

STATE OF ILLINOIS

ILLINOIS COMMERCE COMMISSION

Northern Illinois Gas Company)
d/b/a Nicor Gas Company)
) Docket No. 21-0098
Proposed general increase in gas rates.)

Rebuttal Testimony of

DR. BENTE VILLADSEN

Principal, The Brattle Group

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

June 8, 2021

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1 **I. INTRODUCTION AND SUMMARY**

2 **Q. What is your name, occupation, and business address?**

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

5 **Q. Are you the same Bente Villadsen who filed Direct Testimony in this matter?**

6 A. Yes.

7 **A. SUMMARY OF PURPOSE AND CONCLUSIONS**

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

9 A. I have been asked to review and comment on the testimony of Ms. Rochelle Phipps
10 (“Phipps Corrected Testimony”) filed on behalf of the Illinois Commerce Commission
11 Staff (“ICC Staff” or “Staff”) and the testimony of Mr. Christopher Walters (“Walters
12 Testimony”) filed on behalf of the Illinois Industrial Energy Consumers (“IIEC”) and
13 Citizens Utility Board (“CUB”), collectively (“IIEC-CUB”).

14 **Q. Is there anything in Ms. Phipps or Mr. Walters’ Direct Testimonies that caused you
15 to change your recommended return on equity for Nicor Gas?**

16 A. No. Having reviewed the Direct Testimonies of Ms. Phipps and Mr. Walters as well as
17 recent changes to economic and financial conditions, I continue to find that my original
18 recommendations for a return on equity (“ROE”) of 10 ¼ percent (10.35% including
19 flotation costs) at a requested 54.459%¹ equity capital structure remains reasonable. I

¹ I note Nicor Gas witness Gregory MacLeod (Nicor Gas Ex. 18.0) testifies that Nicor Gas does not object to Staff’s proposed capital structure, which includes a common equity ratio of 54.459%. I take this into consideration when finding that my original recommended ROE of 10.25% remains reasonable.

20 acknowledge that since my Direct Testimony, economic conditions have changed as
21 COVID-19 vaccine distributions allow social distancing measures to be relaxed and of
22 the economy to re-open. Additionally, a new administration has taken office and
23 economic stimuli has been passed. I address the impacts of these changes in further
24 detail in Section VI.

25 **Q. Please summarize your testimony.**

26 A. Having reviewed the testimonies of Ms. Phipps and Mr. Walters, I summarize my
27 findings below as follows:

- 28 • The ROEs recommended by Ms. Phipps and Mr. Walters' recommendations are
29 much too low given the prevailing market conditions.
- 30 • Ms. Phipps only indirectly takes the effect of financial leverage into account and
31 Mr. Walters fail to take into account the impact of financial leverage on ROE.
32 The approaches used in my analysis – the after-tax weighted average cost of
33 capital and the Hamada method – are standard methodologies taught in MBA
34 textbooks, the CFA curriculum (of which, Mr. Walters is a charter holder), and
35 are considered in several regulatory jurisdictions.
- 36 • Ms. Phipps and Mr. Walters fail to consider relevant information about other
37 highly regulated utility companies, such as water utilities that would provide a
38 reasonable comparison in a proxy sample. Investors can and do compare returns
39 across highly regulated utilities and require a return for Nicor Gas that is
40 comparable to that of other highly regulated utility companies with similar
41 business risk profiles.

42 • Mr. Walters recommended CAPM result is not supported by the range of CAPM
43 estimates derived from his 12 CAPM implementations. Mr. Walters CAPM
44 recommendation is 108 to 125 basis points below the median and average of his
45 CAPM results. The judgment used by Mr. Walters to determine which CAPM
46 result to rely upon is not explained, and the median or average of his results
47 would be an appropriate measure of the CAPM ROE.

48 In the remainder of this rebuttal testimony, I first discuss the reasonableness of Ms.
49 Phipps' and Mr. Walters' recommendations. Second, I comment on Ms. Phipps' and Mr.
50 Walters' cost of equity estimation approaches. Third, I address the criticisms of my
51 estimation approach. Finally, I address recent changes in capital markets since the filing
52 of my Direct Testimony to the degree they affect the cost of equity or are addressed by
53 Ms. Phipps or Mr. Walters.

54 **Q. Are there any exhibits attached to your testimony?**

55 A. Yes. One exhibit is attached to my testimony, Nicor Gas Ex. 30.1 – Nicor Gas Response
56 to Staff Data Request RMP 1.06 (Confidential).

57 **B. SUMMARY OF ROE RECOMMENDATIONS**

58 **Q. Please summarize the recommendations of the cost of equity witnesses.**

59 A. Figure R-1 below summarizes Ms. Phipps' and Mr. Walters' recommended allowed
60 ROEs for Nicor Gas and also shows the recommendation in my Direct Testimony.

61

FIGURE R-1: SUMMARY OF RECOMMENDATIONS FOR NICOR GAS

	Recommended ROE*	Range
Villadsen	10.25%	9.0% - 11.0%
Phipps	9.75%	9.7% - 9.9%
Walters	9.4%	9.0% - 9.8%

Source: Phipps Corrected Testimony, Schedule 4.05 and 4.06
Walters Testimony, Table 8, 9, and 11.
Does not include flotation costs.

