STATE OF ILLINOIS

ILLINOIS COMMERCE COMMISSION

Northern Illinois Gas Company	)	
d/b/a Nicor Gas Company	)	
	)	Docket No. 17-0124
Proposed general increase in gas rates.	)	

Rebuttal Testimony of

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On behalf of Northern Illinois Gas Company
d/b/a Nicor Gas Company

July 24, 2017

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I. INTRODUCTION AND PURPOSE

Q. **Will you please state your name and business address?**

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

Q. **Are you the same Bente Villadsen who provided direct testimony in this proceeding?**

A. Yes. I provided direct testimony on behalf of Northern Illinois Gas Company d/b/a Nicor Gas Company ("Nicor Gas").

Q. **What is the purpose of your rebuttal testimony?**

A. The purpose of this testimony is to respond to the direct testimony of Illinois Commerce Commission ("Commission" or "ICC") Staff ("ICC Staff" or "Staff") witness Rochelle Phipps, Illinois Industrial Energy Consumers ("IIEC") and Citizens Utility Board ("CUB") (collectively, "IIEC/CUB") witness Michael Gorman, and Office of the Illinois Attorney General ("AG") witness David Effron on topics related to Nicor Gas' allowed rate of return ("ROR")and capital structure.

Q. **How is your rebuttal testimony organized?**

A. First, I address the overall reasonableness of the proposed returns on equity ("ROEs"), capital structures, and rates of return proposed by witnesses for Staff and intervenors.[1] Second, I provide my detailed assessment of the capital structure and cost of debt issues they raise. Third, I address the impact of financial leverage, and fourth, the relative risk of Nicor Gas. Fifth, I provide comments on the other witnesses' methodologies and

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[1] Capitalized terms and abbreviations have the same meaning as in my direct testimony.

21   inputs to the cost of equity models as well as responses to their specific critiques of my

22   own analytical approach.

23   **II. ITEMIZED ATTACHMENTS**

24   **Q.   Are there any exhibits to your rebuttal testimony?**

25   A.   Yes. I am sponsoring the following exhibits:

26   •   Nicor Gas Ex. 25.1: Summary Data on Allowed ROE and ROR

27   •   Nicor Gas Ex. 25.2: Current interest rates and forecasted MRP

28   •   Nicor Gas Ex. 25.3: Eurodollar futures and implied short-term yields

29   •   Nicor Gas Ex. 25.4: Operating Leverage

30   •   Nicor Gas Ex. 25.5: Selected Responses to Staff and Nicor Gas Data Requests
31   (Group Exhibit)

32   •   Nicor Gas Ex. 25.6: Selected IIEC/CUB Responses to Nicor Gas Data Requests
33   (Group Exhibit)

34   •   Nicor Gas Ex. 25.7: Replication of Gorman Risk Premium Method

35   **III.   OVERALL REACTIONS AND SUMMARY**

36   **Q.   What rate of return and capital structure recommendations have been provided in**

37   **this case?**

38   A.   Figure 1 below presents a summary of the recommendations presented in the direct

39   testimony of witnesses for Staff, IIEC/CUB and the AG, as well as Nicor Gas' direct

40   testimony proposed capital structure and rate of return.[2]

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[2]   I understand that Nicor Gas has accepted, to narrow the issues in controversy and for the purposes of this case only, certain technical adjustments to the capital structure proposed by Staff and will also update its cost of long-term debt to reflect newer interest rate forecasts. Those updates will be reflected in an updated Schedule D to be served by Nicor Gas.

Figure 1
Summary of Witness Direct Testimony Recommendations

	Nicor Gas	Staff	IIEC-CUB	AG
	[1]	[2]	[3]	[4]
Rate of Return				
ROE	10.70%	9.16%	9.15%	9.15%
ROR	8.08%	7.01%	6.55%	6.92%
Capital Structure				
Equity	54.21%	54.13%	50.89%	51.27%
LT Debt	45.21%	45.28%	31.88%	42.76%
ST Debt	0.59%	0.59%	17.23%	5.96%

Sources:
[1]: Nicor Gas Ex. 2.0, Nicor Gas Ex. 11.0, Nicor Gas Schedule D-1.
[2]: ICC Staff Ex. 3.0, Schedule 3.01
[3]: IIEC-CUB Ex. 1.1
[4]: AG Ex. 1.1

41 **Q.   What is your overall reaction to the recommendation of Staff witness Phipps and**

42 **IIEC/CUB witness Gorman?**

43 A.   Their recommendations are simply too low to reflect actual investor required returns.

44   They are substantially below the norms in the industry despite Nicor Gas' high level of

45   operating leverage driven by accelerating capital expenditure and consequently higher

46   than average risk.   The average allowed ROE and ROR for litigated natural gas utility

47   rate cases during the last 24 month was 9.6% and 7.45%, respectively.[3]   Thus, the overall

48   rate of return on rate base proposed by Staff is 44 basis points below prevailing

49   regulatory norms, while Mr. Gorman's proposed ROR is 90 basis points below the

50   industry average and the AG is 53 basis points below the norm.   And, importantly, these

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[3]   Data from SNL Financial. *See* Nicor Gas Exhibit 25.1 for details.

51   are trailing data and Nicor Gas is litigating rates for a 2018 future test year, all in an era

52   with rising credit costs.

53   Additionally, as discussed in my direct testimony, Nicor Gas has higher operating

54   leverage than comparable companies. While Ms. Phipps is correct that Nicor Gas has an

55   Illinois Rider Qualified Infrastructure Plan ("QIP") in place, that does not change the fact

56   that Nicor Gas revenue to property, plant and equipment ("PP&E") ratio—including QIP

57   recovery revenue and the asset balances funded with QIP spending—is substantially

58   lower than that of the comparable companies. Section IV.B below provides further

59   discussion of operating leverage and relative risk.

60 **Q.**   **Having reviewed the testimonies of the other rate of return witnesses, do you see any**

61   **reason to change your recommendation that Nicor Gas be allowed to earn 10.7%**

62   **return on equity?**

63 A.   No. As I stated above, the suggested returns are below industry norms and fail to consider

64   Nicor Gas' higher operating leverage and "elevated capital investment program."[4]

65   Further, IIEC/CUB witness Gorman and ICC Staff witness Phipps do not provide any

66   valid argument or analysis in support of a lower allowed return on equity for Nicor Gas.

67   Additionally, a review of capital market data at the time of the other witnesses' analyses

68   (i.e., June 2017) compared to the time of my direct testimony analysis (i.e., January –

69   February 2017) reveals no changes that would substantially alter the estimated cost of

70   capital for Nicor Gas. For example, an update of the bond yield spread analysis

71   presented in Figure 4 of Nicor Gas Ex. 11.0 reveals that A-rated utility bond yield

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[4]   Moody's Investor Service, "Northern Illinois Gas Company," July 21, 2017, p. 1.

72   spreads (over treasury bond yields) are essentially the same (very slightly higher) now—

73   still elevated relative to their pre-crisis levels.[5] Similarly, Bloomberg's forecasted market

74   risk premium is 15-20 basis points higher now than at the time of my direct testimony

75   analysis.[6] Blue Chip Economic Indicators provided the same forecast (3.1%) for 2018

76   average 10-year U.S. Treasury bond yields in its June 2017 issue that it did in the January

77   issue that informed my direct testimony analysis. Dividend yields for the natural gas

78   distribution sample were also very similar in June and January.[7] Finally, I note that the

79   acquisition of WGL Holdings Company, which was formally announced at a time

80   subsequent to the vintage of the data used in my direct testimony analysis, is a proper

81   reason to exclude it from the sample. However, in my analysis I presented results for a

82   subsample that excluded WGL; the result then (and now) of doing so is actually to raise

83   the sample average cost of capital estimates slightly.[8]

84 **Q.   Does the increase in Illinois' corporate income tax rate affect your**

85   **recommendation?**

86 A.   No. Increasing Illinois' statutory tax rate from 7.75% to 9.5% will, everything else equal,

87   increase my cost of equity estimates slightly, but not enough to change the

88   recommendation.

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[5]   See Nicor Gas Ex. 25.2.

[6]   See Nicor Gas Ex. 25.2.

[7]   See Nicor Gas Ex. 11.4, Table No. BV-6 and ICC Staff Ex. 3.0, Schedule 3.09.

[8]   See Nicor Gas Ex. 11.4.

89   **Q.   What conclusions have you reached concerning the testimony of Ms. Phipps,**

90   **Mr. Gorman, and Mr. Effron concerning capital structure?**

91   A.   The capital structure proposed by Nicor Gas in this proceeding is reasonable and in line

92   with that forecast for Nicor Gas. Importantly, it is common practice to finance long-lived

93   assets with long-term capital, which is the going-forward proposal for Nicor Gas.

94   Because rates are set for a future period, the best estimate of the prevailing interest rates

95   at the time rates prevail should be used to determine the cost of debt. As interest rates are

96   expected to increase, such estimates are best obtained using up-to-date information on

97   Nicor Gas' July debt issuance and available data on interest rates for 2018.

98   **Q.   Please summarize the remaining conclusions of your rebuttal testimony concerning**

99   **the rate of return on common equity and on rate base.**

100   A.   As noted above, the recommendations of Ms. Phipps, Mr. Gorman, and Mr. Effron are

101   well below industry norms and below what the market indicates.   None of their

102   testimonies provides any argument why Nicor Gas' risk profile merits a return on equity

103   or a rate of return below the norm; nor have the other witnesses provided a compelling

104   argument that financial risk can be ignored. While Mr. Gorman seems to believe that

105   "the Hamada methodology is just another way of unjustly increasing the CAPM results,"[9]

106   authors cited by Mr. Gorman disagree. For example, Duff & Phelps explicitly relies on

107   the Hamada methodology when determining the cost of equity for companies.[10] The

108   textbook and practitioner recognition of financial risk is discussed in detail in Section V.

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[9]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 93.

[10]   IIEC/CUB Ex. 1.0 (Gorman Dir.), footnote 59.   Duff & Phelps, *2017 Valuation Handbook: US Industry Cost of Capital*, p. 39.

109   As discussed in my direct testimony (Nicor Gas Ex. 11.0), Nicor Gas has higher

110   operating leverage than the proxy companies—a fact which needs to be recognized by

111   placing the company towards the upper end of the range (or through an explicit adder). I

112   detail this evidence in Section VI.

113   Finally, in Section VII, I discuss the methodologies relied upon by Ms. Phipps,

114   Mr. Gorman, and myself and show the impact of replacing certain misguided inputs or

115   methods with appropriate alternative.   Overall, I conclude that Ms. Phipps and

116   Mr. Gorman's approach substantially downward biases the cost of equity estimation

117   resulting in a cost of equity recommendation that is out of line with not only industry

118   norms but also Nicor Gas' specific circumstances.

119   Regarding the specifics of Ms. Phipps and Mr. Gorman's implementations of their cost of

120   equity estimation methods, I note that Ms. Phipps's choice of risk-free rate biases her

121   CAPM results downward by about 25 basis points, while her lack of consideration of the

122   risk premium model prevents her from giving weight to ROEs in the range of 9.3% to

123   10.4%[11].

124   Similarly, Mr. Gorman biases his results downward by electing not to perform a risk

125   premium calculation – I estimate his standard 30-year treasury yield risk premium model

126   at 9.3%, but the use of more recent data would result a ROE of about 9.8%. As for his

127   discounted cash flow ("DCF"), Mr. Gorman's reliance on figures he himself has concern

128   about bias his results by no less than 40 basis points. If Mr. Gorman has relied on a

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[11]   The low end is the results from an implementation of Mr. Gorman's standard treasury bond yield risk premium model, while the high end is the upper bound on my risk premium model.

129   reasonable version of the risk premium model and accounted for his DCF concerns, his

130   range would be approximately 9.3% to 9.8% before any consideration of operating or

131   financial leverage. Consequently, Staff's and Mr. Gorman's ROE figures would be

132   consistent with recent industry practice.[12]

133   Appropriate consideration of financial leverage and/or elevated business risk owing to

134   Nicor Gas' higher than average degree of operating leverage results in a further increase

135   in Nicor Gas' ROE of 20-150 basis points, placing a fair representation of Nicor Gas'

136   cost of equity approximately in the 10 to 10¾ percent range.

137   **IV. CAPITAL STRUCTURE AND COST OF DEBT**

138   **Q.   What do you cover in this section?**

139   A.   I address the intervenors' proposed changes to Nicor Gas' regulatory capital structure as

140   well as Staff's proposed changes to the cost of debt reflected in the revenue requirement.

141   Specifically, I address the proposal from Mr. Gorman and Mr. Effron that Nicor Gas'

142   regulatory capital structure should include 17.23% or 5.96% short-term debt (according

143   to their respective recommendations) as well as less equity than proposed by Nicor Gas.[13]

144   Mr. Gorman says he arrives at his 17.23% using the historical amount of short-term

145   debt,[14] while Mr. Effron states he uses one half of the amount outstanding as of year-end

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[12]   As Mr. Effron provides a recommendation but no calculations, I do not provide a range
for his revised figures.

[13]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 42 and AG Ex. 1.0 p. 42.

[14]   IIEC/CUB Ex. 1.6.

146   2016.[15] I also respond to Staff's proposal to use current yields on commercial paper and

147   utility bond indices as the cost of short-term and long-term debt.[16]

148 **Q.   What is your reaction to these recommendations?**

149 A.   The recommendation that Nicor Gas should use substantial short-term debt to finance its

150   rate base is simply contradictory to the tenant that long-lived assets should be financed

151   with long-term capital and should be rejected. As for the recommendations to reduce

152   Nicor Gas' equity percentage, it could not only affect Nicor Gas' credit metrics but also

153   increase its financial leverage. In addition, the equity percentage proposed by Nicor Gas

154   is within the industry norm and consistent with Nicor Gas' forecasted capital structure for

155   the 2018 test year.[17] As for the cost of short-term and long-term debt, it is important to

156   recognize (1) that Nicor Gas expects to price long-term debt in July 2017 and (2) that

157   bond yield curves and market traded forward interest rate instruments indicate that debt

158   costs are increasing. Therefore, it would be appropriate to use the actual embedded cost

159   of debt that is priced in July 2017 for the 2017 long-term debt issuances and to look to

160   forecasts or market-based forward curves for the cost of debt that will be issued in

161   2018.[18]

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[15]   AG Ex. 1.1R, p. 23.

[16]   Staff Ex. 3.0 (Phipps Testimony), p. 73 proposed to use the current (June 8, 2017) rate on 60-day nonfinancial commercial paper converted to an annual yield for the short-term debt for a rate of 1%. Staff Ex. 3.0 pp. 74-75 proposed to use the current yield on long-term Aa-rated utility bond yields, 3.79%, as the cost of debt to be issued in 2017 and 2018.

[17]   Nicor Gas Ex. 2.0, p. 15 (Reese Testimony) shows the forecasted capitalization. SNL data shows that natural gas utilities, whose rate case was determined within the last 24 months, had equity percentages ranging from about 30% to over 60%.

[18]   I understand that Staff emphasize the use of market data (Staff Ex. 3.0 (Phipps Testimony), p. 55) rather than forecasts and therefore look to such information. I commonly also look at consensus forecasts.

162 **Q. With what types of capital should a utility finance its long-lived assets?**

163 A. Principles of corporate finance as well as common sense indicate that long-lived assets

164 should be financed with long-lived capital. This practice is supported by leading

165 corporate finance textbooks and academic research on capital markets and firm behavior.

