BEFORE THE WASHINGTON

UTILITIES & TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Complainant,

v.

PACIFICORP d/b/a PACIFIC POWER & LIGHT COMPANY,

Respondent.

DOCKETS UE-230172 AND UE-210852 (CONSOLIDATED)

CROSS-ANSWERING TESTIMONY OF J. RANDALL WOOLRIDGE, Ph.D. ON BEHALF OF THE WASHINGTON STATE OFFICE OF THE ATTORNEY GENERAL PUBLIC COUNSEL UNIT

EXHIBIT JRW-12T

October 27, 2023

CROSS-ASNWERING TESTIMONY OF
J. RANDALL WOOLRIDGE, Ph.D.

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I. INTRODUCTION AND OVERVIEW

Q. Please state your name and business address.

A. My name is J. Randall Woolridge, and my business address is 120 Haymaker Circle, State College, PA 16801. I am a Professor of Finance, and the Goldman, Sachs & Co. and Frank P. Smeal Endowed University Fellow in Business Administration at the University Park Campus of Pennsylvania State University.

Q. Have you previously provided testimony in this proceeding?

A. Yes, I provided response testimony for the Public Counsel Unit of the Washington State Attorney General's Office (Public Counsel) on the overall fair rate of return or cost of capital for the regulated electric utility service of PacifiCorp d/b/a Pacific Power and Light Company (PacifiCorp or the Company). I also provided an evaluation of PacifiCorp's rate of return testimony in this proceeding.

Q. What is the purpose of your cross-answering testimony?

A. My cross-answering testimony addresses the testimony and return on equity (ROE) recommendation of Commission Staff (Staff) witness, David C. Parcell. Specifically, my testimony addresses flaws in Parcell's analysis that resulted in erroneous recommendations.

II. PARCELL RATE OF RETURN RECOMMENDATION

Q. Please summarize Staff Witness Parcell's testimony.

A. Parcell's testimony includes a discussion of the following topics: (1) the economic and legal principles of the cost of capital for public utilities; (2) a review of general economic conditions; (3) a summary of PacifiCorp's operations; (4) PacifiCorp's capital structure and

cost of debt; (5) proxy group selection; (6) discounted cash flow (DCF) model; (7) Capital Asset Pricing Model (CAPM); (8) Comparable Earnings (CE) analysis; (9) the risk premium (RP) approach; (10) ROE recommendation; and (11) the total proposed cost of capital.

Q. What is Staff witness Parcell's cost of capital recommendation?

A. Parcell's cost of capital recommendation is summarized in Table 1, below.[1]

Table 1
Staff's Cost of Capital Position

Item	Percent	Cost	Weighted Cost
December 31, 2024			
Short-Term Debt	0.76%	3.90%[2]	0.03%
Long-Term Debt	50.13%	4.77%	2.39%
Preferred Stock	0.01%	6.75%	0.00%
Common Equity	49.10%	9.50%	4.66%
Total	100.00%		7.09%

Parcell's recommendation employs a capital structure with a common equity ratio of 49.10 percent, includes short-term debt (0.76 percent at a cost rate of 3.90 percent), long-term debt (50.13 percent at a cost rate of 4.77 percent), preferred stock (0.01 percent at a cost rate of 6.75 percent) and uses a common equity cost rate in the range of 9.50 percent. The overall cost of capital recommendation is 7.09 percent.

Q. Please summarize your assessment of Parcell's conclusions in his capital structure recommendation.

A. I agree that PacifiCorp's proposed capital structure includes an inflated common equity ratio. However, Parcell's ROE recommendation does not accurately reflect the results of the ROE studies. Parcell has distorted his DCF results and, therefore, reports a higher

[1] Direct Test. of David C. Parcell, Exh. DCP-1T at 2:5–9.

recommended ROE than is supported by his ROE studies. As discussed below, in this process Parcell has distorted the DCF analysis by abandoning traditional statistical measures of central tendency like the mean and median. Parcell has also relied excessively on the overly optimistic and upwardly biased EPS growth rate projections of Wall Street analysts. Parcell also makes an elementary statistical error that he highlights and recognizes in testimony, but then goes ahead and commits it. In Parcell's CAPM and alternative risk premium analyses, Parcell has employed inflated equity risk premiums which produce high estimates of the Company's cost of equity capital.