62

I note that Ms. Phipps obtained a result of 8.03% from her Non-Constant Growth

63

DCF (“NCDCF”), which is similar to the Multi-Stage DCF methodology I calculated in

64

my Direct Testimony. I agree with Ms. Phipps that this method should not be relied upon

65

to determine an appropriate cost of equity at this time given the on-going uncertainty in

66

the market. I also agree with Ms. Phipps that the results from the constant growth DCF

67

or simple DCF should be used in determining an appropriate ROE for Nicor Gas.² This

68

results in Ms. Phipps’ range of results of 9.70% - 9.9%.

69

Q. How would you describe Ms. Phipps’ and Mr. Walters’ recommended ROEs?

70

A. The ROEs recommended by Ms. Phipps and Mr. Walters are too low. Ms. Phipps

71

recommended ROE is based on the average of her DCF and risk premium (CAPM)

72

results (9.8%) from which she subtracts a 0.05% risk adjustment based on Nicor’s credit

73

rating.³ Ms. Phipps does not explicitly account for risks related to the on-going

74

heightened market uncertainty⁴ and Nicor Gas specific risks, such as Nicor’s higher

² Phipps Corrected Testimony, p. 11; Villadsen Direct Testimony, p. 55.

³ Phipps Corrected Testimony, p. 23.

⁴ Ms. Phipps relies on the expected market return in her CAPM. This measure will in part consider market uncertainty.

75 capital intensity relative to the proxy sample. Ms. Phipps' recommended ROE also does
76 not account for differences in financial leverage between the proxy group and Nicor Gas,
77 a standard financial technique used by financial professionals and also used in other
78 regulatory settings.

79 Mr. Walters' recommended ROE is derived from a flawed and inconsistent
80 methodology for interpreting the results from his cost of equity methodologies. He uses
81 the average and median to derive his point estimate from the DCF Model.⁵ However, for
82 the CAPM results, Mr. Walters inexplicitly changes methodologies and recommends a
83 point estimate of 9.8% based on 12 different CAPM estimates. However, the average,
84 median, and midpoint of these 12 results are 9.9%, 10.08% and 10.25%, respectively – 10
85 to 35 basis points higher than his recommended point estimate.⁶ To arrive at his
86 recommended ROE for Nicor Gas, Mr. Walters uses the mid-point of his DCF, Risk
87 Premium, and CAPM point estimates.⁷ Using the average (9.9%), median (10.08%) or
88 midpoint (10.25%) of his CAPM results would increase Mr. Walters' recommended ROE
89 to 9.45%, 9.54% or 9.62%, respectively.

90 Mr. Walters acknowledges the financial and economic impacts of the COVID-19
91 pandemic, but he fails to properly assess how the heightened uncertainty impacts the
92 recommended ROE. Mr. Walters also ignores Nicor specific risks and makes no
93 adjustments for financial leverage.

⁵ 9.0% is the average and median of the four DCF results shown in Table 8 on page 40 (the mid-point is 8.99%). Mr. Walters derives a single result of 9.1% from his Risk Premium model.

⁶ I note the mid-point of Mr. Walters' 12 CAPM estimates is 10.25%.

⁷ Walters Testimony, p. 58.

94 **II. FINANCIAL LEVERAGE ADJUSTMENTS**

95 **A. PRELIMINARIES**

96 **Q. What do you cover in this section of your rebuttal testimony?**

97 A. I respond to the critiques and misunderstandings of my Direct Testimony regarding
98 financial leverage. Specifically, I address the concerns of Ms. Phipps and Mr. Walters
99 regarding the use of the after-tax weighted average cost of capital and the Hamada
100 adjustment to account for financial leverage. I also present the regulatory precedent for
101 taking financial leverage into account. Finally, I assess the impacts on Ms. Phipps and
102 Mr. Walters not taking the impact of capital structure into account in their recommended
103 ROEs.

104 **Q. What arguments do Ms. Phipps and Mr. Walters present regarding financial risk?**

105 A. Both Ms. Phipps and Mr. Walters take issue with my use of the after-tax weighted
106 average cost of capital (“ATWACC”) methodology and also my use of the Hamada
107 methodology.⁸ Specifically, the concerns of Ms. Phipps and Mr. Walters fall into four
108 general categories:

- 109 1. *Market vs. book value of capital structures*: Ms. Phipps argues that investors
110 should only be compensated for the capital that is invested in plant and equipment
111 to serve rate payers and not the market value of capital, consistent with original
112 cost ratemaking.⁹ Mr. Walters states that book value capital structure of Nicor

⁸ Phipps Corrected Testimony, pp. 36-42; Walters Testimony p. 67.

⁹ Phipps Corrected Testimony, p. 40.

113 Gas relative to the sample is the relevant comparison because Nicor Gas' stock is
114 not publicly traded.¹⁰

115 2. *Circular-Rate Making*: Ms. Phipps argues that the leverage adjustments would
116 require the Commission to continuously authorize higher ROEs because the
117 upward adjustment would increase the market-to-book value ratio.¹¹

118 3. *Regulatory Precedent*: Mr. Walters argues that the financial risk adjustments lack
119 regulatory precedent in the U.S.¹² and Ms. Phipps argues there is no precedent in
120 Illinois.¹³

121 **Q. How do you respond to Ms. Phipps' assertion that leverage adjustments are**
122 **inappropriate and investors should only be compensated for capital invested in**
123 **plant and equipment?**

124 A. First, Ms. Phipps uses the market value of companies in the S&P 500 when performing
125 her DCF to estimate the Market Risk Premium used in her CAPM analysis.¹⁴ Therefore,
126 both Ms. Phipps and I are both using the market value in our analyses but the difference
127 between our analysis is how market values are used to adjust for financial leverage.

