’s
7 parent intends to continue to issue equity.⁵³ As long as the stock trades at a discount, the
8 Company receives less cash for each share its sells and therefore has to sell more shares
9 than it otherwise would have had to do. This dilutes the value of each share and hence
10 the equity that the Company has in its capital structure. One consequence of the dilution
11 of the equity is that the Company becomes more leveraged, which causes the cost of
12 equity to increase as discussed in Section IV below.

13 From a customer (and other stakeholder) perspective, it is vital that the Company can
14 continue to attract both debt and equity capital. A balanced capital structure (along with
15 solid credit metrics) means that the Company can maintain a solid credit rating, which
16 all else equal has two effects: (i) the cost of raising debt is lower and (ii) the access to
17 debt market is enhanced and especially so during times of financial downturns, market
18 illiquidity, or other capital market events. The access to debt markets at all times is vital
19 as the Company’s needs to invest in infrastructure to meet customer demands and state
20 mandates along with any wildfire obligations, which are large relative to the Company’s
21 cash balance.⁵⁴

22 **Q24. What are SCE’s requirements regarding capital?**

23 A24. According to Edison International’s February 2021 investor presentation, SCE expects
24 to invest approximately \$15-16 billion in distribution, transmission, generation, and

⁵³ Value Line, Edison International, April 23, 2021.

⁵⁴ According to Edison International’s 2020 Annual Report p. 19, SCE’s cash balance was \$55 million as of December 31, 2020.

1 wildfire mitigation during the 2021-2023 period.⁵⁵ Such investments are intended to
2 maintain and improve distribution, transmission and generation assets as well as to
3 mitigate wildfire risks. Such initiatives clearly benefit customers (assuming prudence).

4 Based on the large capital needs, SCE needs both debt and equity capital to fund capital
5 spending needs and at the same time ensure a solid credit rating and access to capital
6 markets. SCE's current credit rating of BBB from S&P, Baa from Moody's, and BBB-
7 from Fitch are only one to two notches into the range of investment grades. In contrast,
8 the average credit rating for the comparable sample is BBB+.

9 Importantly, during the financial crisis of 2008-09, the spread between BBB rated and A
10 rated utility bond yields grew dramatically. For example, during the first 7 months of
11 2009, the spread between BBB and A rated utility bonds averaged 118 basis points as
12 compared to 34 bps for the 2003-2007 and 42 bps for the last five years (July 2016 to
13 June 2021).⁵⁶ Thus, during times of financial distress, it becomes expensive for utilities
14 with a non-A rating to obtain long-term debt.

15 **Q25. What conclusions do you draw from the discussion above?**

16 A25. As discussed in Section B above, the COVID-19 pandemic was an extraordinary event
17 that substantially impacted financial markets. Section C shows that, as measured by
18 stock price reactions, stock price volatility, and change in systematic risk, the impact was
19 larger for utilities than the stock market in general. Section C also demonstrates that SCE
20 has experienced a larger increase in systematic risk than comparable companies, and its
21 P/E ratio was adversely affected even more dramatically. These factors demonstrate that
22 the extraordinary event of the COVID-19 pandemic materially impacted utilities **and**
23 SCE. Consequently, the circumstances are such that the CCM adjustment is

⁵⁵ Edison International, "Fourth Quarter and Full-Year 2020 Financial Results," February 2021.
[Fourth Quarter and Full-Year 2020 Results Presentation \(edison.com\)](https://www.edison.com/~/media/Edison-International/Investor-Relations/Presentations/2020-2021/Fourth-Quarter-and-Full-Year-2020-Results-Presentation.pdf).

⁵⁶ Data Source: Bloomberg Finance L.P. accessed July 2, 2021.

1 inappropriate and a full cost of capital application as provided for by the CCM is
2 warranted.

3 **IV. COST OF CAPITAL PRINCIPLES AND APPROACH**

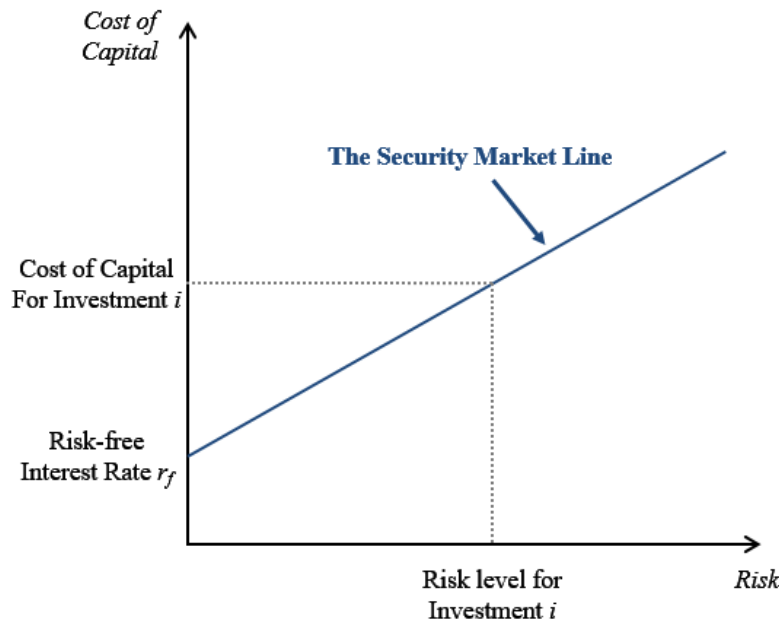
4 **A. RISK AND THE COST OF CAPITAL**

5 **Q26. How is the “Cost of Capital” defined?**

6 A26. The cost of capital is defined as the expected rate of return in capital markets on
7 alternative investments of equivalent risk. Put differently, it is the rate of return investors
8 require based on the risk-return alternatives available in competitive capital markets. The
9 cost of capital is a type of opportunity cost: it represents the rate of return that investors
10 could expect to earn elsewhere without bearing more risk. “Expected” is used in the
11 statistical sense: the mean of the distribution of possible outcomes. The terms “expect”
12 and “expected,” as in the definition of the cost of capital itself, refer to the probability-
13 weighted average over all possible outcomes.

14 The definition of the cost of capital recognizes a tradeoff between risk and return that can
15 be represented by the “security market risk-return line” or “Security Market Line” for
16 short. This line is depicted in Figure 8 below. The higher the risk, the higher the cost of
17 capital required.

Figure 8
The Security Market Line



1 **Q27. What factors contribute to systematic risk for an equity investment?**

2 A27. When estimating the cost of equity for a given asset or business venture, two categories
3 of risk are important. The first is business risk, which is the degree to which the cash
4 flows generated by the business (and its assets) vary in response to moves in the
5 broader market. In context of the CAPM, business risk can be quantified in terms of an
6 “assets beta” or “unlevered beta.” For a company with an assets beta of 1, the value of
7 its enterprise will increase (decrease) by 1 percent for a 1 percent increase (decline) in
8 the market index.

9 The second category of risk relevant for an equity investment depends on how the
10 business enterprise is financed and is called financial risk. Section IV.B below explains
11 how financial risk affects the systematic risk of equity.

1 **Q28. What are the guiding standards that define a just and reasonable allowed rate of**
2 **return on rate-regulated utility investments?**

3 A28. The seminal guidance on this topic was provided by the U.S. Supreme Court in the *Hope*
4 and *Bluefield* cases,⁵⁷ which found that:

- 5 • The return to the equity owner should be commensurate with returns on
6 investments in other enterprises having corresponding risks;⁵⁸
- 7 • The return should be reasonably sufficient to assure confidence in the
8 financial soundness of the utility; and
- 9 • The return should be adequate, under efficient and economical
10 management for the utility to maintain and support its credit and enable
11 it to raise the money necessary for the proper discharge of its public
12 duties.⁵⁹

13 **Q29. How does the standard for just and reasonable rate of return relate to the cost of**
14 **capital?**

15 A29. The first component of the *Hope* and *Bluefield* standard, as articulated above, is directly
16 aligned with the financial concept of the opportunity cost of capital.⁶⁰ The cost of capital
17 is the rate of return investors can expect to earn in capital markets on alternative
18 investments of equivalent risk.⁶¹

⁵⁷ *Bluefield Water Works & Improvement Co. v. Public Service Com'n of West Virginia*, 262 U.S. 679 (1923) (“Bluefield”), and *Federal Power Com'n v. Hope Natural Gas Co.*, 320 U.S. 591 (1944) (“Hope”).

⁵⁸ *Hope*, 320 U.S. at 603.

⁵⁹ *Bluefield*, 262 U.S. at 680.

⁶⁰ A formal link between the opportunity cost of capital as defined by financial economics and the proper expected rate of return for utilities is set forth by Stewart C. Myers, “Application of Finance Theory to Public Utility Rate Cases,” *Bell Journal of Economics & Management Science* 3:58-97 (1972).

⁶¹ The opportunity cost of capital is also referred to as simply the “cost of capital,” and can be equivalently described in terms of the “required return” needed to attract investment in a particular security or other asset (i.e., the level of expected return at which investors will find that asset at least as attractive as an alternative investment).

1 By investing in a regulated utility asset, investors are tying up some capital in that
2 investment, thereby foregoing alternative investment opportunities. Hence, the investors
3 are incurring an “opportunity cost” equal to the returns available on those alternative
4 investments. The allowed return on equity needs to be at least as high as the expected
5 return offered by alternative investments of equivalent risk or investors will choose these
6 alternatives instead. Consequently, the utility’s ability to raise capital and fund its
7 operations will be negatively impacted. This is a fundamental concept in cost of capital
8 proceedings for regulated utilities such as SCE.

9 **Q30. Are there unique factors to consider for SCE?**

10 A30. Yes. The cost of equity capital is measured in capital markets using comparable
11 companies, but such companies do not face the unique circumstances SCE faces.
12 Specifically, SCE continues to face substantial risks of wildfires and associated liabilities
13 as well as risks with the implementation of AB 1054.⁶² Wildfires and the risks associated
14 with wildfires are events that have financial downsides for SCE but no financial upside.
15 It is therefore an asymmetric risk that SCE’s investors face.⁶³ Additionally, SCE has
16 very large balances of more than \$1 billion in memorandum accounts, substantially
17 higher arrearages than pre-COVID levels, and the Company’s credit ratios are under
18 pressure, as shown in the Company Testimony.⁶⁴

⁶² For details, see Company Testimony, Exhibit SCE-01, Section IV

⁶³ In the last cost of capital proceeding, SCE provided testimony regarding the magnitude and potential compensation for such risk, so my testimony ignored such risks. However, I consider these risks when determining where in the reasonable range SCE appropriately would be placed in this testimony as I understand that SCE is not seeking a specific wildfire adder in this proceeding.

⁶⁴ See Company Testimony, Exhibit SCE-01, Section IV.C, which makes clear that memorandum accounts include over \$1 billion of under-collections across a variety of accounts. This same section also discusses the magnitude of SCE’s current arrearages. Section V of the Company Testimony discusses SCE’s credit ratings.

1 Because of the risks facing SCE, both Moody’s and Standard & Poor’s downgraded the
2 Company in 2019.⁶⁵

3 **Q31. Please summarize how you considered risk when estimating the cost of capital.**

4 A31. To evaluate comparable business risk, I looked to a proxy group of regulated electric
5 utilities and took a sample of highly regulated gas distribution and water utilities. The
6 electric, natural gas and water utilities I considered have a high proportion of regulated
7 assets and revenue, with the majority having more than 80 percent of assets subject to
8 regulation. Additionally, they all have a network of assets that are used to serve end
9 customers and they are capital intensive (meaning that each dollar in revenue requires
10 substantial investment in fixed assets). Further, (as explained in Section IV.B) I analyzed
11 and adjusted for differences in financial risk due to different levels of financial leverage
12 among the proxy companies and between the capital structures of the proxy companies
13 and the regulatory capital structure that will be applied to SCE for ratemaking purposes.
14 To determine where in the estimated range SCE’s ROE reasonably falls, I compared the
15 business risk of SCE to that of the proxy group companies. Thus, my recommended ROE
16 takes into account the additional return equity investors require due to the unique
17 asymmetric risks that SCE is facing.

18 **B. FINANCIAL RISK AND THE COST OF EQUITY**

19 **Q32. How does capital structure affect the cost of equity?**

20 A32. Debtholders in a company have a fixed claim on the assets of the company and are paid
21 prior to the company’s owners (equity holders) who hold the inherently variable residual
22 claim on the company’s operating cash flows. Because equity holders only receive the
23 profit that is left over after the fixed debt payments are made, higher degrees of debt in

⁶⁵ Standard & Poor’s Global Ratings downgraded SCE to BBB on January 21, 2019; credit watch negative. Moody’s downgraded SCE on March 5, 2019 to Baa2; credit watch negative. In December 2020, S&P noted the “minimal financial cushion” for SCE’s parent and the risk associated with the wildfire fund under AB 1054 not having a replenishing mechanism (S&P, “Southern California Edison,” December 2, 2020).

1 the capital structure amplify the variability in the expected rate of return earned by equity-
2 holders. This phenomenon of debt resulting in financial leverage for equity holders
3 means that, all else equal, a greater proportion of debt in the capital structure increases
4 risk for equity holders, causing them to require a higher rate of return on their equity
5 investment, even for an equivalent level of underlying business risk.

6 **Q33. How do differences in financial leverage affect the estimation of the cost of equity?**

7 A33. The CAPM and DCF models rely on market data to estimate the cost of equity for the
8 proxy companies, so the results reflect the value of the capital that investors hold during
9 the estimation period (market values).

10 The authorized ROE is applied to the regulatory equity portion of SCE's rate base.
11 Because the cost of equity is measured using a group of proxy companies, it may well be
12 the case that these companies finance their operations with a different debt and equity
13 proportion than the proportion the Commission allows in SCE's rate base. Specifically,
14 the CAPM and DCF models measure the cost of equity using market data and
15 consequently are measures of the cost of equity using the proportion of debt and equity
16 that is inherent in that data. Therefore, I consider the impact of any difference between
17 the financial risk inherent in those cost of equity estimates and the capital structure used
18 to determine SCE's required return on equity.

19 Differences in financial risk due to the different degree of financial leverage in SCE's
20 regulatory capital structure compared to the capital structures of the proxy companies
21 mean that the equity betas measured for the proxy companies must be adjusted before
22 they can be applied to determining SCE's CAPM return on equity. Similarly, the cost of
23 equity measured by applying the DCF models to the proxy companies' market data
24 requires adjustment if it is to serve as an estimate of the appropriate allowed ROE for
25 SCE at the regulatory capital structure the Commission grants.

26 Importantly, taking differences in financial leverage into account does not change the
27 value of the rate base. Rather, it acknowledges the fact that a higher degree of financial

1 leverage in the regulatory capital structure (and the effect of debt equivalence) imposes
2 a higher degree of financial risk for an equity investment in SCE's rate base than is
3 experienced by equity investors in the market-traded stock of the less leveraged proxy
4 companies.

5 **Q34. How specifically do you consider financial risk in your analysis of the cost of equity**
6 **using market data for the proxy group companies?**

7 A34. The impact of financial risk is taken into account in an analysis of cost of equity using
8 market-based models such as the DCF and CAPM in several manners.⁶⁶ One way is to
9 determine the after-tax weighted-average cost of capital for the proxy group using the
10 equity and debt percentages as the weight assigned to the cost of equity and debt.
11 Financial theory holds that for a given level of business risk, the weighted average cost
12 of capital is constant over a broad set of capital structures, *i.e.*, the weighted average cost
13 of capital is the same at, for example, 55 and 45 percent equity, as the cost of equity (and
14 debt) increases as the percentage of equity decreases. As a result, once the weighted cost
15 of capital is determined for the proxy group (at the proxy group's capital structures), I
16 can determine the cost of equity that is required at SCE's capital structure. This approach
17 assumes that the after-tax weighted average cost of capital is constant for a range that
18 spans the capital structures used to estimate the cost of equity and the regulatory capital
19 structure. Because of the objections to the ATWACC in past proceedings, I ensure my
20 recommended range does not rely on this approach to determine the impact of financial
21 risk in the CAPM or ECAPM.

22 A second approach was developed by Professor Hamada, who estimated the cost of
23 equity using the CAPM and made comparisons between companies with different capital
24 structure using beta. Specifically, in the Hamada approach, I use the estimated beta to
25 calculate what beta would be associated with a 100 percent equity financed firm to obtain

⁶⁶ The impact of financial leverage on the risk premium model needs to be considered separately as it uses regulatory data rather than market data, so that it is differences in regulatory capital structures that are relevant for this model.

1 a so-called all-equity or assets beta and then re-lever the beta to determine the beta
2 associated with the regulatory capital structure. This approach requires an estimate of
3 the systematic risk associated with debt (*i.e.*, the debt beta), which is usually quite small.
4 In Appendix BV-B, I set forth additional technical details regarding the methods that can
5 be used to account for financial risk when estimating the cost of capital. I note that the
6 Commission in past cost of capital decisions has relied on results calculated using the
7 Hamada approach.⁶⁷

8 **Q35. Can you provide a numerical illustration of how the cost of equity changes, all else**
9 **equal, when the degree of leverage changes?**

10 A35. Yes. I constructed a simple example below, where only the leverage of a company varies.
11 I assumed the return on equity is 11.00 percent at a 50 percent equity capital structure
12 and determine the return on equity that would result in the same overall return if
13 the percentage of equity in the capital structure were reduced to 45 percent.

Figure 9
Illustration of Impact of Financial Risk on ROE

		Company A (50% Equity)	Company B (45% Equity)
Rate Base	[a]	\$1,000	\$1,000
Equity	[b]	\$500	\$450
Debt	[c]	\$500	\$550
Total Cost of Capital (8%)	[d] = [a] × 8%	\$80.0	\$80.0
Cost of Debt (5%)	[e] = [c] × 5%	\$25.0	\$27.5
Equity Return	[f] = [d] - [e]	\$55.0	\$52.5
Rate of Return on Equity (ROE)	[g] = [f] / [b]	11.00%	11.67%

⁶⁷ California Public Utilities Commission, Decision 12-12-034, issued December 20, 2012, p.38. See also, Direct Testimony of Dr. Paul Hunt in that same proceeding (Exhibit SCE-1), p. 63, 67.

1 Figure 9 above illustrates how financial risk⁶⁸ affects returns and the ROE. The overall
2 return remains the same for Company A and B at \$80. But Company B with the lower
3 equity share and higher financial leverage must earn a higher percentage ROE in order
4 to maintain the same overall return. This higher percentage allowed ROE represents the
5 increased risk to equity investors caused by the higher degree of leverage.

6 Importantly, the financial risk is determined not only by debt and equity but also by any
7 imputed debt from, for example, power purchase agreements or other unique debt-
8 equivalent arrangements.

9 The principle illustrated in Figure 9 is illustrative of the adjustments I performed to
10 account for differences in financial risk when conducting estimates of the cost of equity
11 applicable to SCE.

12 **C. APPROACH TO ESTIMATING THE COST OF EQUITY**

13 **Q36. Please describe your approach for determining the cost of equity for SCE.**

14 A36. As stated above, the standard for establishing a fair rate of return on equity requires that
15 a regulated utility be allowed to earn a return equivalent to what an investor could expect
16 to earn on an alternative investment of equivalent risk. Therefore, my approach to
17 estimating the cost of equity for SCE focuses on measuring the expected returns required
18 by investors to invest in companies that face business and financial risks comparable to
19 those faced by SCE. Because certain of the models require market data, my consideration
20 of comparable companies is restricted to those that have publicly traded stock. To this
21 end, I have selected two proxy groups consisting of publicly traded companies. The
22 proxy groups consist of companies providing (1) primarily regulated electricity services
23 and (2) providing primarily regulated natural gas or water services.⁶⁹ With these proxy

⁶⁸ Financial risk is risk that a company has due to its capital structure.

⁶⁹ I consider both an electric utility sample because SCE is an electric utility and a sample of natural gas distributors and water utilities. The latter sample has the advantage of being highly regulated and commonly by the same regulator as electric utilities in the same jurisdiction. Also, the

1 groups, I derive estimates of the representative cost of equity according to standard
2 financial models including two versions of the CAPM—the traditional version and a
3 version that takes into account the empirical observation that the security market line in
4 Figure 8 is too steep relative to what is observed using market data. I also implement a
5 single-stage and a multi-stage version of the DCF.

6 Lastly, I perform an analysis of historical allowed ROEs for electric utilities in relation
7 to prevailing risk-free interest rates at the time, and use the implied allowed risk-premium
8 relationship to estimate a utility cost of equity consistent with current economic
9 conditions. The results of this implied risk premium analysis (sometimes referred to
10 herein as the “Risk Premium” model) are an additional consideration that informs my
11 recommendation and serves as a check on the reasonableness of my market-based results.

12 **Q37. How do your approach and the models you employ compare to what the**
13 **Commission has considered in the most recent electric utility proceeding?**

14 A37. The Commission has in past decisions considered the DCF, CAPM and Risk Premium
15 models, as do I, and has also recognized that financial leverage affects the cost of
16 equity.⁷⁰ Similarly, the Commission’s Policy and Planning Division in a 2017 report
17 discusses the three models mentioned above and notes that the Commission considers
18 additional risk factors such as financial, business, and regulatory risk.⁷¹ Importantly, the
19 document identifies financial risk as being “determined by the amount of debt or financial
20 leverage in a company's capital structure.”⁷²

systematic risk of electric, natural gas, and water utilities, as measured by beta, is comparable. See, for example, Appendix BV-C, Schedule BV-13, which provides the asset beta for the industries considered.

⁷⁰ Decision 19-12-056, pp. 6, 20-25; Decision 12-12-034, pp. 5, 22-28.

⁷¹ California Public Utilities Commission, Policy and Planning Division, “An Introduction to Utility Cost of Capital,” April 18, 2017, <https://pdf4pro.com/view/an-introduction-to-utility-cost-of-capital-533549.html>.

⁷² *Id.*, p. 8.

1 **Q38. Are there any potential concerns about how current capital market conditions may**
2 **influence the model results?**

3 A38. Yes. There are several. First, as discussed above, the financial markets' response to the
4 COVID-19 pandemic substantially impacted key inputs to financial models through
5 interest rates, investor required risk premium, changes in systematic risk and the relative
6 pricing of various stocks as well as through growth expectations.

7 More recently, the financial markets have rebounded and the S&P 500 now is higher than
8 before the COVID-19 onset, but utility stocks have not followed the increase in the S&P
9 500 and EIX remains well below the market. At the same time, interest rates remain low,
10 investors' expected risk premium remains high, and, more recently, fear of inflation has
11 materialized. During April 2021, the CPI index increased by 4.2 percent annualized with
12 energy up 25 percent. During June and July, the CPI similarly increased by a substantial
13 amount of about 5.4 percent.⁷³ Building materials, gasoline, cars, and certain foods also
14 saw large increases.⁷⁴ Because the cost of capital is measured in nominal terms, an
15 increase in inflation, all else equal, means that the cost of capital increases. This
16 relationship is important because during times of inflation, a historic look at the Baa yield
17 over the past 12 months tells us little about where it will be 12 months in the future.
18 Relying on historical data therefore could result in a substantive under (or over)
19 estimation of the appropriate cost of equity.

20 The presence of these uncertainties and their impact on the cost of equity capital means
21 simply applying the CCM adjustment as if financial markets were behaving as if it was
22 still 2018 or 2019 could lead to bias in the authorized cost of equity.

⁷³ U.S. Bureau of Labor Statistics, "TED: The Economics Daily," July 15, 2021. "Consumer Price Index up 4.2% from April 2020 to April 2021," May 19, 2021, accessed May 24, 2021, and August 16, 2021 <https://www.bls.gov/opub/ted/2021/consumer-price-index-up-4-2-percent-from-april-2020-to-april-2021.htm>.

⁷⁴ Bureau of Labor Statistics: [CPI Home : U.S. Bureau of Labor Statistics \(bls.gov\)](https://www.bls.gov/cpi/) <https://www.bls.gov/cpi/>; viewed May 19, 2021.

1 **V. CAPITAL MARKET CONDITIONS IMPACTING THE INPUTS TO THE COST**
2 **OF EQUITY DETERMINATION**

3 **Q39. What do you cover in this section?**

4 A39. In this section, I address recent changes in capital market conditions that directly impact
5 the cost of equity and were not discussed in Section II above. Specifically, I address (i)
6 interest rates; (ii) investors' perception of the market risk premium; and (iii) inflation
7 expectations and the impact on the cost of equity.

8 **Q40. Please provide a summary of the data and developments discussed below.**

9 A40. First, I focus the discussion on the expected developments in interest rates, which directly
10 impact the cost of equity as estimated by two standard models (the CAPM and risk
11 premium model). Interest rates also may impact indirectly the DCF method as investors'
12 expectations concerning interest rates may impact stock prices and growth. Second, I
13 discuss investor expectations as to the market risk premium, *i.e.*, the return over and
14 above the risk-free rate that investors require to hold equity. This measure again affects
15 the inputs to the financial models and the interpretation of the results. Third, I discuss
16 growth and inflation expectations, which directly affect the DCF model, as well the other
17 models through the expected interest rate developments.

18 **A. INTEREST RATES**

19 **Q41. How do interest rates affect the cost of equity?**

20 A41. The current interest rate environment affects the cost of equity estimation in several
21 ways. Most directly, the CAPM uses as one of its inputs a measure of the risk-free rate
22 (see Section IV). The estimated cost of equity using the CAPM decreases (increases) by
23 one percentage point when the risk-free rate decreases (increases) by one percentage
24 point, all else equal. Therefore, to the extent that prevailing government yields are
25 depressed due to economic uncertainties related to COVID-19 or monetary policy
26 responses, using current yields as the risk-free rate will depress the CAPM estimate

1 below what is representative of the forward-looking cost of equity that will be in effect
2 during the relevant regulatory period. Therefore, the allowed fair return on equity for
3 SCE should reflect the future interest rate environment.

4 **Q42. What are the relevant developments regarding interest rates?**

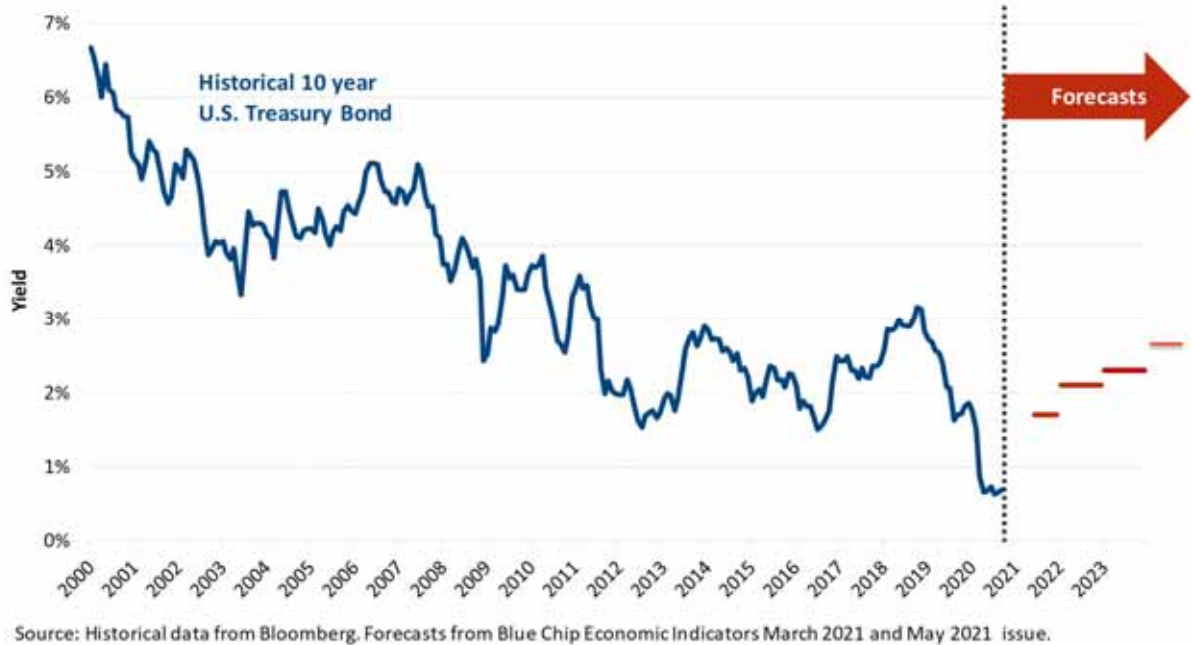
5 A42. Current interest rates remain low at 1.62 percent⁷⁵ despite significant increases since the
6 historic low levels in 2020. In contrast, the yield on 20-year U.S. Government bonds
7 was 2.9 percent at the time of the last cost of capital proceeding.⁷⁶ Looking forward,
8 treasury bonds are forecasted to increase as depicted in Figure 10 below. Blue Chip
9 Economic Indicators' ("BCEI") editions for March 2021 and May 2021 forecast that the
10 yield on 10-year treasury bonds will increase. Specifically, BCEI's May 2021 edition
11 projects the 10-year government bond yield will be 1.7 in 2021 and 2.1 in 2022, while
12 the March 2021 edition projects the rate to be 2.3 and 2.5 percent in 2023 and 2024,
13 respectively (Figure 10).⁷⁷ The expectations for the period 2022-2024 are relevant for
14 this proceeding. Because the risk-free rate is an input to several cost of equity estimation
15 models, the relationship between current and forecasted risk-free rates is an important
16 consideration.

⁷⁵ Federal Reserve, FRED, as of June 16, 2021.

⁷⁶ Villadsen Direct Testimony in SCE-02, Application A.19-04-014, p. 18 or Federal Reserve, FRED at [Treasury Constant Maturity | FRED | St. Louis Fed \(stlouisfed.org\)](https://fred.stlouisfed.org/series/ConstantMaturityRate).

⁷⁷ Wolters Kluwer Blue Chip Economic Indicators, May 2021 p. 2 (2021, 2022) and March 2021 (2023, 2024), p. 14. The May edition does not provide forecasts beyond 2022.

Figure 10: Historical and Projected Ten-Year Treasury Bond Yields⁷⁸



1 Because the government bond yield is forecasted to increase over the period during which
2 SCE’s allowed ROE will be in effect, it is important to use the forecast to determine the
3 cost of equity.⁷⁹

4 **B. RISK PREMIUMS**

5 **Q43. What is the current evidence regarding market volatility?**

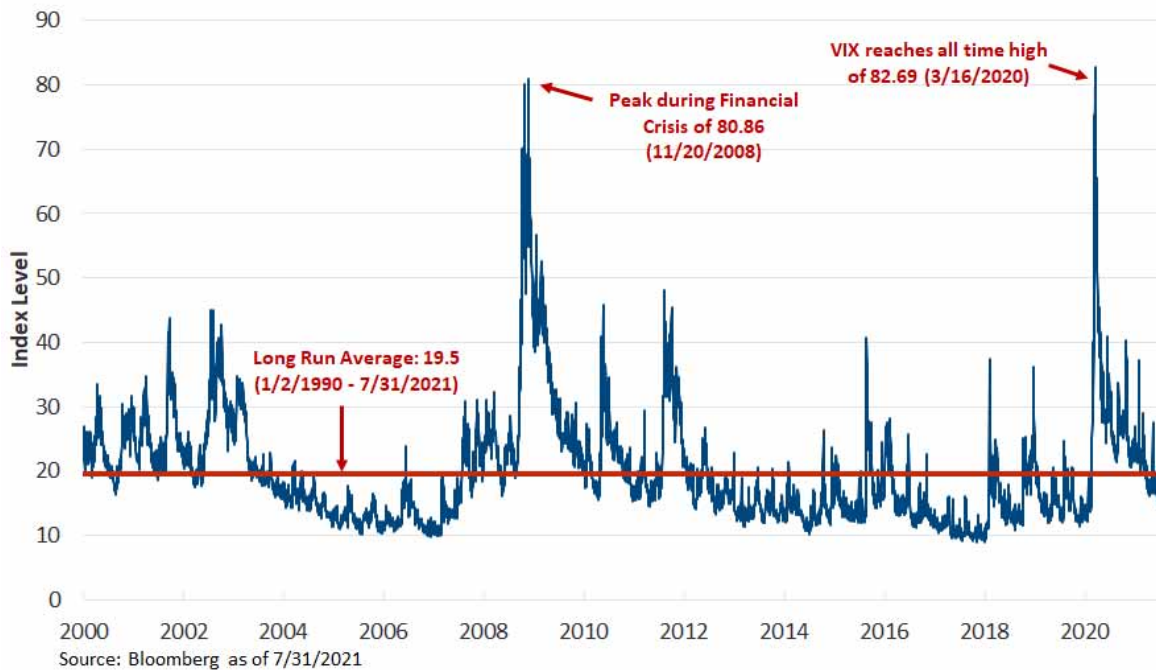
6 A43. During the early months of COVID-19, financial markets became extremely volatile as
7 shown in near-term common volatility measures, such as the VIX, which is frequently
8 referred to as the market’s fear index. The VIX reached an all-time high of 82.69 on
9 March 16, 2020, which was higher than the peak of 80.86 during the Financial Crisis.

⁷⁸ *Id.*

⁷⁹ In past cost of capital proceedings, I have considered the spread between utility bond yields and government bond yields to assess the need for a normalization of the risk-free rate or an adjustment to the MRP. However, the spread is currently slightly above 100 bps, which is only slightly above the long run average. Therefore, I do not consider the impact of this spread in this testimony.

1 However, the VIX has recently retreated to its long-term average or slightly below at
2 between 16.6 and 30 in February and March 2021, with the highest level seen at the
3 beginning of the month on February 1, 2021.⁸⁰

Figure 11: VIX: 2000 through July 2021



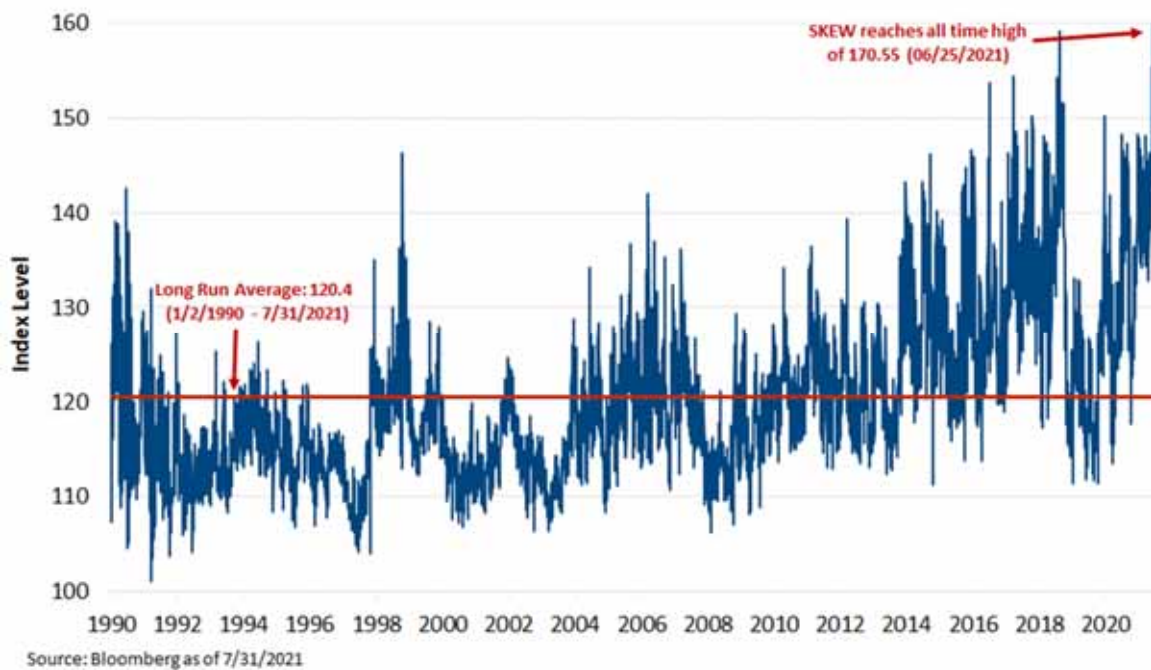
4 Similarly, the SKEW index, which measures the market’s willingness to pay for
5 protection against negative “black swan” stock market events (*i.e.*, sudden substantial
6 downturns),⁸¹ shows that investors are cautious. A SKEW value of 100 indicates outlier
7 returns are unlikely, but as the SKEW increases, the probability of outlier returns
8 becomes more significant. Figure 12 below shows the development in the SKEW since
9 2005 and that the index has recently increased following a period of declining SKEW.

⁸⁰ Bloomberg, as of February 28, 2021 and CBOE as of January 27, 2021; <https://www.google.com/search?q=VIX+cboe&sourceid=ie7&rls=com.microsoft:en-US:IE-Address&ie=&oe=#spf=1611799158418>.

⁸¹ For example, <http://www.cboe.com/products/vix-index-volatility/volatility-indicators/skew>.

1 The index spiked over 148.3 on June 30, 2020 and stood at 136.2 on February 26, 2021,
2 which is well above its long run average of 120.1. The recent spike in the SKEW shows
3 that investors continue to pay for protection against downside risks.

Figure 12: SKEW



4 As both the VIX and SKEW measures are forward-looking, the variability in VIX and
5 SKEW shows that investors expect volatility to continue (for at least a year) but are
6 cautiously optimistic about investing in equity. Of note, the SKEW index reached its
7 historical high on June 25, 2021 at 170 - - well above the long-term average of 120.

8 **Q44. What is the Market Risk Premium?**

9 A44. In general, a risk premium is the amount of “excess” return—above the risk-free rate of
10 return—that investors require to compensate them for taking on risk. As illustrated in
11 Figure 8, the riskier the investment, the larger the risk premium investors will require.

12 The MRP is the risk premium associated with investing in the market as a whole. Since
13 the so-called “market portfolio” embodies the maximum possible degree of

1 diversification for investors,⁸² the MRP is a highly relevant benchmark indicating the
2 level of risk compensation demanded by capital market participants. It is also a direct
3 input necessary to estimating the cost of equity using the CAPM and other risk-
4 positioning models.

5 **Q45. What is the current evidence related to the MRP?**

6 A45. The heightened volatility in the market has increased the premium that investors require
7 to hold risky assets, especially when measured utilizing forward-looking methodologies
8 that estimate expected market returns with reference to current dividend yields.
9 Bloomberg’s forward-looking estimate of the MRP for the U.S. increased to as high as
10 9.84 percent in March 2020 and remained high at 8.58 percent as of May 2021.⁸³

⁸² In finance theory, the “market portfolio” describes a value-weighted combination of all risky investment assets (*e.g.*, stocks, bonds, real estate) that can be purchased in markets. In practice, academics and financial analysts nearly always use a broad-based stock market index, such as the S&P 500, to represent the overall market.

⁸³ Bloomberg, as of May 31, 2021. Measured over a 10-year U.S. Treasury bond.

1 **Figure 13: Bloomberg’s Daily Market Risk Premium and Risk-Free Rate**
2 **(Jan. 2020 – May 2021).**



4 **Q46. Are higher risk premiums relevant given that treasuries are near historic lows?**

5 A46. Yes—higher risk premiums are highly relevant for cost of equity estimation as current
6 risk-free rates are extremely low. As shown above in **Figure 13**, the MRP has increased
7 as the risk-free rate declined. Further, as academic and industry analyses show, the
8 allowed risk premium over the risk-free rate is inversely related to the risk-free rate. For
9 example, Villadsen et al. (2017) found that the allowed risk premium increases by
10 approximately 0.44 percent for each 1 percent decline in the risk-free rate for the period
11 1990 to 2015.⁸⁴ Morin finds that the risk premium increases by 0.52 percent for each 1

⁸⁴ Bente Villadsen, Michael J. Vilbert, Dan Harris, and A. Lawrence Kolbe, “*Risk and Return for Regulated Industries*,” Academic Press, 2017, pp. 118-119.

1 percent decline in the risk-free rate.⁸⁵ Importantly, statistical analyses of the relationship
2 between the allowed ROE and the risk-free rate in the electric and gas utilities industry
3 show that since 2011, a 1 percent decline in the risk-free rate leads to much smaller
4 decline in the ROE than previously.⁸⁶ This phenomenon also is documented in the
5 forward-looking market risk premium Bloomberg calculated in Figure 13 above.

6 According to Bloomberg, the MRP as of May 31, 2021 is 8.58 percent over the 10-year
7 Treasury bond for an MRP of about 8.08 percent over the 20-year Treasury bond.⁸⁷ Thus,
8 the forward-looking MRP is higher than the historical average MRP of about 7.25
9 percent. It also is an increase over the forward-looking MRP at the time of the last cost
10 of capital proceeding, where the Bloomberg MRP was approximately 7.7 percent.⁸⁸

11 However, what truly matters to utility investors is the premium over and above the risk-
12 free rate they require to invest in utility stocks. That figure is determined by the
13 systematic risk (*e.g.*, beta) **and** the market risk premium. Looking to the current measure
14 of beta, it is approximately 0.89, so with an MRP of 8 percent, the utility equity risk
15 premium is approximately 7.12 percent, while at the last cost of capital proceeding the
16 same measure was approximately 4.56 percent, for an increase of more than 250 basis
17 points.⁸⁹

18 As I explain below, at the time of the last cost of capital proceeding in California, the
19 spread between utility bond yields and government bond yields was substantially
20 elevated. This is no longer the case. Consequently, I conservatively use the Bloomberg
21 MRP rather than a measure that takes the impact of yield spreads into account.
22 Importantly, the systematic risk of utilities such as SCE has increased, so the combined
23 effect of the systematic risk (beta) and the MRP, the premium that utility investors require

⁸⁵ Roger A. Morin, “*New Regulatory Finance*,” Public Utilities Reports, Inc., 2006, pp. 123-125.

⁸⁶ For details, see Appendices BV-E and BV-F.

⁸⁷ Bloomberg, as of May 31, 2021.

⁸⁸ Villadsen Direct Testimony in Application A.19-04-014, p. 23.

⁸⁹ The average beta was 0.57, so using an MRP of 8 percent result in a utility equity risk premium of $0.57*8\% = 4.56\%$. Using the current beta of 0.89 and an MRP of 8 percent results in a utility equity risk premium of $0.89*8\% = 7.12\%$.

1 over and above the risk-free rate to invest in utility equities, has increased by more than
2 250 basis points. Also, the Federal Energy Regulatory Commission’s approach to
3 determining the MRP recently provided an estimate of 9.6 to 10.9 percent as shown in
4 Appendix BV-I and again the betas relied upon by the FERC have increased. For these
5 reasons, I view the Bloomberg estimate of 8.08 percent as conservative and note that the
6 utility-specific equity risk premium has increased much more than has the market risk
7 premium.

8 **Q47. Is there evidence that the MRP will remain elevated for a period of time going**
9 **forward?**

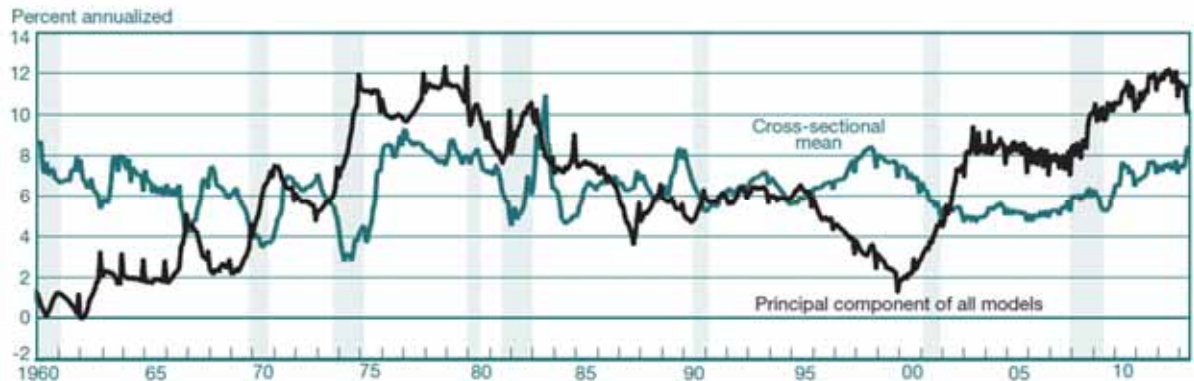
10 A47. Yes. In 2015, Duarte and Rose of the Federal Reserve of New York performed a study
11 that aggregated the results of many models of the required MRP in the United States and
12 tracked them over time.⁹⁰ This analysis found a very high MRP after the financial crisis,
13 relative to time periods prior to the crisis.

14 The authors estimated the MRP that resulted from a range of models each year from 1960
15 through the time of their study. The authors then reported the average as well as the first
16 principal component of the results.⁹¹ The authors found that the models used to
17 determine the risk premium were converging to provide comparable estimates and that
18 the average annual estimate of the MRP had reached an all-time high in 2012-2013.
19 (Figure 14 below is a copy of the summary chart from Duarte and Rosa’s 2015 paper).

⁹⁰ Fernando Durate and Carlo Rosa, “The Equity Risk Premium: A Review of Models,” *Federal Reserve Bank of New York*, December 2015 (“Duarte and Rosa, 2015”).
https://www.newyorkfed.org/research/staff_reports/sr714.html.

⁹¹ Duarte and Rosa emphasize the “first principal component” of the 20 models. This means that the authors used statistics to compute the weighted average combination of the models that captures the variability among the 20 models over time.

Figure 14: Duarte and Rosa's Chart 3
One-Year Ahead MRP and Cross-Sectional Mean of Models



1

2 These directional trends identified by Duarte and Rosa are reasonably consistent with
3 those observed from Bloomberg, and they further support the proposition that the
4 elevation of the MRP over its historical pre-crisis levels was a persistent feature of capital
5 markets in the time following the financial crisis. Specifically, the financial crisis saw
6 high volatility and a flight to quality – similar to conditions seen in 2020 in response to
7 the COVID-19 pandemic and the period during which the authors found a high MRP
8 broadly coincided with low interest rates. Therefore, it is reasonable to expect that the
9 current MRP will remain elevated compared to historical levels, especially given the
10 uncertainty related to the extent of economic and financial impacts from COVID-19 and
11 the historically low interest rates.

12 **C. INFLATION AND GROWTH**

13 **Q48. What are recent indicators of the growth and inflation for the US economy?**

14 A48. Recent surveys by economists, such as the BCEI survey, indicate that U.S. real GDP will
15 increase by 5.7 percent in 2021 and 4.1 percent in 2022 for a nominal GDP at about 8
16 percent and 6 percent, respectively.⁹² In August, the U.S. Federal Reserve announced a
17 policy change whereby they would target inflation of 2 percent on average, noting that

⁹² Wolters Kluwer Blue Chip Economic Indicators, March 2021, p. 2-3

1 the Federal Reserve would hold overnight borrowing interest rates lower for longer.⁹³
2 Recent projections from the FOMC clarified that policy rates will remain at current levels
3 through at least 2023.⁹⁴ This will likely continue to exert downward pressure on interest
4 rates over the near to medium term. At the same time, there are increasing fears of
5 inflation. For example, Obama’s former economic advisor and Harvard professor
6 Lawrence Summers has warned that “*the trillions of dollars Biden wanted to spend could*
7 *create ‘inflationary pressures of a kind we have not seen in a generation.’”*⁹⁵ Professor
8 Summers’ concerns are consistent with recent inflation concerns expressed in Bank of
9 America’s recent Fund Manager Survey, where inflation topped the list of managers
10 concerns.⁹⁶

11 The Bureau of Labor Statistics recently estimated the annualized Consumer Price Index
12 (CPI) for June 2021 at 5.4 percent⁹⁷ - - the largest increase since August 2008. Thus, the
13 inflation is currently much higher than in the recent past. The period over which the
14 inflation will continue at this level is currently uncertain.

15 **D. IMPACT ON ROE ESTIMATION**

16 **Q49. Please summarize how the economic developments discussed above have affected**
17 **the return on equity and debt that investors require.**

18 A49. Utilities rely on investors in capital markets to provide funding to support their capital
19 expenditure programs and efficient business operations. Investors consider the risk-
20 return tradeoff in choosing how to allocate their capital among different investment

⁹³ U.S. Federal Reserve, “Federal Open Market Committee announces approval of updates to its Statement on Longer-Run Goals and Monetary Policy Strategy,” August 27, 2020, accessed March 2, 2021, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20200827a.htm>.

⁹⁴ U.S. Federal Reserve, “March 17, 2021: FOMC Projections materials, accessible version,” March 17, 2020, <https://www.federalreserve.gov/monetarypolicy/fomcprojtab120210317.htm>.

⁹⁵ Lydia Moynihan, New York Post, “Larry Summers raises inflation concerns as he blasts Biden’s spending,” May 17, 2021.

⁹⁶ CNBC, “Investors now fear inflation more than COVID, Bank of America Survey shows,” March 16, 2021.

⁹⁷ Bureau of Labor Statistics, “Economic News Release,” July 13, 2021.

1 opportunities. It is therefore important to consider how investors view the current
2 economic conditions, including the plausible developments in the risk-free rate, the
3 current Market Risk Premium, and the growth in the U.S. GDP.

4 These investors have been dramatically affected by the COVID-19 pandemic and the
5 resulting market volatility. Similarly, the effects of the Federal Reserve's monetary
6 policy have artificially lowered the risk-free rate. As a result, government bond yields
7 are at historical lows, while the forecasted MRP is above the historical average. Thus,
8 the premium investors require to hold securities that are not risk-free has increased. As
9 SCE is expected to be compensated as a utility on the equity component of its rate base,
10 the same factors would affect SCE's equity.

11 **Q50. How does this impact the cost of equity estimation for SCE?**

12 A50. The cost of equity and capital structure established for SCE in this proceeding are
13 expected to be in effect beyond the current extraordinary impacts of the COVID-19
14 pandemic. The analysis and recommendations should reflect expected market conditions
15 that will prevail over the relevant rate period and not exclusively the current market
16 conditions. As discussed further below, many of the inputs to the cost of equity
17 estimation methodologies are currently at unprecedented levels. Because of the
18 extraordinary events that has led to this filing, sole reliance on backward-looking
19 economic and financial conditions to estimate SCE's cost of equity would unfairly lock
20 SCE and their customers into the current economic and financial environment. Thus, it
21 is important to consider forecasted interest rates and MRP.

22 **Q51. Does your analysis consider the current economic conditions?**

23 A51. Yes. In implementing the CAPM and Implied Risk Premium models, I took into account
24 risk-free rates expected to be in effect during the period for which the cost of equity is
25 being set as well as the forecasted MRP.

1 **VI. ESTIMATING THE COST OF EQUITY**

2 **A. PROXY GROUP SELECTION**

3 **Q52. How do you identify proxy companies of comparable business risk to SCE?**

4 A52. SCE is primarily engaged in the regulated electric utility business. The business risk
5 associated with these endeavors depends on many factors, including the specific
6 characteristics of the service territory and regulatory environment in which the provider
7 of these services operates. Consequently, it is not possible to identify publicly traded
8 proxy companies that replicate every aspect of SCE's risk profile. However, selecting
9 companies with business operations concentrated in regulated industries or having
10 similar lines of business and/or business environments is an appropriate starting point for
11 selecting one or more proxy groups of comparable risk to SCE. As a second step, I need
12 to evaluate SCE or California-specific risks to ensure that SCE's ROE is placed
13 appropriately relative to the samples.

14 To this end, I have selected a sample of highly regulated entities that provide services to
15 residential, commercial and industrial customers. I also consider two subgroups
16 composed of companies focused on (i) the provision of electricity to end users ("Electric
17 Utility Proxy Group") and (ii) the provision of other highly-regulated utility services (*i.e.*,
18 natural gas or water) to end customers ("Other Highly Regulated Utilities Proxy Group"
19 or "OHRU")).⁹⁸ These two proxy groups are similar to SCE in that they are rate regulated
20 by state utility commissions, serve customers through a network of assets, and rely on
21 substantial capital to provide service; *i.e.*, they are capital intensive, as is SCE.

22 I believe it is important that a proxy group used to assess the cost of equity for SCE consist
23 of regulated companies because regulation tends to place substantial requirements on
24 companies and also provides protection. I also believe the physical characteristics of the

⁹⁸ I bundle the natural gas and water utilities for two reasons. First, there are very few water utilities that meet my selection criteria and second, they share the characteristics of (i) being regulated by state commissions, (ii) providing services to ultimate customers through a network of pipes, and (iii) being capital intensive.

1 industry – *e.g.*, network, capital intensive, serving many different customers—are
2 characteristic of SCE and of other highly regulated utilities. The network characteristic
3 implies that assets cannot readily be employed in a different capacity. Capital intensity
4 affects the operating risks through the split between fixed and variable costs. For example,
5 many of the same regulatory mechanisms apply to electric, natural gas, and water utilities
6 and all three types of utilities generally serve residential, commercial, and industrial
7 customers.⁹⁹

8 **Q53. Why are you including a sample of water and natural gas utilities when evaluating**
9 **the cost of capital for an electric utility?**

10 A53. For several reasons. First, investors make comparisons across regulated companies, so
11 it becomes important to consider whether the returns awarded to SCE are comparable not
12 only to other electric utilities but also to other similar risk benchmarks. I note that the
13 Commission specifically requested a comparison of SCE to other entities in its most
14 recent cost of capital proceeding.¹⁰⁰ Second, electric, natural gas, and water utilities
15 generally share not only regulators but also the characteristics of being (a) capital-
16 intensive, (b) network industries, (c) having an obligation to serve and interfacing with
17 the local community. In many jurisdictions they are asked to engage in electricity, natural
18 gas, or water conservation. I therefore believe these companies provide a useful
19 benchmark when evaluating the cost of equity for SCE.

20 **Q54. Please summarize how you selected the members of the Electric Utility Proxy Group**
21 **and the OHRU Proxy Group.**

22 A54. To identify companies suitable for inclusion in the Electric Utility Proxy Group, I started
23 with the universe of publicly traded integrated companies in the electricity utility industry
24 as identified by *Value Line Investment Analyzer* (“*Value Line*”). I started with Value

⁹⁹ See, for example, Standard & Poor’s Global Intelligence, “RRA Regulatory Focus: Adjustment Clauses,” November 12, 2019.

¹⁰⁰ California Public Utilities Commission, D.17-07-005 (Jul. 13, 2017), p. 12.

1 Line’s list of publicly traded companies classified as water utility industry or natural gas
2 distribution. Next, I reviewed business descriptions and financial reports of these
3 companies and eliminated companies that had less than 50 percent of their assets
4 dedicated to regulated utility activities in their industry; *e.g.*, electric, water or natural gas
5 services.¹⁰¹

6 With this group of companies, I applied further screening criteria to eliminate companies
7 that have had recent significant events that could affect the market data necessary to
8 perform cost of capital estimation. Specifically, I identified companies that have cut their
9 dividends or engaged in substantial merger and acquisition (“M&A”) activities over the
10 relevant estimation window.¹⁰² I eliminated companies with such dividend cuts because
11 the announcement of a cut may produce disturbances in the stock prices and growth rate
12 expectations in addition to potentially being a signal of financial distress. I generally
13 eliminated companies with significant M&A activities because such events typically
14 affect a company’s stock price in ways that are not representative of how investors
15 perceive its business and financial risk characteristics. For example, a utility’s stock
16 price will commonly jump upon the announcement of an acquisition to match the
17 acquirer’s bid.

18 Further, I require companies have an investment grade credit rating¹⁰³ and more than
19 \$300 million in market capitalization to avoid micro caps. I also eliminated Edison
20 International from the Electric Utility Proxy Group as the owner of SCE. Additionally,

¹⁰¹ I rely on Edison Electric Institute (EEI), Stock Performance – 2019 Financial Update for the electric companies. This report gives industry financial information as well as a percentage of regulated assets for each of the companies. I calculate the share of assets devoted to regulated activities for the water and gas utilities.

¹⁰² As described in Sections VI.C, the CAPM requires five years of historical data, while the DCF relies on current market data.

¹⁰³ In some cases, a proxy company does not have a credit rating from any of the major rating agencies. However, if they were to be rated, they would receive an investment grade rating. In these instances, I assign the company the average credit rating of the rest of the proxy group. All companies in the Electric Utility Proxy Group have a credit rating.

1 I eliminated Portland General Electric and FirstEnergy due to ongoing investigations. A
2 final, and fundamental, requirement is that the proxy companies have the necessary data
3 available for estimation.

4 **Q55. What are the characteristics of the Electric Utility Proxy Group?**

5 A55. The Electric Utility Proxy Group is comprised of electric utilities whose primary source
6 of revenues and majority of assets are subject to regulation. The final proxy group
7 consists of the 27 electric utilities listed in Figure 15 below. These companies own
8 regulated electric utility subsidiaries and are classified by EEI as either “regulated”
9 (having at least 80 percent of their assets dedicated to regulated utility operations) or
10 “mostly regulated” (having at least 50 percent regulated assets).¹⁰⁴ (These EEI categories
11 are designated with an “R” or “M” in the table below). Therefore, the Electric Utility
12 Proxy Group is broadly representative of the regulated electric industry from a business
13 risk perspective.

14 Figure 15 reports the proxy companies’ annual revenues for the most recent four quarters
15 as of Q4, 2020 and also reports the market capitalization, credit rating, beta and growth
16 rate. The annual revenue as well as the market cap was obtained from Bloomberg. S&P
17 Research Insight reports the credit rating. The growth rate estimate is a weighted average
18 between estimates from Thomson Reuters and *Value Line*. Betas were obtained from
19 *Value Line*.

¹⁰⁴ Edison Electric Institute (EEI), Stock Performance.

Figure 15
Electric Proxy Group

Company	Annual Revenue (Q2 2020) (\$MM)	Regulated Assets	Market Cap. (Q1 2021) (\$MM)	Value Line Beta	S&P Credit Rating	Long-Term Growth Estimate
	[1]	[2]	[3]	[4]	[5]	[6]
ALLETE	\$1,197	MR	\$3,572	0.90	BBB	9.1%
Alliant Energy	\$3,401	R	\$13,180	0.85	A-	5.6%
Amer. Elec. Power	\$15,452	R	\$41,719	0.75	A-	6.3%
Ameren Corp.	\$5,920	R	\$20,329	0.80	BBB+	7.1%
Avista Corp.	\$1,345	R	\$3,217	0.95	BBB	6.9%
Black Hills	\$1,793	R	\$4,159	1.00	BBB+	5.0%
CMS Energy Corp.	\$6,899	R	\$17,207	0.80	BBB+	7.2%
CenterPoint Energy	\$7,798	R	\$12,240	1.15	BBB+	5.9%
DTE Energy	\$12,933	MR	\$25,278	0.95	BBB+	5.3%
Dominion Energy	\$14,583	R	\$59,958	0.85	BBB+	6.4%
Duke Energy	\$24,069	R	\$72,162	0.85	BBB+	5.2%
Energy Corp.	\$10,531	R	\$19,647	0.95	BBB+	5.9%
Evergy Inc.	\$5,409	R	\$13,384	0.95	A-	5.8%
Exelon Corp.	\$34,182	MR	\$42,102	0.95	BBB+	4.5%
Hawaiian Elec.	\$2,546	MR	\$4,621	0.80	BBB-	3.2%
IDACORP Inc.	\$1,376	R	\$5,021	0.85	BBB	3.9%
MGE Energy	\$556	R	\$2,584	0.75	AA-	5.3%
NextEra Energy	\$17,110	MR	\$144,727	0.90	A-	7.8%
NorthWestern Corp.	\$1,264	R	\$3,470	0.95	BBB	4.2%
OGE Energy	\$3,322	R	\$6,470	1.05	BBB+	5.4%
Otter Tail Corp.	\$917	R	\$1,899	0.90	BBB	8.2%
Pinnacle West Capital	\$3,622	R	\$9,004	0.90	A-	4.5%
Public Serv. Enterprise	\$9,711	MR	\$29,610	0.90	BBB+	3.4%
Sempra Energy	\$11,600	R	\$39,444	0.95	BBB+	6.4%
Southern Co.	\$21,267	R	\$64,403	0.95	A-	6.1%
WEC Energy Group	\$7,825	R	\$28,568	0.80	A-	6.4%
Xcel Energy Inc.	\$12,256	R	\$34,620	0.80	A-	6.2%
Electric Sample	\$8,847		\$26,763	0.90	BBB+	5.8%

Sources and Notes:

[1]: Bloomberg as of May 31, 2021.

[2]: Key R - Regulated (80% or more of assets regulated).

MR - Mostly Regulated (less than 80% of assets regulated).

[3]: See Schedule No. BV-3 Panels A through I.

[4]: See Schedule No. BV-10

[5]: Bloomberg as of May 31, 2021.

[6]: See Schedule No. BV-5.

1 **Q56. What are the characteristics of the OHRU Proxy Group?**

2 A56. The characteristics of the Other Highly Regulated Utilities Proxy Group are summarized
3 below. Importantly, these utilities all serve final customers through a network of pipes
4 and mains. They are regulated by state commissions and, compared to the electric utility

1 proxy group, have fewer unregulated assets. The final proxy group consists of the 17
2 regulated water and natural gas distribution utilities listed in Figure 16 below. The
3 percentage of assets that are devoted to regulated utility services was calculated from the
4 companies' annual reports or 10-K filings. A company that has at least 80 percent of its
5 assets dedicated to regulated utility operations is "Regulated," while a company that has
6 at least 50 percent regulated assets is "Mostly regulated."¹⁰⁵

7 Figure 16 below reports the proxy companies' annual revenues for the most recent four
8 quarters as of Q4, 2020 and the most recent market capitalization, credit rating, beta and
9 growth rate. The annual revenue as well as the market cap were obtained from
10 Bloomberg. The credit rating is reported by S&P Research Insight. The growth rate
11 estimate is a weighted average between estimates from Thomson Reuters and *Value Line*.
12 Betas were obtained from *Value Line*.

¹⁰⁵ Edison Electric Institute (EEI), Stock Performance.