Q. What are the reported results of staff witness Parcell's equity cost rate studies for PacifiCorp?

A. Parcell's reported equity cost rate results for his ROE studies are presented in Table 2.[2]

Table 2
Reported Cost of Equity Capital Position

Methodology	Range
Discounted Cash Flow ("DCF")	9.6%-9.9% (9.75% mid-point)
Capital Asset Pricing Model ("CAPM")	9.7%-9.8% (9.75% mid-point)
Comparable Earnings ("CE")	9.0%-9.5% (9.25% mid-point)
Risk Premium ("RP")	10.0%-10.5% (10.25% mid-point)

Based on these results, Parcell recommends a ROE of 9.50 percent for PacifiCorp.

A. Capital Structure

Q. What is Parcell's capital structure recommendation for PacifiCorp?

A. Mr. Parcell recommends a capital structure with a common equity ratio of 49.10 percent. Parcell explains his recommendation on pages 30–31 of his testimony:[3]

[2] Parcell, Exh. DCP-1T at 5:4–5.
[3] *Id.* at 37:1–10.

> I recommend that the Commission use the same capital structure ratios adopted in prior litigated cases, which is 49.1 percent common equity. This 49.1 percent common equity ratio is similar to that of the industry-wide electric and combination electric utilities I just cited. I note that the Commission again evaluated and recognized the appropriateness of this capital structure in PacifiCorp's last litigated general rate proceeding, which was decided in 2016.

Parcell also cites the Washington Utilities and Transportation Commission's (Commission's) recent policy on capital structure, and specifically the fact that the Commission has noted that the appropriate capital structure can either be the Company's historical capital structure, the projected capital structure, or a hypothetical capital structure. In the end, Parcell concludes that a capital structure with a common equity ratio of 49.10 percent, which has been approved by the Commission in the Company's recent rate cases, is appropriate in this case.

Q. Do you agree with Parcell's capital structure recommendation?

A. Yes. We both agree that a capital structure with a common equity ratio of 49.1 percent is appropriate for PacifiCorp.

B. DCF Approach

Q. Please review Parcell's DCF results.

A. Initially, I agree with Parcell when he states: "The DCF model is one of the oldest and most commonly-used models for estimating the ROE for public utilities;"[4] As shown in Table 2, Mr. Parcell states that his DCF results are in the range of 9.6 percent to 9.9 percent for his group.

[4] Parcell, Exh DCP-1T at 33:11–12.

Table 3
Staff's DCF Result[5]

Proxy Group	Mean	Median	Mean Low[43]	Mean High[44]	Median Low[45]	Median High[46]
	8.4%	8.4%	7.4%	9.6%	7.5%	9.9%

Q. How has Parcell distorted his reported DCF ROE results?

A. Parcell has distorted his DCF results by using non-traditional statistical measures. Parcell concludes that his DCF results are in the range of 9.60 percent to 9.90 percent. There are several issues with his analyses.

(1) Parcell reports a DCF ROE result of 9.60 percent to 9.90 percent, with a midpoint of 9.75 percent. These are Parcell's "Mean-High" and "Median-High" DCF results. These "High" results means that Parcell uses the average dividend yield plus the highest DCF growth rate. As shown in Table 3 above, the big error with using the "High" results is that both the mean and median DCF results are only 8.40 percent. Parcell provides no explanation as to why he chose the two results that use only one projected EPS growth rate and ignored his mean and median DCF result of 8.40 percent.

(2) Parcell has ignored the fact that the long-term EPS growth rates of Wall Street analysts are overly optimistic and upwardly biased. As I noted in my initial testimony, it is well known that Wall Street securities analysts produce overly optimistic and upwardly biased long-term EPS growth-rate forecasts. This has

[5] *Id.* at 36:13–12.

been demonstrated in a number of academic studies.[6] Hence, using these growth rates as a DCF growth rate will provide an overstated equity cost rate.

Furthermore, I provided the results of a study I performed on the accuracy of analysts' EPS growth rates for electric utilities and gas distribution companies over the 1985 to 2022 time period. In the study, I used the utilities listed in the electric utilities and gas distribution companies covered by *Value Line*. I collected the three- to five-year projected EPS growth rate from I/B/E/S for each utility and compared that growth rate to the utility's actual subsequent three-to-five-year EPS growth rate. As shown in Figure 1, the mean forecasted EPS growth rate (depicted in the red line) is consistently greater than the achieved actual EPS growth rate over the time period, with the exception of few short periods. Over the entire period, the mean forecasted EPS growth rate is over 200 basis points above the actual EPS growth rate. As such, the projected EPS growth rates for electric utilities are overly optimistic and upwardly based.