128 Second, Ms. Phipps comments may be based on a misunderstanding of the
129 application of the return on equity. Both the CAPM and DCF models rely on market data
130 to estimate the cost of equity for sample companies, so the results reflect the value of the
131 capital that investors hold during the estimation period (market values). Third, the
132 allowed return on equity is applied to rate base, which is determined using the historical

¹⁰ Walters Testimony, p. 69.

¹¹ Phipps Corrected Testimony p. 42.

¹² Walters Testimony, p. 67.

¹³ Phipps Corrected Testimony, p. 46.

¹⁴ Phipps Corrected Testimony, p. 17 and WP Market Return 2021-1.xlsx.

133 cost and hence reflect the net book value of assets. Taking differences in financial
134 leverage into consideration does not change the value of rate base and consequently does
135 not depart from original cost ratemaking principles. Adjustment for differences in
136 leverage does consider the fact that the more debt a company has, the higher the financial
137 risk associated with an equity investment in that company. Furthermore, the higher risk
138 to investors will increase the cost equity capital raised through primary investing to fund
139 investments in plant and equipment to serve ratepayers.

140 **Q. How do you respond to Ms. Phipps' assertion that market-to-book values greater**
141 **than one will cause a continual upward adjustment to the allowed rate of return?**

142 A. Standard cost of equity estimation methods, including the capital asset pricing model
143 ("CAPM") and discounted cash flow ("DCF") express a company's cost of equity in
144 percentage terms per dollar of equity at the observed market capital structures. This tells
145 us the unit price of risk, but it is only the correct rate if applied to the corresponding
146 amount of equity. However, cost of service regulation (in Illinois) applies the rate of
147 return to the book value and not the market value, for good reason: It is striving to give a
148 fair return on and recovery of the utility's investment costs, not their economic value. If
149 rates of return were awarded against market value, then it would create a circular
150 situation whereby the allowed rate would either boost or suppress the market value
151 gaining the allowance according to whether it was high or low.

152 Most utilities have a greater share of debt in their book capital structure than in
153 their market value capital structure (i.e. they are more levered in book terms). As a
154 result, if the market cost of equity were granted against the book amount (cost basis),
155 then the utility shareholders would not be earning enough to offset the risk of full cost

156 recovery. The additional debt in the book capital structure will put investors at risk for
157 non-recovery. The leverage adjustment in turn takes this additional leverage into account
158 and adjusts the allowed return of equity (from the market measured rate) just enough to
159 ensure the risk of cost recovery is compensated. Making the adjustments keeps investors
160 whole, and the equity competitive with other investment opportunities.

161 **Q. Does financial leverage considerations result in a “never ending upward movement**
162 **in the allowed rate of return”?**¹⁵

163 A. No. The never ending upward movement does not occur because the market weighted
164 average cost of capital does not change with capital structure and is therefore unaffected
165 by explicit considerations of financial risk. By holding the market weighted average cost
166 of capital constant, all else equal, a higher stock price would correspond to a lower
167 market return on equity, thus breaking the cycle envisioned by Ms. Phipps. This step-
168 down of market returns would offset what would otherwise be increases in regulatory
169 ROEs in future rate cases. The financial risk adjustment is therefore a one-time event, all
170 else being equal. Importantly, this principal of non-circularity is also applicable to the
171 Hamada adjustment.

172 **B. FINANCIAL ECONOMICS**

173 **Q. How should capital structure be taken into account to ensure that the allowed**
174 **returns meet the fair return standard?**

175 A. The proportion of debt in the capital structure—also known as financial leverage—
176 influences the risk borne by equity investors. For a given degree of business risk, a

¹⁵ *Id.*

177 higher proportion of debt financing increases the expected variability of equity returns.
178 Thus, to compare the fair returns of two otherwise identical firms, on a risk adjusted
179 basis, the capital structures must be taken into account. For example, if more debt is
180 used, the greater financial risk imposed by the greater financial leverage must be
181 compensated by a commensurately higher expected return on equity. Otherwise, the
182 more leveraged firm will not receive a fair return and will be at a disadvantage in the
183 competition to attract capital in equity markets.

184 **Q. How does leverage relate to the cost of equity?**

185 A. Financial risk or capital structure is a large topic in financial economics. The principle
186 that financial leverage amplifies the variability of equity returns and thereby increases the
187 financial risk to equity investors is a firmly established core principal of corporate
188 finance. It is directly connected to the Modigliani Miller proposition that, except as
189 influenced by the tax-deductibility of debt and the cost of financial distress, the value of a
190 firm's assets is independent of its choice of financing. This intuitive framework means
191 that some measures of the overall cost of capital for firms with comparable systematic
192 business risk should be the same regardless of capital structure,¹⁶ even if the cost of the
193 equity and/or debt components of financing vary in proportion to the degree of financial
194 leverage.

