

**I&E Statement No. 2-SR  
Witness: Christopher M. Henkel**

**PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**v.**

**COLUMBIA GAS OF PENNSYLVANIA, INC.**

**Docket No. R-2018-2647577**

**Surrebuttal Testimony**

**of**

**Christopher M. Henkel**

**Bureau of Investigation & Enforcement**

**Concerning:**

**Rate of Return**

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## **INTRODUCTION OF WITNESS**

**Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

A. My name is Christopher M. Henkel. My business address is Pennsylvania Public Utility Commission, P.O. Box 3265, Harrisburg, PA 17105-3265.

**Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

A. I am employed by the Pennsylvania Public Utility Commission (Commission) in the Bureau of Investigation & Enforcement (I&E) as a Fixed Utility Financial Analyst.

**Q. ARE YOU THE SAME CHRISTOPHER HENKEL WHO IS RESPONSIBLE FOR THE DIRECT TESTIMONY CONTAINED IN I&E STATEMENT NO. 2 AND THE SCHEDULES IN I&E EXHIBIT NO. 2?**

A. Yes.

**Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY?**

A. The purpose of my surrebuttal testimony is to address statements made by Columbia Gas of Pennsylvania, Inc. (Columbia or Company) witness Paul R. Moul in his rebuttal testimony (Columbia Statement No. 8-R) regarding rate of return topics including the cost of common equity and the overall fair rate of return, which will be applied to the Company's rate base. In addition, I will

address the management effectiveness claim discussed by Mr. Moul and Company witness Michael A. Huwar (Columbia Statement No. 1-R).

**SUMMARY OF MR. MOUL’S REBUTTAL TESTIMONY**

**Q. SUMMARIZE MR. MOUL’S RESPONSE IN REBUTTAL TESTIMONY TO YOUR RECOMMENDATIONS MADE IN DIRECT TESTIMONY.**

A. Mr. Moul disputes my response to the effects of the Tax Cuts and Jobs Act (TCJA) of 2018, recommendations regarding choice of proxy group companies, the use of methods other than the Discounted Cash Flow (DCF) to calculate cost of equity, the DCF growth rate, disallowance of his DCF and CAPM leverage adjustments, the Capital Asset Pricing Model (CAPM) risk-free rate, the use of a geometric mean, disallowance of his size adjustment, my disagreement with his use of the Risk Premium and Comparable Earnings methods, and my recommended disallowance of additional basis points for management effectiveness.

**TAX CUTS AND JOBS ACT (TCJA)**

**Q. WHAT IS MR. MOUL’S REBUTTAL TESTIMONY REGARDING YOUR RESPONSE TO THE EFFECTS OF THE TCJA ON THE RISK PROFILE OF COLUMBIA?**

A. Mr. Moul opines that the I&E recommended return on equity is inappropriately low, considering the increased risk to Columbia fostered by the TCJA. He asserts that the lower federal corporate income tax rate resulting from the TCJA will reduce Columbia's credit quality, increasing its risk. Mr. Moul points to the forecasted reduction in Columbia's interest coverage ratio, from 5.13 to 4.40 times, to support his assertion.<sup>1</sup> He also claims that the credit rating agencies are very concerned about the cash flow implications of the TCJA.<sup>2</sup>

**Q. DO YOU AGREE WITH MR. MOUL'S ASSERTION THAT I&E IS RECOMMENDING AN INAPPROPRIATELY LOW RETURN ON EQUITY, CONSIDERING THE IMPACT OF THE TCJA ON THE RISK PROFILE OF COLUMBIA IN THE INSTANT CASE?**

A. No. I recognize that credit agencies are monitoring regulated utilities for harmful impacts to cash flow resulting from the TCJA. In January 2018, Moody's reduced the outlook of 25 regulated utilities, largely because of effects from the TCJA.<sup>3</sup> However, in the article Mr. Moul provides, Jim Hempstead, a Managing Director at Moody's, said the reduced outlook applies to companies that already had limited cushion in their rating for deterioration in financial performance.<sup>4</sup> The same article states that the vast majority of U.S. regulated utilities, however, continue to

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<sup>1</sup> Columbia Statement No. 8-R, page 4, lines 3-10.

<sup>2</sup> Columbia Statement No. 8-R, page 5, lines 1-2.

<sup>3</sup> Columbia Exhibit PRM-1R, page 1, paragraph 1.

<sup>4</sup> Columbia Exhibit PRM-1R, page 1, paragraph 2.

maintain stable rating outlooks and have sufficient cushion within projected financial metrics for their current ratings.<sup>5</sup> As stated previously in my direct testimony, and, as Mr. Moul points out, Columbia's interest coverage ratio falls within the upper range of Mr. Moul's proxy group, indicating a cushion exists for reduced cash flow.<sup>6</sup>

### **PROXY GROUP**

**Q. WHAT IS MR. MOUL'S REBUTTAL TESTIMONY REGARDING YOUR PROXY GROUP?**

A. Mr. Moul opines that using the percentage of revenues from utility operations as a criterion for a proxy group is incorrect and that the percentage of natural gas assets to total assets is a more appropriate criterion because the margins of utility-based activities are not comparable to those of non-utility business segments.<sup>7</sup>

**Q. DO YOU AGREE WITH MR. MOUL'S ASSERTION THAT THE PERCENTAGE OF NATURAL GAS UTILITY ASSETS TO TOTAL ASSETS IS A MORE APPROPRIATE CRITERION?**

A. No. Calculating the percentage of utility assets that make up the total assets of a company is not always a reliable way of determining if a business is primarily a regulated utility. Assets are accounted for at the original cost minus depreciation,

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<sup>5</sup> Columbia Exhibit PRM-1R, page 1, paragraph 6.

