

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.)

Surrebuttal Testimony of

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Principal, The Brattle Group

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

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1 **I. PURPOSE AND SUMMARY OF CONCLUSIONS**

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

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

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

7 A. Yes. I provided direct testimony filed March 10, 2017 and rebuttal testimony filed
8 July 24, 2017 on behalf of Northern Illinois Gas Company d/b/a Nicor Gas Company
9 (“Nicor Gas”).

10 **Q. What is the purpose of your surrebuttal testimony?**

11 A. I respond to portions of the rebuttal testimonies of Ms. Rochelle M. Phipps on behalf of
12 Staff (Staff Ex. 8.0 and the schedules labelled Staff Ex. 8.01 – 8.07)¹ and Mr. Michael P.
13 Gorman on behalf of IIEC-CUB (IIEC/CUB Ex. 3.0 and the schedules labelled
14 IIEC/CUB Ex. 3.1 and 3.2). I have also reviewed the rebuttal testimony of Mr. David J.
15 Effron on behalf of the Illinois Attorney General’s office (AG Ex. 3.0), but it does not
16 address my rebuttal testimony, so I do not comment on it.

17 **Q. What, in summary, as the recommendations to which you respond?**

18 A. First, while neither the Staff nor the IIEC / CUB witness has changed their recommended
19 ROE since direct, both witnesses have adjusted the recommended capital structure and

¹ Capitalized terms and acronyms used in this testimony have the same meanings as in my prior testimonies.

20 Staff also changed its recommended cost of long-term debt (“LT debt”). The changes are
21 not consistent in that the proportions of debt changed, but the cost of debt did not.

22 Specifically, Ms. Phipps’s rebuttal testimony increases the amount of short-term debt
23 (“ST Debt”) more than eight-fold to 5.01% (from 0.59% in direct), but maintains a short-
24 term cost of debt of 1%. She reduces the equity percentage to 52.66% (from 54.13% in
25 direct) and maintains the ROE at 9.16%. The ratio of long-term debt then becomes
26 42.33% and Ms. Phipps increases the recommended cost of that LT debt by 2 basis points
27 to 4.49%.

28 Mr. Gorman also maintains his ROE recommendation of 9.15% as well as his cost of
29 debt recommendations (1.85% for ST and 4.94% for LT debt). Mr. Gorman reduces the
30 share of short-term debt to 0.59% (the same share that Ms. Phipps abandons), increases
31 the ratio of long-term debt to 48.34% (from 31.9% in direct) and slightly increases the
32 equity share to 51.07% (from 50.89%).

33 Table 1 below presents a summary of the recommendations presented in the rebuttal
34 testimonies of witnesses for Staff, IIEC-CUB, and the AG, as well as Nicor Gas’s
35 rebuttal testimony proposed capital structure and rate of return. Table 2 compares the
36 Direct and Rebuttal recommendations of witnesses for Staff, the IIEC-CUB, and the AG.

Table 1
Summary of Witness Rebuttal Testimony Recommendations

	Nicor Gas	ICC Staff	IIEC-CUB	AG
	[1]	[2]	[3]	[4]
Rate of Return				
ROE	10.70%	9.16%	9.15%	9.15%
ROR	7.87%	6.80%	7.07%	6.79%
Capital Structure				
Equity	54.50%	52.66%	51.07%	52.45%
LT Debt	42.94%	42.33%	48.34%	41.33%
ST Debt	2.55%	5.01%	0.59%	6.22%

Sources:

[1]: Nicor Gas Ex. 25.0.

[2]: ICC Staff Ex. 8.0.

[3]: IIEC/CUB Ex. 3.0.

[4]: AG Ex. 3.0.

Table 2
Comparison of Witness Recommendations (Direct / Rebuttal)

	Staff (Phipps)	IIEC-CUB (Gorman)	AG (Efron)
	[1]	[2]	[3]
Rate of Return			
ROE	9.16% / 9.16%	9.15% / 9.15%	9.15% / 9.15%
ROR	6.99% / 6.80%	6.55% / 7.07%	6.92% / 6.79%
Capital Structure			
Equity	54.1% / 52.7%	50.9% / 51.1%	51.3% / 52.5%
LT Debt	45.3% / 42.3%	31.9% / 48.3%	42.8% / 41.3%
ST Debt	0.6% / 5.0%	17.2% / 0.6%	6.0% / 6.2%

Sources:

[1]: ICC Staff Ex. 3.0 and 8.0.

[2]: IIEC/CUB Ex. 1.1 and 3.0.

[3]: AG Ex. 1.1 and 3.0.

37 **Q. What conclusions should the Commission draw from the rebuttal testimonies and**
38 **your analysis of them?**

39 A. None of the rebuttal testimonies justify a change in my recommended point estimate for
40 Nicor Gas's cost of equity. After taking into account my review and analysis of the
41 rebuttal testimonies of Ms. Phipps and Mr. Gorman, the Commission should conclude:

- 42 • An ROE of 10.7% and ROR of 7.87% (including flotation costs) is reasonable
43 and within industry standards.
- 44 • Nicor Gas' higher capital expenditure program merits a higher ROE, as:
 - 45 ▪ Any impact of Nicor Gas' QIP, future test year, or similar other regulatory
46 mechanisms is already included in the cost of equity estimates from the
47 sample companies, since these companies also benefit from such
48 mechanisms—or in some cases have additional mechanisms for reducing
49 regulatory lag (such as Straight Fixed Variable rate design or decoupling)
50 that Nicor Gas does not employ; such mechanisms primarily affect the
51 timing of cash flows.
 - 52 ▪ My calculation of operating leverage for Nicor Gas and the sample
53 companies included the impact of QIP impact and hence the quantifiable
54 difference is not QIP related.
- 55 • The Staff and IIEC/CUB witnesses misunderstand and mischaracterize the basis
56 and purpose of my financial risk adjustment procedures.
 - 57 ▪ Neither witness presents a valid argument for ignoring differences in
58 financial leverage when determining the cost of equity for Nicor Gas.
59 Higher financial leverage compared to the sample has a real impact on the
60 Company's equity capital costs and the Commission should recognize it.
 - 61 ▪ Neither witness makes a valid argument against the unlevering and
62 relevering betas (*i.e.*, the "Hamada adjustment") in the CAPM analysis.
63 The Commission should take this opportunity to recognize that this
64 correction may be properly applied by analysts presenting cost of capital
65 estimates to the Commission. Refusing to consider this standard
66 technique is contrary what is now accepted corporate finance theory and
67 practice, and ignores how betas are in fact derived.
- 68 • The Staff and IIEC/CUB witnesses fail to justify their assertion that the empirical
69 CAPM (ECAPM) is redundant when using *Value Line* adjusted betas.
70 Consequently their failure to consider ECAPM estimates such as those I have
71 performed biases their recommendations downward.

- 72 • Staff changes Nicor Gas’ capital structure in a manner that is inconsistent with
73 Staff’s recognition that “a selective update” should be avoided and that capital
74 structure and the cost of the capital structure components interact.²
- 75 • Staff’s proposed short-term debt costs fails to consider market developments and
76 are based on the unrealistic assumptions that the current interest rate, rather than
77 what we currently know about future rates, is the best predictor of future rates.
- 78 • Staff’s criticisms of my use of forecasted bond yields to estimate the risk free rate
79 of interest during the time rates will be in effect are flawed and unconvincing.
- 80 • Staff’s criticism of my proposed adjustment to allow Nicor Gas to recover its
81 unrecovered equity flotations costs is flawed and unconvincing.
- 82 • Staff’s “relative risk adjustment” inappropriately focuses on minor differences in
83 credit metrics that do not have a measurable impact on the cost of equity.

84 Lastly, I note that the fact that I do not address all issues in other testimony does not
85 constitute agreement.

86 **Q. What are the factors contributing to the difference between your cost of equity
87 recommendation and those of the Staff and IIEC / CUB witnesses?**

88 A. Various factors contribute to the difference. For example, neither Ms. Phipps nor Mr.
89 Gorman considers an estimate derived from a risk premium model, despite the fact that
90 doing so is part of Mr. Gorman’s standard practice in other cost of capital testimony he
91 has submitted around the country. Given that my risk premium estimate was
92 approximately 10.2%,³ and given that Mr. Gorman in recent testimony has found his risk
93 premium model to result in higher ROEs than his CAPM and DCF implementation,⁴ it is
94 evident that leaving this model out creates a significant downward bias in the Staff and
95 IIEC/CUB recommendations. Further, Ms. Phipps uses an inappropriately low estimate

² Staff Ex. 8.0, p. 3 and 34.

³ Nicor Gas Ex. 11.0, p. 54.

⁴ For example, the Opening Testimony of Michael P. Gorman in UE 319 before the Public Utility Commission of Oregon, ICNU 200, p. 47 found the risk premium results to be 70 basis points higher than his DCF results and 40 basis points higher than his CAPM results.

96 of the risk-free rate in her CAPM analysis. As I explained in my rebuttal testimony,
97 using the more appropriate estimate I employ in my CAPM analysis (without any other
98 modifications to her methodology) would have raised her CAPM estimate by
99 approximately 25 basis points.⁵ Ms. Phipps and Mr. Gorman also fail to properly account
100 for financial risk using established standard techniques for financial leverage adjustment.

101 My recommendation also differs from those of the other witnesses in that I recognize that
102 Nicor Gas's elevated capital spending places them at the higher than average business
103 risk compared to the sample companies, and therefore recommend an allowed ROE at the
104 high end of the range of reasonable cost of equity estimates.⁶ Ms. Phipps and Mr.
105 Gorman assert that Nicor Gas does not face higher business risk than the sample because
106 it has access to regulatory mechanisms including the QIP rider. However, their
107 arguments fail to recognize that such mechanisms are in place for most of the sample.
108 Further, they do not address the quantitative evidence I presented—using data that
109 incorporates the impact of QIP—that Nicor Gas has substantially greater operating
110 leverage than the sample companies do, and thus (according to established academic
111 evidence) faces higher systematic business risk as measured by assets beta.⁷

⁵ Nicor Gas Ex. 25.0, p. 49.

⁶ My recommended point estimate of 10.7% is approximately 20 basis points above the midpoint (10.5%) of the reasonable range I found in my direct testimony (10 ¼ - 10 ¾ percent), and approximately 50 basis points above the average of the midpoints of the ranges of my estimates for the CAPM, DCF, and Implied Risk Premium methods. So placement within the range (including recognition of the need to allow Nicor Gas to recover its previously unrecovered equity flotation costs) could be considered to contribute up to 50 basis points toward the difference in recommendations.