195 It is commonly recognized in finance textbooks that financial leverage impacts
196 the cost of equity for a company. A replication from a standard MBA textbook is
197 provided below:¹⁷

¹⁶ Except in cases of extremely high or low leverage, where the tax and financial distress effects may dominate.

¹⁷ Jonathan Berk and Peter DeMarzo, "Corporate Finance," Third Edition, 2013 (Berk & DeMarzo 2013), p. 492.

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

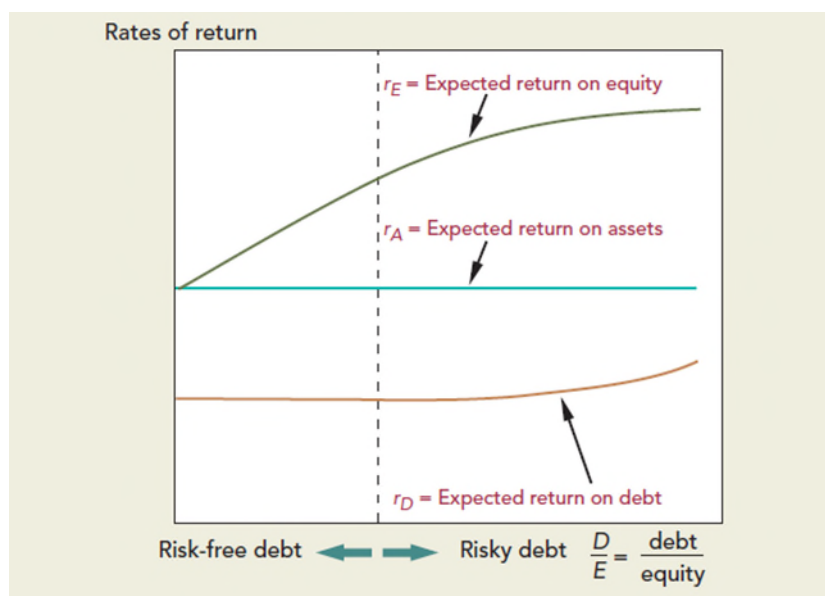
increases the risk of the equity. Given the increase in risk, equity holders will demand a higher risk premium and, therefore, a higher expected return. The increase in the cost of equity exactly offsets the benefit of a greater reliance on the cheaper debt capital, so that the firm's overall cost of capital remains unchanged.

198 As Professors Berk and DeMarzo further note:

199 The levered equity return equals the unlevered equity return, plus an extra
200 “kick” due to leverage...The amount of additional risk depends on the
201 amount of leverage, measured by the firm’s **market value debt-equity ratio,**
202 **D/E...**¹⁸ (emphasis added)

203 This relationship is further illustrated in Figure R-2, reproduced from the seminal
204 textbook *Principles of Corporate Finance* by Brealey, Myers, and Allen. It illustrates that
205 as capital structure shifts to use a greater proportion of lower cost debt financing, the
206 investor required return on equity (and debt, especially at higher leverage ratios)
207 increases to compensate for the greater financial risk, such that the overall required return
208 on assets remain unchanged.

¹⁸ 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.

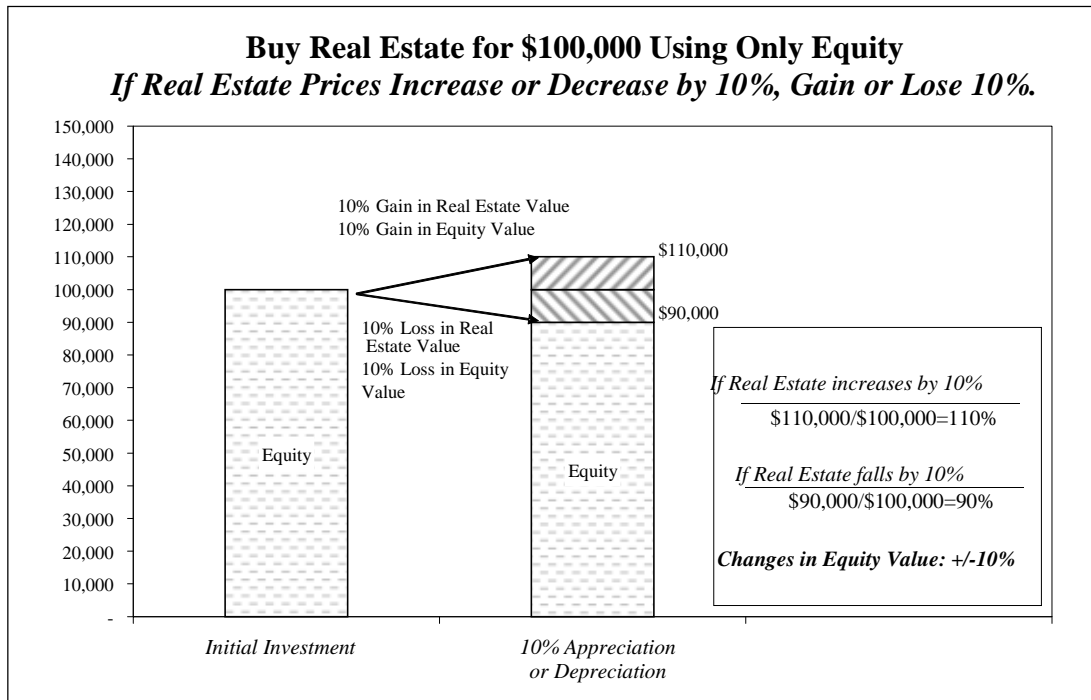
FIGURE R-2: ILLUSTRATION OF THE MODIGLIANI MILLER PRINCIPLE¹⁹