<sup>6</sup> I&E Statement No. 2, pp. 38-39.

<sup>7</sup> Columbia Statement No. 8-R, p. 10, lines 10-16.

which means that the value of an asset depends on its age. Therefore, it is possible for the regulated utility segment of a company to predominantly have assets that are depreciated, causing the level of utility operations for a company to be understated by the utility assets to total assets ratio. In other words, a parent company can have most of its utility assets depreciated, but still do more business as a utility than as another business.

Another reason that the percentage of utility business is not always accurately represented by using the percentage of utility assets to total assets is that there are differences between businesses in the amount of capital needed. A utility with all new equipment may need a large level of assets to produce a small level of cash flow while another business may need only a small amount of assets to produce a large level of cash flow. Therefore, comparing the assets of a natural gas utility segment to the total assets of a company is not an appropriate criterion as it could be misleading.

**Q. MR. MOUL ARGUES THAT USING THE PERCENTAGE OF REVENUES RECEIVED FROM UTILITY OPERATIONS AS A CRITERION TO BE SELECTED FOR THE PROXY GROUP IS NOT APPROPRIATE. DO YOU AGREE?**

A. No. Revenues represent the percentage of cash flow a company receives from each business line related to providing a good or service. If fewer than 50% of a

company's revenues come from the regulated natural gas business sector, it is not comparable to the subject utility. Therefore, it must be rejected from the proxy group because it does not provide a similar level of regulated business and likely does not share the same level of risk. Mr. Moul argues that margins on other business segments within proxy group companies are generally dissimilar to the utility business. However, if more than 50% of revenues for a particular company flow from the regulated natural gas sector, that company is still operating primarily as a natural gas utility regardless of the margins it realizes from other sectors of its operations, and, more importantly, that company is similar in terms of risk to the subject utility in this proceeding.

**Q. WHICH OF THE THREE COMPANIES THAT MR. MOUL USES IN HIS PROXY GROUP AND THAT YOU DO NOT USE IN YOURS WERE EXCLUDED FOR FAILING TO MEET THE CRITERION THAT 50% OR MORE REVENUES MUST BE GENERATED FROM THE NATURAL GAS UTILITY INDUSTRY?**

A. Chesapeake Utilities Corp., New Jersey Resources Corp., and South Jersey Industries, Inc. were excluded for not meeting my criterion that 50% or more of revenues must be generated from regulated natural gas utility operations.<sup>8</sup>

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<sup>8</sup> I&E Statement No. 2, p. 8, lines 12-15.

**Q. HAVE YOU CHANGED YOUR PROXY GROUP AS A RESULT OF MR. MOUL'S REBUTTAL TESTIMONY?**

A. No. For the reasons discussed above, the percentage of revenue from regulated utility operations is an appropriate criterion. Chesapeake Utilities Corp., New Jersey Resources Corp., and South Jersey Industries, Inc. have an insufficient percentage of regulated natural gas revenues; they should not be included in the proxy group and compared to Columbia.

**DISCOUNTED CASH FLOW**

**Q. SUMMARIZE MR. MOUL'S REBUTTAL TESTIMONY REGARDING YOUR DCF ANALYSIS.**

A. Mr. Moul agrees that the results of a DCF analysis should be given weight toward the calculation of cost of equity but disagrees with my approach. Mr. Moul also disagrees with my DCF results based on the outcomes of certain individual companies and he disputes the growth rate I used. He further disagrees with my recommendation to reject his leverage adjustment.<sup>9</sup>

**EXCLUSIVE USE OF THE DCF**

**Q. SUMMARIZE MR. MOUL'S REBUTTAL TESTIMONY REGARDING YOUR USE OF THE DCF.**

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<sup>9</sup> Columbia Statement No. 8-R, pp. 10-16.

A. Mr. Moul claims that the use of more than one method provides a superior foundation for the cost of equity determination because this type of analysis more effectively captures the multiplicity of factors that motivate investors to devote capital as an investment in an enterprise.<sup>10</sup>

**Q. WERE ANY METHODS OTHER THAN THE DCF EMPLOYED IN YOUR ANALYSIS?**

A. Yes. Although my recommendation was based primarily on the results of my DCF analysis, I also used the CAPM as a comparison. The result of my DCF analysis is 9.72%,<sup>11</sup> which is slightly above the results of my CAPM range of 8.98% (historic) to 9.47% (forecasted).<sup>12</sup> For the reasons discussed in my direct testimony, the DCF method is the most reliable.<sup>13</sup> I have considered the fact that no method can perfectly predict the return on equity which is why I also use the CAPM as a comparison to the DCF. Even though no single method captures every factor that influences investors, the calculation of the cost of equity is not made more reliable or accurate by placing weight on the results of methods less reliable than the DCF model. I agree with Mr. Moul that a proper determination of the cost of equity should not consider only a single method. Where we disagree is to what extent one should rely on each particular method.