Figure 16: Gas and Water Proxy Group Characteristics

Company	Annual Revenue (Q2 2020) (\$MM)	Regulated Assets	Market Cap. (Q1 2021) (\$MM)	Value Line Beta	S&P Credit Rating	Long-Term Growth Estimate
	[1]	[2]	[3]	[4]	[5]	[6]
Amer. States Water	\$496	R	\$2,724	0.65	A+	5.7%
Amer. Water Works	\$3,821	R	\$25,882	0.85	A	7.6%
Artesian Res Corp	\$89	R	\$377	0.75	A	4.0%
Atmos Energy	\$3,201	R	\$12,394	0.80	A-	6.9%
California Water	\$816	R	\$2,774	0.65	A+	8.0%
Chesapeake Utilities	\$527	R	\$2,056	0.80	A-	6.3%
Essential Utilities	\$1,791	R	\$10,692	0.95	A	5.0%
Global Water Resources Inc	\$40	R	\$383	0.75	A	15.0%
Middlesex Water	\$142	R	\$1,367	0.70	A	3.7%
New Jersey Resources	\$1,956	MR	\$3,907	1.00	A-	5.2%
NiSource Inc.	\$4,622	R	\$9,233	0.85	BBB+	8.1%
Northwest Natural	\$804	R	\$1,613	0.85	BBB+	4.4%
ONE Gas Inc.	\$1,627	R	\$4,004	0.80	BBB+	6.1%
SJW Group	\$564	R	\$1,815	0.80	A-	8.2%
South Jersey Inds.	\$1,682	R	\$2,456	1.05	BBB	7.7%
Southwest Gas	\$3,348	R	\$3,907	0.95	BBB+	6.8%
Spire Inc.	\$2,191	R	\$3,804	0.85	A-	4.9%
Gas Sample	\$2,218		\$4,819	0.88	BBB+	6.3%
Water Sample	\$970		\$5,752	0.76	A	7.1%
Combined Sample	\$1,630		\$5,258	0.83	A-	6.7%

Sources and Notes:

[1]: Bloomberg as of May 31, 2021.

[2]: Key R - Regulated (80% or more of assets regulated).

MR - Mostly Regulated (less than 80% of assets regulated).

[3]: See Schedule No. BV-3 Panels A through I.

[4]: See Schedule No. BV-10

[5]: Bloomberg as of May 31, 2021.

[6]: See Schedule No. BV-5.

1 Q57. How do the two proxy groups compare to SCE in terms of financial metrics?

2 A57. SCE's electric operations generated a gross annual revenue figure of \$13.5 billion in
3 2020,¹⁰⁶ which is higher than the average for the Electric Utility Proxy Group and above
4 that of all water and gas utility proxies. SCE's unsecured credit rating at BBB and a
5 negative outlook¹⁰⁷ is below that of the average electric utility proxy and even further

¹⁰⁶ Edison International, 2020 10-K, p. 14.

¹⁰⁷ Press Release, Standard & Poor's, Edison International and Subsidiary Southern California Edison Downgraded to 'BBB'; Ratings Placed On Watch Negative (Jan. 21, 2019) *available at* https://www.standardandpoors.com/en_US/web/guest/article/-/view/type/HTML/id/2155495.

1 below that of the OHRU. Relative to the Electric Utility Proxy Group, SCE is more
2 heavily regulated, but the ORHU group, like SCE, is heavily regulated as all but one
3 company have more than 80 percent of assets subject to regulation.

4 **B. CAPITAL STRUCTURE**

5 **Q58. What regulatory capital structure for SCE did you use in your analysis?**

6 A58. As recommended by SCE witnesses,¹⁰⁸ I use a capital structure including 52.00 percent
7 equity in one calculation. This is consistent with SCE's requested regulatory capital
8 structure. However, I also consider a second capital structure, which takes into account
9 debt equivalence of \$1 billion in SCE's capital structure and therefore relies on 46.94
10 percent debt, 5.53 percent preferred, and 47.53 percent equity.¹⁰⁹ As the Commission
11 has previously acknowledged the importance of imputed debt (or debt equivalence),¹¹⁰
12 the capital structure that results from taking into account SCE's imputed debt is important
13 for the determination of the cost of equity.

14 **C. THE CAPM BASED COST OF EQUITY ESTIMATES**

15 **Q59. Please briefly explain the CAPM.**

16 A59. The CAPM assumes the collective investment decisions of investors in capital markets
17 will result in equilibrium prices for all risky assets such that the returns investors expect
18 to receive on their investments are commensurate with the risk of those assets relative to
19 the market as a whole. The CAPM posits a risk-return relationship known as the Security
20 Market Line (see Figure 8 in Section IV), in which the required expected return on an
21 asset is proportional to that asset's relative risk as measured by that asset's beta.

¹⁰⁸ SCE Testimony, Section V.

¹⁰⁹ For calculation purposes, I treat preferred as 50 percent debt and 50 percent equity, which is consistent with the treatment of credit rating agencies. This results in a calculation using 50.295 percent equity and 49.705 percent debt.

¹¹⁰ California Public Utilities Commission, D.05-12-043 and confirmed in Decision 19-12-056, p. 26.

1 More precisely, the CAPM states that the cost of capital for an investment, S (*e.g.*, a
2 particular common stock), is determined by the risk-free rate plus the stock's systematic
3 risk multiplied by the market risk premium. Mathematically, the relationship is given by
4 the following equation:

$$5 \quad r_s = r_f + \beta_s \times MRP \quad (1)$$

- 6 • r_s is the cost of capital for investment S;
- 7 • r_f is the risk-free interest rate;
- 8 • β_s is the beta risk measure for the investment S; and
- 9 • MRP is the market equity risk premium.

10 The CAPM is a “risk-positioning model,” which operates on the principle (corroborated
11 by empirical data) that investors price risky securities to offer a higher expected rate of
12 return than safe securities. It says that an investment whose returns do not vary relative
13 to market returns should receive the risk-free interest rate (that is the return on a zero-
14 risk security, the y-axis intercept in Figure 8), whereas investments of the same risk as
15 the overall market (*i.e.*, those that by definition have average systematic market risk) are
16 priced so as to expect to return the risk-free rate plus the MRP. Further, it says that the
17 risk premium of a security over the risk-free rate equals the product of the beta of that
18 security and the MRP.

19 **1. Inputs to the CAPM**

20 **Q60. What inputs does your implementation of the CAPM require?**

21 A60. As demonstrated by equation (1), estimating the cost of equity for a given company
22 requires a measure of the risk-free rate of interest and the MRP, as well as a measure of
23 the stock's beta. There are several choices and sources of data that inform the selection
24 of these inputs. I discuss these issues below. (Additional technical detail, along with a
25 discussion of the finance theory underlying the CAPM is provided in Appendix BV-B.)

1 **Q61. What value did you use for the risk-free rate of interest?**

2 A61. I use the yield on a 20-year U.S. Treasury bond as the risk-free asset for purposes of my
3 analysis. Recognizing the fact that the cost of capital set in this proceeding may be in
4 place over the period January 2022 through December 2024, I rely on a forecast of what
5 Treasury bond yields will be in 2023, which represents the middle of the period.
6 Specifically, *Blue Chip Economic Indicators* projects that the yield on a 10-year
7 Government Bond will be 2.1, 2.3 and 2.5 percent by 2022, 2023 and 2024,
8 respectively.¹¹¹ I adjust the 2.3 percent yield for 2022-2024 upward by 50 basis points
9 (“bps”), which is my estimate of the representative historical maturity premium for the
10 20-year over the 10-year Government Bond. This adjustment results in a risk-free rate of
11 2.8 percent.

12 **Q62. What value did you use for the MRP?**

13 A62. Like the cost of capital itself, the MRP is a forward-looking concept. It is by definition
14 the premium above the risk-free interest rate that investors can expect to earn by investing
15 in a value-weighted portfolio of all risky investments in the market. The premium is not
16 directly observable. Rather, it must be inferred or forecasted based on known market
17 information. One commonly used method for estimating the MRP is to measure the
18 historical average premium of market returns over the income returns on government
19 bonds a long historical period.¹¹² The average market risk premium from 1926 to the
20 present (2020) is 7.25 percent.¹¹³ I use this value of the MRP along with a risk-free rate
21 of 2.8 percent in one of my CAPM scenarios. I also calculate a forward-looking MRP of

¹¹¹ Blue Chip Economic Indicators, May 2021 (for 2022) and March 2021 (for 2023 and 2024).

¹¹² The longest period for which Duff & Phelps reports data is 1926 to current. Based on financial textbooks such as Ross, Westerfield and Jaffe, “*Corporate Finance*,” 10th Edition, 2013, pp. 324-327, I use the longest period for which reliable estimates are available – in this case 1926 to 2020.

¹¹³ Duff & Phelps, *Ibbotson SBBI 2020 Valuation Yearbook* 10-21.

1 8.08 percent over the 20-year government bond using Bloomberg. Thus, I use an MRP
2 of 8.08 percent as my second scenario.¹¹⁴

3 **Q63. What betas did you use for the companies in your proxy groups?**

4 A63. I used *Value Line* betas, which are estimated using the most recent five years of weekly
5 historical returns data.¹¹⁵ The *Value Line* levered equity betas are reported in Figure 15
6 and Figure 16 above. Importantly, as explained in Section II, these betas—which are
7 measured (by *Value Line*) using the market stock return data of the proxy companies—
8 reflect the level of financial risk inherent in the proxy companies’ market value leverage
9 ratios over the estimation period. Because SCE’s regulatory capital structure includes a
10 higher proportion of debt financing compared to that used to determine the cost of equity
11 for the proxy companies, the financial risk associated with an equity investment in SCE’s
12 rate base is correspondingly greater than the financial risk borne by investors in the proxy
13 companies’ publicly traded stock.¹¹⁶

14 Consequently, standard textbook techniques are applied to unlever the *Value Line* betas
15 reported in Figure 15 and Figure 16 above and relever the resulting asset betas at SCE’s
16 regulatory capital structure (including debt equivalence).¹¹⁷

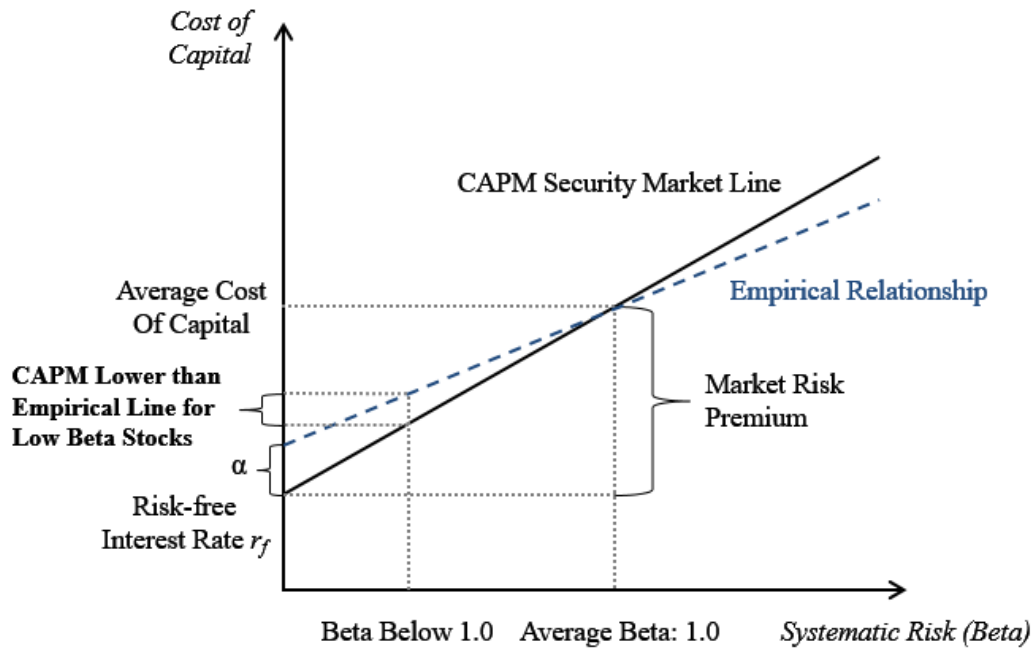
¹¹⁴ In the 2019 Cost of Capital Proceeding the relied upon MRPs were 6.9 percent for the historic MRP and 8.07 percent for the forecasted MRP. The historic MRP is that most recently reported by Duff & Phelps – now 7.25 percent. The forward-looking MRP was derived using the spread between utility bond yields and government bond yields in the prior cost of capital proceeding using the method described in the academic paper by Edwin J. Elton, Martin J. Gruber, Deepak Agarwal, and Christopher Mann, “Explaining the Rate Spread on Corporate Bonds,” *Journal of Finance*, February 2001, pp. 247-277. See also Villadsen Direct Testimony in Application A.19-040014, pp. 42-43. At present, I conservatively rely on the Bloomberg forecasted MRP but note that, for example, FERC’s approach to determining the MRP would result in an MRP of 9.6 to 10.9 percent.

¹¹⁵ See *Value Line Glossary*, accessible at <http://www.valueline.com/Glossary/Glossary.aspx>

¹¹⁶ For a summary of the capital structure used to estimate the cost of equity for the proxy companies, see Appendix D, Schedule No. BV-4.

¹¹⁷ See Appendix D, Schedule Nos. BV-13 – BV-15. The Technical Appendix (Appendix BV-B) to this testimony provides a detailed description of the standard textbook formulas used to implement the “Hamada” technique for unlevering measured equity betas based on the proxy companies’ capital structures to calculate “asset betas” that measure the proxy companies’ business risk

Figure 16
The Empirical Security Market Line



1 Q65. Why do you use the ECAPM?

2 A65. Academic research finds that the CAPM has not generally performed well as an empirical
3 model. One of its shortcomings is directly addressed by the ECAPM, which recognizes
4 the consistent empirical observation that the CAPM underestimates the cost of capital for
5 low beta stocks. In other words, the ECAPM is based on recognizing that the actual
6 observed risk-return line is flatter and has a higher intercept than that predicted by the
7 CAPM. The alpha parameter (α) in the ECAPM adjusts for this fact, which has been
8 established by repeated empirical tests of the CAPM. Appendix BV-B Section II.C
9 discusses the empirical findings that have tested the CAPM and also provides
10 documentation for the magnitude of the adjustment, α .

1 **3. Results from the CAPM Based Models**

2 **Q66. Please summarize the parameters of the scenarios and variations you considered in**
3 **your CAPM and ECAPM analyses.**

4 A66. The parameters are displayed in Figure 17 below. As discussed above, I consider two
5 scenarios. In each case, the risk-free interest rate represents Blue Chip Economic
6 Indicators' projection for the ten-year Treasury Yield in 2023, adjusted to a 20-year
7 horizon. The MRP is the long-term historical arithmetic average of annual realized
8 premiums of U.S. stock market returns over long-term (approximately 20-year maturity)
9 Treasury bond income returns from 1926 to 2020 as reported by Duff and Phelps in
10 Scenario 1. In Scenario 2, I look to the forecasted yield from Bloomberg. The
11 Bloomberg forecasted MRP is below that recently calculated using the Federal Energy
12 Regulatory Commission's preferred method to determine the MRP (resulting in an MRP
13 of 9.6 to 10.9 percent)¹¹⁹ and is thus conservative.¹²⁰

Figure 17
Parameters in Risk Positioning Analyses

	Scenario I	Scenario II
Risk-Free Rate	2.8%	2.8%
MRP	7.25%	8.08%
Beta	Sourced from Value Line	Sourced from Value Line

14 **Q67. Please summarize the results of the CAPM-based models.**

15 A67. The results of CAPM and ECAPM estimation for the two proxy groups are presented in
16 Figure 18 below. The ranges of results for each model (CAPM and ECAPM) reflect the

¹¹⁹ FERC Opinion No. 569-A, Docket No. EL14-12-004, EL15-45-013, May 21, 2021, FERC Order on Rehearing, See Appendix BV-I.

¹²⁰ I note further that Bloomberg's forward-looking MRP as of June 30, 2021 is 8.18 percent over the 20-year Treasury bond yield and hence higher than the figure I use for the May 31, 2021 date.

1 application of different specific versions of the textbook formulas used to account for the
2 impact of financial leverage.

Figure 18
Panel A: Electric Sample CAPM / ECAPM Summary at 52% Equity

Estimated Return on Equity	Scenario 1 [1]	Scenario 2 [2]
Electric Sample		
<i>Financial Risk Adjusted Method</i>		
CAPM	10.2%	11.0%
ECAPM ($\alpha = 1.5\%$)	10.3%	11.2%
<i>Hamada Adjustment Without Taxes</i>		
CAPM	10.0%	10.8%
ECAPM ($\alpha = 1.5\%$)	10.0%	10.8%
<i>Hamada Adjustment With Taxes</i>		
CAPM	9.8%	10.6%
ECAPM ($\alpha = 1.5\%$)	9.9%	10.7%

Panel B: Electric Sample CAPM / ECAPM Summary with Debt Equivalence

Estimated Return on Equity	Scenario 1 [1]	Scenario 2 [2]
Electric Sample		
<i>Financial Risk Adjusted Method</i>		
CAPM	10.4%	11.2%
ECAPM ($\alpha = 1.5\%$)	10.6%	11.4%
<i>Hamada Adjustment Without Taxes</i>		
CAPM	10.1%	11.0%
ECAPM ($\alpha = 1.5\%$)	10.1%	11.0%
<i>Hamada Adjustment With Taxes</i>		
CAPM	10.0%	10.8%
ECAPM ($\alpha = 1.5\%$)	10.0%	10.8%

Sources and Notes:

[1]: Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 7.25%.

[2]: Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 8.08%.

Figure 19
Panel A: OHRU Sample CAPM / ECAPM Summary at 52% Equity

Estimated Return on Equity	Scenario 1 [1]	Scenario 2 [2]
OHRU Sample		
<i>Financial Risk Adjusted Method</i>		
CAPM	10.4%	11.2%
ECAPM ($\alpha = 1.5\%$)	10.7%	11.6%
<i>Hamada Adjustment Without Taxes</i>		
CAPM	10.0%	10.8%
ECAPM ($\alpha = 1.5\%$)	10.0%	10.9%
<i>Hamada Adjustment With Taxes</i>		
CAPM	9.8%	10.6%
ECAPM ($\alpha = 1.5\%$)	9.8%	10.6%

1 **Panel B: OHRU Sample CAPM / ECAPM Summary with Debt Equivalence**

OHRU Sample		
<i>Financial Risk Adjusted Method</i>		
CAPM	10.6%	11.5%
ECAPM ($\alpha = 1.5\%$)	10.9%	11.8%
<i>Hamada Adjustment Without Taxes</i>		
CAPM	10.2%	11.1%
ECAPM ($\alpha = 1.5\%$)	10.2%	11.0%
<i>Hamada Adjustment With Taxes</i>		
CAPM	9.9%	10.7%
ECAPM ($\alpha = 1.5\%$)	9.9%	10.8%

Sources and Notes:

[1]: Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 7.25%.

[2]: Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 8.08%.

2

3 **Q68. How do you interpret the results of your CAPM and ECAPM Analyses?**

4 A68. Looking to Figure 18 above, the results for the Electric Sample are in the range of 9.75
5 percent to 11.25 percent using the regulatory capital structure and in the range of 10
6 percent to 11.5 percent using the capital structure that included debt equivalence.¹²¹ At

¹²¹ I round to the nearest 0.25 percent when determining ranges of reasonable results.

1 the same time, the results for the OHRU are higher and in the range of 9.75 percent to
2 11.50 percent using the regulatory capital structure and in the range of 10 percent to 11.75
3 percent using the capital structure that includes debt equivalence. As discussed above,
4 the established academic evidence indicates that the traditional CAPM tends to
5 understate the cost of equity for lower-than-average risk companies such as those in the
6 Electric Utility Proxy Group and the OHRU. I therefore give somewhat greater weight
7 to the ECAPM results to inform my recommendation.

8 **D. DCF BASED ESTIMATES**

9 **Q69. Can you describe the DCF model's approach to estimating the cost of equity?**

10 A69. The DCF model attempts to estimate the cost of capital for a given company directly,
11 rather than based on its risk relative to the market as the CAPM does. The DCF method
12 assumes that the market price of a stock is equal to the present value of the dividends that
13 its owners expect to receive. The method also assumes that this present value can be
14 calculated by the standard formula for the present value of a cash flow—literally a stream
15 of expected “cash flows” discounted at a risk-appropriate discount rate. When the cash
16 flows are dividends, that discount rate is the cost of equity capital:

17
$$P_0 = \frac{D_1}{1+r} + \frac{D_2}{(1+r)^2} + \frac{D_3}{(1+r)^3} + \dots + \frac{D_T}{(1+r)^T} \quad (3)$$

18 Where,

19 P_0 is the current market price of the stock;

20 D_t is the dividend cash flow expected at the end of period t ;

21 T is the last period in which a dividend cash flow is to be received; and

22 r is the cost of equity capital.

1 model, earnings and dividends can grow at different rates, but must grow at the same rate
2 in the final, constant growth rate period.¹²³

3 In my implementation of the multi-stage DCF, I assume that companies grow their
4 dividend for five years at the forecasted company-specific rate of earnings growth, with
5 that growth then tapering over the next five years toward the growth rate of the overall
6 economy (*i.e.*, the long-term GDP growth rate forecasted to be in effect ten years or more
7 into the future).

8 **1. DCF Inputs and Results**

9 **Q71. What growth rate information do you use?**

10 A71. The first step in my DCF analysis (either constant growth or multi-stage formulations) is
11 to examine a sample of investment analysts' forecasted earnings growth rates for
12 companies in my proxy group. For the single-stage DCF and for the first stage of the
13 multi-stage DCF, I use investment analyst forecasts of company-specific growth rates
14 sourced from *Value Line* and Thomson Reuters *IBES*.

15 For the long-term growth rate for the final, constant-growth stage of the multistage DCF
16 estimates, I use the long-term U.S. GDP growth forecast of 3.9 percent from Blue Chip
17 Economic Indicators.¹²⁴ Thus, the long-run (or terminal) growth rate in the multi-stage
18 model is nominal GDP growth.

19 **Q72. What are the pros and cons of the input data?**

20 A72. Both the Gordon Growth and single-stage DCF models require forecast growth rates that
21 reflect investor expectations about the pattern of dividend growth for the companies over
22 a sufficiently long horizon, but estimates are typically only available for three - five years.

¹²³ See Appendix BV-B, Section I for further discussion of the various versions of the DCF model, as well as the details of the specific versions I implement in this proceeding.

¹²⁴ See Blue Chip Economic Indicators, March 2021, p. 14.

1 In the multi-stage version, I taper these growth rates toward a stable growth rate
2 corresponding to a forecast of long-term GDP growth for all companies.

3 One issue with the data is that it includes solely dividend payments as cash distributions
4 to shareholders, while some companies also use share repurchases to distribute cash to
5 shareholders. To the extent that companies distribute cash to shareholders via share
6 repurchases, a DCF model that uses dividends as the payment to shareholders will under-
7 estimate the cost of equity capital.

8 **Q73. Please summarize the DCF based cost of equity estimates for the proxy groups.**

9 A73. The results of the DCF based estimation for the proxy groups are displayed below in
10 Figure 20.

Figure 20
Panel A: DCF Model Results for Electric and OHRU at 52% Equity

	Simple	Multi-stage
	[1]	[2]
Electric Sample	9.9%	8.2%
OHRU Sample	10.4%	7.5%

11 **Panel B: DCF Model Results for Electric and OHRU with Debt Equivalence**

	Simple	Multi-stage
	[1]	[2]
Electric Sample	10.1%	8.4%
OHRU Sample	10.6%	7.7%

12

13 **Q74. How do you interpret the results of your DCF analyses?**

14 A74. The DCF models are estimated based on dividend yields that may be expected to increase
15 as interest rates continue to rise in the coming months and years. As a consequence, the
16 multi-stage DCF model's assumption that *current* prices reflect investors' expectations

1 that dividend growth will converge with the rate of GDP growth in the long term may
2 underestimate how that pattern of expected dividends will be valued in the market
3 throughout the period for which the rates decided in this proceeding will be in effect (*i.e.*,
4 2022 onward).¹²⁵ Thus, while I acknowledge that the single-stage DCF model makes the
5 strong assumption that current three-to-five year Earnings Per Share growth expectations
6 will persist into perpetuity, I conclude that a reasonable estimate of the cost of equity
7 falls somewhere between what is estimated by the two versions of the model but much
8 closer to the single-stage DCF than the multi-stage DCF. In considering the results from
9 the two proxy groups, I believe the Electric DCF model supports a range of 9 to 10
10 percent and the OHRU sample a range of 9 – 10.5 percent at 52 percent equity. Including
11 debt equivalence in the capital structure, a reasonable ROE based on the Electric DCF
12 model is in the range of 9.25 percent to 10.0 percent and 9.25 percent to 10.5 percent for
13 the Electric and OHRU proxy sample, respectively.¹²⁶

14 **E. RISK PREMIUM MODEL ESTIMATES**

15 **Q75. Did you estimate the cost of equity that results from an analysis of risk premiums**
16 **implied by allowed ROEs in past utility rate cases?**

17 A75. Yes. In this type of analysis, sometimes called the “risk premium model,” the cost of
18 equity capital for utilities is estimated based on the historical relationship between
19 allowed ROEs in utility rate cases and the risk-free rate of interest at the time the ROEs
20 were granted. These estimates add a “risk premium” implied by this relationship to the
21 relevant (prevailing or forecast) risk-free interest rate:

¹²⁵ Blue Chip’s forecasted nominal GDP growth was 3.9 percent at the time of estimation. Thus, it includes both real growth and inflation. If the inflation rate picks up as indicated by the inflation figure for April, the nominal GDP growth will necessarily increase and the use of the current (as of March 2021) estimate will be too low.

Source: Bureau of Labor Statistics: [CPI Home : U.S. Bureau of Labor Statistics \(bls.gov\)](https://www.bls.gov/cpi/), <https://www.bls.gov/cpi/>; viewed May 16, 2021.

¹²⁶ The lower bound is calculated as the average of the single-stage and the multi-stage results, while the upper end is the single-stage result. In each case, I round to the nearest ¼ percent.

1
$$\text{Cost of Equity} = r_f + \text{Risk Premium}$$

2 **Q76. What are the merits of this approach?**

3 A76. First, it estimates the cost of equity from regulated entities as opposed to holding
4 companies, so that the relied-upon figure is directly applicable to a rate base. Second,
5 the allowed returns are readily observable to market participants, who will use this one
6 data input in making investment decisions. Therefore, the information is at the very least
7 a good check on whether the return is comparable to that of other investments. Third, I
8 analyze the spread between the allowed ROE at a given time and the then-prevailing
9 interest rate to ensure that I properly consider the interest rate regime at the time the ROE
10 was awarded. This implementation ensures that I can compare allowed ROE granted at
11 different times and under different interest rate regimes.

12 **Q77. How did you use rate case data to estimate the risk premiums for your analysis?**

13 A77. The rate case data from 1990-2021Q1 is derived from Regulatory Research Associates.¹²⁷
14 Using this data I compared (statistically) the average allowed rate of return on equity
15 granted by U.S. state regulatory agencies in electric utility and electric distribution rate
16 cases to the average 20--year Treasury bond yield that prevailed in each quarter.¹²⁸ I
17 calculated the allowed utility “risk premium” in each quarter as the difference between
18 allowed returns and the Treasury bond yield, since this represents the compensation for
19 risk allowed by regulators. Then I used the statistical technique of ordinary least squares
20 (“OLS”) regression to estimate the parameters of the linear equation:

21
$$\text{Risk Premium} = A_0 + A_1 \times (\text{Treasury Bond Yield}) \quad (8)$$

¹²⁷ SNL Financial as of May 2021.

¹²⁸ I rely on the 20-year government bond to be consistent with the analysis using the CAPM to avoid confusion about the risk-free rate. While it is important to use a long-term risk-free rate to match the long-lived nature of the assets, the exact maturity is a matter of choice.

1 I derived my estimates of A_0 and A_1 using standard statistical methods (OLS regression).
 2 I report my results for the two periods in Figure 21. The statistical analysis underlying
 3 the results below are reported in Appendix BV-E and Appendix BV-F, which shows that
 4 the risk premium model fits the data well as the R-squared is above 80 percent and R-
 5 squared is a measure of how well the data fits the model. Statistical analyses with higher
 6 R-squared results are rare in economics.

Figure 21
Panel A: Implied Risk Premium - All Electric Utilities

	R Squared	Estimate of Intercept (A_0)	Estimate of Slope (A_1)	Implied Cost of Equity Range
	[1]	[2]	[3]	[4]
Electric Utility	86.1%	8.54%	-0.55%	9.8%

Sources and Notes:

[1]-[3]: Estimated Using S&P Market Intelligence, as of February 2021

[4]: Risk-free rate of 2.8%

Panel B: Implied Risk Premium – Vertically Integrated Electric Utilities

	R Squared	Estimate of Intercept (A_0)	Estimate of Slope (A_1)	Implied Cost of Equity Range
	[1]	[2]	[3]	[4]
Electric Utility	87.0%	8.7%	-57.5%	9.9%

Sources and Notes:

[1]-[3]: Estimated Using S&P Market Intelligence, as of February 2021

[4]: Risk-free rate of 2.8%

7 The negative slope coefficient reflects the empirical fact that regulators grant smaller risk
 8 premiums when risk-free interest rates (as measured by Treasury bond yields) are higher.
 9 This is consistent with past observations that the premium investors require to hold equity
 10 over government bonds increases as government bond yields decline. In the regression

1 described above, the risk premium declined by less than the increase in Treasury bond
2 yields. Therefore, the allowed ROE on average declined by less than 100 bps when the
3 government bond yield declined by 100 bps. Based on this analysis, I find that the current
4 market conditions are consistent with an ROE of 9.8 percent for all electric utilities and
5 9.9 percent for vertically integrated electric utilities.

6 **Q78. What conclusions did you draw from your risk premium analysis?**

7 A78. The results in Figure 21 indicate an ROE of 9.8 to 9.9 percent for SCE based on the risk
8 premium model, which overlaps with the estimates from the reasonable range from the
9 DCF and CAPM models at 52 percent equity. While the risk premium model based on
10 historical allowed returns is not underpinned by fundamental finance principles in the
11 manner of the CAPM or DCF models, I believe that this analysis, when properly designed
12 and executed and placed in the proper context, is a valid and useful approach to
13 estimating utility ROE. Because the risk premium analysis as implemented takes into
14 account the interest rate prevailing during the quarter when the decision granting the ROE
15 was issued, it provides a useful benchmark for the cost of equity in any interest
16 environment. Because it relies on the returns for regulated utilities, I believe this method
17 provides a good way to directly assess whether the ROE is commensurate with that
18 available to alternative investments of similar risk. The average and median equity
19 percentage for electric utilities having an ROE determination in 2021 was 50 and 52
20 percent, respectively, which are very close to that of SCE.

21 **Q79. Please summarize your results before considering where to place SCE.**

22 A79. Figure 22 below summarizes the ranges of results I obtained above.

23

Figure 22: Summary of Results

	At 52% Equity		Including Debt Equivalence	
	Low End	High End	Low End	High End
CAPM / ECAPM	9.75%	11.50%	10.00%	11.75%
DCF	9.00%	10.50%	9.25%	10.50%
Risk Premium	9.80%	9.90%	9.80%	9.90%
Midpoint	9.40%	10.70%	9.63%	10.83%
Average	9.52%	10.63%	9.68%	10.72%

1 Based on the results above, a reasonable range for an electric utility, prior to any unique
2 company or jurisdictional considerations, is 9.5 to 10.75 percent (rounded to the nearest
3 ¼ percent). This range is determined as the average low end rounded to the nearest ¼
4 percent to the average of the high end rounded to the nearest ¼ percent. Taking debt
5 equivalence into account a reasonable range is 9.75 percent to 10.75 percent.¹²⁹

6 **VII. SCE SPECIFIC CIRCUMSTANCES AND ROE RECOMMENDATION**

7 **A. BUSINESS RISK CHARACTERISTICS**

8 **Q80. What business risks does SCE face?**

9 A80. As discussed in the Company's Testimony, the Company's exposure to wildfire risk
10 remains high and EIX has issued shares to cover part of its wildfire liabilities.¹³⁰ As
11 discussed in the Company Testimony, (i) the wildfire season and the magnitude has
12 increased in recent years, (ii) risks associated with the implementation of AB 1054
13 remain, and (iii) equity analysts explicitly discount EIX's stock price for wildfire risks.¹³¹

¹²⁹ Because the Commission in the past has been critical of the ATWACC method, I note that the range of 9.75 to 10.75 percent is fully supported without reliance on an application of the ATWACC method in the CAPM.

¹³⁰ Company Testimony, Section IV; Value Line Investment Survey, Edison International, April 24, 2021.

¹³¹ Company Testimony, Section IV.

1 Additionally, SCE’s credit metrics remain below those of its peers¹³² and SCE has
2 substantial deferral balances, meaning that there are very large outstanding balances that
3 has yet to be collected.¹³³ The combination of relatively weak credit metrics, large
4 wildfire obligations, and large deferral balances, which imply postponed cash flows,
5 increases SCE’s relative risks. Regardless of a utility’s financial circumstances, changes,
6 and especially uncertain changes, expose it to risk, which is magnified if cash flow is
7 lower than among the peers.

8 As discussed in the Company’s Testimony, the accumulation in deferral accounts
9 exceeds \$1 billion, which constitute a substantial proportion of the Company’s rate base,
10 and during the COVID-19 period arrearages have increased substantially.¹³⁴ As a result
11 SCE needs to fund substantial amounts that are not reflected in the rate base and more
12 than what I reflected in the capital structure that includes debt equivalence. Because of
13 the magnitude of deferred amounts and the arrearages, the Company’s leverage is higher
14 than what is reflected in the figures above, so that the Company faces risks of realizing
15 the funds, and, due to the lag in getting cash flow, credit metric pressures. These facts
16 mean that the Company’s business risks are higher than those of its peers. This is
17 discussed at length in the Company Testimony.

18 **Q81. Has the Commission in the past recognized SCE’s higher than average business**
19 **risk?**

20 A81. Yes. In Decision 12-12-034, the Commission noted:

21 [W]e conclude that the adopted ROE should be set at the upper end
22 of the adopted ROE range found just and reasonable.¹³⁵

23
24 Consequently, it is not new to the Commission that SCE faces risks above and beyond
25 those of the proxy companies. For example, in Decision 19-12-056, the Commission

¹³² *Id.*, Section V.

¹³³ *Id.*, Section IV.

¹³⁴ *Id.*, Section IV.

¹³⁵ CPUC Decision 12-12-034, issued December 26, 2012. p. 39.

1 again found that SCE’s return on equity should be set in the upper end of what was just
2 and reasonable¹³⁶ and authorized an ROE of 10.3 percent, “significantly higher than
3 the 9.60% average ROEs granted to United States electric utilities during 2018.”¹³⁷

4 **VIII. COST OF CAPITAL RECOMMENDATION**

5 **Q82. What do you recommend regarding the CCM?**

6 A82. I recommend that the CCM adjustment mechanism not be applied to the 2022 year. The
7 reasons for this recommendation are the extraordinary financial market conditions caused
8 by the COVID-19 pandemic and the adverse impact on utilities and especially SCE. As
9 shown in Section III, the impact on the utility industry’s systematic risk and consequently
10 the utility risk premium has been dramatic. Therefore, changes in utility bond yields are
11 currently not an approximation for changes in the cost of capital. Therefore, it would not
12 be appropriate to use the CCM adjustment mechanism to set the cost of equity for 2022.

13 **Q83. What do you recommend regarding SCE’s return on equity and the ROE that the**
14 **Commission should set?**

15 A83. I recommend SCE be allowed an ROE at the top of the reasonable range and a regulatory
16 equity percentage of 52 percent. The reasonable range for a sample of electric utilities is
17 9.5 to 10.75 percent before any consideration of company or jurisdictional risk. Based
18 on the business risks of SCE and the risks inherently in California, I recommend that
19 SCE be placed at the top of the reasonable range. The recommendation is supported by
20 the asymmetric risk SCE faces from wildfire risks, the risks associated with the
21 implementation of AB 1054, the very large deferral balances, and relatively low credit
22 metrics. It is also consistent with the Commission’s past recognition that the “adopted
23 ROE should be set at the upper end of the adopted ROE range found just and reasonable.”

¹³⁶ CPUC Decision 19-12-056, issued December 12, 2020, pp. 40-41.

¹³⁷ *Ibid.*, p. 2.

1 Looking to the numerical analysis, the recommendation is supported by looking to the
2 average and midpoint of the results from the models. For example, the midpoint of the
3 high end of the range is 10.83 percent and the average is 10.63 percent if debt equivalence
4 is considered, so the upper end is reasonably approximated by 10.75 percent. The range
5 is fully supported by looking to the Commission's preferred financial leverage
6 consideration.¹³⁸ Lastly, I note that if ongoing inflation risks materialize, the
7 recommended return on equity may well be below what would be reasonable in an
8 inflationary environment.

9 **Q84. Does your recommendation include any return to investors for SCE's wildfire**
10 **risks?**

11 A84. I have not explicitly considered a wildfire premium in this proceeding, but I did consider
12 SCE's unique business risks.

13

¹³⁸ Ignoring the figures obtained using the ATWACC method, the CAPM / ECAPM results range from 9.9 to 11.0 percent for the electric utility proxy group and from 9.8 to 11.1 percent for the OHRU proxy group. Hence the CAPM / ECAPM results include the upper bound of 10.75 percent.

1 **SOUTHERN CALIFORNIA EDISON COMPANY**
2 **QUALIFICATIONS AND PREPARED TESTIMONY**
3 **OF DR. BENTE VILLADSEN**

4 **Q85. Please state your name and business address for the record.**

5 A85. My name is Bente Villadsen, and my business address is The Brattle Group, One Beacon
6 St., Suite 2600, Boston, MA 02108.

7 **Q86. Briefly describe your present responsibilities at The Brattle Group.**

8 A86. As a Principal it is my responsibility to research and direct research into the utility
9 industry as it pertains to cost of capital and related issues. It is also my responsibility to
10 consult on utility industry issues and testify, when appropriate. Among my other duties
11 is the supervision and training of staff and ensuring that work products are of high quality
12 and accurate.

13 **Q87. Briefly describe your educational and professional qualifications.**

14 A87. I have 20 years of experience working with regulated utilities on cost of capital and
15 related matters. My practice focuses on cost of capital, regulatory finance, and
16 accounting issues. I am the co-author of the text, “Risk and Return for Regulated
17 Industries”¹³⁹ and a frequent speaker on regulatory finance at conferences or webinars. I
18 have testified or filed expert reports on cost of capital in Alaska, Arizona, California,
19 Hawaii, Illinois, New Mexico, New York, Ohio, Oregon, and Washington, as well as
20 before the Bonneville Power Administration, Federal Energy Regulatory Commission,
21 the Surface Transportation Board, the Alberta Utilities Commission, and the Ontario
22 Energy Board. I have provided white papers on cost of capital to the British Columbia
23 Utilities Commission, the Canadian Transportation Agency as well as to European and

¹³⁹ Bente Villadsen, Michael J. Vilbert, Dan Harris, A. Lawrence Kolbe, “Risk and Return for Regulated Industries,” Academic Press, 2017.

1 Australian regulators on cost of capital. I have testified or filed testimony on regulatory
2 accounting issues before the Federal Energy Regulatory Commission (“FERC”), the
3 Regulatory Commission of Alaska, the Michigan Public Service Commission, the Texas
4 Public Utility Commission as well as in international and U.S. arbitrations and regularly
5 provide advice to utilities on regulatory matters as well as risk management.

6 I hold a Ph.D. from Yale University and a BS/MS from University of Aarhus, Denmark.
7 Appendix BV-A contains more information on my professional qualifications as well as
8 a list of my prior testimonies and publications.

9 **Q88. What is the purpose of your testimony in this proceeding?**

10 A88. I am sponsoring Exhibit SCE-02 including attached Appendices: BV-A through BV-I.
11 Specifically, Southern California Edison Company (“SCE” or the “Company”) has asked
12 me to estimate the cost of equity that the Public Utilities Commission of the State of
13 California (“Commission”) should allow SCE an opportunity to earn on the equity
14 financed portion of its regulated utility rate base.

15 **Q89. Was this material prepared by you or under your supervision?**

16 A89. Yes. It was.

17 **Q90. Insofar as this material is factual in nature, do you believe it to be correct?**

18 A90. Yes, I do.

19 **Q91. Insofar as this material is in the nature of opinion or judgment, does it represent**
20 **your best judgment?**

21 A91. Yes, it does.

22

23 **Q92. Does this conclude your direct testimony?**

24 A92. Yes, it does.

APPENDICES TO EXHIBIT SCE-02

(Direct Testimony of Dr. Bente Villadsen)

Appendix BV-A: Resume of Dr. Bente Villadsen

Appendix BV-B: Technical Appendix

Appendix BV-C: Cost of Equity Estimation at 52% Equity

Appendix BV-D: Cost of Equity Estimation including Debt Equivalence

Appendix BV-E: Implied Risk Premium – All Electric

Appendix BV-F: Implied Risk Premium – Vertically Integrated Electric

Appendix BV-G: Value Line and Estimated Betas

Appendix BV-H: P/E Ratios

Appendix BV-I: FERC Approach to Calculating MRP

APPENDIX A: RESUME OF DR. BENTE VILLADSEN

BENTE VILLADSEN RESUME

Dr. Bente Villadsen's work concentrates in the areas of regulatory finance and accounting. Her recent work has focused on accounting issues, damages, cost of capital and regulatory finance. Dr. Villadsen has testified on cost of capital and accounting, analyzed credit issues in the utility industry, risk management practices as well the impact of regulatory initiatives such as energy efficiency and de-coupling on cost of capital and earnings. Among her recent advisory work is assisting entities in the acquisition of regulated utilities regarding issues such the return on equity, capital structure, recovery of costs and capital expenditures, growth opportunities, and regulatory environments as well as the precedence for regulatory approval in mergers or acquisitions. Dr. Villadsen's accounting work has pertained to disclosure issues and principles including impairment testing, fair value accounting, leases, accounting for hybrid securities, accounting for equity investments, cash flow estimation as well as overhead allocation. Dr. Villadsen has estimated damages in the U.S. as well as internationally for companies in the construction, telecommunications, energy, cement, and rail road industry. She has filed testimony and testified in federal and state court, in international and U.S. arbitrations and before state and federal regulatory commissions on accounting issues, damages, discount rates and cost of capital for regulated entities.

Dr. Villadsen holds a Ph.D. from Yale University's School of Management with a concentration in accounting. She has a joint degree in mathematics and economics (BS and MS) from University of Aarhus in Denmark. Prior to joining The Brattle Group, Dr. Villadsen was a faculty member at Washington University in St. Louis, University of Michigan, and University of Iowa.

She has taught financial and managerial accounting as well as econometrics, quantitative methods, and economics of information to undergraduate or graduate students. Dr. Villadsen serves as the president of the Society of Utility Regulatory Financial Analysts for 2016-2018.

AREAS OF EXPERTISE

- Regulatory Finance
 - Cost of Capital
 - Cost of Service (including prudence)
 - Energy Efficiency, De-coupling and the Impact on Utilities Financials
 - Relationship between regulation and credit worthiness
 - Risk Management
 - Regulatory Advisory in Mergers & Acquisitions
- Accounting and Corporate Finance
 - Application of Accounting Standards
 - Disclosure Issues
 - Forensics
 - Credit Issues in the Utility Industry
- Damages and Valuation (incl. international arbitration)
 - Utility valuation

BENTE VILLADSEN RESUME

- Lost Profit for construction, oil&gas, utilities
- Valuation of construction contract
- Damages from the choice of inaccurate accounting methodology

EXPERIENCE

Regulatory Finance

- Dr. Villadsen has testified on cost of capital and capital structure for many regulated entities including electric and gas utilities, pipelines, railroads, water utilities and barges in many jurisdictions including at the FERC, the Surface Transportation Board, the states of Alaska, Arizona, California, Hawaii, Illinois, Michigan, New Mexico, New York, Oregon, and Washington as well as in the provinces of Alberta and Ontario.
- On behalf of the Association of American Railroads, Dr. Villadsen appeared as an expert before the Surface Transportation Board (STB) and submitted expert reports on the determination of the cost of equity for U.S. freight railroads. The STB agreed to continue to use two estimation methods with the parameters suggested.
- On behalf of two taxpayers, Dr. Villadsen has testified on the methodology used to estimate the discount rate for the income approach to property valuation in Utah district court.
- For several electric, gas and transmission utilities as well as pipelines in Alberta, Canada, Dr. Villadsen filed evidence and appeared as an expert on the cost of equity and appropriate capital structure for 2015-17. Her evidence was heard by the Alberta Utilities Commission.
- For potential acquirers of electric, natural gas, and water utilities, Dr. Villadsen has conducted regulatory due diligence in the form of an assessment of the regulatory environment in the jurisdictions at issue including the ability to earn the allowed return and recover costs associated with operations or capital expenditures. Her evaluations also involved an assessment of needed capital expenditures and the recovery of such expenditure through rates or specific adjustment clauses. Her prior work includes more than 15 US states, the FERC, and several Canadian provinces.
- Dr. Villadsen has estimated the cost of capital and recommended an appropriate capital structure for natural gas and liquids pipelines in Canada, Mexico, and the US. using the jurisdictions' preferred estimation technique as well as other standard techniques. This work has been used in negotiations with shippers as well as before regulators.

BENTE VILLADSEN RESUME

- For the Ontario Energy Board Staff, Dr. Villadsen submitted evidence on the appropriate capital structure for a power generator that is engaged in a nuclear refurbishment program.
- Dr. Villadsen has advised many acquirers and potential acquirers of regulated utilities regarding the return on equity, capital structure, recovery of costs and capital expenditures, growth opportunities, and regulatory environments as well as the precedence for regulatory approval in mergers or acquisitions. Her work has pertained to many jurisdiction in the U.S. and Canada including more than 20 states and three provinces as well as the Federal Energy Regulatory Commission. She has worked on electric, natural gas, pipeline, transmission, and water utility acquisitions.
- She has estimated the cost of equity on behalf of entities such as Anchorage Municipal Light and Power, Arizona Public Service, Portland General Electric, Anchorage Water and Wastewater, NW Natural, Nicor, Consolidated Edison, Southern California Edison, American Water, California Water, and EPCOR in state regulatory proceedings. She has also submitted testimony before the FERC on behalf of electric transmission and natural gas pipelines as well as Bonneville Power Authority. Much of her testimony involves not only cost of capital estimation but also capital structure, the impact on credit metrics and various regulatory mechanisms such as revenue stabilization, riders and trackers.
- In Australia, she has submitted led and co-authored a report on cost of equity and debt estimation methods for the Australian Pipeline Industry Association. The equity report was filed with the Australian Energy Regulator as part of the APIA's response to the Australian Energy Regulator's development of rate of return guidelines and both reports were filed with the Economic Regulation Authority by the Dampier Bunbury Pipeline. She has also submitted a report on aspects of the WACC calculation for Aurizon Network to the Queensland Competition Authority.
- In Canada, Dr. Villadsen has co-authored reports for the British Columbia Utilities Commission and the Canadian Transportation Agency regarding cost of capital methodologies. Her work consisted partly of summarizing and evaluating the pros and cons of methods and partly of surveying Canadian and world-wide practices regarding cost of capital estimation.
- Dr. Villadsen worked with utilities to estimate the magnitude of the financial risk inherent in long-term gas contracts. In doing so, she relied on the rating agency of Standard & Poor's published methodology for determining the risk when measuring credit ratios.

BENTE VILLADSEN RESUME

- She has worked on behalf of infrastructure funds, pension funds, utilities and others on understanding and evaluating the regulatory environment in which electric, natural gas, or water utilities operate for the purpose of enhancing investors ability to understand potential investments. She has also provided advise and testimony in the approval phase of acquisitions.
- On behalf of utilities that are providers of last resort, she has provided estimates of the proper compensation for providing the state-mandated services to wholesale generators.
- In connection with the AWC Companies application to construct a backbone electric transmission project off the Mid-Atlantic Coast, Dr. Villadsen submitted testimony before the Federal Energy Regulatory Commission on the treatment the accounting and regulatory treatment of regulatory assets, pre-construction costs, construction work in progress, and capitalization issues.
- On behalf of ITC Holdings, she filed testimony with the Federal Energy Regulatory Commission regarding capital structure issues.
- For a FERC-regulated entity, Dr. Villadsen undertook an assessment of the company's classification of specific long-term commitments, leases, regulatory assets, asset retirement obligations, and contributions / distributions to owners in the company's FERC Form 1.
- Testimony on the impact of transaction specific changes to pension plans and other rate base issues on behalf of Balfour Beatty Infrastructure Partners before the Michigan Public Service Commission.
- On behalf of financial institutions, Dr. Villadsen has led several teams that provided regulatory guidance regarding state, provincial or federal regulatory issues for integrated electric utilities, transmission assets and generation facilities. The work was requested in connection with the institutions evaluation of potential investments.
- For a natural gas utility facing concerns over mark to market losses on long term gas hedges, Dr. Villadsen helped develop a program for basing a portion of hedge targets on trends in market volatility rather than on just price movements and volume goals. The approach was refined and approved in a series of workshops involving the utility, the state regulatory staff, and active intervener groups. These workshops evolved into a forum for quarterly updates on market trends and hedging positions.
- She has advised the private equity arm of three large financial institutions as well as two infrastructure companies, a sovereign fund and pension fund in connection with their acquisition of regulated transmission, distribution or integrated electric assets in the U.S. and Canada. For these clients, Dr. Villadsen evaluated the regulatory climate and the treatment of

BENTE VILLADSEN RESUME

acquisition specific changes affecting the regulated entity, capital expenditures, specific cost items and the impact of regulatory initiatives such as the FERC's incentive return or specific states' approaches to the recovery of capital expenditures riders and trackers. She has also reviewed the assumptions or worked directly with the acquirer's financial model.

- On behalf of a provider of electric power to a larger industrial company, Dr. Villadsen assisted in the evaluation of the credit terms and regulatory provisions for the long-term power contract.
- For several large electric utility, Dr. Villadsen reviewed the hedging strategies for electricity and gas and modeled the risk mitigation of hedges entered into. She also studies the prevalence and merits of using swaps to hedge gas costs. This work was used in connection with prudence reviews of hedging costs in Colorado, Oregon, Utah, West Virginia, and Wyoming.
- She estimated the cost of capital for major U.S. and Canadian utilities, pipelines, and railroads. The work has been used in connection with the companies' rate hearings before the Federal Energy Regulatory Commission, the Canadian National Energy Board, the Surface Transportation Board, and state and provincial regulatory bodies. The work has been performed for pipelines, integrated electric utilities, non-integrated electric utilities, gas distribution companies, water utilities, railroads and other parties. For the owner of Heathrow and Gatwick Airport facilities, she has assisted in estimating the cost of capital of U.K. based airports. The resulting report was filed with the U.K. Competition Commission.
- For a Canadian pipeline, Dr. Villadsen co-authored an expert report regarding the cost of equity capital and the magnitude of asset retirement obligations. This work was used in arbitration between the pipeline owner and its shippers.
- In a matter pertaining to regulatory cost allocation, Dr. Villadsen assisted counsel in collecting necessary internal documents, reviewing internal accounting records and using this information to assess the reasonableness of the cost allocation.
- She has been engaged to estimate the cost of capital or appropriate discount rate to apply to segments of operations such as the power production segment for utilities.
- In connection with rate hearings for electric utilities, Dr. Villadsen has estimated the impact of power purchase agreements on the company's credit ratings and calculated appropriate compensation for utilities that sign such agreements to fulfill, for example, renewable energy requirements.
- Dr. Villadsen has been part of a team assessing the impact of conservation initiatives, energy efficiency, and decoupling of volumes and revenues on electric utilities financial performance.

BENTE VILLADSEN RESUME

Specifically, she has estimated the impact of specific regulatory proposals on the affected utilities earnings and cash flow.

- On behalf of Progress Energy, she evaluated the impact of a depreciation proposal on an electric utility's financial metric and also investigated the accounting and regulatory precedent for the proposal.
- For a large integrated utility in the U.S., Dr. Villadsen has for several years participated in a large range of issues regarding the company's rate filing, including the company's cost of capital, incentive based rates, fuel adjustment clauses, and regulatory accounting issues pertaining to depreciation, pensions, and compensation.
- Dr. Villadsen has been involved in several projects evaluating the impact of credit ratings on electric utilities. She was part of a team evaluating the impact of accounting fraud on an energy company's credit rating and assessing the company's credit rating but-for the accounting fraud.
- For a large electric utility, Dr. Villadsen modeled cash flows and analyzed its financing decisions to determine the degree to which the company was in financial distress as a consequence of long-term energy contracts.
- For a large electric utility without generation assets, Dr. Villadsen assisted in the assessment of the risk added from offering its customers a price protection plan and being the provider of last resort (POLR).
- For several infrastructure companies, Dr. Villadsen has provided advice regarding the regulatory issues such as the allowed return on equity, capital structure, the determination of rate base and revenue requirement, the recovery of pension, capital expenditure, fuel, and other costs as well as the ability to earn the allowed return on equity. Her work has spanned 12 U.S. states as well as Canada, Europe, and South America. She has been involved in the electric, natural gas, water, and toll road industry.

Accounting and Corporate Finance

- For an electric utility subject to international arbitration, Dr. Villadsen submitted expert testimony on the application of IFRS as it pertains to receivables, the classification of liabilities and contingencies.
- In international arbitration, she submitted an expert report on IFRS' requirements regarding carve out financials, impairment, the allocation of costs to segments, and disclosure issues.

BENTE VILLADSEN RESUME

- On behalf of a construction company in arbitration with a sovereign, Dr. Villadsen filed an expert report report quantifying damages in the form of lost profit and consequential damages.
- In arbitration before the International Chamber of Commerce Dr. Villadsen testified regarding the true-up clauses in a sales and purchase agreement, she testified on the distinction between accruals and cash flow measures as well as on the measurement of specific expenses and cash flows.
- On behalf of a taxpayer, Dr. Villadsen recently testified in federal court on the impact of discount rates on the economic value of alternative scenarios in a lease transaction.
- On behalf of a taxpayer, Dr. Villadsen has provided an expert report on the nature of the cost of equity used in regulatory proceedings as well as the interest rate regime in 2014.
- In an arbitration matter before the International Centre for Settlement of Investment Disputes, she provided expert reports and oral testimony on the allocation of corporate overhead costs and damages in the form of lost profit. Dr. Villadsen also reviewed internal book keeping records to assess how various inter-company transactions were handled.
- Dr. Villadsen provided expert reports and testimony in an international arbitration under the International Chamber of Commerce on the proper application of US GAAP in determining shareholders' equity. Among other accounting issues, she testified on impairment of long-lived assets, lease accounting, the equity method of accounting, and the measurement of investing activities.
- In a proceeding before the International Chamber of Commerce, she provided expert testimony on the interpretation of certain accounting terms related to the distinction of accruals and cash flow.
- In an arbitration before the American Arbitration Association, she provided expert reports on the equity method of accounting, the classification of debt versus equity and the distinction between categories of liabilities in a contract dispute between two major oil companies. For the purpose of determining whether the classification was appropriate, Dr. Villadsen had to review the company's internal book keeping records.
- In U.S. District Court, Dr. Villadsen filed testimony regarding the information required to determine accounting income losses associated with a breach of contract and cash flow modeling.

BENTE VILLADSEN RESUME

- Dr. Villadsen recently assisted counsel in a litigation matter regarding the determination of fair values of financial assets, where there was a limited market for comparable assets. She researched how the designation of these assets to levels under the FASB guidelines affect the value investors assign to these assets.
- She has worked extensively on litigation matters involving the proper application of mark-to-market and derivative accounting in the energy industry. The work relates to the proper valuation of energy contracts, the application of accounting principles, and disclosure requirements regarding derivatives.
- Dr. Villadsen evaluated the accounting practices of a mortgage lender and the mortgage industry to assess the information available to the market and ESOP plan administrators prior to the company's filing for bankruptcy. A large part of the work consisted of comparing the company's and the industry's implementation of gain-of-sale accounting.
- In a confidential retention matter, Dr. Villadsen assisted attorneys for the FDIC evaluate the books for a financial investment institution that had acquired substantial Mortgage Backed Securities. The dispute evolved around the degree to which the financial institution had impaired the assets due to possible put backs and the magnitude and estimation of the financial institution's contingencies at the time of it acquired the securities.
- In connection with a securities litigation matter she provided expert consulting support and litigation consulting on forensic accounting. Specifically, she reviewed internal documents, financial disclosure and audit workpapers to determine (1) how the balance's sheets trading assets had been valued, (2) whether the valuation was following GAAP, (3) was properly documented, (4) was recorded consistently internally and externally, and (5) whether the auditor had looked at and documented the valuation was in accordance with GAAP.
- In a securities fraud matter, Dr. Villadsen evaluated a company's revenue recognition methods and other accounting issues related to allegations of improper treatment of non-cash trades and round trip trades.
- For a multi-national corporation with divisions in several countries and industries, Dr. Villadsen estimated the appropriate discount rate to value the divisions. She also assisted the company in determining the proper manner in which to allocate capital to the various divisions, when the company faced capital constraints.
- Dr. Villadsen evaluated the performance of segments of regulated entities. She also reviewed and evaluated the methods used for overhead allocation.

BENTE VILLADSEN RESUME

- She has worked on accounting issues in connection with several tax matters. The focus of her work has been the application of accounting principles to evaluate intra-company transactions, the accounting treatment of security sales, and the classification of debt and equity instruments.
- For a large integrated oil company, Dr. Villadsen estimated the company's cost of capital and assisted in the analysis of the company's accounting and market performance.
- In connection with a bankruptcy proceeding, Dr. Villadsen provided litigation support for attorneys and an expert regarding corporate governance.

Damages and Valuation

- For the Alaska Industrial Development and Export Authority, Dr. Villadsen co-authored a report that estimated the range of recent acquisition and trading multiples for natural gas utilities.
- On behalf of a taxpayer, Dr. Villadsen testified on the economic value of alternative scenarios in a lease transaction regarding infrastructure assets.
- For a foreign construction company involved in an international arbitration, she estimated the damages in the form of lost profit on the breach of a contract between a sovereign state and a construction company. As part of her analysis, Dr. Villadsen relied on statistical analyses of cost structures and assessed the impact of delays.
- In an international arbitration, Dr. Villadsen estimated the damages to a telecommunication equipment company from misrepresentation regarding the product quality and accounting performance of an acquired company. She also evaluated the IPO market during the period to assess the possibility of the merged company to undertake a successful IPO.
- On behalf of pension plan participants, Dr. Villadsen used an event study estimated the stock price drop of a company that had engaged in accounting fraud. Her testimony conducted an event study to assess the impact of news regarding the accounting misstatements.
- In connection with a FINRA arbitration matter, Dr. Villadsen estimated the value of a portfolio of warrants and options in the energy sector and provided support to counsel on finance and accounting issues.

BENTE VILLADSEN RESUME

- She assisted in the estimation of net worth of individual segments for firms in the consumer product industry. Further, she built a model to analyze the segment's vulnerability to additional fixed costs and its risk of bankruptcy.
- Dr. Villadsen was part of a team estimating the damages that may have been caused by a flawed assumption in the determination of the fair value of mortgage related instruments. She provided litigation support to the testifying expert and attorneys.
- For an electric utility, Dr. Villadsen estimated the loss in firm value from the breach of a power purchase contract during the height of the Western electric power crisis. As part of the assignment, Dr. Villadsen evaluated the creditworthiness of the utility before and after the breach of contract.
- Dr. Villadsen modeled the cash flows of several companies with and without specific power contract to estimate the impact on cash flow and ultimately the creditworthiness and value of the utilities in question.

BOOKS

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“FERC’s new ROE methodology for pipelines and electric transmission,” (with Michael J. Vilbert) *UBS Fireside Chat*, June 24, 2020.

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Prepared Direct Testimony on the cost of equity for Southern California Edison's transmission assets submitted to the *Federal Energy Regulatory Commission*, Docket No. ER19-1553, April 2019.

Direct and Rebuttal Testimony on cost of equity for Consolidated Edison of New York submitted to the *New York Public Service Commission*, Matter No. 19-00317, January, June 2019.

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BENTE VILLADSEN RESUME

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Direct Testimony on the rate impact of the pension re-allocation and other items for Upper Peninsula Power Company in connection with the acquisition by BBIP before the *Michigan Public Service Commission* in Docket No. U-17564, March 2014.

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APPENDIX BV-B: TECHNICAL APPENDIX

This technical appendix contains methodological details related to the implementations of the DCF and CAPM / ECAPM models. It also contains a discussion of both the basic finance principles and the specific standard formulations of the financial leverage adjustments employed to determine the cost of equity for a company with the level of financial risk inherent in SCE’s requested regulatory capital structure.

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I. DCF Models

A. DCF ESTIMATION OF COST OF EQUITY

The DCF method for estimating the cost of equity capital assumes that the market price of a stock is equal to the present value of the dividends that its owners expect to receive. The method also assumes that this present value can be calculated by the standard formula for the present value of a cash flow stream:

$$P_0 = \frac{D_1}{1+r} + \frac{D_2}{(1+r)^2} + \frac{D_3}{(1+r)^3} + \dots + \frac{D_T}{(1+r)^T} \quad (1)$$

where P_0 is the current market price of the stock; D_t is the dividend cash flow expected at the end of period t ; r is the cost of equity capital; and T is the last period in which a dividend cash flow is to be received. The formula simply says that the stock price is equal to the sum of the expected future dividends, each discounted for the time and risk between now and the time the dividend is expected to be received. Since the current market price is known, it is possible to infer the cost of equity that corresponds to that price and a forecasted pattern of expected future dividends. In terms of Equation (1), if P_0 is known and D_1, D_2, \dots, D_T are estimated, an analyst can “solve for” the cost of equity capital r .

B. DETAILS OF THE DCF MODEL

Perhaps the most widely known and used application of the DCF method assumes that the expected rate of dividend growth remains constant forever. In the so-called Gordon Growth Model, the relationship expressed in Equation (1) is such that the present value equation can be rearranged algebraically into a formula for estimating the cost of equity. Specifically, if investors expect a dividend stream that will grow forever at a steady rate, then the market price of the stock will be given by

$$P_0 = \frac{D_1}{r-g} \quad (2)$$

where D_1 is the dividend expected at the end of the first period, g is the perpetual growth rate, and P_0 and r are the market price and the cost of capital, as before. Equation (2) is a simplified version of Equation (1) that can be solved algebraically to yield the well-known “DCF formula” for the cost of equity capital,

$$r = \frac{D_1}{P_0} + g = \frac{D_0 \times (1 + g)}{P_0} + g \quad (3)$$

There are other versions of the DCF model that relax this restrictive assumption and posit a more complex or nuanced pattern of expected future dividend payments. For example, if there is reason to believe that investors do *not* expect a company’s dividends to grow at a steady rate forever, but rather have different growth rate expectations in the near term (e.g., over the next five or ten years), compared to the distant future (e.g., a period *starting* ten years from the present moment), a “multi-stage” growth pattern can be modeled in the present value formula (Equation (1)).