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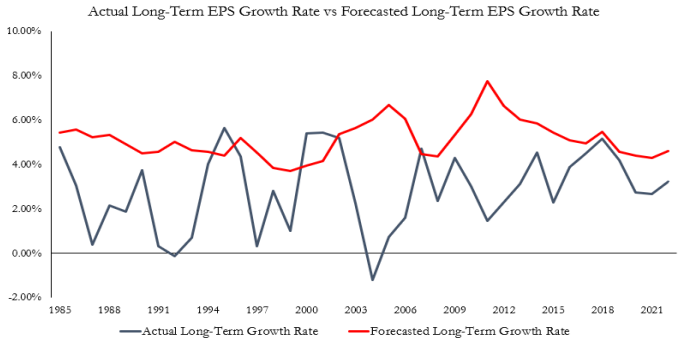
[6] The studies that demonstrate analysts' long-term EPS forecasts are overly-optimistic and upwardly biased include: R.D. Harris, *The Accuracy, Bias, and Efficiency of Analysts' Long Run Earnings Growth Forecasts*, J. OF BUS. FIN. & ACCT., at 725–755 (June/July 1999); P. DeChow, A. Hutton, and R. Sloan, *The Relation Between Analysts' Forecasts of Long-Term Earnings Growth and Stock Price Performance Following Equity Offerings*, CONTEMPORARY ACCT. RSCH. (2000)*;* K. Chan, L., Karceski, J., & Lakonishok, J., *The Level and Persistence of Growth Rates*, J. OF FIN.*,* at 643−684, (2003); M. Lacina, B. Lee, and Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* EMERALD GRP. PUBL'N LTD., at 77–101 (Apr. 1, 2010). Goedhart, Rishi Raj, and Abhishek Saxena, *Equity Analysts, Still Too Bullish*, MCKINSEY ON FIN., at 14–17 (2010).

Figure 1 Mean Forecasted vs. Actual Long-Term EPS Growth Rates Electric Utilities and Gas Distribution Companies 1985–2022



Data Source: S&P Global Market Intelligence, Capital IQ, I/B/E/S, 2023.

In my initial testimony, I also cited the results of a study by Szakmary, Conover, and Lancaster (2008) ("SCL") that evaluated the accuracy of *Value Line*'s three- to five-year EPS growth rate forecasts using companies in the Dow Jones Industrial Average over a 30-year time period. The study found these forecasted EPS growth rates to be significantly higher than the EPS growth rates that these companies subsequently achieved.[7]

(3) Mr. Parcell also made an elementary statistical mistake that he even recognizes as an error, but he still commits it. In discussing the DCF results, Parcell states: "I note that the individual DCF calculations shown on Exh. DCP-9 should not be interpreted to reflect the expected cost of capital for individual companies; rather, the individual values shown should be interpreted as alternative information considered by investors."[8] This observation is illustrative of the statistical error that Mr. Parcell is making by only using the highest DCF growth rates in calculating the Mean-High and Median-High DCF equity cost rates. The problem is that the

[7] Szakmary, A., Conover, C., & Lancaster, C., *An Examination of* Value Line*'s Long-Term Projections*, J. BANKING & FIN., at 820–833 (May 2008).
[8] Parcell, Exh. DCP-1T at 36:15–18.

individual DCF cost of equity estimates are measured with error, most likely due to the growth rate estimates. In statistics, this is the well-known errors-in-variables (EIV) problem. The EIV problem results from incorrectly measured dependent variables (in this case, the DCF equity cost rate estimates) in a regression model. Errors in measuring the dependent variable (the growth rates) are incorporated in the error term in the regression, which cause no problems. However, when an independent variable is measured with error, this error appears in both the regressor variable and in the error term of the regression model. The typical way to address this issue is to group the data to mitigate the EIV problem. And that is why, in estimating an equity cost rate, rate of return analysts use a proxy group and employ the means or medians for the entire group. The presumption in using such an approach is that the measurement errors for the individual companies in the group will average out, and therefore the results of the entire group are a meaningful measure for the cost of equity capital, but not the individual company results.

C. CAPM Approach

Q. Please review Mr. Parcell's CAPM results.

A. Mr. Parcell's CAPM results are presented in Table 5 for his proxy group.[9]

Table 4
Staff's CAPM Results

	Mean	Median
Proxy Group	9.7%	9.8%

[9] Parcell, Exh. DCP-1T at 42:10–11.