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<sup>10</sup> Columbia Statement No. 8-R, p. 10, lines 23-25.

<sup>11</sup> I&E Exhibit No. 2, Schedule 4.

<sup>12</sup> I&E Exhibit No. 2, Schedules 12 and 13.

<sup>13</sup> I&E Statement No. 2, pp. 17-18.

## **EVALUATING THE DCF BASED ON INDIVIDUAL RESULTS**

### **Q. SUMMARIZE MR. MOUL’S RESPONSE IN REBUTTAL TESTIMONY REGARDING THE RESULTS OF YOUR DCF?**

A. Mr. Moul explains that when some results are unreasonable on their face, the application or the reliability of that method must be questioned. He points out that investors expect a higher return on equity than debt because of the higher risk associated with common equity.<sup>14</sup> However, Mr. Moul inappropriately uses the 6.50% market premium from his Risk Premium (RP) method as a valuation for the increased return that investors expect on Columbia’s common equity in comparison to Baa-rated public utility bonds.<sup>15</sup> He claims that the DCF results of two companies in my proxy group “fail the reasonableness test” because their resulting cost of equity does not cover his requisite 650 basis point spread between cost of debt and cost of equity.<sup>16</sup>

### **Q. WHAT IS YOUR RESPONSE TO MR. MOUL’S ATTEMPT TO DISAGGREGATE YOUR RESULTS?**

A. Mr. Moul’s attempt to remove individual companies from my proxy group creates a biased overall result that overstates Columbia’s cost of equity and tampers with market-based information. I chose criteria for my proxy group with the intention

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<sup>14</sup> Columbia Statement No. 8-R, p. 12, lines 10-16.

<sup>15</sup> Columbia Statement No. 8-R, p. 12, lines 16-21.

<sup>16</sup> Columbia Statement No. 8-R, p. 12, lines 12-14.

of creating a group that is comparable to Columbia, and then used the companies that fit my criteria within a DCF model to calculate Columbia's cost of equity.

Mr. Moul selected the two companies in my proxy group with the lowest DCF results, Northwest Natural Gas and Southwest Gas, and implied they should be removed because their DCF results are not higher than the range of 10.93% to 11.21% (six-month average yield of Baa-rated public utility bonds, 4.43% to 4.71%; *plus* the 6.50 % market premium from Mr. Moul's RP method). However, he inconsistently keeps the same two companies in his own proxy group analysis, even though his own DCF results produce an expected ROE yield that fails to cover his prescribed 6.50% spread:<sup>17</sup>

<u>Company</u>	<u>2017 Avg. Monthly Dividend Yield</u>	<u>Forecasted Growth Rate</u>	<u>Expected ROE</u>
Northwest Natural Gas	3.04%	7.00%	<b>10.04%</b>
South Jersey Industries	2.41%	8.00%	<b>10.41%</b>

The only way that Mr. Moul's DCF results can cover a spread of 6.50% is to add a credit quality adjustment, which I previously recommended should be rejected in direct testimony,<sup>18</sup> and his leverage adjustment, which I will address again below. Of the four remaining companies in my proxy group, three have DCF results that

<sup>17</sup> Columbia Exhibit No. 400, Schedules 7 and 9.

<sup>18</sup> I&E Statement No. 2, pp. 53-55.

fail to cover Mr. Moul's recommended 6.50% spread, but Mr. Moul does not recommend removing them:<sup>19</sup>

<b>Company</b>	<b>Average: 52 wk &amp; Spot Yield</b>	<b>+</b>	<b>Growth</b>	<b>=</b>	<b>Expected ROE</b>
Atmos Energy Corp	2.47%		7.29%		9.76%
NiSource Inc.	3.52%		9.27%		12.79%
One Gas Inc.	2.94%		6.37%		9.31%
Spire Inc.	3.39%		5.81%		9.20%

Furthermore, for reasons previously discussed in my direct testimony, the Commission typically does not use the RP method to determine cost of equity.<sup>20</sup> Finally, while the cost of equity should theoretically be higher than the cost of debt (to compensate investors for assuming higher risk), I am not aware of any cases where the Commission adopted the market premium from a RP model as a proxy for the spread between the cost of debt and cost of equity for a subject utility. OCA witness Dr. Griffing seems to corroborate the unreasonableness of Mr. Moul's 6.50% spread in direct testimony; he used a 2.50% debt to equity spread as a benchmark for reasonableness,<sup>21</sup> which is 400 basis points lower than Mr. Moul's recommendation. My recommended cost of equity in this proceeding, 9.72%, is nearly double the cost of debt for Columbia, 5.11%.<sup>22</sup> Indeed, this satisfies the basic tenet that the cost of equity must be higher than the cost of debt by a meaningful margin to compensate investors for the higher risk associated with common equity investments.

<sup>19</sup> I&E Exhibit No. 2, Schedules 5 and 6.

<sup>20</sup> I&E Statement No. 2, 18-21.

<sup>21</sup> OCA Statement No. 2, p. 26, lines 3-9.

<sup>22</sup> I&E Statement No. 2, p. 5, lines 9-10.