1. Dividends, Cash Flows, and Share Repurchases

In addition to the DCF model described above, there are many alternative formulations. Notable among these are versions of the model that use cash flows rather than dividends in the present value formula (Equation (1)).¹

Because investors are interested in cash flow, it is technically important to capture *all* cash flows that are distributed to shareholders when estimating the cost of equity using the DCF method. In some circumstances, investors may expect to receive cash in forms other than dividends. An important example concerns the fact that many companies distribute cash to shareholders through share buybacks in addition to dividends. To the extent such repurchases are expected by investors, but not captured in the forecasted pattern of future dividends; a dividend-based implementation of the DCF model will underestimate the cost of equity.

Similarly, if investors have reason to suspect that a company’s dividend payments will not reflect a full distribution of its available cash free cash flows in the period they were generated, it may be appropriate to replace the forecasted dividends with estimated free cash flows to equity in the present value formula (Equation (1)). Focusing on *available* cash rather than that actually distributed in the form of dividends can help account for instances when near-term investing and financing activities (e.g., capital expenditures or asset sales, debt issuances or retirements, or share repurchases) may cause dividend growth patterns to diverge from growth in earnings.

¹ For an example in a regulatory context, the U.S. Surface Transportation Board uses a cash flow based model with three stages to estimate the cost of equity for the railroads. See Surface Transportation Board Decision, “STB Ex Parte No. 664 (Sub-No. 1),” Decided January 23, 2009. Confirmed in EP-664 (Sub-No. 2), October 31, 2016 and EP 664 (Sub-No. 4), June 23, 2020.

Many utility companies such as those included in my proxy group have long histories of paying a dividend. In fact, as mentioned in Section I of this Appendix, one of my standard requirements for inclusion in my proxy group is that a company pays dividends for 5-years without a gap or a dividend cut (on per share basis). Additionally, although some utility companies have engaged in share repurchase programs, the companies in my proxy group do not distribute substantial cash flows by means other than dividends.

C. DCF MODEL INPUTS

1. Dividends and Prices

As described above, DCF models are forward-looking, comparing the *current* price of a stock to its expected *future* dividends to estimate the required expected return demanded by the market for that stock (i.e., the cost of equity). Therefore, the models demand the current market price and currently prevailing forecasts of future dividends as inputs.

The stock price input I employ for each proxy group company is the average of the closing stock prices for the 15 trading days ending on the date of my analysis. This guards against biases that may arise on a single trading day, yet is consistent with using current stock prices.

2. Company Specific Growth Rates

a. Analysts' Forecasted Growth Rates

Finding the right growth rate(s) is usually the “hard part” of applying the DCF model, which is sometimes criticized due to what has been called “optimism bias” in the earnings growth rate forecasts of security analysts. Optimism bias is defined as tendency for analysts to forecast earnings growth rates that are higher than are actually achieved. Any optimism bias might be related to incentives faced by analysts that provide rewards not strictly based upon the accuracy of the forecasts. To the extent optimism bias is present in the analysts' earnings forecasts the cost of capital estimates from the DCF model would be too high.

While academic researchers during the 1990s as well as in early 2000s found evidence of analysts' optimism bias, there is some evidence that regulatory reforms have eliminated the issue. A more recent paper by Hovakimina and Saenyasiri (2010) found that recent efforts to curb analysts' incentive to provide optimistic forecasts have worked, so that “the median forecast bias essentially

disappeared.”² Thus, some recent research indicates that the analyst bias may be a problem of the past.

The findings of several academic studies³ show that analyst earnings forecasts turn out to be too optimistic for stocks that are more difficult to value, for instance, stocks of smaller firms, firms with high volatility or turnover, younger firms, or firms whose prospects are uncertain. Coincidentally, stocks with greater analyst disagreement have higher analyst optimism bias—all of these describe companies that are more volatile and/or less transparent—none of which is applicable to the majority of utility companies with wide analyst coverage and information transparency. Consequently, optimism bias is not expected to be an issue for utilities.

b. Sources for Forecasted Growth Rates

For the reasons described above, I rely on analyst forecasts of earnings growth for the company-specific growth rate inputs to my implementations of the single- and multi-stage DCF models. Most companies in my proxy group have coverage from equity analysts reporting to Thomson Reuters IBES, so I use the consensus 3-5 year EPS growth rate provided by that service. I supplement these consensus values with growth rates based on EPS estimates from *Value Line*.⁴

II. CAPM and ECAPM

A. THE CAPITAL ASSET PRICING MODEL (CAPM)

The Capital Asset Pricing Model (CAPM) is a theoretical model stating that the collective investment decisions of investors in capital markets will result in equilibrium prices for all risky assets such that the returns investors expect to receive on their investments are commensurate with the risk of those assets relative to the market as a whole. The CAPM posits a risk-return relationship known as the Security Market Line (see Figure 3 in the cost of capital report), in which

² A. Hovakimian and E. Saenyasiri, “Conflicts of Interest and Analyst Behavior: Evidence from Recent Changes in Regulation,” *Financial Analysts Journal*, vol. 66, 2010.

³ These studies include the following: (i) Hribar, P, McInnis, J. “Investor Sentiment and Analysts’ Earnings Forecast Errors,” *Management Science* Vol. 58, No. 2 (February 2012): pp. 293-307; (ii) Scherbina, A. (2004), “Analyst Disagreement, Forecast Bias and Stock Returns,” downloaded from Harvard Business School Working Knowledge: <http://hbswk.hbs.edu/item/5418.html>; and (iii) Michel, J-S., Pandes J.A. (2012), “Are Analysts Really Too Optimistic?” downloaded from <http://www.efmaefm.org>.

⁴ Specifically, I compute the growth rate implied by *Value Line*’s current year EPS estimate and its projected 3-5 year EPS estimate. I then average this in with the IBES consensus estimate as an additional independent estimate, giving it a weight of 1 and weighting the IBES consensus according to the number of analysts who contributed estimates.

the required expected return on an asset is proportional to that asset's risk relative to the market as measured by its "beta". More precisely, the CAPM states that the cost of capital for an investment S (e.g., a particular common stock), is given by the following equation:

$$r_s = r_f + \beta_s \times MRP \quad (4)$$

where r_s is the required return on investment S ;

r_f is the risk-free interest rate;

β_s is the beta risk measure for the investment S ; and

MRP is the market equity risk premium.

The CAPM is based on portfolio theory, and recognizes two fundamental principles of finance: (1) investors seek to minimize the possible variance of their returns for a given level of expected returns (or alternatively, they demand higher *expected* returns when there is greater uncertainty about those returns), and (2) investors can reduce the variability of their returns by diversifying—constructing portfolios of many assets that do not all go up or down at the same time or to the same degree. Under the assumptions of the CAPM, the market participants will construct portfolios of risky investments that minimize risk for a given return so that the aggregate holdings of all investors represent the "market portfolio." The risk-return trade-off faced by investors then concerns their exposure to the risk inherent in the market portfolio, as they weight their investment capital between the portfolio of risky assets and the risk-free asset.

Because of the effects of diversification, the relevant measure of risk for an individual security is its *contribution* to the risk of the market portfolio. Therefore, beta (β) is defined to capture the sensitivity of the security's returns to the market's returns. Formally,

$$\beta_s = \frac{\text{covariance}(r_s, R_m)}{\text{variance}(R_m)} \quad (5)$$

where R_m is the return on the market portfolio.

Beta is usually calculated by statistically comparing (using regression analysis) the excess (positive or negative) of the return on the individual security over the government bond rate with the excess of the return on a market index such as the S&P 500 over a government bond rate.

The basic idea behind beta is the risk that cannot be diversified away in large portfolios is what matters to investors. Beta is a measure of the risks that *cannot* be eliminated by diversification. It is this non-diversifiable risk, or "systematic risk", for which investors require compensation in the

form of higher expected returns. By definition, a stock with a beta equal to 1.0 has average non-diversifiable risk; its returns vary to the same degree as those on the market as a whole. According to the CAPM, the required return demanded by investors (i.e., the cost of equity) for investing in that stock will match the expected return on the market as a whole. Similarly, stocks with betas above 1.0 have more than average risk, and so have a cost of equity greater than the expected market return; those with betas below 1.0 have less than average risk, and are expected to earn lower than market levels of return.

B. INPUTS TO THE CAPM

1. The Risk-free Interest Rate

The precise meaning of a “risk-free” asset according to the finance theory underlying the CAPM is an investment whose return is guaranteed, with no possibility that it will vary around its expected value in response to the movements of the broader market. (Equivalently, the CAPM beta of a risk-free asset is zero.) In developed economies like the U.S., government debt is generally considered have no default risk. In this sense they are “risk-free”; however, unless they are held to maturity, the rate of return on government bonds may in fact vary around their stated or expected yields.⁵

The theoretical CAPM is a single period model, meaning that it posits a relationship between risk and return over a single “holding period” of an investment. Because investors can rebalance their portfolios over short horizons, many academic studies and practical applications of the CAPM use the short-term government bond as the measure of the risk-free rate of return. However, regulators frequently use a version based on a measure of the long-term risk-free rate; e.g., a long-term government bond. I rely on the 20-year Treasury bond as a measure of the risk-free asset in this proceeding.⁶ I use the term “risk-free rate” as describing the yield on the 20-year Treasury bond.

However, I do not believe the *current* yield on long-term Treasury bonds is a good estimate for the risk-free rate that will prevail over the time period relevant to this proceeding as currently prevailing bond yields are near historic lows for a variety of circumstances that should not be expected to persist for the reasons discussed in my direct testimony. For this reason I rely on the average of Blue Chip’s forecast of 2.1%, 2.3% and 2.5% for the yield on a 10-year Treasury bond

⁵ This is due to interest rate fluctuations that can change the market value of previously issued debt in relation to the yield on new issuances

⁶ The use of a 20-year government bond is consistent with the measurement of the Ibbotson MRP and permits me to use a series that has been in consistent circulation since the 1990’s (the 30-year government bond was not issued from 2002 to 2006).

for 2022, 2023 and 2024, which is the middle of the period for which the cost of capital is being determined.⁷ I adjust this value upward by 50 basis points, which is my estimate of the maturity premium for the 20-year over the 10-year Treasury Bond. This provides me with an estimate of the 20-year Treasury bond for 2022-2024 of 2.8%.

2. The Market Equity Risk Premium

a. Historical Average Market Risk Premium

Like the cost of capital itself, the market risk premium is a forward-looking concept. It is by definition the premium above the risk-free interest rate that investors can *expect* to earn by investing in a value-weighted portfolio of all risky investments in the market. The premium is not directly observable, and must be inferred or forecasted based on known market information.

One commonly use method for estimating the MRP is to measure the historical average premium of market returns over the income returns on risk-free government bonds over some long historical period. When such a calculation is performed using the traditional industry standard Ibbotson data, the result is an arithmetic average of the annual observed premiums of U.S. stock market returns over income returns on long-term (approximate average maturity of 20-years) U.S. Treasury bonds from 1926 to the present is 7.25%.⁸

b. Forward Looking Market Equity Risk Premium

An alternative approach to estimating the MRP eschews historical averages in favor of using current market information and forecasts to infer the expected return on the market as a whole, which can then be compared to prevailing government bond yields to estimate the equity risk premium. Bloomberg performs such estimates of country-specific MRPs by implementing the DCF model on the market as a whole—using forecast market-wide dividend yields and current level on market indexes; for the U.S. Bloomberg performs a multi-stage DCF using dividend-paying stocks in the S&P 500 to infer the expected market return.

When calculated relative to 20-year Treasury bond yields, Bloomberg's estimate of the forward-looking market-implied MRP at the end of May 2021 was 8.58% over the 10-year Treasury bond yield for a MRP of about 8.08 percent over the 20-year Treasury bond yield. This Bloomberg forward-looking MRP estimate is above the historical long-term average. I note that looking to the

⁷ Blue Chip Economic Indicators, March 2021.

⁸ Duff & Phelps, Cost of Capital Navigator, U.S. Cost of Capital Module 2021.

forward looking MRP using the methodology from the FERC Order 569-A is higher at 9.6% using Value Line growth rates and 10.9% using IBES growth rates.

C. THE EMPIRICAL CAPM

1. Description of the ECAPM

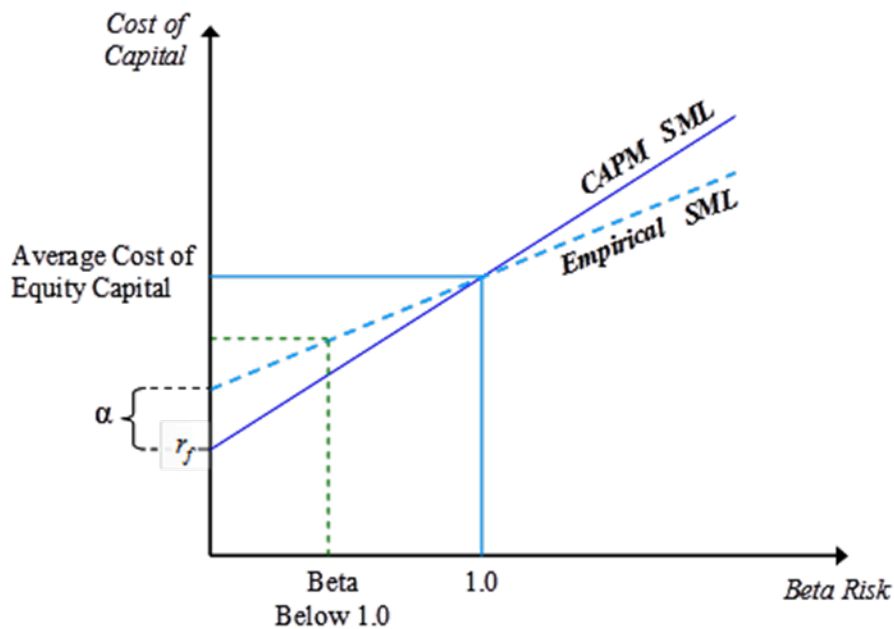
Empirical research has shown that the CAPM tends to overstate the actual sensitivity of the cost of capital to beta: low-beta stocks tend to have higher risk premiums than predicted by the CAPM and high-beta stocks tend to have lower risk premiums than predicted. A number of variations on the original CAPM theory have been proposed to explain this finding, but the observation itself can also be used to estimate the cost of capital directly, using beta to measure relative risk by making a direct empirical adjustment to the CAPM.

The Empirical CAPM (ECAPM) makes use of these empirical findings. It estimates the cost of capital with the equation,

$$r_S = r_f + \alpha + \beta_S \times (MRP - \alpha) \quad (6)$$

where α is the “alpha” adjustment of the risk-return line, a constant, and the other symbols are defined as for the CAPM (see Equation (4)). The alpha adjustment has the effect of increasing the intercept but reducing the slope of the Security Market Line, which results in a Security Market Line that more closely matches the results of empirical tests. In other words, the ECAPM produces more accurate predictions of eventual realized risk premiums than does the CAPM.

Figure B-1
The Empirical Security Market Line



2. Academic Evidence on the Alpha Term in the ECAPM

Figure B-2 below summarizes the empirical results of tests of the CAPM, including their estimates of the “alpha” parameter necessary to improve the accuracy of the CAPM’s predictions of realized returns.

Figure B-2

EMPIRICAL EVIDENCE ON THE ALPHA FACTOR IN ECAPM*

AUTHOR	RANGE OF ALPHA	PERIOD RELIED UPON
Black (1993) ¹	1% for betas 0 to 0.80	1931-1991
Black, Jensen and Scholes (1972) ²	4.31%	1931-1965
Fama and McBeth (1972)	5.76%	1935-1968
Fama and French (1992) ³	7.32%	1941-1990
Fama and French (2004) ⁴	N/A	
Litzenberger and Ramaswamy (1979) ⁵	5.32%	1936-1977
Litzenberger, Ramaswamy and Sosin (1980)	1.63% to 3.91%	1926-1978
Pettengill, Sundaram and Mathur (1995) ⁶	4.6%	1936-1990

* The figures reported in this table are for the longest estimation period available and, when applicable, use the authors' recommended estimation technique. Many of the articles cited also estimate alpha for sub-periods and those alphas may vary.

¹Black estimates alpha in a one step procedure rather than in an un-biased two-step procedure.

²Estimate a negative alpha for the subperiod 1931-39 which contain the depression years 1931-33 and 1937-39.

³Calculated using Ibbotson's data for the 30-day treasury yield.

⁴The article does not provide a specific estimate of alpha; however, it supports the general finding that the CAPM underestimates returns for low-beta stocks and overestimates returns for high-beta stocks.

⁵Relies on Lizenberger and Ramaswamy's before-tax estimation results. Comparable after-tax alpha estimate is 4.4%.

⁶Pettengill, Sundaram and Mathur rely on total returns for the period 1936 through 1990 and use 90-day treasuries. The 4.6% figure is calculated using auction averages 90-day treasuries back to 1941 as no other series were found this far back.

Sources:

Black, Fischer. 1993. Beta and Return. *The Journal of Portfolio Management* 20 (Fall): 8-18.

Black, F., Michael C. Jensen, and Myron Scholes. 1972. The Capital Asset Pricing Model: Some Empirical Tests, from *Studies in the theory of Capital Markets*. In *Studies in the Theory of Capital Markets*, edited by Michael C. Jensen, 79-121. New York: Praeger.

Fama, Eugene F. and James D. MacBeth. 1972. Risk, Returns and Equilibrium: Empirical Tests. *Journal of Political Economy* 81 (3): 607-636.

Fama, Eugene F. and Kenneth R. French. 1992. The Cross-Section of Expected Stock Returns. *Journal of Finance* 47 (June): 427-465.

Fama, Eugene F. and Kenneth R. French. 2004. The Capital Asset Pricing Model: Theory and Evidence. *Journal of Economic Perspectives* 18 (3): 25-46.

Litzenberger, Robert H. and Krishna Ramaswamy. 1979. The Effect of Personal Taxes and Dividends on Capital Asset Prices, Theory and Empirical Evidence. *Journal of Financial Economics* XX (June): 163-195.

Litzenberger, Robert H. and Krishna Ramaswamy and Howard Sosin. 1980. On the CAPM Approach to Estimation of a Public Utility's Cost of Equity Capital. *The Journal of Finance* 35 (2): 369-387.

III. Financial Risk and the Cost of Equity

A common issue in regulatory proceedings is how to apply data from a benchmark set of comparable securities when estimating a fair return on equity for the target/regulated company.⁹ It may be tempting to simply estimate the cost of equity capital for each of the proxy companies (using one of the above approaches) and average them. After-all, the companies were chosen to be comparable in their business risk characteristics, so why would an investor necessarily prefer equity in one to the other (on average)?

The problem with this argument is that it ignores the fact that underlying asset risk (i.e., the risk inherent in the lines of business in which the firm invests its assets) for each company is typically divided between debt and equity holders. The firm's debt and equity are therefore financial derivatives of the underlying asset return, each offering a differently structured claim on the cash flows generated by those assets. Even though the risk of the underlying assets may be comparable, a different capital structure splits that risk differently between debt and equity holders. The relative structures of debt and equity claims are such that higher degrees of debt financing increase the variability of returns on equity, *even when the variability of asset returns remains constant*. As a consequence, otherwise identical firms with different capital structures will impose different levels of risk on their equity holders. Stated differently, increased leverage adds financial risk to a company's equity.¹⁰

A. THE EFFECT OF FINANCIAL LEVERAGE ON THE COST OF EQUITY

To develop an intuition for the manner in which financial leverage affects the risk of equity, it is helpful to consider a concrete example. Figure B-3 and Figure B-4 below demonstrate the impact of leverage on the risk and return for equity by comparing equity's risk when a company uses no debt to finance its assets, and when it uses a 50-50 capital structure (i.e., it finances 50 percent of its assets with equity, 50 percent with debt). For illustrative purposes, the figures assume that the cash flows will be either \$5 or \$15 and that these two possibilities have the same chance of occurring (e.g., the chance that either occurs is $\frac{1}{2}$).

⁹ This is also a common valuation problem in general business contexts.

¹⁰ I refer to this effect in terms of *financial risk* because the additional risk to equity holders stems from how the company chooses to finance its assets. In this context financial risk is distinct from and independent of the *business risk* associated with the manner in which the firm deploys its cash flow generating assets. The impact of leverage on risk is conceptually no different than that faced by a homeowner who takes out a mortgage. The equity of a homeowner who finances his home with 90% debt is much riskier than the equity of one who only finances with 50% debt.

Figure B-3: All Equity Capital Structure

	Asset Cash Flow	Debt Service	Equity Dividend	ROE
\$100 → 1/2	\$15	\$0	\$15	15/100 = 15%
\$100 → 1/2	\$5	\$0	\$5	5/100 = 5%
				$E(ROE) = 10\%$
				$\sigma(ROE) = 5\%$

Figure B-4: 50/50 Capital Structure

	Asset cash flow	Debt Service	Equity Dividend	ROE
\$100 → 1/2	\$15	\$2.50	\$12.50	12.50/50 = 25%
\$100 → 1/2	\$5	\$2.50	\$2.50	2.50/50 = 5%
				$E(ROE) = 15\%$
				$\sigma(ROE) = 10\%$

This simple example illustrates that the introduction of debt increases both the mean (expected) return to equity holders and the variance of that return, even though the firm’s expected cash flows—which are a property of the line of business in which its assets are invested—are unaffected by the firm’s financing choices. The “magic” of financial leverage is not magic at all—leveraged equity investors can only earn a higher return because they take on greater risk.

B. METHODS TO ACCOUNT FOR FINANCIAL RISK

1. Cost of Equity Implied by the Overall Cost of Capital

If the companies in a proxy group are truly comparable in terms of the systematic risks of the underlying assets, then the overall cost of capital of each company should be about the same across companies (except for sampling error), so long as they do not use extreme leverage or no leverage. The intuition here is as follows. A firm’s asset value (and return) is allocated between equity and debt holders.¹¹ The expected return to the underlying asset is therefore equal to the value weighted

¹¹ Other claimants can be added to the weighted average if they exist. For example, when a firm’s capital structure contains preferred equity, the term $\frac{P}{V} \times r_p$ is added to the expression for the overall cost of capital shown in Equation (7), where P refers to the market value of preferred equity, r_p is the cost of preferred equity and $V = E + D + P$. In my analysis, I attribute the same implied yield to the cost of preferred equity as to the cost of debt.

average of the expected returns to equity and debt holders – which is the overall cost of capital (r^*), or the expected return on the assets of the firm as a whole.¹²

$$r^* = \frac{E}{V} \times r_E + \frac{D}{V} \times r_D(1 - \tau_c) \quad (7)$$

where r_D is the market cost of debt,
 r_E is the market cost of equity,
 τ_c is the corporate income tax rate,
 D is the market value of the firm's debt,
 E is the market value of the firm's equity, and
 $V = E + D$ is the total market value of the firm.

Since the overall cost of capital is the cost of capital for the underlying asset risk, and this is comparable across companies, it is reasonable to believe that the overall cost of capital of the underlying companies should also be comparable, so long as capital structures do not involve unusual leverage ratios compared to other companies in the industry.¹³

The notion that the overall cost of capital is constant across a broad middle range of capital structures is based upon the Modigliani-Miller theorem that choice of financing does not affect the firm's value. Franco Modigliani and Merton Miller eventually won Nobel Prizes in part for their work on the effects of debt.¹⁴ Their 1958 paper made what is in retrospect a very simple point: if there are no taxes and no risk to the use of excessive debt, use of debt will have no effect on a company's operating cash flows (i.e., the cash flows to investors as a group, debt and equity combined). If the operating cash flows are the same regardless of whether the company finances

¹² As this is on an after-tax basis, the cost of debt reflects the tax value of interest deductibility. Note that the precise formulation of the weighted average formula representing the required return on the firm's *assets* independent of financing (sometimes called the *unlevered* cost of capital) depends on specific assumptions made regarding the value of tax shields from tax-deductible corporate debt, the role of personal income tax, and the cost of financial distress. See Taggart, Robert A., "Consistent Valuation and Cost of Capital Expressions with Corporate and Personal Taxes," *Financial Management*, 1991; 20(3) for a detailed discussion of these assumptions and formulations. Equation (7) represents the overall weighted average cost of capital to the firm, which can be assumed to be constant across a relatively broad range of capital structures.

¹³ Empirically, companies within the same industry tend to have similar capital structures, while typical capital structures may vary between industries, so whether a leverage ratio is "unusual" depends upon the company's line of business.

¹⁴ Franco Modigliani and Merton H. Miller (1958), "The Cost of Capital, Corporation Finance and the Theory of Investment," *American Economic Review*, 48, pp. 261-297.

mostly with debt or mostly with equity, then the value of the firm cannot be affected at all by the debt ratio. In cost of capital terms, this means the overall cost of capital is constant regardless of the debt ratio, too.

Obviously, the simple and elegant Modigliani-Miller theorem makes some counterfactual assumptions: no taxes and no cost of financial distress from excessive debt. However, subsequent research, including some by Modigliani and Miller,¹⁵ showed that while taxes and costs to financial distress affect a firm's incentives when choosing its capital structure as well as its overall cost of capital,¹⁶ the latter can still be shown to be constant across a broad range of capital structures.¹⁷

This reasoning suggests that one could compute the overall cost of capital for each of the proxy companies and then average to produce an estimate of the overall cost of capital associated with the underlying asset risk. Assuming that the overall cost of capital is constant, one can then rearrange the overall cost of capital formula to estimate what the implied cost of equity is at the target company's capital structure on a book value basis.¹⁸

2. Unlevering and Relevering Betas in the CAPM (Hamada Adjustment)

An alternative approach to account for the impact of financial risk is to examine the impact of leverage on beta. Notice that this means working within the CAPM framework as the methodology cannot be applied directly to the DCF models.

¹⁵ Franco Modigliani and Merton H. Miller (1963), "Corporate Income Taxes and the Cost of Capital: A Correction," *American Economic Review*, 53, pp. 433-443.

¹⁶ When a company uses a high level of debt financing, for example, there is significant risk of bankruptcy and all the costs associated with it. The so called costs of financial distress that occurs when a company is over-leveraged can increase its cost of capital. In contrast a company can generally decrease its cost of capital by taking on reasonable levels of debt, owing in part to the deductibility of interest from corporate taxes.

¹⁷ This is a simplified treatment of what is generally a complex and on-going area of academic investigation. The roles of taxes, market imperfections and constraints, etc. are areas of on-going research and differing assumptions can yield subtly different formulations for how to formulate the weighted average cost of capital that is constant over all (or most) capital structures.

¹⁸ Market value capital structures are used in estimating the overall cost of capital for the proxy companies.

Recognizing that under general conditions, the value of a firm can be decomposed into its value with and without a tax shield, I obtain:¹⁹

$$V = V_U + PV(ITS) \quad (8)$$

where $V = E + D$ is the total value of the firm as in Equation (7),

V_U is the “unlevered” value of the firm—its value if financed entirely by equity

$PV(ITS)$ represents the present value of the interest tax shields associated with debt

For a company with a fixed book-value capital structure and no additional costs to leverage, it can be shown that the formula above implies:

$$r_E = r_U + \frac{D}{E}(1 - \tau_c)(r_U - r_D) \quad (9)$$

where r_U is the “unlevered cost of capital”—the required return on assets if the firm’s assets were financed with 100% equity and zero debt—and the other parameters are defined as in Equation (7).

Replacing each of these returns by their CAPM representation and simplifying them gives the following relationship between the “levered” equity beta β_L for a firm (i.e., the one observed in market data as a consequence of the firm’s actual market value capital structure) and the “unlevered” beta β_U that would be measured for the same firm if it had no debt in its capital structure:

$$\beta_L = \beta_U + \frac{D}{E}(1 - \tau_c)(\beta_U - \beta_D) \quad (10)$$

where β_D is the beta on the firm’s debt. The unlevered beta is assumed to be constant with respect to capital structure, reflecting as it does the systematic risk of the firm’s assets. Since the beta on

¹⁹ This follows development in Fernandez (2003). Other standard papers in this area include Hamada (1972), Miles and Ezzell (1985), Harris and Pringle (1985), Fernandez (2006). (See Fernandez, P., “Levered and Unlevered Beta,” IESE Business School Working Paper WP-488, University of Navarra, Jan 2003 (rev. May 2006); Hamada, R.S., “The Effect of the Firm’s Capital Structure on the Systematic Risk of Common Stock,” *Journal of Finance*, 27, May 1972, pp. 435-452; Miles, J.A. and J.R. Ezzell, “Reformulating Tax Shield Valuation: A Note,” *Journal of Finance*, XL5, Dec 1985, pp. 1485-1492; Harris, R.S. and J.J. Pringle, “Risk-Adjusted Discount Rates Extensions from the Average-Risk Case,” *Journal of Financial Research*, Fall 1985, pp. 237-244; Fernandez, P., “The Value of Tax Shields Depends Only on the Net Increases of Debt,” IESE Business School Working Paper WP-613, University of Navarra, 2006.) Additional discussion can be found in Brealey, Myers, and Allen (2014).

an investment grade firm's debt is much lower than the beta of its assets (i.e., $\beta_D < \beta_U$), this equation embodies the fact that increasing financial leverage (and thereby increasing the debt to equity ratio) increases the systematic risk of *levered* equity (β_L).

An alternative formulation derived by Harris and Pringle (1985) provides the following equation that holds when the market value capital structures (rather than book value) are assumed to be held constant:

$$\beta_L = \beta_U + \frac{D}{E}(\beta_U - \beta_D) \quad (11)$$

Unlike Equation (10), Equation (11) does not include an adjustment for the corporate tax deduction. However, both equations account for the fact that increased financial leverage increases the systematic risk of equity that will be measured by its market beta. And both equations allow an analyst to adjust for differences in financial risk by translating back and forth between β_L and β_U . In principal, Equation (10) is more appropriate for use with regulated utilities, which are typically deemed to maintain a fixed book value capital structure. However, I employ both formulations when adjusting my CAPM estimates for financial risk, and consider the results as sensitivities in my analysis.

It is clear that the beta of debt needs to be determined as an input to either Equation (10), or Equation (11). Rather than estimating debt betas, I rely on the standard financial textbook of Professors Berk & DeMarzo, who report a debt beta of 0.05 for A rated debt and a beta of 0.10 for BBB rated debt.²⁰

Once a decision on debt betas is made, the levered equity beta of each proxy company can be computed (in this case by Value Line) from market data and then translated to an unlevered beta at the company's market value capital structure. The unlevered betas for the proxy companies are comparable on an "apples to apples" basis, since they reflect the systematic risk inherent in the assets of the proxy companies, independent of their financing. The unlevered betas are averaged to produce an estimate of the industry's unlevered beta. To estimate the cost of equity for the regulated target company, this estimate of unlevered beta can be "re-levered" to the regulated

²⁰ Berk, J. & DeMarzo, P., *Corporate Finance, 2nd Edition*. 2011 Prentice Hall, p. 389.

company's capital structure, and CAPM reapplied with this levered beta, which reflects both the business and financial risk of the target company.

Hamada adjustment procedures—so-named for Professor Robert S. Hamada who contributed to their development²¹—are ubiquitous among finance practitioners when using the CAPM to estimate discount rates.

²¹ Hamada, R.S., "The Effect of the Firm's Capital Structure on the Systematic Risk of Common Stock", *The Journal of Finance*, 27(2), 1971, pp. 435-452.

Appendix BV-C, Schedules BV-1 to BV-15

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Schedule No. BV-2

Electric and OHRU Samples

Classification of Companies by Assets

Company	Company Category
ALLETE	MR
Alliant Energy	R
Amer. Elec. Power	R
Amer. States Water	R
Amer. Water Works	R
Ameren Corp.	R
Artesian Res Corp	R
Atmos Energy	R
Avista Corp.	R
Black Hills	R
CMS Energy Corp.	R
California Water	R
CenterPoint Energy	R
Chesapeake Utilities	R
Consol. Edison	R
DTE Energy	MR
Dominion Energy	R
Duke Energy	R
Entergy Corp.	R
Essential Utilities	R
Evergy Inc.	R
Eversource Energy	R
Exelon Corp.	MR
Global Water Resources Inc	R
Hawaiian Elec.	MR
IDACORP Inc.	R
MGE Energy	R
Middlesex Water	R
New Jersey Resources	MR
NextEra Energy	MR
NiSource Inc.	R
NorthWestern Corp.	R
Northwest Natural	R
OGE Energy	R
ONE Gas Inc.	R
Otter Tail Corp.	R
Pinnacle West Capital	R
Public Serv. Enterprise	MR
SJW Group	R
Sempra Energy	R
South Jersey Inds.	R
Southern Co.	R
Southwest Gas	R
Spire Inc.	R
Unitil Corp.	R
WEC Energy Group	R
Xcel Energy Inc.	R

Sources and Notes:

Calculations based on EEI definitions and Company 10K filings:

R = Regulated (greater than 80 percent of total assets are regulated).

MR = Mostly Regulated (Less than 80 percent of total assets are regulated).

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel A: ALLETE

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$2,321	\$2,321	\$2,271	\$2,199	\$2,097	\$2,002	\$1,850	[a]
Shares Outstanding (in millions) - Common	52	52	52	52	51	51	49	[b]
Price per Share - Common	\$70	\$68	\$61	\$83	\$70	\$67	\$57	[c]
Market Value of Common Equity	\$3,638	\$3,572	\$3,155	\$4,268	\$3,614	\$3,419	\$2,796	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$3,638	\$3,572	\$3,155	\$4,268	\$3,614	\$3,419	\$2,796	[f] = [d] + [e]
Market to Book Value of Common Equity	1.57	1.54	1.39	1.94	1.72	1.71	1.51	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$378	\$378	\$275	\$556	\$404	\$361	\$379	[j]
Current Liabilities	\$575	\$575	\$623	\$322	\$400	\$365	\$224	[k]
Current Portion of Long-Term Debt	\$304	\$304	\$330	\$23	\$106	\$163	\$15	[l]
Net Working Capital	\$108	\$108	(\$18)	\$257	\$110	\$159	\$170	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	#N/A N/A	#N/A N/A	#N/A N/A	#N/A N/A	\$0	\$1	\$1	[n]
Adjusted Short-Term Debt	\$0	\$0	#VALUE!	\$0	\$0	\$0	\$0	[o] = See Sources and Notes.
Long-Term Debt	\$1,667	\$1,667	\$1,420	\$1,551	\$1,397	\$1,370	\$1,551	[p]
Book Value of Long-Term Debt	\$1,971	\$1,971	N/A	\$1,573	\$1,503	\$1,533	\$1,566	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$2,122	\$2,122	\$1,792	\$1,535	\$1,628	\$1,654	\$1,676	
Carrying Amount	\$1,806	\$1,806	\$1,623	\$1,495	\$1,513	\$1,569	\$1,605	
Adjustment to Book Value of Long-Term Debt	\$316	\$316	\$169	\$39	\$114	\$85	\$71	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$2,287	\$2,287	N/A	\$1,613	\$1,617	\$1,618	\$1,637	[s] = [q] + [r].
Market Value of Debt	\$2,287	\$2,287	N/A	\$1,613	\$1,617	\$1,618	\$1,637	[t] = [s].
MARKET VALUE OF FIRM								
	\$5,924	\$5,858	N/A	\$5,881	\$5,231	\$5,036	\$4,433	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	61.40%	60.97%	N/A	72.58%	69.09%	67.88%	63.07%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	N/A	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	38.60%	39.03%	N/A	27.42%	30.91%	32.12%	36.93%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel B: Alliant Energy

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$5,766	\$5,766	\$5,502	\$4,682	\$4,232	\$3,897	\$3,765	[a]
Shares Outstanding (in millions) - Common	250	250	250	237	231	228	227	[b]
Price per Share - Common	\$57	\$53	\$47	\$47	\$40	\$40	\$36	[c]
Market Value of Common Equity	\$14,326	\$13,180	\$11,774	\$11,192	\$9,211	\$9,018	\$8,218	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$14,326	\$13,180	\$11,774	\$11,192	\$9,211	\$9,018	\$8,218	[f] = [d] + [e]
Market to Book Value of Common Equity	2.48	2.29	2.14	2.39	2.18	2.31	2.18	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$200	\$200	\$200	\$200	\$200	\$200	\$200	[h]
Market Value of Preferred Equity	\$200	\$200	\$200	\$200	\$200	\$200	\$200	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$755	\$755	\$912	\$815	\$726	\$750	\$769	[j]
Current Liabilities	\$1,408	\$1,408	\$1,650	\$1,588	\$2,074	\$1,165	\$1,349	[k]
Current Portion of Long-Term Debt	\$308	\$308	\$357	\$260	\$856	\$5	\$313	[l]
Net Working Capital	(\$345)	(\$345)	(\$381)	(\$513)	(\$492)	(\$411)	(\$267)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$336	\$336	\$271	\$515	\$431	\$303	\$213	[n]
Adjusted Short-Term Debt	\$336	\$336	\$271	\$513	\$431	\$303	\$213	[o] = See Sources and Notes.
Long-Term Debt	\$6,471	\$6,471	\$5,834	\$5,377	\$4,057	\$4,316	\$3,523	[p]
Book Value of Long-Term Debt	\$7,115	\$7,115	\$6,462	\$6,150	\$5,344	\$4,624	\$4,050	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$8,109	\$8,109	\$6,920	\$5,861	\$5,448	\$4,799	\$4,336	
Carrying Amount	\$6,777	\$6,777	\$6,190	\$5,503	\$4,866	\$4,320	\$3,836	
Adjustment to Book Value of Long-Term Debt	\$1,332	\$1,332	\$730	\$358	\$581	\$479	\$501	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$8,447	\$8,447	\$7,191	\$6,508	\$5,925	\$5,102	\$4,550	[s] = [q] + [r].
Market Value of Debt	\$8,447	\$8,447	\$7,191	\$6,508	\$5,925	\$5,102	\$4,550	[t] = [s].
MARKET VALUE OF FIRM								
	\$22,973	\$21,827	\$19,165	\$17,900	\$15,336	\$14,320	\$12,968	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	62.36%	60.38%	61.43%	62.53%	60.06%	62.97%	63.37%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	0.87%	0.92%	1.04%	1.12%	1.30%	1.40%	1.54%	[w] = [i] / [u].
Debt - Market Value Ratio	36.77%	38.70%	37.52%	36.36%	38.64%	35.63%	35.09%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel C: Amer. Elec. Power

(\$MM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
MARKET VALUE OF COMMON EQUITY								
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
Book Value, Common Shareholder's Equity	\$21,028	\$21,028	\$19,782	\$19,243	\$18,500	\$17,689	\$18,127	[a]
Shares Outstanding (in millions) - Common	499	499	495	493	493	492	491	[b]
Price per Share - Common	\$86	\$84	\$81	\$84	\$67	\$67	\$65	[c]
Market Value of Common Equity	\$43,004	\$41,719	\$40,157	\$41,379	\$33,080	\$32,904	\$31,947	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$43,004	\$41,719	\$40,157	\$41,379	\$33,080	\$32,904	\$31,947	[f] = [d] + [e]
Market to Book Value of Common Equity	2.05	1.98	2.03	2.15	1.79	1.86	1.76	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$4,258	\$4,258	\$5,292	\$3,915	\$4,135	\$3,616	\$4,146	[j]
Current Liabilities	\$10,220	\$10,220	\$11,655	\$7,991	\$9,471	\$7,915	\$7,222	[k]
Current Portion of Long-Term Debt	\$2,371	\$2,371	\$2,344	\$1,818	\$2,616	\$2,514	\$2,033	[l]
Net Working Capital	(\$3,591)	(\$3,591)	(\$4,019)	(\$2,258)	(\$2,720)	(\$1,784)	(\$1,042)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$3,048	\$3,048	\$4,464	\$1,858	\$2,659	\$1,536	\$1,221	[n]
Adjusted Short-Term Debt	\$3,048	\$3,048	\$4,019	\$1,858	\$2,659	\$1,536	\$1,042	[o] = See Sources and Notes.
Long-Term Debt	\$30,840	\$30,840	\$26,519	\$23,996	\$18,845	\$16,722	\$17,749	[p]
Book Value of Long-Term Debt	\$36,259	\$36,259	\$32,882	\$27,672	\$24,120	\$20,772	\$20,825	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$37,457	\$37,457	\$30,172	\$24,094	\$23,650	\$22,212	\$21,201	
Carrying Amount	\$31,073	\$31,073	\$26,726	\$23,347	\$21,173	\$20,391	\$19,573	
Adjustment to Book Value of Long-Term Debt	\$6,385	\$6,385	\$3,447	\$747	\$2,476	\$1,821	\$1,629	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$42,644	\$42,644	\$36,329	\$28,419	\$26,596	\$22,593	\$22,454	[s] = [q] + [r].
Market Value of Debt	\$42,644	\$42,644	\$36,329	\$28,419	\$26,596	\$22,593	\$22,454	[t] = [s].
MARKET VALUE OF FIRM								
	\$85,647	\$84,362	\$76,485	\$69,798	\$59,676	\$55,497	\$54,401	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	50.21%	49.45%	52.50%	59.28%	55.43%	59.29%	58.73%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	49.79%	50.55%	47.50%	40.72%	44.57%	40.71%	41.27%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel D: Amer. States Water

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$649	\$649	\$605	\$562	\$532	\$498	\$467	[a]
Shares Outstanding (in millions) - Common	37	37	37	37	37	37	37	[b]
Price per Share - Common	\$78	\$74	\$80	\$71	\$53	\$44	\$40	[c]
Market Value of Common Equity	\$2,897	\$2,724	\$2,959	\$2,624	\$1,960	\$1,601	\$1,446	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$2,897	\$2,724	\$2,959	\$2,624	\$1,960	\$1,601	\$1,446	[f] = [d] + [e]
Market to Book Value of Common Equity	4.46	4.19	4.90	4.67	3.69	3.21	3.09	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$119	\$119	\$127	\$117	\$146	\$192	\$131	[j]
Current Liabilities	\$113	\$113	\$133	\$108	\$196	\$179	\$139	[k]
Current Portion of Long-Term Debt	\$2	\$2	\$2	\$2	\$40	\$0	\$0	[l]
Net Working Capital	\$8	\$8	(\$3)	\$11	(\$10)	\$14	(\$8)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$0	\$0	\$32	\$0	\$69	\$96	\$43	[n]
Adjusted Short-Term Debt	\$0	\$0	\$3	\$0	\$10	\$0	\$8	[o] = See Sources and Notes.
Long-Term Debt	\$578	\$578	\$492	\$437	\$281	\$321	\$321	[p]
Book Value of Long-Term Debt	\$581	\$581	\$497	\$439	\$332	\$321	\$329	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$560	\$560	\$376	\$388	\$424	\$424	\$404	
Carrying Amount	\$444	\$444	\$285	\$325	\$325	\$326	\$326	
Adjustment to Book Value of Long-Term Debt	\$115	\$115	\$91	\$63	\$99	\$98	\$78	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$696	\$696	\$588	\$502	\$431	\$419	\$407	[s] = [q] + [r].
Market Value of Debt	\$696	\$696	\$588	\$502	\$431	\$419	\$407	[t] = [s].
MARKET VALUE OF FIRM								
	\$3,593	\$3,420	\$3,548	\$3,126	\$2,391	\$2,020	\$1,853	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	80.62%	79.64%	83.42%	83.93%	81.99%	79.25%	78.04%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	19.38%	20.36%	16.58%	16.07%	18.01%	20.75%	21.96%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel E: Amer. Water Works

(\$MM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$6,583	\$6,583	\$6,243	\$5,932	\$5,451	\$5,287	\$5,082	[a]
Shares Outstanding (in millions) - Common	181	181	181	181	178	178	178	[b]
Price per Share - Common	\$153	\$143	\$118	\$105	\$81	\$77	\$68	[c]
Market Value of Common Equity	\$27,831	\$25,882	\$21,445	\$19,019	\$14,435	\$13,631	\$12,128	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$27,831	\$25,882	\$21,445	\$19,019	\$14,435	\$13,631	\$12,128	[f] = [d] + [e]
Market to Book Value of Common Equity	4.23	3.93	3.43	3.21	2.65	2.58	2.39	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$1,466	\$1,466	\$1,801	\$691	\$729	\$767	\$638	[j]
Current Liabilities	\$2,451	\$2,451	\$2,767	\$2,156	\$2,539	\$2,418	\$1,614	[k]
Current Portion of Long-Term Debt	\$321	\$321	\$49	\$81	\$421	\$574	\$54	[l]
Net Working Capital	(\$664)	(\$664)	(\$917)	(\$1,384)	(\$1,389)	(\$1,077)	(\$922)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$1,115	\$1,115	\$1,641	\$1,201	\$1,183	\$980	\$839	[n]
Adjusted Short-Term Debt	\$664	\$664	\$917	\$1,201	\$1,183	\$980	\$839	[o] = See Sources and Notes.
Long-Term Debt	\$9,412	\$9,412	\$8,712	\$7,669	\$6,403	\$5,753	\$5,861	[p]
Book Value of Long-Term Debt	\$10,397	\$10,397	\$9,678	\$8,951	\$8,007	\$7,307	\$6,754	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$11,807	\$11,807	\$9,770	\$7,921	\$7,643	\$7,044	\$6,757	
Carrying Amount	\$9,656	\$9,656	\$8,664	\$7,638	\$6,809	\$6,320	\$5,914	
Adjustment to Book Value of Long-Term Debt	\$2,151	\$2,151	\$1,106	\$283	\$834	\$724	\$843	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$12,548	\$12,548	\$10,784	\$9,234	\$8,841	\$8,031	\$7,597	[s] = [q] + [r].
Market Value of Debt	\$12,548	\$12,548	\$10,784	\$9,234	\$8,841	\$8,031	\$7,597	[t] = [s].
MARKET VALUE OF FIRM								
	\$40,379	\$38,430	\$32,229	\$28,253	\$23,276	\$21,662	\$19,725	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	68.92%	67.35%	66.54%	67.32%	62.02%	62.93%	61.49%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	31.08%	32.65%	33.46%	32.68%	37.98%	37.07%	38.51%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel F: Ameren Corp.

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$9,148	\$9,148	\$8,085	\$7,705	\$7,230	\$7,064	\$6,869	[a]
Shares Outstanding (in millions) - Common	256	256	247	246	244	243	243	[b]
Price per Share - Common	\$84	\$80	\$72	\$73	\$55	\$55	\$49	[c]
Market Value of Common Equity	\$21,466	\$20,329	\$17,715	\$17,973	\$13,395	\$13,369	\$11,868	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$21,466	\$20,329	\$17,715	\$17,973	\$13,395	\$13,369	\$11,868	[f] = [d] + [e]
Market to Book Value of Common Equity	2.35	2.22	2.19	2.33	1.85	1.89	1.73	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$1,823	\$1,823	\$1,464	\$1,422	\$1,567	\$1,450	\$1,458	[j]
Current Liabilities	\$2,307	\$2,307	\$2,367	\$2,392	\$3,345	\$2,762	\$1,839	[k]
Current Portion of Long-Term Debt	\$8	\$8	\$357	\$343	\$1,170	\$681	\$135	[l]
Net Working Capital	(\$476)	(\$476)	(\$546)	(\$627)	(\$608)	(\$631)	(\$246)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$889	\$889	\$615	\$799	\$960	\$914	\$581	[n]
Adjusted Short-Term Debt	\$476	\$476	\$546	\$627	\$608	\$631	\$246	[o] = See Sources and Notes.
Long-Term Debt	\$11,527	\$11,527	\$9,378	\$8,250	\$6,766	\$6,597	\$6,881	[p]
Book Value of Long-Term Debt	\$12,011	\$12,011	\$10,281	\$9,220	\$8,544	\$7,909	\$7,262	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$13,315	\$13,315	\$10,441	\$8,669	\$8,531	\$7,772	\$7,814	
Carrying Amount	\$11,086	\$11,086	\$9,357	\$8,439	\$7,935	\$7,276	\$7,275	
Adjustment to Book Value of Long-Term Debt	\$2,229	\$2,229	\$1,084	\$230	\$596	\$496	\$539	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$14,240	\$14,240	\$11,365	\$9,450	\$9,140	\$8,405	\$7,801	[s] = [q] + [r].
Market Value of Debt	\$14,240	\$14,240	\$11,365	\$9,450	\$9,140	\$8,405	\$7,801	[t] = [s].
MARKET VALUE OF FIRM								
	\$35,706	\$34,569	\$29,080	\$27,423	\$22,535	\$21,774	\$19,669	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	60.12%	58.81%	60.92%	65.54%	59.44%	61.40%	60.34%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	39.88%	41.19%	39.08%	34.46%	40.56%	38.60%	39.66%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel G: Artesian Res Corp

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$172	\$172	\$162	\$155	\$148	\$140	\$134	[a]
Shares Outstanding (in millions) - Common	9	9	9	9	9	9	9	[b]
Price per Share - Common	\$40	\$40	\$34	\$39	\$36	\$33	\$27	[c]
Market Value of Common Equity	\$377	\$377	\$321	\$358	\$334	\$300	\$241	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$377	\$377	\$321	\$358	\$334	\$300	\$241	[f] = [d] + [e]
Market to Book Value of Common Equity	2.20	2.19	1.97	2.31	2.25	2.14	1.80	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$15	\$15	\$13	\$13	\$14	\$12	\$12	[j]
Current Liabilities	\$44	\$44	\$28	\$40	\$30	\$43	\$17	[k]
Current Portion of Long-Term Debt	\$2	\$2	\$2	\$2	\$5	\$26	\$1	[l]
Net Working Capital	(\$28)	(\$28)	(\$13)	(\$25)	(\$11)	(\$4)	(\$4)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$23	\$23	\$9	\$19	\$16	\$5	\$7	[n]
Adjusted Short-Term Debt	\$23	\$23	\$9	\$19	\$11	\$4	\$4	[o] = See Sources and Notes.
Long-Term Debt	\$142	\$142	\$144	\$116	\$105	\$82	\$103	[p]
Book Value of Long-Term Debt	\$167	\$167	\$154	\$137	\$121	\$112	\$109	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$171	\$171	\$158	\$117	\$111	\$112	\$120	
Carrying Amount	\$144	\$144	\$146	\$118	\$107	\$104	\$105	
Adjustment to Book Value of Long-Term Debt	\$27	\$27	\$12	(\$1)	\$4	\$8	\$15	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$194	\$194	\$166	\$136	\$125	\$121	\$124	[s] = [q] + [r].
Market Value of Debt	\$194	\$194	\$166	\$136	\$125	\$121	\$124	[t] = [s].
MARKET VALUE OF FIRM								
	\$571	\$571	\$487	\$494	\$459	\$421	\$365	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	66.04%	66.01%	65.84%	72.51%	72.83%	71.34%	66.01%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	33.96%	33.99%	34.16%	27.49%	27.17%	28.66%	33.99%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel H: Atmos Energy

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$7,821	\$7,821	\$6,304	\$5,508	\$4,721	\$3,835	\$3,345	[a]
Shares Outstanding (in millions) - Common	131	131	122	117	111	105	102	[b]
Price per Share - Common	\$99	\$95	\$96	\$102	\$82	\$80	\$72	[c]
Market Value of Common Equity	\$12,989	\$12,394	\$11,788	\$11,949	\$9,080	\$8,374	\$7,391	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$12,989	\$12,394	\$11,788	\$11,949	\$9,080	\$8,374	\$7,391	[f] = [d] + [e]
Market to Book Value of Common Equity	1.66	1.58	1.87	2.17	1.92	2.18	2.21	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$1,620	\$1,620	\$830	\$671	\$623	\$563	\$653	[j]
Current Liabilities	\$871	\$871	\$933	\$864	\$1,349	\$1,496	\$1,227	[k]
Current Portion of Long-Term Debt	\$0	\$0	\$32	\$125	\$450	\$250	\$0	[l]
Net Working Capital	\$749	\$749	(\$72)	(\$68)	(\$276)	(\$683)	(\$574)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$0	\$0	\$200	\$0	\$130	\$671	\$627	[n]
Adjusted Short-Term Debt	\$0	\$0	\$72	\$0	\$130	\$671	\$574	[o] = See Sources and Notes.
Long-Term Debt	\$7,325	\$7,325	\$4,528	\$3,529	\$2,618	\$2,315	\$2,456	[p]
Book Value of Long-Term Debt	\$7,325	\$7,325	\$4,632	\$3,654	\$3,197	\$3,235	\$3,030	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$6,295	\$6,295	\$4,216	\$3,162	\$3,382	\$2,845	\$2,669	
Carrying Amount	\$5,160	\$5,160	\$3,560	\$3,085	\$3,085	\$2,460	\$2,460	
Adjustment to Book Value of Long-Term Debt	\$1,135	\$1,135	\$656	\$77	\$297	\$385	\$209	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$8,460	\$8,460	\$5,289	\$3,730	\$3,495	\$3,620	\$3,239	[s] = [q] + [r].
Market Value of Debt	\$8,460	\$8,460	\$5,289	\$3,730	\$3,495	\$3,620	\$3,239	[t] = [s].
MARKET VALUE OF FIRM								
	\$21,449	\$20,854	\$17,076	\$15,679	\$12,575	\$11,994	\$10,630	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	60.56%	59.43%	69.03%	76.21%	72.21%	69.82%	69.53%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	39.44%	40.57%	30.97%	23.79%	27.79%	30.18%	30.47%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel I: Avista Corp.

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$2,030	\$2,030	\$1,959	\$1,867	\$1,758	\$1,686	\$1,590	[a]
Shares Outstanding (in millions) - Common	69	69	67	66	66	64	63	[b]
Price per Share - Common	\$46	\$46	\$43	\$41	\$51	\$39	\$40	[c]
Market Value of Common Equity	\$3,192	\$3,217	\$2,875	\$2,690	\$3,355	\$2,528	\$2,525	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$3,192	\$3,217	\$2,875	\$2,690	\$3,355	\$2,528	\$2,525	[f] = [d] + [e]
Market to Book Value of Common Equity	1.57	1.58	1.47	1.44	1.91	1.50	1.59	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$344	\$344	\$274	\$365	\$310	\$357	\$279	[j]
Current Liabilities	\$506	\$506	\$566	\$567	\$670	\$367	\$432	[k]
Current Portion of Long-Term Debt	\$7	\$7	\$114	\$112	\$275	\$3	\$93	[l]
Net Working Capital	(\$155)	(\$155)	(\$177)	(\$90)	(\$85)	(\$6)	(\$59)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$203	\$203	\$185	\$119	\$50	\$105	\$90	[n]
Adjusted Short-Term Debt	\$155	\$155	\$177	\$90	\$50	\$6	\$59	[o] = See Sources and Notes.
Long-Term Debt	\$2,177	\$2,177	\$1,958	\$1,874	\$1,543	\$1,730	\$1,599	[p]
Book Value of Long-Term Debt	\$2,339	\$2,339	\$2,249	\$2,076	\$1,868	\$1,739	\$1,752	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$1,190	\$1,190	\$1,125	\$1,142	\$1,068	\$1,049	\$1,056	
Carrying Amount	\$964	\$964	\$964	\$1,054	\$951	\$951	\$951	
Adjustment to Book Value of Long-Term Debt	\$226	\$226	\$161	\$89	\$117	\$98	\$105	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$2,565	\$2,565	\$2,410	\$2,165	\$1,985	\$1,837	\$1,857	[s] = [q] + [r].
Market Value of Debt	\$2,565	\$2,565	\$2,410	\$2,165	\$1,985	\$1,837	\$1,857	[t] = [s].
MARKET VALUE OF FIRM								
	\$5,757	\$5,782	\$5,285	\$4,855	\$5,339	\$4,365	\$4,381	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	55.44%	55.64%	54.39%	55.41%	62.83%	57.92%	57.62%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	44.56%	44.36%	45.61%	44.59%	37.17%	42.08%	42.38%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

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[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel J: Black Hills

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$2,625	\$2,625	\$2,523	\$2,279	\$1,819	\$1,674	\$1,481	[a]
Shares Outstanding (in millions) - Common	63	63	63	60	54	53	51	[b]
Price per Share - Common	\$66	\$66	\$59	\$73	\$53	\$66	\$59	[c]
Market Value of Common Equity	\$4,166	\$4,159	\$3,730	\$4,410	\$2,836	\$3,526	\$3,035	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$4,166	\$4,159	\$3,730	\$4,410	\$2,836	\$3,526	\$3,035	[f] = [d] + [e]
Market to Book Value of Common Equity	1.59	1.58	1.48	1.93	1.56	2.11	2.05	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$579	\$579	\$490	\$485	\$492	\$401	\$402	[j]
Current Liabilities	\$1,230	\$1,230	\$720	\$591	\$789	\$392	\$639	[k]
Current Portion of Long-Term Debt	\$7	\$7	\$6	\$7	\$256	\$6	\$0	[l]
Net Working Capital	(\$644)	(\$644)	(\$224)	(\$100)	(\$41)	\$16	(\$237)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$816	\$816	\$319	\$165	\$164	\$51	\$216	[n]
Adjusted Short-Term Debt	\$644	\$644	\$224	\$100	\$41	\$0	\$216	[o] = See Sources and Notes.
Long-Term Debt	\$3,529	\$3,529	\$3,137	\$2,955	\$2,859	\$3,211	\$3,159	[p]
Book Value of Long-Term Debt	\$4,180	\$4,180	\$3,367	\$3,062	\$3,155	\$3,216	\$3,375	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$4,208	\$4,208	\$3,479	\$3,039	\$3,351	\$3,351	\$1,992	
Carrying Amount	\$3,537	\$3,537	\$3,146	\$2,957	\$3,115	\$3,217	\$1,854	
Adjustment to Book Value of Long-Term Debt	\$672	\$672	\$334	\$83	\$235	\$134	\$139	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$4,852	\$4,852	\$3,701	\$3,144	\$3,391	\$3,351	\$3,513	[s] = [q] + [r].
Market Value of Debt	\$4,852	\$4,852	\$3,701	\$3,144	\$3,391	\$3,351	\$3,513	[t] = [s].
MARKET VALUE OF FIRM								
	\$9,018	\$9,011	\$7,431	\$7,554	\$6,226	\$6,877	\$6,548	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	46.20%	46.15%	50.20%	58.38%	45.54%	51.27%	46.35%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	53.80%	53.85%	49.80%	41.62%	54.46%	48.73%	53.65%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel K: CMS Energy Corp.