⁷ See Nicor Gas Ex. 25.0, pp. 40-42. See also Nicor Gas Ex. 25.4.

112 Additionally, by not implementing an ECAPM analysis, Ms. Phipps and Mr. Gorman
113 ignore the finding that the CAPM tends to under (over) predict required returns for stocks
114 with betas lower (higher) than 1. Since the betas for the proxy companies (when
115 appropriately unlevered and relevered to adjust for differences in financial risk) are less
116 than 1, failing to consider the ECAPM biases the other witnesses' results and
117 recommendations downward.

118 When Ms. Phipps implies (as she appears to do in her direct testimony⁸) that the only
119 material difference between my results and hers is the treatment of financial leverage, she
120 ignores other important differences including all of those mentioned above. Of course,
121 Ms. Phipps and Mr. Gorman so also fail to properly account for financial risk using
122 established standard techniques for financial leverage adjustment. That is a critical
123 difference; but it is far from the only one.

124 **Q. How is your surrebuttal testimony organized?**

125 A. The remainder of my surrebuttal testimony is organized as follows. Section II lists the
126 exhibit to my surrebuttal testimony; Section III discusses Staff's and IIEC / CUB's
127 rebuttal testimony on ROE and ROR reasonableness. Section IV addresses Staff's and
128 IIEC / CUB's discussion that the QIP renders that risk of the large capex program moot.
129 It also provides evidence that decoupling and future test years are widespread among the
130 sample companies. Section V responds to Staff's and IIEC / CUB's rebuttal on capital
131 structure and Section VI responds the same parties' rebuttal testimony on the Empirical

⁸ Staff Ex. 3.0, pp. 6-7 lines 101-113 and p. 11, lines 181-188.

132 CAPM. Section VII addresses capital structure and the cost of debt and Section VII
133 comment on other issues raised in Staff's or IIEC / CUB's rebuttal testimony.

134 **II. ITEMIZED ATTACHMENTS**

135 **Q. Are there any exhibits to your surrebuttal testimony?**

136 A. Yes. I sponsor the following exhibit:

- 137 • Nicor Gas Ex. 37.1: Regulatory Mechanisms.

138 **III. REASONABLENESS OF ROE AND ROR RECOMMENDATIONS**

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

140 A. This section responds to Ms. Phipps discussion of "Prevailing Regulatory Norms
141 Regarding ROE"⁹ and Mr. Gorman's discussion of industry and specific companies
142 allowed ROEs and ROR in section II.A of his testimony.¹⁰ I focus on the characteristics
143 of the ROE and ROR as a measure of the allowed return and cost to customers as well as
144 how that return is measured.

145 **Q. How do Ms. Phipps and Mr. Gorman characterize the reasonableness of their ROE
146 / ROR recommendations?**

147 A. They attempt to characterize their recommendations as "middle of the road" while
148 mischaracterizing my recommendations as outside the norm. In so doing, they also

⁹ Staff Ex. 8.0, pp. 3-6.

¹⁰ IIEC / CUB Ex. 3.0, pp. 3-6.

149 ignore the degree to which their own recommendations fall below recent Illinois
150 decisions.¹¹

151 Preliminarily, Ms. Phipps, Mr. Gorman, and I agree that the average allowed ROE and
152 ROR for natural gas utilities over the past 24 months nationally has been about 9.6% and
153 7.45%, respectively.

154 Ms. Phipps, however, then compares the recommended equity weighted ROE¹²—a value
155 that represents neither the ROR that affects customers’ rates nor the ROE that must
156 reflect market demands—for Nicor Gas to the equity weighted ROEs derived from other
157 natural gas and water utilities decisions. Ms. Phipps finds that the average equity
158 weighted ROE for natural gas and water utilities was 4.78% and 4.64%, respectively,¹³
159 and the equity weighted ROE in Illinois was 4.61% and 4.92, respectively.¹⁴ Based on
160 these calculations, Ms. Phipps concludes that Nicor Gas’ proposed return on equity and
161 weighted ROE “substantially exceed industry norms.”¹⁵

162 Mr. Gorman “acknowledge[s] that the average industry authorized return on equity are
163 slightly higher than my [Mr. Gorman’s] recommended return on equity” but states that
164 his “results is within the range of industry authorized returns in 2017.”¹⁶ To support this
165 statement, Mr. Gorman cites a settlement in New York, which involved a ROE of 8.7%

¹¹ As shown in Staff Ex. 8.0, p. 5 more recent Illinois ROE awards to natural gas and water companies have been in the range of 9.4% to 9.79%.

¹² By this, Ms. Phipps means the product of the allowed ROE and the allowed equity capital structure ratio.

¹³ Staff Ex. 8.0, Table Two, p. 6.

¹⁴ Staff Ex. 8.0, Table One, p. 5. The average for water utilities was calculated as the average of Illinois-American Water, Utility Service of Illinois, and Aqua Illinois.

¹⁵ Staff Ex. 8.0, p. 5, line 71.

¹⁶ IIEC / CUB 3.0, p. 4, lines 62-64.

166 and a multitude of other factors. He also cites two settlements with a ROE of 9.7% as the
167 highest authorized return on equity in 2017.¹⁷ Mr. Gorman concludes that my ROE
168 recommendation is 120 basis points above the national average and 100 basis points
169 above the highest allowed ROE in 2017.¹⁸

170 **Q. What are your reactions to Ms. Phipps and Mr. Gorman’s statements?**

171 A. First, the data does not show that my recommendation “substantially exceeds industry
172 norms” or is “100 basis point above the highest allowed ROE.” Second, I disagree with
173 Ms. Phipps’ use of the equity-weighted ROE as a measure of the reasonableness of the
174 allowed ROE because (1) customers ultimately are concerned with the cost of service
175 (and the quality of that service), but not with the composition of the return on capital, and
176 (2) investors are concerned with the return on each unit of equity, not the weighted
177 return. Third, I disagree with the use of Illinois-specific allowed ROEs as Nicor Gas
178 raises funds throughout the U.S. and some of the decisions cited by Ms. Phipps are not
179 comparable to the situation facing Nicor Gas. For example, some of the Illinois cases
180 cited by Ms. Phipps were filed in 2014 and involve issues other than those that are
181 present here.¹⁹ Fourth, Mr. Gorman is selective in his description of the range of allowed
182 ROEs nationwide – for example, he includes the very low 8.7% ROE settlement in New
183 York, but excludes the February 2017 10.55% ROE settlement in Georgia.²⁰ This

¹⁷ IIEC / CUB 3.0, p. 4.

¹⁸ IIEC / CUB 3.0, p. 4.

¹⁹ *E.g.*, the joint D-0224 / D-0225 decision, which includes a discussion of reorganization issues.

²⁰ Atlanta Gas Light Company, GA. Source: Regulatory Research Analysts, “Major Rate Case Decisions – January-June 2017,” July 26, 2017 (RRA Major Rate Cases). Note that the ROR of this case is 8.1%.

184 omission allows him to understate the highest reported ROE by 85 basis points.²¹
185 Additionally, Mr. Gorman fails to recognize that some of the decisions he cites include
186 flotation costs as is the case with Nicor Gas’s proposal, but many cases do not.

187 **Q. Why do you disagree with Ms. Phipps’ and Mr. Gorman’s overall conclusions?**

188 A. First, Ms. Phipps states that my recommendation substantially exceeds industry norms,
189 but that statement is only true if a narrow weighted ROE measure is used. For example,
190 Illinois cases cited by Ms. Phipps included allowed RORs up to 8.89% and nationwide
191 ROEs as high as 10.55% have been observed for natural gas companies and up to 10.4%
192 for water utilities.²² Hence my recommendation does not “substantially exceed industry
193 norms.”

194 Second, Mr. Gorman is selective in his use of decisions in that he includes the lowest
195 allowed ROE obtained in New York, but not the highest allowed ROE in Georgia – both
196 are settlements in cases with multiple other aspects. Second, Mr. Gorman does not
197 recognize that any comparison needs to consider not only the allowed ROE but also the
198 total cost to customers – the ROR range from 6.82% to 8.02% for the first half of 2017
199 according to Regulatory Research Associates, so Nicor Gas’ requested ROR of 7.87%²³
200 is within that range.

²¹ Like the 8.7% allowed ROE in New York, the 10.55% in Georgia is part of a larger settlement that involves multiple issues. Source: RRA Major Rate Cases and Georgia Public Service Commission, D-40828, February 21, 2017.

²² Order in 14-0419, RRA Major Rate Cases, and Regulatory Research Associates, “Water Advisory: Water Monthly Regulatory Update – July/August 2017,” August 7, 2017.

²³ Nicor Schedule D-1 SUPP. See also, Staff Ex. 8.0, Schedule 8.01.

201 **Q. Why is the weighted ROE not a good measure of the allowed return?**

202 A. Customers ultimately are concerned about the price they pay (and quality of) for natural
203 gas services, which is determined by the revenue requirement (rate design, and sales
204 volumes). It is the weighted cost of capital that determines the revenue requirement
205 (along with other non-return factors). From the perspective of investors, the requirement
206 is that their equity investments earn a return commensurate with comparable risk
207 investments. That return is provided by the ROE itself, not the product of the ROE and
208 the equity ratio.

209 **Q. Why do you disagree with the emphasis on allowed ROEs in Illinois as comparators
210 to Nicor Gas?**

211 A. I disagree with the emphasis on Illinois decisions for two reasons. First, Nicor Gas raises
212 capital in the U.S. as well as potentially overseas. Consequently, Illinois is not an island
213 and Illinois-specific allowed returns are not necessarily a good measure of the return
214 required by investors who might invest in utility companies such as Nicor Gas.

215 Second, Ms. Phipps provided the allowed ROE and ROR for eight natural gas and water
216 utilities – the range of decision of which occurred from January 2015 (Dockets 14-0224 /
217 14-0225) through May 2017 (Docket 16-401). In several of these decisions the capital
218 structure and the cost of debt was uncontested and in Docket No. 14-0741, the ROE was
219 a joint stipulation by Staff and the company. This decision resulted in an ROR of 7.88%
220 (higher than Nicor Gas' proposed rate). Because of the limited number of decisions, the
221 time span they cover, and most importantly because many involve issues or settlements
222 that are not present in the current case, the average of these decisions is not
223 representative. Having said this I note that these decisions have resulted in wide range of

224 allowed returns with the weighted cost ranging from below 6.5% to above 8%.²⁴ As a
225 result, I do not believe they are helpful in narrowing the range of reasonable returns.