## **LEVERAGE ADJUSTMENT**

**Q. SUMMARIZE MR. MOUL’S REBUTTAL TESTIMONY REGARDING HIS LEVERAGE ADJUSTMENT.**

A. First, Mr. Moul clarifies that his “leverage adjustment” is not a traditional “market-to-book” ratio adjustment. Second, he states that credit rating agencies do not measure the market-required cost of equity for a company, nor are they concerned with how it is applied in the rate-setting context. Rather, the credit rating agencies are only concerned with the interests of lenders and the timely payment of interest and principal by utilities. Third, Mr. Moul questions my references to prior Commission orders. Fourth, he suggests that he has used the academic literature and extended it into the rate-setting process. Finally, Mr. Moul disagrees with my assertion that investors base their decisions on book value capitalization.<sup>23</sup>

**Q. HAVE YOU STATED THAT MR. MOUL’S ADJUSTMENT IS A MARKET-TO-BOOK RATIO ADJUSTMENT?**

A. No. As stated in my direct testimony, Mr. Moul does not propose to change the capital structure of the utility (a leverage adjustment), nor does he propose to apply the market-to-book ratio to the DCF model (a market-to-book adjustment).<sup>24</sup>

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<sup>23</sup> Columbia Statement No. 8-R, pp. 14-16.

<sup>24</sup> I&E Statement No. 2, p. 47, lines 7-9.

**Q. WHAT IS YOUR RESPONSE TO MR. MOUL'S REBUTTAL TESTIMONY CONCERNING CREDIT RATING AGENCIES?**

A. Mr. Moul has supported the I&E argument that his proposed leverage adjustment is not needed by stating that the credit rating agencies are only concerned with the timely payment of interest and principal by utilities. Mr. Moul's stated need for the leverage adjustment is based on his assertion that the difference between the book value capital structure and his market value capital structure causes a financial risk difference.<sup>25</sup>

Financial risk does relate to the capital structure of a company, but it is created by the financing decisions (the use of debt or equity) and the amount of leverage or debt with which a company chooses to finance its assets. Financial risk and the book value capital structure of a company are represented in the income statement, which is part of what is evaluated by rating agencies. Mr. Moul agrees with me that credit rating agencies use a company's financial statements in their analysis to assess financial risk and determine creditworthiness.<sup>26</sup>

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<sup>25</sup> Columbia Statement No. 8, p. 29, lines 11-13.

<sup>26</sup> Columbia Statement No. 8-R, p. 14, lines 7-9.

**Q. WHAT IS YOUR RESPONSE TO MR. MOUL’S REBUTTAL TESTIMONY REGARDING YOUR REFERENCE TO PRIOR COMMISSION ORDERS?**

A. Mr. Moul refers to the discussion in my direct testimony where I point to two recent cases (Aqua Pennsylvania and City of Lancaster – Bureau of Water) where the Commission has rejected a “leverage adjustment.” He claims that the adjustment proposed in the City of Lancaster case was much different than what he is proposing in this case. Additionally, Mr. Moul explains that even though the Commission declined to make a “leverage adjustment” in the Aqua Pennsylvania case, it does not invalidate its use. Further, Mr. Moul states, “Notably, the Commission did not repudiate the leverage adjustment in the Aqua case, but instead arrived at an 11.00% return on equity for Aqua by including a separate return increment for management performance.”<sup>27</sup> Interestingly, Mr. Moul is recommending a 117-basis point “leverage adjustment”<sup>28</sup>, a 35-basis point credit quality adjustment, as well as 20-basis points for recognition of claimed strong management performance.<sup>29</sup>

**Q. WHAT IS YOUR RESPONSE REGARDING THE LACK OF ACADEMIC LITERATURE SUPPORTING MR. MOUL’S LEVERAGE ADJUSTMENT?**

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<sup>27</sup> Columbia Statement No. 8-R, pp.14-15.

<sup>28</sup> Columbia Exhibit No. 400, Schedule 1.

<sup>29</sup> Columbia Statement No. 8, p. 5, lines 14-15

A. Mr. Moul claims that leverage adjustments are routinely discussed in academic literature, often referencing the work of Modigliani and Miller and Hamada.<sup>30</sup> He states, “I have merely extended these well-accepted principles to the ratesetting process by using a precise analytics process based upon data that is readily available to investors and regulators.”<sup>31</sup> Conversely, as I also pointed out in my direct testimony, Mr. Moul states:

I know of no means to mathematically solve for the 1.07% leverage adjustment by expressing it in the terms of any particular relationship of market price to book value. The 1.07% adjustment is merely a convenient way to compare the 10.55% return computed directly with the Modigliani & Miller formulas to the 9.48% return generated by the DCF model based on a market value capital structure.<sup>32</sup>

**Q. WHAT IS YOUR RESPONSE TO MR. MOUL’S CLAIM THAT INVESTORS DO NOT BASE THEIR DECISIONS ON BOOK VALUE, BUT RATHER THE RETURN THEY WILL EARN ON THE DOLLARS THEY INVEST.**

A. Mr. Moul’s assertion that an investor is unconcerned with the book value debt or “some accounting value of little relevance to them,”<sup>33</sup> of a utility is unsupported. Clearly an investor takes the financial risk of the utility into consideration when determining a required return. In addition, the market capitalization information included in Value Line’s reports and discussed by Mr. Moul is not the same as

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<sup>30</sup> Columbia Statement No. 8-R, p. 15, lines 10-12.