(\$MM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$5,727	\$5,727	\$5,185	\$4,858	\$4,596	\$4,370	\$4,109	[a]
Shares Outstanding (in millions) - Common	290	290	286	284	283	280	279	[b]
Price per Share - Common	\$63	\$59	\$57	\$55	\$44	\$45	\$42	[c]
Market Value of Common Equity	\$18,341	\$17,207	\$16,449	\$15,700	\$12,395	\$12,540	\$11,591	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$18,341	\$17,207	\$16,449	\$15,700	\$12,395	\$12,540	\$11,591	[f] = [d] + [e]
Market to Book Value of Common Equity	3.20	3.00	3.17	3.23	2.70	2.87	2.82	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$2,513	\$2,513	\$2,817	\$2,376	\$2,207	\$2,215	\$1,890	[j]
Current Liabilities	\$2,885	\$2,885	\$2,940	\$2,106	\$2,482	\$1,926	\$2,047	[k]
Current Portion of Long-Term Debt	\$1,506	\$1,506	\$1,721	\$852	\$1,286	\$812	\$950	[l]
Net Working Capital	\$1,134	\$1,134	\$1,598	\$1,122	\$1,011	\$1,101	\$793	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$0	\$0	\$0	\$30	\$0	\$0	\$0	[n]
Adjusted Short-Term Debt	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[o] = See Sources and Notes.
Long-Term Debt	\$13,612	\$13,612	\$12,616	\$11,240	\$9,082	\$9,233	\$8,284	[p]
Book Value of Long-Term Debt	\$15,118	\$15,118	\$14,337	\$12,092	\$10,368	\$10,045	\$9,234	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$17,512	\$17,512	\$14,185	\$11,630	\$10,715	\$9,953	\$9,599	
Carrying Amount	\$15,120	\$15,120	\$13,062	\$11,589	\$10,204	\$9,504	\$9,125	
Adjustment to Book Value of Long-Term Debt	\$2,392	\$2,392	\$1,123	\$41	\$511	\$449	\$474	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$17,510	\$17,510	\$15,460	\$12,133	\$10,879	\$10,494	\$9,708	[s] = [q] + [r].
Market Value of Debt	\$17,510	\$17,510	\$15,460	\$12,133	\$10,879	\$10,494	\$9,708	[t] = [s].
MARKET VALUE OF FIRM								
	\$35,851	\$34,717	\$31,909	\$27,833	\$23,274	\$23,034	\$21,299	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	51.16%	49.56%	51.55%	56.41%	53.26%	54.44%	54.42%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	48.84%	50.44%	48.45%	43.59%	46.74%	45.56%	45.58%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel L: California Water

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$930	\$930	\$755	\$714	\$681	\$651	\$633	[a]
Shares Outstanding (in millions) - Common	51	51	49	48	48	48	48	[b]
Price per Share - Common	\$57	\$55	\$49	\$54	\$37	\$35	\$26	[c]
Market Value of Common Equity	\$2,875	\$2,774	\$2,403	\$2,598	\$1,798	\$1,674	\$1,253	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$2,875	\$2,774	\$2,403	\$2,598	\$1,798	\$1,674	\$1,253	[f] = [d] + [e]
Market to Book Value of Common Equity	3.09	2.98	3.18	3.64	2.64	2.57	1.98	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$302	\$302	\$270	\$193	\$166	\$128	\$149	[j]
Current Liabilities	\$655	\$655	\$513	\$384	\$464	\$293	\$158	[k]
Current Portion of Long-Term Debt	\$5	\$5	\$22	\$106	\$6	\$36	\$6	[l]
Net Working Capital	(\$348)	(\$348)	(\$221)	(\$85)	(\$293)	(\$129)	(\$4)	[m] = [j] - ([k] + [l]).
Notes Payable (Short-Term Debt)	\$435	\$435	\$335	\$125	\$275	\$130	\$35	[n]
Adjusted Short-Term Debt	\$348	\$348	\$221	\$85	\$275	\$129	\$4	[o] = See Sources and Notes.
Long-Term Debt	\$781	\$781	\$786	\$723	\$516	\$522	\$558	[p]
Book Value of Long-Term Debt	\$1,134	\$1,134	\$1,030	\$915	\$797	\$687	\$567	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$944	\$944	\$873	\$850	\$607	\$631	\$600	
Carrying Amount	\$786	\$786	\$809	\$815	\$532	\$558	\$519	
Adjustment to Book Value of Long-Term Debt	\$158	\$158	\$64	\$35	\$76	\$73	\$82	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$1,292	\$1,292	\$1,094	\$949	\$872	\$759	\$649	[s] = [q] + [r].
Market Value of Debt	\$1,292	\$1,292	\$1,094	\$949	\$872	\$759	\$649	[t] = [s].
MARKET VALUE OF FIRM								
	\$4,167	\$4,066	\$3,497	\$3,548	\$2,671	\$2,433	\$1,902	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	68.99%	68.22%	68.73%	73.24%	67.33%	68.79%	65.88%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	31.01%	31.78%	31.27%	26.76%	32.67%	31.21%	34.12%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel M: CenterPoint Energy

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
MARKET VALUE OF COMMON EQUITY								
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
Book Value, Common Shareholder's Equity	\$6,353	\$6,353	\$6,970	\$6,476	\$4,857	\$3,537	\$3,506	[a]
Shares Outstanding (in millions) - Common	552	552	503	502	431	431	431	[b]
Price per Share - Common	\$25	\$22	\$14	\$31	\$27	\$28	\$21	[c]
Market Value of Common Equity	\$13,638	\$12,240	\$7,275	\$15,349	\$11,653	\$11,932	\$8,943	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$13,638	\$12,240	\$7,275	\$15,349	\$11,653	\$11,932	\$8,943	[f] = [d] + [e]
Market to Book Value of Common Equity	2.15	1.93	1.04	2.37	2.40	3.37	2.55	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$2,363	\$2,363	\$1,740	\$1,740	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$2,363	\$2,363	\$1,740	\$1,740	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$3,219	\$3,219	\$4,164	\$3,419	\$3,049	\$2,896	\$2,335	[j]
Current Liabilities	\$4,326	\$4,326	\$4,042	\$3,139	\$2,616	\$2,642	\$2,534	[k]
Current Portion of Long-Term Debt	\$1,788	\$1,788	\$1,426	\$420	\$613	\$787	\$1,124	[l]
Net Working Capital	\$681	\$681	\$1,548	\$700	\$1,046	\$1,041	\$925	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$927	\$927	\$893	\$687	\$674	\$727	\$498	[n]
Adjusted Short-Term Debt	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[o] = See Sources and Notes.
Long-Term Debt	\$14,048	\$14,048	\$13,830	\$13,808	\$8,176	\$7,892	\$7,354	[p]
Book Value of Long-Term Debt	\$15,836	\$15,836	\$15,256	\$14,228	\$8,789	\$8,679	\$8,478	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$15,226	\$15,226	\$16,067	\$9,140	\$8,679	\$5,079	\$0	
Carrying Amount	\$13,401	\$13,401	\$15,093	\$9,308	\$9,220	\$4,865	\$0	
Adjustment to Book Value of Long-Term Debt	\$1,825	\$1,825	\$974	\$(168)	\$(541)	\$214	\$0	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$17,661	\$17,661	\$16,230	\$14,060	\$8,248	\$8,893	\$8,478	[s] = [q] + [r].
Market Value of Debt	\$17,661	\$17,661	\$16,230	\$14,060	\$8,248	\$8,893	\$8,478	[t] = [s].
MARKET VALUE OF FIRM								
	\$33,662	\$32,264	\$25,245	\$31,149	\$19,901	\$20,825	\$17,421	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	40.51%	37.94%	28.82%	49.28%	58.55%	57.30%	51.33%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	7.02%	7.32%	6.89%	5.59%	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	52.47%	54.74%	64.29%	45.14%	41.45%	42.70%	48.67%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel N: Chesapeake Utilities

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$726	\$726	\$584	\$544	\$505	\$461	\$374	[a]
Shares Outstanding (in millions) - Common	18	18	16	16	16	16	15	[b]
Price per Share - Common	\$117	\$117	\$85	\$93	\$71	\$69	\$61	[c]
Market Value of Common Equity	\$2,050	\$2,056	\$1,404	\$1,518	\$1,161	\$1,121	\$930	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$2,050	\$2,056	\$1,404	\$1,518	\$1,161	\$1,121	\$930	[f] = [d] + [e]
Market to Book Value of Common Equity	2.82	2.83	2.40	2.79	2.30	2.43	2.49	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$129	\$129	\$112	\$154	\$138	\$119	\$100	[j]
Current Liabilities	\$316	\$316	\$402	\$509	\$374	\$321	\$274	[k]
Current Portion of Long-Term Debt	\$15	\$15	\$17	\$73	\$9	\$12	\$9	[l]
Net Working Capital	(\$172)	(\$172)	(\$273)	(\$282)	(\$227)	(\$190)	(\$165)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$156	\$156	\$254	\$276	\$229	\$199	\$173	[n]
Adjusted Short-Term Debt	\$156	\$156	\$254	\$276	\$227	\$190	\$165	[o] = See Sources and Notes.
Long-Term Debt	\$518	\$518	\$450	\$298	\$222	\$137	\$149	[p]
Book Value of Long-Term Debt	\$689	\$689	\$722	\$647	\$459	\$338	\$323	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$549	\$549	\$505	\$324	\$215	\$162	\$165	
Carrying Amount	\$523	\$523	\$487	\$327	\$205	\$146	\$154	
Adjustment to Book Value of Long-Term Debt	\$26	\$26	\$18	(\$3)	\$10	\$16	\$11	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$715	\$715	\$740	\$644	\$469	\$354	\$334	[s] = [q] + [r].
Market Value of Debt	\$715	\$715	\$740	\$644	\$469	\$354	\$334	[t] = [s].
MARKET VALUE OF FIRM								
	\$2,765	\$2,770	\$2,145	\$2,161	\$1,629	\$1,475	\$1,264	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	74.15%	74.21%	65.48%	70.21%	71.24%	76.00%	73.58%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	25.85%	25.79%	34.52%	29.79%	28.76%	24.00%	26.42%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

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[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel P: DTE Energy

(\$MM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$12,552	\$12,552	\$11,822	\$10,545	\$9,888	\$9,194	\$8,887	[a]
Shares Outstanding (in millions) - Common	194	194	193	183	181	179	179	[b]
Price per Share - Common	\$140	\$130	\$90	\$124	\$102	\$101	\$89	[c]
Market Value of Common Equity	\$27,115	\$25,278	\$17,390	\$22,731	\$18,547	\$18,188	\$16,008	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$27,115	\$25,278	\$17,390	\$22,731	\$18,547	\$18,188	\$16,008	[f] = [d] + [e]
Market to Book Value of Common Equity	2.16	2.01	1.47	2.16	1.88	1.98	1.80	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$4,376	\$4,376	\$3,526	\$2,840	\$2,957	\$2,567	\$2,362	[j]
Current Liabilities	\$2,595	\$2,595	\$3,972	\$3,647	\$2,541	\$1,834	\$2,209	[k]
Current Portion of Long-Term Debt	\$502	\$502	\$419	\$1,532	\$106	\$13	\$462	[l]
Net Working Capital	\$2,283	\$2,283	(\$27)	\$725	\$522	\$746	\$615	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$52	\$52	\$1,131	\$156	\$635	\$59	\$365	[n]
Adjusted Short-Term Debt	\$0	\$0	\$27	\$0	\$0	\$0	\$0	[o] = See Sources and Notes.
Long-Term Debt	\$20,098	\$20,098	\$17,150	\$12,874	\$12,185	\$11,758	\$8,758	[p]
Book Value of Long-Term Debt	\$20,600	\$20,600	\$17,596	\$14,406	\$12,291	\$11,771	\$9,220	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$18,031	\$18,031	\$18,031	\$13,825	\$13,274	\$11,905	\$9,835	
Carrying Amount	\$19,439	\$19,439	\$16,606	\$13,622	\$12,288	\$11,270	\$9,285	
Adjustment to Book Value of Long-Term Debt	(\$1,408)	(\$1,408)	\$1,425	\$203	\$986	\$635	\$550	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$19,192	\$19,192	\$19,021	\$14,609	\$13,277	\$12,406	\$9,770	[s] = [q] + [r].
Market Value of Debt	\$19,192	\$19,192	\$19,021	\$14,609	\$13,277	\$12,406	\$9,770	[t] = [s].
MARKET VALUE OF FIRM								
	\$46,307	\$44,470	\$36,411	\$37,340	\$31,824	\$30,594	\$25,778	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	58.56%	56.84%	47.76%	60.88%	58.28%	59.45%	62.10%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	41.44%	43.16%	52.24%	39.12%	41.72%	40.55%	37.90%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel Q: Dominion Energy

(\$MM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
MARKET VALUE OF COMMON EQUITY								
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
Book Value, Common Shareholder's Equity	\$24,312	\$24,312	\$28,339	\$26,909	\$17,689	\$14,917	\$12,880	[a]
Shares Outstanding (in millions) - Common	806	806	839	802	653	629	597	[b]
Price per Share - Common	\$77	\$74	\$72	\$76	\$70	\$78	\$73	[c]
Market Value of Common Equity	\$62,311	\$59,958	\$60,627	\$61,058	\$45,586	\$48,770	\$43,855	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$62,311	\$59,958	\$60,627	\$61,058	\$45,586	\$48,770	\$43,855	[f] = [d] + [e]
Market to Book Value of Common Equity	2.56	2.47	2.14	2.27	2.58	3.27	3.40	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$2,387	\$2,387	\$2,387	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$2,387	\$2,387	\$2,387	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$6,662	\$6,662	\$6,536	\$5,975	\$4,281	\$4,285	\$3,711	[j]
Current Liabilities	\$11,836	\$11,836	\$10,448	\$9,776	\$9,339	\$7,842	\$7,518	[k]
Current Portion of Long-Term Debt	\$2,639	\$2,639	\$2,919	\$3,142	\$3,603	\$2,391	\$1,774	[l]
Net Working Capital	(\$2,535)	(\$2,535)	(\$993)	(\$659)	(\$1,455)	(\$1,166)	(\$2,033)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$2,815	\$2,815	\$2,190	\$2,412	\$2,713	\$2,627	\$3,028	[n]
Adjusted Short-Term Debt	\$2,535	\$2,535	\$993	\$659	\$1,455	\$1,166	\$2,033	[o] = See Sources and Notes.
Long-Term Debt	\$32,371	\$32,371	\$34,615	\$37,279	\$31,120	\$31,096	\$24,186	[p]
Book Value of Long-Term Debt	\$37,545	\$37,545	\$38,527	\$41,080	\$36,178	\$34,653	\$27,993	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$38,773	\$38,773	\$36,155	\$31,045	\$31,223	\$28,273	\$23,210	
Carrying Amount	\$31,996	\$31,996	\$32,055	\$29,952	\$28,666	\$26,587	\$21,873	
Adjustment to Book Value of Long-Term Debt	\$6,777	\$6,777	\$4,100	\$1,093	\$2,557	\$1,686	\$1,337	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$44,322	\$44,322	\$42,627	\$42,173	\$38,735	\$36,339	\$29,330	[s] = [q] + [r].
Market Value of Debt	\$44,322	\$44,322	\$42,627	\$42,173	\$38,735	\$36,339	\$29,330	[t] = [s].
MARKET VALUE OF FIRM								
	\$109,020	\$106,667	\$105,641	\$103,231	\$84,321	\$85,109	\$73,185	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	57.16%	56.21%	57.39%	59.15%	54.06%	57.30%	59.92%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	2.19%	2.24%	2.26%	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	40.65%	41.55%	40.35%	40.85%	45.94%	42.70%	40.08%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

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Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel R: Duke Energy

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
MARKET VALUE OF COMMON EQUITY								
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
Book Value, Common Shareholder's Equity	\$46,224	\$46,224	\$44,959	\$44,056	\$41,792	\$41,179	\$39,892	[a]
Shares Outstanding (in millions) - Common	769	769	735	728	701	700	689	[b]
Price per Share - Common	\$102	\$94	\$79	\$90	\$77	\$82	\$79	[c]
Market Value of Common Equity	\$78,481	\$72,162	\$57,750	\$65,703	\$53,715	\$57,478	\$54,583	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$78,481	\$72,162	\$57,750	\$65,703	\$53,715	\$57,478	\$54,583	[f] = [d] + [e]
Market to Book Value of Common Equity	1.70	1.56	1.28	1.49	1.29	1.40	1.37	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$1,962	\$1,962	\$1,962	\$974	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$1,962	\$1,962	\$1,962	\$974	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$8,508	\$8,508	\$10,181	\$9,168	\$8,279	\$8,005	\$7,943	[j]
Current Liabilities	\$17,333	\$17,333	\$15,170	\$12,282	\$12,998	\$10,941	\$10,891	[k]
Current Portion of Long-Term Debt	\$5,586	\$5,586	\$5,077	\$2,805	\$3,951	\$1,977	\$2,075	[l]
Net Working Capital	(\$3,239)	(\$3,239)	\$88	(\$309)	(\$768)	(\$959)	(\$873)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$4,064	\$4,064	\$3,033	\$3,029	\$2,969	\$3,558	\$3,486	[n]
Adjusted Short-Term Debt	\$3,239	\$3,239	\$0	\$309	\$768	\$959	\$873	[o] = See Sources and Notes.
Long-Term Debt	\$56,120	\$56,120	\$57,725	\$55,169	\$49,030	\$47,021	\$38,232	[p]
Book Value of Long-Term Debt	\$64,945	\$64,945	\$62,802	\$58,283	\$53,749	\$49,957	\$41,180	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$69,292	\$69,292	\$63,062	\$54,534	\$55,331	\$49,161	\$0	
Carrying Amount	\$59,863	\$59,863	\$58,126	\$54,529	\$52,279	\$47,895	\$0	
Adjustment to Book Value of Long-Term Debt	\$9,429	\$9,429	\$4,936	\$5	\$3,052	\$1,266	\$0	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$74,374	\$74,374	\$67,738	\$58,288	\$56,801	\$51,223	\$41,180	[s] = [q] + [r].
Market Value of Debt	\$74,374	\$74,374	\$67,738	\$58,288	\$56,801	\$51,223	\$41,180	[t] = [s].
MARKET VALUE OF FIRM								
	\$154,817	\$148,498	\$127,450	\$124,965	\$110,516	\$108,701	\$95,763	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	50.69%	48.59%	45.31%	52.58%	48.60%	52.88%	57.00%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	1.27%	1.32%	1.54%	0.78%	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	48.04%	50.08%	53.15%	46.64%	51.40%	47.12%	43.00%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

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Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel S: Entergy Corp.

(\$MM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$11,017	\$11,017	\$10,224	\$8,970	\$7,975	\$8,057	\$9,361	[a]
Shares Outstanding (in millions) - Common	201	201	200	190	181	179	179	[b]
Price per Share - Common	\$106	\$98	\$93	\$95	\$78	\$76	\$78	[c]
Market Value of Common Equity	\$21,265	\$19,647	\$18,609	\$18,039	\$14,120	\$13,582	\$13,932	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$21,265	\$19,647	\$18,609	\$18,039	\$14,120	\$13,582	\$13,932	[f] = [d] + [e]
Market to Book Value of Common Equity	1.93	1.78	1.82	2.01	1.77	1.69	1.49	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$254	\$254	\$254	\$219	\$198	\$203	\$318	[h]
Market Value of Preferred Equity	\$254	\$254	\$254	\$219	\$198	\$203	\$318	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$4,789	\$4,789	\$3,974	\$3,408	\$3,656	\$3,397	\$4,001	[j]
Current Liabilities	\$4,512	\$4,512	\$6,018	\$4,861	\$5,233	\$3,879	\$3,839	[k]
Current Portion of Long-Term Debt	\$629	\$629	\$1,230	\$215	\$1,261	\$336	\$799	[l]
Net Working Capital	\$906	\$906	(\$814)	(\$1,239)	(\$316)	(\$145)	\$961	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$1,028	\$1,028	\$1,942	\$1,942	\$805	\$1,323	\$766	[n]
Adjusted Short-Term Debt	\$0	\$0	\$814	\$1,239	\$316	\$145	\$0	[o] = See Sources and Notes.
Long-Term Debt	\$24,075	\$24,075	\$18,229	\$17,394	\$15,613	\$13,951	\$13,526	[p]
Book Value of Long-Term Debt	\$24,704	\$24,704	\$20,273	\$18,848	\$17,190	\$14,432	\$14,326	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$24,814	\$24,814	\$19,060	\$15,880	\$15,367	\$14,816	\$13,579	
Carrying Amount	\$22,370	\$22,370	\$17,874	\$16,168	\$15,075	\$14,833	\$13,326	
Adjustment to Book Value of Long-Term Debt	\$2,444	\$2,444	\$1,186	(\$288)	\$292	(\$17)	\$253	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$27,149	\$27,149	\$21,459	\$18,560	\$17,482	\$14,415	\$14,579	[s] = [q] + [r].
Market Value of Debt	\$27,149	\$27,149	\$21,459	\$18,560	\$17,482	\$14,415	\$14,579	[t] = [s].
MARKET VALUE OF FIRM								
	\$48,668	\$47,049	\$40,322	\$36,818	\$31,800	\$28,200	\$28,829	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	43.69%	41.76%	46.15%	48.99%	44.40%	48.16%	48.33%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	0.52%	0.54%	0.63%	0.60%	0.62%	0.72%	1.10%	[w] = [i] / [u].
Debt - Market Value Ratio	55.78%	57.70%	53.22%	50.41%	54.98%	51.12%	50.57%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

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[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel T: Essential Utilities

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
MARKET VALUE OF COMMON EQUITY								
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
Book Value, Common Shareholder's Equity	\$4,810	\$4,810	\$4,613	\$1,993	\$1,972	\$1,867	\$1,761	[a]
Shares Outstanding (in millions) - Common	246	246	245	178	178	178	177	[b]
Price per Share - Common	\$47	\$44	\$39	\$36	\$34	\$32	\$32	[c]
Market Value of Common Equity	\$11,491	\$10,692	\$9,440	\$6,499	\$5,971	\$5,645	\$5,618	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$11,491	\$10,692	\$9,440	\$6,499	\$5,971	\$5,645	\$5,618	[f] = [d] + [e]
Market to Book Value of Common Equity	2.39	2.22	2.05	3.26	3.03	3.02	3.19	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$348	\$348	\$368	\$144	\$124	\$122	\$123	[j]
Current Liabilities	\$503	\$503	\$827	\$434	\$259	\$278	\$174	[k]
Current Portion of Long-Term Debt	\$80	\$80	\$115	\$158	\$104	\$119	\$29	[l]
Net Working Capital	(\$75)	(\$75)	(\$344)	(\$133)	(\$31)	(\$36)	(\$23)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$75	\$75	\$381	\$38	\$33	\$28	\$28	[n]
Adjusted Short-Term Debt	\$75	\$75	\$344	\$38	\$31	\$28	\$23	[o] = See Sources and Notes.
Long-Term Debt	\$5,601	\$5,601	\$4,790	\$2,475	\$2,063	\$1,798	\$1,744	[p]
Book Value of Long-Term Debt	\$5,757	\$5,757	\$5,249	\$2,670	\$2,198	\$1,945	\$1,796	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$6,366	\$6,366	\$3,324	\$2,588	\$2,263	\$2,019	\$1,905	
Carrying Amount	\$5,630	\$5,630	\$3,077	\$2,564	\$2,143	\$1,911	\$1,779	
Adjustment to Book Value of Long-Term Debt	\$736	\$736	\$247	\$24	\$120	\$108	\$126	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$6,493	\$6,493	\$5,496	\$2,694	\$2,318	\$2,053	\$1,922	[s] = [q] + [r].
Market Value of Debt	\$6,493	\$6,493	\$5,496	\$2,694	\$2,318	\$2,053	\$1,922	[t] = [s].
MARKET VALUE OF FIRM								
	\$17,983	\$17,184	\$14,937	\$9,193	\$8,289	\$7,697	\$7,540	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	63.90%	62.22%	63.20%	70.69%	72.04%	73.33%	74.51%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	36.10%	37.78%	36.80%	29.31%	27.96%	26.67%	25.49%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

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[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel U: Evergy Inc.

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
MARKET VALUE OF COMMON EQUITY								
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
Book Value, Common Shareholder's Equity	\$8,806	\$8,806	\$8,529	\$9,423	#N/A N/A	#N/A N/A	#N/A N/A	[a]
Shares Outstanding (in millions) - Common	227	227	227	245	#N/A N/A	#N/A N/A	#N/A N/A	[b]
Price per Share - Common	\$62	\$59	\$55	\$57	\$51	\$55	\$48	[c]
Market Value of Common Equity	\$14,132	\$13,384	\$12,424	\$14,043	N/A	N/A	N/A	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$14,132	\$13,384	\$12,424	\$14,043	N/A	N/A	N/A	[f] = [d] + [e]
Market to Book Value of Common Equity	1.60	1.52	1.46	1.49	N/A	N/A	N/A	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$2,002	\$2,002	\$1,733	\$1,928	#N/A N/A	#N/A N/A	#N/A N/A	[j]
Current Liabilities	\$3,244	\$3,244	\$2,398	\$3,335	#N/A N/A	#N/A N/A	#N/A N/A	[k]
Current Portion of Long-Term Debt	\$534	\$534	\$20	\$750	\$0	\$0	\$0	[l]
Net Working Capital	(\$708)	(\$708)	(\$645)	(\$658)	N/A	N/A	N/A	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$1,660	\$1,660	\$1,377	\$1,670	#N/A N/A	#N/A N/A	#N/A N/A	[n]
Adjusted Short-Term Debt	\$708	\$708	\$645	\$658	\$0	\$0	\$0	[o] = See Sources and Notes.
Long-Term Debt	\$9,119	\$9,119	\$8,994	\$7,232	#N/A N/A	#N/A N/A	#N/A N/A	[p]
Book Value of Long-Term Debt	\$10,361	\$10,361	\$9,658	\$8,639	N/A	N/A	N/A	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$11,274	\$11,274	\$9,750	\$7,412	\$4,011	\$0	\$0	
Carrying Amount	\$9,627	\$9,627	\$8,998	\$7,342	\$3,688	\$0	\$0	
Adjustment to Book Value of Long-Term Debt	\$1,647	\$1,647	\$752	\$70	\$323	\$0	\$0	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$12,008	\$12,008	\$10,411	\$8,710	N/A	N/A	N/A	[s] = [q] + [r].
Market Value of Debt	\$12,008	\$12,008	\$10,411	\$8,710	N/A	N/A	N/A	[t] = [s].
MARKET VALUE OF FIRM								
	\$26,140	\$25,392	\$22,835	\$22,753	N/A	N/A	N/A	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	54.06%	52.71%	54.41%	61.72%	N/A	N/A	N/A	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	N/A	N/A	N/A	[w] = [i] / [u].
Debt - Market Value Ratio	45.94%	47.29%	45.59%	38.28%	N/A	N/A	N/A	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel W: Exelon Corp.

(\$MM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$32,015	\$32,015	\$32,482	\$31,357	\$30,231	\$26,530	\$25,717	[a]
Shares Outstanding (in millions) - Common	977	977	974	971	965	926	922	[b]
Price per Share - Common	\$45	\$43	\$35	\$50	\$38	\$36	\$35	[c]
Market Value of Common Equity	\$43,982	\$42,102	\$33,737	\$48,360	\$36,757	\$33,270	\$32,275	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$43,982	\$42,102	\$33,737	\$48,360	\$36,757	\$33,270	\$32,275	[f] = [d] + [e]
Market to Book Value of Common Equity	1.37	1.32	1.04	1.54	1.22	1.25	1.25	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$193	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$193	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$12,997	\$12,997	\$12,476	\$12,476	\$11,533	\$12,194	\$11,364	[j]
Current Liabilities	\$13,580	\$13,580	\$11,774	\$12,229	\$10,153	\$14,437	\$13,770	[k]
Current Portion of Long-Term Debt	\$2,281	\$2,281	\$2,848	\$2,757	\$1,203	\$3,645	\$2,058	[l]
Net Working Capital	\$1,698	\$1,698	\$3,550	\$3,004	\$2,583	\$1,402	(\$348)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$3,128	\$3,128	\$1,979	\$1,254	\$1,654	\$2,048	\$3,640	[n]
Adjusted Short-Term Debt	\$0	\$0	\$0	\$0	\$0	\$0	\$348	[o] = See Sources and Notes.
Long-Term Debt	\$36,638	\$36,638	\$35,198	\$34,745	\$33,294	\$31,685	\$29,955	[p]
Book Value of Long-Term Debt	\$38,919	\$38,919	\$38,046	\$37,502	\$34,497	\$35,330	\$32,361	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$43,752	\$43,752	\$40,033	\$35,869	\$36,705	\$34,813	\$25,924	
Carrying Amount	\$36,912	\$36,912	\$36,039	\$35,424	\$34,264	\$34,005	\$25,145	
Adjustment to Book Value of Long-Term Debt	\$6,840	\$6,840	\$3,994	\$445	\$2,441	\$808	\$779	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$45,759	\$45,759	\$42,040	\$37,947	\$36,938	\$36,138	\$33,140	[s] = [q] + [r].
Market Value of Debt	\$45,759	\$45,759	\$42,040	\$37,947	\$36,938	\$36,138	\$33,140	[t] = [s].
MARKET VALUE OF FIRM								
	\$89,741	\$87,861	\$75,777	\$86,307	\$73,695	\$69,408	\$65,608	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	49.01%	47.92%	44.52%	56.03%	49.88%	47.93%	49.19%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	0.29%	[w] = [i] / [u].
Debt - Market Value Ratio	50.99%	52.08%	55.48%	43.97%	50.12%	52.07%	50.51%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel X: Global Water Resources Inc

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$31	\$31	\$35	\$27	\$14	\$14	\$18	[a]
Shares Outstanding (in millions) - Common	23	23	23	22	20	20	18	[b]
Price per Share - Common	\$17	\$17	\$10	\$10	\$9	\$9	N/A	[c]
Market Value of Common Equity	\$378	\$383	\$229	\$210	\$177	\$171	N/A	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$378	\$383	\$229	\$210	\$177	\$171	N/A	[f] = [d] + [e]
Market to Book Value of Common Equity	12.36	12.53	6.53	7.77	12.75	12.04	N/A	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$23	\$23	\$22	\$18	\$11	\$19	\$20	[j]
Current Liabilities	\$14	\$14	\$10	\$10	\$11	\$13	\$13	[k]
Current Portion of Long-Term Debt	\$2	\$2	\$0	\$0	\$0	\$0	\$2	[l]
Net Working Capital	\$11	\$11	\$12	\$8	\$0	\$6	\$8	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[n]
Adjusted Short-Term Debt	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[o] = See Sources and Notes.
Long-Term Debt	\$113	\$113	\$115	\$115	\$114	\$114	\$103	[p]
Book Value of Long-Term Debt	\$115	\$115	\$115	\$115	\$114	\$114	\$105	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$128	\$128	\$121	\$108	\$116	\$108	\$117	
Carrying Amount	\$113	\$113	\$115	\$115	\$114	\$115	\$105	
Adjustment to Book Value of Long-Term Debt	\$15	\$15	\$6	(\$7)	\$1	(\$7)	\$12	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$130	\$130	\$121	\$109	\$116	\$108	\$117	[s] = [q] + [r].
Market Value of Debt	\$130	\$130	\$121	\$109	\$116	\$108	\$117	[t] = [s].
MARKET VALUE OF FIRM								
	\$508	\$513	\$350	\$319	\$293	\$279	N/A	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	74.45%	74.72%	65.38%	65.92%	60.44%	61.41%	N/A	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	N/A	[w] = [i] / [u].
Debt - Market Value Ratio	25.55%	25.28%	34.62%	34.08%	39.56%	38.59%	N/A	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel Y: Hawaiian Elec.

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$2,321	\$2,321	\$2,277	\$2,184	\$2,092	\$2,066	\$1,942	[a]
Shares Outstanding (in millions) - Common	109	109	109	109	109	109	108	[b]
Price per Share - Common	\$44	\$42	\$43	\$40	\$34	\$33	\$32	[c]
Market Value of Common Equity	\$4,791	\$4,621	\$4,666	\$4,408	\$3,684	\$3,621	\$3,442	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$4,791	\$4,621	\$4,666	\$4,408	\$3,684	\$3,621	\$3,442	[f] = [d] + [e]
Market to Book Value of Common Equity	2.06	1.99	2.05	2.02	1.76	1.75	1.77	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$34	\$34	\$34	\$34	\$34	\$34	\$34	[h]
Market Value of Preferred Equity	\$34	\$34	\$34	\$34	\$34	\$34	\$34	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$3,175	\$3,175	\$2,024	\$1,950	\$1,983	\$1,727	\$1,463	[j]
Current Liabilities	\$8,146	\$8,146	\$6,863	\$6,635	\$6,638	\$6,066	\$5,712	[k]
Current Portion of Long-Term Debt	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[l]
Net Working Capital	(\$4,970)	(\$4,970)	(\$4,839)	(\$4,685)	(\$4,655)	(\$4,338)	(\$4,249)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$203	\$203	\$258	\$200	\$339	\$202	\$425	[n]
Adjusted Short-Term Debt	\$203	\$203	\$258	\$200	\$339	\$202	\$425	[o] = See Sources and Notes.
Long-Term Debt	\$2,405	\$2,405	\$2,275	\$2,122	\$1,684	\$1,619	\$1,579	[p]
Book Value of Long-Term Debt	\$2,608	\$2,608	\$2,532	\$2,322	\$2,023	\$1,821	\$2,003	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$2,488	\$2,488	\$2,157	\$1,904	\$1,813	\$1,705	\$1,669	
Carrying Amount	\$2,119	\$2,119	\$1,964	\$1,880	\$1,684	\$1,619	\$1,578	
Adjustment to Book Value of Long-Term Debt	\$369	\$369	\$193	\$25	\$129	\$86	\$91	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$2,977	\$2,977	\$2,725	\$2,347	\$2,152	\$1,907	\$2,094	[s] = [q] + [r].
Market Value of Debt	\$2,977	\$2,977	\$2,725	\$2,347	\$2,152	\$1,907	\$2,094	[t] = [s].
MARKET VALUE OF FIRM								
	\$7,802	\$7,631	\$7,425	\$6,789	\$5,871	\$5,562	\$5,570	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	61.41%	60.55%	62.84%	64.93%	62.75%	65.10%	61.79%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	0.44%	0.45%	0.46%	0.51%	0.58%	0.62%	0.62%	[w] = [i] / [u].
Debt - Market Value Ratio	38.15%	39.00%	36.70%	34.56%	36.66%	34.28%	37.59%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

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[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel Z: IDACORP Inc.

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$2,569	\$2,569	\$2,467	\$2,380	\$2,257	\$2,159	\$2,058	[a]
Shares Outstanding (in millions) - Common	51	51	50	50	50	50	50	[b]
Price per Share - Common	\$100	\$99	\$86	\$100	\$85	\$82	\$74	[c]
Market Value of Common Equity	\$5,075	\$5,021	\$4,344	\$5,027	\$4,295	\$4,143	\$3,731	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$5,075	\$5,021	\$4,344	\$5,027	\$4,295	\$4,143	\$3,731	[f] = [d] + [e]
Market to Book Value of Common Equity	1.98	1.95	1.76	2.11	1.90	1.92	1.81	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$594	\$594	\$473	\$576	\$638	\$409	\$587	[j]
Current Liabilities	\$262	\$262	\$248	\$273	\$332	\$181	\$312	[k]
Current Portion of Long-Term Debt	\$0	\$0	\$0	\$0	\$130	\$0	\$101	[l]
Net Working Capital	\$332	\$332	\$225	\$303	\$436	\$228	\$377	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$0	\$0	\$0	\$0	\$0	\$0	\$23	[n]
Adjusted Short-Term Debt	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[o] = See Sources and Notes.
Long-Term Debt	\$2,000	\$2,000	\$1,837	\$1,835	\$1,834	\$1,745	\$1,744	[p]
Book Value of Long-Term Debt	\$2,000	\$2,000	\$1,837	\$1,835	\$1,964	\$1,745	\$1,845	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$2,467	\$2,467	\$2,084	\$1,943	\$1,915	\$1,859	\$1,813	
Carrying Amount	\$2,000	\$2,000	\$1,837	\$1,835	\$1,746	\$1,746	\$1,726	
Adjustment to Book Value of Long-Term Debt	\$467	\$467	\$247	\$108	\$169	\$113	\$87	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$2,467	\$2,467	\$2,084	\$1,943	\$2,133	\$1,858	\$1,932	[s] = [q] + [r].
Market Value of Debt	\$2,467	\$2,467	\$2,084	\$1,943	\$2,133	\$1,858	\$1,932	[t] = [s].
MARKET VALUE OF FIRM								
	\$7,542	\$7,488	\$6,428	\$6,970	\$6,428	\$6,001	\$5,664	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	67.29%	67.06%	67.58%	72.12%	66.82%	69.04%	65.88%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	32.71%	32.94%	32.42%	27.88%	33.18%	30.96%	34.12%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

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[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AA: MGE Energy

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$998	\$998	\$869	\$829	\$787	\$733	\$697	[a]
Shares Outstanding (in millions) - Common	36	36	35	35	35	35	35	[b]
Price per Share - Common	\$75	\$71	\$63	\$66	\$56	\$63	\$51	[c]
Market Value of Common Equity	\$2,699	\$2,584	\$2,194	\$2,295	\$1,929	\$2,194	\$1,759	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$2,699	\$2,584	\$2,194	\$2,295	\$1,929	\$2,194	\$1,759	[f] = [d] + [e]
Market to Book Value of Common Equity	2.70	2.59	2.52	2.77	2.45	2.99	2.52	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$202	\$202	\$162	\$221	\$249	\$254	\$247	[j]
Current Liabilities	\$184	\$184	\$111	\$112	\$106	\$84	\$118	[k]
Current Portion of Long-Term Debt	\$5	\$5	\$20	\$5	\$24	\$4	\$34	[l]
Net Working Capital	\$23	\$23	\$71	\$113	\$167	\$175	\$164	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$54	\$54	\$3	\$6	\$3	\$0	\$0	[n]
Adjusted Short-Term Debt	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[o] = See Sources and Notes.
Long-Term Debt	\$536	\$536	\$540	\$510	\$397	\$391	\$356	[p]
Book Value of Long-Term Debt	\$541	\$541	\$560	\$515	\$422	\$396	\$390	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$639	\$639	\$612	\$519	\$475	\$430	\$436	
Carrying Amount	\$528	\$528	\$548	\$502	\$427	\$391	\$396	
Adjustment to Book Value of Long-Term Debt	\$111	\$111	\$64	\$16	\$48	\$39	\$40	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$652	\$652	\$624	\$531	\$470	\$435	\$430	[s] = [q] + [r].
Market Value of Debt	\$652	\$652	\$624	\$531	\$470	\$435	\$430	[t] = [s].
MARKET VALUE OF FIRM								
	\$3,350	\$3,236	\$2,817	\$2,826	\$2,399	\$2,629	\$2,189	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	80.55%	79.86%	77.86%	81.21%	80.41%	83.46%	80.34%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	19.45%	20.14%	22.14%	18.79%	19.59%	16.54%	19.66%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AB: Middlesex Water

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$349	\$349	\$327	\$254	\$230	\$220	\$209	[a]
Shares Outstanding (in millions) - Common	17	17	17	16	16	16	16	[b]
Price per Share - Common	\$82	\$78	\$57	\$58	\$37	\$36	\$31	[c]
Market Value of Common Equity	\$1,425	\$1,367	\$987	\$950	\$597	\$593	\$497	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$1,425	\$1,367	\$987	\$950	\$597	\$593	\$497	[f] = [d] + [e]
Market to Book Value of Common Equity	4.08	3.92	3.01	3.74	2.59	2.70	2.38	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$2	\$2	\$2	\$2	\$2	\$2	\$2	[h]
Market Value of Preferred Equity	\$2	\$2	\$2	\$2	\$2	\$2	\$2	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$31	\$31	\$40	\$30	\$25	\$27	\$25	[j]
Current Liabilities	\$66	\$66	\$81	\$93	\$64	\$50	\$31	[k]
Current Portion of Long-Term Debt	\$8	\$8	\$8	\$8	\$7	\$6	\$6	[l]
Net Working Capital	(\$27)	(\$27)	(\$33)	(\$56)	(\$32)	(\$16)	(\$0)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$13	\$13	\$34	\$50	\$28	\$15	\$2	[n]
Adjusted Short-Term Debt	\$13	\$13	\$33	\$50	\$28	\$15	\$0	[o] = See Sources and Notes.
Long-Term Debt	\$278	\$278	\$240	\$165	\$140	\$136	\$131	[p]
Book Value of Long-Term Debt	\$298	\$298	\$281	\$222	\$175	\$157	\$137	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$159	\$159	\$161	\$103	\$98	\$85	\$88	
Carrying Amount	\$148	\$148	\$151	\$101	\$95	\$83	\$86	
Adjustment to Book Value of Long-Term Debt	\$12	\$12	\$10	\$1	\$3	\$2	\$3	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$310	\$310	\$291	\$223	\$177	\$159	\$140	[s] = [q] + [r].
Market Value of Debt	\$310	\$310	\$291	\$223	\$177	\$159	\$140	[t] = [s].
MARKET VALUE OF FIRM								
	\$1,737	\$1,679	\$1,280	\$1,176	\$777	\$754	\$640	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	82.03%	81.41%	77.10%	80.79%	76.87%	78.62%	77.70%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	0.12%	0.12%	0.16%	0.21%	0.31%	0.32%	0.38%	[w] = [i] / [u].
Debt - Market Value Ratio	17.85%	18.46%	22.73%	19.00%	22.82%	21.05%	21.92%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AC: New Jersey Resources

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$1,822	\$1,822	\$1,889	\$1,569	\$1,467	\$1,286	\$1,207	[a]
Shares Outstanding (in millions) - Common	96	96	96	89	88	86	86	[b]
Price per Share - Common	\$43	\$41	\$31	\$50	\$39	\$39	\$35	[c]
Market Value of Common Equity	\$4,114	\$3,907	\$2,922	\$4,446	\$3,456	\$3,367	\$3,043	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$4,114	\$3,907	\$2,922	\$4,446	\$3,456	\$3,367	\$3,043	[f] = [d] + [e]
Market to Book Value of Common Equity	2.26	2.14	1.55	2.83	2.36	2.62	2.52	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$535	\$535	\$501	\$605	\$815	\$678	\$460	[j]
Current Liabilities	\$416	\$416	\$824	\$584	\$694	\$626	\$478	[k]
Current Portion of Long-Term Debt	\$27	\$27	\$26	\$125	\$166	\$61	\$12	[l]
Net Working Capital	\$146	\$146	(\$297)	\$146	\$286	\$112	(\$6)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$9	\$9	\$467	\$46	\$151	\$238	\$153	[n]
Adjusted Short-Term Debt	\$0	\$0	\$297	\$0	\$0	\$0	\$6	[o] = See Sources and Notes.
Long-Term Debt	\$2,376	\$2,376	\$1,752	\$1,180	\$998	\$1,024	\$844	[p]
Book Value of Long-Term Debt	\$2,403	\$2,403	\$2,076	\$1,304	\$1,164	\$1,085	\$862	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$2,455	\$2,455	\$984	\$669	\$673	\$732	\$584	
Carrying Amount	\$2,103	\$2,103	\$893	\$672	\$672	\$708	\$583	
Adjustment to Book Value of Long-Term Debt	\$352	\$352	\$91	(\$3)	\$1	\$24	\$1	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$2,755	\$2,755	\$2,167	\$1,301	\$1,165	\$1,108	\$864	[s] = [q] + [r].
Market Value of Debt	\$2,755	\$2,755	\$2,167	\$1,301	\$1,165	\$1,108	\$864	[t] = [s].
MARKET VALUE OF FIRM								
	\$6,869	\$6,663	\$5,089	\$5,748	\$4,621	\$4,476	\$3,907	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	59.89%	58.65%	57.41%	77.36%	74.79%	75.23%	77.89%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	40.11%	41.35%	42.59%	22.64%	25.21%	24.77%	22.11%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AD: NextEra Energy

(\$MM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
MARKET VALUE OF COMMON EQUITY								
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
Book Value, Common Shareholder's Equity	\$37,378	\$37,378	\$36,403	\$34,226	\$32,706	\$25,497	\$22,912	[a]
Shares Outstanding (in millions) - Common	1,961	1,961	1,956	1,916	1,884	1,872	1,844	[b]
Price per Share - Common	\$73	\$74	\$54	\$48	\$40	\$33	\$29	[c]
Market Value of Common Equity	\$143,654	\$144,727	\$106,031	\$91,854	\$75,124	\$61,199	\$54,125	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$143,654	\$144,727	\$106,031	\$91,854	\$75,124	\$61,199	\$54,125	[f] = [d] + [e]
Market to Book Value of Common Equity	3.84	3.87	2.91	2.68	2.30	2.40	2.36	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$8,237	\$8,237	\$9,725	\$8,222	\$5,612	\$5,827	\$7,096	[j]
Current Liabilities	\$15,783	\$15,783	\$13,722	\$17,926	\$9,579	\$9,761	\$10,587	[k]
Current Portion of Long-Term Debt	\$3,837	\$3,837	\$2,489	\$2,614	\$1,168	\$2,766	\$2,145	[l]
Net Working Capital	(\$3,709)	(\$3,709)	(\$1,508)	(\$7,090)	(\$2,799)	(\$1,168)	(\$1,346)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$2,766	\$2,766	\$3,601	\$7,716	\$2,969	\$2,559	\$2,472	[n]
Adjusted Short-Term Debt	\$2,766	\$2,766	\$1,508	\$7,090	\$2,799	\$1,168	\$1,346	[o] = See Sources and Notes.
Long-Term Debt	\$46,065	\$46,065	\$41,116	\$29,883	\$28,062	\$28,539	\$27,791	[p]
Book Value of Long-Term Debt	\$52,668	\$52,668	\$45,113	\$39,587	\$32,029	\$32,473	\$31,282	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$51,525	\$51,525	\$42,928	\$30,043	\$35,447	\$31,623	\$30,412	
Carrying Amount	\$46,082	\$46,082	\$39,667	\$29,498	\$33,134	\$30,418	\$28,897	
Adjustment to Book Value of Long-Term Debt	\$5,443	\$5,443	\$3,261	\$545	\$2,313	\$1,205	\$1,515	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$58,111	\$58,111	\$48,374	\$40,132	\$34,342	\$33,678	\$32,797	[s] = [q] + [r].
Market Value of Debt	\$58,111	\$58,111	\$48,374	\$40,132	\$34,342	\$33,678	\$32,797	[t] = [s].
MARKET VALUE OF FIRM								
	\$201,765	\$202,838	\$154,405	\$131,986	\$109,466	\$94,877	\$86,922	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	71.20%	71.35%	68.67%	69.59%	68.63%	64.50%	62.27%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	28.80%	28.65%	31.33%	30.41%	31.37%	35.50%	37.73%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

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Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AE: NiSource Inc.

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$5,052	\$5,052	\$4,861	\$4,900	\$4,506	\$4,191	\$3,872	[a]
Shares Outstanding (in millions) - Common	392	392	383	373	338	324	321	[b]
Price per Share - Common	\$26	\$24	\$24	\$28	\$23	\$24	\$23	[c]
Market Value of Common Equity	\$10,017	\$9,233	\$9,076	\$10,536	\$7,885	\$7,663	\$7,391	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$10,017	\$9,233	\$9,076	\$10,536	\$7,885	\$7,663	\$7,391	[f] = [d] + [e]
Market to Book Value of Common Equity	1.98	1.83	1.87	2.15	1.75	1.83	1.91	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$880	\$880	\$880	\$880	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$880	\$880	\$880	\$880	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$1,594	\$1,594	\$3,225	\$1,916	\$1,634	\$1,471	\$1,395	[j]
Current Liabilities	\$2,259	\$2,259	\$4,162	\$4,015	\$3,226	\$3,664	\$2,496	[k]
Current Portion of Long-Term Debt	\$44	\$44	\$8	\$61	\$263	\$809	\$264	[l]
Net Working Capital	(\$621)	(\$621)	(\$929)	(\$2,039)	(\$1,330)	(\$1,384)	(\$837)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$520	\$520	\$2,046	\$2,080	\$1,567	\$1,514	\$845	[n]
Adjusted Short-Term Debt	\$520	\$520	\$929	\$2,039	\$1,330	\$1,384	\$837	[o] = See Sources and Notes.
Long-Term Debt	\$9,202	\$9,202	\$7,818	\$7,155	\$7,287	\$5,591	\$5,906	[p]
Book Value of Long-Term Debt	\$9,767	\$9,767	\$8,754	\$9,254	\$8,879	\$7,784	\$7,006	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$11,034	\$11,034	\$8,764	\$7,228	\$8,603	\$7,064	\$6,976	
Carrying Amount	\$9,243	\$9,243	\$7,870	\$7,155	\$7,797	\$6,421	\$6,382	
Adjustment to Book Value of Long-Term Debt	\$1,791	\$1,791	\$895	\$73	\$807	\$643	\$594	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$11,558	\$11,558	\$9,649	\$9,327	\$9,686	\$8,426	\$7,600	[s] = [q] + [r].
Market Value of Debt	\$11,558	\$11,558	\$9,649	\$9,327	\$9,686	\$8,426	\$7,600	[t] = [s].
MARKET VALUE OF FIRM								
	\$22,455	\$21,670	\$19,606	\$20,742	\$17,571	\$16,090	\$14,990	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	44.61%	42.60%	46.30%	50.79%	44.87%	47.63%	49.30%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	3.92%	4.06%	4.49%	4.24%	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	51.47%	53.33%	49.22%	44.97%	55.13%	52.37%	50.70%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

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Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AF: NorthWestern Corp.

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$2,114	\$2,114	\$2,060	\$1,990	\$1,835	\$1,709	\$1,615	[a]
Shares Outstanding (in millions) - Common	54	54	54	54	53	52	52	[b]
Price per Share - Common	\$64	\$64	\$58	\$71	\$52	\$58	\$61	[c]
Market Value of Common Equity	\$3,480	\$3,470	\$3,162	\$3,808	\$2,760	\$3,031	\$3,156	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$3,480	\$3,470	\$3,162	\$3,808	\$2,760	\$3,031	\$3,156	[f] = [d] + [e]
Market to Book Value of Common Equity	1.65	1.64	1.53	1.91	1.50	1.77	1.95	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$359	\$359	\$330	\$288	\$258	\$245	\$250	[j]
Current Liabilities	\$386	\$386	\$348	\$347	\$326	\$545	\$518	[k]
Current Portion of Long-Term Debt	\$3	\$3	\$3	\$2	\$2	\$2	\$2	[l]
Net Working Capital	(\$25)	(\$25)	(\$15)	(\$57)	(\$66)	(\$298)	(\$266)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$0	\$0	\$0	\$0	\$0	\$229	\$162	[n]
Adjusted Short-Term Debt	\$0	\$0	\$0	\$0	\$0	\$229	\$162	[o] = See Sources and Notes.
Long-Term Debt	\$2,478	\$2,478	\$2,256	\$2,100	\$2,038	\$1,817	\$1,794	[p]
Book Value of Long-Term Debt	\$2,481	\$2,481	\$2,259	\$2,102	\$2,040	\$2,048	\$1,958	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$2,630	\$2,630	\$2,417	\$2,118	\$1,902	\$1,852	\$1,845	
Carrying Amount	\$2,315	\$2,315	\$2,233	\$2,102	\$1,793	\$1,793	\$1,782	
Adjustment to Book Value of Long-Term Debt	\$314	\$314	\$184	\$16	\$108	\$59	\$63	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$2,795	\$2,795	\$2,442	\$2,118	\$2,149	\$2,107	\$2,021	[s] = [q] + [r].
Market Value of Debt	\$2,795	\$2,795	\$2,442	\$2,118	\$2,149	\$2,107	\$2,021	[t] = [s].
MARKET VALUE OF FIRM								
	\$6,276	\$6,265	\$5,605	\$5,926	\$4,909	\$5,139	\$5,177	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	55.46%	55.38%	56.43%	64.27%	56.23%	58.99%	60.97%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	44.54%	44.62%	43.57%	35.73%	43.77%	41.01%	39.03%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AG: Northwest Natural

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$936	\$936	\$902	\$794	\$772	\$875	\$807	[a]
Shares Outstanding (in millions) - Common	31	31	31	29	29	29	27	[b]
Price per Share - Common	\$54	\$53	\$60	\$65	\$56	\$59	\$52	[c]
Market Value of Common Equity	\$1,650	\$1,613	\$1,838	\$1,886	\$1,624	\$1,688	\$1,435	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$1,650	\$1,613	\$1,838	\$1,886	\$1,624	\$1,688	\$1,435	[f] = [d] + [e]
Market to Book Value of Common Equity	1.76	1.72	2.04	2.38	2.10	1.93	1.78	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$303	\$303	\$720	\$272	\$242	\$266	\$272	[j]
Current Liabilities	\$586	\$586	\$799	\$526	\$317	\$235	\$362	[k]
Current Portion of Long-Term Debt	\$96	\$96	\$1	\$109	\$75	\$62	\$25	[l]
Net Working Capital	(\$186)	(\$186)	(\$77)	(\$145)	(\$0)	\$93	(\$65)	[m] = [j] - ([k] + [l]).
Notes Payable (Short-Term Debt)	\$236	\$236	\$550	\$176	\$50	\$0	\$165	[n]
Adjusted Short-Term Debt	\$186	\$186	\$77	\$145	\$0	\$0	\$65	[o] = See Sources and Notes.
Long-Term Debt	\$941	\$941	\$1,033	\$634	\$683	\$658	\$570	[p]
Book Value of Long-Term Debt	\$1,224	\$1,224	\$1,112	\$888	\$759	\$720	\$660	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$1,136	\$1,136	\$957	\$762	\$853	\$793	\$0	
Carrying Amount	\$955	\$955	\$881	\$736	\$780	\$719	\$0	
Adjustment to Book Value of Long-Term Debt	\$181	\$181	\$76	\$26	\$73	\$74	\$0	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$1,405	\$1,405	\$1,188	\$914	\$832	\$794	\$660	[s] = [q] + [r].
Market Value of Debt	\$1,405	\$1,405	\$1,188	\$914	\$832	\$794	\$660	[t] = [s].
MARKET VALUE OF FIRM								
	\$3,055	\$3,017	\$3,026	\$2,800	\$2,456	\$2,482	\$2,094	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	54.02%	53.44%	60.74%	67.36%	66.12%	68.02%	68.50%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	45.98%	46.56%	39.26%	32.64%	33.88%	31.98%	31.50%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AH: OGE Energy

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$3,606	\$3,606	\$3,553	\$3,976	\$3,842	\$3,444	\$3,298	[a]
Shares Outstanding (in millions) - Common	200	200	200	200	200	200	200	[b]
Price per Share - Common	\$34	\$32	\$30	\$43	\$32	\$36	\$28	[c]
Market Value of Common Equity	\$6,778	\$6,470	\$5,961	\$8,591	\$6,359	\$7,171	\$5,576	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$6,778	\$6,470	\$5,961	\$8,591	\$6,359	\$7,171	\$5,576	[f] = [d] + [e]
Market to Book Value of Common Equity	1.88	1.79	1.68	2.16	1.66	2.08	1.69	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$503	\$503	\$523	\$454	\$494	\$538	\$456	[j]
Current Liabilities	\$1,837	\$1,837	\$855	\$884	\$1,215	\$915	\$707	[k]
Current Portion of Long-Term Debt	\$6	\$6	\$6	\$3	\$500	\$225	\$0	[l]
Net Working Capital	(\$1,328)	(\$1,328)	(\$327)	(\$428)	(\$222)	(\$152)	(\$251)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$1,278	\$1,278	\$375	\$366	\$194	\$128	\$188	[n]
Adjusted Short-Term Debt	\$1,278	\$1,278	\$327	\$366	\$194	\$128	\$188	[o] = See Sources and Notes.
Long-Term Debt	\$3,495	\$3,495	\$3,196	\$2,944	\$2,500	\$2,703	\$2,629	[p]
Book Value of Long-Term Debt	\$4,779	\$4,779	\$3,528	\$3,313	\$3,194	\$3,056	\$2,817	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$4,328	\$4,328	\$3,646	\$3,322	\$3,388	\$2,904	\$2,656	
Carrying Amount	\$3,494	\$3,494	\$3,195	\$3,147	\$2,999	\$2,631	\$2,899	
Adjustment to Book Value of Long-Term Debt	\$834	\$834	\$451	\$175	\$389	\$273	(\$244)	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$5,613	\$5,613	\$3,979	\$3,488	\$3,582	\$3,330	\$2,573	[s] = [q] + [r].
Market Value of Debt	\$5,613	\$5,613	\$3,979	\$3,488	\$3,582	\$3,330	\$2,573	[t] = [s].
MARKET VALUE OF FIRM								
	\$12,391	\$12,083	\$9,940	\$12,079	\$9,942	\$10,500	\$8,149	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	54.70%	53.55%	59.97%	71.12%	63.97%	68.29%	68.42%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	45.30%	46.45%	40.03%	28.88%	36.03%	31.71%	31.58%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AI: ONE Gas Inc.

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$2,297	\$2,297	\$2,189	\$2,105	\$2,021	\$1,945	\$1,867	[a]
Shares Outstanding (in millions) - Common	53	53	53	53	52	52	52	[b]
Price per Share - Common	\$75	\$75	\$76	\$89	\$65	\$67	\$60	[c]
Market Value of Common Equity	\$4,001	\$4,004	\$4,005	\$4,692	\$3,421	\$3,504	\$3,118	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$4,001	\$4,004	\$4,005	\$4,692	\$3,421	\$3,504	\$3,118	[f] = [d] + [e]
Market to Book Value of Common Equity	1.74	1.74	1.83	2.23	1.69	1.80	1.67	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$1,159	\$1,159	\$408	\$516	\$502	\$481	\$418	[j]
Current Liabilities	\$879	\$879	\$776	\$658	\$845	\$308	\$229	[k]
Current Portion of Long-Term Debt	\$7	\$7	\$7	\$6	\$300	\$0	\$0	[l]
Net Working Capital	\$287	\$287	(\$362)	(\$136)	(\$43)	\$173	\$189	[m] = [j] - ([k] + [l]).
Notes Payable (Short-Term Debt)	\$447	\$447	\$475	\$296	\$283	\$85	\$0	[n]
Adjusted Short-Term Debt	\$0	\$0	\$362	\$136	\$43	\$0	\$0	[o] = See Sources and Notes.
Long-Term Debt	\$4,083	\$4,083	\$1,286	\$1,318	\$893	\$1,193	\$1,192	[p]
Book Value of Long-Term Debt	\$4,090	\$4,090	\$1,655	\$1,460	\$1,236	\$1,193	\$1,192	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$2,000	\$2,000	\$1,500	\$1,400	\$1,300	\$1,200	\$1,200	
Carrying Amount	\$1,600	\$1,600	\$1,286	\$1,300	\$1,200	\$1,200	\$1,200	
Adjustment to Book Value of Long-Term Debt	\$400	\$400	\$214	\$100	\$100	\$0	\$0	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$4,490	\$4,490	\$1,869	\$1,560	\$1,336	\$1,193	\$1,192	[s] = [q] + [r].
Market Value of Debt	\$4,490	\$4,490	\$1,869	\$1,560	\$1,336	\$1,193	\$1,192	[t] = [s].
MARKET VALUE OF FIRM								
	\$8,490	\$8,494	\$5,874	\$6,252	\$4,758	\$4,697	\$4,310	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	47.12%	47.14%	68.19%	75.05%	71.91%	74.61%	72.35%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	52.88%	52.86%	31.81%	24.95%	28.09%	25.39%	27.65%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

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[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AJ: Otter Tail Corp.

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$888	\$888	\$800	\$740	\$708	\$679	\$614	[a]
Shares Outstanding (in millions) - Common	42	42	40	40	40	39	38	[b]
Price per Share - Common	\$48	\$46	\$41	\$50	\$43	\$37	\$28	[c]
Market Value of Common Equity	\$1,982	\$1,899	\$1,655	\$1,983	\$1,702	\$1,460	\$1,075	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$1,982	\$1,899	\$1,655	\$1,983	\$1,702	\$1,460	\$1,075	[f] = [d] + [e]
Market to Book Value of Common Equity	2.23	2.14	2.07	2.68	2.40	2.15	1.75	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$259	\$259	\$256	\$274	\$240	\$219	\$210	[j]
Current Liabilities	\$459	\$459	\$176	\$201	\$166	\$236	\$233	[k]
Current Portion of Long-Term Debt	\$140	\$140	\$5	\$4	\$0	\$45	\$52	[l]
Net Working Capital	(\$61)	(\$61)	\$85	\$77	\$74	\$28	\$29	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$135	\$135	\$20	\$44	\$30	\$59	\$43	[n]
Adjusted Short-Term Debt	\$61	\$61	\$0	\$0	\$0	\$0	\$0	[o] = See Sources and Notes.
Long-Term Debt	\$624	\$624	\$742	\$607	\$590	\$490	\$494	[p]
Book Value of Long-Term Debt	\$825	\$825	\$747	\$611	\$590	\$536	\$546	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$858	\$858	\$742	\$602	\$543	\$584	\$563	
Carrying Amount	\$765	\$765	\$690	\$590	\$491	\$539	\$498	
Adjustment to Book Value of Long-Term Debt	\$94	\$94	\$53	\$11	\$52	\$45	\$65	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$919	\$919	\$799	\$623	\$642	\$581	\$611	[s] = [q] + [r].
Market Value of Debt	\$919	\$919	\$799	\$623	\$642	\$581	\$611	[t] = [s].
MARKET VALUE OF FIRM								
	\$2,901	\$2,818	\$2,454	\$2,605	\$2,344	\$2,041	\$1,686	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	68.33%	67.39%	67.43%	76.10%	72.60%	71.54%	63.75%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	31.67%	32.61%	32.57%	23.90%	27.40%	28.46%	36.25%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

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Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AK: Pinnacle West Capital

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$5,683	\$5,683	\$5,469	\$5,251	\$5,020	\$4,829	\$4,600	[a]
Shares Outstanding (in millions) - Common	113	113	112	112	112	112	111	[b]
Price per Share - Common	\$86	\$80	\$74	\$96	\$78	\$83	\$73	[c]
Market Value of Common Equity	\$9,661	\$9,004	\$8,335	\$10,727	\$8,709	\$9,289	\$8,110	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$9,661	\$9,004	\$8,335	\$10,727	\$8,709	\$9,289	\$8,110	[f] = [d] + [e]
Market to Book Value of Common Equity	1.70	1.58	1.52	2.04	1.74	1.92	1.76	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$1,170	\$1,170	\$1,078	\$876	\$957	\$795	\$826	[j]
Current Liabilities	\$1,331	\$1,331	\$2,295	\$1,591	\$1,874	\$1,194	\$1,586	[k]
Current Portion of Long-Term Debt	\$74	\$74	\$662	\$315	\$582	\$125	\$358	[l]
Net Working Capital	(\$86)	(\$86)	(\$555)	(\$399)	(\$335)	(\$274)	(\$402)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$215	\$215	\$563	\$244	\$370	\$207	\$262	[n]
Adjusted Short-Term Debt	\$86	\$86	\$555	\$244	\$335	\$207	\$262	[o] = See Sources and Notes.
Long-Term Debt	\$6,826	\$6,826	\$4,885	\$4,940	\$4,291	\$4,274	\$3,463	[p]
Book Value of Long-Term Debt	\$6,986	\$6,986	\$6,102	\$5,499	\$5,208	\$4,606	\$4,082	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$7,613	\$7,613	\$6,194	\$5,234	\$5,305	\$4,426	\$4,106	
Carrying Amount	\$6,314	\$6,314	\$5,633	\$5,138	\$4,872	\$4,147	\$3,820	
Adjustment to Book Value of Long-Term Debt	\$1,299	\$1,299	\$562	\$95	\$433	\$279	\$286	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$8,285	\$8,285	\$6,664	\$5,595	\$5,641	\$4,885	\$4,369	[s] = [q] + [r].
Market Value of Debt	\$8,285	\$8,285	\$6,664	\$5,595	\$5,641	\$4,885	\$4,369	[t] = [s].
MARKET VALUE OF FIRM								
	\$17,946	\$17,289	\$14,998	\$16,321	\$14,350	\$14,175	\$12,479	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	53.83%	52.08%	55.57%	65.72%	60.69%	65.54%	64.99%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	46.17%	47.92%	44.43%	34.28%	39.31%	34.46%	35.01%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AL: Public Serv. Enterprise

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
MARKET VALUE OF COMMON EQUITY								
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
Book Value, Common Shareholder's Equity	\$16,277	\$16,277	\$15,249	\$14,814	\$14,104	\$13,005	\$13,318	[a]
Shares Outstanding (in millions) - Common	504	504	504	504	504	505	505	[b]
Price per Share - Common	\$62	\$59	\$42	\$59	\$49	\$45	\$46	[c]
Market Value of Common Equity	\$31,415	\$29,610	\$21,252	\$29,917	\$24,481	\$22,523	\$23,085	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$31,415	\$29,610	\$21,252	\$29,917	\$24,481	\$22,523	\$23,085	[f] = [d] + [e]
Market to Book Value of Common Equity	1.93	1.82	1.39	2.02	1.74	1.73	1.73	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$3,595	\$3,595	\$3,727	\$3,027	\$2,806	\$2,716	\$3,263	[j]
Current Liabilities	\$4,546	\$4,546	\$5,160	\$4,473	\$3,948	\$3,111	\$2,910	[k]
Current Portion of Long-Term Debt	\$1,429	\$1,429	\$1,665	\$925	\$1,000	\$500	\$562	[l]
Net Working Capital	\$478	\$478	\$232	(\$521)	(\$142)	\$105	\$915	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$665	\$665	\$1,062	\$1,151	\$594	\$315	\$12	[n]
Adjusted Short-Term Debt	\$0	\$0	\$0	\$521	\$142	\$0	\$0	[o] = See Sources and Notes.
Long-Term Debt	\$15,590	\$15,590	\$14,306	\$13,466	\$12,072	\$10,898	\$9,676	[p]
Book Value of Long-Term Debt	\$17,019	\$17,019	\$15,971	\$14,912	\$13,214	\$11,398	\$10,238	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$19,143	\$19,143	\$16,723	\$14,767	\$14,062	\$12,003	\$10,256	
Carrying Amount	\$16,180	\$16,180	\$15,108	\$14,462	\$13,068	\$11,395	\$9,568	
Adjustment to Book Value of Long-Term Debt	\$2,963	\$2,963	\$1,615	\$305	\$994	\$608	\$688	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$19,982	\$19,982	\$17,586	\$15,217	\$14,208	\$12,006	\$10,926	[s] = [q] + [r].
Market Value of Debt	\$19,982	\$19,982	\$17,586	\$15,217	\$14,208	\$12,006	\$10,926	[t] = [s].
MARKET VALUE OF FIRM								
	\$51,397	\$49,592	\$38,838	\$45,134	\$38,689	\$34,529	\$34,011	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	61.12%	59.71%	54.72%	66.28%	63.28%	65.23%	67.87%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	38.88%	40.29%	45.28%	33.72%	36.72%	34.77%	32.13%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AM: SJW Group

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$978	\$978	\$884	\$888	\$458	\$421	\$384	[a]
Shares Outstanding (in millions) - Common	30	30	28	28	21	20	20	[b]
Price per Share - Common	\$63	\$61	\$57	\$62	\$54	\$48	\$36	[c]
Market Value of Common Equity	\$1,891	\$1,815	\$1,619	\$1,776	\$1,101	\$977	\$737	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$1,891	\$1,815	\$1,619	\$1,776	\$1,101	\$977	\$737	[f] = [d] + [e]
Market to Book Value of Common Equity	1.93	1.85	1.83	2.00	2.41	2.32	1.92	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$123	\$123	\$129	\$488	\$61	\$74	\$63	[j]
Current Liabilities	\$290	\$290	\$238	\$87	\$95	\$51	\$98	[k]
Current Portion of Long-Term Debt	\$76	\$76	\$22	\$0	\$0	\$0	\$15	[l]
Net Working Capital	(\$90)	(\$90)	(\$87)	\$402	(\$34)	\$23	(\$20)	[m] = [j] - ([k] + [l]).
Notes Payable (Short-Term Debt)	\$122	\$122	\$131	\$32	\$39	\$0	\$40	[n]
Adjusted Short-Term Debt	\$90	\$90	\$87	\$0	\$34	\$0	\$20	[o] = See Sources and Notes.
Long-Term Debt	\$1,303	\$1,303	\$1,317	\$511	\$431	\$433	\$366	[p]
Book Value of Long-Term Debt	\$1,469	\$1,469	\$1,427	\$511	\$465	\$434	\$401	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$1,571	\$1,571	\$1,396	\$490	\$538	\$502	\$500	
Carrying Amount	\$1,288	\$1,288	\$1,284	\$431	\$431	\$433	\$381	
Adjustment to Book Value of Long-Term Debt	\$283	\$283	\$112	\$59	\$107	\$69	\$119	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$1,752	\$1,752	\$1,539	\$569	\$572	\$502	\$520	[s] = [q] + [r].
Market Value of Debt	\$1,752	\$1,752	\$1,539	\$569	\$572	\$502	\$520	[t] = [s].
MARKET VALUE OF FIRM								
	\$3,643	\$3,567	\$3,158	\$2,346	\$1,674	\$1,480	\$1,257	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	51.90%	50.87%	51.27%	75.72%	65.80%	66.06%	58.62%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	48.10%	49.13%	48.73%	24.28%	34.20%	33.94%	41.38%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AN: Sempra Energy

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
MARKET VALUE OF COMMON EQUITY								
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
Book Value, Common Shareholder's Equity	\$22,545	\$22,545	\$17,859	\$15,088	\$14,151	\$13,264	\$11,946	[a]
Shares Outstanding (in millions) - Common	303	303	292	274	264	251	249	[b]
Price per Share - Common	\$137	\$130	\$107	\$125	\$111	\$111	\$102	[c]
Market Value of Common Equity	\$41,474	\$39,444	\$31,387	\$34,203	\$29,273	\$27,851	\$25,386	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$41,474	\$39,444	\$31,387	\$34,203	\$29,273	\$27,851	\$25,386	[f] = [d] + [e]
Market to Book Value of Common Equity	1.84	1.75	1.76	2.27	2.07	2.10	2.13	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$1,474	\$1,474	\$2,278	\$2,278	\$1,713	\$20	\$20	[h]
Market Value of Preferred Equity	\$1,474	\$1,474	\$2,278	\$2,278	\$1,713	\$20	\$20	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$4,200	\$4,200	\$5,424	\$3,262	\$3,394	\$2,953	\$2,883	[j]
Current Liabilities	\$6,875	\$6,875	\$12,177	\$8,612	\$9,109	\$5,812	\$5,132	[k]
Current Portion of Long-Term Debt	\$505	\$505	\$2,079	\$2,204	\$1,871	\$839	\$1,066	[l]
Net Working Capital	(\$2,170)	(\$2,170)	(\$4,674)	(\$3,146)	(\$3,844)	(\$2,020)	(\$1,183)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$1,817	\$1,817	\$5,742	\$2,523	\$3,665	\$2,054	\$1,177	[n]
Adjusted Short-Term Debt	\$1,817	\$1,817	\$4,674	\$2,523	\$3,665	\$2,020	\$1,177	[o] = See Sources and Notes.
Long-Term Debt	\$22,023	\$22,023	\$20,198	\$20,193	\$21,740	\$14,791	\$13,361	[p]
Book Value of Long-Term Debt	\$24,345	\$24,345	\$26,951	\$24,920	\$27,276	\$17,650	\$15,604	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$25,478	\$25,478	\$10,003	\$7,086	\$7,153	\$7,153	\$7,153	
Carrying Amount	\$22,259	\$22,259	\$8,625	\$6,435	\$6,117	\$6,117	\$6,117	
Adjustment to Book Value of Long-Term Debt	\$3,219	\$3,219	\$1,378	\$651	\$1,036	\$1,036	\$1,036	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$27,564	\$27,564	\$28,329	\$25,571	\$28,312	\$18,686	\$16,640	[s] = [q] + [r].
Market Value of Debt	\$27,564	\$27,564	\$28,329	\$25,571	\$28,312	\$18,686	\$16,640	[t] = [s].
MARKET VALUE OF FIRM								
	\$70,512	\$68,482	\$61,994	\$62,052	\$59,298	\$46,557	\$42,046	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	58.82%	57.60%	50.63%	55.12%	49.37%	59.82%	60.38%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	2.09%	2.15%	3.67%	3.67%	2.89%	0.04%	0.05%	[w] = [i] / [u].
Debt - Market Value Ratio	39.09%	40.25%	45.70%	41.21%	47.75%	40.14%	39.58%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

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[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AO: South Jersey Inds.