226 **Q. What is wrong with Mr. Gorman’s description and use of allowed ROE data?**

227 A. Mr. Gorman claims that my recommended ROE is “100 basis points above the highest
228 authorized return for a natural gas company of 9.7% in 2017” pointing to two allowed
229 ROEs of 9.7% as the highest, which is not accurate. Mr. Gorman’s own source,
230 “Regulatory Research Analysts” reports an allowed ROE of 10.55%, which is very close
231 to my recommendation, less floatation costs.

232 I also note that Mr. Gorman, unlike his in many testimonies he previously submitted
233 around the country, does not report any risk premium analysis or result in this case.
234 Given that Mr. Gorman commonly relies on forecasted interest rates, currently allowed
235 ROE’s would be expected to increase with interest rates.²⁵

236 **Q. What can the Commission conclude about your recommendation from the**
237 **discussion in this Section III?**

238 A. The range of allowed ROEs is very wide and varies depending on the circumstances of
239 the utility and on characteristics of the proceeding in which the ROE is set. Once Nicor
240 Gas’s higher operating leverage and unrecovered flotation costs are taken into account,
241 my recommendation is within the range of what has been allowed elsewhere.

²⁴ See, e.g., joint Decision 14-224 / 14-225 p. 135 and Decision 14-0419, p. 49.

²⁵ IIEC / CUB Ex. 3.0, p. 33 states that “Risk premium methodologies are generally based on risk premiums based on historical data, applied to a forward-looking market factor.”

242 **IV. NICOR GAS’S SPECIFIC RISKS – OPERATING LEVERAGE**

243 **Q. What, in summary, are the arguments of Staff Witness Phipps’ and IIEC / CUB**
244 **witness Gorman concerning Nicor Gas’ specific risks?**

245 A. Ms. Phipps states that Nicor Gas operates under a future test year, can use a Straight-
246 Fixed Variable (SFV) rate design, and has a Qualified Infrastructure Plant (QIP) rider that
247 allows Nicor Gas to include infrastructure in rate base between rate cases. She observes
248 that such mechanisms can reduce regulatory lag and enhance cash flow.²⁶ Mr. Gorman
249 similarly points to the QIP rider as a risk reducing factor.²⁷ Both Ms. Phipps and Mr.
250 Gorman go on to say that I misjudge the risk characteristics of Nicor Gas by “ignoring
251 the benefits of such ratemaking mechanisms ...”²⁸ and fail “to recognize this risk
252 mitigation to investors for capital investment cost recovery risk ...”²⁹ In so doing, both
253 witnesses inaccurately describe my testimony and analysis and reach flawed conclusions.
254 I do not ignore those mechanisms, and Nicor Gas’s ability to use mechanisms of that sort
255 does not justify suppressing its ROE.

256 **Q. How do you respond to the claim that the QIP reduces risk?**

257 A. Nicor Gas’s QIP is not a differentiating factor that reduces its revenue risk as compared
258 to other, similar utilities. Mechanisms like QIP are in place in many states, including the
259 states in which most of the sample companies operate. For example, the American Gas
260 Association lists 40 states as having a tracker or surcharge mechanism in place for

²⁶ Staff Ex. 8.0, pp. 18-19.

²⁷ IIEC / CUB Ex. 3.0, pp. 6-8.

²⁸ Staff Ex. 8.0, p. 19.

²⁹ IIEC / CUB Ex. 3.0, p. 8.

261 infrastructure investments,³⁰ which means that any impact of such trackers or surcharges
 262 is already captured in the cost of equity estimates. To emphasize this fact, I am attaching
 263 the AGA’s survey of the use of cost recovery mechanisms and have also collected
 264 information on the use of such mechanisms among the sample companies. This
 265 information is presented in Table 3, which additionally shows the use of future test year
 266 and decoupling mechanisms among subsidiaries of the sample companies. The vast
 267 majority have QIP-like mechanism in place.

Table 3: Regulatory Mechanisms Among Sample Companies

Company	States with Jurisdictions	Infrastructure	Decoupling	Future Test Year
	[1]	[2]	[3]	[4]
WGL	Maryland	Y	Y	(Y)
	Virginia	Y	Y	N
	DC	Y	N	(Y)
Southwest Gas	Arizona	Y	Y	N
	Nevada	Y	Y	N
	California	Y	Y	Y
South Jersey Gas	New Jersey	Y	Y	(Y)
Northwest Natural Gas	Oregon	Y	Y	Y
	Washington	Y	N	N
New Jersey Natural Gas	New Jersey	Y	Y	(Y)
Atmos	Texas	Y	Y	N
	Louisiana	Y*	Y	Y
	Kansas	Y	Y	N
	Mississippi	Y*	Y	Y
	Kentucky	Y	Y	Y
	Tennessee	Y	Y	Y
Chesapeake Utilities	Delaware	Y*	N	(Y)
	Florida	Y	N	Y

Notes:

[2]: Y* denotes the state commission employs a rate stabilization mechanism rather than an infrastructure tracker.

[4]: (Y) denotes a partial future test year.

Sources:

[1]: RRA Adjustment Clauses, SNL, August 22, 2016.

[2]: From American Gas Association, as of December 2014.

[3]: RRA Adjustment Clauses, SNL, August 22, 2016.

[4]: Forward Test Years for US Energy Utilities, presented by Dr. Mark Newton Lowry, President of Pacific Economics Group Research.

³⁰ See Nicor Gas Ex.38.2

268 Further, the revenue, operating profit, and PP&E impact of the QIP is included in the
269 calculations underlying my quantification of the degree of operating leverage, so the
270 ratios take this mechanism into account. As this point is discussed in detail in my
271 rebuttal testimony, I simply refer to that discussion here.³¹ The bottom line is that having
272 a QIP is the norm and is not the basis for any downward adjustment of Nicor Gas risk or
273 capital cost in this case.

274 **Q. How do you address Ms. Phipps’s comments about the future test year and the**
275 **ability to use Straight Fixed Variable (SFV) rate design?**

276 A. First, there is no evidence that a SFV mechanism would lower Nicor Gas’ cost of equity,
277 for several reasons. Nicor Gas does not employ such a mechanism, while the majority of
278 the companies in the sample have some form of decoupling mechanism, which has a
279 similar the effect as SFV. Like QIP, it is the baseline for the sample. However, in
280 contrast, it is my understanding that Nicor Gas does not employ SFV rate design, nor
281 does it have a decoupling mechanism in place. Moreover, research has also shown there
282 is no impact on the cost of capital from decoupling mechanisms.³²

283 Second, as for ability to use a future test year, no evidence has been presented that a
284 future test year impacts the equity risk of Nicor Gas. And, even if were true that future
285 test year has a measurable impact on the equity risk of utilities, about half of the
286 operating companies in the natural gas sample have a future test year as shown in Table

³¹ Nicor Gas Ex. 25.0, p. 41.

³² Refer to Table 3 for details. Regulatory Research Associates, “Adjustment Clauses – A State-by-State Overview,” August 22, 2016 provides information about decoupling on a state-by-state and utility-specific bases. Joe Wharton and Michael Vilbert, “Decoupling and the Cost of Capital,” The Electricity Journal vol. 28, 2015, pp. 19-28 show there is no impact on the cost of capital from decoupling.

287 3, so a large portion of the effect would already be captured in the cost of equity
288 estimation based on the sample companies.

289 **Q. How about the claim that credit rating agencies view Nicor Gas' business risk**
290 **favorably?**³³

291 A. As stated in my rebuttal testimony,³⁴ credit rating agencies are concerned about credit
292 worthiness, i.e., default risk. As the QIP (or other early recovery mechanisms) provide
293 the company with earlier cash flows, the ability to meet interest rate and repayment
294 obligations increases and hence the risk to bondholders declines. However, this is not to
295 say that the risk to equity holders declines – they invest in the company over an indefinite
296 horizon and carry all residual risk, so the risks they face are not the same as those
297 bondholders face. Therefore, the use of credit rating agencies view to claim **equity**
298 **investors'** risk is low should not carry any weight.

299 **Q. What should the Commission conclude from the discussion in this Section IV?**

300 A. As discussed above, the majority of states and utilities in the sample have an
301 infrastructure recovery mechanism and some type of decoupling, while about half have a
302 forward-looking test year. Therefore, the impact of such mechanisms is already included
303 in the proxy group estimates. Therefore, the degree to which Nicor Gas has more (or
304 less) exposure to recovery risk relative to the sample and the impact the cost of equity
305 needs consideration. Further, as my calculation of operating leverage includes the effect
306 of QIP (or similar mechanisms) on revenues and gross PP&E for Nicor Gas and the
307 comparable companies, so that there is no un-accounted for effect. As I showed in Nicor

³³ Staff Ex. 8.0, p. 18; IIECC / CUB 3.0, pp. 8-9.

³⁴ Nicor Gas Ex. 25.0, pp. 36-39.

308 Gas Ex. 11.0, Figure 17 and Nicor Gas Ex. 25.0, p. 42, Nicor Gas has quantifiably higher
309 operating leverage than the sample companies and therefore, as discussed in my rebuttal
310 merits a higher return on equity.³⁵

311 **V. FINANCIAL RISK ADJUSTMENTS**

312 **A. STAFF AND IIEC/CUB RATE OF RETURN WITNESSES**
313 **MISUNDERSTAND AND MISCHARACTERIZE THE BASIS AND**
314 **PURPOSE OF MY FINANCIAL RISK ADJUSTMENT PROCEDURES**

315 **Q. How do Ms. Phipps and Mr. Gorman respond to your rebuttal testimony argument**
316 **that the financial risk that affects the cost of equity is affected by market value**
317 **financial leverage?**

318 A. Both Ms. Phipps and Mr. Gorman devote substantial portions of their rebuttal testimonies
319 to disputing this basic fact, although neither of them disputes that the CAPM and DCF
320 model use market data and market values to determine the cost of equity. They try,
321 unsuccessfully, to argue why financial leverage should not matter, while ignoring the fact
322 that it does matter and that modern financial theory and practice recognizes that it does
323 matter.

324 In support of her assertion that book and not market value is relevant, Ms. Phipps refers
325 to interest coverage and cash flow to debt credit metrics that Moody's and S&P calculate
326 based on (book value) accounting data to inform their credit rating determinations.³⁶
327 Similarly, Mr. Gorman references a textbook, the CFA curriculum, and *Value Line* to
328 support his position that "financial risk can be measured based on book value financial

³⁵ Nicor Gas Ex. 25.0, pp. 40-42.

³⁶ Staff Ex. 8.0, p. 7.