<sup>31</sup> Columbia Statement No. 8-R, p. 15, lines 14-16.

<sup>32</sup> Columbia Statement No. 8, p. 32, lines 9-11.

<sup>33</sup> Columbia Statement No. 8-R, p. 16, lines 1-5.

market value capital structure. Market capitalization refers to the number of shares outstanding multiplied by the current price. A market value capital structure refers to the ratio of market debt to market equity, which is not included in Value Line's reports. Therefore, Mr. Moul's contention that Value Line includes market capitalization data does not offer any support for his leverage adjustment.

**Q. HAS YOUR RECOMMENDATION CHANGED FROM YOUR DIRECT TESTIMONY REGARDING MR. MOUL'S LEVERAGE ADJUSTMENT?**

A. No. For the reasons discussed above, I continue to recommend that Mr. Moul's leverage adjustment be rejected.

**CAPITAL ASSET PRICING MODEL**

**Q. SUMMARIZE MR. MOUL'S REBUTTAL TESTIMONY REGARDING YOUR APPLICATION OF THE CAPM.**

A. Mr. Moul opines that my CAPM analysis understates the cost of equity for several reasons, including my use of the yield on 10-year Treasury notes for my risk-free rate, use of a geometric mean to calculate my historic market return, reliance on out of date information for my forecasted market return, failure to use leverage-adjusted betas, and rejection of his size adjustment.<sup>34</sup> Each of these topics are discussed in more detail below.

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<sup>34</sup> Columbia Statement No. 8-R, p. 22, lines 21-24.

**RISK-FREE RATE**

**Q. SUMMARIZE MR. MOUL’S REBUTTAL TESTIMONY REGARDING YOUR USE OF THE YIELD ON THE 10-YEAR U.S. TREASURY NOTE.**

A. Mr. Moul claims that his use of the yield on a 30-year U.S. Treasury Bond is more appropriate than my use of the yield on a 10-year Treasury Note because a longer-term bond is less susceptible to Federal policy actions.<sup>35</sup>

**Q. DO YOU AGREE WITH MR. MOUL THAT USING THE YIELD OF A 30-YEAR U.S. TREASURY BOND IS MORE APPROPRIATE DUE TO A LONGER-TERM BOND BEING LESS SUSCEPTIBLE TO FEDERAL POLICY ACTIONS?**

A. No. As explained in my direct testimony,<sup>36</sup> I chose the 10-year Treasury Note as it balances the short-comings of the short-term T-Bill and the 30-year Treasury Bond. Although long-term Treasury Bonds have less risk of being influenced by federal policies, they have substantial maturity risk associated with the market risk. In addition, long-term treasury bonds bear the risk of unexpected inflation. Therefore, my choice of a 10-year Treasury Note is more appropriate.

**Q. SUMMARIZE MR. MOUL’S REBUTTAL TESTIMONY REGARDING YOUR RISK-FREE RATE USED IN THE CAPM FORMULA.**

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<sup>35</sup> Columbia Statement No. 8-R, p. 23, lines 16-21.

<sup>36</sup> I&E Statement No. 2, pp. 28-29.

A. Mr. Moul opines that I have incorrectly given weight to the yield on the 10-year Treasury Note for the fourth quarter of 2018 as I do for the entire five-year period encompassing 2019 to 2023. Then, Mr. Moul incorrectly recalculates the risk-free rate by averaging the 10-year treasury yield by year to determine a risk-free rate of 3.52%.<sup>37</sup>

**Q. DO YOU AGREE WITH MR. MOUL’S ANALYSIS OF YOUR RISK-FREE RATE?**

A. No. Mr. Moul’s new calculation proposes to give equal weight to each separate year from 2018 to 2023. The flaw with this approach is that the further out into the future one forecasts, the less reliable and more speculative the estimates become; therefore, to give the less reliable estimates equal weight would not be prudent. It is more appropriate to weight the quarters and years as I have done in my direct testimony.<sup>38</sup> My calculation likely provides a much more accurate estimation of the risk-free rate during the period of the Fully Projected Future Test Year, as the further out one forecasts, the less reliable the information becomes.

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<sup>37</sup> Columbia Statement No. 8-R, p. 24, lines 1-8.

<sup>38</sup> I&E Exhibit No. 2, Schedule 10.

## **GEOMETRIC MEAN**

**Q. SUMMARIZE MR. MOUL’S REBUTTAL TESTIMONY REGARDING THE USE OF AN ARITHMETIC MEAN RATHER THAN A GEOMETRIC MEAN.**

A. Mr. Moul opines that the arithmetic mean should be used instead of the geometric mean in determining an appropriate market return for my CAPM analysis.