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$1,737	\$1,737	\$1,497	\$1,515	\$1,281	\$1,308	\$1,093	[a]
Shares Outstanding (in millions) - Common	103	103	92	92	80	80	71	[b]
Price per Share - Common	\$26	\$24	\$25	\$31	\$28	\$35	\$28	[c]
Market Value of Common Equity	\$2,660	\$2,456	\$2,265	\$2,909	\$2,197	\$2,758	\$1,962	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$2,660	\$2,456	\$2,265	\$2,909	\$2,197	\$2,758	\$1,962	[f] = [d] + [e]
Market to Book Value of Common Equity	1.53	1.41	1.51	1.92	1.71	2.11	1.79	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$489	\$489	\$462	\$521	\$414	\$437	\$396	[j]
Current Liabilities	\$753	\$753	\$1,566	\$1,205	\$924	\$681	\$698	[k]
Current Portion of Long-Term Debt	\$143	\$143	\$471	\$336	\$264	\$32	\$29	[l]
Net Working Capital	(\$121)	(\$121)	(\$632)	(\$349)	(\$247)	(\$212)	(\$273)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$171	\$171	\$697	\$355	\$248	\$205	\$340	[n]
Adjusted Short-Term Debt	\$121	\$121	\$632	\$349	\$247	\$205	\$273	[o] = See Sources and Notes.
Long-Term Debt	\$3,063	\$3,063	\$2,068	\$2,119	\$975	\$1,079	\$1,047	[p]
Book Value of Long-Term Debt	\$3,327	\$3,327	\$3,172	\$2,803	\$1,485	\$1,316	\$1,349	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$1,197	\$1,197	\$915	\$895	\$839	\$1,081	\$1,079	
Carrying Amount	\$1,069	\$1,069	\$965	\$893	\$822	\$1,047	\$1,036	
Adjustment to Book Value of Long-Term Debt	\$128	\$128	(\$50)	\$2	\$17	\$33	\$43	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$3,455	\$3,455	\$3,122	\$2,805	\$1,502	\$1,350	\$1,392	[s] = [q] + [r].
Market Value of Debt	\$3,455	\$3,455	\$3,122	\$2,805	\$1,502	\$1,350	\$1,392	[t] = [s].
MARKET VALUE OF FIRM								
	\$6,115	\$5,911	\$5,387	\$5,714	\$3,699	\$4,108	\$3,354	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	43.50%	41.55%	42.05%	50.91%	59.40%	67.14%	58.50%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	56.50%	58.45%	57.95%	49.09%	40.60%	32.86%	41.50%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

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[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AP: Southern Co.

(\$MM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
MARKET VALUE OF COMMON EQUITY								
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
Book Value, Common Shareholder's Equity	\$28,482	\$28,482	\$27,725	\$26,437	\$24,676	\$25,094	\$20,797	[a]
Shares Outstanding (in millions) - Common	1,059	1,059	1,056	1,040	1,012	995	919	[b]
Price per Share - Common	\$65	\$61	\$52	\$52	\$44	\$50	\$51	[c]
Market Value of Common Equity	\$68,350	\$64,403	\$55,432	\$53,779	\$44,500	\$49,982	\$46,496	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$68,350	\$64,403	\$55,432	\$53,779	\$44,500	\$49,982	\$46,496	[f] = [d] + [e]
Market to Book Value of Common Equity	2.40	2.26	2.00	2.03	1.80	1.99	2.24	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$291	\$291	\$291	\$291	\$324	\$727	\$727	[h]
Market Value of Preferred Equity	\$291	\$291	\$291	\$291	\$324	\$727	\$727	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$9,469	\$9,469	\$9,430	\$8,709	\$9,524	\$8,427	\$5,461	[j]
Current Liabilities	\$11,586	\$11,586	\$9,553	\$9,919	\$13,630	\$12,284	\$7,856	[k]
Current Portion of Long-Term Debt	\$3,779	\$3,779	\$2,039	\$2,541	\$3,235	\$3,269	\$2,392	[l]
Net Working Capital	\$1,662	\$1,662	\$1,916	\$1,331	(\$871)	(\$588)	(\$3)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$1,092	\$1,092	\$1,710	\$1,251	\$4,271	\$2,818	\$1,195	[n]
Adjusted Short-Term Debt	\$0	\$0	\$0	\$0	\$871	\$588	\$3	[o] = See Sources and Notes.
Long-Term Debt	\$48,379	\$48,379	\$45,845	\$42,177	\$44,446	\$42,786	\$26,091	[p]
Book Value of Long-Term Debt	\$52,158	\$52,158	\$47,884	\$44,718	\$48,552	\$46,643	\$28,486	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$56,264	\$56,264	\$48,339	\$44,824	\$51,348	\$46,286	\$27,913	
Carrying Amount	\$48,349	\$48,349	\$44,561	\$45,023	\$48,151	\$45,080	\$27,216	
Adjustment to Book Value of Long-Term Debt	\$7,915	\$7,915	\$3,778	(\$199)	\$3,197	\$1,206	\$697	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$60,073	\$60,073	\$51,662	\$44,519	\$51,749	\$47,849	\$29,183	[s] = [q] + [r].
Market Value of Debt	\$60,073	\$60,073	\$51,662	\$44,519	\$51,749	\$47,849	\$29,183	[t] = [s].
MARKET VALUE OF FIRM								
	\$128,714	\$124,767	\$107,385	\$98,589	\$96,573	\$98,558	\$76,406	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	53.10%	51.62%	51.62%	54.55%	46.08%	50.71%	60.85%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	0.23%	0.23%	0.27%	0.30%	0.34%	0.74%	0.95%	[w] = [i] / [u].
Debt - Market Value Ratio	46.67%	48.15%	48.11%	45.16%	53.59%	48.55%	38.19%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AQ: Southwest Gas

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$2,774	\$2,774	\$2,548	\$2,347	\$1,880	\$1,715	\$1,652	[a]
Shares Outstanding (in millions) - Common	58	58	55	53	48	48	47	[b]
Price per Share - Common	\$68	\$67	\$61	\$83	\$69	\$83	\$65	[c]
Market Value of Common Equity	\$3,948	\$3,907	\$3,343	\$4,432	\$3,320	\$3,935	\$3,078	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$3,948	\$3,907	\$3,343	\$4,432	\$3,320	\$3,935	\$3,078	[f] = [d] + [e]
Market to Book Value of Common Equity	1.42	1.41	1.31	1.89	1.77	2.29	1.86	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$1,001	\$1,001	\$673	\$830	\$1,107	\$454	\$470	[j]
Current Liabilities	\$1,036	\$1,036	\$980	\$974	\$603	\$497	\$578	[k]
Current Portion of Long-Term Debt	\$67	\$67	\$170	\$43	\$25	\$26	\$49	[l]
Net Working Capital	\$32	\$32	(\$137)	(\$101)	\$529	(\$16)	(\$59)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$310	\$310	\$157	\$188	\$23	\$0	\$0	[n]
Adjusted Short-Term Debt	\$0	\$0	\$137	\$101	\$0	\$0	\$0	[o] = See Sources and Notes.
Long-Term Debt	\$2,697	\$2,697	\$2,310	\$2,160	\$1,998	\$1,564	\$1,389	[p]
Book Value of Long-Term Debt	\$2,764	\$2,764	\$2,617	\$2,305	\$2,023	\$1,590	\$1,438	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$2,155	\$2,155	\$2,155	\$2,155	\$1,920	\$1,680	\$1,646	
Carrying Amount	\$2,732	\$2,732	\$2,300	\$2,107	\$1,799	\$1,550	\$1,551	
Adjustment to Book Value of Long-Term Debt	(\$577)	(\$577)	(\$146)	\$48	\$121	\$130	\$94	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$2,187	\$2,187	\$2,471	\$2,352	\$2,144	\$1,720	\$1,532	[s] = [q] + [r].
Market Value of Debt	\$2,187	\$2,187	\$2,471	\$2,352	\$2,144	\$1,720	\$1,532	[t] = [s].
MARKET VALUE OF FIRM								
	\$6,135	\$6,094	\$5,814	\$6,784	\$5,464	\$5,655	\$4,610	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	64.36%	64.12%	57.49%	65.33%	60.76%	69.58%	66.77%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	35.64%	35.88%	42.51%	34.67%	39.24%	30.42%	33.23%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AR: Spire Inc.

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
MARKET VALUE OF COMMON EQUITY								
Book Value, Common Shareholder's Equity	\$2,489	\$2,489	\$2,424	\$2,406	\$2,154	\$1,883	\$1,681	[a]
Shares Outstanding (in millions) - Common	52	52	51	51	48	46	43	[b]
Price per Share - Common	\$74	\$74	\$70	\$81	\$70	\$67	\$67	[c]
Market Value of Common Equity	\$3,811	\$3,804	\$3,588	\$4,116	\$3,363	\$3,046	\$2,892	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$3,811	\$3,804	\$3,588	\$4,116	\$3,363	\$3,046	\$2,892	[f] = [d] + [e]
Market to Book Value of Common Equity	1.53	1.53	1.48	1.71	1.56	1.62	1.72	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$242	\$242	\$242	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$242	\$242	\$242	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$1,040	\$1,040	\$719	\$794	\$718	\$684	\$504	[j]
Current Liabilities	\$1,508	\$1,508	\$1,153	\$1,337	\$928	\$1,015	\$619	[k]
Current Portion of Long-Term Debt	\$111	\$111	\$5	\$215	\$106	\$0	\$0	[l]
Net Working Capital	(\$357)	(\$357)	(\$428)	(\$328)	(\$104)	(\$331)	(\$115)	[m] = [j] - ([k] + [l]).
Notes Payable (Short-Term Debt)	\$654	\$654	\$561	\$512	\$392	\$567	\$254	[n]
Adjusted Short-Term Debt	\$357	\$357	\$428	\$328	\$104	\$331	\$115	[o] = See Sources and Notes.
Long-Term Debt	\$2,693	\$2,693	\$2,485	\$2,042	\$2,074	\$1,925	\$1,852	[p]
Book Value of Long-Term Debt	\$3,160	\$3,160	\$2,919	\$2,585	\$2,284	\$2,256	\$1,967	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$3,120	\$3,120	\$2,373	\$2,074	\$2,210	\$2,257	\$1,944	
Carrying Amount	\$2,628	\$2,628	\$2,123	\$2,076	\$2,095	\$2,084	\$1,852	
Adjustment to Book Value of Long-Term Debt	\$491	\$491	\$251	(\$2)	\$115	\$173	\$93	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$3,651	\$3,651	\$3,169	\$2,583	\$2,399	\$2,430	\$2,059	[s] = [q] + [r].
Market Value of Debt	\$3,651	\$3,651	\$3,169	\$2,583	\$2,399	\$2,430	\$2,059	[t] = [s].
MARKET VALUE OF FIRM								
	\$7,704	\$7,697	\$6,999	\$6,699	\$5,762	\$5,476	\$4,951	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	49.47%	49.42%	51.26%	61.44%	58.37%	55.63%	58.41%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	3.14%	3.14%	3.46%	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	47.39%	47.44%	45.28%	38.56%	41.63%	44.37%	41.59%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AT: WEC Energy Group

(\$MM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
MARKET VALUE OF COMMON EQUITY								
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
Book Value, Common Shareholder's Equity	\$10,767	\$10,767	\$10,344	\$9,985	\$9,668	\$9,126	\$8,818	[a]
Shares Outstanding (in millions) - Common	315	315	315	315	316	316	316	[b]
Price per Share - Common	\$95	\$91	\$89	\$78	\$62	\$60	\$59	[c]
Market Value of Common Equity	\$30,100	\$28,568	\$28,187	\$24,757	\$19,414	\$19,054	\$18,547	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$30,100	\$28,568	\$28,187	\$24,757	\$19,414	\$19,054	\$18,547	[f] = [d] + [e]
Market to Book Value of Common Equity	2.80	2.65	2.72	2.48	2.01	2.09	2.10	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$30	\$30	\$30	\$30	\$30	\$30	\$30	[h]
Market Value of Preferred Equity	\$30	\$30	\$30	\$30	\$30	\$30	\$30	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$2,356	\$2,356	\$1,845	\$2,008	\$1,981	\$1,855	\$1,896	[j]
Current Liabilities	\$3,715	\$3,715	\$2,848	\$2,890	\$3,606	\$2,055	\$2,230	[k]
Current Portion of Long-Term Debt	\$787	\$787	\$694	\$370	\$958	\$158	\$152	[l]
Net Working Capital	(\$572)	(\$572)	(\$308)	(\$512)	(\$667)	(\$41)	(\$181)	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$1,580	\$1,580	\$827	\$1,145	\$1,200	\$670	\$896	[n]
Adjusted Short-Term Debt	\$572	\$572	\$308	\$512	\$667	\$41	\$181	[o] = See Sources and Notes.
Long-Term Debt	\$12,318	\$12,318	\$11,195	\$10,393	\$8,644	\$9,173	\$9,009	[p]
Book Value of Long-Term Debt	\$13,677	\$13,677	\$12,197	\$11,274	\$10,269	\$9,372	\$9,342	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$14,343	\$14,343	\$13,036	\$10,555	\$10,342	\$9,818	\$9,681	
Carrying Amount	\$12,451	\$12,451	\$11,858	\$10,336	\$9,562	\$9,286	\$9,222	
Adjustment to Book Value of Long-Term Debt	\$1,893	\$1,893	\$1,178	\$219	\$780	\$532	\$459	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$15,570	\$15,570	\$13,375	\$11,493	\$11,049	\$9,904	\$9,801	[s] = [q] + [r].
Market Value of Debt	\$15,570	\$15,570	\$13,375	\$11,493	\$11,049	\$9,904	\$9,801	[t] = [s].
MARKET VALUE OF FIRM								
	\$45,700	\$44,169	\$41,592	\$36,281	\$30,494	\$28,988	\$28,379	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	65.86%	64.68%	67.77%	68.24%	63.67%	65.73%	65.36%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	0.07%	0.07%	0.07%	0.08%	0.10%	0.10%	0.11%	[w] = [i] / [u].
Debt - Market Value Ratio	34.07%	35.25%	32.16%	31.68%	36.23%	34.17%	34.54%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

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Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-3

Market Value of the Electric and OHRU Samples

Panel AU: Xcel Energy Inc.

(SMM)

	DCF Capital Structure	1st Quarter, 2021	1st Quarter, 2020	1st Quarter, 2019	1st Quarter, 2018	1st Quarter, 2017	1st Quarter, 2016	Notes
MARKET VALUE OF COMMON EQUITY								
	DCF Capital Structure	03/31/21	03/31/20	03/31/19	03/31/18	03/31/17	03/31/16	
Book Value, Common Shareholder's Equity	\$14,700	\$14,700	\$13,302	\$12,329	\$11,561	\$11,070	\$10,672	[a]
Shares Outstanding (in millions) - Common	538	538	525	515	509	508	508	[b]
Price per Share - Common	\$71	\$64	\$59	\$56	\$44	\$44	\$41	[c]
Market Value of Common Equity	\$38,293	\$34,620	\$31,060	\$29,051	\$22,484	\$22,433	\$20,839	[d] = [b] x [c].
Market Value of GP Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[e] = See Sources and Notes.
Total Market Value of Equity	\$38,293	\$34,620	\$31,060	\$29,051	\$22,484	\$22,433	\$20,839	[f] = [d] + [e]
Market to Book Value of Common Equity	2.60	2.36	2.33	2.36	1.94	2.03	1.95	[g] = [f] / [a].
MARKET VALUE OF PREFERRED EQUITY								
Book Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[h]
Market Value of Preferred Equity	\$0	\$0	\$0	\$0	\$0	\$0	\$0	[i] = [h].
MARKET VALUE OF DEBT								
Current Assets	\$4,315	\$4,315	\$2,983	\$2,909	\$2,782	\$2,633	\$2,733	[j]
Current Liabilities	\$4,877	\$4,877	\$5,839	\$4,424	\$4,122	\$3,708	\$3,189	[k]
Current Portion of Long-Term Debt	\$242	\$242	\$1,245	\$170	\$457	\$755	\$657	[l]
Net Working Capital	(\$320)	(\$320)	(\$1,611)	(\$1,345)	(\$883)	(\$319)	\$201	[m] = [j] - ([k] - [l]).
Notes Payable (Short-Term Debt)	\$1,477	\$1,477	\$1,765	\$1,252	\$1,025	\$605	\$183	[n]
Adjusted Short-Term Debt	\$320	\$320	\$1,611	\$1,252	\$883	\$319	\$0	[o] = See Sources and Notes.
Long-Term Debt	\$22,757	\$22,757	\$18,173	\$17,727	\$14,522	\$13,696	\$13,148	[p]
Book Value of Long-Term Debt	\$23,319	\$23,319	\$21,029	\$19,149	\$15,862	\$14,771	\$13,805	[q] = [l] + [o] + [p].
Unadjusted Market Value of Long Term Debt	\$24,412	\$24,412	\$20,227	\$16,755	\$16,531	\$15,513	\$14,095	
Carrying Amount	\$20,066	\$20,066	\$18,109	\$16,209	\$14,977	\$14,450	\$13,148	
Adjustment to Book Value of Long-Term Debt	\$4,346	\$4,346	\$2,118	\$546	\$1,554	\$1,063	\$947	[r] = See Sources and Notes.
Market Value of Long-Term Debt	\$27,665	\$27,665	\$23,147	\$19,695	\$17,416	\$15,834	\$14,752	[s] = [q] + [r].
Market Value of Debt	\$27,665	\$27,665	\$23,147	\$19,695	\$17,416	\$15,834	\$14,752	[t] = [s].
MARKET VALUE OF FIRM								
	\$65,958	\$62,285	\$54,207	\$48,746	\$39,900	\$38,267	\$35,591	[u] = [f] + [i] + [t].
DEBT AND EQUITY TO MARKET VALUE RATIOS								
Common Equity - Market Value Ratio	58.06%	55.58%	57.30%	59.60%	56.35%	58.62%	58.55%	[v] = [f] / [u].
Preferred Equity - Market Value Ratio	-	-	-	-	-	-	-	[w] = [i] / [u].
Debt - Market Value Ratio	41.94%	44.42%	42.70%	40.40%	43.65%	41.38%	41.45%	[x] = [t] / [u].

Sources and Notes:

Bloomberg as of May 31, 2021

Capital structure from 1st Quarter, 2021 calculated using respective balance sheet information and 15-day average prices ending at period end.

The DCF Capital structure is calculated using 1st Quarter, 2021 balance sheet information and a 15-trading day average closing price ending on 5/31/2021.

Prices are reported in Workpaper #1 to Schedule No. BV-6.

[e] = Market Value of GP equity is not estimated here.

[o] =

(1): 0 if [m] > 0.

(2): The absolute value of [m] if [m] < 0 and |[m]| < [n].

(3): [n] if [m] < 0 and |[m]| > [n].

[r]: Difference between fair value of Long-Term debt and carrying amount of Long-Term debt per company 10-K. Data for adjustment is from 2016 to 2020 10-Ks.

Schedule No. BV-4

Electric and OHRU Samples

Capital Structure Summary of the Electric and OHRU Samples

Company	DCF Capital Structure			5-Year Average Capital Structure		
	Common Equity - Value Ratio	Preferred Equity - Value Ratio	Debt - Value Ratio	Common Equity - Value Ratio	Preferred Equity - Value Ratio	Debt - Value Ratio
	[1]	[2]	[3]	[4]	[5]	[6]
ALLETE	0.61	0.00	0.39	0.68	0.00	0.32
Alliant Energy	0.62	0.01	0.37	0.62	0.01	0.37
Amer. Elec. Power	0.50	0.00	0.50	0.56	0.00	0.44
Amer. States Water	0.81	0.00	0.19	0.81	0.00	0.19
Amer. Water Works	0.69	0.00	0.31	0.65	0.00	0.35
Ameren Corp.	0.60	0.00	0.40	0.61	0.00	0.39
Artesian Res Corp	0.66	0.00	0.34	0.70	0.00	0.30
Atmos Energy	0.61	0.00	0.39	0.70	0.00	0.30
Avista Corp.	0.55	0.00	0.45	0.57	0.00	0.43
Black Hills	0.46	0.00	0.54	0.50	0.00	0.50
CMS Energy Corp.	0.51	0.00	0.49	0.54	0.00	0.46
California Water	0.69	0.00	0.31	0.69	0.00	0.31
CenterPoint Energy	0.41	0.07	0.52	0.48	0.03	0.49
Chesapeake Utilities	0.74	0.00	0.26	0.71	0.00	0.29
Consol. Edison	0.49	0.00	0.51	0.55	0.00	0.45
DTE Energy	0.59	0.00	0.41	0.57	0.00	0.43
Dominion Energy	0.57	0.02	0.41	0.57	0.01	0.42
Duke Energy	0.51	0.01	0.48	0.50	0.01	0.49
Entergy Corp.	0.44	0.01	0.56	0.47	0.01	0.53
Essential Utilities	0.64	0.00	0.36	0.70	0.00	0.30
Eversource Energy	0.54	0.00	0.46	0.56	0.00	0.44
Eversource Energy	0.59	0.00	0.40	0.61	0.00	0.39
Exelon Corp.	0.49	0.00	0.51	0.49	0.00	0.51
Global Water Resources Inc	0.74	0.00	0.26	0.65	0.00	0.35
Hawaiian Elec.	0.61	0.00	0.38	0.63	0.01	0.36
IDACORP Inc.	0.67	0.00	0.33	0.68	0.00	0.32
MGE Energy	0.81	0.00	0.19	0.81	0.00	0.19
Middlesex Water	0.82	0.00	0.18	0.79	0.00	0.21
New Jersey Resources	0.60	0.00	0.40	0.71	0.00	0.29
NextEra Energy	0.71	0.00	0.29	0.68	0.00	0.32
NiSource Inc.	0.45	0.04	0.51	0.47	0.02	0.51
NorthWestern Corp.	0.55	0.00	0.45	0.59	0.00	0.41
Northwest Natural	0.54	0.00	0.46	0.65	0.00	0.35
OGE Energy	0.55	0.00	0.45	0.65	0.00	0.35
ONE Gas Inc.	0.47	0.00	0.53	0.70	0.00	0.30
Otter Tail Corp.	0.68	0.00	0.32	0.71	0.00	0.29
Pinnacle West Capital	0.54	0.00	0.46	0.61	0.00	0.39
Public Serv. Enterprise	0.61	0.00	0.39	0.63	0.00	0.37
SJW Group	0.52	0.00	0.48	0.63	0.00	0.37
Sempra Energy	0.59	0.02	0.39	0.55	0.02	0.43
South Jersey Inds.	0.43	0.00	0.57	0.54	0.00	0.46
Southern Co.	0.53	0.00	0.47	0.52	0.00	0.48
Southwest Gas	0.64	0.00	0.36	0.64	0.00	0.36
Spire Inc.	0.49	0.03	0.47	0.56	0.01	0.43
Unitil Corp.	0.57	0.00	0.43	0.60	0.00	0.40
WEC Energy Group	0.66	0.00	0.34	0.66	0.00	0.34
Xcel Energy Inc.	0.58	0.00	0.42	0.58	0.00	0.42
Electric Sample Average	0.57	0.01	0.42	0.59	0.00	0.40
OHRU Sample Average	0.62	0.00	0.38	0.66	0.00	0.33

Sources and Notes:

[1], [4]: Workpaper #1 to Schedule No. BV-4.

[2], [5]: Workpaper #2 to Schedule No. BV-4.

[3], [6]: Workpaper #3 to Schedule No. BV-4.

Values in this table may not add up exactly to 1.0 because of rounding.

Schedule No. BV-5

Electric and OHRU Samples

Estimated Growth Rates of the Electric and OHRU Samples

Company	Thomson Reuters IBES Estimate		Value Line		Annualized Growth Rate	Combined Growth Rate
	Long-Term Growth Rate	Number of Estimates	EPS Year 2021 Estimate	EPS Year 2024-2026 Estimate		
	[1]	[2]	[3]	[4]	[5]	[6]
ALLETE	7.0%	1	3.10	4.75	11.3%	9.1%
Alliant Energy	5.5%	2	2.60	3.25	5.7%	5.6%
Amer. Elec. Power	6.2%	3	4.65	6.00	6.6%	6.3%
Amer. States Water	5.2%	1	2.40	3.05	6.2%	5.7%
Amer. Water Works	8.6%	1	4.25	5.50	6.7%	7.6%
Ameren Corp.	7.7%	1	3.70	4.75	6.4%	7.1%
Artesian Res Corp	4.0%	1	n/a	n/a	n/a	4.0%
Atmos Energy	7.2%	3	5.10	6.50	6.3%	6.9%
Avista Corp.	6.9%	1	2.10	2.75	7.0%	6.9%
Black Hills	4.7%	1	3.85	4.75	5.4%	5.0%
CMS Energy Corp.	7.3%	4	2.85	3.75	7.1%	7.2%
California Water	11.7%	1	1.90	2.25	4.3%	8.0%
CenterPoint Energy	4.6%	1	1.40	1.85	7.2%	5.9%
Chesapeake Utilities	4.7%	1	4.55	6.15	7.8%	6.3%
Consol. Edison	2.9%	2	4.40	5.25	4.5%	3.5%
DTE Energy	4.7%	2	7.15	9.25	6.6%	5.3%
Dominion Energy	6.8%	4	3.95	4.75	4.7%	6.4%
Duke Energy	5.0%	3	5.15	6.50	6.0%	5.2%
Energy Corp.	5.8%	1	5.95	7.50	6.0%	5.9%
Essential Utilities	6.4%	1	1.65	1.90	3.6%	5.0%
Eergy Inc.	5.8%	1	3.40	4.25	5.7%	5.8%
Eversource Energy	6.8%	3	3.85	4.75	5.4%	6.5%
Exelon Corp.	-0.4%	1	2.45	3.50	9.3%	4.5%
Global Water Resources Inc	15.0%	1	n/a	n/a	n/a	15.0%
Hawaiian Elec.	1.3%	1	1.85	2.25	5.0%	3.2%
IDACORP Inc.	3.2%	1	4.80	5.75	4.6%	3.9%
MGE Energy	5.9%	1	2.70	3.25	4.7%	5.3%
Middlesex Water	2.7%	1	2.25	2.70	4.7%	3.7%
New Jersey Resources	6.0%	1	2.15	2.55	4.4%	5.2%
NextEra Energy	8.0%	4	2.65	3.50	7.2%	7.8%
NiSource Inc.	3.5%	1	1.40	2.25	12.6%	8.1%
NorthWestern Corp.	4.5%	3	3.50	4.00	3.4%	4.2%
Northwest Natural	3.8%	1	2.55	3.10	5.0%	4.4%
OGE Energy	3.8%	1	2.10	2.75	7.0%	5.4%
ONE Gas Inc.	5.0%	1	3.80	5.00	7.1%	6.1%
Otter Tail Corp.	9.0%	1	2.45	3.25	7.3%	8.2%
Pinnacle West Capital	3.5%	2	5.05	6.50	6.5%	4.5%
Public Serv. Enterprise	2.5%	2	3.45	4.25	5.4%	3.4%
SJW Group	7.0%	1	2.55	3.65	9.4%	8.2%
Sempra Energy	4.3%	1	7.75	10.75	8.5%	6.4%
South Jersey Inds.	4.8%	1	1.80	2.70	10.7%	7.7%
Southern Co.	6.5%	1	3.40	4.25	5.7%	6.1%
Southwest Gas	4.0%	1	4.50	6.50	9.6%	6.8%
Spire Inc.	7.3%	1	5.00	5.50	2.4%	4.9%
Unitil Corp.	3.8%	1	n/a	n/a	n/a	3.8%
WEC Energy Group	6.2%	3	4.00	5.25	7.0%	6.4%
Xcel Energy Inc.	6.2%	1	2.95	3.75	6.2%	6.2%

Sources and Notes:

[1] - [2]: Thomson Reuters as of May 31, 2021.

[3] - [4]: From Valueline Investment Analyzer as of May 31, 2021.

[5]: $([4] / [3])^{(1/4)} - 1$.

[6]: $([1] \times [2] + [5]) / ([2] + 1)$.

Weighted average growth rate. If information is missing from one source, the weighted average is based solely on the other source.

Schedule No. BV-6

DCF Cost of Equity of the Electric and OHRU Samples

Panel A: Simple DCF Method (Quarterly)

Company	Stock Price	Most Recent Dividend	Quarterly Dividend Yield	Combined Long-Term Growth Rate	Quarterly Growth Rate	DCF Cost of Equity
	[1]	[2]	[3]	[4]	[5]	[6]
ALLETE	\$69.69	\$0.63	0.92%	9.1%	2.2%	13.1%
Alliant Energy	\$57.27	\$0.40	0.71%	5.6%	1.4%	8.6%
Amer. Elec. Power	\$86.14	\$0.74	0.87%	6.3%	1.5%	10.0%
Amer. States Water	\$78.47	\$0.34	0.43%	5.7%	1.4%	7.5%
Amer. Water Works	\$153.39	\$0.60	0.40%	7.6%	1.9%	9.3%
Ameren Corp.	\$84.01	\$0.55	0.67%	7.1%	1.7%	9.9%
Artesian Res Corp	\$40.21	\$0.26	0.66%	4.0%	1.0%	6.7%
Atmos Energy	\$99.40	\$0.63	0.64%	6.9%	1.7%	9.7%
Avista Corp.	\$46.10	\$0.42	0.93%	6.9%	1.7%	10.9%
Black Hills	\$66.26	\$0.57	0.86%	5.0%	1.2%	8.7%
CMS Energy Corp.	\$63.36	\$0.44	0.70%	7.2%	1.8%	10.2%
California Water	\$56.55	\$0.23	0.41%	8.0%	1.9%	9.8%
CenterPoint Energy	\$24.71	\$0.16	0.66%	5.9%	1.4%	8.7%
Chesapeake Utilities	\$117.00	\$0.44	0.38%	6.3%	1.5%	7.9%
Consol. Edison	\$78.36	\$0.78	1.00%	3.5%	0.9%	7.6%
DTE Energy	\$139.97	\$1.09	0.79%	5.3%	1.3%	8.6%
Dominion Energy	\$77.31	\$0.63	0.83%	6.4%	1.6%	9.9%
Duke Energy	\$102.06	\$0.97	0.96%	5.2%	1.3%	9.3%
Entergy Corp.	\$105.99	\$0.95	0.91%	5.9%	1.4%	9.7%
Essential Utilities	\$46.78	\$0.25	0.54%	5.0%	1.2%	7.3%
Eversource Energy	\$62.26	\$0.54	0.87%	5.8%	1.4%	9.5%
Exelon Corp.	\$83.39	\$0.60	0.73%	6.5%	1.6%	9.6%
Exelon Corp.	\$45.02	\$0.38	0.86%	4.5%	1.1%	8.1%
Global Water Resources I	\$16.73	\$0.02	0.15%	15.0%	3.6%	15.7%
Hawaiian Elec.	\$43.88	\$0.34	0.78%	3.2%	0.8%	6.4%
IDACORP Inc.	\$100.47	\$0.71	0.71%	3.9%	1.0%	6.9%
MGE Energy	\$74.63	\$0.37	0.50%	5.3%	1.3%	7.4%
Middlesex Water	\$81.51	\$0.27	0.34%	3.7%	0.9%	5.1%
New Jersey Resources	\$42.74	\$0.33	0.79%	5.2%	1.3%	8.5%
NextEra Energy	\$73.26	\$0.39	0.54%	7.8%	1.9%	10.1%
NiSource Inc.	\$25.54	\$0.22	0.88%	8.1%	2.0%	11.8%
NorthWestern Corp.	\$64.16	\$0.62	0.98%	4.2%	1.0%	8.3%
Northwest Natural	\$53.84	\$0.48	0.90%	4.4%	1.1%	8.2%
OGE Energy	\$33.86	\$0.40	1.20%	5.4%	1.3%	10.5%
ONE Gas Inc.	\$75.14	\$0.58	0.78%	6.1%	1.5%	9.4%
Otter Tail Corp.	\$47.75	\$0.39	0.83%	8.2%	2.0%	11.7%
Pinnacle West Capital	\$85.69	\$0.83	0.98%	4.5%	1.1%	8.6%
Public Serv. Enterprise	\$62.33	\$0.51	0.83%	3.4%	0.8%	6.8%
SJW Group	\$63.47	\$0.34	0.55%	8.2%	2.0%	10.5%
Sempra Energy	\$136.88	\$1.10	0.82%	6.4%	1.6%	9.9%
South Jersey Inds.	\$25.93	\$0.30	1.19%	7.7%	1.9%	12.9%
Southern Co.	\$64.54	\$0.66	1.04%	6.1%	1.5%	10.5%
Southwest Gas	\$68.07	\$0.60	0.89%	6.8%	1.7%	10.6%
Spire Inc.	\$73.75	\$0.65	0.89%	4.9%	1.2%	8.6%
Unitil Corp.	\$55.36	\$0.38	0.69%	3.8%	0.9%	6.7%
WEC Energy Group	\$95.42	\$0.68	0.72%	6.4%	1.6%	9.5%
Xcel Energy Inc.	\$71.17	\$0.46	0.65%	6.2%	1.5%	8.9%

Sources and Notes:

[1]: Workpaper #1 to Schedule No. BV-6.

[2]: Workpaper #2 to Schedule No. BV-6.

[3]: $([2] / [1]) \times (1 + [5])$.

[4]: Schedule No. BV-5, [6].

[5]: $\{(1 + [4])^{(1/4)}\} - 1$.

[6]: $\{([3] + [5] + 1)^{4}\} - 1$.

Schedule No. BV-6

DCF Cost of Equity of the Electric and OHRU Samples

Panel B: Multi-Stage DCF (Using Blue Chip Long-Term GDP Growth Forecast as the Perpetual Rate)

Company	Stock Price	Most Recent Dividend	Combined Long-Term Growth Rate	Growth Rate: Year 6	Growth Rate: Year 7	Growth Rate: Year 8	Growth Rate: Year 9	Growth Rate: Year 10	GDP Long-Term Growth Rate	DCF Cost of Equity
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
ALLETE	\$69.69	\$0.63	9.1%	8.3%	7.4%	6.5%	5.6%	4.8%	3.9%	9.1%
Alliant Energy	\$57.27	\$0.40	5.6%	5.3%	5.0%	4.7%	4.5%	4.2%	3.9%	7.2%
Amer. Elec. Power	\$86.14	\$0.74	6.3%	5.9%	5.5%	5.1%	4.7%	4.3%	3.9%	8.1%
Amer. States Water	\$78.47	\$0.34	5.7%	5.4%	5.1%	4.8%	4.5%	4.2%	3.9%	5.9%
Amer. Water Works	\$153.39	\$0.60	7.6%	7.0%	6.4%	5.8%	5.1%	4.5%	3.9%	6.0%
Ameren Corp.	\$84.01	\$0.55	7.1%	6.5%	6.0%	5.5%	5.0%	4.4%	3.9%	7.3%
Artesian Res Corp	\$40.21	\$0.26	4.0%	4.0%	4.0%	4.0%	3.9%	3.9%	3.9%	6.6%
Atmos Energy	\$99.40	\$0.63	6.9%	6.4%	5.9%	5.4%	4.9%	4.4%	3.9%	7.1%
Avista Corp.	\$46.10	\$0.42	6.9%	6.4%	5.9%	5.4%	4.9%	4.4%	3.9%	8.6%
Black Hills	\$66.26	\$0.57	5.0%	4.8%	4.7%	4.5%	4.3%	4.1%	3.9%	7.8%
CMS Energy Corp.	\$63.36	\$0.44	7.2%	6.7%	6.1%	5.6%	5.0%	4.5%	3.9%	7.5%
California Water	\$56.55	\$0.23	8.0%	7.3%	6.6%	6.0%	5.3%	4.6%	3.9%	6.1%
CenterPoint Energy	\$24.71	\$0.16	5.9%	5.6%	5.2%	4.9%	4.6%	4.2%	3.9%	7.0%
Chesapeake Utilities	\$117.00	\$0.44	6.3%	5.9%	5.5%	5.1%	4.7%	4.3%	3.9%	5.7%
Consol. Edison	\$78.36	\$0.78	3.5%	3.5%	3.6%	3.7%	3.8%	3.8%	3.9%	8.0%
DTE Energy	\$139.97	\$1.09	5.3%	5.1%	4.8%	4.6%	4.4%	4.1%	3.9%	7.5%
Dominion Energy	\$77.31	\$0.63	6.4%	6.0%	5.5%	5.1%	4.7%	4.3%	3.9%	7.9%
Duke Energy	\$102.06	\$0.97	5.2%	5.0%	4.8%	4.6%	4.3%	4.1%	3.9%	8.2%
Entergy Corp.	\$105.99	\$0.95	5.9%	5.5%	5.2%	4.9%	4.6%	4.2%	3.9%	8.2%
Essential Utilities	\$46.78	\$0.25	5.0%	4.8%	4.6%	4.4%	4.3%	4.1%	3.9%	6.3%
Evergy Inc.	\$62.26	\$0.54	5.8%	5.5%	5.1%	4.8%	4.5%	4.2%	3.9%	8.0%
Eversource Energy	\$83.39	\$0.60	6.5%	6.0%	5.6%	5.2%	4.8%	4.3%	3.9%	7.5%
Exelon Corp.	\$45.02	\$0.38	4.5%	4.4%	4.3%	4.2%	4.1%	4.0%	3.9%	7.6%
Global Water Resources Inc	\$16.73	\$0.02	15.0%	13.2%	11.3%	9.5%	7.6%	5.8%	3.9%	5.2%
Hawaiian Elec.	\$43.88	\$0.34	3.2%	3.3%	3.4%	3.5%	3.7%	3.8%	3.9%	7.0%
IDACORP Inc.	\$100.47	\$0.71	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	6.9%
MGE Energy	\$74.63	\$0.37	5.3%	5.1%	4.8%	4.6%	4.4%	4.1%	3.9%	6.2%
Middlesex Water	\$81.51	\$0.27	3.7%	3.7%	3.8%	3.8%	3.8%	3.9%	3.9%	5.3%
New Jersey Resources	\$42.74	\$0.33	5.2%	5.0%	4.8%	4.5%	4.3%	4.1%	3.9%	7.5%
NextEra Energy	\$73.26	\$0.39	7.8%	7.2%	6.5%	5.9%	5.2%	4.6%	3.9%	6.7%
NiSource Inc.	\$25.54	\$0.22	8.1%	7.4%	6.7%	6.0%	5.3%	4.6%	3.9%	8.6%
NorthWestern Corp.	\$64.16	\$0.62	4.2%	4.1%	4.1%	4.0%	4.0%	3.9%	3.9%	8.1%
Northwest Natural	\$53.84	\$0.48	4.4%	4.3%	4.2%	4.2%	4.1%	4.0%	3.9%	7.8%
OGE Energy	\$33.86	\$0.40	5.4%	5.1%	4.9%	4.6%	4.4%	4.1%	3.9%	9.4%
ONE Gas Inc.	\$75.14	\$0.58	6.1%	5.7%	5.3%	5.0%	4.6%	4.3%	3.9%	7.6%
Otter Tail Corp.	\$47.75	\$0.39	8.2%	7.4%	6.7%	6.0%	5.3%	4.6%	3.9%	8.4%
Pinnacle West Capital	\$85.69	\$0.83	4.5%	4.4%	4.3%	4.2%	4.1%	4.0%	3.9%	8.1%
Public Serv. Enterprise	\$62.33	\$0.51	3.4%	3.5%	3.6%	3.7%	3.7%	3.8%	3.9%	7.2%
SJW Group	\$63.47	\$0.34	8.2%	7.5%	6.8%	6.0%	5.3%	4.6%	3.9%	6.9%
Sempra Energy	\$136.88	\$1.10	6.4%	6.0%	5.6%	5.2%	4.7%	4.3%	3.9%	7.9%
South Jersey Inds.	\$25.93	\$0.30	7.7%	7.1%	6.5%	5.8%	5.2%	4.5%	3.9%	10.1%
Southern Co.	\$64.54	\$0.66	6.1%	5.7%	5.4%	5.0%	4.6%	4.3%	3.9%	8.8%
Southwest Gas	\$68.07	\$0.60	6.8%	6.3%	5.8%	5.4%	4.9%	4.4%	3.9%	8.3%
Spire Inc.	\$73.75	\$0.65	4.9%	4.7%	4.5%	4.4%	4.2%	4.1%	3.9%	7.8%
Unitil Corp.	\$55.36	\$0.38	3.8%	3.8%	3.8%	3.9%	3.9%	3.9%	3.9%	6.8%
WEC Energy Group	\$95.42	\$0.68	6.4%	6.0%	5.6%	5.2%	4.7%	4.3%	3.9%	7.4%
Xcel Energy Inc.	\$71.17	\$0.46	6.2%	5.8%	5.4%	5.0%	4.7%	4.3%	3.9%	7.0%

Sources and Notes:

[1]: Workpaper #1 to Schedule No. BV-6.

[2]: Workpaper #2 to Schedule No. BV-6.

[3]: Schedule No. BV-5, [6].

[4]: [3] - (([3] - [9]) / 6).

[5]: [4] - (([3] - [9]) / 6).

[6]: [5] - (([3] - [9]) / 6).

[7]: [6] - (([3] - [9]) / 6).

[8]: [7] - (([3] - [9]) / 6).

[9]: BlueChip Economic Indicators, March 2021 This number is assumed to be the perpetual growth rate.

[10]: Workpaper #3 to Schedule No. BV-6.

Schedule No. BV-7

Overall After-Tax DCF Cost of Capital of the Electric and OHRU Samples

Panel A: Simple DCF Method (Quarterly)

Company	1st Quarter, 2021 S&P Bond Rating	1st Quarter, 2021 Preferred Equity Rating	DCF Cost of Equity	DCF Common Equity to Market Value Ratio	Cost of Preferred Equity	DCF Preferred Equity to Market Value Ratio	DCF Cost of Debt	DCF Debt to Market Value Ratio	California Edison's Representative Income Tax Rate	Overall Weighted After-Tax Cost of Capital
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
ALLETE	BBB	-	13.1%	0.61	-	0.00	3.5%	0.39	28.0%	9.0%
Alliant Energy	A	A	8.6%	0.62	n/a	0.01	3.2%	0.37	28.0%	6.2%
Amer. Elec. Power	A	-	10.0%	0.50	-	0.00	3.2%	0.50	28.0%	6.2%
Amer. States Water	A	-	7.5%	0.81	-	0.00	3.2%	0.19	28.0%	6.5%
Amer. Water Works	A	-	9.3%	0.69	-	0.00	3.2%	0.31	28.0%	7.2%
Ameren Corp.	BBB	-	9.9%	0.60	-	0.00	3.5%	0.40	28.0%	7.0%
Artesian Res Corp	A	-	6.7%	0.66	-	0.00	3.2%	0.34	28.0%	5.2%
Atmos Energy	A	-	9.7%	0.61	-	0.00	3.2%	0.39	28.0%	6.8%
Avista Corp.	BBB	-	10.9%	0.55	-	0.00	3.5%	0.45	28.0%	7.2%
Black Hills	BBB	-	8.7%	0.46	-	0.00	3.5%	0.54	28.0%	5.4%
CMS Energy Corp.	BBB	-	10.2%	0.51	-	0.00	3.5%	0.49	28.0%	6.5%
California Water	A	-	9.8%	0.69	-	0.00	3.2%	0.31	28.0%	7.5%
CenterPoint Energy	BBB	BBB	8.7%	0.41	n/a	0.07	3.5%	0.52	28.0%	4.8%
Chesapeake Utilities	A	-	7.9%	0.74	-	0.00	3.2%	0.26	28.0%	6.5%
Consol. Edison	A	-	7.6%	0.49	-	0.00	3.2%	0.51	28.0%	4.9%
DTE Energy	BBB	-	8.6%	0.59	-	0.00	3.5%	0.41	28.0%	6.1%
Dominion Energy	BBB	BBB	9.9%	0.57	n/a	0.02	3.5%	0.41	28.0%	6.7%
Duke Energy	BBB	BBB	9.3%	0.51	n/a	0.01	3.5%	0.48	28.0%	5.9%
Entergy Corp.	BBB	BBB	9.7%	0.44	n/a	0.01	3.5%	0.56	28.0%	5.7%
Essential Utilities	A	-	7.3%	0.64	-	0.00	3.2%	0.36	28.0%	5.5%
Eversource Energy	A	A	9.6%	0.59	n/a	0.00	3.2%	0.40	28.0%	6.6%
Exelon Corp.	BBB	-	8.1%	0.49	-	0.00	3.5%	0.51	28.0%	5.2%
Global Water Resources Inc	A	-	15.7%	0.74	-	0.00	3.2%	0.26	28.0%	12.3%
Hawaiian Elec.	BBB	BBB	6.4%	0.61	n/a	0.00	3.5%	0.38	28.0%	4.9%
IDACORP Inc.	BBB	-	6.9%	0.67	-	0.00	3.5%	0.33	28.0%	5.5%
MGE Energy	AA	-	7.4%	0.81	-	0.00	3.1%	0.19	28.0%	6.4%
Middlesex Water	A	A	5.1%	0.82	n/a	0.00	3.2%	0.18	28.0%	4.6%
New Jersey Resources	A	-	8.5%	0.60	-	0.00	3.2%	0.40	28.0%	6.0%
NextEra Energy	A	-	10.1%	0.71	-	0.00	3.2%	0.29	28.0%	7.9%
NiSource Inc.	BBB	BBB	11.8%	0.45	n/a	0.04	3.5%	0.51	28.0%	6.6%
NorthWestern Corp.	BBB	-	8.3%	0.55	-	0.00	3.5%	0.45	28.0%	5.7%
Northwest Natural	BBB	-	8.2%	0.54	-	0.00	3.5%	0.46	28.0%	5.6%
OGE Energy	BBB	-	10.5%	0.55	-	0.00	3.5%	0.45	28.0%	6.9%
ONE Gas Inc.	BBB	-	9.4%	0.47	-	0.00	3.5%	0.53	28.0%	5.7%
Otter Tail Corp.	BBB	-	11.7%	0.68	-	0.00	3.5%	0.32	28.0%	8.8%
Pinnacle West Capital	A	-	8.6%	0.54	-	0.00	3.2%	0.46	28.0%	5.7%
Public Serv. Enterprise	BBB	-	6.8%	0.61	-	0.00	3.5%	0.39	28.0%	5.2%
SJW Group	A	-	10.5%	0.52	-	0.00	3.2%	0.48	28.0%	6.6%
Sempra Energy	BBB	BBB	9.9%	0.59	n/a	0.02	3.5%	0.39	28.0%	6.8%
South Jersey Inds.	BBB	-	12.9%	0.43	-	0.00	3.5%	0.57	28.0%	7.0%
Southern Co.	A	A	10.5%	0.53	n/a	0.00	3.2%	0.47	28.0%	6.7%
Southwest Gas	BBB	-	10.6%	0.64	-	0.00	3.5%	0.36	28.0%	7.7%
Spire Inc.	A	A	8.6%	0.49	n/a	0.03	3.2%	0.47	28.0%	5.4%
Unitil Corp.	BBB	BBB	6.7%	0.57	n/a	0.00	3.5%	0.43	28.0%	4.9%
WEC Energy Group	A	A	9.5%	0.66	n/a	0.00	3.2%	0.34	28.0%	7.0%
Xcel Energy Inc.	A	-	8.9%	0.58	-	0.00	3.2%	0.42	28.0%	6.2%
Simple OHRU Sample Average			9.4%	0.62	#DIV/0!	0.00	3.3%	0.38	28.0%	6.6%
Simple Electric Sample Average			9.3%	0.57	#DIV/0!	0.01	3.4%	0.42	28.0%	6.4%

Sources and Notes:

- [1]: Bloomberg as of May 31, 2021.
- [2]: Preferred ratings were assumed equal to debt rating;
- [3]: Schedule No. BV-6; Panel A, [6].
- [4]: Schedule No. BV-4, [1].
- [5]: Workpaper #2 to Schedule No. BV-11, Panel C.
- [6]: Schedule No. BV-4, [2].
- [7]: Workpaper #2 to Schedule No. BV-11, Panel B.
- [8]: Schedule No. BV-4, [3].
- [9]: Provided by Southern California Edison.
- [10]: $([3] \times [4]) + ([5] \times [6]) + ([7] \times [8] \times (1 - [9]))$. A strikethrough indicates the utility was excluded from the full sample average calculation as a result of its cost of equity not exceeding its cost of debt by 150 basis points

Schedule No. BV-7

Overall After-Tax DCF Cost of Capital of the Electric and OHRU Samples

Panel B: Multi-Stage DCF (Using Blue Chip Long-Term GDP Growth Forecast as the Perpetual Rate)

Company	1st Quarter, 2021 S&P Bond Rating	1st Quarter, 2021 Preferred Equity Rating	DCF Cost of Equity	DCF Common Equity to Market Value Ratio	Cost of Preferred Equity	DCF Preferred Equity to Market Value Ratio	DCF Cost of Debt	DCF Debt to Market Value Ratio	California Edison's Representative Income Tax Rate	Overall Weighted After-Tax Cost of Capital
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
ALLETE	BBB	-	9.1%	0.61	-	0.00	3.5%	0.39	28.0%	6.6%
Alliant Energy	A	A	7.2%	0.62	n/a	0.01	3.2%	0.37	28.0%	5.3%
Amer. Elec. Power	A	-	8.1%	0.50	-	0.00	3.2%	0.50	28.0%	5.2%
Amer. States Water	A	-	5.9%	0.81	-	0.00	3.2%	0.19	28.0%	5.2%
Amer. Water Works	A	-	6.0%	0.69	-	0.00	3.2%	0.31	28.0%	4.9%
Ameren Corp.	BBB	-	7.3%	0.60	-	0.00	3.5%	0.40	28.0%	5.4%
Artesian Res Corp	A	-	6.6%	0.66	-	0.00	3.2%	0.34	28.0%	5.2%
Atmos Energy	A	-	7.1%	0.61	-	0.00	3.2%	0.39	28.0%	5.2%
Avista Corp.	BBB	-	8.6%	0.55	-	0.00	3.5%	0.45	28.0%	5.9%
Black Hills	BBB	-	7.8%	0.46	-	0.00	3.5%	0.54	28.0%	4.9%
CMS Energy Corp.	BBB	-	7.5%	0.51	-	0.00	3.5%	0.49	28.0%	5.1%
California Water	A	-	6.1%	0.69	-	0.00	3.2%	0.31	28.0%	5.0%
CenterPoint Energy	BBB	BBB	7.0%	0.41	n/a	0.07	3.5%	0.52	28.0%	4.2%
Chesapeake Utilities	A	-	5.7%	0.74	-	0.00	3.2%	0.26	28.0%	4.9%
Consol. Edison	A	-	8.0%	0.49	-	0.00	3.2%	0.51	28.0%	5.1%
DTE Energy	BBB	-	7.5%	0.59	-	0.00	3.5%	0.41	28.0%	5.4%
Dominion Energy	BBB	BBB	7.9%	0.57	n/a	0.02	3.5%	0.41	28.0%	5.5%
Duke Energy	BBB	BBB	8.2%	0.51	n/a	0.01	3.5%	0.48	28.0%	5.4%
Entergy Corp.	BBB	BBB	8.2%	0.44	n/a	0.01	3.5%	0.56	28.0%	5.0%
Essential Utilities	A	-	6.3%	0.64	-	0.00	3.2%	0.36	28.0%	4.9%
Eversource Energy	A	A	8.0%	0.54	-	0.00	3.2%	0.46	28.0%	5.4%
Exelon Corp.	BBB	-	7.5%	0.59	n/a	0.00	3.2%	0.40	28.0%	5.4%
Global Water Resources Inc	A	-	7.6%	0.49	-	0.00	3.5%	0.51	28.0%	5.0%
Hawaiian Elec.	A	-	5.2%	0.74	-	0.00	3.2%	0.26	28.0%	4.4%
Hawaiian Elec.	BBB	BBB	7.0%	0.61	n/a	0.00	3.5%	0.38	28.0%	5.3%
IDACORP Inc.	BBB	-	6.9%	0.67	-	0.00	3.5%	0.33	28.0%	5.4%
MGE Energy	AA	-	6.2%	0.81	-	0.00	3.1%	0.19	28.0%	5.4%
Middlesex Water	A	A	5.3%	0.82	n/a	0.00	3.2%	0.18	28.0%	4.7%
New Jersey Resources	A	-	7.5%	0.60	-	0.00	3.2%	0.40	28.0%	5.4%
NextEra Energy	A	-	6.7%	0.71	-	0.00	3.2%	0.29	28.0%	5.5%
NiSource Inc.	BBB	BBB	8.6%	0.45	n/a	0.04	3.5%	0.51	28.0%	5.1%
NorthWestern Corp.	BBB	-	8.1%	0.55	-	0.00	3.5%	0.45	28.0%	5.6%
Northwest Natural	BBB	-	7.8%	0.54	-	0.00	3.5%	0.46	28.0%	5.4%
OGE Energy	BBB	-	9.4%	0.55	-	0.00	3.5%	0.45	28.0%	6.3%
ONE Gas Inc.	BBB	-	7.6%	0.47	-	0.00	3.5%	0.53	28.0%	4.9%
Otter Tail Corp.	BBB	-	8.4%	0.68	-	0.00	3.5%	0.32	28.0%	6.5%
Pinnacle West Capital	A	-	8.1%	0.54	-	0.00	3.2%	0.46	28.0%	5.5%
Public Serv. Enterprise	BBB	-	7.2%	0.61	-	0.00	3.5%	0.39	28.0%	5.4%
SJW Group	A	-	6.9%	0.52	-	0.00	3.2%	0.48	28.0%	4.7%
Sempra Energy	BBB	BBB	7.9%	0.59	n/a	0.02	3.5%	0.39	28.0%	5.6%
South Jersey Inds.	BBB	-	10.1%	0.43	-	0.00	3.5%	0.57	28.0%	5.8%
Southern Co.	A	A	8.8%	0.53	n/a	0.00	3.2%	0.47	28.0%	5.8%
Southwest Gas	BBB	-	8.3%	0.64	-	0.00	3.5%	0.36	28.0%	6.3%
Spire Inc.	A	A	7.8%	0.49	n/a	0.03	3.2%	0.47	28.0%	5.0%
Unitil Corp.	BBB	BBB	6.8%	0.57	n/a	0.00	3.5%	0.43	28.0%	4.9%
WEC Energy Group	A	A	7.4%	0.66	n/a	0.00	3.2%	0.34	28.0%	5.7%
Xcel Energy Inc.	A	-	7.0%	0.58	-	0.00	3.2%	0.42	28.0%	5.1%
Multi-Stage OHRU Sample Average			7.0%	0.62	#DIV/0!	0.00	3.3%	0.38	28.0%	5.1%
Multi-Stage Electric Sample Average			7.7%	0.57	#DIV/0!	0.01	3.4%	0.42	28.0%	5.5%

Sources and Notes:

- [1]: Bloomberg as of May 31, 2021. [6]: Schedule No. BV-4, [2].
 [2]: Preferred ratings were assumed equal to debt rating; [7]: Workpaper #2 to Schedule No. BV-11, Panel B.
 [3]: Schedule No. BV-6, Panel B, [10]. [8]: Schedule No. BV-4, [3].
 [4]: Schedule No. BV-4, [1]. [9]: Provided by Southern California Edison.
 [5]: Workpaper #2 to Schedule No. BV-11, Panel C. [10]: $([3] \times [4]) + ([5] \times [6]) + ([7] \times [8] \times (1 - [9]))$. A strikethrough indicates the utility was excluded from the full sample average calculation as a result of its cost of equity not exceeding its cost of debt by 150 basis points

Schedule No. BV-8

DCF Cost of Equity at Southern California Edison's Proposed Capital Structure

Electric and OHRU Samples

	Overall After - Tax Cost of Capital	Southern California Edison's Representative Regulatory % Debt	Representative Cost of BBB Rated Utility Debt	Southern California Edison's Representative Income Tax Rate	Southern California Edison's Regulatory % Preferred Equity	Southern California Edison's Cost of Preferred Equity	Southern California Edison's Representative Regulatory % Equity	Estimated Return on Equity
	[1]	[2]	[3]	[4]			[5]	[6]
Electric Sample								
Simple DCF Quarterly	6.4%	48.0%	3.5%	28.0%	0.0%	3.5%	52.0%	9.9%
Multi-Stage DCF - Using the Blue Chip Economic Indicator Long-Term GDP Growth Forecast as the Perpetual Rate	5.5%	48.0%	3.5%	28.0%	0.0%	3.5%	52.0%	8.2%
OHRU Sample								
Simple DCF Quarterly	6.6%	48.0%	3.5%	28.0%	0.0%	3.5%	52.0%	10.4%
Multi-Stage DCF - Using the Blue Chip Economic Indicator Long-Term GDP Growth Forecast as the Perpetual Rate	5.1%	48.0%	3.5%	28.0%	0.0%	3.5%	52.0%	7.5%

Sources and Notes:

[1]: Schedule No. BV-7; Panels A-B, [10].