166 Notably, Professors Berk and DeMarzo of Stanford University state in their widely-used

167 textbook that "short-term needs should be financed with short-term debt and long-term

168 needs should be financed with long-term sources of funds."[19] Similarly, looking at

169 industry practices, Professors Graham and Harvey similarly find that "the most popular

170 explanation of how firms choose between short- and long-term debt is that they match

171 debt maturity with asset life."[20]

172 This is also why commercial data providers such as Duff & Phelps calculate the capital

173 structure as a mixture of equity, preferred equity, and long-term debt.[21] Thus, it is

174 common to rely long-term funding to finance long-lived assets.

175 **Q. How does this principle relate to the evaluation of Nicor Gas' capital structure and**

176 **the recommendations of intervenors?**

177 A. Nicor Gas reports $3.183 million in net utility plant and a rate base of $2,601 for year-

178 end 2018.[22] Thus, clearly the vast majority of Nicor Gas' financing pertains to long-lived

179 assets. Consequently, it would be appropriate to look first to finance these assets with

180 long-term financing; e.g., equity and long-term debt.

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[19] Berk and DeMarzo, *Corporate Finance,* 2007, p. 857

[20] John Graham and Campbell Harvey, "The theory and practice of corporate finance: evidence from the field," *Journal of Financial Economics*, December 10th, 2001, p. 228.
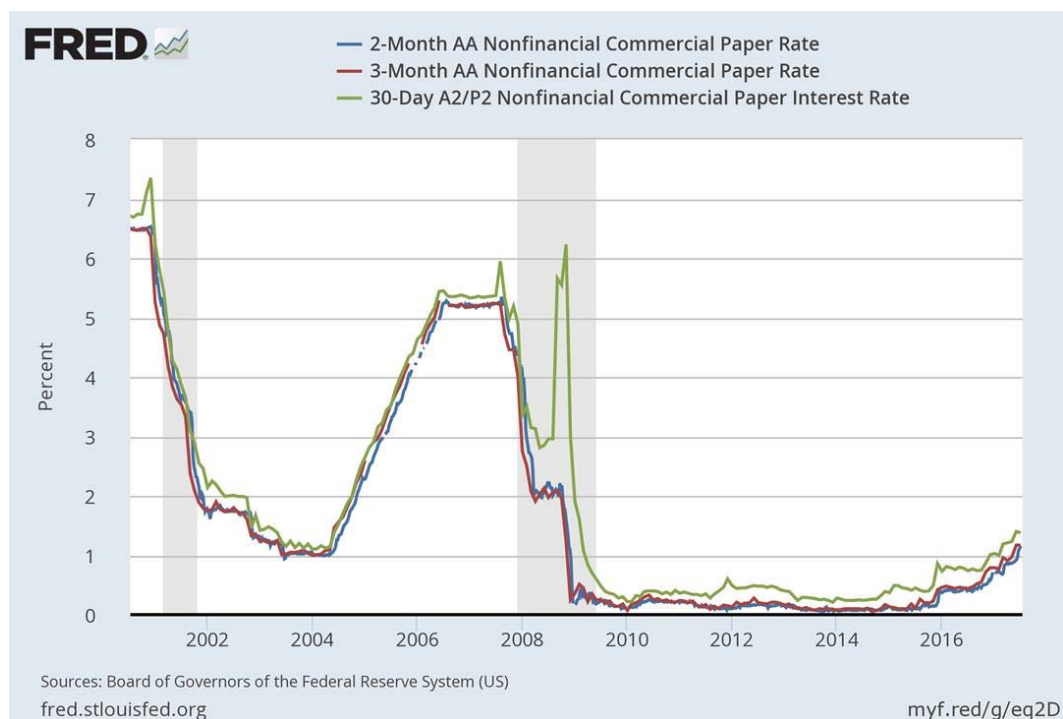
[21] Duff & Phelps, *2017 Valuation Handbook: US Industry Cost of Capital*, p. 49.

[22] Nicor Gas Ex. 3.1, p. 4 (Morley Testimony).

181 **Q.** **What about the fact that Nicor Gas has in the past used short-term debt levels above**

182 **those proposed in this case?**

183 A. As shown in below, short-term debt has been unusually inexpensive in recent years,

184 making short-term financing atypically advantageous for both Nicor Gas and its

185 customers. This is shown in Figure 2 below.

Figure 2
Cost of Short-Term Debt

Sources: Board of Governors of the Federal Reserve System (US)
fred.stlouisfed.org   myf.red/g/eq2D

186 However, indications are that the cost of short-term debt is increasing, so that a

187 continuation of short-term financing will involve substantial risk of facing higher costs

188 going forward. At the same time, long-term debt remains inexpensive relative to

189 historical levels, such that locking in the current rate makes sense. To see that the short-

190 term debt is expected to increase, I look to the so-called yield curve, which shows the

191 yield on debt of varying maturity. Looking at the current yield curve (labelled 7/3/2017)

192 and comparing it to that of 12/31/2016, 12/31/2015, and 12/31/2104, it is clear that the

193   front-end (1-6 month maturities) of the curve has moved up, while the back-end (20-30

194   year maturities) has remained relatively constant. This is an indication that compared to

195   the recent past, short-term debt is becoming more expensive, while the cost of long-term

196   debt has changed much less.

197   This "flattening" of the yield curve means that long-term debt is cheaper than it has been

198   relative to short-term financing. There is no longer the magnitude of interest savings

199   from using short-term debt as there was in the past few. At the same time, the use of

200   short-term debt exposes Nicor Gas and its customers to a higher level of interest rate risk

201   associated with repeated refinancing. Therefore it makes good financial sense to move

202   towards the more common financing practice of using long-term debt (and equity) to

203   finance long-lived assets.

Figure 3: Treasury Yield Curves on Select Trade Dates
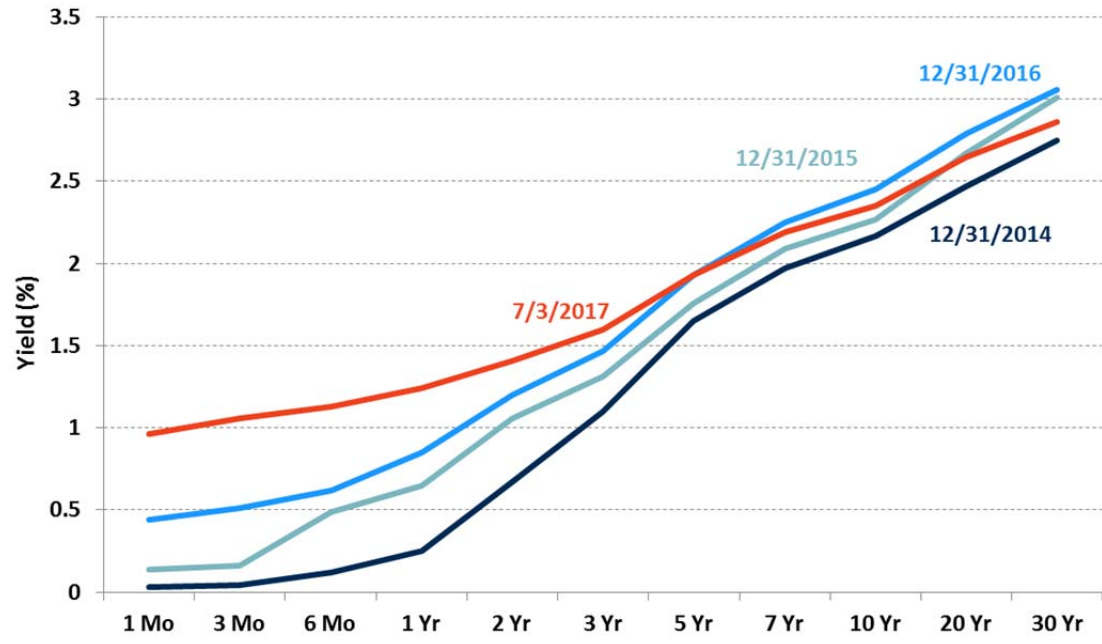
Source: U.S. Department of the Treasury.

204   In addition to the flattening of the yield curve, I note that the pricing of, for example,

205   Eurodollar futures imply an increasing yield on short-term (90-day) lending. For

206   example, data from the CME Group shows that the yield on 3-month borrowing is

207   expected to increase from approximately 1.36% for September 2017 to approximately

208   1.86% at year-end 2018 for an increase of 50 basis points.[23] While Nicor Gas may not

209   necessarily enter into this specific contract, the market data shows that the cost of short-

210   term debt is increasing (for 2020, the same data indicate a yield of 2.31%).

211   In sum, the evidence cited above demonstrates that the market is shifting, so that short-

212   term debt is becoming relatively more expensive. Therefore I believe it is appropriate for

213   Nicor Gas to move towards the textbook recommendation of financing long-term assets

214   with long-term financing, and for the ICC to recognize this in setting Nicor Gas'

215   regulatory capital structure.

216 **Q. How does the discussion above relate to the proposals in the AG's and IIEC/CUB's**

217   **testimonies to increase the short-term debt percentage in Nicor Gas' capital**

218   **structure?**

219 A.   The points raised above demonstrate that the AG and IIEC/CUB proposals are not

220   reasonable. Because (i) "long-term needs should be financed with long-term sources of

221   funds," (ii) the cost of short-term debt is expected to increase, and (iii) the proposed

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[23]   Nicor Gas Ex. 25.3. See also

       http://www.cmegroup.com/trading/interest-rates/stir/eurodollar_quotes_settlements_futures.htm

222   capital structure is consistent with that forecast by Nicor Gas and the industry, I find that

223   Nicor Gas' proposed proportion of short-term debt is reasonable.[24]

224 **Q.   How about the proposals to decrease the equity percentages?**

225 A.   Nicor Gas' proposed capital structure is comparable to what other gas LDCs have used in

226   recent rate cases and consistent with Nicor Gas' forecasted capital structure, so I find it to

227   be reasonable. In addition, I note that I take financial leverage into account in deriving

228   my estimates of Nicor Gas' cost of equity, such that a higher equity percentage leads to a

229   relatively lower ROE recommendation, and vice versa.

230 **Q.   What is an appropriate method to determine the cost of debt that will be issued in**

231   **2017 and 2018?**

232 A.   For debt that will be issued prior to the closure of this matter, I propose using the actual

233   embedded cost of debt—including the actual prices of 2017 debt where available—since

234   this would maximize accuracy and provide consistency with the treatment of older debt

235   included in Nicor Gas' capital structure. For debt that is expected to be issued in the

236   future, it would be appropriate to look to the expected costs of debt at the expected date

237   of issue. Thus, the cost of short-term debt should reflect the expected cost of such debt

238   during the period rates are in effect, while the cost of long-term debt that has yet to be

239   issued should reflect the value-weighted average cost of actual debt that will be issued in

240   July 2017 and the expected cost of the debt that will be issued in 2018. As the actual cost

241   of 2017 long-term debt will become known before this case concludes, the remaining

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[24]   For clarity, I note that I include short-term debt in excess of what is used to finance working capital as debt in my determination of the proxy companies' capital structures. Nicor Ex. 11.4, pp. 3-9.

242   question becomes how to determine the expected cost of short-term and long-term debt in

243   2018.

244   For the matter at hand, I propose to determine the cost of long-term debt by adding

245   (subtracting) the market-indicated increase (decrease) in such costs to the cost of debt

246   that will become known later this month.   Similarly, for the cost of short-term debt, the

247   Commission could look to analyst forecasts and/or forward curves for debt with the

248   characteristics of short-term debt issued by Nicor Gas. These forward-looking costs of

249   debt can then be used to determine the revenue requirement.[25]

250   **V. FINANCIAL RISK AND THE COST OF EQUITY**

251   **Q.   Why do you devote a section to financial risk?**

252   A.   Financial risk or capital structure is a large topic in financial economics and it is

253   commonly recognized in finance textbooks that financial leverage impacts the cost of

254   equity for a company.   A replication of the text from a standard MBA textbook is

255   provided below:[26]

COMMON MISTAKE | **Is Debt Better Than Equity?**

Because debt has a lower cost of capital than equity, a common mistake is to assume that a firm can reduce its overall WACC by increasing the amount of debt financing. If this strategy works, shouldn't a firm take on as much debt as possible, at least as long as the debt is not risky?

This argument ignores the fact that even if the debt is risk free and the firm will not default, adding leverage increases the risk of the equity. Given the increase in risk, equity holders will demand a higher risk premium and, therefore, a higher expected return. The increase in the cost of equity exactly offsets the benefit of a greater reliance on the cheaper debt capital, so that the firm's overall cost of capital remains unchanged.

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[25]   I have in the past recommended forecasted yields as appropriate for estimating the cost of debt for future issuances. I note that Staff focuses on market measures. While I agree that market data can be informative, I emphasize that an appropriate forward yield must be used, since *currently*-prevailing yields do not provide the best market indication of what borrowing costs will be for *future* issuances.

[26]   Jonathan Berk and Peter DeMarzo, "Corporate Finance," Third Edition, 2013 (Berk & DeMarzo 2013), p. 492.

256 As Professors Berk and DeMarzo further note:

> The levered equity return equals the unlevered equity return, plus and
> 257 extra "kick" due to leverage. … The amount of additional risk depends on
> 258 the amount of leverage, measured by the firm's market value debt-equity
> 259 ratio, D/E….[27]
> 260

261 Financial economics simply do not leave any doubt that the cost of equity increases with

262 financial leverage and that the relevant measure of financial leverage depends on market

263 value. I, like other witnesses, estimate the cost of equity using market data in the CAPM-

264 based and DCF-based models and therefore the estimation process uses market data.[28]

265 As several intervener witnesses object to my considerations of financial risk, I respond to

266 any misconceptions about the methodology and address their concerns to ensure that the

267 methods are understood.

268 **A. HOW FINANCIAL LEVERAGE AFFECTS THE COST OF EQUITY**

269 **Q. Could you provide a numerical example to illustrate the impact of financial leverage**

270 **on cost of equity?**

271 A. As a simple example, think of an investor who takes money out of her savings and

272 invests $100,000 in real estate. The future value of the real estate is uncertain. If the real

273 estate market booms, she wins. If the real estate market goes down, she loses. Figure 4

274 below illustrates this.

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[27] Berk & Peter DeMarzo 2013, p. 489. Similar comments appear in Richard A. Brealey, Stewart C. Myers, and Franklin Allen, 2014, Principles of Corporate Finance, 11th edition, McGraw-Hill Irwin (Brealey, Myers & Allen 2014), p. 433.

[28] Versions of the risk premium model that use allowed or realized ROEs (such as my implied risk premium model) do rely on book value measures.