Mr. Moul claims that the geometric mean consists merely of a rate of return taken from two data points and that it cannot provide a reasonable representation of the market risk premium in the context of the CAPM. He continues by citing *Stocks, Bonds, Bills & Inflation: 1996 Yearbook*, published by Ibbotson Associates and the *Stocks, Bonds, Bills & Inflation: 2014 Yearbook*. Mr. Moul then improperly recalculates the I&E historic market return average to be 12.21% in lieu of the 10.80% contained in my direct testimony.<sup>39</sup>

**Q. IS THE USE OF A GEOMETRIC MEAN FOR THE CALCULATION OF THE HISTORICAL CAPM INAPPROPRIATE AS MR. MOUL ASSERTS?**

A. No. The geometric mean is appropriate in calculating the *historic* CAPM as it normalizes the returns or yields, and thus, measures the change over more than one period. The arithmetic average is more susceptible to being influenced by outliers, and therefore is not as good at representing the central tendency of a set of numbers. I have chosen to use the geometric mean to calculate a historical return

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<sup>39</sup> Columbia Statement No. 8-R, pp. 24-26.

because I am calculating a historical CAPM. For the historical performance of the market to be a valid representation of the future, a geometric mean should be calculated to minimize the effect of any individual years that deviated from normal years. The arithmetic mean is influenced by any outliers in the data set, and therefore would be a better representation of the volatility of returns than it is of historical performance.

**Q. PLEASE CONTINUE.**

A. One of the difficulties of calculating the CAPM is that the risk premium is measured by the difference between the return on the market and the risk-free rate, and since the return on the market and the risk-free rate do not always change in the same direction or by the same percent, the risk premium itself is not constant over time. When measuring a historical risk premium, these volatilities, and therefore the potential inaccuracies of the CAPM, are accentuated using the arithmetic mean. The geometric mean more accurately represents the typical value and therefore is a better representation of the historical market risk premium, because it is not as influenced by fluctuation in the market as the arithmetic average.

**Q. DO MR. MOUL'S QUOTES FROM THE IBBOTSON YEARBOOK  
INVALIDATE YOUR USE OF THE GEOMETRIC MEAN?**

A. No. I have used the geometric mean to find a *historical* return; the Ibbotson Yearbook is arguing against the use of a geometric mean in a *forecasted* CAPM and discusses the use of the arithmetic mean in a forward looking CAPM. I have only used the geometric mean in my historic CAPM; therefore, the Ibbotson quotes used by Mr. Moul do not apply. As stated by Ibbotson, “The geometric mean is backward-looking.”<sup>40</sup>

**Q. CAN YOU PROVIDE A SIMPLE EXAMPLE DEMONSTRATING THE SHORTCOMINGS OF APPLYING THE ARITHMETIC MEAN IN A REGULATORY SETTING?**

A. Yes. Suppose a hypothetical investor has \$100 to invest over a two-year period. At the end of the first year, the investor earns a 100% return so that his ending wealth at the end of period 1 is \$200. At the end of the second year, the investor has a -50% return (loses \$100) so that his ending wealth at the end of period 2 is \$100. It is quite clear that over the two-year period, the investor has not earned a return, since he ends the two-year period with the same \$100 that he started with. The calculated geometric return is  $0\% = (\$100/\$100)^{1/2}$ , which accurately represents the net zero increase in wealth. However, the calculated arithmetic return is  $25\% = (100\% - 50\%)/2$ . The investor who relies on the arithmetic mean expects to have an ending wealth of \$125; instead, their actual wealth is only \$100. This illustrates the inherent bias that results from using the arithmetic mean to

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<sup>40</sup> 2015 Ibbotson *Stocks, Bonds, Bills, and Inflation Classic Yearbook*, Morningstar Inc., 2015, p. 83.

calculate returns over multiple periods. Clearly, the use of the arithmetic mean for cost of capital purposes in a regulatory setting produces biased results. The geometric mean is more accurate and appropriate in this setting.

### **FORECASTED MARKET RETURN**

**Q. IN HIS REBUTTAL TESTIMONY, WHAT CONCERNS DOES MR. MOUL EXPRESS REGARDING YOUR FORECASTED RETURN ON MARKET?**

A. Mr. Moul argues that I did not rely on the most recently published data to calculate my forecasted market return, causing my return on the overall market to be understated in my CAPM analysis.<sup>41</sup>

**Q. DO YOU AGREE WITH MR. MOUL'S CONCERNS REGARDING YOUR FORECASTED RETURN ON MARKET?**

A. No. Financial information from respected and commonly used sources such as Value Line, Yahoo! Finance, Morningstar, Zacks, etc. is updated regularly (monthly, weekly, daily, hourly, etc., depending on the source). At the time of my analysis, I utilized the most recent financial information accessible to me. In the scope of a base rate proceeding, continuously changing recommendations based on newer market data is not prudent.

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<sup>41</sup> Columbia Statement No. 8-R, p. 26, lines 14-19.

## **SIZE ADJUSTMENT**

**Q. SUMMARIZE YOUR DIRECT TESTIMONY REGARDING A SIZE ADJUSTMENT.**

A. In direct testimony, I stated that Mr. Moul's 102-basis point CAPM size adjustment is unnecessary because none of the technical literature cited in his direct testimony supporting investment adjustments related to the size of a company is specific to the utility industry. In addition, I presented an article by Dr. Annie Wong that demonstrated there is no need to make an adjustment for the size of a company in utility rate regulation.<sup>42</sup>

**Q. SUMMARIZE MR. MOUL'S RESPONSE IN REBUTTAL TESTIMONY REGARDING A SIZE ADJUSTMENT.**

A. Mr. Moul states that enormous changes have occurred in the industry since the article "Utility Stocks and the Size Effect: An Empirical Analysis" by Dr. Annie Wong was published. He also references the Fama/French study, "The Cross-Section of Expected Stock Returns," to illustrate that his size adjustment is a separate factor from beta that helps explain systematic risk and returns.<sup>43</sup>

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<sup>42</sup> I&E Statement No. 2, p. 57, lines 6-15.