[2]: Provided by Southern California Edison.

[3]: Based on a BBB rating. Yield from Bloomberg as of May 31, 2021.

[4]: Provided by Southern California Edison.

[5]: Provided by Southern California Edison.

[6]: $\{ [1] - ([2] \times [3] \times (1 - [4])) \} / [5]$.

Schedule No. BV-9 Risk-Free Rates

BCEI Forecast of 10 year U.S. Treasury Yield	[a]	2.30%
Long-run Average of 20 year U.S. Treasury Yield	[b]	4.63%
Long-run Average of 10 year U.S. Treasury Yield	[c]	4.13%
Maturity Premium	[d] = [b] - [c]	0.50%
Base Projection of 20 year U.S. Treasury Yield	[e] = [a] + [d]	2.80%

Sources and Notes:

[a]: Blue Chip Economic Indicators, based on March and May 2021 Publication. Midpoint of 2022-2024 forecasts.

[b], [c]: Bloomberg as of 5/31/2021, see Workpaper #1 to Schedule No. BV-9.

Schedule No. BV-10

Risk Positioning Cost of Equity of the Electric and OHRU Samples (Using Value Line Betas)

Panel A: Scenario 1 - Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 7.25%

Company	Long-Term	Value Line Betas	Long-Term Market	CAPM Cost of Equity	ECAPM (1.5%) Cost
	Risk-Free Rate		Risk Premium		of Equity
	[1]	[2]	[3]	[4]	[5]
ALLETE	2.80%	0.90	7.25%	9.3%	9.5%
Alliant Energy	2.80%	0.85	7.25%	9.0%	9.2%
Amer. Elec. Power	2.80%	0.75	7.25%	8.2%	8.6%
Amer. States Water	2.80%	0.65	7.25%	7.5%	8.0%
Amer. Water Works	2.80%	0.85	7.25%	9.0%	9.2%
Ameren Corp.	2.80%	0.80	7.25%	8.6%	8.9%
Artesian Res Corp	2.80%	0.75	7.25%	8.2%	8.6%
Atmos Energy	2.80%	0.80	7.25%	8.6%	8.9%
Avista Corp.	2.80%	0.95	7.25%	9.7%	9.8%
Black Hills	2.80%	1.00	7.25%	10.1%	10.1%
CMS Energy Corp.	2.80%	0.80	7.25%	8.6%	8.9%
California Water	2.80%	0.65	7.25%	7.5%	8.0%
CenterPoint Energy	2.80%	1.15	7.25%	11.1%	10.9%
Chesapeake Utilities	2.80%	0.80	7.25%	8.6%	8.9%
Consol. Edison	2.80%	0.75	7.25%	8.2%	8.6%
DTE Energy	2.80%	0.95	7.25%	9.7%	9.8%
Dominion Energy	2.80%	0.85	7.25%	9.0%	9.2%
Duke Energy	2.80%	0.85	7.25%	9.0%	9.2%
Entergy Corp.	2.80%	0.95	7.25%	9.7%	9.8%
Essential Utilities	2.80%	0.95	7.25%	9.7%	9.8%
Evergy Inc.	2.80%	0.95	7.25%	9.7%	9.8%
Eversource Energy	2.80%	0.90	7.25%	9.3%	9.5%
Exelon Corp.	2.80%	0.95	7.25%	9.7%	9.8%
Global Water Resources Inc	2.80%	0.75	7.25%	8.2%	8.6%
Hawaiian Elec.	2.80%	0.80	7.25%	8.6%	8.9%
IDACORP Inc.	2.80%	0.85	7.25%	9.0%	9.2%
MGE Energy	2.80%	0.75	7.25%	8.2%	8.6%
Middlesex Water	2.80%	0.70	7.25%	7.9%	8.3%
New Jersey Resources	2.80%	1.00	7.25%	10.1%	10.1%
NextEra Energy	2.80%	0.90	7.25%	9.3%	9.5%
NiSource Inc.	2.80%	0.85	7.25%	9.0%	9.2%
NorthWestern Corp.	2.80%	0.95	7.25%	9.7%	9.8%
Northwest Natural	2.80%	0.85	7.25%	9.0%	9.2%
OGE Energy	2.80%	1.05	7.25%	10.4%	10.3%
ONE Gas Inc.	2.80%	0.80	7.25%	8.6%	8.9%
Otter Tail Corp.	2.80%	0.90	7.25%	9.3%	9.5%
Pinnacle West Capital	2.80%	0.90	7.25%	9.3%	9.5%
Public Serv. Enterprise	2.80%	0.90	7.25%	9.3%	9.5%
SJW Group	2.80%	0.80	7.25%	8.6%	8.9%
Sempra Energy	2.80%	0.95	7.25%	9.7%	9.8%
South Jersey Inds.	2.80%	1.05	7.25%	10.4%	10.3%
Southern Co.	2.80%	0.95	7.25%	9.7%	9.8%
Southwest Gas	2.80%	0.95	7.25%	9.7%	9.8%
Spire Inc.	2.80%	0.85	7.25%	9.0%	9.2%
Unitil Corp.	2.80%	0.85	7.25%	9.0%	9.2%
WEC Energy Group	2.80%	0.80	7.25%	8.6%	8.9%
Xcel Energy Inc.	2.80%	0.80	7.25%	8.6%	8.9%

Sources and Notes:

[1], [3]: Villadsen Direct Testimony.

[2]: From Valueline Investment Analyzer as of May 31, 2021.

[4]: [1] + ([2] x [3]).

[5]: ([1] + 1.5%) + [2] x ([3] - 1.5%).

Schedule No. BV-10

Risk Positioning Cost of Equity of the Electric and OHRU Samples (Using Value Line Betas)

Panel B: Scenario 2 - Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 8.08%

Company	Long-Term Risk-Free Rate	Value Line Betas	Long-Term Market Risk Premium	CAPM Cost of Equity	ECAPM (1.5%) Cost of Equity
	[1]	[2]	[3]	[4]	[5]
ALLETE	2.80%	0.90	8.08%	10.1%	10.2%
Alliant Energy	2.80%	0.85	8.08%	9.7%	9.9%
Amer. Elec. Power	2.80%	0.75	8.08%	8.9%	9.2%
Amer. States Water	2.80%	0.65	8.08%	8.1%	8.6%
Amer. Water Works	2.80%	0.85	8.08%	9.7%	9.9%
Ameren Corp.	2.80%	0.80	8.08%	9.3%	9.6%
Artesian Res Corp	2.80%	0.75	8.08%	8.9%	9.2%
Atmos Energy	2.80%	0.80	8.08%	9.3%	9.6%
Avista Corp.	2.80%	0.95	8.08%	10.5%	10.6%
Black Hills	2.80%	1.00	8.08%	10.9%	10.9%
CMS Energy Corp.	2.80%	0.80	8.08%	9.3%	9.6%
California Water	2.80%	0.65	8.08%	8.1%	8.6%
CenterPoint Energy	2.80%	1.15	8.08%	12.1%	11.9%
Chesapeake Utilities	2.80%	0.80	8.08%	9.3%	9.6%
Consol. Edison	2.80%	0.75	8.08%	8.9%	9.2%
DTE Energy	2.80%	0.95	8.08%	10.5%	10.6%
Dominion Energy	2.80%	0.85	8.08%	9.7%	9.9%
Duke Energy	2.80%	0.85	8.08%	9.7%	9.9%
Entergy Corp.	2.80%	0.95	8.08%	10.5%	10.6%
Essential Utilities	2.80%	0.95	8.08%	10.5%	10.6%
Eergy Inc.	2.80%	0.95	8.08%	10.5%	10.6%
Eversource Energy	2.80%	0.90	8.08%	10.1%	10.2%
Exelon Corp.	2.80%	0.95	8.08%	10.5%	10.6%
Global Water Resources Inc	2.80%	0.75	8.08%	8.9%	9.2%
Hawaiian Elec.	2.80%	0.80	8.08%	9.3%	9.6%
IDACORP Inc.	2.80%	0.85	8.08%	9.7%	9.9%
MGE Energy	2.80%	0.75	8.08%	8.9%	9.2%
Middlesex Water	2.80%	0.70	8.08%	8.5%	8.9%
New Jersey Resources	2.80%	1.00	8.08%	10.9%	10.9%
NextEra Energy	2.80%	0.90	8.08%	10.1%	10.2%
NiSource Inc.	2.80%	0.85	8.08%	9.7%	9.9%
NorthWestern Corp.	2.80%	0.95	8.08%	10.5%	10.6%
Northwest Natural	2.80%	0.85	8.08%	9.7%	9.9%
OGE Energy	2.80%	1.05	8.08%	11.3%	11.2%
ONE Gas Inc.	2.80%	0.80	8.08%	9.3%	9.6%
Otter Tail Corp.	2.80%	0.90	8.08%	10.1%	10.2%
Pinnacle West Capital	2.80%	0.90	8.08%	10.1%	10.2%
Public Serv. Enterprise	2.80%	0.90	8.08%	10.1%	10.2%
SJW Group	2.80%	0.80	8.08%	9.3%	9.6%
Sempra Energy	2.80%	0.95	8.08%	10.5%	10.6%
South Jersey Inds.	2.80%	1.05	8.08%	11.3%	11.2%
Southern Co.	2.80%	0.95	8.08%	10.5%	10.6%
Southwest Gas	2.80%	0.95	8.08%	10.5%	10.6%
Spire Inc.	2.80%	0.85	8.08%	9.7%	9.9%
Unitil Corp.	2.80%	0.85	8.08%	9.7%	9.9%
WEC Energy Group	2.80%	0.80	8.08%	9.3%	9.6%
Xcel Energy Inc.	2.80%	0.80	8.08%	9.3%	9.6%

Sources and Notes:

[1], [3]: Villadsen Direct Testimony.

[2]: From ValueLine Investment Analyzer as of May 31, 2021.

[4]: [1] + ([2] x [3]).

[5]: ([1] + 1.5%) + [2] x ([3] - 1.5%).

Schedule No. BV-11

Overall After-Tax Risk Positioning Cost of Capital of the Electric and OHRU Samples (Using Value Line Betas)

Panel A: CAPM Cost of Equity Scenario 1 - Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 7.25%

Company	CAPM Cost of Equity	ECAPM (1.5%) Cost of Equity	5-Year Average Common Equity to Market Value Ratio	Weighted - Average Cost of Preferred Equity	5-Year Average Preferred Equity to Market Value Ratio	Weighted- Average Cost of Debt	5-Year Average Debt to Market Value Ratio	Edison's Representative Income Tax Rate	Overall After-Tax Cost of Capital (CAPM)	Overall After-Tax Cost of Capital (ECAPM 1.5%)
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
ALLETE	9.3%	9.5%	0.68	-	0.00	3.5%	0.32	28.0%	7.1%	7.2%
Alliant Energy	9.0%	9.2%	0.62	3.2%	0.01	3.2%	0.37	28.0%	6.4%	6.6%
Amer. Elec. Power	8.2%	8.6%	0.56	-	0.00	3.2%	0.44	28.0%	5.6%	5.9%
Amer. States Water	7.5%	8.0%	0.81	-	0.00	3.2%	0.19	28.0%	6.6%	7.0%
Amer. Water Works	9.0%	9.2%	0.65	-	0.00	3.2%	0.35	28.0%	6.6%	6.8%
Ameren Corp.	8.6%	8.9%	0.61	-	0.00	3.5%	0.39	28.0%	6.3%	6.4%
Artesian Res Corp	8.2%	8.6%	0.70	-	0.00	3.2%	0.30	28.0%	6.4%	6.7%
Atmos Energy	8.6%	8.9%	0.70	-	0.00	3.2%	0.30	28.0%	6.7%	6.9%
Avista Corp.	9.7%	9.8%	0.57	-	0.00	3.5%	0.43	28.0%	6.6%	6.7%
Black Hills	10.1%	10.1%	0.50	-	0.00	3.5%	0.50	28.0%	6.3%	6.3%
CMS Energy Corp.	8.6%	8.9%	0.54	-	0.00	3.5%	0.46	28.0%	5.8%	5.9%
California Water	7.5%	8.0%	0.69	-	0.00	3.2%	0.31	28.0%	5.9%	6.3%
CenterPoint Energy	11.1%	10.9%	0.48	3.5%	0.03	3.4%	0.49	28.0%	6.6%	6.5%
Chesapeake Utilities	8.6%	8.9%	0.71	-	0.00	3.2%	0.29	28.0%	6.8%	7.0%
Consol. Edison	8.2%	8.6%	0.55	-	0.00	3.2%	0.45	28.0%	5.6%	5.8%
DTE Energy	9.7%	9.8%	0.57	-	0.00	3.5%	0.43	28.0%	6.6%	6.7%
Dominion Energy	9.0%	9.2%	0.57	3.5%	0.01	3.5%	0.42	28.0%	6.2%	6.3%
Duke Energy	9.0%	9.2%	0.50	3.3%	0.01	3.3%	0.49	28.0%	5.7%	5.8%
Entergy Corp.	9.7%	9.8%	0.47	3.5%	0.01	3.5%	0.53	28.0%	5.9%	5.9%
Essential Utilities	9.7%	9.8%	0.70	-	0.00	3.2%	0.30	28.0%	7.4%	7.5%
Eversource Energy	9.7%	9.8%	0.56	-	0.00	3.2%	0.44	28.0%	6.4%	6.5%
Eversource Energy	9.3%	9.5%	0.61	3.2%	0.00	3.2%	0.39	28.0%	6.6%	6.7%
Exelon Corp.	9.7%	9.8%	0.49	-	0.00	3.5%	0.51	28.0%	6.1%	6.1%
Global Water Resources Inc	8.2%	8.6%	0.65	-	0.00	3.2%	0.35	28.0%	6.2%	6.4%
Hawaiian Elec.	8.6%	8.9%	0.63	3.5%	0.01	3.5%	0.36	28.0%	6.4%	6.6%
IDACORP Inc.	9.0%	9.2%	0.68	-	0.00	3.5%	0.32	28.0%	6.9%	7.1%
MGE Energy	8.2%	8.6%	0.81	-	0.00	3.1%	0.19	28.0%	7.1%	7.4%
Middlesex Water	7.9%	8.3%	0.79	3.2%	0.00	3.2%	0.21	28.0%	6.7%	7.0%
New Jersey Resources	10.1%	10.1%	0.71	-	0.00	3.2%	0.29	28.0%	7.8%	7.8%
NextEra Energy	9.3%	9.5%	0.68	-	0.00	3.2%	0.32	28.0%	7.1%	7.2%
NiSource Inc.	9.0%	9.2%	0.47	3.5%	0.02	3.5%	0.51	28.0%	5.6%	5.7%
NorthWestern Corp.	9.7%	9.8%	0.59	-	0.00	3.5%	0.41	28.0%	6.7%	6.8%
Northwest Natural	9.0%	9.2%	0.65	-	0.00	3.5%	0.35	28.0%	6.7%	6.8%
OGE Energy	10.4%	10.3%	0.65	-	0.00	3.4%	0.35	28.0%	7.6%	7.6%
ONE Gas Inc.	8.6%	8.9%	0.70	-	0.00	3.3%	0.30	28.0%	6.7%	6.9%
Otter Tail Corp.	9.3%	9.5%	0.71	-	0.00	3.5%	0.29	28.0%	7.3%	7.4%
Pinnacle West Capital	9.3%	9.5%	0.61	-	0.00	3.2%	0.39	28.0%	6.6%	6.7%
Public Serv. Enterprise	9.3%	9.5%	0.63	-	0.00	3.5%	0.37	28.0%	6.8%	6.9%
SJW Group	8.6%	8.9%	0.63	-	0.00	3.2%	0.37	28.0%	6.3%	6.4%
Sempra Energy	9.7%	9.8%	0.55	3.5%	0.02	3.5%	0.43	28.0%	6.5%	6.5%
South Jersey Inds.	10.4%	10.3%	0.54	-	0.00	3.5%	0.46	28.0%	6.8%	6.7%
Southern Co.	9.7%	9.8%	0.52	3.2%	0.00	3.2%	0.48	28.0%	6.1%	6.2%
Southwest Gas	9.7%	9.8%	0.64	-	0.00	3.5%	0.36	28.0%	7.1%	7.1%
Spire Inc.	9.0%	9.2%	0.56	3.2%	0.01	3.2%	0.43	28.0%	6.1%	6.2%
Unitil Corp.	9.0%	9.2%	0.60	3.5%	0.00	3.5%	0.40	28.0%	6.4%	6.5%
WEC Energy Group	8.6%	8.9%	0.66	3.2%	0.00	3.2%	0.34	28.0%	6.5%	6.7%
Xcel Energy Inc.	8.6%	8.9%	0.58	-	0.00	3.2%	0.42	28.0%	6.0%	6.1%
OHRU Sample Average	8.8%	9.1%	66.4%	3.3%	0.2%	3.3%	33.4%	28.0%	6.6%	6.8%
Electric Sample Average	9.3%	9.5%	59.3%	3.4%	0.4%	3.4%	40.3%	28.0%	6.5%	6.6%

Sources and Notes:

[1]: Schedule No. BV-10; Panel A, [4].

[2]: Schedule No. BV-10; Panel A, [5].

[3]: Schedule No. BV-4, [4].

[4]: Workpaper #2 to Schedule No. BV-11, Panel C.

[5]: Schedule No. BV-4, [5].

[6]: Workpaper #2 to Schedule No. BV-11, Panel B.

[7]: Schedule No. BV-4, [6].

[8]: Provided by Southern California Edison.

[9] = [1] x [3] + [4] x [5] + [6] x [7] x (1 - [8])

[10] = [2] x [3] + [4] x [5] + [6] x [7] x (1 - [8])

Schedule No. BV-11

Overall After-Tax Risk Positioning Cost of Capital of the Electric and OHRU Samples (Using Value Line Betas)

Panel B: CAPM Cost of Equity Scenario 2 - Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 8.08%

Company	CAPM Cost of Equity	ECAPM (1.5%) Cost of Equity	5-Year Average Common Equity to Market Value Ratio	Weighted - Average Cost of Preferred Equity	5-Year Average Preferred Equity to Market Value Ratio	Weighted- Average Cost of Debt	5-Year Average Debt to Market Value Ratio	Edison's Representative Income Tax Rate	Overall After-Tax Cost of Capital (CAPM)	Overall After-Tax Cost of Capital (ECAPM 1.5%)
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Company	capmlt	ecapmlt2	capm_equity_ratio	average	capm_pref_ratio	average	capm_debt_ratio		CAPM	ECAPM2
ALLETE	10.1%	10.2%	0.68	-	0.00	3.5%	0.32	28.0%	7.7%	7.8%
Alliant Energy	9.7%	9.9%	0.62	3.2%	0.01	3.2%	0.37	28.0%	6.9%	7.0%
Amer. Elec. Power	8.9%	9.2%	0.56	-	0.00	3.2%	0.44	28.0%	6.0%	6.2%
Amer. States Water	8.1%	8.6%	0.81	-	0.00	3.2%	0.19	28.0%	7.0%	7.4%
Amer. Water Works	9.7%	9.9%	0.65	-	0.00	3.2%	0.35	28.0%	7.1%	7.2%
Ameren Corp.	9.3%	9.6%	0.61	-	0.00	3.5%	0.39	28.0%	6.7%	6.8%
Artesian Res Corp	8.9%	9.2%	0.70	-	0.00	3.2%	0.30	28.0%	6.9%	7.1%
Atmos Energy	9.3%	9.6%	0.70	-	0.00	3.2%	0.30	28.0%	7.2%	7.4%
Avista Corp.	10.5%	10.6%	0.57	-	0.00	3.5%	0.43	28.0%	7.1%	7.1%
Black Hills	10.9%	10.9%	0.50	-	0.00	3.5%	0.50	28.0%	6.7%	6.7%
CMS Energy Corp.	9.3%	9.6%	0.54	-	0.00	3.5%	0.46	28.0%	6.1%	6.3%
California Water	8.1%	8.6%	0.69	-	0.00	3.2%	0.31	28.0%	6.3%	6.6%
CenterPoint Energy	12.1%	11.9%	0.48	3.5%	0.03	3.4%	0.49	28.0%	7.1%	7.0%
Chesapeake Utilities	9.3%	9.6%	0.71	-	0.00	3.2%	0.29	28.0%	7.3%	7.5%
Consol. Edison	8.9%	9.2%	0.55	-	0.00	3.2%	0.45	28.0%	5.9%	6.2%
DTE Energy	10.5%	10.6%	0.57	-	0.00	3.5%	0.43	28.0%	7.1%	7.1%
Dominion Energy	9.7%	9.9%	0.57	3.5%	0.01	3.5%	0.42	28.0%	6.6%	6.7%
Duke Energy	9.7%	9.9%	0.50	3.3%	0.01	3.3%	0.49	28.0%	6.1%	6.2%
Entergy Corp.	10.5%	10.6%	0.47	3.5%	0.01	3.5%	0.53	28.0%	6.2%	6.3%
Essential Utilities	10.5%	10.6%	0.70	-	0.00	3.2%	0.30	28.0%	8.0%	8.0%
Eversource Energy	10.1%	10.2%	0.61	3.2%	0.00	3.2%	0.39	28.0%	7.1%	7.1%
Exelon Corp.	10.5%	10.6%	0.49	-	0.00	3.5%	0.51	28.0%	6.5%	6.5%
Global Water Resources Inc	8.9%	9.2%	0.65	-	0.00	3.2%	0.35	28.0%	6.6%	6.8%
Hawaiian Elec.	9.3%	9.6%	0.63	3.5%	0.01	3.5%	0.36	28.0%	6.8%	7.0%
IDACORP Inc.	9.7%	9.9%	0.68	-	0.00	3.5%	0.32	28.0%	7.4%	7.6%
MGE Energy	8.9%	9.2%	0.81	-	0.00	3.1%	0.19	28.0%	7.6%	7.9%
Middlesex Water	8.5%	8.9%	0.79	3.2%	0.00	3.2%	0.21	28.0%	7.1%	7.5%
New Jersey Resources	10.9%	10.9%	0.71	-	0.00	3.2%	0.29	28.0%	8.4%	8.4%
NextEra Energy	10.1%	10.2%	0.68	-	0.00	3.2%	0.32	28.0%	7.6%	7.7%
NiSource Inc.	9.7%	9.9%	0.47	3.5%	0.02	3.5%	0.51	28.0%	5.9%	6.0%
NorthWestern Corp.	10.5%	10.6%	0.59	-	0.00	3.5%	0.41	28.0%	7.2%	7.2%
Northwest Natural	9.7%	9.9%	0.65	-	0.00	3.5%	0.35	28.0%	7.1%	7.3%
OGE Energy	11.3%	11.2%	0.65	-	0.00	3.4%	0.35	28.0%	8.2%	8.1%
ONE Gas Inc.	9.3%	9.6%	0.70	-	0.00	3.3%	0.30	28.0%	7.2%	7.4%
Otter Tail Corp.	10.1%	10.2%	0.71	-	0.00	3.5%	0.29	28.0%	7.9%	8.0%
Pinnacle West Capital	10.1%	10.2%	0.61	-	0.00	3.2%	0.39	28.0%	7.1%	7.2%
Public Serv. Enterprise	10.1%	10.2%	0.63	-	0.00	3.5%	0.37	28.0%	7.3%	7.3%
SJW Group	9.3%	9.6%	0.63	-	0.00	3.2%	0.37	28.0%	6.7%	6.9%
Sempra Energy	10.5%	10.6%	0.55	3.5%	0.02	3.5%	0.43	28.0%	6.9%	6.9%
South Jersey Inds.	11.3%	11.2%	0.54	-	0.00	3.5%	0.46	28.0%	7.2%	7.2%
Southern Co.	10.5%	10.6%	0.52	3.2%	0.00	3.2%	0.48	28.0%	6.6%	6.6%
Southwest Gas	10.5%	10.6%	0.64	-	0.00	3.5%	0.36	28.0%	7.6%	7.6%
Spire Inc.	9.7%	9.9%	0.56	3.2%	0.01	3.2%	0.43	28.0%	6.5%	6.6%
Unitil Corp.	9.7%	9.9%	0.60	3.5%	0.00	3.5%	0.40	28.0%	6.8%	6.9%
WEC Energy Group	9.3%	9.6%	0.66	3.2%	0.00	3.2%	0.34	28.0%	6.9%	7.1%
Xcel Energy Inc.	9.3%	9.6%	0.58	-	0.00	3.2%	0.42	28.0%	6.3%	6.5%
OHRU Sample Average	9.5%	9.7%	0.66	3.3%	0.00	3.3%	0.33	28.0%	7.1%	7.2%
Electric Sample Average	10.0%	10.2%	0.59	3.4%	0.00	3.4%	0.40	28.0%	6.9%	7.0%

Sources and Notes:

- [1]: Schedule No. BV-10; Panel B, [4].
- [2]: Schedule No. BV-10; Panel B, [5].
- [3]: Schedule No. BV-4, [4].
- [4]: Workpaper #2 to Schedule No. BV-11, Panel C.
- [5]: Schedule No. BV-4, [5].
- [6]: Workpaper #2 to Schedule No. BV-11, Panel B.
- [7]: Schedule No. BV-4, [6].
- [8]: Provided by Southern California Edison.
- [9] = [1] x [3] + [4] x [5] + [6] x [7] x (1 - [8])
- [10] = [2] x [3] + [4] x [5] + [6] x [7] x (1 - [8])

Schedule No. BV-12

Risk Positioning Cost of Equity at Southern California Edison's Proposed Capital Structure

Electric and OHRU Samples

Using Value Line Betas

	Overall After-Tax Cost of Capital (Scenario 1)	Overall After-Tax Cost of Capital (Scenario 2)	Southern California Edison's Representative Regulatory % Debt	Representative Cost of BBB-Rated Utility Debt	Southern California Edison's Representative Income Tax Rate	Southern California Edison's Regulatory % Preferred Equity	Southern California Edison's Cost of Preferred Equity	Southern California Edison's Representative Regulatory % Equity	Estimated Return on Equity (Scenario 1)	Estimated Return on Equity (Scenario 2)
	[1]	[2]	[3]	[4]	[5]			[6]	[7]	[8]
Electric Sample										
CAPM using Value Line Betas	6.5%	6.9%	48.0%	3.5%	28.0%	0.0%	3.5%	52.0%	10.2%	11.0%
ECAPM (1.50%) using Value Line Betas	6.6%	7.0%	48.0%	3.5%	28.0%	0.0%	3.5%	52.0%	10.3%	11.2%
OHRU Sample										
CAPM using Value Line Betas	6.6%	7.1%	48.0%	3.5%	28.0%	0.0%	3.5%	52.0%	10.4%	11.2%
ECAPM (1.50%) using Value Line Betas	6.8%	7.2%	48.0%	3.5%	28.0%	0.0%	3.5%	52.0%	10.7%	11.6%

Sources and Notes:

[1]: Schedule No. BV-11; Panel A, [9] - [10].

[2]: Schedule No. BV-11; Panel B, [9] - [10].

[3]: Provided by Southern California Edison.

[4]: Based on a BBB rating. Yield from Bloomberg as of May 31, 2021.

[5]: Provided by Southern California Edison.

[6]: Provided by Southern California Edison.

[7]: $\{[1] - ([3] \times [4] \times (1 - [5]))\} / [6]$

[8]: $\{[2] - ([3] \times [4] \times (1 - [5]))\} / [6]$

Scenario 1: Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 7.25%.

Scenario 2: Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 8.08%.

Schedule No. BV-13

Hamada Adjustment to Obtain Unlevered Asset Beta

Company	Value Line Betas	Debt Beta	5-Year Average Common Equity to Market Value Ratio	5-Year Average Preferred Equity to Market Value Ratio	5-Year Average Debt to Market Value Ratio	Southern California Edison's	Asset Beta: Without Taxes	Asset Beta: With Taxes	
						Representative Income Tax Rate			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	
ALLETE	*	0.90	0.10	0.68	0.00	0.32	28.0%	0.64	0.70
Alliant Energy	*	0.85	0.05	0.62	0.01	0.37	28.0%	0.54	0.60
Amer. Elec. Power	*	0.75	0.05	0.56	0.00	0.44	28.0%	0.44	0.50
Amer. States Water	*	0.65	0.05	0.81	0.00	0.19	28.0%	0.54	0.57
Amer. Water Works	*	0.85	0.05	0.65	0.00	0.35	28.0%	0.57	0.62
Ameren Corp.	*	0.80	0.10	0.61	0.00	0.39	28.0%	0.53	0.58
Artesian Res Corp	*	0.75	0.05	0.70	0.00	0.30	28.0%	0.54	0.58
Atmos Energy	*	0.80	0.05	0.70	0.00	0.30	28.0%	0.58	0.63
Avista Corp.	*	0.95	0.10	0.57	0.00	0.43	28.0%	0.59	0.65
Black Hills	*	1.00	0.10	0.50	0.00	0.50	28.0%	0.55	0.63
CMS Energy Corp.	*	0.80	0.10	0.54	0.00	0.46	28.0%	0.47	0.53
California Water	*	0.65	0.05	0.69	0.00	0.31	28.0%	0.46	0.50
CenterPoint Energy	*	1.15	0.08	0.48	0.03	0.49	28.0%	0.59	0.67
Chesapeake Utilities	*	0.80	0.05	0.71	0.00	0.29	28.0%	0.59	0.63
Consol. Edison	*	0.75	0.05	0.55	0.00	0.45	28.0%	0.44	0.49
DTE Energy	*	0.95	0.10	0.57	0.00	0.43	28.0%	0.59	0.65
Dominion Energy	*	0.85	0.10	0.57	0.01	0.42	28.0%	0.53	0.59
Duke Energy	*	0.85	0.06	0.50	0.01	0.49	28.0%	0.46	0.52
Entergy Corp.	*	0.95	0.10	0.47	0.01	0.53	28.0%	0.50	0.56
Essential Utilities	*	0.95	0.05	0.70	0.00	0.30	28.0%	0.68	0.73
Eversource Energy	*	0.95	0.05	0.56	0.00	0.44	28.0%	0.55	0.62
Exelon Corp.	*	0.90	0.05	0.61	0.00	0.39	28.0%	0.57	0.63
Exelon Corp.	*	0.95	0.10	0.49	0.00	0.51	28.0%	0.52	0.59
Global Water Resources Inc	*	0.75	0.05	0.65	0.00	0.35	28.0%	0.50	0.55
Hawaiian Elec.	*	0.80	0.10	0.63	0.01	0.36	28.0%	0.54	0.59
IDACORP Inc.	*	0.85	0.10	0.68	0.00	0.32	28.0%	0.61	0.66
MGE Energy	*	0.75	0.05	0.81	0.00	0.19	28.0%	0.61	0.65
Middlesex Water	*	0.70	0.05	0.79	0.00	0.21	28.0%	0.56	0.59
New Jersey Resources	*	1.00	0.05	0.71	0.00	0.29	28.0%	0.72	0.78
NextEra Energy	*	0.90	0.05	0.68	0.00	0.32	28.0%	0.62	0.68
NiSource Inc.	*	0.85	0.10	0.47	0.02	0.51	28.0%	0.45	0.51
NorthWestern Corp.	*	0.95	0.10	0.59	0.00	0.41	28.0%	0.60	0.67
Northwest Natural	*	0.85	0.10	0.65	0.00	0.35	28.0%	0.58	0.64
OGE Energy	*	1.05	0.08	0.65	0.00	0.35	28.0%	0.71	0.78
ONE Gas Inc.	*	0.80	0.06	0.70	0.00	0.30	28.0%	0.58	0.62
Otter Tail Corp.	*	0.90	0.10	0.71	0.00	0.29	28.0%	0.67	0.72
Pinnacle West Capital	*	0.90	0.05	0.61	0.00	0.39	28.0%	0.57	0.63
Public Serv. Enterprise	*	0.90	0.10	0.63	0.00	0.37	28.0%	0.60	0.66
SJW Group	*	0.80	0.05	0.63	0.00	0.37	28.0%	0.52	0.58
Sempra Energy	*	0.95	0.10	0.55	0.02	0.43	28.0%	0.57	0.63
South Jersey Inds.	*	1.05	0.10	0.54	0.00	0.46	28.0%	0.61	0.69
Southern Co.	*	0.95	0.05	0.52	0.00	0.48	28.0%	0.52	0.59
Southwest Gas	*	0.95	0.10	0.64	0.00	0.36	28.0%	0.64	0.70
Spire Inc.	*	0.85	0.05	0.56	0.01	0.43	28.0%	0.50	0.56
Unitil Corp.	*	0.85	0.10	0.60	0.00	0.40	28.0%	0.55	0.60
WEC Energy Group	*	0.80	0.05	0.66	0.00	0.34	28.0%	0.55	0.60
Xcel Energy Inc.	*	0.80	0.05	0.58	0.00	0.42	28.0%	0.48	0.54
OHRU Sample Average		0.83	0.06	0.66	0.00	0.33	0.28	0.57	0.62
Electric Sample Average		0.90	0.08	0.59	0.00	0.40	0.28	0.56	0.62

Sources and Notes:

- [1]: Workpaper # 1 to Schedule No. BV-10, [1].
- [2]: Workpaper #1 to Schedule No. BV-13, [7].
- [3]: Schedule No. BV-4, [4].
- [4]: Schedule No. BV-4, [5].

- [5]: Schedule No. BV-4, [6].
- [6]: Southern California Edison's Representative Tax Rate.
- [7]: $[1]*[3] + [2]*([4] + [5])$.
- [8]: $\{[1]*[3] + [2]*([4]+[5]*(1-[6]))\} / ([3] + [4] + [5]*(1-[6]))$.

Schedule No. BV-14

Electric and OHRU Samples Average Asset Beta Relevered at Southern California Edison's Proposed Capital Structure

	Asset Beta	Assumed Debt Beta	Southern California Edison's Representative Regulatory % Debt	Southern California Edison's Representative Income Tax Rate	Southern California Edison's Representative Regulatory % Equity	Estimated Equity Beta
	[1]	[2]	[3]	[4]	[5]	[6]
<u>Electric Sample</u>						
Asset Beta Without Taxes	0.56	0.10	48.0%	28.0%	52.0%	0.99
Asset Beta With Taxes	0.62	0.10	48.0%	28.0%	52.0%	0.97
<u>OHRU Sample</u>						
Asset Beta Without Taxes	0.57	0.10	48.0%	28.0%	52.0%	1.00
Asset Beta With Taxes	0.62	0.10	48.0%	28.0%	52.0%	0.96

Sources and Notes:

[1]: Schedule No. BV-13, [7] - [8].

[2]: Villadsen Testimony.

[3]: Provided by Southern California Edison.

[4]: Southern California Edison's Representative Tax Rate.

[5]: Provided by Southern California Edison.

[6]: $[1] + [3]/[5]*([1] - [2])$ without taxes, $[1] + [3]*(1 - [4])/[5]*([1] - [2])$ with taxes.

Schedule No. BV-15

Risk-Positioning Cost of Equity using Hamada-Adjusted Betas

Panel A: Scenario 1 - Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 7.25%

Company	Long-Term Risk-Free Rate	Hamada Adjusted Equity Betas	Long-Term Market Risk	CAPM Cost of Equity	ECAPM (1.5%) Cost of Equity
	[1]	[2]	[3]	[4]	[5]
<u>Electric Sample</u>					
Asset Beta Without Taxes	2.80%	0.99	7.25%	10.0%	10.0%
Asset Beta With Taxes	2.80%	0.97	7.25%	9.8%	9.9%
<u>OHRU Sample</u>					
Asset Beta Without Taxes	2.80%	1.00	7.25%	10.0%	10.0%
Asset Beta With Taxes	2.80%	0.96	7.25%	9.8%	9.8%

Sources and Notes:

[1]: Villadsen Direct Testimony.

[2]: Schedule No. BV-14, [6].

[3]: Villadsen Direct Testimony.

[4]: [1] + ([2] x [3]).

[5]: ([1] + 1.5%) + [2] x ([3] - 1.5%).

Schedule No. BV-15

Risk-Positioning Cost of Equity using Hamada-Adjusted Betas

Panel B: Scenario 2 - Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 8.08%

Company	Long-Term Risk-Free Rate	Hamada Adjusted Equity Betas	Long-Term Market Risk	CAPM Cost of Equity	ECAPM (1.5%) Cost of Equity
	[1]	[2]	[3]	[4]	[5]
<u>Electric Sample</u>					
Asset Beta Without Taxes	2.80%	0.99	8.08%	10.8%	10.8%
Asset Beta With Taxes	2.80%	0.97	8.08%	10.6%	10.7%
<u>OHRU Sample</u>					
Asset Beta Without Taxes	2.80%	1.00	8.08%	10.8%	10.9%
Asset Beta With Taxes	2.80%	0.96	8.08%	10.6%	10.6%

Sources and Notes:

[1]: Villadsen Direct Testimony.

[2]: Schedule No. BV-14, [6].

[3]: Villadsen Direct Testimony.

[4]: [1] + ([2] x [3]).

[5]: ([1] + 1.5%) + [2] x ([3] - 1.5%).

Appendix BV-D, Schedules BV-1 to BV-15

Schedule No. BV-1

Table of Contents

Schedule No. BV-1	Table of Contents
Schedule No. BV-2	See Appendix BV-C, Table No. BV-2
Schedule No. BV-3	See Appendix BV-C, Table No. BV-3
Schedule No. BV-4	See Appendix BV-C, Table No. BV-4
Schedule No. BV-5	See Appendix BV-C, Table No. BV-5
Schedule No. BV-6	DCF Cost of Equity of the Electric and OHRU Samples
Schedule No. BV-7	Overall After-Tax DCF Cost of Capital of the Electric and OHRU Samples
Schedule No. BV-8	DCF Cost of Equity at Southern California Edison's Proposed Capital Structure
Schedule No. BV-9	Risk-Free Rates
Schedule No. BV-10	Risk Positioning Cost of Equity of the Electric and OHRU Samples
Schedule No. BV-11	Overall After-Tax Risk Positioning Cost of Capital of the Electric and OHRU Samples
Schedule No. BV-12	Risk Positioning Cost of Equity at Southern California Edison's Proposed Capital Structure
Schedule No. BV-13	Hamada Adjustment to Obtain Unlevered Asset Beta
Schedule No. BV-14	Electric and OHRU Samples Average Asset Beta Relevered at Southern California Edison's Proposed Capital Structure
Schedule No. BV-15	Risk-Positioning Cost of Equity using Hamada-Adjusted Betas

Schedule No. BV-6

DCF Cost of Equity of the Electric and OHRU Samples

Panel A: Simple DCF Method (Quarterly)

Company	Stock Price	Most Recent Dividend	Quarterly Dividend Yield	Combined Long-Term Growth Rate	Quarterly Growth Rate	DCF Cost of Equity
	[1]	[2]	[3]	[4]	[5]	[6]
ALLETE	\$69.69	\$0.63	0.92%	9.1%	2.2%	13.1%
Alliant Energy	\$57.27	\$0.40	0.71%	5.6%	1.4%	8.6%
Amer. Elec. Power	\$86.14	\$0.74	0.87%	6.3%	1.5%	10.0%
Amer. States Water	\$78.47	\$0.34	0.43%	5.7%	1.4%	7.5%
Amer. Water Works	\$153.39	\$0.60	0.40%	7.6%	1.9%	9.3%
Ameren Corp.	\$84.01	\$0.55	0.67%	7.1%	1.7%	9.9%
Artesian Res Corp	\$40.21	\$0.26	0.66%	4.0%	1.0%	6.7%
Atmos Energy	\$99.40	\$0.63	0.64%	6.9%	1.7%	9.7%
Avista Corp.	\$46.10	\$0.42	0.93%	6.9%	1.7%	10.9%
Black Hills	\$66.26	\$0.57	0.86%	5.0%	1.2%	8.7%
CMS Energy Corp.	\$63.36	\$0.44	0.70%	7.2%	1.8%	10.2%
California Water	\$56.55	\$0.23	0.41%	8.0%	1.9%	9.8%
CenterPoint Energy	\$24.71	\$0.16	0.66%	5.9%	1.4%	8.7%
Chesapeake Utilities	\$117.00	\$0.44	0.38%	6.3%	1.5%	7.9%
Consol. Edison	\$78.36	\$0.78	1.00%	3.5%	0.9%	7.6%
DTE Energy	\$139.97	\$1.09	0.79%	5.3%	1.3%	8.6%
Dominion Energy	\$77.31	\$0.63	0.83%	6.4%	1.6%	9.9%
Duke Energy	\$102.06	\$0.97	0.96%	5.2%	1.3%	9.3%
Entergy Corp.	\$105.99	\$0.95	0.91%	5.9%	1.4%	9.7%
Essential Utilities	\$46.78	\$0.25	0.54%	5.0%	1.2%	7.3%
Eversource Energy	\$83.39	\$0.60	0.73%	6.5%	1.6%	9.6%
Exelon Corp.	\$45.02	\$0.38	0.86%	4.5%	1.1%	8.1%
Global Water Resources I	\$16.73	\$0.02	0.15%	15.0%	3.6%	15.7%
Hawaiian Elec.	\$43.88	\$0.34	0.78%	3.2%	0.8%	6.4%
IDACORP Inc.	\$100.47	\$0.71	0.71%	3.9%	1.0%	6.9%
MGE Energy	\$74.63	\$0.37	0.50%	5.3%	1.3%	7.4%
Middlesex Water	\$81.51	\$0.27	0.34%	3.7%	0.9%	5.1%
New Jersey Resources	\$42.74	\$0.33	0.79%	5.2%	1.3%	8.5%
NextEra Energy	\$73.26	\$0.39	0.54%	7.8%	1.9%	10.1%
NiSource Inc.	\$25.54	\$0.22	0.88%	8.1%	2.0%	11.8%
NorthWestern Corp.	\$64.16	\$0.62	0.98%	4.2%	1.0%	8.3%
Northwest Natural	\$53.84	\$0.48	0.90%	4.4%	1.1%	8.2%
OGE Energy	\$33.86	\$0.40	1.20%	5.4%	1.3%	10.5%
ONE Gas Inc.	\$75.14	\$0.58	0.78%	6.1%	1.5%	9.4%
Otter Tail Corp.	\$47.75	\$0.39	0.83%	8.2%	2.0%	11.7%
Pinnacle West Capital	\$85.69	\$0.83	0.98%	4.5%	1.1%	8.6%
Public Serv. Enterprise	\$62.33	\$0.51	0.83%	3.4%	0.8%	6.8%
SJW Group	\$63.47	\$0.34	0.55%	8.2%	2.0%	10.5%
Sempra Energy	\$136.88	\$1.10	0.82%	6.4%	1.6%	9.9%
South Jersey Inds.	\$25.93	\$0.30	1.19%	7.7%	1.9%	12.9%
Southern Co.	\$64.54	\$0.66	1.04%	6.1%	1.5%	10.5%
Southwest Gas	\$68.07	\$0.60	0.89%	6.8%	1.7%	10.6%
Spire Inc.	\$73.75	\$0.65	0.89%	4.9%	1.2%	8.6%
Unitil Corp.	\$55.36	\$0.38	0.69%	3.8%	0.9%	6.7%
WEC Energy Group	\$95.42	\$0.68	0.72%	6.4%	1.6%	9.5%
Xcel Energy Inc.	\$71.17	\$0.46	0.65%	6.2%	1.5%	8.9%

Sources and Notes:

[1]: Workpaper #1 to Schedule No. BV-6.

[2]: Workpaper #2 to Schedule No. BV-6.

[3]: $([2] / [1]) \times (1 + [5])$.

[4]: Schedule No. BV-5, [6].

[5]: $\{(1 + [4])^{(1/4)}\} - 1$.

[6]: $\{([3] + [5] + 1)^{4}\} - 1$.

Schedule No. BV-6

DCF Cost of Equity of the Electric and OHRU Samples

Panel B: Multi-Stage DCF (Using Blue Chip Long-Term GDP Growth Forecast as the Perpetual Rate)

Company	Stock Price	Most Recent Dividend	Combined Long-Term Growth Rate	Growth Rate: Year 6	Growth Rate: Year 7	Growth Rate: Year 8	Growth Rate: Year 9	Growth Rate: Year 10	GDP Long-Term Growth Rate	DCF Cost of Equity
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
ALLETE	\$69.69	\$0.63	9.1%	8.3%	7.4%	6.5%	5.6%	4.8%	3.9%	9.1%
Alliant Energy	\$57.27	\$0.40	5.6%	5.3%	5.0%	4.7%	4.5%	4.2%	3.9%	7.2%
Amer. Elec. Power	\$86.14	\$0.74	6.3%	5.9%	5.5%	5.1%	4.7%	4.3%	3.9%	8.1%
Amer. States Water	\$78.47	\$0.34	5.7%	5.4%	5.1%	4.8%	4.5%	4.2%	3.9%	5.9%
Amer. Water Works	\$153.39	\$0.60	7.6%	7.0%	6.4%	5.8%	5.1%	4.5%	3.9%	6.0%
Ameren Corp.	\$84.01	\$0.55	7.1%	6.5%	6.0%	5.5%	5.0%	4.4%	3.9%	7.3%
Artesian Res Corp	\$40.21	\$0.26	4.0%	4.0%	4.0%	4.0%	3.9%	3.9%	3.9%	6.6%
Atmos Energy	\$99.40	\$0.63	6.9%	6.4%	5.9%	5.4%	4.9%	4.4%	3.9%	7.1%
Avista Corp.	\$46.10	\$0.42	6.9%	6.4%	5.9%	5.4%	4.9%	4.4%	3.9%	8.6%
Black Hills	\$66.26	\$0.57	5.0%	4.8%	4.7%	4.5%	4.3%	4.1%	3.9%	7.8%
CMS Energy Corp.	\$63.36	\$0.44	7.2%	6.7%	6.1%	5.6%	5.0%	4.5%	3.9%	7.5%
California Water	\$56.55	\$0.23	8.0%	7.3%	6.6%	6.0%	5.3%	4.6%	3.9%	6.1%
CenterPoint Energy	\$24.71	\$0.16	5.9%	5.6%	5.2%	4.9%	4.6%	4.2%	3.9%	7.0%
Chesapeake Utilities	\$117.00	\$0.44	6.3%	5.9%	5.5%	5.1%	4.7%	4.3%	3.9%	5.7%
Consol. Edison	\$78.36	\$0.78	3.5%	3.5%	3.6%	3.7%	3.8%	3.8%	3.9%	8.0%
DTE Energy	\$139.97	\$1.09	5.3%	5.1%	4.8%	4.6%	4.4%	4.1%	3.9%	7.5%
Dominion Energy	\$77.31	\$0.63	6.4%	6.0%	5.5%	5.1%	4.7%	4.3%	3.9%	7.9%
Duke Energy	\$102.06	\$0.97	5.2%	5.0%	4.8%	4.6%	4.3%	4.1%	3.9%	8.2%
Entergy Corp.	\$105.99	\$0.95	5.9%	5.5%	5.2%	4.9%	4.6%	4.2%	3.9%	8.2%
Essential Utilities	\$46.78	\$0.25	5.0%	4.8%	4.6%	4.4%	4.3%	4.1%	3.9%	6.3%
Eversource Energy	\$83.39	\$0.60	6.5%	6.0%	5.6%	5.2%	4.8%	4.3%	3.9%	7.5%
Exelon Corp.	\$45.02	\$0.38	4.5%	4.4%	4.3%	4.2%	4.1%	4.0%	3.9%	7.6%
Global Water Resources Inc	\$16.73	\$0.02	15.0%	13.2%	11.3%	9.5%	7.6%	5.8%	3.9%	5.2%
Hawaiian Elec.	\$43.88	\$0.34	3.2%	3.3%	3.4%	3.5%	3.7%	3.8%	3.9%	7.0%
IDACORP Inc.	\$100.47	\$0.71	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	3.9%	6.9%
MGE Energy	\$74.63	\$0.37	5.3%	5.1%	4.8%	4.6%	4.4%	4.1%	3.9%	6.2%
Middlesex Water	\$81.51	\$0.27	3.7%	3.7%	3.8%	3.8%	3.8%	3.9%	3.9%	5.3%
New Jersey Resources	\$42.74	\$0.33	5.2%	5.0%	4.8%	4.5%	4.3%	4.1%	3.9%	7.5%
NextEra Energy	\$73.26	\$0.39	7.8%	7.2%	6.5%	5.9%	5.2%	4.6%	3.9%	6.7%
NiSource Inc.	\$25.54	\$0.22	8.1%	7.4%	6.7%	6.0%	5.3%	4.6%	3.9%	8.6%
NorthWestern Corp.	\$64.16	\$0.62	4.2%	4.1%	4.1%	4.0%	4.0%	3.9%	3.9%	8.1%
Northwest Natural	\$53.84	\$0.48	4.4%	4.3%	4.2%	4.2%	4.1%	4.0%	3.9%	7.8%
OGE Energy	\$33.86	\$0.40	5.4%	5.1%	4.9%	4.6%	4.4%	4.1%	3.9%	9.4%
ONE Gas Inc.	\$75.14	\$0.58	6.1%	5.7%	5.3%	5.0%	4.6%	4.3%	3.9%	7.6%
Otter Tail Corp.	\$47.75	\$0.39	8.2%	7.4%	6.7%	6.0%	5.3%	4.6%	3.9%	8.4%
Pinnacle West Capital	\$85.69	\$0.83	4.5%	4.4%	4.3%	4.2%	4.1%	4.0%	3.9%	8.1%
Public Serv. Enterprise	\$62.33	\$0.51	3.4%	3.5%	3.6%	3.7%	3.7%	3.8%	3.9%	7.2%
SJW Group	\$63.47	\$0.34	8.2%	7.5%	6.8%	6.0%	5.3%	4.6%	3.9%	6.9%
Sempra Energy	\$136.88	\$1.10	6.4%	6.0%	5.6%	5.2%	4.7%	4.3%	3.9%	7.9%
South Jersey Inds.	\$25.93	\$0.30	7.7%	7.1%	6.5%	5.8%	5.2%	4.5%	3.9%	10.1%
Southern Co.	\$64.54	\$0.66	6.1%	5.7%	5.4%	5.0%	4.6%	4.3%	3.9%	8.8%
Southwest Gas	\$68.07	\$0.60	6.8%	6.3%	5.8%	5.4%	4.9%	4.4%	3.9%	8.3%
Spire Inc.	\$73.75	\$0.65	4.9%	4.7%	4.5%	4.4%	4.2%	4.1%	3.9%	7.8%
Unitil Corp.	\$55.36	\$0.38	3.8%	3.8%	3.8%	3.9%	3.9%	3.9%	3.9%	6.8%
WEC Energy Group	\$95.42	\$0.68	6.4%	6.0%	5.6%	5.2%	4.7%	4.3%	3.9%	7.4%
Xcel Energy Inc.	\$71.17	\$0.46	6.2%	5.8%	5.4%	5.0%	4.7%	4.3%	3.9%	7.0%

Sources and Notes:

[1]: Workpaper #1 to Schedule No. BV-6.

[2]: Workpaper #2 to Schedule No. BV-6.

[3]: Schedule No. BV-5, [6].

[4]: [3] - (([3] - [9]) / 6).

[5]: [4] - (([3] - [9]) / 6).

[6]: [5] - (([3] - [9]) / 6).

[7]: [6] - (([3] - [9]) / 6).

[8]: [7] - (([3] - [9]) / 6).

[9]: BlueChip Economic Indicators, March 2021 This number is assumed to be the perpetual growth rate.

[10]: Workpaper #3 to Schedule No. BV-6.

Schedule No. BV-7

Overall After-Tax DCF Cost of Capital of the Electric and OHRU Samples

Panel A: Simple DCF Method (Quarterly)

Company	1st Quarter, 2021	1st Quarter, 2021	DCF Cost of Equity	DCF Common Equity to Market Value Ratio	Cost of Preferred Equity	DCF Preferred Equity to Market Value Ratio	DCF Cost of Debt	DCF Debt to Market Value Ratio	California	Overall Weighted
	S&P Bond Rating	Preferred Equity Rating							Edison's Representative Income Tax Rate	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
ALLETE	BBB	-	13.1%	0.61	-	0.00	3.5%	0.39	28.0%	9.0%
Alliant Energy	A	A	8.6%	0.62	3.2%	0.01	3.2%	0.37	28.0%	6.2%
Amer. Elec. Power	A	-	10.0%	0.50	-	0.00	3.2%	0.50	28.0%	6.2%
Amer. States Water	A	-	7.5%	0.81	-	0.00	3.2%	0.19	28.0%	6.5%
Amer. Water Works	A	-	9.3%	0.69	-	0.00	3.2%	0.31	28.0%	7.2%
Ameren Corp.	BBB	-	9.9%	0.60	-	0.00	3.5%	0.40	28.0%	7.0%
Artesian Res Corp	A	-	6.7%	0.66	-	0.00	3.2%	0.34	28.0%	5.2%
Atmos Energy	A	-	9.7%	0.61	-	0.00	3.2%	0.39	28.0%	6.8%
Avista Corp.	BBB	-	10.9%	0.55	-	0.00	3.5%	0.45	28.0%	7.2%
Black Hills	BBB	-	8.7%	0.46	-	0.00	3.5%	0.54	28.0%	5.4%
CMS Energy Corp.	BBB	-	10.2%	0.51	-	0.00	3.5%	0.49	28.0%	6.5%
California Water	A	-	9.8%	0.69	-	0.00	3.2%	0.31	28.0%	7.5%
CenterPoint Energy	BBB	BBB	8.7%	0.41	3.5%	0.07	3.5%	0.52	28.0%	5.1%
Chesapeake Utilities	A	-	7.9%	0.74	-	0.00	3.2%	0.26	28.0%	6.5%
Consol. Edison	A	-	7.6%	0.49	-	0.00	3.2%	0.51	28.0%	4.9%
DTE Energy	BBB	-	8.6%	0.59	-	0.00	3.5%	0.41	28.0%	6.1%
Dominion Energy	BBB	BBB	9.9%	0.57	3.5%	0.02	3.5%	0.41	28.0%	6.8%
Duke Energy	BBB	BBB	9.3%	0.51	3.5%	0.01	3.5%	0.48	28.0%	6.0%
Entergy Corp.	BBB	BBB	9.7%	0.44	3.5%	0.01	3.5%	0.56	28.0%	5.7%
Essential Utilities	A	-	7.3%	0.64	-	0.00	3.2%	0.36	28.0%	5.5%
Eversource Energy	A	A	9.5%	0.54	-	0.00	3.2%	0.46	28.0%	6.2%
Exelon Corp.	BBB	-	9.6%	0.59	3.2%	0.00	3.2%	0.40	28.0%	6.6%
Global Water Resources Inc	BBB	-	8.1%	0.49	-	0.00	3.5%	0.51	28.0%	5.2%
Hawaiian Elec.	A	-	15.7%	0.74	-	0.00	3.2%	0.26	28.0%	12.3%
IDACORP Inc.	BBB	BBB	6.4%	0.61	3.5%	0.00	3.5%	0.38	28.0%	4.9%
MGE Energy	BBB	-	6.9%	0.67	-	0.00	3.5%	0.33	28.0%	5.5%
Middlesex Water	AA	-	7.4%	0.81	-	0.00	3.1%	0.19	28.0%	6.4%
New Jersey Resources	A	A	5.1%	0.82	3.2%	0.00	3.2%	0.18	28.0%	4.6%
NextEra Energy	A	-	8.5%	0.60	-	0.00	3.2%	0.40	28.0%	6.0%
NiSource Inc.	A	-	10.1%	0.71	-	0.00	3.2%	0.29	28.0%	7.9%
NorthWestern Corp.	BBB	BBB	11.8%	0.45	3.5%	0.04	3.5%	0.51	28.0%	6.7%
Northwest Natural	BBB	-	8.3%	0.55	-	0.00	3.5%	0.45	28.0%	5.7%
OGE Energy	BBB	-	8.2%	0.54	-	0.00	3.5%	0.46	28.0%	5.6%
ONE Gas Inc.	BBB	-	10.5%	0.55	-	0.00	3.5%	0.45	28.0%	6.9%
Otter Tail Corp.	BBB	-	9.4%	0.47	-	0.00	3.5%	0.53	28.0%	5.7%
Pinnacle West Capital	BBB	-	11.7%	0.68	-	0.00	3.5%	0.32	28.0%	8.8%
Public Serv. Enterprise	A	-	8.6%	0.54	-	0.00	3.2%	0.46	28.0%	5.7%
SJW Group	BBB	-	6.8%	0.61	-	0.00	3.5%	0.39	28.0%	5.2%
Sempra Energy	A	-	10.5%	0.52	-	0.00	3.2%	0.48	28.0%	6.6%
South Jersey Inds.	BBB	BBB	9.9%	0.59	3.5%	0.02	3.5%	0.39	28.0%	6.9%
Southern Co.	BBB	-	12.9%	0.43	-	0.00	3.5%	0.57	28.0%	7.0%
Southwest Gas	A	A	10.5%	0.53	3.2%	0.00	3.2%	0.47	28.0%	6.7%
Spire Inc.	BBB	-	10.6%	0.64	-	0.00	3.5%	0.36	28.0%	7.7%
Unitil Corp.	A	A	8.6%	0.49	3.2%	0.03	3.2%	0.47	28.0%	5.5%
WEC Energy Group	BBB	BBB	6.7%	0.57	3.5%	0.00	3.5%	0.43	28.0%	4.9%
Xcel Energy Inc.	A	A	9.5%	0.66	3.2%	0.00	3.2%	0.34	28.0%	7.0%
Simple OHRU Sample Average	A	-	8.9%	0.58	-	0.00	3.2%	0.42	28.0%	6.2%
Simple Electric Sample Average			9.4%	0.62	3.3%	0.00	3.3%	0.38	28.0%	6.6%
			9.3%	0.57	3.4%	0.01	3.4%	0.42	28.0%	6.4%

Sources and Notes:

- [1]: Bloomberg as of May 31, 2021.
- [2]: Preferred ratings were assumed equal to debt rating;
- [3]: Schedule No. BV-6; Panel A, [6].
- [4]: Schedule No. BV-4, [1].
- [5]: Workpaper #2 to Schedule No. BV-11, Panel C.
- [6]: Schedule No. BV-4, [2].
- [7]: Workpaper #2 to Schedule No. BV-11, Panel B.
- [8]: Schedule No. BV-4, [3].
- [9]: Provided by Southern California Edison.
- [10]: $([3] \times [4]) + ([5] \times [6]) + ([7] \times [8]) \times (1 - [9])$. A strikethrough indicates the utility was excluded from the full sample average calculation as a result of its cost of equity not exceeding its cost of debt by 150 basis points

Schedule No. BV-7

Overall After-Tax DCF Cost of Capital of the Electric and OHRU Samples

Panel B: Multi-Stage DCF (Using Blue Chip Long-Term GDP Growth Forecast as the Perpetual Rate)

Company	1st Quarter, 2021 S&P Bond Rating	1st Quarter, 2021 Preferred Equity Rating	DCF Cost of Equity	DCF Common Equity to Market Value Ratio	Cost of Preferred Equity	DCF Preferred Equity to Market Value Ratio	DCF Cost of Debt	DCF Debt to Market Value Ratio	California Edison's Representative Income Tax Rate	Overall Weighted After-Tax Cost of Capital
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
ALLETE	BBB	-	9.1%	0.61	-	0.00	3.5%	0.39	28.0%	6.6%
Alliant Energy	A	A	7.2%	0.62	3.2%	0.01	3.2%	0.37	28.0%	5.4%
Amer. Elec. Power	A	-	8.1%	0.50	-	0.00	3.2%	0.50	28.0%	5.2%
Amer. States Water	A	-	5.9%	0.81	-	0.00	3.2%	0.19	28.0%	5.2%
Amer. Water Works	A	-	6.0%	0.69	-	0.00	3.2%	0.31	28.0%	4.9%
Ameren Corp.	BBB	-	7.3%	0.60	-	0.00	3.5%	0.40	28.0%	5.4%
Artesian Res Corp	A	-	6.6%	0.66	-	0.00	3.2%	0.34	28.0%	5.2%
Atmos Energy	A	-	7.1%	0.61	-	0.00	3.2%	0.39	28.0%	5.2%
Avista Corp.	BBB	-	8.6%	0.55	-	0.00	3.5%	0.45	28.0%	5.9%
Black Hills	BBB	-	7.8%	0.46	-	0.00	3.5%	0.54	28.0%	4.9%
CMS Energy Corp.	BBB	-	7.5%	0.51	-	0.00	3.5%	0.49	28.0%	5.1%
California Water	A	-	6.1%	0.69	-	0.00	3.2%	0.31	28.0%	5.0%
CenterPoint Energy	BBB	BBB	7.0%	0.41	3.5%	0.07	3.5%	0.52	28.0%	4.4%
Chesapeake Utilities	A	-	5.7%	0.74	-	0.00	3.2%	0.26	28.0%	4.9%
Consol. Edison	A	-	8.0%	0.49	-	0.00	3.2%	0.51	28.0%	5.1%
DTE Energy	BBB	-	7.5%	0.59	-	0.00	3.5%	0.41	28.0%	5.4%
Dominion Energy	BBB	BBB	7.9%	0.57	3.5%	0.02	3.5%	0.41	28.0%	5.6%
Duke Energy	BBB	BBB	8.2%	0.51	3.5%	0.01	3.5%	0.48	28.0%	5.4%
Energys Corp.	BBB	BBB	8.2%	0.44	3.5%	0.01	3.5%	0.56	28.0%	5.0%
Essential Utilities	A	-	6.3%	0.64	-	0.00	3.2%	0.36	28.0%	4.9%
Eversource Energy	A	A	8.0%	0.54	-	0.00	3.2%	0.46	28.0%	5.4%
Exelon Corp.	BBB	-	7.5%	0.59	3.2%	0.00	3.2%	0.40	28.0%	5.4%
Global Water Resources Inc	BBB	-	7.6%	0.49	-	0.00	3.5%	0.51	28.0%	5.0%
Hawaiian Elec.	A	-	5.2%	0.74	-	0.00	3.2%	0.26	28.0%	4.4%
Hawaiian Elec.	BBB	BBB	7.0%	0.61	3.5%	0.00	3.5%	0.38	28.0%	5.3%
IDACORP Inc.	BBB	-	6.9%	0.67	-	0.00	3.5%	0.33	28.0%	5.4%
MGE Energy	AA	-	6.2%	0.81	-	0.00	3.1%	0.19	28.0%	5.4%
Middlesex Water	A	A	5.3%	0.82	3.2%	0.00	3.2%	0.18	28.0%	4.7%
New Jersey Resources	A	-	7.5%	0.60	-	0.00	3.2%	0.40	28.0%	5.4%
NextEra Energy	A	-	6.7%	0.71	-	0.00	3.2%	0.29	28.0%	5.5%
NiSource Inc.	BBB	BBB	8.6%	0.45	3.5%	0.04	3.5%	0.51	28.0%	5.3%
NorthWestern Corp.	BBB	-	8.1%	0.55	-	0.00	3.5%	0.45	28.0%	5.6%
Northwest Natural	BBB	-	7.8%	0.54	-	0.00	3.5%	0.46	28.0%	5.4%
OGE Energy	BBB	-	9.4%	0.55	-	0.00	3.5%	0.45	28.0%	6.3%
ONE Gas Inc.	BBB	-	7.6%	0.47	-	0.00	3.5%	0.53	28.0%	4.9%
Otter Tail Corp.	BBB	-	8.4%	0.68	-	0.00	3.5%	0.32	28.0%	6.5%
Pinnacle West Capital	A	-	8.1%	0.54	-	0.00	3.2%	0.46	28.0%	5.5%
Public Serv. Enterprise	BBB	-	7.2%	0.61	-	0.00	3.5%	0.39	28.0%	5.4%
SJW Group	A	-	6.9%	0.52	-	0.00	3.2%	0.48	28.0%	4.7%
Sempra Energy	BBB	BBB	7.9%	0.59	3.5%	0.02	3.5%	0.39	28.0%	5.7%
South Jersey Inds.	BBB	-	10.1%	0.43	-	0.00	3.5%	0.57	28.0%	5.8%
Southern Co.	A	A	8.8%	0.53	3.2%	0.00	3.2%	0.47	28.0%	5.8%
Southwest Gas	BBB	-	8.3%	0.64	-	0.00	3.5%	0.36	28.0%	6.3%
Spire Inc.	A	A	7.8%	0.49	3.2%	0.03	3.2%	0.47	28.0%	5.1%
Unitil Corp.	BBB	BBB	6.8%	0.57	3.5%	0.00	3.5%	0.43	28.0%	4.9%
WEC Energy Group	A	A	7.4%	0.66	3.2%	0.00	3.2%	0.34	28.0%	5.7%
Xcel Energy Inc.	A	-	7.0%	0.58	-	0.00	3.2%	0.42	28.0%	5.1%
Multi-Stage OHRU Sample Average			7.0%	0.62	3.3%	0.00	3.3%	0.38	28.0%	5.1%
Multi-Stage Electric Sample Average			7.7%	0.57	3.4%	0.01	3.4%	0.42	28.0%	5.5%

Sources and Notes:

- [1]: Bloomberg as of May 31, 2021. [6]: Schedule No. BV-4, [2].
 [2]: Preferred ratings were assumed equal to debt rating; [7]: Workpaper #2 to Schedule No. BV-11, Panel B.
 [3]: Schedule No. BV-6, Panel B, [10]. [8]: Schedule No. BV-4, [3].
 [4]: Schedule No. BV-4, [1]. [9]: Provided by Southern California Edison.
 [5]: Workpaper #2 to Schedule No. BV-11, Panel C. [10]: $([3] \times [4]) + ([5] \times [6]) + ([7] \times [8] \times (1 - [9]))$. A strikethrough indicates the utility was excluded from the full sample average calculation as a result of its cost of equity not exceeding its cost of debt by 150 basis points

Schedule No. BV-8

DCF Cost of Equity at Southern California Edison's Proposed Capital Structure

Electric and OHRU Samples

	Overall After - Tax Cost of Capital	Southern California Edison's Representative Regulatory % Debt	Representative Cost of BBB Rated Utility Debt	Southern California Edison's Representative Income Tax Rate	Southern California Edison's Regulatory % Preferred Equity	Southern California Edison's Cost of Preferred Equity	Southern California Edison's Representative Regulatory % Equity	Estimated Return on Equity
	[1]	[2]	[3]	[4]			[5]	[6]
Electric Sample								
Simple DCF Quarterly	6.4%	49.4%	3.5%	28.0%	0.0%	3.5%	50.6%	10.1%
Multi-Stage DCF - Using the Blue Chip Economic Indicator Long-Term GDP Growth Forecast as the Perpetual Rate	5.5%	49.4%	3.5%	28.0%	0.0%	3.5%	50.6%	8.4%
OHRU Sample								
Simple DCF Quarterly	6.6%	49.4%	3.5%	28.0%	0.0%	3.5%	50.6%	10.6%
Multi-Stage DCF - Using the Blue Chip Economic Indicator Long-Term GDP Growth Forecast as the Perpetual Rate	5.1%	49.4%	3.5%	28.0%	0.0%	3.5%	50.6%	7.7%

Sources and Notes:

[1]: Schedule No. BV-7; Panels A-B, [10].