210 Financial economics simply do not leave any doubt that the cost of equity
 211 increases with financial leverage and that the relevant measure of financial leverage
 212 depends on market value. I—like other witnesses—estimate the cost of equity using
 213 market data in the CAPM and DCF-based models. Since the Risk Premium model is
 214 based on book values, the relevant leverage for this methodology is book value based.

215 **Q. Could you provide a numerical example to illustrate the impact of financial leverage**
 216 **on cost of equity?**

217 A. Yes. A simple example, think of an investor who takes money out of her savings and
 218 invests \$100,000 in real estate. The future value of the real estate is uncertain. If the real
 219 estate market booms, she will realize a gain. However, if the real estate market declines,
 220 she will realize a loss. Figure R-3 below provides an illustration of this:

¹⁹ Brealey, Myers, and Allen, *Principles of Corporate Finance*, 10th Ed. (2011), p. 429, Figure 17.2.

FIGURE R-3: RETURN ON AN ALL EQUITY INVESTMENT

222 Compare this to the situation illustrated in Figure R-4 below, where the investor

223 finances the same real estate purchase using 50% cash from her savings (equity) and

224 finances 50% using funds from a mortgage (debt). In this case, the variability in the

225 investor’s expected equity return is two-times greater than in Figure R-3. The entire

226 fluctuation of 10% from rising or falling real estate prices falls on the investor’s equity

227 investment, which is smaller (\$50,000) for the leveraged investment depicted in Figure

228 R-4 as compared to the all-equity \$100,000 investment shown in Figure R-3. The equity

229 return for the leveraged investment goes up or down by 20% in the leverage scenario

230 even though the actual change in the value of the real estate (+/- 10%) is the same as

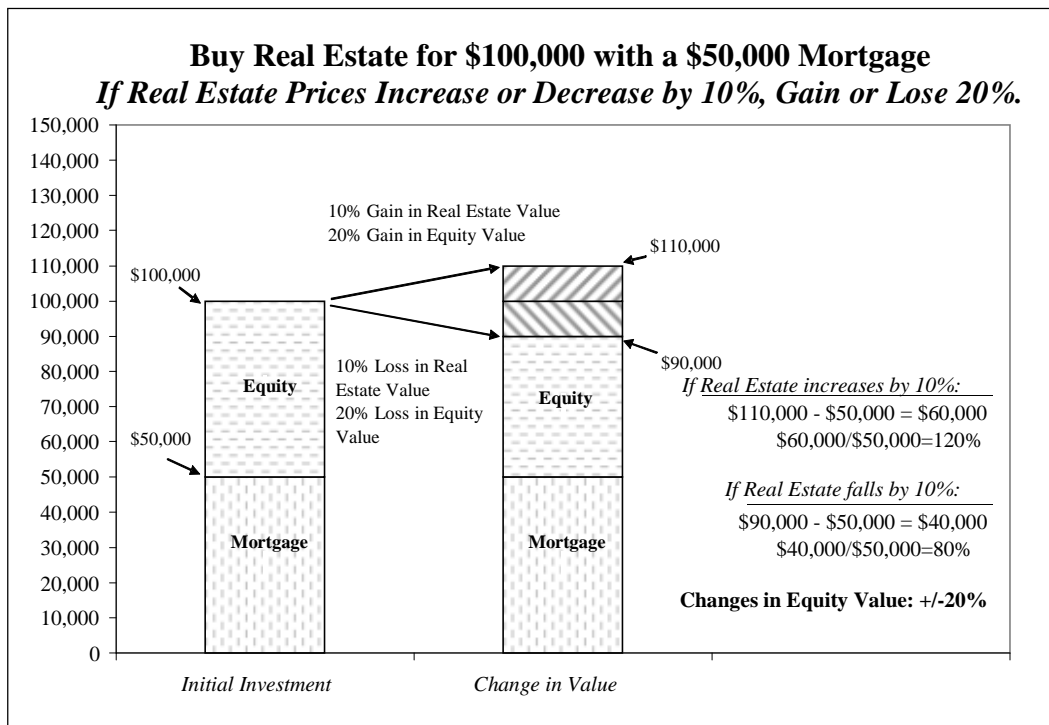
231 depicted in Figure R-3 for the all-equity investment. The lesson from this example is

232 obvious: debt adds risk because, while there is more potential gain on the equity

233 investment by using debt, there is a higher potential loss on that equity investment that

234 goes with it. This concept is colloquially referred to as “high risk, high reward.”