Figure 4
Return on an All-Equity Investment

Buy Real Estate for $100,000 using only Equity
If Real Estate Prices Increase or Decrease by 10%, Gain or Lose 10%.
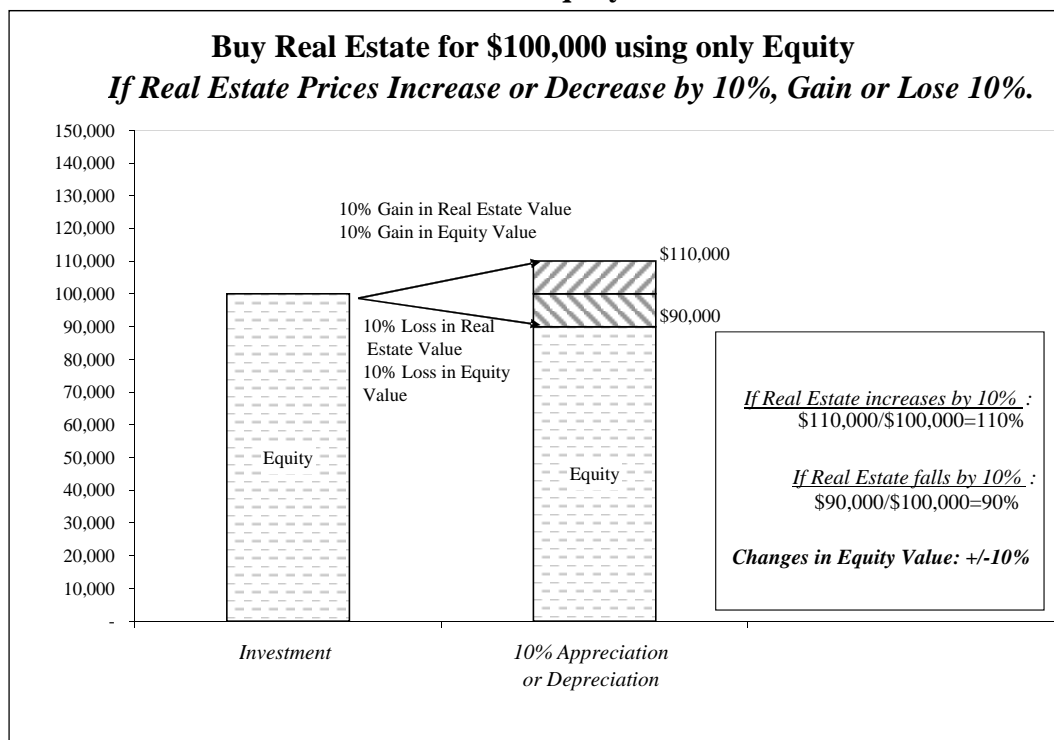
Compare this to the situation illustrated in Figure 5 below, where the investor finances

the same real estate purchase using 50 percent cash from savings (equity) and 50 percent

funds from a mortgage (debt). In this case variability in the investor's expected equity

return is two times greater than that of Figure 4. The entire fluctuation of 10 percent

from rising or falling real estate prices falls on the investor's equity investment, which is

smaller ($50,000) for the leveraged investment depicted in Figure 5 compared to the all-

equity $100,000 investment shown in Figure 4. The equity return for the leveraged

investment goes up or down by 20% in Figure 5, even though the actual change in the

value of the real estate (+/‐ 10%) is the same as depicted in Figure 4 for the all-equity

investment. The lesson from the example is obvious: debt adds risk to equity.

Figure 5
Return on a Leveraged Equity Investment

Buy Real Estate for $100,000 with a $50,000 Mortgage
If Real Estate Increases or Falls by 10%, Gain or Lose 20%.

10% Gain in Real Estate Value
20% Gain in Equity Value

$110,000

$100,000

10% Loss in Real Estate Value
20% Loss in Equity Value

Equity

$90,000

If Real Estate increases by 10%:
$110,000 - $50,000 = $60,000
$60,000/$50,000=120%

$50,000

If Real Estate falls by 10%:
$90,000 - $50,000 = $40,000
$40,000/$50,000=80%

Equity

Mortgage

Mortgage

Changes in Equity Value: +/-20%

Initial Investment   *Change in Value*

285   **Q.**   **Do finance textbooks also address the question of how financial leverage affects the**

286   **cost of equity?**

287   A.   Yes. Textbooks on corporate finance provide examples like the one I present above to

288   illustrate how the introduction of debt financing amplifies the variability of equity

289   returns, thus increasing the risk to equity holders and causing them to demand higher

290   expected returns. For example, Professors Brealey, Myers, and Allen write

291   Our example shows how borrowing creates financial leverage or gearing.
292   Financial leverage does not affect the risk or the expected return on the
293   firm's assets, but it does push up the risk of the common stock.
294   Shareholders demand a correspondingly higher return because of this
295   *financial risk*.[29]

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[29]   Brealey, Myers and Allen (2017), *Principles of Corporate Finance, 12th Edition*, p. 446 [emphasis original].

296   Similarly, Professors Berk and DeMarzo summarize the effect of leverage on the cost of

297   capital as follows.

298   *…[L]everage increases the risk of equity even when there is no risk that*
299   *the firm will default.* Thus, while debt may be cheaper when considered
300   on its own, it raises the cost of capital for equity. Considering both sources
301   of capital together, the firm's average cost of capital with leverage is …
302   the same as for the unlevered firm.[30]

303   These statements by preeminent finance scholars in widely-used Corporate Finance

304   textbooks highlight two important points that can also be intuitively observed based on

305   the real estate investment example:

306   •   The variability of returns on the asset itself (e.g., the piece of real estate) is
307   unchanged by the introduction of financial leverage, therefore "leverage does not
308   affect the risk or the expected return on the firm's assets". Rather, it is the risk and
309   required returns of the equity and debt financing instruments that are changed by
310   the degree of financial leverage.

311   •   The mechanism by which leverage adds variability to returns is independent of
312   any effect of increased leverage on the risk that the firm will be unable to fulfill
313   its fixed financial obligations, and thus (as Berk and DeMarzo put it) "leverage
314   increases the risk of equity even when there is no risk that the firm will default."

315 **Q.   Does Mr. Gorman accept these fundamental finance principles as articulated in**

316   **standard Corporate Finance textbooks?**

317 A. No, he does not. For example, in response to a data request, Mr. Gorman stated that he

318   did not agree with the proposition "that if two otherwise identical firms have different

319   market value capital structures, the (common equity) shareholders of the firm with higher

320   market value financial leverage will face greater investment risk."[31]   Mr. Gorman's

321   explanation of his disagreement addressed none of the accepted finance principles or

322   concepts taught in standard corporate finance curricula or textbooks, and instead referred

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[30]   Berk and DeMarzo (2014), *Corporate Finance, 3rd Ed.*, p. 482 [emphasis original].

[31]   IIEC/CUB Response to Data Request No. NG-IECC-CUB 3.13 (*See* Nicor Gas Ex. 25.6).

323   to "the variability of earned return on book equity" being influenced by "many factors

324   including book leverage."[32] This response reveals a misunderstanding of what drives the

325   risk faced by equity investors, since book value measurements cannot capture how

326   financial leverage affects the systematic risk (e.g., as measured in the *market* beta) and

327   required return for equity investors (as estimated using *market* price and return data).

328 **Q.**   **Can you illustrate using your real estate example why market value leverage must is**

329   **the relevant measure determining the financial risk affecting equity investors?**

330 A.   Yes. Suppose in the above real estate example that the investor had invested in real

331   estate 15 years ago, taking a $50,000 mortgage to purchase a property worth $100,000.

332   Further assume that in the 15 years since the purchase, accounting depreciation has

333   reduced the book value of the property to $70,000, while the investor has paid her

334   mortgage down to a remaining balance of $30,000. The book value of the investor's

335   equity investment is therefore $40,000 (= $70,000 − $30,000).

336   To calculate the return on equity if (for example) real estate prices rise or fall 20 percent,

337   one needs to know how real estate prices have developed over the past 15 years. For

338   example, if the market value of the property is now $200,000, then a 20 percent change in

339   the price of real estate represents a $40,000 gain or loss, equal to 100% of the investor's

340   book value equity.

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[32]   IIEC/CUB Response to Data Request No. NG-IECC-CUB 3.11. (*See* Nicor Gas Ex. 25.6.) Mr. Gorman was asked to provide academic or professional materials he reviewed or relied on for "the proposition that the effect of financial leverage on the risk of common equity of a company is a function of the book value capital structure of the issuer." However, while Mr. Gorman stated that he "has reviewed extensive material in both academic and professional materials in deriving the position he takes in his testimony," he was unable to produce any such material generally and can produce no such material supporting his conclusion on this topic, which is squarely at odds with accepted learning. *See* IEEC/CUB Response to Date Request No. NG-IECC-CUB 3.03 (*See* Nicor Gas Ex. 25.6).

341   The market return to the investor, however, is measured relative to her market value

342   equity in the property: $200,000 less the $30,000 outstanding mortgage balance,[33] or

343     $170,000. Therefore, when real estate prices change by 20 percent, the market return on

344   the investor's equity is **+/-** 23.5% (= $40,000 / $170,000), compared to +/- 100%

345   (= $40,000 / $40,000) return on the book value of equity.

346   The lesson from this example is clear. It is obviously not correct to say that a 20% drop

347   in housing prices will wipe out the investor's equity, or that a 20% increase in housing

348   prices would double it, as implied by the book value. Using book values would imply

349   much different variability of expected returns—and thus different risk—than what is

350   actually experienced by the investor. Therefore, when measuring the financial leverage

351   of market-traded assets, market values should be used.   More generally, financial

352   leverage should always be measured based on the capital structure that dictates the risk

353   and return of the investment.

354   **B.   RESPONSE TO CRITICISMS OF FINANCIAL RISK METHODOLOGY**

355 **Q.   What methods do you use to account for differences in financial risk?**

356 A.   As described in my direct testimony, I consider several methods to ensure that no one

357   method unduly biases the estimation process. The most commonly used method in

358   modern finance theory as presented in textbooks and employed in practice is the Hamada

359   method, which converts the equity beta that is estimated for each proxy company into the

360   so-called unlevered beta (or assets beta) that would apply if the proxy company were

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[33]   Technically, this assumes the market value of the mortgage (i.e., the price a lender would pay for it at current market interest rates) is equal to the outstanding balance, but any discrepancy between market and carrying value of the mortgage would not change the effect of the example.

361		hypothetically financed by 100% equity. As an alternative and for the DCF method, I also
362		calculate the overall cost of capital as a weighted average of the cost of equity and the
363		after-tax cost of debt and attempt to ensure that customers pay the same for capital
364		regardless of capital structure as illustrated in Figure 10 of my direct testimony.[34]

365 **Q. How did you measure leverage in performing your cost of capital calculations?**

366 A. As discussed in my direct testimony, I measure leverage using the same type of data as

367 used in the models to ensure an apples-to-apples measurement. The capital asset pricing

368 model ("CAPM") and DCF approach rely on measurements of beta and dividend yield

369 that are determined for the capital structures inherent in the market data for the sample.

370 Thus, I also use market value capital structures. Because the CAPM as implemented uses

371 Value Line betas, which are estimated over a five-year period, I need to use a five-year

372 capital structure for the sample, whereas the DCF methodology uses market value capital

373 structure data from a moment contemporaneous with the market price data I use for the

374 dividend yield calculation.

375 **Q. What differences in financial leverage did you have to account for in your**

376 **measurements?**

377 A. To the extent that the degree of financial leverage differs among the sample companies,

378 must be taken into account to arrive at an accurate capital cost estimate. For example, as

379 illustrated in Nicor Gas Ex. 11.4, Table No. BV-13, New Jersey Resources (NJR) had a

380 5-year average debt to market value ratio of 25.7%, compared to 38.1% for South Jersey

381 Industries (SJI). Therefore, even though their equity betas (as measured by Value Line)

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[34] Nicor Gas Ex. 11.0, p. 41.

382   were the same (at 0.80 as shown in column [1] of Nicor Gas Ex, 11.4, Table No. BV-13),

383   SJI's equity beta reflected more financial risk due to its greater financial leverage.

384   Consequently, the unlevered "asset beta" (calculated using either version of the Hamada

385   unlevering technique in columns [7] or [8]) is lower for South Jersey Industries than for

386   New Jersey Resources, reflecting the fact that South Jersey's equity beta reflects a higher

387   degree of financial risk and a lower degree of systematic business risk, which is measured

388   by the unlevered beta.

389   With respect to my DCF calculations illustrated in Nicor Gas Ex. 11.4, Table No. BV-7

390   Panel A, consider a comparison of Atmos Energy (ATO) and New Jersey Resources

391   (NJR). The DCF cost of equity (column [3]), measured using market stock price and

392   dividend data, was approximately 60 basis points higher for ATO (8.9%) than for NJR

393   (8.3%). However, the overall after-tax cost of capital estimates (column [10]) for the

394   ATO and NJR were much closer (at approximately 6.8% and 6.7%, respectively). This

395   reflects that fact that Atmos Energy's higher contemporaneous debt to market value ratio

396   (32.1% vs. 27.3% for NJR, as shown in column [8]) imparts higher financial risk that

397   accounts for the higher expected equity return demanded by investors when they

398   purchase Atmos's stock.

399 **Q.**   **When calculating averages across the sample companies, what quantities provide an**

400   **indicator of the business risk of the sample?**

401 A.   The unlevered beta and overall after-tax cost of capital control for differences in financial

402   leverage among the sample companies and the financial leverage used for rate making

403   purposes. Therefore, it is these quantities that can be meaningfully compared and

404   averaged on an "apples to apples" basis. Conversely, it *not* appropriate to base cost of

405   equity estimates on simple averages of the directly calculates cost of equity estimates or

406   equity betas for the sample companies, as Ms. Phipps and Mr. Gorman do. Taking such

407   an average effectively combines apples and oranges by incorporating estimates affected

408   by *both* business risk *and* differences in financial leverage. It therefore does not measure

409   Nicor Gas' cost of equity at its rate making capital structure.

410 **Q.   Since you measure the sample's business risk based on averages of the unlevered**

411   **beta (assets beta), how do you derive the equity beta and cost of equity capital that**

412   **are representative for Nicor Gas?**

413 A.   As described in my direct testimony,[35] the Hamada adjustment technique applies the

414   estimate of unlevered business risk (i.e., the risk of the underlying assets independent of

415   financing) to Nicor Gas by re-levering the average assets beta at its requested regulatory

416   capital structure, consisting of 54.2% equity. I do the same with respect the sample

417   average overall after-tax weighted average cost of capital estimates that I derive for the

418   DCF and CAPM.

419 **Q.   What justifications do the other cost of capital witnesses in this proceeding offer to**

420   **reject the financial risk adjustments you performed in your direct testimony**

421   **analysis?**

422 A.   Although most if not all cost of capital witnesses acknowledge that financial leverage

423   increases financial risk to equity investors and increases the cost of equity,[36] they dispute

424   the use of formal model to measure the impact. For example, Mr. Gorman argues that

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[35]   Nicor Gas Ex. 11.0, p. 13 and Nicor Gas Ex. 11.2, pp 21-24.

[36]   For example, Staff Ex. 3.0, p. 64 is concerned about the authorized capital structure for companies used in the implied risk premium analysis.

425   both Value Line and S&P assess a company's financial risk based on its book value

426   leverage, book value cash flows, and the earnings on its book value common equity,[37]

427   rather than market value as textbooks recommend.[38] (In fact, Value line reports

428   companies' "capital structure" using the book value of debt and the market value of

429   equity.)[39] Mr. Gorman also inaccurately states that I believe that there are two levels of

430   financial risk, one on a book value basis and one a market value basis.[40] Ms. Phipps

431   mischaracterizes my use of the overall after-tax cost of capital as a "market-to-book

432   based leverage adjustment,"[41] and misattributes my quantification of differences in

433   financial leverage to "differences that result from measuring a capital structure using

434   market values versus book values."[42]

435   **1.   Mr. Gorman Incorrectly Asserts That Financial Risk is Determined**
436   **by Book Value**

437 **Q.   Does Mr. Gorman accurately describe how you implemented your financial risk**

438 **adjustments?**

439 A.   No. Mr. Gorman describes my calculation as follows.

440   [Dr. Villadsen calculates] the ATWACC using the market return on equity
441   estimate (CAPM and DCF estimates) and market weighted capital

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[37]   IIEC/CUB Ex. 1.0 (Gorman Dir.), pp. 86-87.