<sup>43</sup> Columbia Statement No. 8-R, pp. 26-27.

**Q. DOES THE TIME WHICH HAS ELAPSED SINCE AN ARTICLE WAS WRITTEN NECESSARILY INVALIDATE ITS RESULTS?**

A. No. Although Mr. Moul states that enormous changes have occurred in the industry since the 1960s, he presents no evidence that these “changes” have caused a size adjustment to be needed. To the contrary, Dr. Wong’s study demonstrated that one does *not* need to be made in the regulated utility industry. As stated in my direct testimony, absent any credible article to refute Dr. Wong’s findings, Mr. Moul’s size adjustment to his CAPM results should be rejected.

**Q. DOES THE FAMA/FRENCH STUDY REFUTE DR. WONG’S ARTICLE?**

A. No. As stated in my direct testimony, Dr. Wong’s article presents evidence that although a size effect may exist for industrial stocks, it does not exist for utility stocks. As the Fama/French study is not specific to utility stocks, it does not demonstrate that a size effect exists in the utility industry. In addition, the size effect that exists for industrial stocks varies to such an extent that it is difficult to predict. The difficulty in predicting the effect of size is demonstrated in the variance from year to year of the measurement of difference between the annual returns on the large and small-capitalization stocks of the NYSE/AMEX/NASDAQ in the Ibbotson *Stocks, Bonds, Bills & Inflation: 2015 Yearbook*. As stated on page 100 of the SBBI Yearbook,

While the largest stocks actually declined in 2001, the smallest stocks rose more than 30%. A more extreme case occurred in the depression-recovery year of 1933, when the difference between the first and 10th decile returns was far more substantial. The divergence in the performance of small- and large- cap stocks is evident. In 30 of the 89 years since 1926, the difference between the total returns of the largest stocks (decile 1) and the smallest stocks (decile 10) has been greater than 25 percentage points.

Page 109 states,

In four of the last 10 years, large-capitalization stocks (deciles 1-2 of NYSE/AMEX/NASDAQ) have outperformed small-capitalization stocks (deciles 9-10). This has led some market observers to speculate that there is no size premium. But statistical evidence suggests that periods of underperformance should be expected.

Page 112 states,

Because investors cannot predict when small-cap returns will be higher than large-cap returns, it has been argued that they do not expect higher rates of return for small stocks.

**Q. WHAT IS YOUR RECOMMENDATION REGARDING MR. MOUL'S SIZE ADJUSTMENT?**

A. I continue to recommend that his use of the 1.02% size adjustment be disallowed in calculating the CAPM.

**Q. MR. MOUL HAS RECALCULATED YOUR CAPM RESULTS. DO YOU AGREE WITH HIS RECALCULATION?**

A. No. Mr. Moul's recalculation is incorrect for a couple of reasons. He used an inaccurate risk-free rate and an unnecessary size adjustment, as stated in both my direct testimony and above. Because of these factors, a recalculation of my CAPM results is imprudent; any recalculation provided by Mr. Moul of my CAPM results is unreliable and unnecessary.

### **RISK PREMIUM**

**Q. SUMMARIZE MR. MOUL'S REBUTTAL TESTIMONY REGARDING THE RP METHOD.**

A. Mr. Moul opines that the RP approach should be given serious consideration because it is straight-forward, understandable and uses a company's own borrowing rate. He claims it provides a direct and complete reflection of a utility's risk and return. Mr. Moul also states that I make an unfounded assertion that the RP method does not measure the current cost of equity as directly as the DCF.<sup>44</sup>

**Q. DO YOU AGREE WITH MR. MOUL THAT THE RP METHOD PROVIDES A DIRECT AND COMPLETE REFLECTION OF A UTILITY'S RISK AND RETURN?**

A. No. The RP method produces an indirect measure when compared to the DCF Method.

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<sup>44</sup> Columbia Statement No. 8-R, pp. 30-31.

**Q. PLEASE COMMENT ON THE INDIRECT MEASURE OF THE RP METHOD VERSUS THE MORE DIRECT MEASURE OF THE DCF METHOD.**

A. Mr. Moul claims my assertion that the Risk Premium method does not measure the current cost of equity as directly as the DCF is without foundation. In my direct testimony, I have clearly illustrated how the two measures are different.<sup>45</sup> The main difference is that the RP method determines the rate of return on common equity indirectly by observing the cost of debt and adding to it an equity risk premium. The DCF measures equity more directly because it uses the growth rates and dividends of individual companies in the proxy group as inputs, whereas the RP method measures cost of equity indirectly using debt information.