FIGURE R-4: RETURN ON A LEVERAGED EQUITY INVESTMENT



236 **Q. Do finance textbooks also address the question of how financial leverage affects the**
 237 **cost of equity?**

238 **A.** Yes. Standard textbooks on corporate finance provide examples, like the one I presented
 239 above, to illustrate how the introduction of debt financing amplifies the variability of
 240 equity returns and thus increasing the risk to equity holders which causes them to demand
 241 higher expected returns. For example, Professors Brealey, Myers, and Allen write:

Our example shows how borrowing creates financial leverage or gearing.
 Financial leverage does not affect the risk or the expected return on the firm’s
 assets, but it does push up the risk of the common stock. Shareholders
 demand a correspondingly higher return because of this *financial risk*.²⁰

246 Similarly, Professors Berk and DeMarzo summarize the effect of leverage on the
 247 cost of capital as follows.

²⁰ Brealey, Myers and Allen (2017), *Principles of Corporate Finance, 12th Edition*, p. 446 (emphasis in original).

248 ...[L]everage increases the risk of equity even when there is no risk that the
249 firm will default. Thus, while debt may be cheaper when considered on its
250 own, it raises the cost of capital for equity. Considering both sources of
251 capital together, the firm's average cost of capital with leverage is ... the
252 same as for the unlevered firm.²¹

253 These statements by preeminent finance scholars in widely-used Corporate
254 Finance textbooks highlight two important points that can also be intuitively observed
255 based on the real estate investment example:

- 256 • The variability of returns on the asset itself (e.g., the piece of real estate) is
257 unchanged by the introduction of financial leverage, therefore “leverage does not
258 affect the risk or the expected return on the firm's assets.” Rather, it is the risk
259 and required returns of the equity and debt financing instruments that are changed
260 by the degree of financial leverage.
- 261 • The mechanism by which leverage adds variability to returns is independent of
262 any effect of increased leverage on the risk that the firm will be unable to fulfill
263 its fixed financial obligations, and thus (as Berk and DeMarzo put it) “leverage
264 increases the risk of equity even when there is no risk that the firm will default.”

265 **Q. Do financial economist recognize the calculation of after-tax weighted-average cost**
266 **of capital based on market values?**

267 A. Yes. Looking to the most widely-used MBA textbook by Professor Brealey, Myers, and
268 Allen, they explain that:

269 The formula for the after-tax weighted average cost of capital is²²:

²¹ Berk and DeMarzo (2014), *Corporate Finance, 3rd Ed.*, p. 482 (emphasis in original).

²² This specification ignores preferred shares, but such financing could easily be added.

270
$$WACC = r_D(1 - TC) \left(\frac{D}{V} \right) + r_E \left(\frac{E}{V} \right)$$

271 where r_D and r_E are the expected rate of return demanded by investors in the
272 firm's debt and equity securities, D and E are the current market values of
273 debt and equity and V is the total market value of the firm ($V = D + E$).²³

274 Professors Brealey, Myers, and Allen then show that the after-tax weighted
275 average cost of capital is flat over a broad range of capital structures and calculates the
276 cost of equity using the same formula as I do.²⁴

277 **Q. Do financial economists recognize the Hamada technique?**

278 A. Yes. The Technical Appendix (Appendix B) to my direct testimony provides a detailed
279 description of the standard textbook formulas used to implement the Hamada technique
280 for unlevering measured equity betas based on the proxy companies' capital structure to
281 calculate "asset betas" that measure the proxy companies' business risk independent of
282 the financial risk imposed by differing capital structures. I also note that standard MBA
283 textbooks,²⁵ practitioner texts,²⁶ as well as the CFA curriculum²⁷ all describe the Hamada
284 approach and use formula like those relied upon in my direct testimony. Thus, the
285 Hamada method is simply a well-established methodology taught in business schools as
286 well as to CFA applicants.

²³ Brealey, Myers and Allen (2014), p. 492.

²⁴ *Id.*

²⁵ Brealey, Myers and Allen (2014), pp. 492-493, Berk and DeMarzo (2014) pp. 415-417, Ross, Westerfield and Jaffe (2013), pp. 571-573.

²⁶ Roger A. Morin, "New Regulatory Finance," Public Utilities Reports, Inc., 2006, pp. 221-225; Leonardo R. Giacchino and Jonathan A. Lesser, "Principles of Utility Corporate Finance," Public Utilities Report, Inc., 2011, pp. 229-232.

²⁷ See, for example, 2016 CFA Level I Volume 4: Corporate Finance and Portfolio Management, Chapter 4.

287 **Q. What are the implications of these fundamental financial principles for Mr.**
288 **Walters' ROE results?**

289 A. Failing to recognize the impact of financial leverage on the cost of equity results in a non-
290 trivial downward bias in the cost of equity estimates. This can readily be estimated by
291 looking to the differences in sample betas obtained at an assumed capital structure for the
292 proxy group utilizing the same beta at their recommended equity ratio. First I calculate
293 the asset (or zero-debt financing) beta using the betas provided by Mr. Walters along with
294 an assumed market value capital structure for the proxy group. Next, I calculate the re-
295 levered beta that is consistent with an equity ratio of 54.537%. By failing to account for
296 these fundamental financial principles, it is evident that the estimates provided by Mr.
297 Walters are downwardly biased by at least 54 basis points.