[38]   See, for example, Brealey, Myers and Allen (2014) p. 433 or Berk & DeMarzo (2013), p. 489. See Also, Bente Villadsen, Michael J. Vilbert, Dan Harris, and A. Lawrence Kolbe, "*Risk and Return for* Regulated *Industries,*" Academic Press 2017, Chapter 7 and the references herein.

[39]   See for example, the following Value Line reports: "Atmos Energy Corp.", "Chesapeake Util.", New Jersey Res.", "NW Natl' Gas", "South Jersey Inds.", "Southwest Gas", and "WGL Holdings" – all dated June 2, 2017. In each instance, Value Line reports the "Capital Structure as of 3/31/2017" using market values for the equity (MPG Confidential WP 4).

[40]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 86.

[41]   Staff Ex. 3.0 (Phipps Testimony), p. 10.

[42]   Staff Ex. 3.0 (Phipps Testimony), p. 12.

442   structures for each proxy company. She then uses this market ATWACC
443   and each company's book value capital structures to derive a return on
444   equity that produces the same ATWACC on the proxy group's book
445   capital structure that was produced on its market value capital structure.[43]

446   Mr. Gorman also states, "Dr. Villadsen proposes to upwardly adjust her CAPM and DCF

447   model results for the difference in financial risk based on the proxy companies' market

448   value of common equity, compared to their book value common equity."[44]

449   These statements are simply incorrect. My adjustments for financial leverage in no way

450   rely on the book value capital structures of the proxy group companies. Rather, I use the

451   textbook approach of determining the average asset beta—appropriately measured using

452   market returns and capital structure data—for my sample companies and relevering that

453   asset beta to an equity beta using Nicor Gas' capital structure. I also look to the overall

454   cost of capital as determined using the market-value capital structure of the sample

455   companies and derive an ROE from that, which is consistent with Nicor Gas' proposed

456   regulatory capital structure.

457   Mr. Gorman's apparent misunderstanding of my methods of accounting for financial risk

458   may explain his further mischaracterization of my position as a "belief that there are two

459   levels of financial risk," or that "firms have a different level of financial risk, depending

460   on whether one is observing their market value capital structure or the book value capital

461   structure." [45]

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[43]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 85.

[44]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 86.

[45]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 86.

462 **Q.** **Do you, as Mr. Gorman states, believe that there are two levels of financial risk?**

463 A.   No. There is only one measure of financial risk, and that measure is based upon market

464   value. This proposition is supported by accepted modern finance theory and every

465   textbook on corporate finance of which I am aware.[46] Further, the view is not just an

466   ivory-tower creation. Duff & Phelps, a respected commercial provider of cost of capital

467   data relied on in the "real world," also uses market-value capital structure in the cost of

468   capital estimates.[47]

469   Every day experience also indicates that market value is the measure of financial risk. As

470   illustrated above using the example of a real estate investor, it is the appraised market

471   value of the property—not the original purchase price or other book value measure—that

472   is relevant in determining how debt (a mortgage) affects the investor's equity return when

473   home prices change. The larger the percentage of the *appraised market value* that is

474   financed with a mortgage, the larger will be variability in your equity return as the

475   property's value varies. This share changes as market values change, even if the

476   property's "book value" is unchanged.

477 **Q.** **Isn't it true that Value Line and credit rating agencies measure financial risk with**

478   **reference to book values as noted by Mr. Gorman?[48]**

479 A.   Yes and no. Credit rating agencies are concerned with the credit worthiness of debt

480   issuing entities; their ability to pay interest and repay debt. As noted above, they are only

481   indirectly concerned with the cost of equity capital. To ensure credit worthiness, credit

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[46]   See Footnote 38 above.

[47]   See, for example, Duff and Phelps, 2016 Valuation Handbook p. 39.

[48]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 87.

482   rating agencies rely upon accounting and other information to calculate financial ratios to

483   measure the financial health of a company. Using primarily accounting information

484   allows for consistency between companies when evaluating the credit worthiness of a

485   company. A credit report based upon market information would need to be updated

486   frequently.

487   Regardless of how credit rating agencies determine credit worthiness, the determination

488   of the cost of equity is necessarily different as equity investors have no "guaranteed"

489   periodic payment and are behind bond holders in case of default.

490   As for Value Line, as noted above, the investor service reports companies' "capital

491   structure" using the book value of debt and the *market* value of equity.

492   **2.   Ms. Phipps Does Not Accurately Describe My Use of Methods for**
493   **Accounting for Financial Risk**

494 **Q.   Do you employ a "market-to-book leverage adjustment" as asserted by ICC Staff**

495 **witness Phipps?**

496 A.   No. Contrary to what Ms. Phipps implies in her testimony, my methods of accounting for

497   financial risk have nothing to do with "changing the measure of capital structure ratios

498   from a market to book value basis."[49] Importantly, I am not proposing to multiply or add

499   a measure based on the market-to-book ratio of Nicor Gas or the proxy group. Rather, as

500   explained in my Direct Testimony and above, my financial risk adjustments reflect the

501   fact that I estimate the cost of equity using market data and this data reflect the market

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[49]   Staff Ex. 3.0 (Phipps Testimony), p. 13.

502   value capital structures of the sample companies. In contrast, Nicor Gas' revenue

503   requirement is determined using a regulatory capital structure.

504   **Q.   Is Ms. Phipps correct when she emphasizes that "[c]apital structures are merely**

505   **indicators of financial risk; they are not sources of financial risk"?[50]**

506   A.   She is correct only in part. Capital structure ratios are measurements that provide an

507   indication of a firm's degree of financial leverage, but the financial leverage measured by

508   such ratios certainly *is* a source of financial risk. As demonstrated above, market value

509   measurements of financial leverage determine the relevant financial risk for traded assets.

510   **Q.   Since the financial risk of market traded assets is properly determined by market-**

511   **value leverage, is there any issue with the fact that Nicor Gas' regulatory capital**

512   **structure is measured on a book value basis?**

513   A.   While it is true (as established above) that financial leverage for market-traded assets is

514   appropriately measured on the a market value basis, it is also true that the regulated entity

515   Nicor Gas does not have publicly traded stock and thus has no market value capital

516   structure. Part of the purpose of this proceeding is to determine the regulatory capital

517   structure that is representative of how Nicor Gas' assets will be financed in the test year.

518   This regulatory capital structure is the one that determines the variability of returns on

519   equity invested in Nicor Gas, and thus the financial risk associated with that equity

520   investment. In citing ICC precedent, Ms. Phipps highlights this fact:

521   In the Commission's judgment, the book value **capital structure reflects**
522   **the amount of capital a utility actually utilizes to finance the**
523   **acquisition of assets, including those assets used to provide utility**
524   **service**. In establishing the overall or weighted average cost of capital, the

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[50]   Staff Ex. 3.0 (Phipps Testimony), p. 12.

525   proportion of common equity, based on the book value capital structure, is
526   multiplied by market required return on common equity.[51]

527   It is therefore appropriate to apply the sample average overall cost of capital to Nicor

528   Gas' regulatory capital structure when calculating Nicor Gas' required return on equity.

529   Similarly, in implementing the Hamada adjustment, it is appropriate to un-lever the

530   sample company betas based on the market value capital structures that determine how

531   financial leverage affects their market returns, and to re-lever the sample average assets

532   beta at Nicor Gas' regulatory capital structure, which determines the financial leverage

533   that affects the risk of Nicor Gas' equity.

534 **Q.   Does the consideration of financial leverage attempt to provide the same return on**

535   **book value rate base as the ROE estimate based upon the market value of stock?**

536 A.   No. It is critical to note that the product of the allowed rate of return times the rate base

537   will NOT generate the same amount of money that the calculated weighted-average cost

538   of capital times the market value of the sample companies would generate. The return is

539   not increased to duplicate what the sample companies expect to earn on their market

540   value capital structure. In other words, the methodology does not say that a 10 percent

541   return on a market value of 1.5 times book value should yield a 15 percent return on book

542   value. What it does say is that a company that has a lower equity percentage than what

543   was used to estimate the return on equity requires a higher return on equity than what was

544   estimated (and vice versa).

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[51]   Staff Ex. 3.0 (Phipps Testimony), p. 14, citing North Shore Gas Co. and The Peoples Gas
Light and Coke Co., ICC Order Docket Nos. 14-0224/14-0225 (Consol.), 126-127 and 132-133
(Jan. 21, 2015).

**3.	Mr. Gorman and Ms. Phipps Do Not Provide Principled Arguments for Rejecting the Hamada Adjustment**

Q.	**What are Ms. Phipps' arguments for rejecting the Hamada adjustment?**

A.	Unlike Mr. Gorman, Ms. Phipps accurately describes how I implemented the Hamada adjustment in my cost of capital analysis.[52] Her only argument for rejecting that analysis is that ICC has in the past "declined to adopt Hamada leverage adjustments because they are based on the same incorrect presumptions that underlie the M/B leverage adjustments."[53]

Q.	**Is the Hamada adjustment based on "incorrect presumptions"?**

A.	No. The Hamada adjustment is based on fundamental finance principle that differences in financial leverage lead to differences in financial risk that are captured in the measurement of equity beta. The procedures I employ to unlever and relever beta are standard accepted techniques in corporate finance and are taught in every corporate finance textbook of which I am aware.[54] Moreover, as I noted above, the Hamada adjustment is not a "market-to-book leverage adjustment" such as has been rejected by the ICC in the past.

Q.	**Does Mr. Gorman provide any valid principled basis for his assertion that "the Hamada methodology is … a way of unjustly increasing the CAPM results?"**

A.	No. Mr. Gorman's criticisms of my application of the Hamada adjustment are all premised on misunderstandings and mischaracterizations. First, he inaccurately claims

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[52]	Staff Ex. 3.0 (Phipps Testimony), p. 11.

[53]	Staff Ex. 3.0 (Phipps Testimony), p. 16.

[54]	See, for example, Berk and Demarzo 201, Chapter 14, Brealey, Myers and Allen 2014, Chapter 19, p. 494, Ross, Westerfield and Jaffe, "Corporate Finance," 2014, Chapter 18.

565   that my "analysis is not based on a complete assessment of financial risk."[55] While

566   Mr. Gorman apparently wishes to apply a different definition, financial risk as I define it

567   relates to the effect of financial leverage on the variability of expected equity returns.

568   The Hamada method of unlevering and relevering betas addresses precisely that effect.[56]

569   Additionally, Mr. Gorman argues that the Hamada adjustment is somehow deficient in

570   that it is focused on accounting for differences in financial risk to the exclusion of other

571   sources of systematic risk.[57] This argument ignores the fact that beta itself is designed to

572   measure systematic risk as influenced by all such factors; adjusting for differences in

573   financial risk is simply a way to compare risk caused by all the other factors—commonly

574   grouped into the category of "business risk"—on an apples-to-apples basis. If

575   Mr. Gorman believes that there are other differences in business risk factors among the

576   sample companies, or between the sample and Nicor Gas, he could have explicitly

577   discussed or adjusted for such differences in his own analysis, rather than disingenuously

578   criticizing me for failing to account for them using a textbook approach that is

579   specifically designed only to account for differences in financial risk due to differences in

580   financial leverage.[58]

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[55]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 92.

[56]   Nicor Gas Ex. 11.0, pp. 12-13 and Nicor Gas Ex. 11.2, p. 23.

[57]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 93.

[58]   In fact, in my direct testimony I did address differences in business risk associated with operating leverage—which is different than financial leverage and so cannot be accounted for using the Hamada approach. See Nicor Gas Ex. 11.0, pp. 57-60.

C.   FINANCIAL RISK ADJUSTMENT AND REGULATORY POLICY

582 **Q.   How do you respond to Mr. Gorman's assertion that the ATWACC is poor**

583 **regulatory policy?**

584 A.   Mr. Gorman discusses three reasons that he believes the ATWACC would be poor

585 regulatory policy,[59] but none of the reasons are accurate. First, he claims that the

586 ATWACC is not transparent. This is puzzling as the approach is discussed in every

587 MBA text I know of.[60] Nothing I am recommending would change how a regulated

588 company manages its capital structure or its reporting requirements to its regulator.

589 Second, Mr. Gorman claims that the ATWACC would somehow eliminate a utility's

590 ability to hedge its market costs,[61] but the overall after-tax cost of capital or the Hamada

591 methodology has nothing to do with this ability. I agree that the cost of capital changes

592 between rate cases, but between rate cases, the allowed ROE and revenue requirement

593 would not change in any way that is related to how the ROE originally was determined.

594 This whole objection is simply incorrect. Of course, the cost of capital may change with

595 the next rate case but that is because the cost of debt and equity has changed and has

596 nothing to do with how financial leverage is considered in determining the ROE.

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[59]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 88.

[60]   See, for example, Brealey, Myers and Allen (2014), *Principles of Corporate Finance, 11th Edition,* McGraw-Hill Irwin, New York, Chapter 19, Ross, Westerfield, and Jaffe (2014), *Corporate Finance,* 10th Edition, McGraw-Hill, Chapter 11 , Bodie, Kane and Marcus (2009), *Investments,* McGraw-Hill Irwin, New York, 8th ed., 2009, Chapter 18, and Koller, Goedhart and Wessels (2005), *Valuation,* 4th ed., John Wiley & Sons., Inc., Chapter 5.

[61]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 88.

597		Third, Mr. Gorman claims that the ATWACC inflates the equity return for utility
598		investors.[62] Again, this is not accurate. The consideration of financial leverage simply
599		recognizes that financial risk is important and should be recognized when setting the
600		allowed ROE. It is not an "adder" as Mr. Gorman claims; rather is symmetrical in its
601		application: as financial leverage decreases, so does the required return on equity, and
602		vice versa.

603 **Q.** **Are the financial risk adjustment procedures you rely on accepted and employed by**
604 **other regulators?**

605 A. Yes, a number of regulators in the U.S. and in countries around the world rely upon the

606 ATWACC to set rates and/or apply a version of the Hamada adjustment when analyzing

607 betas. For example, the Surface Transportation Board ("STB") uses the weighted-

608 average cost of capital to determine revenue adequacy for railroads,[63] as does the Federal

609 Communication Commission to set rates for local exchange carriers.[64] The Pennsylvania

610 Public Utility Commission has accepted financial leverage,[65] and the Florida Public

611 Service Commission uses a very similar method to regulate small water companies.[66] In a

612 recent decision, the FERC used the weighted-average cost of capital (calculated as I do)

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[62]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 88.

[63]   STD Decision in Docket No. EP 558 (Sub-No. 18), August 6, 2015.

[64]   Federal Communications Commission, "Prescribing the Authorized Rate of Return," WC Docket No. 10-90, May 16, 2013.

[65]   Pennsylvania Public Utility Commission, Order and Decision in R-00038304 (Pennsylvania-American Water Company), January 16, 2004.