**COMPARABLE EARNINGS**

**Q. SUMMARIZE MR. MOUL’S REBUTTAL TESTIMONY REGARDING THE COMPARABLE EARNINGS (CE) METHOD.**

A. Mr. Moul claims that using the CE method satisfies the comparability standard established in the *Hope* case. Additionally, he states, “the financial community has expressed the view that the regulatory process must consider the returns that are being achieved in the non-regulated sector to ensure that regulated companies can compete effectively in the capital markets.”<sup>46</sup>

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<sup>45</sup> I&E Statement No. 2, pp. 17-21.

<sup>46</sup> Columbia Statement No. 8-R, p. 32.

**Q. DO YOU AGREE THAT THE COMPANIES USED BY MR. MOUL IN HIS CE METHOD ARE COMPARABLE TO COLUMBIA GAS?**

A. No. As stated on I&E Statement No. 2, page 33, the companies in Mr. Moul's analysis are not utilities and therefore, are too disparate to be used in a CE analysis. For example, the criteria Mr. Moul uses to choose the companies in his CE group results in the selection of companies such as Darden Restaurants, Inc., Estee Lauder Companies, Inc., Allstate Corporation, and The Hershey Company. All these companies operate in industries very different from a utility company and operate under varying degrees of regulation. Also, most if not all the companies Mr. Moul uses in his analysis are not monopolies as utilities largely are. This means that they have significantly more competition and would require a higher return for the added risk. Further, the CE method should be excluded because it is entirely subjective as to which companies are comparable and it is debatable whether historic accounting returns are representative of the future.

**MANAGEMENT PERFORMANCE ADJUSTMENT**

**Q. SUMMARIZE MR. MOUL'S AND MR. HUWAR'S REBUTTAL TESTIMONY REGARDING MANAGEMENT EFFECTIVENESS POINTS.**

A. Mr. Moul continues to recommend that 20 basis points be included in the cost of equity to recognize the Company's management performance.<sup>47</sup> Mr. Huwar

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<sup>47</sup> Columbia Statement 8-R, p.34. lines 21-24.

agrees with my direct testimony that Columbia’s aggressive infrastructure replacement program is funded by its ratepayers, and that reliability, customer satisfaction and a focus on safety are requirements of every public utility under 66 Pa. C.S.A., §1501. Mr. Huwar also agrees Columbia has benefited from its use of a Distribution System Improvement Charge that provides funding for infrastructure replacement without the need to file base rate cases but claims I have not considered the recovery cap on DSIC of 5% of distribution revenues in relation to Columbia’s projected level of capital expenditures. Mr. Huwar claims that I dismiss and ignore points made in his direct testimony and states that I do not believe utilities should be rewarded for meeting their obligations under the Pennsylvania Public Utility Code.<sup>48</sup>

**Q. WHAT IS YOUR RESPONSE TO MR. HUWAR’S REBUTTAL TESTIMONY REGARDING AN ADDITIONAL 20 BASIS POINTS FOR MANAGEMENT PERFORMANCE?**

A. As discussed in my direct testimony,<sup>49</sup> I maintain that neither Columbia, nor any utility company for that matter, should reap additional rewards for programs funded by ratepayers or for meeting their obligations under 66 Pa C.S.A. §1501.

I am aware that under 66 Pa C.S.A. §523 the Commission shall consider a utility’s performance; however, it is not mandatory that the Commission grant

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<sup>48</sup> Columbia Statement No. 1-R, p. 3, lines 1-18.

<sup>49</sup> I&E Statement No. 2, pp. 59-60.

additional points. Moreover, I continue to assert that for any company, true strong management performance is earning a higher return through its efficient use of resources and cost cutting measures. The greater the net income resulting from cost savings and true efficiency in management and operations is available to be passed on to shareholders. Therefore, I continue to recommend that the addition of basis points to the cost of equity for management performance be disallowed.

**Q. WHAT IS YOUR RESPONSE TO MR. HUWAR’S REBUTTAL TESTIMONY REGARDING COLUMBIA’S USE OF A DSIC?**

A. It is my understanding that Columbia has only recently started using the DSIC mechanism as a means of recovering its capital expenditures and has not yet reached its allowed cap of 5% of distribution revenues. Even if Columbia cannot recover its capital expenditures while fully utilizing the DSIC at its allowed cap of 5%, it still has the option to file another rate case, which it regularly does. In Columbia’s previous rate case, at Docket No. R-2016-2529660, witness Paloney (Columbia Statement No. 1, p. 12, lines 9-11) states, “Over the eight-year period since 2008, Columbia has sought base rate relief six times, resulting in average annual distribution rate increases of 10.08% during that time.”

**OVERALL RATE OF RETURN**

**Q. HAS YOUR OVERALL RATE OF RETURN RECOMMENDATION CHANGED FROM YOUR DIRECT TESTIMONY?**

A. No. I continue to support each recommendation made in I&E Statement No. 2.

**Q. WHAT IS YOUR OVERALL RATE OF RETURN RECOMMENDATION?**

A. I recommend the following rate of return for Columbia:

<u>Type of Capital</u>	<u>Ratio</u>	<u>Cost Rate</u>	<u>Weighted Cost</u>
Long-Term Debt	44.42%	5.11%	2.27%
Short-Term Debt	3.24%	3.20%	.10%
Common Equity	52.34%	9.72%	5.09%
Total	100.00%		<u>7.46%<sup>50</sup></u>

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

A. Yes.

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<sup>50</sup> I&E Exhibit No. 2, Schedule 1.