[2]: Provided by Southern California Edison.

[3]: Based on a BBB rating. Yield from Bloomberg as of May 31, 2021.

[4]: Provided by Southern California Edison.

[5]: Provided by Southern California Edison.

[6]: $\{ [1] - ([2] \times [3] \times (1 - [4])) \} / [5]$.

Schedule No. BV-9 Risk-Free Rates

BCEI Forecast of 10 year U.S. Treasury Yield	[a]	2.30%
Long-run Average of 20 year U.S. Treasury Yield	[b]	4.63%
Long-run Average of 10 year U.S. Treasury Yield	[c]	4.13%
Maturity Premium	[d] = [b] - [c]	0.50%
Base Projection of 20 year U.S. Treasury Yield	[e] = [a] + [d]	2.80%

Sources and Notes:

[a]: Blue Chip Economic Indicators, based on March and May 2021 Publication. Midpoint of 2022-2024 forecasts.

[b], [c]: Bloomberg as of 5/31/2021, see Workpaper #1 to Schedule No. BV-9.

Schedule No. BV-10

Risk Positioning Cost of Equity of the Electric and OHRU Samples (Using Value Line Betas)

Panel A: Scenario 1 - Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 7.25%

Company	Long-Term	Value Line Betas	Long-Term Market	CAPM Cost of Equity	ECAPM (1.5%) Cost
	Risk-Free Rate		Risk Premium		of Equity
	[1]	[2]	[3]	[4]	[5]
ALLETE	2.80%	0.90	7.25%	9.3%	9.5%
Alliant Energy	2.80%	0.85	7.25%	9.0%	9.2%
Amer. Elec. Power	2.80%	0.75	7.25%	8.2%	8.6%
Amer. States Water	2.80%	0.65	7.25%	7.5%	8.0%
Amer. Water Works	2.80%	0.85	7.25%	9.0%	9.2%
Ameren Corp.	2.80%	0.80	7.25%	8.6%	8.9%
Artesian Res Corp	2.80%	0.75	7.25%	8.2%	8.6%
Atmos Energy	2.80%	0.80	7.25%	8.6%	8.9%
Avista Corp.	2.80%	0.95	7.25%	9.7%	9.8%
Black Hills	2.80%	1.00	7.25%	10.1%	10.1%
CMS Energy Corp.	2.80%	0.80	7.25%	8.6%	8.9%
California Water	2.80%	0.65	7.25%	7.5%	8.0%
CenterPoint Energy	2.80%	1.15	7.25%	11.1%	10.9%
Chesapeake Utilities	2.80%	0.80	7.25%	8.6%	8.9%
Consol. Edison	2.80%	0.75	7.25%	8.2%	8.6%
DTE Energy	2.80%	0.95	7.25%	9.7%	9.8%
Dominion Energy	2.80%	0.85	7.25%	9.0%	9.2%
Duke Energy	2.80%	0.85	7.25%	9.0%	9.2%
Entergy Corp.	2.80%	0.95	7.25%	9.7%	9.8%
Essential Utilities	2.80%	0.95	7.25%	9.7%	9.8%
Evergy Inc.	2.80%	0.95	7.25%	9.7%	9.8%
Eversource Energy	2.80%	0.90	7.25%	9.3%	9.5%
Exelon Corp.	2.80%	0.95	7.25%	9.7%	9.8%
Global Water Resources Inc	2.80%	0.75	7.25%	8.2%	8.6%
Hawaiian Elec.	2.80%	0.80	7.25%	8.6%	8.9%
IDACORP Inc.	2.80%	0.85	7.25%	9.0%	9.2%
MGE Energy	2.80%	0.75	7.25%	8.2%	8.6%
Middlesex Water	2.80%	0.70	7.25%	7.9%	8.3%
New Jersey Resources	2.80%	1.00	7.25%	10.1%	10.1%
NextEra Energy	2.80%	0.90	7.25%	9.3%	9.5%
NiSource Inc.	2.80%	0.85	7.25%	9.0%	9.2%
NorthWestern Corp.	2.80%	0.95	7.25%	9.7%	9.8%
Northwest Natural	2.80%	0.85	7.25%	9.0%	9.2%
OGE Energy	2.80%	1.05	7.25%	10.4%	10.3%
ONE Gas Inc.	2.80%	0.80	7.25%	8.6%	8.9%
Otter Tail Corp.	2.80%	0.90	7.25%	9.3%	9.5%
Pinnacle West Capital	2.80%	0.90	7.25%	9.3%	9.5%
Public Serv. Enterprise	2.80%	0.90	7.25%	9.3%	9.5%
SJW Group	2.80%	0.80	7.25%	8.6%	8.9%
Sempra Energy	2.80%	0.95	7.25%	9.7%	9.8%
South Jersey Inds.	2.80%	1.05	7.25%	10.4%	10.3%
Southern Co.	2.80%	0.95	7.25%	9.7%	9.8%
Southwest Gas	2.80%	0.95	7.25%	9.7%	9.8%
Spire Inc.	2.80%	0.85	7.25%	9.0%	9.2%
Unitil Corp.	2.80%	0.85	7.25%	9.0%	9.2%
WEC Energy Group	2.80%	0.80	7.25%	8.6%	8.9%
Xcel Energy Inc.	2.80%	0.80	7.25%	8.6%	8.9%

Sources and Notes:

[1], [3]: Villadsen Direct Testimony.

[2]: From Valueline Investment Analyzer as of May 31, 2021.

[4]: [1] + ([2] x [3]).

[5]: ([1] + 1.5%) + [2] x ([3] - 1.5%).

Schedule No. BV-10

Risk Positioning Cost of Equity of the Electric and OHRU Samples (Using Value Line Betas)

Panel B: Scenario 2 - Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 8.08%

Company	Long-Term Risk-Free Rate	Value Line Betas	Long-Term Market Risk Premium	CAPM Cost of Equity	ECAPM (1.5%) Cost of Equity
	[1]	[2]	[3]	[4]	[5]
ALLETE	2.80%	0.90	8.08%	10.1%	10.2%
Alliant Energy	2.80%	0.85	8.08%	9.7%	9.9%
Amer. Elec. Power	2.80%	0.75	8.08%	8.9%	9.2%
Amer. States Water	2.80%	0.65	8.08%	8.1%	8.6%
Amer. Water Works	2.80%	0.85	8.08%	9.7%	9.9%
Ameren Corp.	2.80%	0.80	8.08%	9.3%	9.6%
Artesian Res Corp	2.80%	0.75	8.08%	8.9%	9.2%
Atmos Energy	2.80%	0.80	8.08%	9.3%	9.6%
Avista Corp.	2.80%	0.95	8.08%	10.5%	10.6%
Black Hills	2.80%	1.00	8.08%	10.9%	10.9%
CMS Energy Corp.	2.80%	0.80	8.08%	9.3%	9.6%
California Water	2.80%	0.65	8.08%	8.1%	8.6%
CenterPoint Energy	2.80%	1.15	8.08%	12.1%	11.9%
Chesapeake Utilities	2.80%	0.80	8.08%	9.3%	9.6%
Consol. Edison	2.80%	0.75	8.08%	8.9%	9.2%
DTE Energy	2.80%	0.95	8.08%	10.5%	10.6%
Dominion Energy	2.80%	0.85	8.08%	9.7%	9.9%
Duke Energy	2.80%	0.85	8.08%	9.7%	9.9%
Entergy Corp.	2.80%	0.95	8.08%	10.5%	10.6%
Essential Utilities	2.80%	0.95	8.08%	10.5%	10.6%
Evergy Inc.	2.80%	0.95	8.08%	10.5%	10.6%
Eversource Energy	2.80%	0.90	8.08%	10.1%	10.2%
Exelon Corp.	2.80%	0.95	8.08%	10.5%	10.6%
Global Water Resources Inc	2.80%	0.75	8.08%	8.9%	9.2%
Hawaiian Elec.	2.80%	0.80	8.08%	9.3%	9.6%
IDACORP Inc.	2.80%	0.85	8.08%	9.7%	9.9%
MGE Energy	2.80%	0.75	8.08%	8.9%	9.2%
Middlesex Water	2.80%	0.70	8.08%	8.5%	8.9%
New Jersey Resources	2.80%	1.00	8.08%	10.9%	10.9%
NextEra Energy	2.80%	0.90	8.08%	10.1%	10.2%
NiSource Inc.	2.80%	0.85	8.08%	9.7%	9.9%
NorthWestern Corp.	2.80%	0.95	8.08%	10.5%	10.6%
Northwest Natural	2.80%	0.85	8.08%	9.7%	9.9%
OGE Energy	2.80%	1.05	8.08%	11.3%	11.2%
ONE Gas Inc.	2.80%	0.80	8.08%	9.3%	9.6%
Otter Tail Corp.	2.80%	0.90	8.08%	10.1%	10.2%
Pinnacle West Capital	2.80%	0.90	8.08%	10.1%	10.2%
Public Serv. Enterprise	2.80%	0.90	8.08%	10.1%	10.2%
SJW Group	2.80%	0.80	8.08%	9.3%	9.6%
Sempra Energy	2.80%	0.95	8.08%	10.5%	10.6%
South Jersey Inds.	2.80%	1.05	8.08%	11.3%	11.2%
Southern Co.	2.80%	0.95	8.08%	10.5%	10.6%
Southwest Gas	2.80%	0.95	8.08%	10.5%	10.6%
Spire Inc.	2.80%	0.85	8.08%	9.7%	9.9%
Unitil Corp.	2.80%	0.85	8.08%	9.7%	9.9%
WEC Energy Group	2.80%	0.80	8.08%	9.3%	9.6%
Xcel Energy Inc.	2.80%	0.80	8.08%	9.3%	9.6%

Sources and Notes:

[1], [3]: Villadsen Direct Testimony.

[2]: From ValueLine Investment Analyzer as of May 31, 2021.

[4]: [1] + ([2] x [3]).

[5]: ([1] + 1.5%) + [2] x ([3] - 1.5%).

Schedule No. BV-11

Overall After-Tax Risk Positioning Cost of Capital of the Electric and OHRU Samples (Using Value Line Betas)

Panel A: CAPM Cost of Equity Scenario 1 - Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 7.25%

Company	CAPM Cost of Equity	ECAPM (1.5%) Cost of Equity	5-Year Average Common Equity to Market Value Ratio	Weighted - Average Cost of Preferred Equity	5-Year Average Preferred Equity to Market Value Ratio	Weighted- Average Cost of Debt	5-Year Average Debt to Market Value Ratio	Edison's Representative Income Tax Rate	Overall After-Tax Cost of Capital (CAPM)	Overall After-Tax Cost of Capital (ECAPM 1.5%)
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
ALLETE	9.3%	9.5%	0.68	-	0.00	3.5%	0.32	28.0%	7.1%	7.2%
Alliant Energy	9.0%	9.2%	0.62	3.2%	0.01	3.2%	0.37	28.0%	6.4%	6.6%
Amer. Elec. Power	8.2%	8.6%	0.56	-	0.00	3.2%	0.44	28.0%	5.6%	5.9%
Amer. States Water	7.5%	8.0%	0.81	-	0.00	3.2%	0.19	28.0%	6.6%	7.0%
Amer. Water Works	9.0%	9.2%	0.65	-	0.00	3.2%	0.35	28.0%	6.6%	6.8%
Ameren Corp.	8.6%	8.9%	0.61	-	0.00	3.5%	0.39	28.0%	6.3%	6.4%
Artesian Res Corp	8.2%	8.6%	0.70	-	0.00	3.2%	0.30	28.0%	6.4%	6.7%
Atmos Energy	8.6%	8.9%	0.70	-	0.00	3.2%	0.30	28.0%	6.7%	6.9%
Avista Corp.	9.7%	9.8%	0.57	-	0.00	3.5%	0.43	28.0%	6.6%	6.7%
Black Hills	10.1%	10.1%	0.50	-	0.00	3.5%	0.50	28.0%	6.3%	6.3%
CMS Energy Corp.	8.6%	8.9%	0.54	-	0.00	3.5%	0.46	28.0%	5.8%	5.9%
California Water	7.5%	8.0%	0.69	-	0.00	3.2%	0.31	28.0%	5.9%	6.3%
CenterPoint Energy	11.1%	10.9%	0.48	3.5%	0.03	3.4%	0.49	28.0%	6.6%	6.5%
Chesapeake Utilities	8.6%	8.9%	0.71	-	0.00	3.2%	0.29	28.0%	6.8%	7.0%
Consol. Edison	8.2%	8.6%	0.55	-	0.00	3.2%	0.45	28.0%	5.6%	5.8%
DTE Energy	9.7%	9.8%	0.57	-	0.00	3.5%	0.43	28.0%	6.6%	6.7%
Dominion Energy	9.0%	9.2%	0.57	3.5%	0.01	3.5%	0.42	28.0%	6.2%	6.3%
Duke Energy	9.0%	9.2%	0.50	3.3%	0.01	3.3%	0.49	28.0%	5.7%	5.8%
Entergy Corp.	9.7%	9.8%	0.47	3.5%	0.01	3.5%	0.53	28.0%	5.9%	5.9%
Essential Utilities	9.7%	9.8%	0.70	-	0.00	3.2%	0.30	28.0%	7.4%	7.5%
Eversource Energy	9.7%	9.8%	0.56	-	0.00	3.2%	0.44	28.0%	6.4%	6.5%
Eversource Energy	9.3%	9.5%	0.61	3.2%	0.00	3.2%	0.39	28.0%	6.6%	6.7%
Exelon Corp.	9.7%	9.8%	0.49	-	0.00	3.5%	0.51	28.0%	6.1%	6.1%
Global Water Resources Inc	8.2%	8.6%	0.65	-	0.00	3.2%	0.35	28.0%	6.2%	6.4%
Hawaiian Elec.	8.6%	8.9%	0.63	3.5%	0.01	3.5%	0.36	28.0%	6.4%	6.6%
IDACORP Inc.	9.0%	9.2%	0.68	-	0.00	3.5%	0.32	28.0%	6.9%	7.1%
MGE Energy	8.2%	8.6%	0.81	-	0.00	3.1%	0.19	28.0%	7.1%	7.4%
Middlesex Water	7.9%	8.3%	0.79	3.2%	0.00	3.2%	0.21	28.0%	6.7%	7.0%
New Jersey Resources	10.1%	10.1%	0.71	-	0.00	3.2%	0.29	28.0%	7.8%	7.8%
NextEra Energy	9.3%	9.5%	0.68	-	0.00	3.2%	0.32	28.0%	7.1%	7.2%
NiSource Inc.	9.0%	9.2%	0.47	3.5%	0.02	3.5%	0.51	28.0%	5.6%	5.7%
NorthWestern Corp.	9.7%	9.8%	0.59	-	0.00	3.5%	0.41	28.0%	6.7%	6.8%
Northwest Natural	9.0%	9.2%	0.65	-	0.00	3.5%	0.35	28.0%	6.7%	6.8%
OGE Energy	10.4%	10.3%	0.65	-	0.00	3.4%	0.35	28.0%	7.6%	7.6%
ONE Gas Inc.	8.6%	8.9%	0.70	-	0.00	3.3%	0.30	28.0%	6.7%	6.9%
Otter Tail Corp.	9.3%	9.5%	0.71	-	0.00	3.5%	0.29	28.0%	7.3%	7.4%
Pinnacle West Capital	9.3%	9.5%	0.61	-	0.00	3.2%	0.39	28.0%	6.6%	6.7%
Public Serv. Enterprise	9.3%	9.5%	0.63	-	0.00	3.5%	0.37	28.0%	6.8%	6.9%
SJW Group	8.6%	8.9%	0.63	-	0.00	3.2%	0.37	28.0%	6.3%	6.4%
Sempra Energy	9.7%	9.8%	0.55	3.5%	0.02	3.5%	0.43	28.0%	6.5%	6.5%
South Jersey Inds.	10.4%	10.3%	0.54	-	0.00	3.5%	0.46	28.0%	6.8%	6.7%
Southern Co.	9.7%	9.8%	0.52	3.2%	0.00	3.2%	0.48	28.0%	6.1%	6.2%
Southwest Gas	9.7%	9.8%	0.64	-	0.00	3.5%	0.36	28.0%	7.1%	7.1%
Spire Inc.	9.0%	9.2%	0.56	3.2%	0.01	3.2%	0.43	28.0%	6.1%	6.2%
Unitil Corp.	9.0%	9.2%	0.60	3.5%	0.00	3.5%	0.40	28.0%	6.4%	6.5%
WEC Energy Group	8.6%	8.9%	0.66	3.2%	0.00	3.2%	0.34	28.0%	6.5%	6.7%
Xcel Energy Inc.	8.6%	8.9%	0.58	-	0.00	3.2%	0.42	28.0%	6.0%	6.1%
OHRU Sample Average	8.8%	9.1%	66.4%	3.3%	0.2%	3.3%	33.4%	28.0%	6.6%	6.8%
Electric Sample Average	9.3%	9.5%	59.3%	3.4%	0.4%	3.4%	40.3%	28.0%	6.5%	6.6%

Sources and Notes:

[1]: Schedule No. BV-10; Panel A, [4].

[2]: Schedule No. BV-10; Panel A, [5].

[3]: Schedule No. BV-4, [4].

[4]: Workpaper #2 to Schedule No. BV-11, Panel C.

[5]: Schedule No. BV-4, [5].

[6]: Workpaper #2 to Schedule No. BV-11, Panel B.

[7]: Schedule No. BV-4, [6].

[8]: Provided by Southern California Edison.

[9] = [1] x [3] + [4] x [5] + [6] x [7] x (1 - [8])

[10] = [2] x [3] + [4] x [5] + [6] x [7] x (1 - [8])

Schedule No. BV-11

Overall After-Tax Risk Positioning Cost of Capital of the Electric and OHRU Samples (Using Value Line Betas)

Panel B: CAPM Cost of Equity Scenario 2 - Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 8.08%

Company	CAPM Cost of Equity	ECAPM (1.5%) Cost of Equity	5-Year Average Common Equity to Market Value Ratio	Weighted - Average Cost of Preferred Equity	5-Year Average Preferred Equity to Market Value Ratio	Weighted- Average Cost of Debt	5-Year Average Debt to Market Value Ratio	Edison's Representative Income Tax Rate	Overall After-Tax Cost of Capital (CAPM)	Overall After-Tax Cost of Capital (ECAPM 1.5%)
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Company	capm1t	ecapm1t2	capm_equity_ratio	average	capm_pref_ratio	average	capm_debt_ratio		CAPM	ECAPM2
ALLETE	10.1%	10.2%	0.68	-	0.00	3.5%	0.32	28.0%	7.7%	7.8%
Alliant Energy	9.7%	9.9%	0.62	3.2%	0.01	3.2%	0.37	28.0%	6.9%	7.0%
Amer. Elec. Power	8.9%	9.2%	0.56	-	0.00	3.2%	0.44	28.0%	6.0%	6.2%
Amer. States Water	8.1%	8.6%	0.81	-	0.00	3.2%	0.19	28.0%	7.0%	7.4%
Amer. Water Works	9.7%	9.9%	0.65	-	0.00	3.2%	0.35	28.0%	7.1%	7.2%
Ameren Corp.	9.3%	9.6%	0.61	-	0.00	3.5%	0.39	28.0%	6.7%	6.8%
Artesian Res Corp	8.9%	9.2%	0.70	-	0.00	3.2%	0.30	28.0%	6.9%	7.1%
Atmos Energy	9.3%	9.6%	0.70	-	0.00	3.2%	0.30	28.0%	7.2%	7.4%
Avista Corp.	10.5%	10.6%	0.57	-	0.00	3.5%	0.43	28.0%	7.1%	7.1%
Black Hills	10.9%	10.9%	0.50	-	0.00	3.5%	0.50	28.0%	6.7%	6.7%
CMS Energy Corp.	9.3%	9.6%	0.54	-	0.00	3.5%	0.46	28.0%	6.1%	6.3%
California Water	8.1%	8.6%	0.69	-	0.00	3.2%	0.31	28.0%	6.3%	6.6%
CenterPoint Energy	12.1%	11.9%	0.48	3.5%	0.03	3.4%	0.49	28.0%	7.1%	7.0%
Chesapeake Utilities	9.3%	9.6%	0.71	-	0.00	3.2%	0.29	28.0%	7.3%	7.5%
Consol. Edison	8.9%	9.2%	0.55	-	0.00	3.2%	0.45	28.0%	5.9%	6.2%
DTE Energy	10.5%	10.6%	0.57	-	0.00	3.5%	0.43	28.0%	7.1%	7.1%
Dominion Energy	9.7%	9.9%	0.57	3.5%	0.01	3.5%	0.42	28.0%	6.6%	6.7%
Duke Energy	9.7%	9.9%	0.50	3.3%	0.01	3.3%	0.49	28.0%	6.1%	6.2%
Entergy Corp.	10.5%	10.6%	0.47	3.5%	0.01	3.5%	0.53	28.0%	6.2%	6.3%
Essential Utilities	10.5%	10.6%	0.70	-	0.00	3.2%	0.30	28.0%	8.0%	8.0%
Eversource Energy	10.1%	10.2%	0.61	3.2%	0.00	3.2%	0.39	28.0%	7.1%	7.1%
Exelon Corp.	10.5%	10.6%	0.49	-	0.00	3.5%	0.51	28.0%	6.5%	6.5%
Global Water Resources Inc	8.9%	9.2%	0.65	-	0.00	3.2%	0.35	28.0%	6.6%	6.8%
Hawaiian Elec.	9.3%	9.6%	0.63	3.5%	0.01	3.5%	0.36	28.0%	6.8%	7.0%
IDACORP Inc.	9.7%	9.9%	0.68	-	0.00	3.5%	0.32	28.0%	7.4%	7.6%
MGE Energy	8.9%	9.2%	0.81	-	0.00	3.1%	0.19	28.0%	7.6%	7.9%
Middlesex Water	8.5%	8.9%	0.79	3.2%	0.00	3.2%	0.21	28.0%	7.1%	7.5%
New Jersey Resources	10.9%	10.9%	0.71	-	0.00	3.2%	0.29	28.0%	8.4%	8.4%
NextEra Energy	10.1%	10.2%	0.68	-	0.00	3.2%	0.32	28.0%	7.6%	7.7%
NiSource Inc.	9.7%	9.9%	0.47	3.5%	0.02	3.5%	0.51	28.0%	5.9%	6.0%
NorthWestern Corp.	10.5%	10.6%	0.59	-	0.00	3.5%	0.41	28.0%	7.2%	7.2%
Northwest Natural	9.7%	9.9%	0.65	-	0.00	3.5%	0.35	28.0%	7.1%	7.3%
OGE Energy	11.3%	11.2%	0.65	-	0.00	3.4%	0.35	28.0%	8.2%	8.1%
ONE Gas Inc.	9.3%	9.6%	0.70	-	0.00	3.3%	0.30	28.0%	7.2%	7.4%
Otter Tail Corp.	10.1%	10.2%	0.71	-	0.00	3.5%	0.29	28.0%	7.9%	8.0%
Pinnacle West Capital	10.1%	10.2%	0.61	-	0.00	3.2%	0.39	28.0%	7.1%	7.2%
Public Serv. Enterprise	10.1%	10.2%	0.63	-	0.00	3.5%	0.37	28.0%	7.3%	7.3%
SJW Group	9.3%	9.6%	0.63	-	0.00	3.2%	0.37	28.0%	6.7%	6.9%
Sempra Energy	10.5%	10.6%	0.55	3.5%	0.02	3.5%	0.43	28.0%	6.9%	6.9%
South Jersey Inds.	11.3%	11.2%	0.54	-	0.00	3.5%	0.46	28.0%	7.2%	7.2%
Southern Co.	10.5%	10.6%	0.52	3.2%	0.00	3.2%	0.48	28.0%	6.6%	6.6%
Southwest Gas	10.5%	10.6%	0.64	-	0.00	3.5%	0.36	28.0%	7.6%	7.6%
Spire Inc.	9.7%	9.9%	0.56	3.2%	0.01	3.2%	0.43	28.0%	6.5%	6.6%
Unitil Corp.	9.7%	9.9%	0.60	3.5%	0.00	3.5%	0.40	28.0%	6.8%	6.9%
WEC Energy Group	9.3%	9.6%	0.66	3.2%	0.00	3.2%	0.34	28.0%	6.9%	7.1%
Xcel Energy Inc.	9.3%	9.6%	0.58	-	0.00	3.2%	0.42	28.0%	6.3%	6.5%
OHRU Sample Average	9.5%	9.7%	0.66	3.3%	0.00	3.3%	0.33	28.0%	7.1%	7.2%
Electric Sample Average	10.0%	10.2%	0.59	3.4%	0.00	3.4%	0.40	28.0%	6.9%	7.0%

Sources and Notes:

- [1]: Schedule No. BV-10; Panel B, [4].
- [2]: Schedule No. BV-10; Panel B, [5].
- [3]: Schedule No. BV-4, [4].
- [4]: Workpaper #2 to Schedule No. BV-11, Panel C.
- [5]: Schedule No. BV-4, [5].
- [6]: Workpaper #2 to Schedule No. BV-11, Panel B.
- [7]: Schedule No. BV-4, [6].
- [8]: Provided by Southern California Edison.
- [9] = [1] x [3] + [4] x [5] + [6] x [7] x (1 - [8])
- [10] = [2] x [3] + [4] x [5] + [6] x [7] x (1 - [8])

Schedule No. BV-12

Risk Positioning Cost of Equity at Southern California Edison's Proposed Capital Structure

Electric and OHRU Samples

Using Value Line Betas

	Overall After-Tax Cost of Capital (Scenario 1)	Overall After-Tax Cost of Capital (Scenario 2)	Southern California Edison's Representative Regulatory % Debt	Representative Cost of BBB-Rated Utility Debt	Southern California Edison's Representative Income Tax Rate	Southern California Edison's Regulatory % Preferred Equity	Southern California Edison's Cost of Preferred Equity	Southern California Edison's Representative Regulatory % Equity	Estimated Return on Equity (Scenario 1)	Estimated Return on Equity (Scenario 2)
	[1]	[2]	[3]	[4]	[5]			[6]	[7]	[8]
Electric Sample										
CAPM using Value Line Betas	6.5%	6.9%	49.4%	3.5%	28.0%	0.0%	3.5%	50.6%	10.4%	11.2%
ECAPM (1.50%) using Value Line Betas	6.6%	7.0%	49.4%	3.5%	28.0%	0.0%	3.5%	50.6%	10.6%	11.4%
OHRU Sample										
CAPM using Value Line Betas	6.6%	7.1%	49.4%	3.5%	28.0%	0.0%	3.5%	50.6%	10.6%	11.5%
ECAPM (1.50%) using Value Line Betas	6.8%	7.2%	49.4%	3.5%	28.0%	0.0%	3.5%	50.6%	10.9%	11.8%

Sources and Notes:

[1]: Schedule No. BV-11; Panel A, [9] - [10].

[2]: Schedule No. BV-11; Panel B, [9] - [10].

[3]: Provided by Southern California Edison.

[4]: Based on a BBB rating. Yield from Bloomberg as of May 31, 2021.

[5]: Provided by Southern California Edison.

[6]: Provided by Southern California Edison.

[7]: $\{[1] - ([3] \times [4] \times (1 - [5]))\} / [6]$

[8]: $\{[2] - ([3] \times [4] \times (1 - [5]))\} / [6]$

Scenario 1: Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 7.25%.

Scenario 2: Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 8.08%.

Schedule No. BV-13

Hamada Adjustment to Obtain Unlevered Asset Beta

Company	Value Line Betas	Debt Beta	5-Year Average Common Equity to Market Value Ratio	5-Year Average Preferred Equity to Market Value Ratio	5-Year Average Debt to Market Value Ratio	Southern California Edison's	Asset Beta: Without Taxes	Asset Beta: With Taxes	
						Representative Income Tax Rate			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	
ALLETE	*	0.90	0.10	0.68	0.00	0.32	28.0%	0.64	0.70
Alliant Energy	*	0.85	0.05	0.62	0.01	0.37	28.0%	0.54	0.60
Amer. Elec. Power	*	0.75	0.05	0.56	0.00	0.44	28.0%	0.44	0.50
Amer. States Water	*	0.65	0.05	0.81	0.00	0.19	28.0%	0.54	0.57
Amer. Water Works	*	0.85	0.05	0.65	0.00	0.35	28.0%	0.57	0.62
Ameren Corp.	*	0.80	0.10	0.61	0.00	0.39	28.0%	0.53	0.58
Artesian Res Corp	*	0.75	0.05	0.70	0.00	0.30	28.0%	0.54	0.58
Atmos Energy	*	0.80	0.05	0.70	0.00	0.30	28.0%	0.58	0.63
Avista Corp.	*	0.95	0.10	0.57	0.00	0.43	28.0%	0.59	0.65
Black Hills	*	1.00	0.10	0.50	0.00	0.50	28.0%	0.55	0.63
CMS Energy Corp.	*	0.80	0.10	0.54	0.00	0.46	28.0%	0.47	0.53
California Water	*	0.65	0.05	0.69	0.00	0.31	28.0%	0.46	0.50
CenterPoint Energy	*	1.15	0.08	0.48	0.03	0.49	28.0%	0.59	0.67
Chesapeake Utilities	*	0.80	0.05	0.71	0.00	0.29	28.0%	0.59	0.63
Consol. Edison	*	0.75	0.05	0.55	0.00	0.45	28.0%	0.44	0.49
DTE Energy	*	0.95	0.10	0.57	0.00	0.43	28.0%	0.59	0.65
Dominion Energy	*	0.85	0.10	0.57	0.01	0.42	28.0%	0.53	0.59
Duke Energy	*	0.85	0.06	0.50	0.01	0.49	28.0%	0.46	0.52
Entergy Corp.	*	0.95	0.10	0.47	0.01	0.53	28.0%	0.50	0.56
Essential Utilities	*	0.95	0.05	0.70	0.00	0.30	28.0%	0.68	0.73
Eversource Energy	*	0.95	0.05	0.56	0.00	0.44	28.0%	0.55	0.62
Exelon Corp.	*	0.90	0.05	0.61	0.00	0.39	28.0%	0.57	0.63
Exelon Corp.	*	0.95	0.10	0.49	0.00	0.51	28.0%	0.52	0.59
Global Water Resources Inc	*	0.75	0.05	0.65	0.00	0.35	28.0%	0.50	0.55
Hawaiian Elec.	*	0.80	0.10	0.63	0.01	0.36	28.0%	0.54	0.59
IDACORP Inc.	*	0.85	0.10	0.68	0.00	0.32	28.0%	0.61	0.66
MGE Energy	*	0.75	0.05	0.81	0.00	0.19	28.0%	0.61	0.65
Middlesex Water	*	0.70	0.05	0.79	0.00	0.21	28.0%	0.56	0.59
New Jersey Resources	*	1.00	0.05	0.71	0.00	0.29	28.0%	0.72	0.78
NextEra Energy	*	0.90	0.05	0.68	0.00	0.32	28.0%	0.62	0.68
NiSource Inc.	*	0.85	0.10	0.47	0.02	0.51	28.0%	0.45	0.51
NorthWestern Corp.	*	0.95	0.10	0.59	0.00	0.41	28.0%	0.60	0.67
Northwest Natural	*	0.85	0.10	0.65	0.00	0.35	28.0%	0.58	0.64
OGE Energy	*	1.05	0.08	0.65	0.00	0.35	28.0%	0.71	0.78
ONE Gas Inc.	*	0.80	0.06	0.70	0.00	0.30	28.0%	0.58	0.62
Otter Tail Corp.	*	0.90	0.10	0.71	0.00	0.29	28.0%	0.67	0.72
Pinnacle West Capital	*	0.90	0.05	0.61	0.00	0.39	28.0%	0.57	0.63
Public Serv. Enterprise	*	0.90	0.10	0.63	0.00	0.37	28.0%	0.60	0.66
SJW Group	*	0.80	0.05	0.63	0.00	0.37	28.0%	0.52	0.58
Sempra Energy	*	0.95	0.10	0.55	0.02	0.43	28.0%	0.57	0.63
South Jersey Inds.	*	1.05	0.10	0.54	0.00	0.46	28.0%	0.61	0.69
Southern Co.	*	0.95	0.05	0.52	0.00	0.48	28.0%	0.52	0.59
Southwest Gas	*	0.95	0.10	0.64	0.00	0.36	28.0%	0.64	0.70
Spire Inc.	*	0.85	0.05	0.56	0.01	0.43	28.0%	0.50	0.56
Unitil Corp.	*	0.85	0.10	0.60	0.00	0.40	28.0%	0.55	0.60
WEC Energy Group	*	0.80	0.05	0.66	0.00	0.34	28.0%	0.55	0.60
Xcel Energy Inc.	*	0.80	0.05	0.58	0.00	0.42	28.0%	0.48	0.54
OHRU Sample Average		0.83	0.06	0.66	0.00	0.33	0.28	0.57	0.62
Electric Sample Average		0.90	0.08	0.59	0.00	0.40	0.28	0.56	0.62

Sources and Notes:

- [1]: Workpaper # 1 to Schedule No. BV-10, [1].
- [2]: Workpaper #1 to Schedule No. BV-13, [7].
- [3]: Schedule No. BV-4, [4].
- [4]: Schedule No. BV-4, [5].

- [5]: Schedule No. BV-4, [6].
- [6]: Southern California Edison's Representative Tax Rate.
- [7]: $[1]*[3] + [2]*([4] + [5])$.
- [8]: $\{[1]*[3] + [2]*([4]+[5]*(1-[6]))\} / ([3] + [4] + [5]*(1-[6]))$.

Schedule No. BV-14

Electric and OHRU Samples Average Asset Beta Relevered at Southern California Edison's Proposed Capital Structure

	Asset Beta	Assumed Debt Beta	Southern California Edison's Representative Regulatory % Debt	Southern California Edison's Representative Income Tax Rate	Southern California Edison's Representative Regulatory % Equity	Estimated Equity Beta
	[1]	[2]	[3]	[4]	[5]	[6]
<u>Electric Sample</u>						
Asset Beta Without Taxes	0.56	0.10	49.4%	28.0%	50.6%	1.01
Asset Beta With Taxes	0.62	0.10	49.4%	28.0%	50.6%	0.99
<u>OHRU Sample</u>						
Asset Beta Without Taxes	0.57	0.10	49.4%	28.0%	50.6%	1.02
Asset Beta With Taxes	0.62	0.10	49.4%	28.0%	50.6%	0.98

Sources and Notes:

[1]: Schedule No. BV-13, [7] - [8].

[2]: Villadsen Testimony.

[3]: Provided by Southern California Edison.

[4]: Southern California Edison's Representative Tax Rate.

[5]: Provided by Southern California Edison.

[6]: $[1] + [3]/[5]*([1] - [2])$ without taxes, $[1] + [3]*(1 - [4])/[5]*([1] - [2])$ with taxes.

Schedule No. BV-15

Risk-Positioning Cost of Equity using Hamada-Adjusted Betas

Panel A: Scenario 1 - Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 7.25%

Company	Long-Term Risk-Free Rate	Hamada Adjusted Equity Betas	Long-Term Market Risk	CAPM Cost of Equity	ECAPM (1.5%) Cost of Equity
	[1]	[2]	[3]	[4]	[5]
<u>Electric Sample</u>					
Asset Beta Without Taxes	2.80%	1.01	7.25%	10.1%	10.1%
Asset Beta With Taxes	2.80%	0.99	7.25%	10.0%	10.0%
<u>OHRU Sample</u>					
Asset Beta Without Taxes	2.80%	1.02	7.25%	10.2%	10.2%
Asset Beta With Taxes	2.80%	0.98	7.25%	9.9%	9.9%

Sources and Notes:

[1]: Villadsen Direct Testimony.

[2]: Schedule No. BV-14, [6].

[3]: Villadsen Direct Testimony.

[4]: [1] + ([2] x [3]).

[5]: ([1] + 1.5%) + [2] x ([3] - 1.5%).

Schedule No. BV-15

Risk-Positioning Cost of Equity using Hamada-Adjusted Betas

Panel B: Scenario 2 - Long-Term Risk Free Rate of 2.80%, Long-Term Market Risk Premium of 8.08%

Company	Long-Term Risk-Free Rate [1]	Hamada Adjusted Equity Betas [2]	Long-Term Market Risk [3]	CAPM Cost of Equity [4]	ECAPM (1.5%) Cost of Equity [5]
<u>Electric Sample</u>					
Asset Beta Without Taxes	2.80%	1.01	8.08%	11.0%	11.0%
Asset Beta With Taxes	2.80%	0.99	8.08%	10.8%	10.8%
<u>OHRU Sample</u>					
Asset Beta Without Taxes	2.80%	1.02	8.08%	11.1%	11.0%
Asset Beta With Taxes	2.80%	0.98	8.08%	10.7%	10.8%

Sources and Notes:

[1]: Villadsen Direct Testimony.

[2]: Schedule No. BV-14, [6].

[3]: Villadsen Direct Testimony.

[4]: [1] + ([2] x [3]).

[5]: ([1] + 1.5%) + [2] x ([3] - 1.5%).

Appendix BV-E: Implied Risk Premium - All Electric

Implied Risk Premium Model Estimates

	R Squared	Estimate of Intercept (A0)	Estimate of Slope (A1)	Implied Cost of Equity Range
	[1]	[2]	[3]	[4]
Electric Utility	86.1%	8.5%	-55.3%	9.8%

Sources and Notes:

[1]-[3]: Estimated Using S&P Market Intelligence, as of May 2021

[4]: Risk-free rate of 2.8%

Schedule No. BV-16, Panel B
Risk Premiums Determined by Relationship Between
Authorized ROEs^[1] and Long-term Treasury Bond Rates
During the Period 1990 - 2021
Includes Utility Yield Spread Adjustment
Electric Utilities

$$\text{Risk Premium} = A_0 + (A_1 \times \text{Treasury Bond Rate})$$

R Squared	0.861
Estimate of Intercept (A_0)	8.54%
Estimate of Slope (A_1)	-0.553

Predicted Risk Premium 6.99%	+	Exp. Treasury Bond Rate 2.80%	=	Est. Cost of Equity for All Natural Gas Utilities 9.8%
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Sources and Notes:

[1]: Authorized ROE Data from S&P Market Intelligence as of 05/31/2021.

[2]: March 2021 Blue Chip consensus forecast for 2023 10 year T-bill yield + maturity premium between 10 year and 20 year U.S. Government bonds + utility yield spread adjustment.

See Regression Results for derivation of regression coefficients A_0 and A_1

Quarterly Risk Premiums for Electric Utilities

1990 - 2021

Quarter	Average Authorized Return on Equity [1]	20 year Treasury Bond Yield [2]	Risk Premium [3] = [1] - [2]
1990 Q1	12.62%	8.44%	4.19%
1990 Q2	12.85%	8.66%	4.19%
1990 Q3	12.54%	8.75%	3.79%
1990 Q4	12.68%	8.47%	4.21%
1991 Q1	12.66%	8.11%	4.55%
1991 Q2	12.67%	8.23%	4.44%
1991 Q3	12.49%	8.07%	4.43%
1991 Q4	12.42%	7.60%	4.83%
1992 Q1	12.38%	7.55%	4.83%
1992 Q2	11.83%	7.64%	4.18%
1992 Q3	12.03%	7.04%	4.99%
1992 Q4	12.14%	7.14%	5.00%
1993 Q1	11.84%	6.68%	5.15%
1993 Q2	11.64%	6.43%	5.21%
1993 Q3	11.15%	5.97%	5.18%
1993 Q4	11.04%	6.28%	4.76%
1994 Q1	11.07%	6.65%	4.41%
1994 Q2	11.13%	7.48%	3.65%
1994 Q3	12.75%	7.72%	5.03%
1994 Q4	11.24%	8.09%	3.15%
1995 Q1	11.96%	7.76%	4.20%
1995 Q2	11.32%	7.02%	4.30%
1995 Q3	11.37%	6.77%	4.60%
1995 Q4	11.58%	6.30%	5.28%
1996 Q1	11.46%	6.38%	5.08%
1996 Q2	11.46%	7.10%	4.36%
1996 Q3	10.70%	7.09%	3.61%
1996 Q4	11.56%	6.71%	4.85%
1997 Q1	11.08%	6.91%	4.17%
1997 Q2	11.62%	7.02%	4.60%
1997 Q3	12.00%	6.59%	5.41%
1997 Q4	11.06%	6.22%	4.84%
1998 Q1	11.31%	5.95%	5.36%
1998 Q2	12.20%	5.94%	6.26%
1998 Q3	11.65%	5.61%	6.04%
1998 Q4	12.30%	5.38%	6.92%
1999 Q1	10.40%	5.66%	4.74%
1999 Q2	10.94%	6.09%	4.85%
1999 Q3	10.75%	6.40%	4.35%
1999 Q4	11.10%	6.61%	4.49%
2000 Q1	11.21%	6.59%	4.62%
2000 Q2	11.00%	6.34%	4.66%
2000 Q3	11.68%	6.10%	5.58%
2000 Q4	12.50%	5.89%	6.61%
2001 Q1	11.38%	5.59%	5.79%
2001 Q2	10.88%	5.84%	5.04%
2001 Q3	10.76%	5.62%	5.14%

Quarterly Risk Premiums for Electric Utilities

1990 - 2021

Quarter	Average Authorized Return on Equity [1]	20 year Treasury Bond Yield [2]	Risk Premium [3] = [1] - [2]
2001 Q4	11.57%	5.48%	6.09%
2002 Q1	10.05%	5.74%	4.31%
2002 Q2	11.41%	5.77%	5.64%
2002 Q3	11.25%	5.19%	6.06%
2002 Q4	11.57%	5.02%	6.55%
2003 Q1	11.43%	4.90%	6.52%
2003 Q2	11.16%	4.59%	6.57%
2003 Q3	9.88%	5.17%	4.70%
2003 Q4	11.09%	5.16%	5.93%
2004 Q1	11.00%	4.89%	6.11%
2004 Q2	10.64%	5.36%	5.28%
2004 Q3	10.75%	5.07%	5.68%
2004 Q4	10.91%	4.87%	6.04%
2005 Q1	10.56%	4.76%	5.80%
2005 Q2	10.13%	4.55%	5.57%
2005 Q3	10.85%	4.51%	6.34%
2005 Q4	10.59%	4.77%	5.83%
2006 Q1	10.38%	4.76%	5.62%
2006 Q2	10.63%	5.29%	5.34%
2006 Q3	10.06%	5.09%	4.98%
2006 Q4	10.39%	4.83%	5.55%
2007 Q1	10.39%	4.90%	5.49%
2007 Q2	10.27%	5.07%	5.19%
2007 Q3	10.02%	5.01%	5.01%
2007 Q4	10.39%	4.65%	5.74%
2008 Q1	10.15%	4.40%	5.75%
2008 Q2	10.54%	4.59%	5.94%
2008 Q3	10.38%	4.49%	5.89%
2008 Q4	10.39%	3.97%	6.42%
2009 Q1	10.45%	3.69%	6.76%
2009 Q2	10.58%	4.19%	6.39%
2009 Q3	10.41%	4.28%	6.12%
2009 Q4	10.54%	4.27%	6.28%
2010 Q1	10.45%	4.49%	5.96%
2010 Q2	10.08%	4.20%	5.88%
2010 Q3	10.29%	3.60%	6.69%
2010 Q4	10.34%	3.84%	6.50%
2011 Q1	9.96%	4.32%	5.64%
2011 Q2	10.12%	4.07%	6.05%
2011 Q3	10.36%	3.34%	7.02%
2011 Q4	10.34%	2.75%	7.59%
2012 Q1	10.30%	2.80%	7.51%
2012 Q2	9.92%	2.55%	7.36%
2012 Q3	9.78%	2.37%	7.41%
2012 Q4	10.05%	2.46%	7.59%
2013 Q1	9.74%	2.75%	6.99%
2013 Q2	9.84%	2.78%	7.06%

Quarterly Risk Premiums for Electric Utilities

1990 - 2021

Quarter	Average Authorized Return on Equity [1]	20 year Treasury Bond Yield [2]	Risk Premium [3] = [1] - [2]
2013 Q3	9.83%	3.44%	6.39%
2013 Q4	9.82%	3.50%	6.32%
2014 Q1	9.57%	3.42%	6.16%
2014 Q2	9.83%	3.18%	6.65%
2014 Q3	9.77%	3.01%	6.76%
2014 Q4	9.78%	2.69%	7.08%
2015 Q1	9.66%	2.32%	7.34%
2015 Q2	9.51%	2.62%	6.89%
2015 Q3	9.47%	2.65%	6.82%
2015 Q4	9.65%	2.60%	7.05%
2016 Q1	9.70%	2.32%	7.38%
2016 Q2	9.41%	2.15%	7.26%
2016 Q3	9.76%	1.91%	7.85%
2016 Q4	9.55%	2.52%	7.04%
2017 Q1	9.61%	2.78%	6.83%
2017 Q2	9.61%	2.64%	6.97%
2017 Q3	9.73%	2.58%	7.15%
2017 Q4	9.74%	2.62%	7.12%
2018 Q1	9.59%	2.91%	6.68%
2018 Q2	9.57%	3.00%	6.58%
2018 Q3	9.66%	3.00%	6.66%
2018 Q4	9.44%	3.17%	6.27%
2019 Q1	9.57%	2.85%	6.71%
2019 Q2	9.58%	2.58%	6.99%
2019 Q3	9.57%	2.08%	7.49%
2019 Q4	9.74%	2.10%	7.65%
2020 Q1	9.45%	1.71%	7.74%
2020 Q2	9.52%	1.15%	8.37%
2020 Q3	9.34%	1.15%	8.20%
2020 Q4	9.32%	1.40%	7.91%
2021 Q1	9.45%	1.92%	7.53%
2021 Q2	9.65%	2.21%	7.44%

Sources:

[1]: S&P Market Intelligence as of 05/31/2021.

[2]: Bloomberg as of 5/31/2021.

Appendix BV-F: Implied Risk Premium - Vertically Integrated

Implied Risk Premium Model Estimates

	R Squared	Estimate of Intercept (A0)	Estimate of Slope (A1)	Implied Cost of Equity Range
	[1]	[2]	[3]	[4]
Electric Utility	87.4%	8.7%	-57.4%	9.9%

Sources and Notes:

[1]-[3]: Estimated Using S&P Market Intelligence, as of May 2021

[4]: Risk-free rate of 2.8%

Schedule No. BV-16, Panel B
Risk Premiums Determined by Relationship Between
Authorized ROEs^[1] and Long-term Treasury Bond Rates
During the Period 1990 - 2021
Includes Utility Yield Spread Adjustment
Electric Utilities

$$\text{Risk Premium} = A_0 + (A_1 \times \text{Treasury Bond Rate})$$

R Squared	0.874
Estimate of Intercept (A_0)	8.73%
Estimate of Slope (A_1)	-0.574

Predicted Risk Premium 7.12%	+	Exp. Treasury Bond Rate 2.80%	=	Est. Cost of Equity for All Natural Gas Utilities 9.9%
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Sources and Notes:

[1]: Authorized ROE Data from S&P Market Intelligence as of 05/31/2021.

[2]: March 2021 Blue Chip consensus forecast for 2023 10 year T-bill yield + maturity premium between 10 year and 20 year U.S. Government bonds + utility yield spread adjustment.

See Regression Results for derivation of regression coefficients A_0 and A_1

Quarterly Risk Premiums for Electric Utilities

1990 - 2021

Quarter	Average Authorized Return on Equity [1]	20 year Treasury Bond Yield [2]	Risk Premium [3] = [1] - [2]
1990 Q1	12.62%	8.44%	4.19%
1990 Q2	12.85%	8.66%	4.19%
1990 Q3	12.54%	8.75%	3.79%
1990 Q4	12.68%	8.47%	4.21%
1991 Q1	12.66%	8.11%	4.55%
1991 Q2	12.67%	8.23%	4.44%
1991 Q3	12.49%	8.07%	4.43%
1991 Q4	12.42%	7.60%	4.83%
1992 Q1	12.38%	7.55%	4.83%
1992 Q2	11.83%	7.64%	4.18%
1992 Q3	12.03%	7.04%	4.99%
1992 Q4	12.14%	7.14%	5.00%
1993 Q1	11.84%	6.68%	5.15%
1993 Q2	11.64%	6.43%	5.21%
1993 Q3	11.15%	5.97%	5.18%
1993 Q4	11.04%	6.28%	4.76%
1994 Q1	11.07%	6.65%	4.41%
1994 Q2	11.13%	7.48%	3.65%
1994 Q3	12.75%	7.72%	5.03%
1994 Q4	11.24%	8.09%	3.15%
1995 Q1	11.96%	7.76%	4.20%
1995 Q2	11.32%	7.02%	4.30%
1995 Q3	11.37%	6.77%	4.60%
1995 Q4	11.58%	6.30%	5.28%
1996 Q1	11.46%	6.38%	5.08%
1996 Q2	11.46%	7.10%	4.36%
1996 Q3	10.70%	7.09%	3.61%
1996 Q4	11.56%	6.71%	4.85%
1997 Q1	11.08%	6.91%	4.17%
1997 Q2	11.62%	7.02%	4.60%
1997 Q3	12.00%	6.59%	5.41%
1997 Q4	11.06%	6.22%	4.84%
1998 Q1	11.31%	5.95%	5.36%
1998 Q2	12.20%	5.94%	6.26%
1998 Q3	11.65%	5.61%	6.04%
1998 Q4	12.30%	5.38%	6.92%
1999 Q1	10.40%	5.66%	4.74%
1999 Q2	10.94%	6.09%	4.85%
1999 Q3	10.75%	6.40%	4.35%
1999 Q4	11.10%	6.61%	4.49%
2000 Q1	11.21%	6.59%	4.62%
2000 Q2	11.00%	6.34%	4.66%
2000 Q3	11.68%	6.10%	5.58%
2000 Q4	12.50%	5.89%	6.61%
2001 Q1	11.38%	5.59%	5.79%
2001 Q2	11.00%	5.84%	5.16%
2001 Q3	10.76%	5.62%	5.14%

Quarterly Risk Premiums for Electric Utilities

1990 - 2021

Quarter	Average Authorized Return on Equity [1]	20 year Treasury Bond Yield [2]	Risk Premium [3] = [1] - [2]
2001 Q4	11.99%	5.48%	6.52%
2002 Q1	10.05%	5.74%	4.31%
2002 Q2	11.41%	5.77%	5.64%
2002 Q3	11.65%	5.19%	6.46%
2002 Q4	11.57%	5.02%	6.55%
2003 Q1	11.72%	4.90%	6.82%
2003 Q2	11.16%	4.59%	6.57%
2003 Q3	10.50%	5.17%	5.33%
2003 Q4	11.34%	5.16%	6.18%
2004 Q1	11.00%	4.89%	6.11%
2004 Q2	10.64%	5.36%	5.28%
2004 Q3	10.75%	5.07%	5.68%
2004 Q4	11.24%	4.87%	6.37%
2005 Q1	10.63%	4.76%	5.87%
2005 Q2	10.31%	4.55%	5.76%
2005 Q3	11.08%	4.51%	6.58%
2005 Q4	10.63%	4.77%	5.86%
2006 Q1	10.70%	4.76%	5.93%
2006 Q2	10.79%	5.29%	5.50%
2006 Q3	10.35%	5.09%	5.26%
2006 Q4	10.65%	4.83%	5.82%
2007 Q1	10.59%	4.90%	5.70%
2007 Q2	10.33%	5.07%	5.25%
2007 Q3	10.40%	5.01%	5.39%
2007 Q4	10.65%	4.65%	6.00%
2008 Q1	10.62%	4.40%	6.22%
2008 Q2	10.54%	4.59%	5.94%
2008 Q3	10.43%	4.49%	5.94%
2008 Q4	10.39%	3.97%	6.42%
2009 Q1	10.75%	3.69%	7.06%
2009 Q2	10.75%	4.19%	6.56%
2009 Q3	10.50%	4.28%	6.22%
2009 Q4	10.59%	4.27%	6.33%
2010 Q1	10.59%	4.49%	6.10%
2010 Q2	10.18%	4.20%	5.98%
2010 Q3	10.40%	3.60%	6.81%
2010 Q4	10.38%	3.84%	6.54%
2011 Q1	10.09%	4.32%	5.77%
2011 Q2	10.26%	4.07%	6.20%
2011 Q3	10.57%	3.34%	7.23%
2011 Q4	10.39%	2.75%	7.63%
2012 Q1	10.30%	2.80%	7.51%
2012 Q2	9.95%	2.55%	7.40%
2012 Q3	9.90%	2.37%	7.53%
2012 Q4	10.16%	2.46%	7.71%
2013 Q1	9.85%	2.75%	7.10%
2013 Q2	9.86%	2.78%	7.08%

Quarterly Risk Premiums for Electric Utilities

1990 - 2021

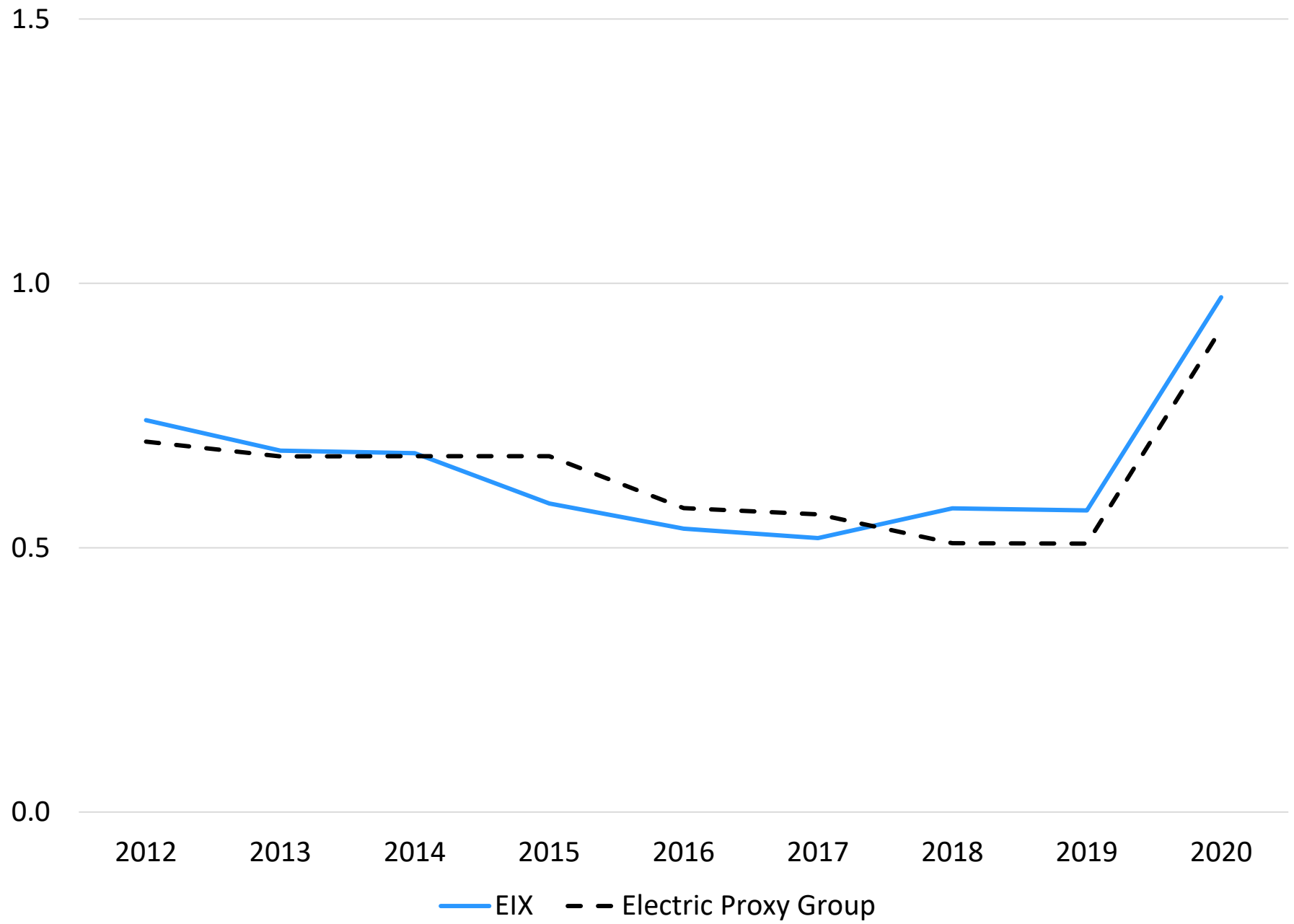
Quarter	Average Authorized Return on Equity [1]	20 year Treasury Bond Yield [2]	Risk Premium [3] = [1] - [2]
2013 Q3	10.12%	3.44%	6.68%
2013 Q4	9.97%	3.50%	6.46%
2014 Q1	9.86%	3.42%	6.44%
2014 Q2	10.10%	3.18%	6.92%
2014 Q3	9.90%	3.01%	6.89%
2014 Q4	9.94%	2.69%	7.25%
2015 Q1	9.64%	2.32%	7.32%
2015 Q2	9.83%	2.62%	7.20%
2015 Q3	9.40%	2.65%	6.75%
2015 Q4	9.86%	2.60%	7.26%
2016 Q1	9.70%	2.32%	7.38%
2016 Q2	9.48%	2.15%	7.33%
2016 Q3	9.74%	1.91%	7.83%
2016 Q4	9.83%	2.52%	7.32%
2017 Q1	9.72%	2.78%	6.94%
2017 Q2	9.64%	2.64%	7.01%
2017 Q3	10.00%	2.58%	7.42%
2017 Q4	9.91%	2.62%	7.29%
2018 Q1	9.69%	2.91%	6.78%
2018 Q2	9.75%	3.00%	6.75%
2018 Q3	9.69%	3.00%	6.69%
2018 Q4	9.52%	3.17%	6.35%
2019 Q1	9.72%	2.85%	6.86%
2019 Q2	9.58%	2.58%	6.99%
2019 Q3	9.53%	2.08%	7.45%
2019 Q4	9.89%	2.10%	7.79%
2020 Q1	9.72%	1.71%	8.01%
2020 Q2	9.58%	1.15%	8.43%
2020 Q3	9.30%	1.15%	8.15%
2020 Q4	9.56%	1.40%	8.16%
2021 Q1	9.45%	1.92%	7.53%
2021 Q2	9.65%	2.21%	7.44%

Sources:

[1]: S&P Market Intelligence as of 05/31/2021.