[66]   Florida Public Service Commission, Order in Docket No. 120006-WS, June 28, 2012, pp. 3-4.

613   as a discount rate in a valuation dispute.[67] In a recent decision, the Alabama Public

614   Service Commission said

615   [t]he Commission recognizes that the ATWACC analysis is not a
616   prevalent methodology in the United States; however, the focus of that
617   methodology on the relationship between the market value and the
618   associated financial risk of the utility is compelling."[68]

619   **VI. COMPANY SPECIFIC CONSIDERATIONS OF RISK AND RETURN**

620   **Q.   Will you please summarize this section of your testimony?**

621   A.   Nicor Gas has higher business risk compared to the average natural gas distribution

622   sample company. This conclusion is supported by unrebutted evidence of its higher

623   degree of operating leverage. Ms. Phipps's and Mr. Gorman's arguments that Nicor Gas

624   is actually of average or lower than average risk compared to the sample companies are

625   based on misuses of information related to credit ratings and credit metrics. Credit rating

626   agencies analyze such metrics and issue such ratings to provide information on the risk of

627   default on debt; these tools do **not** provide useful information for evaluating the relative

628   risk of equity investments.

629   Additionally, contrary to the testimony of Ms. Phipps and Mr. Gorman, Nicor Gas'

630   unrecovered equity flotation costs are appropriately recovered through a 10 basis point

631   increase to the allowed ROE (which is incorporated as part of my recommended range

632   and point estimate of 10.7%) as derived in my direct testimony.

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[67]   Order Conditionally Accepting Tariff Revisions, Subject to Compliance Filings, Docket no. ER 14-2940-000, PJM Interconnection, L.L.C., issued November 28, 2014.

[68]   Alabama Public Service Commission, Report and Order in Docket No. 18117 and 18416, August 21, 2013, p. 20.

633 **Q. What do Ms. Phipps and Mr. Gorman say about the business risk of Nicor Gas**

634 **relative the companies in the gas sample?**

635 A. Ms. Phipps argues that Nicor Gas is less risky than the sample. She bases her assessment

636 on analysis of certain financial ratios employed by Moody's Investor Service in their

637 *Ratings Methodology for Regulated Electric and Gas Networks.*[69] Mr. Gorman also

638 largely bases his assessment of relative risk on credit ratings, stating

639 The proxy group has an average corporate credit rating from Moody's of
640 A3, which is a notch lower than Nicor's credit ratings of "A2". Based on
641 this information, I believe my proxy group is reasonably comparable in
642 investment risk to Nicor.[70]

643 While reliance on credit ratings and credit metrics is appropriate when evaluating the

644 relative abilities of Nicor Gas and the sample companies to meet their fixed debt

645 obligations, such information is not directly relevant to the evaluation of risk for equity

646 holders.

647 **A. CREDIT RATINGS ARE NOT A MEASURE OF EQUITY RISK**

648 **Q. Are credit ratings an appropriate measure of the risk of a company's equity?**

649 A. No, the goal of the credit rating agencies is not to measure or evaluate the systematic risk

650 of a company's equity, but rather to evaluate the probability that a company will default

651 on its debt. Moody's states this goal concisely in its methodology documents:

652 Ratings assigned on Moody's global long-term and short-term rating
653 scales are forward-looking opinions of **the relative credit risks of**
654 **financial obligations** issued by non-financial corporates, financial
655 institutions, structured finance vehicles, project finance vehicles, and
656 public sector entities. Long-term ratings are assigned to issuers or
657 obligations with an original maturity of one year or more and **reflect both**

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[69] Staff Ex. 3.0 (Phipps Testimony), p. 47-50, including footnotes 80-81.

[70] IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 49.

| 658 | **on the likelihood of a default on contractually promised payments and** |
| 659 | **the expected financial loss suffered in the event of default.**[71] |

660 Default is a manifestation of the company being unable to make good on its debt

661 obligations. For companies such as Nicor Gas and the proxy companies in the gas

662 sample, the probability of default is very low.[72]

663 While credit ratings speak to the probability of debt-holders being paid a promised

664 amount in a timely fashion, equity risk relates to systematic risk or the tendency of a

665 security's returns to respond to returns in the broader stock market. For this reason, a

666 higher credit rating does not necessarily correspond to lower shareholder risk, or vice

667 versa. Two companies with identical credit ratings need not have the same required

668 return on equity. For instance, factors that make a company's cash flows more sensitive

669 to the broader market would affect the cost of equity even if they do not affect the

670 individual company's probability of default enough to warrant a change in credit rating.

671 **Q.** **How do you respond to Ms. Phipps's use of credit metrics and credit ratings to**

672 **derive a downward adjustment to Nicor Gas' cost of equity?**

673 A. Ms. Phipps attempts to estimate certain credit metrics utilized by Moody's in assessing

674 the "financial strength" factor in its ratings grid. She compares the scores she computes

675 based on Nicor Gas' revenue requirement to metrics computed for the natural gas

676 distribution sample, and uses these calculations to infer an "implied rating of A1" for

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[71] Moody's Investor Service, *Ratings, Symbols, and Definitions*, December 2016. [Emphasis added.]

[72] According to Standard & Poor's, "2016 Annual Global Corporate Default Study and Rating Transitions," April 13, 2017, pp. 10-11, the default rate for BBB or higher rated entities has been 0.00% since 2011. I eliminate non-investment grade companies from my sample.

677 Nicor Gas.[73] She then applies a portion of the difference in yields for differently-rated

678 bonds as an adjustment to the required return on equity.[74]

679 This approach to quantifying differences in risk is conceptually flawed and does not

680 provide meaningful evidence—either quantitative or qualitative—about the risk and

681 required return on equity for Nicor Gas relative to the gas sample.

682 As explained above, credit ratings simply do not measure the risk of equity. The same

683 applies to the credit metrics relied on by Ms. Phipps. In the methodology report she

684 relies on from Moody's, the rating agency explains the purpose of the ratings grid (of

685 which "financial strength" makes up just one factor) as follows.

686

687 The grid is a reference tool that can be used to **approximate credit**
688 **profiles** within the regulated electric and gas utility sector in most cases.
689 … However, the grid is a summary that does not include every rating
690 consideration. The **weights shown for each factor in the grid represent**
691 **an approximation of their importance for rating decisions but actual**
692 **importance may vary substantially**. In addition, the illustrative mapping
693 examples in this **document use historical results while ratings are**
694 **based on our forward-looking expectations**. **As a result, the grid-**
695 **indicated rating is not expected to match the actual rating of each**
696 **company**.[75]

697 Clearly, Moody's does not intend the coverage ratios and other credit metrics relied on by

698 Ms. Phipps to serve as tools for quantifying the risk or relative risk for equity investors.

699 Additionally, Moody's itself does not ascribe the level of precision and comparability to

700 its "grid-indicated ratings" that Phipps assumes in performing her detailed calculations.

701 For these reasons, Ms. Phipps' testimony that "Nicor Gas is slightly less risky than the

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[73]   Staff Ex. 3.0 (Phipps Testimony), p. 48-49, including Table Six.

[74]   Staff Ex. 3.0 (Phipps Testimony), p. 51, ll. 932-943.

[75]   Moody's Investor Service, *Rating Methodology: Regulated Electric and Gas Utilities*,
22-24 (Dec. 23, 2013). Emphasis added.

702 companies in the Gas Sample, necessitating a slight downward adjustment"[76] to ROE is

703 unfounded and should be given no weight.

704 **Q. Do Ms. Phipps or Mr. Gorman make any other comments regarding Nicor Gas' risk**

705 **relative to the sample companies?**

706 A. Yes. In responding to my testimony (in Nicor Gas Ex. 11.0) that Nicor Gas' capital

707 intensity, exacerbated by its recent high and accelerating capital expenditures, makes

708 Nicor Gas riskier than the sample companies on average, Ms. Phipps emphasizes that the

709 bulk of Nicor Gas' capital expenditures are under the QIP program. She argues that

710 because QIP reduces regulatory lag and gives the opportunity an opportunity for timely

711 fixed cost recovery, it necessarily reduces Nicor Gas' business risk.[77] Mr. Gorman also

712 highlights the QIP program as "mitigat[ing Nicor Gas'] investment risk."[78]

713 However, these comments ignore the fact that, regardless of any benefits QIP provides in

714 terms of allowing the Company to recover fixed capital costs outside of a general rate

715 case, Nicor Gas' capital expenditures—including those covered under QIP—have

716 contributed to it having a substantially higher degree of operating leverage compared to

717 the companies in the natural gas distribution sample.

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[76] Staff Ex. 3.0 (Phipps Testimony), p. 47, ll. 875-877.

[77] Staff Ex. 3.0 (Phipps Testimony), pp. 24-26.

[78] IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 32.

718   **B.   NICOR GAS' HIGH OPERATING LEVERAGE INCREASES BUSINESS**
719   **RISK**

720   **Q.   Will you please review how operating leverage increases business risk?**

721   A.   Yes. As explained in my direct testimony, when a company's cost structure contains a

722   higher proportion of fixed (versus variable) costs, it experiences greater variability of

723   bottom line profits (and cash flows distributable to investors) for a given variability of top

724   line sales revenue. Therefore, companies with higher proportions of fixed costs (i.e.,

725   those with higher "operating leverage") have greater business risk.[79] This effect is well

726   established in academic finance and is discussed in standard corporate finance textbooks.

727   Brealey, Myers, and Allen explain as follows.

728   Thus, given the cyclicality of revenues…, the asset beta is proportional to
729   the ratio of the present value of fixed costs to the present value of the
730   project. … Other things being equal, the alternative with the higher ratio
731   of fixed costs to project value will have the higher project beta. Empirical
732   tests confirm that companies with high operating leverage actually do have
733   high betas.[80]

734   **Q.   Did you provide evidence in your direct testimony that Nicor Gas has higher**

735   **operating leverage compared to the sample?**

736   A.   Yes. Figure 17 in my Direct Testimony (Nicor Gas Ex. 11.0) presented statistics on the

737   amount of revenue per dollar of (book value) property plant and equipment ("PP&E")

738   produced by Nicor Gas and the sample companies. It demonstrated that Nicor Gas

739   generates substantially less revenue per unit of plant assets compared to the companies in

740   the natural gas distribution sample, indicating that fixed capital makes up a larger portion

741   of Nicor Gas' cost structure. This higher degree of operating leverage should properly be

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[79]   Nicor Gas Ex. 11.0, p. 57 and Figure 16.

[80]   Brealey, Myers, and Allen, *Corporate Finance*, 11th Ed. (2014), p. 228.

742   interpreted as leading to greater business risk for Nicor Gas. This evidence was not

743   rebutted or even mentioned by either Ms. Phipps or Mr. Gorman.

744   **Q.   Did the data in Figure 17 of your Direct Testimony take account of QIP recovery**

745   **revenue?**

746   A.   Yes. The data accounted for QIP, both in the denominator (PP&E) and the numerator

747   (revenue) of the ratio I relied on in Figure 17 to draw conclusions about the relative

748   capital intensiveness of Nicor Gas and the sample companies. Since QIP recovery

749   revenue was included in the analysis, the existence of a capital tracker cannot be

750   interpreted as a counterpoint to the evidence of Nicor Gas' high operating leverage. The

751   evidence shows that, *even accounting for any timeliness benefits resulting from the QIP*

752   *rider*, the Company generates less revenue per unit of fixed capital investment compared

753   to the sample, exposing it to greater variability of cash flows with respect to changes in

754   sales volume.

755   **Q.   Is there other evidence that Nicor is expecting higher than usual capital**

756   **expenditures?**

757   A.   Yes. As recently noted by Moody's,

758   Nicor Gas is in the midst of an elevated capital investment program of
759   around $2.1 billion from 2017 through 2019.[81]

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[81]   Moody's Investment Service, "Northern Illinois Gas Company," July 21, 2017.

760 Moody's is concerned with the impact on creditworthiness (not equity risk) and notes it

761 under "credit challenges."

762 **Q.** **Can you quantify the operating leverage of Nicor Gas and the proxy group?**

763 A. Yes. For example, I look at the change in operating income relative to the change in gas

764 operating revenue or relative to the change in natural gas volume, I find that Nicor Gas

765 has substantial higher operating leverage than the proxy group. For example, as

766 measured by the change in operating income relative to the change in gas operating

767 revenue, Nicor Gas for 2011-2016 had a measure of 0.33 while the proxy group average

768 was 0.20. The difference is larger if the change in natural gas volumes (rather than dollar

769 sales revenue) is used.[82]

770 Looking to the textbook of Brealey, Myers and Allen, the asset beta of a company

771 increases in proportion to the higher operating leverage,[83] so that Nicor Gas' asset beta is

772 higher than that of the proxy group. Therefore, there is quantifiable evidence that Nicor

773 Gas has higher operating risks than the proxy group.

774 **C.** **ADJUSTMENT FOR NICOR GAS' UNRECOVERED FLOTATION**
775 **COSTS**

776 **Q.** **What did you propose in your direct testimony with regard to Nicor Gas'**

777 **unrecovered equity flotation costs?**

778 A. I proposed that since these costs were not recovered as expenses at the time they were

779 incurred, they should properly be recovered prospectively through an adjustment to the

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[82] Nicor Gas Ex. 25.4.

[83] Brealey, Myers and Allen (2014), pp. 226-229.

780   Company's ROE.[84] I estimate the amount of the necessary adjustment at 10 basis points,

781   based on a representative calculation using a standard modification to the DCF model

782   that accounts for flotation costs. This calculation recognizes that because Nicor Gas

783   incurred issuance costs equaling 2.54% of the market value of the issued shares, only the

784   remaining 97.46% of the capital raised was available for investment in utility assets and

785   able to earn a return of and on capital.[85]

786 **Q.**   **Do the other cost of capital witnesses agree with your flotation cost adjustment?**

787 A.   No. While both Mr. Gorman and Ms. Phipps agree in principle that it is appropriate for

788   equity flotation costs to be recovered in rates, they each disagree with certain aspects of

789   the proposed recovery of Nicor Gas' flotation costs.

790 **Q.**   **How do you respond to Ms. Phipps's criticism of your flotation cost**

791   **recommendation?**

792 A.   Ms. Phipps states that my proposed adjustment is too high and argues that a different

793   formula should be applied to calculate the adjustment—one that effectively increases the

794   ROE by a percentage equal to documented dollar flotation costs divided by Nicor Gas'

795   book value common equity balance to be used in this proceeding.[86]

796   The formula suggested by Ms. Phipps is deficient in that it does not provide sufficient

797   prospective recovery of either the actual costs incurred at the time of issuance or the

798   return *on* equity required by investors but not available to them for the portion of the

799   market value of the issued shares that was "lost" to flotation costs. The dollar flotation

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[84]   Nicor Gas Ex. 11.0, p. 60.

[85]   Nicor Gas Ex. 11.0, pp. 61-62.

[86]   ICC Staff Ex. 3.0 (Phipps Testimony), pp. 20-21.