329 leverage metrics, and that book value metrics are factors used by investors to both assess
330 the valuation of utility stocks, and to measure the investment risk of the stocks.”³⁷

331 **Q. How should the Commission react to these claims?**

332 A. Ms. Phipps and Mr. Gorman miss the point by discussing the use of accounting measures
333 by credit rating agencies or Value Line. While there are contexts in which book value is
334 relevant to financial analysis—especially when it comes to evaluating the probability of
335 default as credit rating agencies do—the other witnesses’ focus on these factors amounts
336 to a distraction from the specific measurement of financial leverage relevant to the
337 standard finance techniques for financial risk adjustment.

338 In particular, Mr. Gorman’s references to curricula are selective and misleading.
339 Although he acknowledges that both *Value Line* and the textbook he cites discuss market
340 value financial leverage as well as accounting measures, Mr. Gorman fails to discuss the
341 context in which these sources use book versus market values. Additionally, the CFA
342 curriculum excerpt he provides does not even mention book value. Mr. Gorman merely
343 asserts that “in industry training for CFAs, financial risk and financial leverage are based
344 on book value factors,”³⁸ while in fact the CFA curriculum explicitly refers to market
345 value when discussing how to compare betas across companies with different leverage. I
346 review this in greater detail below.

347 But apart from these failings, denying the importance of financial leverage is simply
348 denying reality. Financial leverage amplifies the variability (and thus risk) of *equity*

³⁷ IIEC/CUB Ex. 3.0, pp. 11-15. (Quote from p. 11, lines 206-209).

³⁸ IIEC / CUB Ex. 3.0, pp. 13-14, lines 250-271.

349 returns—a fact that cannot be rationally denied.³⁹ As I illustrated in my rebuttal
350 testimony, when the equity investment is in a traded asset—as is the case when the cost
351 of equity is measured (*e.g.*, using the CAPM and DCF) based on stock market data for
352 publicly traded proxy companies—the degree of amplification depends on the market
353 value financial leverage ratio.⁴⁰ Because the levered cost of equity and/or levered equity
354 beta for a publicly-traded proxy company is measured based on movements in the market
355 price of its stock, market value capital structures must be taken into account.

356 I recognize that this calls for change. Regulatory bodies do not always adapt to
357 developing knowledge and evolving understandings of market readily or quickly. Nor,
358 frankly, do all analysts. But, the Commission should keep in mind that purpose of
359 regulation generally, and regulation of cost of capital in particular, is to mirror real
360 market behavior. This Commission, which I understand to be committed to a forward
361 looking, progressive view of regulation, should look at the real data and consider how
362 investors really behave and take this opportunity to find that analysts at least may take
363 financial leverage as measured in MBA textbooks into account when assessing utilities
364 costs of equity.

365 **Q. Will you please address in detail why Mr. Gorman’s reference to the *Value Line***
366 ***Investment Survey* is misleading and irrelevant?**

367 A. Mr. Gorman cites *Value Line*’s definition of “common equity ratio” to suggest that *Value*
368 *Line* endorses using the book value of equity to calculate a company’s capital structure.
369 This citation is misleading. The *Value Line*’s definition of “common equity ratio” he

³⁹ Nicor Gas Ex. 11.0, p 43 and Nicor Gas Ex. 11.2, pp. 16-18.

⁴⁰ Nicor Gas. Ex. 25.0, pp. 20-21.

370 points to merely states how to calculate the book value equity ratio. It does not state that
371 the book value equity ratio is preferable for estimating the financial risk of a market
372 traded asset. To the contrary, in its full-page reports for all of my sample companies,
373 *Value Line* uses the market value of equity and book value of debt to calculate the capital
374 structure (in the box labelled “Capital Structure”).⁴¹ Value Line, the industry source
375 Mr. Gorman turns to as authoritative uses market values to measure what they label
376 “capital structure” and uses book values to measure accounting ratios.

377 **Q. Will you please address in detail why Mr. Gorman’s reference to the CFA**
378 **Institute’s curriculum is misleading?**

379 A. Yes. As Mr. Gorman acknowledges,⁴² the CFA curriculum defines financial risk with
380 respect to a company’s weighted average cost of capital as follows:

381 Financial Risk is the uncertainty of net income and net cash flows
382 attributed to the use of financing that has a fixed cost, such as debt and
383 leases. The greater the use of fixed-financing sources of capital, relative
384 to variable sources, the greater the financial risk. In other words, a
385 company that relies heavily on debt financing instead of equity financing
386 is assuming a great deal of financial risk.⁴³

387 Mr. Gorman omits to say that the CFA text discusses this financial risk in the context of
388 explaining how to account for differences in financial leverage among comparable
389 companies, which “requires a process of ‘unlevering’ and ‘levering’ the beta.” To
390 compute the unlevered beta (i.e. asset beta), the CFA manual specifically dictates the use

⁴¹ See Ex. 25.0, footnote 39 for details.

⁴² IIEC / CUB Ex. 3.0, pp. 13-14, lines 250-271.

⁴³ Bookshelf Online: 2016 CFA Level I Volume 4 Corporate Finance and Portfolio Mangement.

391 of market values of debt and equity in the financial leverage terms of the following
392 formula:⁴⁴

$$\beta_{asset} = \beta_{debt}w_d + \beta_{equity}w_e$$

or

$$\beta_{asset} = \beta_{debt} \left(\frac{D}{D + E} \right) + \beta_{equity} \left(\frac{E}{D + E} \right)$$

where

E = market value of equity

D = market value of debt

$$w_d = \text{proportion of debt} = \frac{D}{D + E}$$

$$w_e = \text{proportion of equity} = \frac{E}{D + E}$$

393 Thus, Mr. Gorman's assertion that using book value factors are more appropriate than
394 adjusting for financial risk and leverage ignores the teachings of the CFA's curriculum
395 and is both unfounded and misleading. The CFA curriculum supports my position, not
396 Mr. Gorman's.

397 **Q. Do Ms. Phipps and Mr. Gorman address the real estate investment example you**
398 **used in your rebuttal testimony to illustrate how market value financial leverage**
399 **affects the risk of a levered equity investment in a market-traded asset?**

400 A. Yes. Both witnesses acknowledge the example, but neither can deny its implications.
401 Ms. Phipps even seems to acknowledge correctly that market value is the relevant
402 consideration for an equity investment in market-traded stock, stating that "[l]ike
403 homeowners, a shareholder does not value her property based on what she paid for it, but

⁴⁴ *Id.* I note that in the CFA formula, the taxes are ignored, so that the formula is comparable to what I labelled "Asset Beta without Taxes" in Nicor Gas Ex. 11.4, pp. 41-42.

404 rather what she can sell it for.”⁴⁵ What one can sell an asset for is the definition of its
405 market value, not its book value. However, Ms. Phipps then asserts that my illustration
406 of the relevance of market value leverage amounts to “an espousal of fair-value
407 ratemaking...,”⁴⁶ which is both inaccurate and beside the point. For his part, Mr. Gorman
408 attempts to distract from the point of my example by discussing other non-relevant
409 components of a real estate investment.

410 **Q. Are the financial leverage adjustment techniques you employ “an espousal of fair-**
411 **value ratemaking” as Ms. Phipps asserts?**

412 A. No. “Fair value” ratemaking refers to the application of an allowed rate of return to a rate
413 base valued based on an estimate of the current “fair” (or market) value of the assets. My
414 approach determines a market-measured rate of return to be applied to a rate base valued
415 at the depreciated original cost (*i.e.*, “book value”) of the assets. This is consistent with
416 the approach all other witness in this proceeding as well as the long-established precedent
417 of the Commission.

418 **Q. Please explain why Mr. Gorman’s discussion of mortgage default is not relevant.**

419 A. Mr. Gorman asserts that my real estate investment analogy “ignores” the question of
420 whether the investor can afford to pay debt service on the mortgage.⁴⁷ This is not
421 relevant in the context of this proceeding. While the possibility of default on debt is
422 technically a risk to an equity investor, it is not a significant risk when it comes to
423 investing in highly-rated utility companies such as Nicor Gas and those in the proxy

⁴⁵ Staff Ex. 8.0, p. 9.

⁴⁶ Staff Ex. 8.0, p. 9.

⁴⁷ IIEC/CUB Ex. 3.0, pp. 16-17.

424 group. These companies have investment grade credit ratings—including many in the
425 “A” range—and such companies have a very low probability of default.

426 By focusing on default risk, Mr. Gorman once again distracts from the *very relevant*
427 impact of increased financial leverage on the variability (and thus the risk) of a levered
428 equity investment, which occurs as a simple mathematical consequence of absorbing the
429 variability in the market value of the asset (or business) over a smaller equity base.
430 Unlike debt defaults, those changes occur every day and are very much the driver of
431 equity investors’ concerns. This effect was explained in the technical appendix to my
432 direct testimony, as well as via the real estate investment example in my rebuttal
433 testimony.⁴⁸

434 Additionally, as I emphasized in my direct testimony “[t]he mechanism by which
435 leverage adds variability to returns is independent of any effect of increased leverage on
436 the risk that the firm will be unable to fulfill its fixed financial obligations.” This simple
437 fact undermines Mr. Gorman’s misguided focus on default risk. As Professors Berk and
438 DeMarzo note in their textbook *Corporate Finance* “...leverage increases the risk of
439 equity even when there is no risk that the firm will default.”⁴⁹ Imagine again the real
440 estate investment, but posit that the investor is the Sultan of Brunei or, more prosaically,
441 Warren Buffett. Debt default risk is gone, but the impact of financial leverage remains.

⁴⁸ Nicor Gas Ex. 11.2, pp. 16-18 and Nicor Gas Ex. 25.0, pp. 16-19.

⁴⁹ Berk and DeMarzo (2014), *Corporate Finance*, 3rd Ed., p. 482 [emphasis original], as cited in Nicor Gas Ex. 25.0, p. 19.

442 **Q. How do you respond to Ms. Phipps’s and Mr. Gorman’s continued insistence that**
443 **the techniques you employ to account for differences in financial leverage amount to**
444 **a “market-to-book based leverage adjustment”?**

445 A. Ms. Phipps and Mr. Gorman continue to mischaracterize my approach. Ms. Phipps states
446 that I “adjust [my] market-based DCF and CAPM models for application to book
447 value,”⁵⁰ while Mr. Gorman says I “essentially argue[] that a return on equity based on
448 market value needs to be increased in order to produce a comparable return on book
449 value.”⁵¹ Neither is a fair or accurate characterization of what I actually do, which is to
450 account for differences between the financial leverage that affects the market-
451 measurements of the levered cost of equity for the publicly traded sample companies and
452 the financial leverage that affects the risk and required return for an equity investment in
453 Nicor Gas’s rate base.