[2]: Bloomberg as of 5/31/2021.

Appendix BV-G: Value Line and Estimated Betas

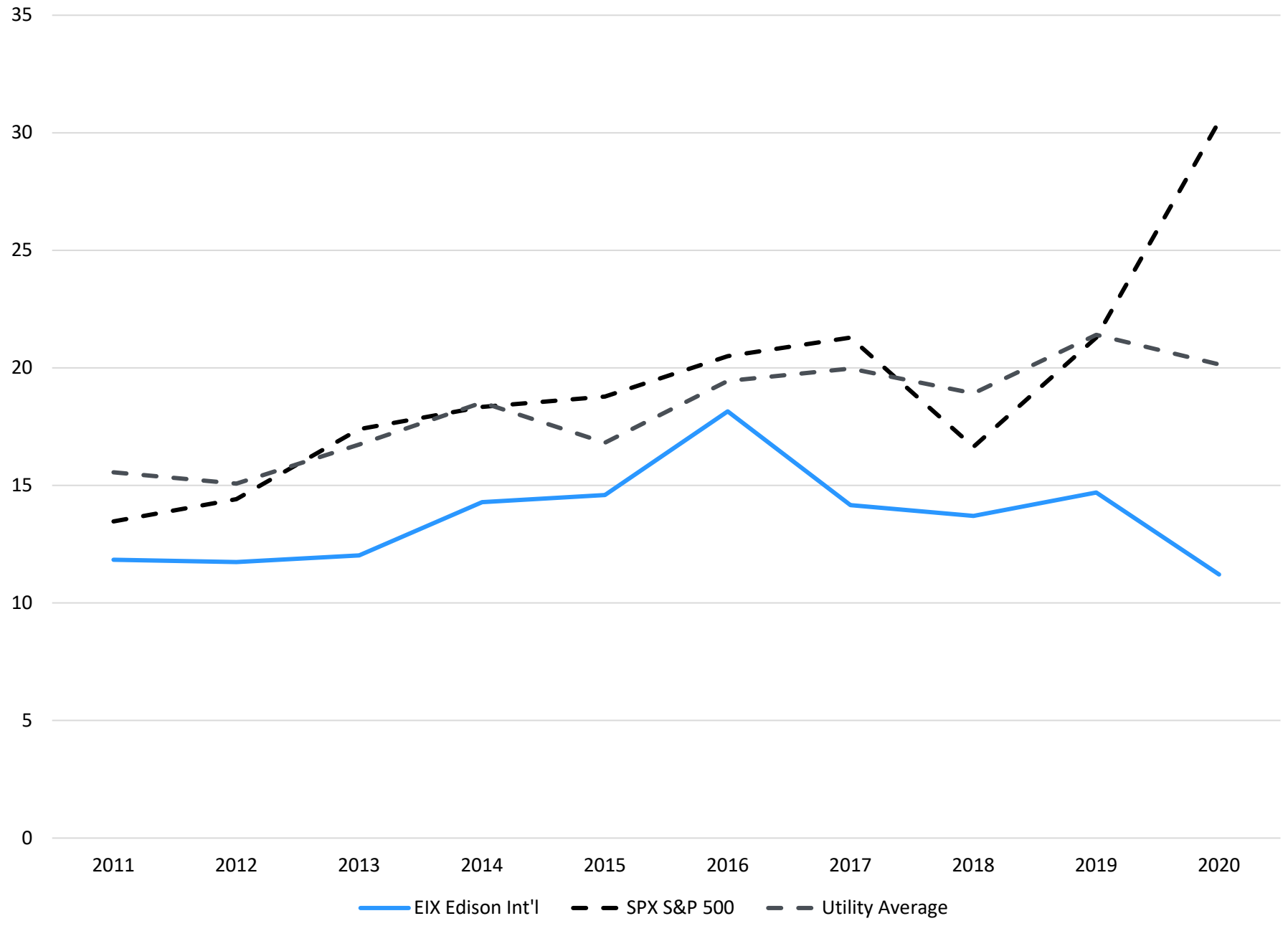


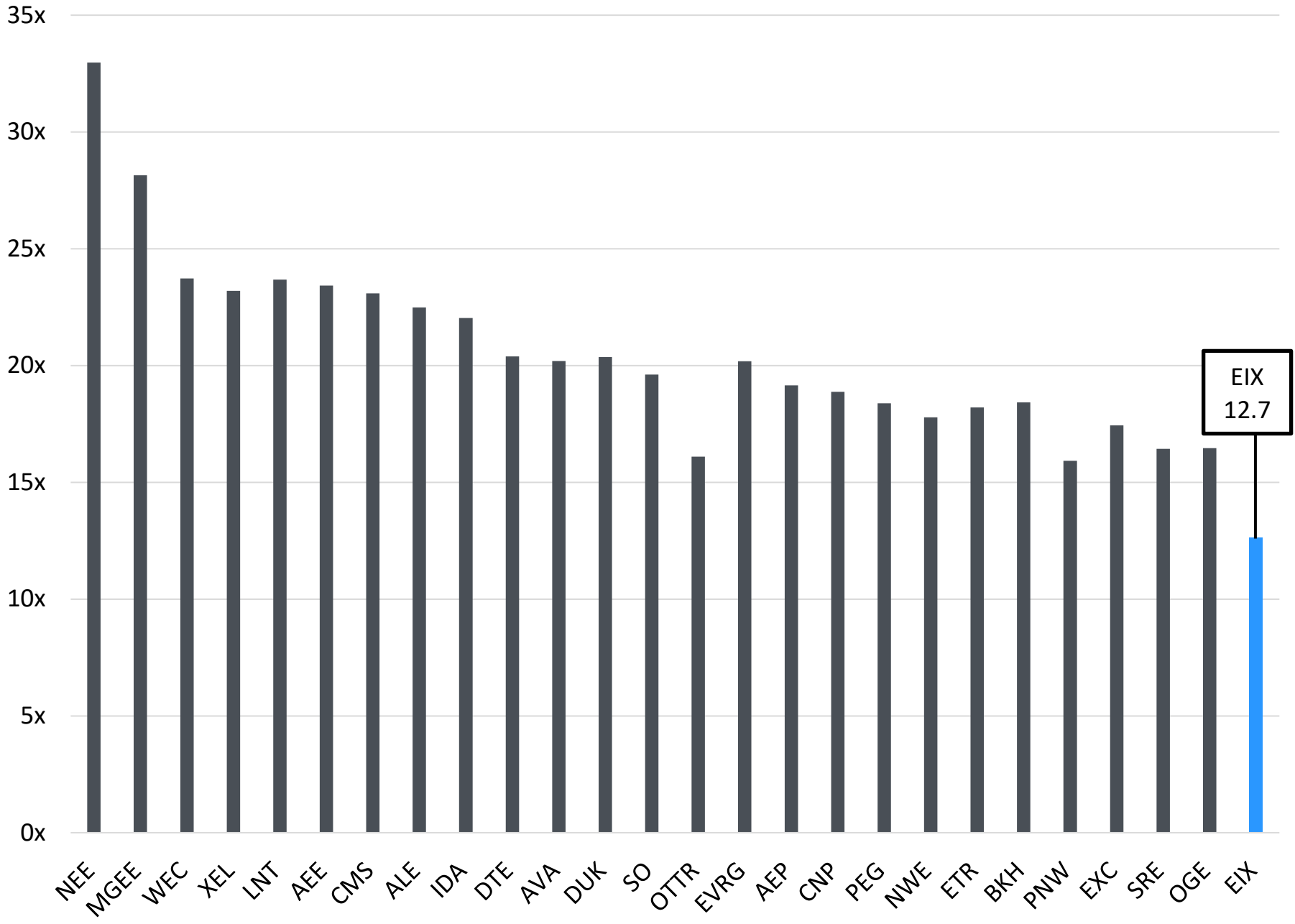
Value Line Betas in Chart

	EIX	Electric Proxy Group
2012	0.74	0.70
2013	0.68	0.67
2014	0.68	0.67
2015	0.58	0.67
2016	0.54	0.57
2017	0.52	0.56
2018	0.57	0.51
2019	0.57	0.51
2020	0.97	0.91

Notes: Stock price data comes from Bloomberg. Each beta is calculated as the using weekly data from the prior 104 weeks. (i.e. the Value Line method)

Appendix BV-H: P/E Ratios





PE Ratio over Time

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
EIX Edison Int'l	11.8	11.7	12.0	14.3	14.6	18.2	14.2	13.7	14.7	11.2
SPX S&P 500	13.5	14.4	17.4	18.3	18.8	20.5	21.3	16.6	21.3	30.5
Utility Average	15.6	15.1	16.7	18.5	16.8	19.4	20.0	18.9	21.4	20.1

FIELD	PE_RATIO	PE_RATIO	PE_RATIO	PE_RATIO	PE_RATIO	PE_RATIO	PE_RATIO	PE_RATIO	PE_RATIO	PE_RATIO	PE_RATIO	PE_RATIO	PE_RATIO	PE_RATIO	PE_RATIO	PE_RATIO	PE_RATIO	BEST_PE_RA
Fiscal Year	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	
End Date	12/31/2005	12/31/2006	12/31/2007	12/31/2008	12/31/2009	12/31/2010	12/31/2011	12/31/2012	12/31/2013	12/31/2014	12/31/2015	12/31/2016	12/31/2017	12/31/2018	12/31/2019	12/31/2020	0	
Period	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	1FY	
AEE US Equity	16.4	20.2	16.4	11.5	9.9	6.5	15.1	14.4	17.3	19.2	16.9	19.6	20.9	19.6	22.9	22.3	23.4	
AEP US Equity	13.6	15.4	16.3	11.3	11.7	12.1	16.6	14.0	14.7	18.3	16.2	16.0	20.1	19.0	22.3	19.0	19.2	
ALE US Equity	19.5	16.8	12.9	11.4	16.4	17.0	17.5	15.9	19.0	19.0	16.6	22.4	23.8	22.7	25.3	18.5	22.5	
AVA US Equity	20.4	17.3	27.3	14.3	13.3	13.1	14.9	16.4	15.6	20.0	18.6	18.4	23.6	19.5	26.6	21.9	20.2	
BKH US Equity	23.5	16.7	21.3	15.1	20.7	17.4	19.9	18.7	24.2	18.1	15.6	19.6	18.6	17.7	20.8	16.5	18.4	
CMS US Equity	15.1	19.4	19.3	8.7	19.7	15.9	16.7	15.8	16.1	20.0	19.1	20.6	21.8	21.3	25.3	22.8	23.1	
CNP US Equity	19.2	15.5	14.8	13.0	14.4	15.2	16.8	15.7	19.6	18.0	16.6	21.3	20.7	18.2	17.5	10.3	18.9	
DTE US Equity	13.2	16.8	15.6	11.2	13.8	12.7	14.7	15.2	16.4	17.1	16.5	18.6	19.1	17.3	20.6	16.3	20.4	
DUK US Equity	15.9	33.5	16.1	12.4	14.6	13.4	14.2	14.6	16.4	17.9	17.2	18.0	18.5	18.3	18.0	42.0	20.4	
EIX US Equity	14.1	13.9	14.5	8.8	9.9	12.7	11.8	11.7	12.0	14.3	14.6	18.2	14.2	13.7	14.7	11.2	12.6	
ETR US Equity	15.6	19.6	20.8	12.8	12.1	11.0	11.6	10.6	11.8	15.1	11.4	10.3	10.7	11.8	9.7	—	18.2	
EVRG US Equity	—	—	—	—	—	—	—	—	—	—	—	—	—	—	22.7	22.5	18.5	20.2
EXC US Equity	17.1	19.2	18.9	13.6	11.3	10.3	10.4	15.6	13.2	15.9	11.2	13.4	16.0	14.1	14.7	13.8	17.4	
IDA US Equity	14.5	16.2	19.5	13.6	12.1	12.5	12.6	12.5	14.2	17.2	17.6	20.5	21.7	20.7	23.2	20.5	22.0	
LNT US Equity	11.2	13.5	15.2	11.5	31.1	13.1	15.0	14.1	15.7	19.1	17.8	20.2	21.9	19.5	23.4	21.2	23.7	
MGEE US Equity	—	—	—	14.4	16.2	17.7	17.8	18.3	17.8	19.7	22.5	30.0	28.5	24.8	31.6	27.1	28.1	
NEE US Equity	16.5	17.9	19.5	13.2	13.0	13.2	13.9	15.9	17.9	21.0	18.4	17.7	24.0	23.6	31.7	33.4	33.0	
NWE US Equity	20.0	33.1	20.5	13.3	13.6	13.7	13.8	15.3	17.6	21.0	18.2	17.2	18.1	17.6	21.0	17.4	17.8	
OGI US Equity	15.1	16.3	13.7	10.1	13.8	14.7	16.3	15.9	17.5	17.9	15.4	19.8	17.2	18.5	20.6	16.0	16.5	
OTTR US Equity	16.1	20.8	16.1	18.4	35.0	143.0	23.2	11.9	19.5	18.9	17.0	25.5	27.3	24.1	23.6	18.2	16.1	
PCG US Equity	15.9	18.4	15.5	12.3	12.3	12.8	16.1	17.4	18.5	16.0	17.1	16.2	12.2	5.9	2.8	8.6	9.2	
PEG US Equity	17.8	17.9	18.1	10.0	10.3	10.6	12.7	11.9	12.3	14.9	12.7	21.6	15.9	19.1	15.5	19.2	18.4	
PNW US Equity	12.8	16.7	14.3	12.8	14.7	13.7	16.1	14.6	14.5	19.1	16.4	19.8	19.6	18.8	18.9	17.6	15.9	
SO US Equity	16.2	17.6	17.4	16.4	14.4	16.2	18.2	16.2	15.2	17.5	16.2	16.9	14.5	14.1	21.3	18.9	19.6	
SPX Index	17.0	16.6	18.2	16.8	19.4	15.4	13.5	14.4	17.4	18.3	18.8	20.5	21.3	16.6	21.3	30.5	22.3	
SRE US Equity	9.4	12.8	14.0	10.4	11.9	13.6	12.6	15.9	22.3	24.5	18.3	23.8	22.5	22.2	27.0	15.8	16.4	
WEC US Equity	16.1	18.0	17.3	13.9	15.6	15.3	16.0	15.7	16.5	20.3	19.8	20.4	21.2	20.7	25.8	23.7	23.7	
XEL US Equity	15.4	17.1	16.7	12.8	14.2	14.6	16.1	14.4	14.6	17.7	17.1	18.4	21.0	19.9	24.0	24.2	23.2	

Notes:
Ratio of the price of a stock and the company's earnings per share. US and Canada: Calculated as Last Price (PR005, PX_LAST) divided by Trailing 12M Diluted EPS From Cont OPS (RR844, T12M_DIL_EPS_CONT_OPS) or Diluted EPS From Continuing Ops (IS147, IS_DIL_EPS_CONT_OPS) if only annual earnings exist.

APPENDIX BV-I: FERC APPROACH TO CALCULATE MRP

Table No. FERC-1
Market Risk Premium Summary

		IBES	Value Line	Weighted Average
Dividend Yield	[a]	1.95%	1.93%	1.94%
Growth Rate	[b]	10.86%	9.62%	10.86%
Estimated Cost of Equity	[c] = [a] + [b]	12.81%	11.55%	12.80%
Risk Free Rate	[d]	1.95%	1.95%	1.95%
Market Risk Premium	[e] = [c] - [d]	10.86%	9.60%	10.85%

Table No. FERC-2
Estimation of S&P 500 Cost of Equity- DDM

Company	Market Cap (\$Millions)	VL Indicated Annual Dividend (\$)	IBES Growth Rates				Value Line Growth Rates			Weighted Average		
			Growth Rate	# of Analyst Estimates (Consensus)	Growth Rate Filtered Between 0 and 20%	Dividend Yield for companies with valid GR	Growth Rate	Growth Rate Filtered Between 0 and 20%	Dividend Yield for companies with valid GR	Growth Rate	Growth Rate Filtered Between 0 and 20%	Dividend Yield for companies with valid GR
Market Cap Weighted Average			14.32%	2.9	10.86%	1.95%	10.31%	9.62%	1.93%	13.12%	10.86%	1.94%
3M Company	112,451	3.0%	8%	3	8%	3%	5%	5%	3%	7%	7%	3%
Abbott Labs.	212,878	1.5%	16%	3	16%	2%	12%	12%	2%	15%	15%	2%
AbbVie Inc.	185,710	4.8%	4%	3	4%	5%	7%	7%	5%	5%	5%	5%
ABIOMED Inc.	14,500	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Accenture Plc	179,762	1.3%	10%	2	10%	1%	8%	8%	1%	9%	9%	1%
Activision Blizzard	74,976	0.5%	18%	3	18%	1%	13%	13%	1%	16%	16%	1%
Adobe Inc.	236,343	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Advance Auto Parts	12,119	0.5%	12%	2	12%	1%	11%	11%	1%	12%	12%	1%
Advanced Micro Dev.	99,544	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AES Corp.	18,018	2.2%	8%	2	8%	2%	22%	n/a	n/a	13%	13%	2%
Aflac Inc.	35,814	2.6%	6%	1	6%	3%	7%	7%	3%	7%	7%	3%
Agilent Technologies	39,449	0.6%	11%	1	11%	1%	11%	11%	1%	11%	11%	1%
Air Products & Chem.	62,509	2.1%	9%	2	9%	2%	13%	13%	2%	10%	10%	2%
Akamai Technologies	16,676	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Alaska Air Group	8,988	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Albemarle Corp.	15,353	1.1%	26%	1	n/a	n/a	7%	7%	1%	16%	16%	1%
Alexandria Real Estate	18,872	2.6%	0%	1	0%	3%	13%	13%	3%	7%	7%	3%
Alexion Pharmac.	33,441	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Align Techn.	43,569	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Allegion plc	11,982	1.1%	7%	2	7%	1%	9%	9%	1%	8%	8%	1%
Alliant Energy	13,590	3.0%	6%	2	6%	3%	6%	6%	3%	6%	6%	3%
Allstate Corp.	35,380	2.7%	0%	3	n/a	n/a	9%	9%	3%	2%	2%	3%
Alphabet Inc.	1,519,034	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Alphabet Inc. 'A'	1,525,261	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Altria Group	95,021	6.6%	5%	2	5%	7%	6%	6%	7%	5%	5%	7%
Amazon.com	1,649,533	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Amcor plc	18,829	4.0%	7%	2	7%	4%	n/a	n/a	n/a	7%	7%	4%
Amer. Airlines	14,872	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Amer. Elec. Power	43,051	3.5%	6%	2	6%	4%	7%	7%	4%	6%	6%	4%
Amer. Express	118,440	1.2%	22%	2	n/a	n/a	6%	6%	1%	17%	17%	1%
Amer. Int'l Group	40,562	2.7%	17%	2	17%	3%	29%	n/a	n/a	21%	n/a	n/a
Amer. Tower 'A'	108,732	2.2%	19%	2	19%	2%	10%	10%	2%	16%	16%	2%
Amer. Water Works	27,726	1.6%	9%	1	9%	2%	8%	8%	2%	8%	8%	2%
Ameren Corp.	20,593	2.8%	8%	1	8%	3%	6%	6%	3%	7%	7%	3%
Ameriprise Fin'l	27,798	1.7%	15%	2	15%	2%	12%	12%	2%	14%	14%	2%
AmerisourceBergen	23,788	1.5%	9%	3	9%	2%	7%	7%	2%	9%	9%	2%
AMETEK Inc.	29,864	0.6%	-1%	1	n/a	n/a	10%	10%	1%	4%	4%	1%
Amgen	143,488	2.9%	7%	5	7%	3%	6%	6%	3%	6%	6%	3%
Amphenol Corp.	40,280	0.9%	12%	1	12%	1%	9%	9%	1%	11%	11%	1%
Analog Devices	58,820	1.7%	12%	2	12%	2%	9%	9%	2%	11%	11%	2%
ANSYS Inc.	30,763	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Anthem Inc.	86,428	1.3%	13%	4	13%	1%	10%	10%	1%	13%	13%	1%
Aon plc	54,153	0.8%	10%	1	10%	1%	8%	8%	1%	9%	9%	1%
Apache Corp.	6,800	0.6%	-24%	1	n/a	n/a	9%	9%	1%	-8%	n/a	n/a
Apple Inc.	2,151,695	0.7%	17%	5	17%	1%	15%	15%	1%	17%	17%	1%
Applied Materials	127,683	0.7%	21%	3	n/a	n/a	12%	12%	1%	19%	19%	1%
Aptiv PLC	37,995	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Archer Daniels Midl'd	32,159	2.6%	6%	1	6%	3%	8%	8%	3%	7%	7%	3%
Arista Networks	23,448	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Assurant Inc.	8,439	1.8%	19%	1	19%	2%	12%	12%	2%	15%	15%	2%
AT&T Inc.	220,378	6.9%	1%	4	1%	7%	3%	3%	7%	1%	1%	7%
Atmos Energy	12,589	2.6%	7%	3	7%	3%	7%	7%	3%	7%	7%	3%
Autodesk Inc.	62,861	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Automatic Data Proc.	79,545	2.0%	9%	4	9%	2%	9%	9%	2%	9%	9%	2%
AutoZone Inc.	31,572	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
AvalonBay Communities	26,200	3.5%	3%	1	3%	4%	1%	1%	4%	2%	2%	4%
Avery Dennison	15,849	1.3%	9%	5	9%	1%	10%	10%	1%	9%	9%	1%
Baker Hughes	15,515	3.6%	3%	1	3%	4%	35%	n/a	n/a	19%	19%	4%
Ball Corp.	28,346	0.7%	14%	4	14%	1%	20%	20%	1%	15%	15%	1%
Bank of America	346,465	1.8%	1%	1	1%	2%	4%	4%	2%	3%	3%	2%
Bank of New York Mellon	42,423	2.5%	13%	1	13%	3%	3%	3%	3%	8%	8%	3%
Baxter Int'l Inc.	43,259	1.2%	11%	3	11%	1%	9%	9%	1%	10%	10%	1%
Becton Dickinson	70,902	1.4%	2%	1	2%	1%	9%	9%	1%	6%	6%	1%
Berkley (W.R.)	13,974	0.6%	27%	2	n/a	n/a	14%	14%	1%	23%	n/a	n/a
Berkshire Hathaway 'B'	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Best Buy Co.	31,112	2.3%	10%	3	10%	2%	9%	9%	2%	9%	9%	2%
Bio-Rad Labs. 'A'	17,209	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Biogen	41,248	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BlackRock Inc.	120,167	2.0%	13%	4	13%	2%	10%	10%	2%	12%	12%	2%
Boeing	147,082	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Booking Holdings	98,725	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BorgWarner	11,126	1.4%	20%	3	n/a	n/a	6%	6%	1%	16%	16%	1%
Boston Properties	16,304	3.8%	7%	1	7%	4%	2%	2%	4%	4%	4%	4%
Boston Scientific	55,628	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bristol-Myers Squibb	139,263	3.1%	8%	3	8%	3%	57%	n/a	n/a	20%	n/a	n/a

Table No. FERC-2
Estimation of S&P 500 Cost of Equity- DDM

Company	Market Cap (\$Millions)	VL Indicated Annual Dividend (\$)	IBES Growth Rates				Value Line Growth Rates			Weighted Average		
			Growth Rate	# of Analyst Estimates (Consensus)	Growth Rate Filtered Between 0 and 20%	Dividend Yield for companies with valid GR	Growth Rate	Growth Rate Filtered Between 0 and 20%	Dividend Yield for companies with valid GR	Growth Rate	Growth Rate Filtered Between 0 and 20%	Dividend Yield for companies with valid GR
Market Cap Weighted Average			14.32%	2.9	10.86%	1.95%	10.31%	9.62%	1.93%	13.12%	10.86%	1.94%
Broadcom Inc.	196,844	3.0%	9%	1	9%	3%	27%	n/a	n/a	18%	18%	3%
Broadridge Fin'l	17,912	1.5%	10%	1	10%	2%	9%	9%	2%	9%	9%	2%
Brown-Forman 'B'	33,688	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
C.H. Robinson	13,083	2.1%	11%	3	11%	2%	7%	7%	2%	10%	10%	2%
Cabot Oil & Gas 'A'	7,371	2.8%	41%	1	n/a	n/a	14%	14%	3%	27%	n/a	n/a
Cadence Design Sys.	39,766	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Campbell Soup	14,914	3.0%	9%	1	9%	3%	5%	5%	3%	7%	7%	3%
Capital One Fin'l	60,820	1.2%	4%	1	4%	1%	2%	2%	1%	3%	3%	1%
Cardinal Health	17,846	3.2%	7%	3	7%	3%	12%	12%	3%	8%	8%	3%
CarMax Inc.	20,559	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Carnival Corp.	30,740	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Carrier Global	37,048	1.1%	17%	2	17%	1%	n/a	n/a	n/a	17%	17%	1%
Catalent Inc.	18,061	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Caterpillar Inc.	125,643	1.8%	19%	3	19%	2%	7%	7%	2%	16%	16%	2%
Cboe Global Markets	10,758	1.7%	2%	1	2%	2%	12%	12%	2%	7%	7%	2%
CBRE Group	26,308	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CDW Corp.	24,168	0.9%	12%	2	12%	1%	11%	11%	1%	11%	11%	1%
Celanese Corp.	17,702	1.8%	22%	1	n/a	n/a	6%	6%	2%	14%	14%	2%
Centene Corp.	36,412	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
CenterPoint Energy	12,880	2.8%	5%	1	5%	3%	8%	8%	3%	6%	6%	3%
CenturyLink Inc.	14,787	7.8%	3%	1	3%	8%	3%	3%	8%	3%	3%	8%
Cerner Corp.	22,101	1.2%	12%	5	12%	1%	8%	8%	1%	11%	11%	1%
CF Industries	9,864	2.7%	-5%	1	n/a	n/a	15%	15%	3%	5%	5%	3%
Charter Communic.	118,491	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Chevron Corp.	200,585	5.1%	-5%	1	n/a	n/a	8%	8%	5%	2%	2%	5%
Chipotle Mex. Grill	41,969	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Chubb Ltd.	72,546	1.9%	23%	3	n/a	n/a	10%	10%	2%	19%	19%	2%
Church & Dwight	21,557	1.2%	8%	4	8%	1%	8%	8%	1%	8%	8%	1%
Cigna Corp.	88,206	1.6%	10%	4	10%	2%	11%	11%	2%	10%	10%	2%
Cincinnati Financial	16,935	2.4%	7%	1	7%	2%	11%	11%	2%	9%	9%	2%
Cintas Corp.	36,795	0.8%	13%	2	13%	1%	13%	13%	1%	13%	13%	1%
Cisco Systems	218,521	2.9%	6%	4	6%	3%	6%	6%	3%	6%	6%	3%
Citigroup Inc.	151,338	2.8%	11%	3	11%	3%	4%	4%	3%	9%	9%	3%
Citizens Fin'l Group	19,220	3.4%	-3%	1	n/a	n/a	2%	2%	3%	-1%	n/a	n/a
Citrix Sys.	17,481	1.0%	11%	2	11%	1%	9%	9%	1%	10%	10%	1%
Clorox Co.	24,391	2.3%	5%	3	5%	2%	7%	7%	2%	5%	5%	2%
CME Group	73,177	1.8%	5%	3	5%	2%	8%	8%	2%	6%	6%	2%
CMS Energy Corp.	17,666	2.9%	7%	4	7%	3%	8%	8%	3%	7%	7%	3%
Coca-Cola	229,211	3.1%	9%	4	9%	3%	7%	7%	3%	9%	9%	3%
Cognizant Technology	41,981	1.2%	3%	1	3%	1%	5%	5%	1%	4%	4%	1%
Colgate-Palmolive	67,669	2.2%	7%	3	7%	2%	5%	5%	2%	7%	7%	2%
Comcast Corp.	250,104	1.9%	18%	4	18%	2%	12%	12%	2%	17%	17%	2%
Comerica Inc.	10,002	3.8%	-11%	1	n/a	n/a	1%	1%	4%	-5%	n/a	n/a
Conagra Brands	17,873	3.0%	6%	2	6%	3%	5%	5%	3%	6%	6%	3%
ConocoPhillips	55,944	3.4%	-9%	2	n/a	n/a	4%	4%	3%	-5%	n/a	n/a
Consol. Edison	25,778	4.1%	3%	2	3%	4%	3%	3%	4%	3%	3%	4%
Constellation Brands	45,409	1.3%	9%	3	9%	1%	7%	7%	1%	8%	8%	1%
Cooper Cos.	18,790	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Copart Inc.	26,802	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Corning Inc.	33,882	2.1%	24%	1	n/a	n/a	20%	20%	2%	22%	n/a	n/a
Corteva Inc.	34,757	1.2%	18%	2	18%	1%	n/a	n/a	n/a	18%	18%	1%
Costco Wholesale	158,829	0.8%	9%	2	9%	1%	11%	11%	1%	9%	9%	1%
Crown Castle Int'l	75,968	3.1%	21%	1	n/a	n/a	12%	12%	3%	16%	16%	3%
CSX Corp.	73,927	1.1%	15%	3	15%	1%	9%	9%	1%	14%	14%	1%
Cummins Inc.	38,235	2.1%	15%	3	15%	2%	6%	6%	2%	13%	13%	2%
CVS Health	97,507	2.7%	4%	3	4%	3%	6%	6%	3%	4%	4%	3%
Danaher Corp.	160,736	0.4%	16%	4	16%	0%	18%	18%	0%	16%	16%	0%
Darden Restaurants	19,070	2.4%	37%	2	n/a	n/a	10%	10%	2%	28%	n/a	n/a
DaVita Inc.	11,729	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Deere & Co.	117,474	1.0%	35%	4	n/a	n/a	14%	14%	1%	30%	n/a	n/a
Delta Air Lines	32,037	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dentsply Sirona	13,971	0.6%	26%	1	n/a	n/a	6%	6%	1%	16%	16%	1%
Devon Energy	8,625	2.0%	25%	1	n/a	n/a	6%	6%	2%	15%	15%	2%
DexCom Inc.	35,462	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Diamondback Energy	12,046	2.2%	44%	2	n/a	n/a	-3%	n/a	n/a	28%	n/a	n/a
Digital Realty Trust	40,053	3.3%	31%	1	n/a	n/a	7%	7%	3%	19%	19%	3%
Discover Fin'l Svcs.	30,292	1.8%	6%	1	6%	2%	6%	6%	2%	6%	6%	2%
Discovery Communic. 'C'	19,425	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Discovery Inc.	21,131	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dish Network 'A'	19,857	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Disney (Walt)	334,044	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dollar General	49,537	0.8%	14%	3	14%	1%	13%	13%	1%	13%	13%	1%
Dollar Tree Inc.	27,343	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Dominion Energy	61,433	3.3%	7%	2	7%	3%	7%	7%	3%	7%	7%	3%
Domino's Pizza	14,859	1.0%	11%	4	11%	1%	15%	15%	1%	12%	12%	1%

Table No. FERC-2
Estimation of S&P 500 Cost of Equity- DDM

Company	Market Cap (\$Millions)	VL Indicated Annual Dividend (\$)	IBES Growth Rates				Value Line Growth Rates			Weighted Average		
			Growth Rate	# of Analyst Estimates (Consensus)	Growth Rate Filtered Between 0 and 20%	Dividend Yield for companies with valid GR	Growth Rate	Growth Rate Filtered Between 0 and 20%	Dividend Yield for companies with valid GR	Growth Rate	Growth Rate Filtered Between 0 and 20%	Dividend Yield for companies with valid GR
Market Cap Weighted Average			14.32%	2.9	10.86%	1.95%	10.31%	9.62%	1.93%	13.12%	10.86%	1.94%
Dover Corp.	20,042	1.4%	10%	2	10%	1%	7%	7%	1%	9%	9%	1%
Dow Inc.	47,557	4.5%	-5%	1	n/a	n/a	n/a	n/a	n/a	-5%	n/a	n/a
DTE Energy	26,295	3.3%	5%	2	5%	3%	6%	6%	3%	5%	5%	3%
Duke Energy	75,224	4.0%	5%	3	5%	4%	5%	5%	4%	5%	5%	4%
Duke Realty Corp.	16,054	2.4%	6%	1	6%	2%	-3%	n/a	n/a	2%	2%	2%
DuPont de Nemours	55,506	1.6%	30%	1	n/a	n/a	n/a	n/a	n/a	30%	n/a	n/a
DXC Technology	7,937	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Eastman Chemical	15,154	2.4%	4%	2	4%	2%	5%	5%	2%	4%	4%	2%
Eaton Corp. plc	55,956	2.2%	16%	3	16%	2%	6%	6%	2%	13%	13%	2%
eBay Inc.	42,244	1.1%	14%	5	14%	1%	19%	19%	1%	15%	15%	1%
Ecolab Inc.	61,328	0.9%	16%	5	16%	1%	6%	6%	1%	15%	15%	1%
Edison Int'l	22,719	4.5%	5%	1	5%	5%	12%	12%	5%	8%	8%	5%
Edwards Lifesciences	52,516	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Electronic Arts	40,962	0.5%	15%	2	15%	1%	9%	9%	1%	13%	13%	1%
Emerson Electric	54,636	2.2%	10%	3	10%	2%	9%	9%	2%	10%	10%	2%
ENERGY CORP.	20,369	3.8%	6%	1	6%	4%	3%	3%	4%	4%	4%	4%
EOG Resources	42,776	2.4%	58%	3	n/a	n/a	7%	7%	2%	45%	n/a	n/a
Equifax Inc.	22,081	0.8%	9%	1	9%	1%	6%	6%	1%	7%	7%	1%
Equinix Inc.	61,008	1.7%	37%	2	n/a	n/a	17%	17%	2%	31%	n/a	n/a
Equity Residential	26,932	3.4%	3%	1	3%	3%	2%	2%	3%	2%	2%	3%
Essex Property Trust	18,384	2.9%	8%	1	8%	3%	1%	1%	3%	4%	4%	3%
Etsy Inc.	25,673	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Everest Re Group Ltd.	10,226	2.5%	68%	1	n/a	n/a	11%	11%	3%	39%	n/a	n/a
Every Inc.	13,896	3.6%	6%	1	6%	4%	8%	8%	4%	7%	7%	4%
Eversource Energy	30,043	2.8%	7%	3	7%	3%	7%	7%	3%	7%	7%	3%
Exelon Corp.	43,871	3.4%	0%	2	n/a	n/a	4%	4%	3%	1%	1%	3%
Expedia Group	24,331	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Expeditors Int'l	18,211	0.9%	4%	2	4%	1%	6%	6%	1%	5%	5%	1%
Extra Space Storage	18,075	2.9%	6%	1	6%	3%	4%	4%	3%	5%	5%	3%
Exxon Mobil Corp.	239,546	6.3%	11%	3	11%	6%	3%	3%	6%	9%	9%	6%
F5 Networks	12,998	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Facebook Inc.	891,994	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fastenal Co.	28,668	2.2%	8%	1	8%	2%	10%	10%	2%	9%	9%	2%
Federal Rlty. Inv. Trust	8,060	4.1%	5%	1	5%	4%	-2%	n/a	n/a	2%	2%	4%
FedEx Corp.	74,060	0.9%	29%	3	n/a	n/a	9%	9%	1%	24%	n/a	n/a
Fidelity Nat'l Info.	91,066	1.0%	14%	4	14%	1%	28%	n/a	n/a	17%	17%	1%
Fifth Third Bancorp	27,370	2.8%	-3%	1	n/a	n/a	4%	4%	3%	1%	1%	3%
First Republic Bank	29,102	0.5%	12%	2	12%	1%	11%	11%	1%	12%	12%	1%
FirstEnergy Corp.	19,025	4.5%	-2%	2	n/a	n/a	9%	9%	5%	2%	2%	5%
Fiserv Inc.	82,527	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
FleetCor Technologies	23,533	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
FLIR Systems	7,522	1.2%	6%	1	6%	1%	7%	7%	1%	6%	6%	1%
Flowserve Corp.	5,168	2.0%	8%	1	8%	2%	8%	8%	2%	8%	8%	2%
FMC Corp.	14,427	1.7%	9%	2	9%	2%	9%	9%	2%	9%	9%	2%
Ford Motor	49,743	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fortinet Inc.	31,335	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fortive Corp.	24,076	0.4%	8%	3	8%	0%	7%	7%	0%	8%	8%	0%
Fortune Brands Home	13,639	1.0%	11%	2	11%	1%	10%	10%	1%	11%	11%	1%
Fox Corp. 'A'	22,070	1.2%	4%	2	4%	1%	n/a	n/a	n/a	4%	4%	1%
Fox Corp. 'B'	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Franklin Resources	15,392	3.6%	6%	3	6%	4%	18%	18%	4%	9%	9%	4%
Freep't-McMoRan Inc.	49,543	1.0%	37%	1	n/a	n/a	33%	n/a	n/a	35%	n/a	n/a
Gallagher (Arthur J.)	25,148	1.5%	8%	2	8%	2%	13%	13%	2%	10%	10%	2%
Gap (The) Inc.	11,482	1.8%	5%	1	5%	2%	3%	3%	2%	4%	4%	2%
Garmin Ltd.	25,804	1.9%	6%	2	6%	2%	9%	9%	2%	7%	7%	2%
Gartner Inc.	16,728	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Gen'l Dynamics	52,899	2.6%	5%	3	5%	3%	5%	5%	3%	5%	5%	3%
Gen'l Electric	117,370	0.3%	323%	1	n/a	n/a	15%	15%	0%	169%	n/a	n/a
Gen'l Mills	37,558	3.4%	4%	3	4%	3%	4%	4%	3%	4%	4%	3%
Gen'l Motors	87,067	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Genuine Parts	16,836	2.8%	5%	1	5%	3%	7%	7%	3%	6%	6%	3%
Gilead Sciences	82,262	4.4%	2%	5	2%	4%	16%	16%	4%	4%	4%	4%
Global Payments	62,755	0.4%	12%	5	12%	0%	12%	12%	0%	12%	12%	0%
Globe Life Inc.	10,389	0.8%	7%	1	7%	1%	8%	8%	1%	8%	8%	1%
Goldman Sachs	112,362	1.5%	17%	2	17%	2%	7%	7%	2%	14%	14%	2%
Grainger (W.W.)	20,943	1.5%	13%	2	13%	2%	5%	5%	2%	10%	10%	2%
Halliburton Co.	18,957	0.9%	39%	1	n/a	n/a	2%	2%	1%	20%	n/a	n/a
Hanesbrands Inc.	6,938	2.9%	5%	2	5%	3%	4%	4%	3%	4%	4%	3%
Hartford Fin'l Svcs.	24,414	2.1%	7%	2	7%	2%	9%	9%	2%	8%	8%	2%
Hasbro Inc.	13,318	2.8%	11%	2	11%	3%	9%	9%	3%	11%	11%	3%
HCA Healthcare	63,395	1.0%	13%	4	13%	1%	11%	11%	1%	13%	13%	1%
Healthpeak Properties	17,568	3.7%	3%	1	3%	4%	-13%	n/a	n/a	-5%	n/a	n/a
Henry (Jack) & Assoc.	11,731	1.2%	10%	3	10%	1%	11%	11%	1%	10%	10%	1%
Hershey Co.	33,435	2.1%	9%	4	9%	2%	6%	6%	2%	8%	8%	2%
Hess Corp.	22,420	1.4%	-23%	1	n/a	n/a	n/a	n/a	n/a	-23%	n/a	n/a

Table No. FERC-2
Estimation of S&P 500 Cost of Equity- DDM

Company	Market Cap (\$Millions)	VL Indicated Annual Dividend (\$)	IBES Growth Rates				Value Line Growth Rates			Weighted Average		
			Growth Rate	# of Analyst Estimates (Consensus)	Growth Rate Filtered Between 0 and 20%	Dividend Yield for companies with valid GR	Growth Rate	Filtered Between 0 and 20%	Dividend Yield for companies with valid GR	Growth Rate	Filtered Between 0 and 20%	Dividend Yield for companies with valid GR
Market Cap Weighted Average			14.32%	2.9	10.86%	1.95%	10.31%	9.62%	1.93%	13.12%	10.86%	1.94%
Hewlett Packard Ent.	20,678	3.0%	13%	3	13%	3%	7%	7%	3%	11%	11%	3%
Hilton Worldwide Hldgs.	34,566	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
HollyFrontier Corp.	5,985	4.3%	-7%	1	n/a	n/a	-2%	n/a	n/a	-4%	n/a	n/a
Hologic Inc.	18,769	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Home Depot	336,218	2.1%	9%	3	9%	2%	8%	8%	2%	9%	9%	2%
Honeywell Int'l	152,251	1.6%	12%	4	12%	2%	10%	10%	2%	12%	12%	2%
Hormel Foods	25,673	2.1%	5%	3	5%	2%	9%	9%	2%	6%	6%	2%
Horton D.R.	33,517	0.9%	18%	1	18%	1%	11%	11%	1%	14%	14%	1%
Host Hotels & Resorts	12,359	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Howmet Aerospace	13,789	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
HP Inc.	40,447	2.4%	15%	2	15%	2%	12%	12%	2%	14%	14%	2%
Humana Inc.	54,399	0.7%	13%	5	13%	1%	11%	11%	1%	13%	13%	1%
Hunt (J.B.)	17,893	0.7%	22%	2	n/a	n/a	8%	8%	1%	17%	17%	1%
Huntington Bancshs.	16,418	3.6%	-2%	1	n/a	n/a	5%	5%	4%	1%	1%	4%
Huntington Ingalls	8,304	2.2%	1%	1	1%	2%	4%	4%	2%	2%	2%	2%
IDEX Corp.	16,213	0.9%	13%	2	13%	1%	8%	8%	1%	11%	11%	1%
IDEXX Labs.	41,735	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
IHS Markit	39,393	0.8%	11%	2	11%	1%	11%	11%	1%	11%	11%	1%
Illinois Tool Works	69,614	2.0%	13%	4	13%	2%	9%	9%	2%	12%	12%	2%
Illumina Inc.	58,480	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Incyte Corp.	17,891	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ingersoll Rand Inc.	20,990	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Int'l Business Mach.	120,446	4.8%	6%	2	6%	5%	2%	2%	5%	4%	4%	5%
Int'l Flavors & Frag.	14,810	2.2%	10%	1	10%	2%	6%	6%	2%	8%	8%	2%
Int'l Paper	21,597	3.7%	26%	1	n/a	n/a	11%	11%	4%	18%	18%	4%
Intel Corp.	269,108	2.1%	5%	3	5%	2%	7%	7%	2%	6%	6%	2%
Intercontinental Exch.	64,375	1.1%	9%	3	9%	1%	8%	8%	1%	9%	9%	1%
Interpublic Group	11,539	3.6%	7%	2	7%	4%	10%	10%	4%	8%	8%	4%
Intuit Inc.	105,018	0.6%	12%	3	12%	1%	16%	16%	1%	13%	13%	1%
Intuitive Surgical	89,420	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Invesco Ltd.	11,920	2.3%	21%	2	n/a	n/a	3%	3%	2%	15%	15%	2%
IPG Photonics	11,751	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
IQVIA Holdings	38,647	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Iron Mountain	10,861	6.5%	2%	1	2%	7%	8%	8%	7%	5%	5%	7%
Jacobs Engineering	17,093	0.6%	13%	3	13%	1%	13%	13%	1%	13%	13%	1%
Johnson & Johnson	430,649	2.5%	7%	3	7%	3%	10%	10%	3%	8%	8%	3%
Johnson Ctrls. Int'l plc	43,324	1.7%	14%	3	14%	2%	9%	9%	2%	13%	13%	2%
JPMorgan Chase	472,449	2.3%	1%	2	1%	2%	6%	6%	2%	3%	3%	2%
Juniper Networks	8,330	3.2%	8%	1	8%	3%	7%	7%	3%	7%	7%	3%
Kansas City South'n	24,037	0.8%	17%	2	17%	1%	13%	13%	1%	16%	16%	1%
Kellogg	21,896	3.7%	3%	3	3%	4%	3%	3%	4%	3%	3%	4%
KeyCorp	20,042	3.6%	11%	1	11%	4%	5%	5%	4%	8%	8%	4%
Keysight Technologies	26,818	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Kimberly-Clark	46,385	3.3%	3%	2	3%	3%	6%	6%	3%	4%	4%	3%
Kimco Realty	8,391	4.1%	5%	1	5%	4%	-2%	n/a	n/a	1%	1%	4%
Kinder Morgan Inc.	38,334	6.4%	2%	1	2%	6%	19%	19%	6%	10%	10%	6%
KLA Corp.	53,654	1.0%	17%	2	17%	1%	13%	13%	1%	16%	16%	1%
Kraft Heinz Co.	49,703	3.9%	-2%	3	n/a	n/a	2%	2%	4%	-1%	n/a	n/a
Kroger Co.	28,160	2.1%	8%	1	8%	2%	5%	5%	2%	6%	6%	2%
L Brands	17,873	0.9%	14%	2	14%	1%	16%	16%	1%	15%	15%	1%
L3Harris Technologies	45,255	1.9%	10%	3	10%	2%	n/a	n/a	n/a	10%	10%	2%
Laboratory Corp.	24,574	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lam Research	94,341	0.8%	31%	2	n/a	n/a	13%	13%	1%	25%	n/a	n/a
Lamb Weston Holdings	11,390	1.2%	11%	2	11%	1%	3%	3%	1%	8%	8%	1%
Las Vegas Sands	47,458	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lauder (Estee)	107,024	0.7%	21%	1	n/a	n/a	11%	11%	1%	16%	16%	1%
Leggett & Platt	6,167	3.4%	5%	1	5%	3%	10%	10%	3%	8%	8%	3%
Leidos Hldgs.	13,991	1.4%	9%	2	9%	1%	11%	11%	1%	10%	10%	1%
Lennar Corp.	32,401	1.0%	11%	1	11%	1%	7%	7%	1%	9%	9%	1%
Lilly (Eli)	174,406	1.9%	12%	3	12%	2%	9%	9%	2%	12%	12%	2%
Lincoln Nat'l Corp.	12,267	2.7%	30%	3	n/a	n/a	9%	9%	3%	25%	n/a	n/a
Linde plc	147,669	1.5%	12%	2	12%	2%	n/a	n/a	n/a	12%	12%	2%
Live Nation Entertain.	18,820	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
LKQ Corp.	13,337	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Lockheed Martin	106,073	2.7%	5%	3	5%	3%	8%	8%	3%	6%	6%	3%
Loews Corp.	14,370	0.5%	14%	1	14%	1%	13%	13%	1%	14%	14%	1%
Lowe's Cos.	145,640	1.2%	17%	3	17%	1%	16%	16%	1%	17%	17%	1%
LyondellBasell Inds.	34,604	4.0%	-4%	1	n/a	n/a	n/a	n/a	n/a	-4%	n/a	n/a
M&T Bank Corp.	19,788	2.8%	15%	1	15%	3%	4%	4%	3%	10%	10%	3%
Marathon Oil Corp.	8,632	1.1%	-20%	3	n/a	n/a	13%	13%	1%	-11%	n/a	n/a
Marathon Petroleum	35,040	4.4%	-7%	2	n/a	n/a	4%	4%	4%	-3%	n/a	n/a
MarketAxess Holdings	19,801	0.5%	10%	2	10%	1%	15%	15%	1%	12%	12%	1%
Marriott Int'l	48,274	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Marsh & McLennan	62,480	1.5%	11%	2	11%	2%	9%	9%	2%	11%	11%	2%
Martin Marietta	21,007	0.7%	9%	2	9%	1%	6%	6%	1%	8%	8%	1%

Table No. FERC-2
Estimation of S&P 500 Cost of Equity- DDM

Company	Market Cap (\$Millions)	VL Indicated Annual Dividend (\$)	IBES Growth Rates				Value Line Growth Rates			Weighted Average		
			Growth Rate	# of Analyst Estimates (Consensus)	Growth Rate Filtered Between 0 and 20%	Dividend Yield for companies with valid GR	Growth Rate	Growth Rate Filtered and 20%	Dividend Yield for companies with valid GR	Growth Rate	Growth Rate Filtered and 20%	Dividend Yield for companies with valid GR
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	
Market Cap Weighted Average			14.32%	2.9	10.86%	1.95%	10.31%	9.62%	1.93%	13.12%	10.86%	1.94%
Masco Corp.	15,776	1.5%	11%	2	11%	2%	8%	8%	2%	10%	10%	2%
MasterCard Inc.	369,225	0.5%	15%	3	15%	1%	12%	12%	1%	14%	14%	1%
Maxim Integrated	25,554	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
McCormick & Co.	23,809	1.6%	6%	1	6%	2%	6%	6%	2%	6%	6%	2%
McDonald's Corp.	173,388	2.3%	20%	3	n/a	n/a	8%	8%	2%	17%	17%	2%
McKesson Corp.	30,761	0.9%	10%	3	10%	1%	9%	9%	1%	10%	10%	1%
Medtronic plc	162,545	2.0%	9%	5	9%	2%	7%	7%	2%	9%	9%	2%
Merck & Co.	192,601	3.4%	9%	3	9%	3%	8%	8%	3%	9%	9%	3%
MetLife Inc.	55,946	2.9%	5%	3	5%	3%	7%	7%	3%	5%	5%	3%
Mettler-Toledo Int'l	28,163	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MGM Resorts Int'l	20,312	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Microchip Technology	43,003	1.0%	12%	1	12%	1%	9%	9%	1%	10%	10%	1%
Micron Technology	105,329	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Microsoft Corp.	1,885,745	0.9%	17%	4	17%	1%	15%	15%	1%	16%	16%	1%
Mid-America Apartment	16,943	2.8%	7%	1	7%	3%	1%	1%	3%	4%	4%	3%
Mohawk Inds.	13,897	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Molson Coors Beverage	11,208	2.3%	3%	3	3%	2%	41%	n/a	n/a	12%	12%	2%
Mondelez Int'l	84,001	2.3%	9%	3	9%	2%	8%	8%	2%	9%	9%	2%
Monster Beverage	49,763	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Moody's Corp.	57,837	0.8%	9%	3	9%	1%	9%	9%	1%	9%	9%	1%
Morgan Stanley	143,033	1.7%	4%	2	4%	2%	9%	9%	2%	6%	6%	2%
Mosaic Company	11,676	0.9%	7%	1	7%	1%	30%	n/a	n/a	19%	19%	1%
Motorola Solutions	32,174	1.5%	7%	1	7%	2%	7%	7%	2%	7%	7%	2%
MSCI Inc.	36,327	0.8%	14%	2	14%	1%	18%	18%	1%	16%	16%	1%
Nasdaq Inc.	24,869	1.3%	8%	3	8%	1%	5%	5%	1%	7%	7%	1%
NetApp Inc.	16,428	2.8%	8%	3	8%	3%	6%	6%	3%	7%	7%	3%
Netflix Inc.	242,259	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Newell Brands	11,480	3.4%	2%	2	2%	3%	n/a	n/a	n/a	2%	2%	3%
Newmont Corp.	49,608	3.6%	-1%	2	n/a	n/a	15%	15%	4%	4%	4%	4%
News Corp. 'A'	15,607	0.7%	49%	2	n/a	n/a	n/a	n/a	n/a	49%	n/a	n/a
News Corp. 'B'	14,202	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
NextEra Energy	151,724	2.0%	8%	6	8%	2%	11%	11%	2%	9%	9%	2%
Nielsen Hldgs. plc	8,957	0.9%	5%	1	5%	1%	n/a	n/a	n/a	5%	5%	1%
NIKE Inc. 'B'	215,597	0.8%	35%	2	n/a	n/a	27%	n/a	n/a	32%	n/a	n/a
NiSource Inc.	9,436	3.6%	3%	1	3%	4%	13%	13%	4%	8%	8%	4%
Norfolk Southern	68,439	1.5%	14%	4	14%	2%	10%	10%	2%	13%	13%	2%
Northern Trust Corp.	22,234	2.5%	7%	2	7%	3%	5%	5%	3%	6%	6%	3%
Northrop Grumman	55,679	1.7%	5%	2	5%	2%	7%	7%	2%	6%	6%	2%
NortonLifeLock Inc.	12,767	2.3%	22%	1	n/a	n/a	7%	7%	2%	14%	14%	2%
Norwegian Cruise Line	9,883	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
NOV Inc.	5,252	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
NRG Energy	9,314	3.4%	-13%	1	n/a	n/a	n/a	n/a	n/a	-13%	n/a	n/a
Nucor Corp.	24,097	2.0%	9%	1	9%	2%	3%	3%	2%	6%	6%	2%
NVIDIA Corp.	350,759	0.1%	22%	2	n/a	n/a	15%	15%	0%	19%	19%	0%
NVR Inc.	17,654	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
O'Reilly Automotive	36,461	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Occidental Petroleum	23,564	0.3%	-5%	1	n/a	n/a	12%	12%	0%	3%	3%	0%
Old Dominion Freight	28,558	0.3%	19%	2	19%	0%	10%	10%	0%	16%	16%	0%
Omnicom Group	16,693	3.5%	10%	1	10%	4%	6%	6%	4%	8%	8%	4%
ONEOK Inc.	22,751	7.6%	8%	1	8%	8%	10%	10%	8%	9%	9%	8%
Oracle Corp.	214,433	1.7%	12%	3	12%	2%	11%	11%	2%	12%	12%	2%
Otis Worldwide	30,178	1.1%	11%	2	11%	1%	n/a	n/a	n/a	11%	11%	1%
PACCAR Inc.	32,050	3.5%	26%	2	n/a	n/a	4%	4%	4%	18%	18%	4%
Packaging Corp.	13,091	2.9%	13%	1	13%	3%	5%	5%	3%	9%	9%	3%
Parker-Hannifin	40,898	1.1%	15%	3	15%	1%	13%	13%	1%	15%	15%	1%
Paychex Inc.	34,160	2.8%	5%	1	5%	3%	7%	7%	3%	6%	6%	3%
Paycom Software	21,479	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PayPal Holdings	299,563	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Pentair plc	10,213	1.3%	13%	1	13%	1%	11%	11%	1%	12%	12%	1%
People's United Fin'l	7,640	4.0%	14%	1	14%	4%	3%	3%	4%	8%	8%	4%
PepsiCo Inc.	197,906	3.0%	9%	3	9%	3%	6%	6%	3%	8%	8%	3%
PerkinElmer Inc.	14,564	0.2%	20%	1	20%	0%	18%	18%	0%	19%	19%	0%
Perrigo Co. plc	5,379	2.4%	10%	1	10%	2%	-2%	n/a	n/a	4%	4%	2%
Pfizer Inc.	199,911	4.2%	10%	3	10%	4%	10%	10%	4%	10%	10%	4%
Philip Morris Int'l	137,485	5.3%	12%	3	12%	5%	7%	7%	5%	10%	10%	5%
Phillips 66	34,944	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Pinnacle West Capital	9,276	4.1%	7%	2	4%	4%	5%	5%	4%	4%	4%	4%
Pioneer Natural Res.	25,252	1.6%	42%	2	n/a	n/a	11%	11%	2%	52%	n/a	n/a
PNC Financial Serv.	75,578	2.5%	-2%	1	n/a	n/a	3%	3%	3%	1%	1%	3%
Pool Corp.	14,349	0.6%	17%	1	17%	1%	18%	18%	1%	17%	17%	1%
PPG Inds.	35,022	1.4%	13%	2	13%	1%	6%	6%	1%	11%	11%	1%
PPL Corp.	22,298	5.8%	-16%	1	n/a	n/a	3%	3%	6%	-7%	n/a	n/a
Price (T. Rowe) Group	40,057	2.4%	13%	3	13%	2%	8%	8%	2%	12%	12%	2%
Principal Fin'l Group	17,019	3.6%	12%	2	12%	4%	5%	5%	4%	9%	9%	4%
Procter & Gamble	336,719	2.5%	9%	2	9%	3%	7%	7%	3%	8%	8%	3%

Table No. FERC-2
Estimation of S&P 500 Cost of Equity- DDM

Company	Market Cap (\$Millions)	VL Indicated Annual Dividend (\$)	IBES Growth Rates				Value Line Growth Rates			Weighted Average		
			Growth Rate	# of Analyst Estimates (Consensus)	Growth Rate Filtered Between 0 and 20%	Dividend Yield for companies with valid GR	Growth Rate	Growth Rate Filtered Between 0 and 20%	Dividend Yield for companies with valid GR	Growth Rate	Growth Rate Filtered Between 0 and 20%	Dividend Yield for companies with valid GR
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
Market Cap Weighted Average			14.32%	2.9	10.86%	1.95%	10.31%	9.62%	1.93%	13.12%	10.86%	1.94%
Tyson Foods 'A'	27,638	2.3%	4%	2	4%	2%	6%	6%	2%	5%	5%	2%
U.S. Bancorp	85,619	2.9%	6%	1	6%	3%	3%	3%	3%	5%	5%	3%
UDR Inc.	13,235	3.3%	-34%	1	n/a	n/a	6%	6%	3%	-14%	n/a	n/a
Ulta Beauty	17,784	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Under Armour 'A'	10,380	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Under Armour 'C'	8,557	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Union Pacific	148,597	1.7%	13%	3	13%	2%	10%	10%	2%	12%	12%	2%
United Airlines Hldgs.	17,334	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
United Parcel Serv.	148,496	2.3%	12%	3	12%	2%	8%	8%	2%	11%	11%	2%
United Rentals	23,247	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
UnitedHealth Group	346,992	1.3%	13%	6	13%	1%	12%	12%	1%	13%	13%	1%
Universal Health `B'	11,609	0.6%	8%	3	8%	1%	10%	10%	1%	8%	8%	1%
Unum Group	5,694	4.0%	3%	3	3%	4%	3%	3%	4%	3%	3%	4%
V.F. Corp.	32,835	2.3%	10%	3	10%	2%	6%	6%	2%	9%	9%	2%
Valero Energy	30,389	5.6%	-13%	1	n/a	n/a	2%	2%	6%	-6%	n/a	n/a
Varian Medical Sys.	16,098	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ventas Inc.	20,416	3.4%	-1%	1	n/a	n/a	5%	5%	3%	2%	2%	3%
VeriSign Inc.	23,190	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Verisk Analytics	29,294	0.6%	10%	3	10%	1%	12%	12%	1%	10%	10%	1%
Verizon Communic.	244,148	4.4%	3%	5	3%	4%	4%	4%	4%	3%	3%	4%
Vertex Pharmac.	55,284	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ViacomCBS Inc.	27,036	2.4%	-4%	3	n/a	n/a	8%	8%	2%	-1%	n/a	n/a
Visa Inc.	428,015	0.6%	18%	2	18%	1%	16%	16%	1%	17%	17%	1%
Vontier Corp.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Vornado R'Ity Trust	8,789	4.6%	17%	1	17%	5%	-19%	n/a	n/a	-1%	n/a	n/a
Vulcan Materials	22,383	0.8%	15%	2	15%	1%	10%	10%	1%	13%	13%	1%
Wabtec Corp.	14,746	0.6%	7%	1	7%	1%	9%	9%	1%	8%	8%	1%
Walgreens Boots	48,016	3.4%	4%	1	4%	3%	5%	5%	3%	4%	4%	3%
Walmart Inc.	395,774	1.6%	6%	4	6%	2%	8%	8%	2%	7%	7%	2%
Waste Management	55,955	1.7%	13%	1	13%	2%	6%	6%	2%	9%	9%	2%
Waters Corp.	18,381	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
WEC Energy Group	29,468	3.0%	6%	3	6%	3%	7%	7%	3%	6%	6%	3%
Wells Fargo	165,259	1.0%	113%	1	n/a	n/a	n/a	n/a	n/a	113%	n/a	n/a
Welltower Inc.	31,389	3.3%	13%	1	13%	3%	n/a	n/a	n/a	13%	13%	3%
West Pharmac. Svcs.	21,370	0.2%	23%	1	n/a	n/a	16%	16%	0%	19%	19%	0%
Western Digital	22,099	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Western Union	10,386	3.6%	9%	2	9%	4%	6%	6%	4%	8%	8%	4%
WestRock Co.	13,900	1.5%	24%	2	n/a	n/a	7%	7%	2%	18%	18%	2%
Weyerhaeuser Co.	27,526	1.8%	5%	1	5%	2%	21%	n/a	n/a	13%	13%	2%
Whirlpool Corp.	14,283	2.1%	8%	1	8%	2%	7%	7%	2%	7%	7%	2%
Williams Cos.	29,258	7.0%	5%	1	5%	7%	12%	12%	7%	9%	9%	7%
Willis Towers Wat. plc	30,672	1.2%	6%	1	6%	1%	12%	12%	1%	9%	9%	1%
Wynn Resorts	14,315	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Xcel Energy Inc.	36,573	2.7%	6%	1	6%	3%	6%	6%	3%	6%	6%	3%
Xerox Holdings	4,966	4.0%	-18%	1	n/a	n/a	9%	9%	4%	-5%	n/a	n/a
Xilinx Inc.	32,288	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Xylem Inc.	19,112	1.0%	18%	1	18%	1%	11%	11%	1%	14%	14%	1%
Yum! Brands	34,215	1.7%	13%	3	13%	2%	10%	10%	2%	12%	12%	2%
Zebra Techn. 'A'	25,946	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zimmer Biomet Hldgs.	33,738	0.6%	11%	4	11%	1%	6%	6%	1%	10%	10%	1%
Zions Bancorp.	9,115	2.4%	-32%	1	n/a	n/a	7%	7%	2%	-13%	n/a	n/a
Zoetis Inc.	75,043	0.6%	11%	6	11%	1%	10%	10%	1%	11%	11%	1%

Sources and Notes:

[1] and [7]: Value Line Investment Analyzer as of 4/7/2021.

[3]: Thomson Reuters as of 4/30/2021.

[6],[9]: Excludes non-dividend paying companies.