800		costs were incurred in the last century; consequently, comparing them directly to Nicor
801		Gas' present common equity balance ignores the time value of money. The opportunity
802		cost of those expenditures to Nicor Gas' investors is their required return on equity, i.e.,
803		the return they would have expected if there had been no flotation costs and the full dollar
804		value of their investment had been used to finance Nicor Gas' rate base and operations.
805		Unlike my proposed adjustment, Ms. Phipps's proposed adjustment formula takes no
806		account of this, and so does not allow Nicor Gas' investors to earn their required return
807		on equity with respect to the flotation costs incurred to raise the equity capital.
808	**Q.**	**How do you respond to Mr. Gorman's criticisms of your flotation cost**
809		**recommendations?**
810	A.	Mr. Gorman puts forth two criticisms. First, he claims that the flotation costs in question
811		were "approximated".[87] This is inaccurate, as the costs were documented in Schedule D-5
812		provided by Nicor Gas. Second, Mr. Gorman states that because Nicor Gas is not a
813		publicly traded company, it does not directly incur equity flotation costs and should not
814		be allowed to recover such costs incurred by its corporate parent on its behalf.[88]
815		Mr. Gorman appears to be arguing that the proceeds from common stock issued by Nicor
816		Gas' corporate parent does not benefit Nicor Gas or its ratepayers—a position which is at
817		odds with Mr. Gorman's acknowledgement that Nicor Gas' common equity capital
818		comes in part from "equity infusion from its parent company."[89] Regardless of what
819		formal entity ultimately issued the equity securities, it is clearly the case that if the

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[87] IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 106.

[88] IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 107.

[89] IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 108.

820   proceeds were used in part to fund Nicor Gas' rate base, it is appropriate that Nicor Gas

821   should recover any costs associated with that portion of the issuance. By adjusting the

822   DCF-implied fair rate of return on equity to account for the equity flotation costs as a

823   percentage of the market value of the issued equity, my approach to accounting for

824   flotation costs appropriately allows for this recovery.

825   **VII.   COST OF EQUITY ESTIMATION METHODOLOGIES**

826   **A.   THE CAPM**

827   **Q.   What are your overall reactions to the other witnesses' implementations of the**

828   **Capital Asset Pricing Model (CAPM) in this case?**

829   A.   While Ms. Phipps, Mr. Gorman, and I all take somewhat different approaches to

830   determining the core inputs to the CAPM—i.e., the risk-free rate, the market risk

831   premium (MRP), and the betas for the sample companies—the inputs selected do not

832   differ greatly among our implementations. In particular, the risk-free rate and MRP

833   inputs employed by Mr. Gorman are very similar to those I used in my direct testimony

834   analysis, and while Ms. Phipps relies on a substantially lower risk-free rate compared to

835   Mr. Gorman and myself, she derives forward-looking estimate of the overall expected

836   return on the market that is slightly higher than that implied by my (or Mr. Gorman's)

837   CAPM inputs. If she had employed a risk-free rate in line with that used by Mr. Gorman

838   and me, Ms. Phipps would have derived a somewhat higher CAPM result.

839   However, most of the difference between my CAPM cost of equity estimates and those of

840   the other witnesses derives from (i) their failure to properly account for the effect of

841   financial leverage by unlevering and relevering betas according to the textbook "Hamada

842   adjustment" approach I employ, and (ii) their unjustified dismissal of the empirical

843   CAPM (ECAPM), which I rely on to account for the observed tendency of the traditional

844   CAPM to underpredict returns for certain assets and overpredict returns for others. I

845   addressed the first of these shortcomings in the other witnesses' CAPM implementations

846   above in Section V. I will address the second (i.e., the ECAPM) below.

847   **1.   The Risk-Free Rate**

848 **Q.**   **What does Mr. Gorman use for the risk-free rate?**

849 A.   Mr. Gorman uses a risk-free rate of 3.70%, based on a forecast of the 30-year Treasury

850   Bond yield for mid-2018 from Blue Chip Financial Forecasts,[90] which is a sister

851   publication to the source (Blue Chip Economic Indicators) of the 10-year Treasury Bond

852   yield that forms the basis of my own risk-free rate inputs. In justifying this choice, he

853   correctly notes that "long-term Treasury bonds have an investment horizon similar to that

854   of common stock," and that "the nominal risk-free rate (or expected inflation rate and real

855   risk-free rate) included in a long-term bond yield is a reasonable estimate of the nominal

856   risk-free rate included in common stock returns."[91]

857   However, Mr. Gorman also states that Treasury bonds "include risk premiums related to

858   unanticipated future inflation and interest rates," and asserts that because of this, "for

859   companies with betas less than 1.0, using the Treasury bond yield as a proxy for the risk-

860   free rate in the CAPM analysis can produce an overstated estimate of the CAPM

861   return."[92] This line of argument is misleading, since (as Mr. Gorman himself admits

862   earlier in the same answer) the inflation—expected or unexpected—facing long-term

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[90]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 68.

[91]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 69.

[92]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 69.

863   Treasury bond investors is the same faced by equity investors over similar long horizons.

864   Similarly, any interest rate risk inherent in U.S. government bond yields only exists if

865   investors sell the bonds before they reach maturity. Over the tenor of the bond, a long-

866   term (default-free) U.S. Treasury security held to maturity truly *is* a risk-free investment.

867 **Q.   Does Ms. Phipps make similar claims to Mr. Gorman regarding long-term**

868   **government bond yields?**

869   Yes. Although she ultimately also relies on a 30-year Treasury bond yield for her risk-

870   free rate, Ms. Phipps repeatedly claims that such a bond yield is an "upwardly biased

871   estimator of the long-term risk-free rate due to the inclusion of an interest rate risk

872   premium associated with its relatively long term to maturity."[93] This claim of bias relies

873   on the same misconception stated by Mr. Gorman, namely that interest rate uncertainty

874   constitutes a source of risk for investors in long-term government bonds, which is true

875   only if the investment horizon does not match the tenor of the bond. Since equity has a

876   perpetual life and utilities invest in and operate infrastructure over long horizons, it is

877   appropriate to treat long-term government bond yields as an *unbiased* estimate of the

878   risk-free rate of return over that horizon. Given the horizon in question, it is *short-term*

879   bond investments that carry interest rate reinvestment risk.

880 **Q.   What Treasury yield does Ms. Phipps rely on to estimate the risk-free rate?**

881 A.   She adopts as her risk-free rate input the 2.87% yield on 30-year U.S. Treasury bonds that

882   prevailed on June 8, 2017.[94] In doing so, she rejects forecasted bond yields such as those

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[93]   Staff Ex. 3.0 (Phipps Testimony), p. 39.

[94]   Staff Ex. 3.0 (Phipps Testimony), pp. 38-39. *See also* ICC Staff Ex. 3.0, Schedule 3.12.

883 relied on by Mr. Gorman and myself, stating that contemporaneous "U.S. Treasury bond

884 yields reflect market forces while forecasts do not," and emphasizing differences between

885 past forecasts and eventual realized yields to discredit the use of expert projections in the

886 CAPM.[95]

887 **Q. Do you agree with Ms. Phipps that forecasted bond yields do not reflect market**

888 **forces and are not valuable in estimating future interest rates?**

889 A. No. While it is certainly true that expert forecasts do not always precisely predict

890 eventual spot yields, research shows that such forecasts generally exhibit a conservative

891 "status quo bias"—tending to over-predict eventual spot yields during falling interest rate

892 environments and *under*-predict actual yields when interest rates are on the rise.[96] Since

893 interest rates have generally followed a downward trajectory since the financial crisis, it

894 is then not surprising that the forecasts analyzed by Ms. Phipps have tended to predict

895 higher yields than were eventually realized. However, when interest rates do rise, they

896 may well do so more dramatically or at a faster pace than anticipated by market

897 participants.

898 Additionally, it is not reasonable to state that forecasts do not reflect market forces. The

899 financial institutions and economic experts that contribute projections to publications

900 such as Blue Chip are both observers of and participants in financial markets. Their

901 opinions are both informed by and exert influence over market forces in determining

902 asset prices (including for government bonds).

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[95] Staff Ex. 3.0 (Phipps Testimony), pp. 54-56.

[96] R.W. Hafer and Scott Hein, "Comparing Futures and Survey Forecasts of Near-Term Treasury Bill Rates," *Federal Reserve Bank of St. Louis*, May/June 1989.

903 **Q.** **How would Ms. Phipps CAPM estimates differ if she relied on a risk-free rate**

904   **estimate in line with those employed by you and Mr. Gorman?**

905 A.   Ms. Phipps's CAPM estimate relies on a forward-looking estimate of 12.06% for the

906   expected return on the market derived using a market-wide DCF calculation. Combining

907   this with her risk-free rate estimate (2.87%) and her sample average beta estimate (0.70)

908   yields a CAPM result of 9.30%.[97] If Ms. Phipps had instead relied on Mr. Gorman's risk-

909   free rate input of 3.70%, her CAPM result would have been higher by 25 basis points.[98]

910   **2.   The Market Risk Premium**

911 **Q.** **How does Ms. Phipps derive the MRP input for her CAPM calculation?**

912 A.   She performs a DCF analysis of dividend-paying stocks in the S&P 500 index, resulting

913   in an implied expected market return of 12.06%.[99] Subtracting Ms. Phipps risk-free rate

914   estimate of 2.87% implies a forward-looking market risk premium of 9.19%.

915 **Q.** **What MRP inputs does Mr. Gorman rely on for his CAPM analysis?**

916   Mr. Gorman uses two MRP estimates: 7.8 percent and 7.9 percent.[100] He derives the first

917   by applying forward-looking estimates of expected inflation and risk-free rates to the

918   historical average real market return as calculated by *Duff & Phelps*.[101] This is not truly a

919   "forward-looking estimate." However, it is similar to Mr. Gorman's second estimate,

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[97]   ICC Staff Ex. 3.0, Schedule 3.12.

[98] $3.70\% + 0.70 \times (12.06\% - 3.70\%) = 9.55\%.$

[99]   Staff Ex. 3.0 (Phipps Testimony), p. 40.

[100]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 76.

[101]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 70.

920   which he derives by calculating the expected rate of return implied by a DCF analysis of

921   the market as a whole (defined by the S&P 500 index). [102]

922   Both of Mr. Gorman's estimates align closely with my "Scenario 2" market risk premium

923   estimate of 7.9%. [103]

924 **Q.   What are your reactions to Mr. Gorman's historical market risk premium estimate?**

925 A.   Mr. Gorman's estimate of the historical market risk premium (6.0%) is improperly

926   derived and unreasonably low. This is because Mr. Gorman averages excess stock

927   returns relative to *total* returns on long-term government bonds rather than income

928   returns,[104] in contravention of sound finance principles. As Duff & Phelps explains (and

929   Mr. Gorman acknowledges), only the cash payments associated with government bonds

930   are truly risk free on an annual return basis, and therefore these income returns are

931   appropriate for calculating the annual premium received by risky equity investments in

932   excess of the *risk-free* rate.[105] In contrast, total returns on long-term government bonds

933   include capital appreciation returns resulting from interest rate and currency fluctuations.

934   These returns are uncertain at the time of the investment and can only be realized by

935   selling the bond before maturity. Consequently, only historical income returns accurately

936   reflect the risk free rate of interest expected by investors upon purchasing long term

937   government bonds.   Put another way, ex-post realized income returns correctly

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[102]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 76.

[103]   Villadsen Direct Testimony, p. 40 (Fig. 9).

[104]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 71.

[105]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 71, citing *Duff & Phelps 2016 Valuation Handbook*, at p. 3-28 to 3-32.

938   correspond to the ex-ante yields on government bonds that reflect the risk-free rate of

939   return available to market participants.

940   Ultimately, however, Mr. Gorman does not rely on this incorrectly-derived estimate of

941   market risk premium in computing his estimates.

942 **Q.   In general, how do the risk-free rate and market risk premium inputs relied on by**

943   **Mr. Gorman and Ms. Phipps align with your own corresponding inputs?**

944 A.   Compared on the basis of the implied overall expected market return Mr. Gorman's and

945   Ms. Phipps's inputs are very similar to my own, and in fact are slightly higher. Figure 6

946   summarizes and compares the inputs.

Figure 6
Comparison of Witness CAPM Risk-Free Rate and MRP Inputs

		Risk-free Rate	Market Risk Premium	Implied Expected Market Return
[1]		[2]	[3]	[4] = [2] +[3]
Villadsen Scenario 1	[a]	4.00%	6.90%	10.90%
Villadsen Scenario 2	[b]	3.60%	7.90%	11.50%
Gorman "low prospective MRP"	[c]	3.70%	7.80%	11.50%
Gorman "high prospective MRP'	[d]	3.70%	7.90%	11.60%
Phipps	[e]	2.87%	9.19%	12.06%

Sources:
[a]-[b]: Nicor Gas Ex. 11.0, p. 40 (Fig. 9)
[c]-[d]: IIECC/CUB Ex. 1.0, p. 76
[e]: ICC Staff Ex. 3.0, p. 40 and Schedule 3.12

947   **3.   Beta**

948 **Q.   What betas do the other cost of capital witnesses in this proceeding use in their**

949   **CAPM analyses?**

950 A.   Like me, Mr. Gorman relies on Value Line betas.[106] Ms. Phipps uses Value Line betas,

951   but also considers betas from Zacks and performs her own regression estimates based on

952   monthly stock returns for the sample companies compared to the NYSE index.[107]

953 **Q.   Does Ms. Phipps criticize your reliance on Value Line betas?**

954 A.   Yes. Ms. Phipps argues that because Value Line betas are derived based on weekly

955   returns, they are potentially biased due to non-synchronous trading, which she states is

956   "greater for weekly data than for monthly data."[108] Ms. Phipps claims this potential bias

957   is the reason she averaged a sample average Value Line beta with sample average betas

958   from Zacks and her own monthly regression analysis.

959 **Q.   How do you respond to this criticism?**

960 A.   While Ms. Phipps is correct that mismatches in the volume and timing of trades between

961   individual securities and the market index can result in biases in measured betas, she does

962   not present any evidence that this is a significant issue for the companies in the natural

963   gas distribution sample. In general, when stocks trade less frequently than the index

964   (which is generally true for smaller companies), betas measured based on more frequent

965   intervals (especially using daily returns) can be biased *downward*. Conversely, larger

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[106]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 69 and IECC-CUB Ex. 1.16.

[107]   Staff Ex. 3.0 (Phipps Testimony), pp. 41-42, 44-45.

[108]   Staff Ex. 3.0 (Phipps Testimony), p 59.

966   companies that may be more actively traded than the average market index component

967   might have their betas biased upward.

968   Absent some specific evidence that the sample companies fall into one or the other of

969   those categories, and that the non-synchronicity of trades for these companies compared

970   to the market index is substantial enough to result in a significant bias, there is no reason

971   to be concerned about the use of weekly betas, which are the standard for data providers

972   such as Value Line and Bloomberg.

973   Additionally, I note that Ms. Phipps's beta estimates do not differ substantially compared

974   to the Value Line betas relied on by Mr. Gorman and myself. The sample average

975   estimate she relies on is 0.70, compared to 0.72 for Mr. Gorman, and 0.73 using the

976   Value Line data available at the time of my direct testimony.

977 **Q.**   **Do you have other comments about the intervenors' treatment of betas in their**

978   **CAPM analyses?**

979 A.   As described in Section V above, Ms. Phipps and Mr. Gorman improperly take sample

980   averages of measured equity betas instead of un-levering those betas and averaging the

981   assets betas, which control for differences in financial leverage and provide a pure

982   measurement of systematic business risk. By failing to take the standard textbook

983   approach, Ms. Phipps and Mr. Gorman ignore that the fundamental risk of the gas

984   distribution industry is measured on assets and consequently fail to consider the impact of

985   financial risk on the cost of equity.