454 **Q. What about Ms. Phipps’s argument that the difference in financial leverage you**
455 **discuss is only the result of applying different “measurement scales”?**

456 A. Ms. Phipps mischaracterizes my approach. Responding to my statement that “a company
457 that has a lower equity percentage than what was used to estimate the return on equity
458 requires a higher return on equity than what was estimated (and vice versa),” she states
459 the following.

460 Dr. Villadsen’s statement is only correct if one is using the same scale to
461 make both measurements. For example, when comparing a company with
462 a 52% book value common equity ratio to a different company with a 48%
463 book value common equity ratio, the company with the lower common
464 equity ratio (and thus a higher debt ratio) likely has more financial risk.

⁵⁰ Staff Ex. 8.0, p. 8, lines 114-115.

⁵¹ IIEC/CUB Ex. 3.0, p. 18, lines 356-357.

465 However, comparing a 48% book value equity ratio of a company to the
466 concurrent 70% market value equity ratio for that same company does not
467 signify different intrinsic levels of financial risk for that company since its
468 debt and equity levels did not change. A company’s risk does not increase
469 (or decrease) simply by viewing the value of its common equity from a
470 different perspective.⁵²

471 This quote from Ms. Phipps’s testimony highlights the discrepancy between her
472 conception of my financial risk adjustment techniques and what the techniques actually
473 do. Two points are important about my approach:

474 1. The techniques I use do **not** “compare the ... book value equity ratio of a
475 company to the concurrent ... market value equity ratio **for that same**
476 **company**” [emphasis added], but rather compare equity ratios *between*
477 different companies.

478 2. The techniques I use are not focused on how an entire **company’s** risk does or
479 does not change, but rather on how the risk of *equity* investments in business
480 ventures with comparable business risk is affected by different levels of
481 financial leverage.

482 It is because Ms. Phipps ignores or minimizes these facts that I say she mischaracterizes
483 the approach I recommend and, more broadly, the accepted financial analysis techniques
484 that I employ.

⁵² Staff Ex. 8.0, p. 12-13. In footnote 22, Ms. Phipps says “[t]his example uses the actual 2016 book value capital structure for the proxy group companies, which Dr. Villadsen refers to as the DCF capital structure. Specifically, the average book value common equity ratio for the proxy group companies is 47.6% whereas the market value common equity ratio for the proxy group companies is 69.7%.”

485 **Q. Given the confusion you identify, can you clearly state again what the financial risk**
486 **adjustment is and why it is necessary to consider differences in financial risk when**
487 **determining the cost of equity for Nicor Gas?**

488 A. I adjust for differences in financial risk between equity investments in (1) the publicly
489 traded sample companies whose stock prices and returns all analysts rely on to derive a
490 market measure of the cost of equity for the sample, and (2) an equity investment in
491 Nicor Gas's business.

492 (1) An equity investment in any one of the sample companies consists of
493 purchasing its stock at its market value. Therefore, as explained above and
494 in my rebuttal testimony, the risk of the stockholders equity investment
495 depends on the market value leverage.

496 (2) An equity investment in Nicor Gas is what its corporate parent makes by
497 accepting the residual income after Nicor Gas satisfies its debt obligations.
498 The variability of those residual returns is governed by the regulatory capital
499 structure allowed by the Commission, which is *based* on book value
500 capitalization.

501 In this case, the regulatory capital structure applied to Nicor Gas's rate base has a higher
502 degree of financial leverage (i.e., a higher debt ratio) compared to the market value
503 capital structures of the publicly-traded sample companies used to estimate Nicor Gas's
504 cost of equity. Therefore, the financial risk associated with the equity investment in Nicor
505 Gas is higher than the financial risk of owning publicly traded common stock in the
506 average proxy company. This is true even if the *business* risk associated with an
507 investment in Nicor Gas and an investment in the sample companies is the same, and

508 even if there is no meaningful risk of default for either Nicor Gas or the sample
509 companies. As the levered cost of equity and associated equity beta are derived from
510 market data, the results reflect the financial leverage that is inherent in the market data
511 used in the estimation process. Consequently, an application to a specific company needs
512 to reflect the financial risk inherent in an equity investment in that company—in this
513 case, Nicor Gas.

514 **Q. Can you illustrate the difference in financial risk with a simple numerical example?**

515 A. Yes. Suppose Utility A is regulated utility operating company that has an allowed
516 regulatory capital structure consisting of 50% equity. If Utility A's operating profits vary
517 by 1%, the cash flows to its equity holders will vary by 2%.⁵³

518 Now, compare this to a hypothetical publicly traded utility holding company (Company
519 B) that has publicly traded stock with a market value that accounts for 2/3 of its capital
520 structure. If the value of Company B's assets (i.e., the present value of its expected
521 future operating cash flows) changes by 1%, the value of its stock will change by 1.5%.

522 Even if the levels of systematic business risk of the two companies are *identical*, and
523 even if there is no risk of default, an equity investment in Utility A is riskier than an
524 equity investment in the stock of Company B, because a given degree of variability in the
525 value of the underlying business has a greater impact on the variability of equity returns
526 to the investor in Utility A.

⁵³ The math here is the same as that illustrated in the real estate example in my rebuttal testimony. For simplicity, this example ignores the effect of taxes. While the financial adjustment techniques I employ do incorporate the effect of taxes, the directional effects illustrated here are not affected by the simplifying assumption.

527 **Q. Does Ms. Phipps present valid reasons for dismissing the regulatory precedents you**
528 **cite as evidence that financial risk adjustment procedures are accepted and**
529 **employed in the regulatory context?**

530 A. No. Her sole reason for dismissing the Surface Transportation Board and Florida Public
531 Service Commission examples is that there is statutory or administrative law language
532 dictating that these regulatory bodies employ the relevant procedures, whereas the ICC is
533 not subject to a similar statute.⁵⁴ Just because the Commission is not statutorily required
534 to appropriately account for differences in financial leverage does not mean it cannot
535 consider financial risk and textbook applications of, for example, the Hamada approach.
536 Moreover, her implicit assumption in rejecting the approaches adopted by the STB and
537 Florida PSC under their respective statutes is that the statute must be requiring a result
538 that would otherwise be improper. This assumption is presumptuous. Absent a statute,
539 the Commission should, in my opinion, apply the best practices from financial economics
540 and that includes a consideration of financial risk as taught in MBA textbooks.

541 **Q. What about Ms. Phipps's comments about the Alabama Public Service Commission**
542 **decision that endorsed the ATWACC financial risk adjustment technique for**
543 **purposes of analyzing the reasonableness of an allowed return?**

544 A. Ms. Phipps tries unsuccessfully to minimize the relevance of the Alabama PSC ruling.
545 She notes that the case concerned determining the reasonableness of the allowed return
546 embedded in then-current rates, rather than setting the allowed rate of return for new

⁵⁴ Staff Ex. 8.0, pp. 14-15.

547 rates,⁵⁵ a distinction that makes no difference. The question of whether the return is
548 embedded or being set does not change the importance of correctly addressing financial
549 leverage. Nor does it change the validity of the principles recognized by the Alabama
550 PSC, which stated (in the portion of the ruling just prior to that quoted by Ms. Phipps on
551 page 17 of her rebuttal testimony):

552 All things being equal, a company with a lower equity ratio has more
553 financial risk than a company with a higher equity ratio, thus requiring a
554 higher ROE to compensate equity investors for that additional risk. As the
555 amount of equity increases, however, the amount of financial risk
556 decreases, thus resulting in a lower investor-required ROE.⁵⁶

557 Ms. Phipps also includes an extended quote from the same order which she claims
558 supports her own focus on weighted ROE in the instant proceeding. Staff Ex. 8.0, pp. 16-
559 17. However, she neglects to acknowledge that in endorsing the ATWACC analysis
560 presented by my colleague and fellow Brattle principal, Dr. Vilbert, the Alabama PSC
561 relied on the results of his analysis, which found that “Alabama Power’s projected overall
562 return (after-tax) of 7.26 ... proved to be in line with the [overall after-tax weighted
563 average cost of capital] results from the comparable group,” which had a reported sample
564 average of 6.80%.⁵⁷ (Note that the ATWACC measures the lower after-tax cost of debt,
565 so that the figures cited above are not directly comparable to the ROR.)

566 I note that the average overall after-tax weighted average cost of capital results for the
567 gas sample presented in my direct testimony analysis ranged from 6.8 to 7.4 percent for

⁵⁵ Staff Ex. 8.0, p. 16.

⁵⁶ Alabama Power Co., Alabama Public Service Commission Report and Order Docket No. 18117 and 18416, p. 22 (Aug. 31, 2013)

⁵⁷ *Id.*, p. 14.

568 the CAPM and simple DCF models.⁵⁸ While adopting a “weighted cost of equity”
569 consistent with market-measured overall cost of capital in this range would be consistent
570 with the Alabama PSC ruling, the 4.61% “weighted ROE” value proposed by Ms. Phipps
571 for Nicor Gas is not consistent with the Alabama PSC’s endorsement of the ATWACC
572 approach to accounting for financial risk.

573 **B. THE STAFF AND IIEC/CUB WITNESSES STILL DO NOT PROVIDE**
574 **COHERENT ARGUMENTS FOR REJECTING THE HAMADA**
575 **ADJUSTMENT TO BETA**

576 **Q. Does Ms. Phipps make any new arguments regarding your approach to unlevering**
577 **and relevering betas (the “Hamada adjustment”) in her rebuttal testimony?**

578 A. Yes. She makes two brief comments. First, she attempts to question the broad
579 acceptance of the need to lever and unlever beta as a standard technique taught in
580 textbooks and employed by financial practitioners by drawing a minor distinction
581 between alternative versions of the unlevering formulas. Second, Ms. Phipps attempts to
582 draw a second distinction by claiming that Hamada adjustment procedures are somehow
583 *only* applicable “for understanding the effect of leverage on a firm’s cost of capital *for*
584 *new investment,*” and not for estimating a utility’s cost of equity in a ratemaking
585 context.⁵⁹ Neither calls into question my conclusions or the need to employ this
586 technique.

⁵⁸ Nicor Gas Ex. 11.4, Table No. BV-7 and Table No. BV-11.

⁵⁹ Staff Ex. 8.0, p. 14, lines 218-221.

587 **Q. What is the significance of the Phipps new comments concerning specific unlevering**
588 **methodologies?**

589 A. Ms. Phipps quotes Duff and Phelps as stating that “the Miles-Ezzell formulas are used to
590 unlever all beta estimates” in its publication *2017 Valuation Handbook, U.S. Industry*
591 *Cost of Capital*.⁶⁰ The implication she apparently intends to draw is that the use of the
592 Miles-Ezzell formulation is somehow fundamentally different than the type of adjustment
593 I employ.