In his CAPM, Parcell used a risk-free rate of 4.10 percent, betas from *Value Line*, and a market risk premium of 6.40 percent. The 6.40 percent is the average of: (1) the difference between the mean stock and bond income returns over the 1926–2022 time period (6.40 percent); (2) the difference between the median stock and bond income returns over the 1926-2022 time period (4.90 percent); and (3) the difference between the mean annual ROE for the S&P 500 and the 20-year Treasury yield over the 1978–2022 time period (7.80 percent).

Q. Please discuss the issues of using historic returns to estimate an equity risk premium.

A. Parcell's three equity risk premium approaches use historical stock and bond returns/yields. It is well-known and well-studied that using historical returns to measure an *ex ante* equity risk premium is erroneous and overstates the true market or equity risk premium.[10] This approach can produce differing results depending on several factors, including the measure of central tendency used, the time period evaluated, and the stock-market index employed.

In addition, there are a myriad of empirical problems in the approach, which result in historical market returns producing inflated estimates of expected risk premiums. Among the errors are the U.S. stock market survivorship bias (the "Peso Problem"); the company survivorship bias (only successful companies survive – poor companies do not

[10] These issues are addressed in a number of studies, including: Aswath Damodaran, *Equity Risk Premiums (ERP): Determinants, Estimation and Implications – The 2017 Edition*, at 30–44 (Univ. of N.Y. Working Paper, 2017); *See* Richard Roll, *On Computing Mean Returns and the Small Firm Premium*, J. OF FIN. ECON., at 371–386 (1983); Jay Ritter, *The Biggest Mistakes We Teach,* J. OF FIN. RSCH. (2002); Bradford Cornell, *The Equity Risk Premium,* at 36–78 (N.Y., John Wiley & Sons, 1999); and Marc Zenner, Scott Hill, John Clark, and Nishant Mago, *The Most Important Number in Finance*, JP MORGAN, at 6 (May. 2008).

survive); the measurement of central tendency (the arithmetic versus geometric mean, where geometric means tend to better capture negative returns and thus investor loss); the historical time horizon used; the change in risk and required return over time; the downward bias in bond historical returns; and unattainable return bias (the return computation procedure presumes monthly portfolio rebalancing).

The bottom line is that there are a number of empirical problems in using historical stock and bond returns to measure an expected equity risk premium.

Q. What source did Mr. Parcell use for his historical stock and bond returns?

A. He uses the historical stock and bond return series that are compiled and published by Kroll, a subsidiary of the investment advisory firm Duff & Phelps.

Q. Is Duff & Phelps a respected investment firm?

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

Q. What is Duff & Phelps' opinion regarding the use of historical stock market returns to estimate an equity risk premium?

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

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

> broad range of economic information and multiple ERP estimation methodologies to arrive at its recommendation.[11]

Q. Does Duff & Phelps use a historic stock market return figure as its recommended equity or market risk premium?

A. No.

Q. What does Duff & Phelps say about the expected equity risk premium and historical returns?

A. Duff & Phelps provides details about its perspective on historical returns versus its estimation of the ERP:

> ERP is a forward-looking concept. It is an expectation as of the valuation date for which no market quotes are directly observable. <u>While an analyst can observe premiums realized over time by referring to historical data (i.e., realized return approach or ex post approach), such realized premium data do not represent the ERP expected in prior periods, nor do they represent the current ERP estimate.</u> Rather, realized premiums represent, at best, only a sample from prior periods of what may have then been the expected ERP. To the extent that realized premiums on the average equate to expected premiums in prior periods, such samples may be representative of current expectations. But to the extent that prior events that are not expected to recur caused realized returns to differ from prior expectations, such samples should be adjusted to remove the effects of these nonrecurring events. Such adjustments are needed to improve the predictive power of the sample.[12]

Q. Does Duff & Phelps publish its recommended equity or market risk premium?

A. Yes, but it is now distributed by its subsidiary Kroll. In fact, on the same site that Kroll sells their annual valuation handbook used by Mr. Parcell, Duff & Phelps publishes its

[11] Duff & Phelps, CLIENT ALERT, at 37 (Mar. 16, 2016) (emphasis supplied).
[12] *Id.* at 35 (emphasis added).

recommended estimate of the equity- or market-risk premium.[13] Page 7 of Exhibit JRW-6 of my testimony shows Duff & Phelps' equity-risk-premium recommendations.

As noted above, Kroll is currently recommending an equity of market risk premium of 5.50 percent. This is below Mr. Parcell's equity risk premiums using historic data.