986   **4.   The Empirical CAPM**

987   **Q.   How do you respond to Ms. Phipps's[109] and Mr. Gorman's[110] assertions that**

988   **employing the ECAPM while using adjusted beta estimates from *Value Line* is**

989   **inappropriate?**

990   A.   They are not correct.   These are two fundamentally different and complementary

991   adjustments. This can be shown by reference to Figure 7 below which illustrates the

992   empirical security market line ("SML"). The adjustment to beta corrects the estimate of

993   the relative risk of the company, which is measured along the horizontal axis of the SML.

994   The ECAPM adjusts the risk-return tradeoff (i.e., the slope) in the SML, which is on the

995   vertical axis. In other words, the expected return (measured on the vertical axis) for a

996   given level of risk (measured on the horizontal axis) is different from the predictions of

997   the theoretical CAPM. Getting the relative risk of the investment correct does not adjust

998   for the slope of the SML, nor does adjusting the slope correct for errors in the estimation
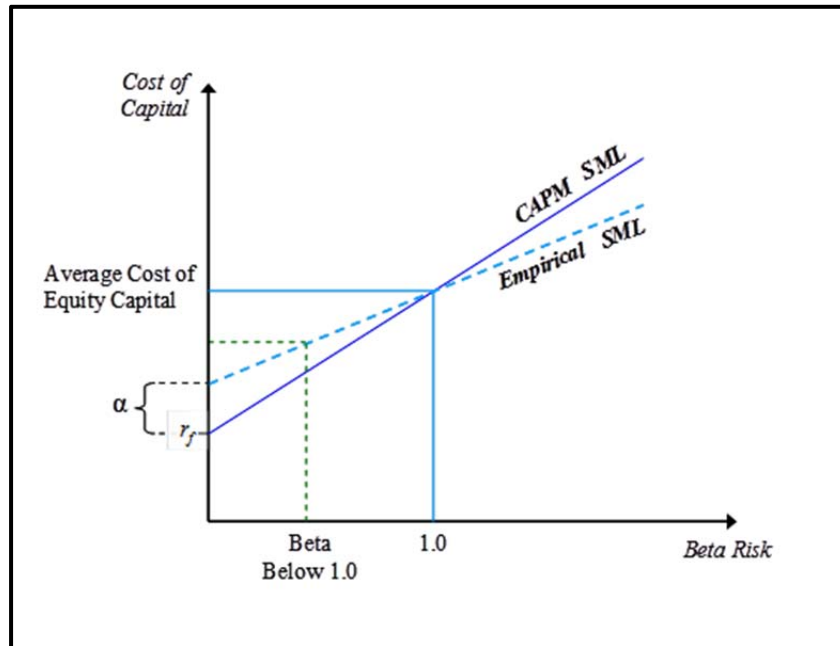
999   of relative risk.

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[109]   Staff Ex. 3.0 (Phipps Testimony), pp. 60-63.

[110]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 61.

Figure 7: The Empirical Security Market Line

1000 **Q. Can you explain further why using *Value Line's* adjusted betas do not correct for**

1001 **the issues raised by empirical tests of the CAPM?**

1002 A. Yes. It is because the issues raised by the empirical tests are completely independent

1003 from the reason betas are adjusted. The beta adjustment performed by Value Line is

1004 based on the method outlined by Professor Marshall Blume,[111] based on his empirical

1005 observation that historical measurements of a firm's beta are not the best predictors of

1006 what that firm's systematic risk *will be* going forward. Professor Blume was able to

1007 apply a consistent adjustment procedure to historical betas that increased their accuracy

1008 in *forecasting* eventual realized betas. Essentially, Professor Blume's adjustment

1009 transforms a historical beta into a better estimate of expected future beta. It is this

1010 expected "true" beta that drives investors' expected returns according to the CAPM.
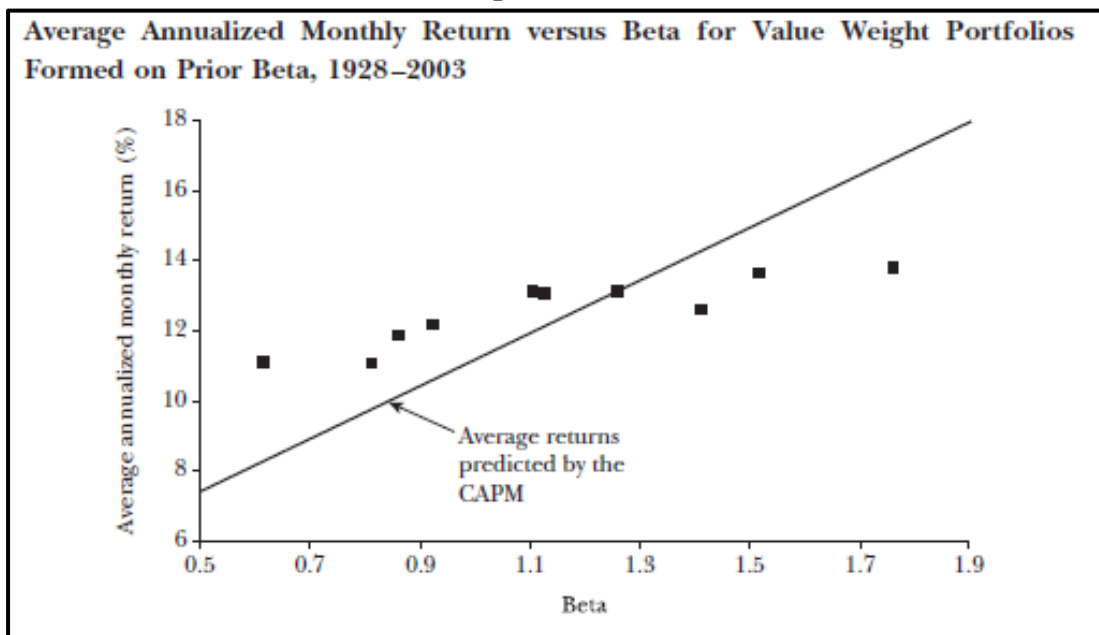
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[111] Blume, Marshall E. (1971), "On the Assessment of Risk," The Journal of Finance, 26, p. 1-10.

1011   Therefore, it is appropriate to use *Value Line's* adjusted betas, rather than raw historical

1012   betas, when employing the CAPM to estimate the forward-looking cost of equity capital.

1013   However, the backward-looking empirical tests of the CAPM that gave rise to the

1014   ECAPM did not suffer from bias in the measurement of betas. Researchers plotted

1015   realized stock portfolio returns against betas measured *over the same time period* to

1016   produce plots such as Figure 8 below, which comes from the 2004 paper by Professors

1017   Eugene Fama and Kenneth French.[112] The fact that betas and returns were measured

1018   contemporaneously means that the betas used in the tests were *already the best possible*

1019   *measure* of the "true" systematic risk over the relevant time period. In other words, no

1020   adjustments were needed for these betas. Despite this, researchers observed that the risk-

1021   return trade-off predicted by the CAPM was too steep to accurately explain the realized

1022   returns.   As explained above the ECAPM explicitly corrects for this empirical

1023   observation.

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

Figure 8
Evidence from Empirical Tests of the CAPM[113]

Average Annualized Monthly Return versus Beta for Value Weight Portfolios Formed on Prior Beta, 1928–2003

1024 **Q.** **Did the empirical tests that gave rise to the ECAPM use raw betas in their analyses?**

1025 A. They did. However, this is simply because, as illustrated in the bottom half of Figure 9

1026   below, the researchers were able to measure raw betas and realized returns from the same

1027   historical period. In other words, no adjustment to the raw beta was necessary to evaluate

1028   the market return realized for the same historical period. Hence, the raw betas they

1029   measured accurately captured the systematic risk that impacted the returns they

1030   measured. In a sense, the measured betas and realized returns were already

1031   contemporaneous in the tests of the CAPM that identified the effect shown in Figure 7

1032   and Figure 8.

Figure 9
Empirical Tests of the CAPM vs. Forward-looking Application of ECAPM
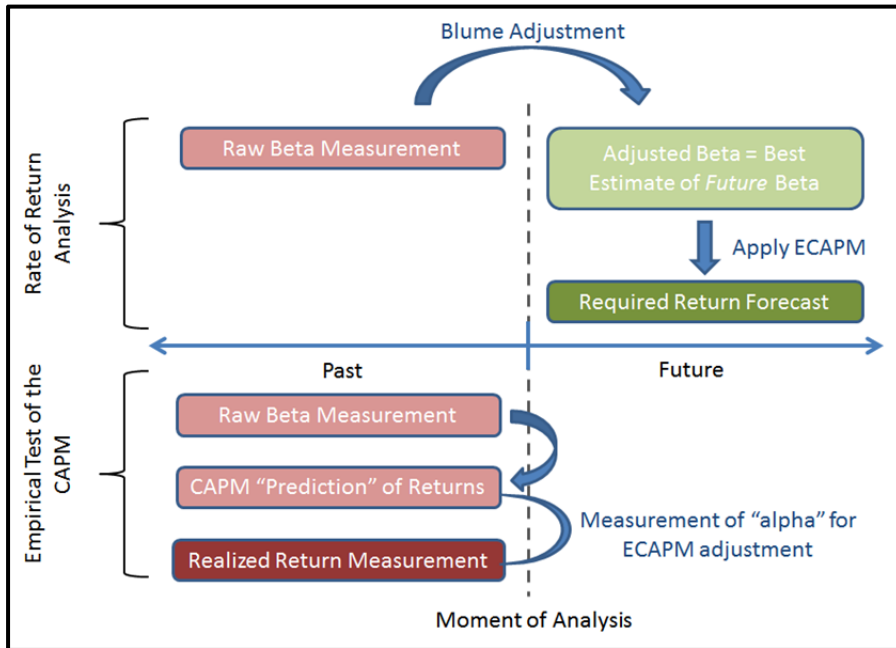
1033 **Q.   How do you respond to Ms. Phipps's comments relating to the paper by**

1034 **Litzenberger, Ramaswamy and Sosin that you cite as supporting the ECAPM?**

1035 A.   Mr. Phipps states that the Litzenberger, *et al*. paper "adopts raw beta as the measure of

1036 risk in its tests of the relationship between risk and realized returns," and asserts that

1037 "Litzenberger *et al*. suggest that globally adjusted betas, such as those which Value Line

1038 publishes, are a solution to the discrepancy between the theoretically predicted and

1039 empirically observed relationship between risk and return."[114]   While she is correct in the

1040 first, instance, Ms. Phipps misinterprets the authors' statements regarding adjusted betas.

1041 What they actually say is that "the existence of reversion towards unity suggests that

1042 "adjusted" betas, computed as convex combinations of the historical beta and unity, are

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[114]   Staff Ex. 3.0 (Phipps Testimony), p. 60, citations omitted.

1043   better predictors than are unadjusted betas." [115] In other words, the Blume adjustment is

1044   designed to account for Blume's observation that historical betas are not the best

1045   predictors of expected future betas. Litzenberger and his co-authors do not bring this up

1046   to suggest that Blume's observations about beta describe the same phenomenon as their

1047   tests of the CAPM. On the contrary, they bring up Blume's research precisely to

1048   demonstrate that the any test of the relationship between *true* beta and expected returns

1049   depends on having the most accurate possible estimate of that true beta—i.e., adjusted

1050   beta.

1051   Additionally, Ms. Phipps ignores the paper's results. Litzenberger *et al*. explain (on page

1052   376) that the estimate of "alpha" they obtain when using historical (i.e., "raw") betas is a

1053   linear combination of the alpha that would be obtained with a perfect estimate of "true"

1054   beta and the weighting factor employed in the Blume "global adjustment" procedure,

1055   which they describe with the equation $\beta_i = \omega\beta_{i(historical)} + (1 - \omega)1$. Using the

1056   equations that the authors present along with their results presented in the "Raw Betas"

1057   panel of Table 1 (on page 380 of the paper), it is possible to derive the estimate of alpha

1058   implied for use of Blume adjusted beta with $\omega = 0.67$:

$$a = a' - b'\left(\frac{1 - \omega}{\omega}\right) = 0.326 - 0.330\left(\frac{0.33}{0.67}\right) = 0.163$$

[115]   Litzenberger, Ramaswamy and Sosin, "On the CAPM Approach to Estimation of a Public Utility's Cost of Equity Capital," Journal of Finance, May 1980, pp. 375-376.

1059   In other words, the results of Litzenberger *et al.*'s study are consistent with an ECAPM

1060   alpha factor of 2.0% when applying Blume-adjusted betas.[116]

1061 **Q.   So then are Ms. Phipps and Mr. Gorman correct that the Commission should reject**

1062   **the ECAPM results because using adjusted betas in the ECAPM will "double count**

1063   **the adjustment" to the estimated required return on equity?**

1064 A.   No. The Blume adjustment to beta and the ECAPM are separate adjustments with no

1065   redundancy between them. In fact, both adjustments are necessary to produce the most

1066   accurate possible forward-looking estimate of the required return on equity.

1067   A rate of return analyst must use a historical measurement of beta to make a forecast of

1068   the expected *future* return on equity. Therefore, the analyst should first apply the Blume

1069   adjustment (as *Value Line* does) to get the best estimate of the systematic risk over the

1070   (future) period in which she will estimate the ROE. Once the risk measurement is

1071   contemporaneous with the returns to be estimated, the analyst should apply the ECAPM

1072   to adjust for the empirical shortcomings of the CAPM.

1073 **Q.   Can you summarize the independent reasons for using adjusted betas and**

1074   **employing the ECAPM?**

1075 A.   Raw historical betas are adjusted to provide a better estimate of *expected* "true" betas,

1076   which are the appropriate measure of risk that predicts expected future returns in the

1077   CAPM. The ECAPM is used because empirical tests show that *even when the best*

1078   *possible estimate* of "true" beta is used, the CAPM tends to under-predict required returns

1079   for low-beta stocks and over-predict required returns for high-beta stocks.

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[116]   Since Litzenberger, *et al.* used monthly return data, their monthly alpha estimate of 0.163% corresponds to $(1.0163)^{12} - 1 = 1.98\%$ when annualized.

1080   These are independent but complementary adjustments supported by empirical tests of

1081   this model of financial theory. Both adjustments are appropriate when using risk-

1082   positioning models to estimate the cost of equity.

1083   **B.**   **DCF MODELS**

1084 **Q.**   **What DCF-based analyses did Ms. Phipps consider in making her cost of capital**

1085   **recommendations?**

1086 A.   Ms. Phipps performed a single-stage (constant growth) DCF calculation using analyst

1087   growth rates sourced from Zacks and Reuters, as well as a multi-stage ("non-constant

1088   growth") DCF calculation employing a long-term growth rate estimate of 4.13% in the

1089   perpetual phase.[117] However, in discussing her recommendation, Ms. Phipps explicitly

1090   relies only on the results of her single-stage DCF calculation.[118]

1091 **Q.**   **Is Ms. Phipps correct in her assertion that you "gave zero weight" to the results of**

1092   **your multi-stage DCF?[119]**

1093 A.   No. As can be seen in my direct testimony,[120] my reasonable range for the DCF approach

1094   takes into account the multi-stage DCE (starting at 9.4% rather than at the single-stage

1095   DCF results of 11.0%). I interpreted my DCF results in light of multiple sources of

1096   downward bias affecting that multi-stage DCF calculation and also downward adjusted

1097   the single-stage DCF results[121]. One such concern is the abnormally low forecasts of

1098   long-term GDP growth that is traditionally used to represent growth in the perpetual

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[117]   ICC Staff Ex. 3.0 (Phipps Testimony), pp. 29-31, Schedules 3.07 and 3.08.