594 She is wrong. The distinction between the Miles-Ezzell formulas and the Hamada
595 formulas is beside the point. More importantly, Duff and Phelps’s discussion reinforces
596 the need for this type of adjustment. Indeed, the same page of Duff & Phelps that Ms.
597 Phipps quotes indicates that “commonly used unlevering methodologies” include
598 formulas named for Hamada, Miles and Ezzell, Harris and Pringle, and Fernandez.⁶¹ The
599 technical Appendix to my direct testimony also references all of these versions and
600 explains that they differ only subtly based on the underlying assumptions about how to
601 value the tax deductibility of debt. Additionally, as noted there, my analysis employs
602 both the Fernandez formula (which differs from the Hamada formula only in that it does
603 not assume a beta of zero for debt) and the Harris and Pringle formula, which differs
604 hardly at all from the Miles-Ezzell formula.⁶²

605 I refer broadly to the standard finance technique of unlevering and relevering betas as the
606 “Hamada adjustment” methodology because the underlying principles were first

⁶⁰ Staff Ex. 8.0, p. 13.

⁶¹ Duff & Phelps, *2017 Valuation Handbook: US Industry Cost of Capital*, p. 39

⁶² See Nicor Gas Ex. 11.2, p. 19 (n. 17) and pp. 22-24 (including n. 24).

607 articulated by Professor Robert S. Hamada.⁶³ But, the relevant distinction is not between
608 the specific versions of the formula used in standard unlevering and relevering
609 methodologies (of which I use two), but between a textbook application of the unlevering
610 and relevering technique, and Ms. Phipps's and Mr. Gorman's failure to implement any
611 such methodology in their CAPM analyses.

612 **Q. What is Ms. Phipps second new comment regarding Hamada adjustments?**

613 A. Ms. Phipps claims that Hamada adjustment procedures are somehow *only* applicable “for
614 understanding the effect of leverage on a firm's cost of capital *for new investment*,” and
615 not for estimating a utility's cost of equity in a ratemaking context.⁶⁴ However neither
616 Ms. Phipps's testimony nor the Commission Order she cites provide any reason why
617 investing in utility rate base would be different from any other kind of investment as
618 relates to the effect of financial leverage on the cost of equity capital. This is not
619 surprising as there is no meaningful distinction between investing in a utility operating
620 company and investing in any other business venture when it comes to the cost of capital.
621 Whatever the investment, investors must earn a return commensurate with what they
622 could earn in an alternative investment of equivalent risk.

623 **Q. Does Mr. Gorman make any new comments in regards to your application of**
624 **Hamada adjustment techniques to unlever and relever beta?**

625 A. Yes. However, his comments appear to confuse the Hamada adjustment—which is used
626 to adjust for differences in financial leverage—with the *Blume* adjustment (of the type
627 employed by *Value Line*)—which “*adjust[s] a beta measured from historical data to*

⁶³ See Nicor Gas Ex. 11.0, pp. 12-13. See also Nicor Gas Ex. 11.2, p. 24, lines 322-332.

⁶⁴ Staff Ex. 8.0, p. 14, lines 218-221.

628 *reflect a forward-looking 'expected' beta.*"⁶⁵ They are fundamentally not the same thing.
629 Mr. Gorman further appears to mistakenly believe that Duff & Phelps justifies the use of
630 the Hamada adjustment for the purpose properly ascribed of the Blume adjustment, (*i.e.*,
631 to produce a better estimate of expected future beta when estimating beta using historical
632 data). This is not the case. In fact, the *Blume* adjustment and the techniques of
633 unlevering betas (which I refer to as the Hamada adjustment) are entirely separate and
634 independent of one another. Duff & Phelps demonstrates this clearly and concisely in
635 another publication (*2017 Valuation Handbook, U.S. Industry Cost of Capital*), which
636 explains that both raw historical betas and Blume-adjusted historical betas can be
637 expressed in either levered or unlevered form.

638 "Unlevered" betas (also called "asset" betas) have the effect of financial
639 leverage removed, thereby reflecting only the effect of business risk. An
640 unlevered beta is the beta that would be expected if a company were
641 financed only with equity capital (*i.e.*, no debt).

642 The (levered) betas calculated in the industry analyses presented herein are
643 as follows: (i) Raw (OLS) Beta, (ii) Blume- adjusted Raw (OLS) Beta,
644 (iii) Peer Group Beta, (iv) Vasicek- adjusted Raw (OLS) Beta, (v) Sum
645 Beta, and (vi) Downside Beta. *Each* of these levered betas is also
646 presented in "unlevered" form.⁶⁶

⁶⁵ IIEC/CUB Ex. 3.0, p. 23. Emphasis original.

⁶⁶ Duff & Phelps, *2017 Valuation Handbook: US Industry Cost of Capital*, p. 39.

647 Mr. Gorman's confusion about the Hamada adjustment renders his rebuttal testimony
648 discussion confused and inaccurate, and he presents no valid arguments against my
649 application of the standard finance techniques for unlevering and relevering betas.⁶⁷

650 **VI. EMPIRICAL CAPM**

651 **Q. Do Ms. Phipps or Mr. Gorman provide any substantive response to your rebuttal**
652 **testimony on the subject of your application of the ECAPM?**

653 A. No. Both Ms. Phipps and Mr. Gorman reiterate the belief that application of the ECAPM
654 is redundant when utilizing *Value Line* betas, which have been adjusted using the Blume
655 adjustment procedure. They therefore claim that the ECAPM should not be applied when
656 using *Value Line* betas.⁶⁸ I fully responded to these arguments in my rebuttal, to which
657 the witnesses do not meaningfully respond; instead repeat the same flawed and factually
658 incorrect arguments they relied on in their direct testimonies. The fact remains that the
659 ECAPM and the Blume adjustment that is applied to *Value Line* betas address two
660 separate and independent empirical findings.

⁶⁷ It is also worth noting that, as described above, the CFA curriculum relied on by Mr. Gorman explicitly indicates that estimating the cost of equity based on comparable companies "requires a process of 'unlevering' and 'levering' the beta." Also as described above, the CFA clearly indicates that each comparable company's beta should be unlevered based on *market value* debt and equity ratios. The CFA text credits Professor Robert S. Hamada as developing the technique and goes on to describe it in a manner that is entirely consistent with my approach:

The beta of the comparable is first "unlevered" by removing the effects of its financial leverage. The unlevered beta is often referred to as the asset beta because it reflects the business risk of the assets. Once we determine the unlevered beta, we adjust it for the capital structure of the company or project that is the focus of our analysis. In other words, we "lever" the asset beta to arrive at an estimate of the equity beta for the project or company of interest.

Bookshelf Online: 2016 CFA Level I Volume 4 Corporate Finance and Portfolio Management.

⁶⁸ Staff Ex. 8.0, p. 30; IIEC//CUB Ex. 3.0, p. 27.

661 **Q. What is the logical flaw in Ms. Phipps’s and Mr. Gorman’s argument that the**
662 **ECAPM and Blume adjustment are redundant?**

663 A. Both witnesses emphasize that the ECAPM and Blume adjustment have the same
664 directional impact on CAPM estimates. For example, Mr. Gorman states that both the
665 ECAPM and using Blume-adjusted (rather than raw, “unadjusted”) betas “have the effect
666 of increasing a CAPM return estimate for companies with betas less than 1, and
667 decreasing CAPM return estimates for companies with betas greater than 1.”⁶⁹ This
668 statement is true, but irrelevant. Similarly, Ms. Phipps claims that “[e]xcept for a
669 difference in the magnitudes of the adjustment to the slope and the intercept [of the
670 security market line], ... adjusting a Value Line beta is mathematically identical to the
671 adjustment behind ECAPM.”⁷⁰

672 Ms. Phipps and Mr. Gorman make an invalid logical leap by concluding that similar
673 directional impacts could only be produced by two alternative versions of the same
674 adjustment. The fact that these two adjustments move the “raw” beta data in the same
675 direction does not make them the same adjustment, or redundant. If a skier is skiing
676 down a mountain with the wind at her back, she cannot conclude that gravity and the
677 wind are the same force just because they are both acting to propel her down the
678 mountain; nor should she assume that either force alone would be sufficient to achieve a
679 given rate of speed. Yet Ms. Phipps and Mr. Gorman make just such a logical error in
680 their reasoning. They also fail to look at the empirical basis for the two distinct
681 adjustments. Empirically, they are simply not the same thing.

⁶⁹ IIEC//CUB Ex. 3.0, p. 27, lines 562-564.

⁷⁰ Staff Ex. 3.0, p. 30, lines 563-566.

682 **Q. Are the ECAPM and the Blume adjustment to beta interchangeable alternative**
683 **method for performing the same type of adjustment?**

684 A. No. Mr. Gorman asserts “Dr. Villadsen’s argument that an ECAPM adjusts the beta for
685 forward-looking tendencies is no different than the *Value Line* Blume beta adjustment
686 formula, which also adjusts a historical beta for forward-looking factors to produce an
687 expected beta.”⁷¹ This is a misrepresentation of both the ECAPM and of my argument.

688 As I explained in my rebuttal testimony, the Blume adjustment to beta and the ECAPM
689 are designed to account for two distinct and independent empirical observations about
690 unadjusted betas: **first**, the tendency of historical betas to be poor predictors of the true
691 beta that is the best forward looking estimate, and **second**, the tendency of the traditional
692 CAPM to under-predict required returns for low-beta stocks and over-predict required
693 returns for high-beta stocks *even when the best possible estimate of the true beta is used*,
694 that is even after the Blume adjustment is applied.⁷² The Blume adjustment is a direct
695 transformation of historically estimated betas to improve their predictive power in
696 response to the first observation. The ECAPM is a correction to the CAPM equation
697 designed to directly compensate for the second observation, which is necessary even with
698 a “true” beta.

⁷¹ IIEC//CUB Ex. 3.0, p. 27-27, lines 558-561.

⁷² Nicor Gas Ex. 25.0, p. 60, lines 1075-1079.