298 This approach is exactly as described in standard textbooks such as Brealey,
299 Myers and Allen (2014), Berk and DeMarzo (2014), and Ross, Westerfield and Jaffe
300 (2013) and the CFA curriculum, of which Mr. Walters is a charterholder.²⁸

301 **Q. What do you conclude from the discussions above?**

302 A. I conclude that both Ms. Phipps' and Mr. Walters' ROE estimates are downwardly biased
303 because they fail to account for the impact of financial leverage on the cost of equity,
304 using standard financial techniques.

²⁸ Brealey, Myers and Allen (2014), pp. 492-493, Berk and DeMarzo (2014) pp. 415-417, Ross, Westerfield and Jaffe (2013), pp. 571-573. 2016 CFA Level I Volume 4: Corporate Finance and Portfolio Management, Chapter 4. In all cases, they apply the Hamada method to the market value capital structure.

305 **C. REGULATORY DECISIONS**

306 **Q. Is it correct that adjusting for financial leverage has no regulatory precedent?**

307 A. No. Multiple regulatory agencies in the U.S. and most outside of North America have
308 adopted a similar approach. In the U.S., the Federal Communications Commission
309 (“FCC”), the Surface Transportation Board (“STB”) and the FERC have accepted the use
310 of weighted-average cost of capital methodologies to determine the cost of capital.
311 Specifically, the FCC in a 2016 order acknowledged that it is reasonable (1) to use
312 market values to estimate the capital structure and (2) derive an implied return on equity
313 from the estimated weighted average cost of capital.²⁹ Thus, the FCC acknowledged that
314 market value capital structures are the relevant measure of leverage and impact the ROE
315 using an approach similar to what I used. The FERC, in Cost of New Entry (“CONE”)
316 studies for the PJM,³⁰ has used the weighted average cost of capital and the Surface
317 Transportation Board calculates the weighted average cost of capital to assess the revenue
318 adequacy for freight railroads.³¹ Finally, the Alabama Public Service Commission has
319 found the method “compelling”:

320 [t]he Commission recognizes that the [after tax weighted average cost of
321 capital] analysis is not a prevalent methodology in the United States;

²⁹ Federal Communications Commission, “Report and Order, Order and Order on Reconsideration, and Further Notice of Proposed Rulemaking,” FCC 16-33, issued March 30, 2016 ¶270 and ¶ 322.

³⁰ Federal Energy Regulatory Commission, “Order Conditionally Accepting Tariff Revisions Subject to Compliance Filing,” Docket ER14-2940-000, November 28, 2014, ¶59. See also, Federal Energy Regulatory Commission, “Order Accepting Proposed Tariff Revisions,” Docket ER19-105-001 and ER19-105-002, April 15, 2019.

³¹ See, for example, Surface Transportation Board, “Docket No. EP 558 (Sub-No. 22), dated August 5, 2019, p. 15.

322 however, the focus of that methodology on the relationship between the
323 market value and the associated financial risk of the utility is compelling.³²

324 Considering next the Hamada approach, I note that the California Public Utilities
325 Commission in the past has relied on results from the method,³³ the Oregon Public
326 Service Commission staff commonly relies on a version of the Hamada method to assess
327 the impact of leverage on the cost of equity,³⁴ and the Florida Public Service Commission
328 uses an equivalent methodology to determine the ROE for small water utilities.³⁵

329 Looking outside the U.S., Mexico's Comisión Reguladora de Energía³⁶ relies on
330 the Hamada method, while regulators in the U.K., the Netherlands, Australia, and New
331 Zealand rely on a mixture of an after-tax weighted average cost of capital and the
332 Hamada method.³⁷

333 **Q. Are the methods unorthodox in utility regulation?**

334 A. No. While not all methods I rely upon are widely used by regulatory commissions,
335 several regulatory entities have found the methods used in financial economics to
336 consider leverage useful. Several of the adoptions are relatively new in that the FERC
337 (for CONE studies) and the FCC only adopted the leverage adjustment within the last
338 five years. Thus, these jurisdictions have moved towards accepting the importance of

³² Report and Order, In re: Public Proceedings established to consider any necessary modifications to the Rate Stabilization and Equalization mechanism applicable to the electric service of Alabama Power Company, Dockets 18117 and 18416, August 21, 2013, p. 20.

³³ The California Public Utilities Commission ("CPUC") relied on Hamada unlevered / relevered data in D.12-12-034 at 38. Here the CPUC pointed to Southern California Edison's CAPM results and ROE range of 9.73 percent to 11.71 percent, which was derived using the Hamada method.

³⁴ Opening Testimony of Matt Muldoon in Docket No. UE 319, Staff Exhibit 500, p. 15.

³⁵ Florida PUC for water and wastewater utilities (Order No. PSC-12-0339-PAA-WS); "Florida 2012 Order", p. 4.

³⁶ CRE, "Directiva sobre la determinación de tarifas y el traslado de precios para las actividades reguladas en materia de gas natural DIR-GAS-001-2207."

³⁷ Villadsen, Bente et. al, "Risk and Return for Regulated Industries," Academic Press, 2017, Chapter 9 and references herein.