[118]   ICC Staff Ex. 3.0 (Phipps Testimony), p. 34, ll. 629-634 and p. 46, ll. 847-849.

[119]   ICC Staff Ex. 3.0 (Phipps Testimony), p. 6, ll. 91-92 and ll. 98-99.

[120]   Nicor Gas Ex. 11.0, p. 63 and Workpaper 1 to Nicor Gas Ex. 11.4.

[121]   Nicor Gas. Ex. 11.0, p. 63.

1099 phase of the model; the projection I rely on in my primary implementation of the model is

1100 very similar to those employed by Ms. Phipps and Mr. Gorman in their multi-stage DCF

1101 calculations. As noted above, both Ms. Phipps and Mr. Gorman de-emphasize or ignore

1102 those results in making their DCF-based cost of equity recommendations.

1103 **Q.** **How do you respond to Ms. Phipps's criticisms of your approach to weighting IBES**

1104 **and *Value Line* growth rates in deriving your company-specific growth rate inputs**

1105 **for the DCF model?**

1106 A. Ms. Phipps criticizes me for weighting the IBES consensus growth rate estimates by the

1107 number of independent brokers that contributed to the consensus when averaging with the

1108 *Value Line*-derived growth estimates.[122] I take issue with Ms. Phipps implication that

1109 this approach was somehow results-oriented. While it is true, as Ms. Phipps points out,

1110 that the two companies whose IBES growth rates aggregated estimates from multiple

1111 independent brokers also happened to have the highest IBES growth rates and the lowest

1112 *Value Line* growth rates in the sample, this is a mere coincidence. I have implemented

1113 the same standard procedure of weighting consensus growth rate estimates by the number

1114 of contributing independent analysts in countless other proceedings, and have never

1115 changed the approach based on the results. I simply assign the same weight to each

1116 independent analyst regardless of where the forecast is reported.

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[122] ICC Staff Ex. 3.0 (Phipps Testimony), p. 53, ll. 970-976.

1117   I also take issue with Ms. Phipps's assertion that I did not "provide any reason" for taking

1118   this approach, since I provided a detailed explanation of my reasoning in a discovery

1119   response submitted well in advance of when Ms. Phipps filed her testimony.[123]

1120   **Q.   Why do you weight IBES consensus growth rate estimates by the number of**

1121   **contributing analysts rather than assigning IBES and *Value Line* equal weight as**

1122   **Ms. Phipps asserts you should have done?[124]**

1123   A.   I do this because, contrary to Ms. Phipps's assertion, IBES does not constitute one of

1124   "two independent sources" of growth rate estimates. Unlike *Value Line*, which is an

1125   independent investor service that provides a single coherent set of projections for each

1126   company it covers, Thomson Reuters's IBES is an aggregation service, which collects

1127   and curates projections and estimates from *multiple* independent broker/analysts. The

1128   consensus long-term growth rate projections reported by IBES are themselves already

1129   averages of the independent estimates provided by contributing analysts. Therefore,

1130   when two analysts contribute to the consensus, an IBES estimate represents an average

1131   computed based on two independent sources, such that incorporating *Value Line* takes the

1132   number of independent sources informing the overall average to three, not two as would

1133   be implied by Ms. Phipps's suggestion to weight IBES and *Value Line* equally. Thus,

1134   Ms. Phipps's criticism is without merit, and my approach is both reasonable and justified.

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[123]   *See* Response to Data Request No. RMP 6.04. *See also* ICC Staff witness Phipps's Response to Data Request No. NG-STAFF 2.05. Both responses are included in Nicor Gas Ex. 25.5.

[124]   ICC Staff Ex. 3.0 (Phipps Testimony), p. 53, ll. 977-979.

1135   Additionally, it is worth noting that the sample average of the combined (i.e., weighted

1136   average) IBES and *Value Line* growth rates in my direct testimony analysis is 6.3%,[125]

1137   compared to the 6.49% average relied on by Ms. Phipps.[126]

1138   **Q.   What DCF-based analyses did Mr. Gorman consider in making his cost of capital**

1139   **recommendations?**

1140   A.   Mr. Gorman performs two versions of a constant growth DCF calculation: one using

1141   analyst growth rates averaged from multiple sources,[127] and another using "sustainable

1142   growth rates" calculated "based on the Company's [sic] current market-to-book ratio and

1143   on Value Line's three- to five-year projections of earnings, dividends, earned returns on

1144   book equity, and stock issuances."[128] Mr. Gorman also performs a multi-stage growth

1145   DCF calculation very similar to my own, using "a 4.20% long-term sustainable growth

1146   rate based on the consensus economists' long-term projected nominal GDP growth

1147   rate."[129]

1148   While Mr. Gorman presents results from all three of his analysis, he deemphasizes his

1149   multi-stage growth rate DCF results, stating that he does not believe such low estimates

1150   (i.e., an average of 7.5%) are "reasonably consistent with market evidence of required

1151   risk premiums and security valuations."[130] Consequently, he bases his DCF-based point

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[125]   Nicor Gas Ex. 11.4, Table No. BV-5.

[126]   ICC Staff Ex. 3.0, Schedule 3.07.

[127]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 53.

[128]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 56. Note that while Mr. Gorman refers to ratios and projections for the "the Company," it can be inferred from his calculations that he actually performed the calculations for the companies in his proxy group.

[129]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 65.

[130]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 66.

1152 estimate of the cost of equity on "the approximate average of [his] constant growth DCF

1153 studies."[131] This apparently includes his "sustainable growth" based constant growth

1154 DCF model, although Mr. Gorman also expresses "concerns" about relying on those

1155 results as well as the multi-stage growth DCF results.[132]

1156 If Mr. Gorman acted upon his concerns with an ROE below 8% and excluded results

1157 below 8% from his constant growth DCF model he observe an average of 10.35% and

1158 9.85% for the consensus growth and sustainable growth rate, respectively. If I, as a

1159 sensitivity check, also eliminate the highest result from Mr. Gorman's analysis, I obtain

1160 constant growth DCF estimates of 9.8% and 9.0%, respectively. Thus, clearly the very

1161 low estimates below 8%, which Mr. Gorman states causes him concern,[133] result in a

1162 downward bias of the cost of equity estimates by 40 to over 100 basis points using the

1163 average of the two constant growth DCF methods.

1164 **Q.   Do you also have concerns about Mr. Gorman's "sustainable growth" DCF**

1165 **calculations?**

1166 A.   Yes. Mr. Gorman based his estimates of the "sustainable growth" rates for the proxy

1167 companies on *Value Line's* projections of dividends, earnings, book ROE, and stock

1168 issuances on a 3-5 year horizon. However, *Value Line* also provides a direct projection

1169 of earnings per share (EPS) on that same horizon—a projection I employ in deriving

1170 growth rates for my own DCF analysis. It is unclear why the set of projections relied on

1171 by Mr. Gorman would produce different growth estimates than the direct EPS projections

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[131]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 66.

[132]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 66, ll. 1137-1138.

[133]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 66.

1172		performed by the same analysts. This inconsistency raises concerns about Mr. Gorman's
1173		assumptions and/or the precision of the various input projections he relied on in deriving
1174		the "sustainable growth" rate.

1175		**C.**	**IMPLIED RISK PREMIUM METHOD**

1176	**Q.**	**What do you cover in this section?**

1177	A.	First, I address the relevance of the implied risk premium model and second, I discuss the
1178		downward bias caused by the lack of looking to the method. While ICC Staff has not
1179		typically relied on the risk premium method, Mr. Gorman does and has in recent
1180		testimonies found it to be the highest of his estimates by a non-trivial amount.[134]

1181	**Q.**	**Why do you consider the implied risk premium relevant?**

1182	A.	I believe that investors consider the information that is available to them – including the
1183		allowed ROE, ROR, and capital structure of similar companies. As Nicor Gas needs to
1184		compete for capital, it is important that the company can do so on equal term with other
1185		"similar risk" companies. Principally, the risk premium method determines the risk
1186		premium over and above a risk-free rate (or a bond yield) that investors in other regulated
1187		companies have access to and use the information to derive a cost of equity using the
1188		expected / forecasted risk-free rate (or bond yield) at the time rates go into effect.
1189		Because the implied risk premium model provides information about available returns

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[134]   For example, his risk premium analysis in recent Oregon testimony (Gorman Dir. in Docket UE 319 (Portland General), Exhibit ICNU / 200-221, p. 47) found the risk premium results to be 40-70 basis points higher than the CAPM or DCF results.

1190   and I believe such information is considered by investors, I disagree with Ms. Phipps that

1191   the method should be rejected.[135]

1192 **Q.   Do you have any other comments regarding Ms. Phipps criticism of your implied**

1193 **risk premium analysis?**

1194 A.   Yes.   Ms. Phipps states that I have not provided the information necessary for the

1195   Commission to determine whether the facts and circumstances in the decisions relied

1196   upon makes them relevant for this proceeding. I have two comments on this point. First,

1197   all decision relied upon were natural gas distribution rate cases[136] and I note that the SNL

1198   data do report capital structures. Second, the key concern is that this information is

1199   available and therefore deserves to be presented for consideration. In my view, the fact

1200   that Staff's recommendation result in an ROE that is upward 50 basis points below the

1201   industry average should be explained.

1202 **Q.   How about Mr. Gorman's leaving out a risk premium analysis?**

1203 A.   In doing so, Mr. Gorman is inconsistent with the approach he has used regularly in the

1204   past, and because the risk premium analysis currently leads to a higher estimated ROE

1205   than Mr. Gorman's other methods, his omission in the case downwardly biases his

1206   results. If I implement Mr. Gorman's standard risk premium analysis using allowed

1207   ROEs for the natural gas industry and 30-year treasury bonds,[137] I find an average risk

1208   premium (over 30-year treasuries) of about 5.6% since 1990. While I believe this figure

1209   is downward biased due to very low risk premia during the high interest in the 1990's,

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[135]   Staff Ex. 3.0 (Phipps Testimony), p. 52.

[136]   Nicor Gas Ex. 11.3, p. 8.

[137]   Gorman Testimony in Docket UE 319 (Portland General), Exhibit ICNU / 214.

1210	simply adding Mr. Gorman's estimated treasury bond yield of 3.7% results in risk
1211	premium ROE of about 9.3%.[138] If I use a more reasonable period of say 2000 to today,
1212	when interest rates were below 6%, the risk premium becomes 6.1% for an estimated
1213	ROE of 9.8% (6.1% plus 3.7%). Thus, the fact that Mr. Gorman deviates from his
1214	standard practice of providing a risk premium analysis results in a substantial downward
1215	bias and considering the relationship between risk premia and interest rates results in an
1216	ROE of about 9.8%.[139] In my estimate, the downward bias is substantial and at least 50-
1217	100 basis points.[140]

1218 **Q.   What about Mr. Gorman's criticism of your implementation of the risk premium**

1219   **model?**

1220 A.   The criticism is focused on my risk premium analysis relying on an inverse relationship

1221   between risk premia and interest rates, which Mr. Gorman finds to be "simplistic." [141]

1222   Importantly, this method uses a statistical relationship, which is more sophisticated than

1223   Mr. Gorman's standard use of simple averages, so I see no difference.   However, the

1224   important point is that it is a comparison to industry norms.

1225   Mr. Gorman also takes issue with my implementation of the model using a forecasted 20-

1226   year government bond yield of 4.0%.[142]   Mr. Gorman seems to overlook that I also

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[138]   Nicor Gas Ex. 25.7.

[139]   Nicor Gas Ex. 25.7.

[140]   The lower bound is obtained as the difference between currently allowed ROEs and Mr. Gorman's recommendation. The upper bound is obtained as the difference between low end of my risk premium results and Mr. Gorman's recommendation.

[141]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 98.

[142]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 98 and 100.

1227	implement the risk premium model using a forecast yield of 3.6%,[143] which is actually
1228	lower than Mr. Gorman's proposed yield of 3.7%.[144] I believe it is reasonable to use a
1229	range of yield forecasts to test the risk premium model and note that an implementation
1230	of Mr. Gorman's treasury yield based risk premium model results in an ROE of about
1231	9.3% (9.8% if only the 2000s are used), while my range was 10.1% to 10.4%.
1232	Consequently, in addition to being inconsistent across cases, Mr. Gorman is downward
1233	biasing his results by a substantial amount when ignoring the risk premium model.

1234   For the reasons above, the criticism by Mr. Gorman should be ignored.

1235   **VIII.   CONCLUSION**

1236   **Q.   Based on your review of the testimonies of Ms. Phipps's, Mr. Effron's, and**
1237   **Mr. Gorman's testimony, what do you conclude regarding Nicor Gas' ROE and**
1238   **capital structure?**

1239   A.   The rebuttal testimony of Ms. Phipps, Mr. Effron, and Mr. Gorman do not provide
1240   evidence that changes my recommended ROE of 10.7% or my evaluation of the proposed
1241   test year capital structure including 54.2% equity and 45.8% debt.

1242   Their proposed allowed ROE of 9.15 and 9.16% are out of line with both industry norms
1243   and financial markets and also fail to consider Nicor Gas' higher operating leverage and
1244   financial risk. Ms. Phipps's results are downwardly biased for several reasons including
1245   her reliance on the currently very low risk-free rate in her CAPM and failure to consider
1246   the risk premium model. Not considering Nicor's higher operating leverage also biases

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[143]   Nicor Gas Ex. 11.3, p. 3.

[144]   IIEC/CUB Ex. 1.0 (Gorman Dir.), p. 76.

1247   her results downward by a non-trivial amount. For example, a reliance on the Brealey,

1248   Myers and Allen (2014) method to determine the impact of operating leverage would

1249   increase the asset beta by at least 50% for an increase in the estimated ROE of more than

1250   100 basis points. Mr. Gorman's failure to consider the risk premium model, which is part

1251   of his standard practice in proceedings such as this one, downwardly biases his results by

1252   a non-trivial amount. While Mr. Gorman is concerned about some very low DCF results,

1253   he does not explicitly take this concern into account and consequently downward biases

1254   his results.

1255   Further, neither Ms. Phipps nor Mr. Gorman appropriately consider the impact of

1256   financial leverage, which, using their estimates, result in a downwardly bias of 20-150

1257   basis points.[145] I do not believe that these factors are additive, but I do believe that there

1258   is a need to consider these aspects as well as the specifics I noted above. Therefore, my

1259   original estimated range of 10¼ to 10¾ percent remains reasonable and 10.7% remains a

1260   good point estimate (including flotation costs).

1261   Finally, the recommendations of Messrs. Effron and Gorman to substantially increase the

1262   proportion of short-term debt in the capital structure should be rejected as it (i) fails to

1263   match long-lived assets with long-term financing, (ii) is inconsistent with the forecasted

1264   capital structure for Nicor, (iii) ignores the recent and forecast changes in interest rates

1265   and yield curve.

1266 **Q.**   **Does this conclude your rebuttal testimony?**

1267 A.   Yes.

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[145]   IIEC/CUB Ex. 1.0, Table 15 and Staff Ex. 3.0, p. 11.