699 **Q. Mr. Gorman asserts that “there is no academic support for using an adjusted beta**
700 **in an ECAPM study.”⁷³ Is he correct?**

701 A. No. His claim is based entirely on the fact that most of the empirical tests of the CAPM
702 that demonstrated the need for the “ECAPM” adjustment did not explicitly employ
703 Blume-adjusted betas. But, that is not because the use of ECAPM duplicates or obviates
704 the need for the Blume adjustment; it reflects the fact that the academics who published
705 this research had other means at their disposal to account for the same phenomenon
706 Blume identified. For example, in his 1972 paper *Risk Return and Equilibrium*, Nobel
707 Prize winner Eugene Fama explained the “regression problem” and how he and co-author
708 James MacBeth dealt with it in performing their empirical tests of the CAPM.

709 In a cross section of $\hat{\beta}_i$ [estimated security beta], high observed $\hat{\beta}_i$ tend to
710 be above the corresponding true β_i and low observed $\hat{\beta}_i$ tend to be below
711 the true β_i . Forming portfolios on the basis of ranked $\hat{\beta}_i$ thus causes
712 bunching of positive and negative sampling errors within portfolios. The
713 result is that a large portfolio $\hat{\beta}_P$ [estimated portfolio beta] would tend to
714 overstate the true β_P , while a low $\hat{\beta}_i$ would tend to be an underestimate.

715 **The regression phenomenon can be avoided to a large extent by**
716 **forming portfolios from ranked $\hat{\beta}_i$ computed from data for one time**
717 **period but then using a subsequent period to obtain the $\hat{\beta}_P$ for these**
718 **portfolios that are used to test the two-parameter model.** With fresh
719 data, within a portfolio errors in the individual security $\hat{\beta}_i$ are to a large
720 extent random across securities, so that in a portfolio $\hat{\beta}_P$ the effects of the
721 regression phenomenon are, it is hoped, minimized.⁷⁴

⁷³ IIEC//CUB Ex. 3.0, p. 27-27, lines 558-561.

⁷⁴ Fama and MacBeth, “Risk, Return, and Equilibrium: Empirical Tests,” *The Journal of Political Economy*, Volume 81, Issue 3 (May-Jun., 1973), p. 615. In the footnote to this passage, Fama and MacBeth further state that “The regression phenomenon that arises in risk-return tests was first recognized by Blume (1970) and then by Black, Jensen, and Scholes (1972), who offer a solution to the problem that is similar in spirit to ours.”

722 **Q. Would it have made sense for the authors of the ECAPM Studies to test the risk-**
723 **return relationship predicted by the CAPM without accounting for Blume’s**
724 **observations in their estimates of beta?**

725 A. No. As Professor Fama stated, testing the CAPM “presents an unavoidable ‘errors-in-the-
726 variables’ problem: The efficiency condition or expected return-risk equation is in terms
727 of true values of the relative risk measure β_i [the true beta], but in empirical tests
728 estimates, $\hat{\beta}_i$ [the estimated beta] must be used.”⁷⁵ If the ECAPM study authors had not
729 attempted to address the “regression phenomenon” component of the “errors-in-the-
730 variables” problem, they would not have known whether their results reflected a new
731 finding about the CAPM risk-return relationship, or were due in part to a previously-
732 identified issue in the estimation of betas.⁷⁶

733 **Q. Would you please summarize the academic evidence from the ECAPM Studies as**
734 **relates to Blume’s empirical observation about betas?**

735 A. Yes. Stated simply⁷⁷—the academic literature establishing the need for the ECAPM
736 addressed the “regression phenomenon” in historically estimated betas that Professor

⁷⁵ Fama and MacBeth, “Risk, Return, and Equilibrium: Empirical Tests,” *The Journal of Political Economy*, Volume 81, Issue 3 (May-Jun., 1973), p. 614.

⁷⁶ The academics cited above *did* control for Professor Blume’s observations, so the finding that the risk-return relationship tend to be “flatter” than predicted by the CAPM is **not** a result of statistical beta estimation issues of the type identified by Blume.

⁷⁷ Also addressed in Nicor Gas Ex. 25.0, pp. 56-58, lines 1013-1032 and illustrated schematically in Figure 9.

737 Blume observed by *not using purely historically estimated betas*.⁷⁸ Indeed, they obtained
738 their beta estimates from the same time period for which they measured returns. Thus
739 they demonstrated the need to address the artificial “flatness” dealt with by ECAPM *even*
740 *when using betas that do not require the Blume adjustment*—betas that are already the
741 best possible estimators of “true beta.” Therefore, not only does the literature directly
742 contradict Mr. Gorman’s characterization, but it also confirms the need to use both the
743 ECAPM and, when using historical betas as predictors of future beta, the Blume
744 adjustment.

745 **Q. What about Ms. Phipps’s comments regarding the ECAPM article by Litzenberger,**
746 **Ramaswamy, and Sosin?**⁷⁹

747 A. Ms. Phipps seems to misunderstand and misrepresent the methods and findings of that
748 paper. Ms. Phipps does accurately describe the article’s finding that “the observed
749 security market line, which maps the relationship between beta and return, is flatter than
750 theory predicts,”⁸⁰ but goes on to imply that the authors believe adjusting betas is a
751 complete and sufficient solution to “bring the resulting predicted return more in line with
752 actual results.”⁸¹ This is not the case.

⁷⁸ As I noted in my rebuttal testimony, the technique described by Professor Fama was only available to the academics who conducted these studies because they were evaluating a relationship between betas and returns from contemporaneous past periods. This technique is not available in the context of this proceeding, because we are engaged in predicting future returns using betas estimated using historical data.

⁷⁹ 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. Cited by Ms. Phipps at Staff Ex. 8.0, p. 27.

⁸⁰ Staff Ex. 8.0, p. 27.

⁸¹ Staff Ex. 8.0, p. 27-28, lines 518-522.

753 The Litzenberger ECAPM article discusses the regression phenomenon identified by
754 Professor Blume and his “global adjustment approach” to addressing it in the context of
755 introducing the linear equations the authors use to empirically investigate the relationship
756 between beta and returns. In pursuit of their goal of deriving an econometrically
757 estimated version of the CAPM (i.e., an ECAPM) that can be used to predict required
758 equity returns for public utilities, Litzenberger et al. explain how the Blume adjustment
759 can be incorporated within the CAPM via algebraic transformations:

760 This [global adjustment] approach implies a linear relationship between
761 future betas and historical betas and suggests that unadjusted betas may be
762 used to predict risk premiums. For example, consider the following
763 relationship between excess rates of returns and globally adjusted betas,

$$\tilde{r}_i = a + b[\omega\beta_{i(historical)} + (1 - \omega)] + \tilde{e}_i$$

764 This relationship reduces to the following relationship between excess
765 rates of return and historical betas,

$$\tilde{r}_i = a' + b'\beta_{i(historical)} + \tilde{e}_i$$

766 where

$$a' = a + b(1 - \omega), \text{ and}$$

$$b' = b\omega.$$

767 Note that for predictive purposes, a' and b' may be estimated directly;
768 knowledge of ω is not required. If the ω used were constant over time,
769 then the cost of equity capital estimates obtained using CAPM parameters
770 measured using this global procedure would be identical to those obtained
771 using unadjusted betas.⁸²

772 The authors effectively “kill two birds with one stone,” by estimating a' and b' directly
773 according to the equation $\tilde{r}_i = a' + b'\beta_{i(historical)} + \tilde{e}_i$. For their “predictive purposes,”
774 this produces an equation that corrects for *both* Blume’s observation about historical

⁸² Litzenberger ECAPM article, p. 376.

775 betas *and* the empirical tendency of the CAPM to under (over) predict returns for low
776 (high) beta securities. However, this does not erase the algebraic link (i.e., $a' = a +$
777 $b(1 - \omega)$ and $b' = b\omega$) between the parameters a' and b' estimated using historical betas
778 and the a and b parameters that define what the authors refer to as the “relationship
779 between excess rates of returns and globally adjusted betas.”⁸³

780 **Q. Do the empirical results reported the Litzenberger ECAPM article support Ms.**
781 **Phipps’s implication that adjusting betas is a complete and sufficient solution to**
782 **bringing the predictions of the CAPM in line with observed reality?**

783 A. No. In the bottom panel of their Table 1, Litzenberger et al. report their estimates for a'
784 and b' according to the transformed CAPM equation that makes direct use of unadjusted
785 historical betas ($\tilde{r}_i = a' + b'\beta_{i(\text{historical})} + \tilde{\epsilon}_i$).⁸⁴ However, these parameter estimates
786 are directly algebraically linked to estimates of a and b in the “relationship between
787 excess rates of returns and globally adjusted betas,

$$788 \quad \tilde{r}_i = a + b[\omega\beta_{i(\text{historical})} + (1 - \omega)] + \tilde{\epsilon}_i.”$$

789 If “globally adjusting” beta were sufficient to correct for the observed flatness of the
790 security market line, the Litzenberger ECAPM article’s estimates of a' and b' would be
791 consistent with “ $a = 0$ ”, a directly proportional relationship between adjusted beta and
792 returns with zero intercept. However, as I showed in my rebuttal testimony, Litzenberger
793 et. al.’s Table 1 estimates $\hat{a}' = 0.136$ and $\hat{b}' = 0.519$, which is actually consistent with
794 an intercept of $a = 0.163$ —equivalent to an annualized ECAPM alpha of approximately

⁸³ Litzenberger ECAPM article, p. 376. Emphasis added.

⁸⁴ Litzenberger ECAPM article, p. 380.

795 2.0 percent — in their equation relating excess rates of returns and globally adjusted
796 betas when a representative ω is used for the Blume adjustment.⁸⁵

797 Thus, contrary to Ms. Phipps's misinterpretations, the Litzenberger ECAPM article
798 demonstrates the necessity of an empirical correction to the CAPM when adjusted betas
799 are employed.

800 **Q. How would the failure to use ECAPM affect the estimation of Nicor Gas' cost of**
801 **capital in this case?**

802 A. Relative to the theoretical CAPM, the ECAPM equation increases the intercept by α and
803 decreases the slope by α for a total impact of $\alpha \times (1 - \beta)$. My implementation of the
804 ECAPM used a conservatively low ECAPM alpha parameter of 1.5%. Therefore, even
805 using the sample average levered equity beta of approximately 0.70 relied on by
806 Ms. Phipps and Mr. Gorman, an appropriate and conservative application of the ECAPM
807 results in an increase of approximately 45 basis points ($1.5\% \times (1 - 0.70) = 0.45\%$)
808 relative to the traditional CAPM. Ms. Phipps's and Mr. Gorman's failure to consider
809 results based on this empirically grounded version of the CAPM biases their results
810 downward to a material degree.