Q. Do you agree that an equity risk premium of 5.50 percent is reasonable?

A. Yes.

D. Alternative Risk Premium Approach

Q. Please review Mr. Parcell's risk premium (RP) results.

A. In Mr. Parcell's alternative risk premium approach, he makes modifications to Ms. Bulkley's RP study.

Q. How has Mr. Parcell modified Ms. Bulkley's RP study?

A. Mr. Parcell makes three modifications to Ms. Bulkley's approach: (1) he uses the yield on A-rated utility bonds and not Treasury bonds; (2) he limits the time period to the last 10 years; and (3) to estimate a risk premium, instead of using a regression, he computes the average annual difference between quarterly average electric utility company authorized ROEs and the yields on A-rated utility bonds over the 2012–2021 time period. The results of this analysis are displayed in Table 5, below.

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[13] *Kroll Cost of Capital Inputs*, KROLL (Sept. 18 2023) https://www.kroll.com/en/insights/publications/cost-of-capital.

Table 5
Staff's Risk Premium Study Results[14]

Year	A-Rated Bonds[63]	Avg ROE	Risk Premiums
2012	4.52%	10.02%	4.98-5.89%
2013	4.21%	9.82%	5.34-5.74%
2014	4.48%	9.76%	5.17-5.48%
2015	4.10%	9.60%	5.32-5.60%
2016	4.10%	9.60%	5.36-5.67%
2017	3.98%	9.68%	5.63-5.75%
2018	4.06%	9.56%	5.31-5.60%
2019	4.12%	9.65%	5.34-5.88%
2020	3.36%	9.39%	5.62-6.37%
2021	3.04%	9.39%	6.28-6.41%
2022	3.75%	9.52%	4.80-6.41%
2012-2022 11-Year Avg.	3.97%	9.64%	5.62-5.68%
2012-2019 8-Year Avg.	4.19%	9.71%	5.43-5.59%

Q. How has Mr. Parcell used this data to arrive at a recommended equity cost rate using the RP model?

A. Table 5 provides the data and estimates used by Mr. Parcell. He does not use his actual figures, but instead he made subjective adjustments to the risk premium data.

Q. What are the errors in Mr. Parcell's alternative risk premium approach?

A. There are several problems with this approach for calculating the risk premium. First, Mr. Parcell's alterative risk premium approach is a model of his own making and interpretation. Mr. Parcell uses his own judgement as to the appropriate risk premium to be added to the utility A-rated utility yields.[15]

Second, Parcell's risk premium approach is a gauge of *commission* behavior and not *investor* behavior. Capital costs are determined in the marketplace through the

[14] Parcell, Exh. DCP-1T at 54:15–23.
[15] *Id.* at 56:3–11.

financial decisions of investors and are reflected in such fundamental factors as dividend yields, expected growth rates, interest rates, and investors' assessment of the risk and expected return of different investments. Regulatory commissions evaluate capital market data in setting authorized ROEs, but also consider other utility- and rate case-specific information in setting ROEs. As such, Parcell's approach and results reflect other factors such as capital structure, credit ratings and other risk measures, service territory, capital expenditures, energy supply issues, rate design, investment and expense trackers, and other factors used by utility commissions in determining an appropriate ROE in addition to capital costs. This may especially be true when the authorized ROE data includes the results of rate cases that are settled and not fully litigated.

Third, since the stocks of electric utilities have been selling above book value for the last decade, it is obvious that the authorized ROEs of state utility commissions are above the returns that investors require.

Fourth, the ROE derived from this approach is dependent on the authorized ROEs from state utility commissions. As discussed in my initial testimony, Werner and Jarvis (2022), demonstrated that authorized ROE over the past four decades have not declined in line with capital costs and therefore past authorized ROEs have overstated the actual cost of equity capital.[16]

Q. Please summarize your assessment of Parcell's testimony, ROE results, and recommendation.

[16] Woolridge, Exh. JRW-1T at 20: 15–22: 19.

A. First, I agree with Mr. Parcell's position on economic conditions and capital structure. However, I believe Mr. Parcell's ROE recommendation is excessive for two reasons: (1) Mr. Parcell has misstated the results of his DCF analysis by reporting DCF results that are above the actual ROEs indicated by the data; and (2) Mr. Parcell's CAPM and risk premium results produce inflated ROEs due to excessive equity risk premiums. In summary, the Commission should recognize the errors and distortions in Mr. Parcell's rate of return recommendation.

Q. Does this conclude your testimony?

A. Yes.