811 **VII. CAPITAL STRUCTURE AND THE COST OF DEBT**

812 **Q. What, in summary, do Ms. Phipps' and Mr. Gorman's rebuttal testimonies**
813 **recommend concerning Nicor Gas' capital structure and cost of debt?**

814 A. Ms. Phipps's rebuttal testimony increases the amount of short-term debt to 5.01% (from
815 0.59%), while she maintains a short-term cost of debt of 1%. At the same time, Ms.

⁸⁵ Nicor Gas. Ex. 25.0, p. 59-60, lines 1051-1060.

816 Phipps reduces the equity percentage to 52.66% (from 54.13% in direct) and maintains
817 the ROE at 9.16%. The amount of long-term debt then becomes 42.33% and Ms. Phipps
818 increases the recommended cost of LT debt by 2 basis points to 4.49%. Mr. Gorman also
819 maintains his ROE recommendation of 9.15% as well as his cost of debt
820 recommendations (1.85% for ST and 4.94% for LT debt), while he reduces the amount of
821 short-term debt by more than 16% to 0.59%, increases the amount of long-term debt to
822 48.34% (from 31.89%) and slightly increases the amount of equity to 51.07% (from
823 50.89%).⁸⁶

824 **Q. What should the Commission conclude about these recommendations?**

825 A. Ms. Phipps' recommends (i) selective updates to the amount of debt that are inconsistent,
826 (ii) a cost of 2018 short-term debt that is too low and inconsistent with market data on
827 interest rate swaps. Also, (iii) as I discussed in my rebuttal,⁸⁷ Ms. Phipps does not fully
828 respect the principle that long-lived assets should be financed with long-term capital
829 (equity and LT debt). In contrast, Mr. Gorman's revised capital structure appropriately
830 recognizes that long-lived assets should be financed predominantly with long-lived
831 financing.⁸⁸

832 **Q. Why do you say Ms. Phipps' update to the short-term debt amount is inconsistent?**

833 A. Ms. Phipps says that

⁸⁶ The recommendations are summarized in Table 1 and Table 2.

⁸⁷ Nicor Gas Ex. 25.0, p. 10, lines 162-180.

⁸⁸ As Mr. Gorman has not changed his recommended cost of short-term or long-term debt, my surrebuttal does not discuss his recommended cost of debt. Similarly, Mr. Gorman has not substantially changed his recommended level of equity for which reason I do not discuss this further.

834 *Updating the cost of short-term debt without adjusting the ROE would be*
835 *a selective update, which should be avoided whenever possible.*⁸⁹

836 Ms. Phipps acknowledges that (book value) capital structure affect the financial risk and
837 hence the cost of equity.⁹⁰ Yet, Ms. Phipps recommends a higher financial leverage
838 through an increase in the short-term debt without changing her recommended cost of
839 short-term debt or cost of equity.⁹¹ This is inconsistent and violates her position that
840 “selective updates are to be avoided.” If the amount of short-term debt (and total debt) is
841 increased, financial risk and hence the cost of equity increases – the cost of debt may
842 increase, too.

843 **Q. What evidence do you have that Ms. Phipps’ cost of short-term debt is too low?**

844 A. As discussed in my rebuttal testimony,⁹² both analyst forecasts and market data on
845 interest rate swaps indicates that the interest on short-term debt is increasing, *i.e.*,
846 investors expect to pay more to borrow short-term going forward than today. Therefore,
847 the cost of short-term debt needs to be consistent with either the forward swap curve on
848 interest rate cost (plus any issuance cost) or the forecasted cost of short-term debt (plus
849 any issuance costs). The recommendation of Ms. Phipps is too low to match either data
850 point.

⁸⁹ Staff Ex. 8.0, p. 34.

⁹⁰ Staff Ex. 8.0, p. 3.

⁹¹ Ms. Phipps increases her recommended cost of long-term debt by two basis points.

⁹² Nicor Gas Ex. 25.0, p. 13, lines 204-215 and Nicor Gas Ex. 25.3 page 1.

851 **VIII. MISCELLANEOUS ISSUES**

852 **Q. How does Ms. Phipps respond to your rebuttal testimony on the issue of flotation**
853 **costs?**

854 A. She accurately describes my proposed adjustment to provide recovery of flotation costs
855 as designed to provide sufficient prospective return both of and on the portion of the
856 capital provided by investors that was lost to flotation costs at the time of the equity
857 issuances.⁹³ However, Ms. Phipps argues that such an adjustment is “inappropriate”
858 because it “account[s] for equity issuance costs as a percentage of the market value of the
859 issued equity,” and suggests that this is somehow different than the “book value common
860 equity” at the time of the issuances.”⁹⁴ That is not an accurate description. At the time
861 equity is issued, the value of the capital raised is determined by the market value of the
862 issued shares. This same dollar amount of capital (less any flotation costs) is then
863 invested directly in the assets of the company, which are by definition are accounted for
864 at “book value” on the balance sheet. Put differently, the market value of issued equity
865 (less flotation costs) is equal to the book value of common equity *at the time of issuance*.
866 Consequently, Ms. Phipps’s criticism of my approach is invalid.

⁹³ Staff Ex. 8.0, p. 21, lines 392-396.

⁹⁴ Staff Ex. 8.0, p. 21-22, lines 396-403.

867 **Q. In her rebuttal testimony, Ms. Phipps states that “[w]hile Dr. Villadsen is correct**
868 **that credit ratings evaluate the probability that a company will default on its debt,**
869 **her conclusion that a higher credit rating does not necessarily correspond to lower**
870 **shareholder risk is incorrect.”⁹⁵ How do you respond?**

871 A. Ms. Phipps argues that

872 Nobel Prize winners Modigliani and Miller conclude that common equity
873 costs are affected by debt leverage. Credit ratings are also affected by
874 debt leverage. That is, as debt leverage rises, the cost of common equity
875 rises and credit ratings fall, and vice versa. Thus, there is an inverse
876 relationship between credit ratings and common equity costs. This is
877 precisely the relationship I am modeling.⁹⁶

878 I fully agree with Ms. Phipps accepting Modigliani and Miller’s conclusion that increased
879 financial leverage amplifies the risk of equity investments, but take issue with her attempt
880 to equate this with the effect of leverage on the probability of default—and therefore on
881 credit ratings. The two mechanisms are not the same, and Modigliani and Miller do not
882 imply that they are. *Excessive* financial leverage may meaningfully contribute to a
883 company’s risk of default, but that conclusion does not apply to minor fluctuations in
884 levels of debt financing, and certainly not to fluctuations within the ranges displayed by
885 A-rated public utility companies such as Nicor Gas.⁹⁷ However *any* change in the degree
886 of financial leverage will necessarily amplify the variability (and therefore the risk) of the
887 returns to equity holders, in the manner I explained and illustrated in my rebuttal
888 testimony (as well as above in this surrebuttal testimony). The fact that the two
889 mechanisms are distinct and operate at different scales is summarized in the statement by

⁹⁵ Staff Ex. 8.0, p. 23, lines 440-443.

⁹⁶ Staff Ex. 8.0, p. 24.

⁹⁷ As noted in Nicor Gas Ex. 25.0, p. 37, footnote 72, the default risk of investment grade utilities is miniscule.

890 Professor's Berk and DeMarzo in their corporate finance textbook that "*leverage*
891 *increases the risk of equity even when there is no risk that the firm will default.*"⁹⁸

892 Indeed, between these two largely independent effects of financial leverage—one on the
893 cost of equity through amplification of variability in equity returns and the other on credit
894 ratings due to material changes in the probability of default—Ms. Phipps is focused on
895 the default issue, when the mechanism that is actually most relevant to Nicor Gas is
896 variability in returns. Instead of purporting to calculate a difference in the cost of equity
897 based on minor differences in credit metrics between the sample companies and Nicor
898 Gas, it is important to acknowledge and measure the substantial difference in equity risk
899 resulting from differences in financial leverage between equity investments in the
900 publicly traded stock of the proxy companies and the equity investment in Nicor Gas.

901 **Q. How do you respond to Ms. Phipps's criticism of your use of forecasted bond yields**
902 **to estimate the risk-free rate of interest?**

903 A. Her criticisms are unconvincing. First, Ms. Phipps states that "since we are estimating
904 Nicor Gas' **current cost of equity**, using interest rate projections in risk premium
905 analysis also mismatches measurement periods."⁹⁹ This ignores the fundamental fact that
906 this proceeding has a 2018 test year and that the rates from this proceeding will be in
907 effect for possibly several years going forward. If the rate of return granted in this
908 proceeding does not adequately compensate potential future as well as current investors,

⁹⁸ Nicor Gas Ex. 25.0, p. 19, citing Berk and DeMarzo (2014), *Corporate Finance*, 3rd Ed., p. 482 [emphasis original].

⁹⁹ Staff Ex. 8.0, p. 26, lines 495-496. Emphasis added.

909 Nicor Gas may struggle to attract capital on reasonable terms. This proceeding is setting
910 the cost of capital not only for today but also for future periods.

911 Second, and this point cannot be overemphasized: it is a logical fallacy that “current
912 [interest] rates are the best predictor of future rates.”¹⁰⁰ If that were true, forwards and
913 futures would track current rates and the best hedging strategy would be to lock in current
914 rates. We know this is not the case. Further, while I agree that “[a]ccurately predicting
915 the direction, magnitude and timing of interest rate changes” is difficult,¹⁰¹ that does not
916 show that the best prediction is that nothing will change.

917 Ms. Phipps attempts to buttress her mistaken assertion that today’s interest rate is the best
918 predictor of interest rates going forward by reference to the Efficient Markets Hypothesis
919 (EMH). This does not help her case. It is correct that according to the EMH, “current
920 interest rates reflect investors’ expectations about future interest rates,”¹⁰² (at least so far
921 as those expectations are based on publicly available information) this does not mean that
922 the EMH posits that *current interest rates for current debt* are the best predictor of
923 interest rates of future debt or effective interest rates of current debt in the future. Indeed,
924 both the theories of rational expectations and the EMH say something quite different.
925 The expectations hypothesis interpretation of the term structure of interest rates suggests
926 that the shape of the yield curve reflects the market’s current expectation for future
927 interest rates. In addition, current trades on interest rate swaps indicate that investors

¹⁰⁰ Staff Ex. 8.0, p. 26.

¹⁰¹ Staff Ex. 8.0, p. 26.

¹⁰² Staff Ex. 8.0, p. 26.

928 expect interest rate to increase.¹⁰³ That current, rational market data all shows that at
929 present, the markets expect rates to rise.

930 **IX. CONCLUSION**

931 **Q. Does this conclude your surrebuttal testimony?**

932 **A. Yes.**

¹⁰³ See, Nicor Gas Ex. 25.0, p. 12 for details.