339 leverage. The methods are also standard curriculum in finance textbooks and commonly
340 used by practitioners who provide cost of capital measures.³⁸

341 **III. MS. PHIPPS' AND MR. WALTERS' APPROACH TO COST OF EQUITY**

342 **A. OVERALL APPROACH**

343 **Q. How do Ms. Phipps and Mr. Walters approach estimating the cost of equity for**
344 **Nicor Gas?**

345 A. Ms. Phipps and Mr. Walters each select a proxy group of natural gas utilities, similar to
346 the proxy sample of natural gas utilities that I consider in my sample. Neither of the
347 other witnesses considered other highly regulated utilities in their proxy groups, such as
348 water utilities.³⁹ After selecting their proxy companies, each witness employed versions
349 of the CAPM and DCF models to estimate a return on equity for Nicor Gas. Mr. Walters
350 also employed a Risk Premium model. As discussed in detail in Section II, neither Ms.
351 Phipps or Mr. Walters used standard financial techniques to calculate the impacts of
352 financial leverage in their analyses.

³⁸ For an example of a commercial data provider's application, see Duff & Phelps, "2019 Valuation Handbook – U.S. Guide to Cost of Capital," Chapter 1 pp. 1-21 For examples of tax authorities applications, see, for example, Utah Rule R884-24P-62 "Valuation of State Assessed Unitary Properties Pursuant to Utah Code Ann. Section 59-2-201", which states "The discount rate (k) shall be based upon a weighted average cost of capital (WACC) considering current market debt rates and equity yields." (<https://rules.utah.gov/publicat/code/r884/r884-24p.htm#T32>).

I understand it is common for taxes based on net present values to use a market value based after-tax weighted-average cost of capital as the discount rate.

³⁹ See Section IV for why water utilities are an appropriate proxy sample when estimating the cost of equity for natural gas utilities, like Nicor Gas.

353 **B. SAMPLE SELECTION**

354 **Q. How does Ms. Phipps and Mr. Walters proxy groups compare to your proxy**
355 **groups?**

356 A. Ms. Phipps' proxy sample is smaller – comprised of seven natural gas utilities –
357 compared to my proxy group (15 regulated utility companies) because she does not
358 consider other regulated utilities, such as water utilities. Ms. Phipps' natural gas utility
359 sample is very similar to my natural gas utility sample, except Ms. Phipps disregards
360 Chesapeake Utilities and NiSource Inc.⁴⁰

361 Mr. Walter's proxy group is also much smaller than my proxy group because his
362 proxy group does not include other highly regulated utility companies – Mr. Walters only
363 considers a proxy group of natural gas utilities. However, Mr. Walters' uses a natural gas
364 utility proxy sample very similar to my natural gas proxy sample, except that he does not
365 include Chesapeake Utilities because it currently does not have a credit rating from a
366 major rating agency.⁴¹ I note that Mr. Walters does include Nisource Inc. in his proxy
367 sample.

368 **Q. Do you agree with Ms. Phipps and Mr. Walters that Chesapeake Utilities should be**
369 **excluded from the natural gas proxy sample?**

370 A. No. Ms. Phipps and Mr. Walters argue that Chesapeake Utilities should not be included
371 in my proxy group because it does not have a credit rating from a major rating agency.⁴²
372 Ms. Phipps also states that it is not evident that Chesapeake “is similar to Nicor Gas in

⁴⁰ Phipps Corrected Testimony, p. 3.

⁴¹ Walters Testimony p. 25.

⁴² Phipps Corrected Testimony, p. 33; Walters Testimony p. 25.

373 terms of risk”⁴³ As discussed in my response to Staff Data Request RMP 1.06, attached
374 hereto as Nicor Gas Ex. 30.1 Confidential, Chesapeake Utilities’ solvency metrics are
375 approximately average compared to its peer group according to S&P Capital IQ and its
376 book equity capital structure is similar to that of the natural gas utility sample.⁴⁴
377 Chesapeake Utilities is a natural gas utility, just like Nicor Gas, and faces similar
378 operational and financial risks. I continue to find that Chesapeake Utilities’ credit
379 metrics merit that it should be included in a proxy sample of highly regulated natural gas
380 utilities.

381 **C. COST OF EQUITY ESTIMATION METHODS**

382 **1. CAPM**

383 **Q. How does Ms. Phipps implement the CAPM?**

384 A. Ms. Phipps uses a risk-free rate based on current 30-year government bond yields of
385 2.27% (as of April 21, 2021).⁴⁵ For the market equity risk premium (MRP), she
386 conducted a DCF analysis using the market value of firms in the S&P 500 using data
387 from Zacks, Nasdaq.com, and Dividend.com.⁴⁶ This resulted in an MRP of 12.35%. Ms.
388 Phipps estimates betas for her gas sample by taking an average of weekly adjusted betas
389 Value Line, monthly adjusted betas from Zacks, and monthly adjusted betas from her
390 own regression analysis. This results in an average beta for the gas sample of 0.76.⁴⁷
391 Ms. Phipps uses the sample companies’ equity beta directly to assess Nicor’s CAPM-

⁴³ Phipps Corrected Testimony, p. 33.

⁴⁴ Nicor Gas Ex. 30.1 Confidential.

⁴⁵ Phipps Corrected Testimony, p. 16.

⁴⁶ Ibid., p. 17.

⁴⁷ Ibid., p. 17-22. Ms. Phipps averages the monthly and weekly betas to determine an average beta for her sample.

392 based cost of equity. She does not use the ECAPM methodology to correct the
393 differences between the theoretically estimated CAPM results and the empirically
394 observed CAPM results.⁴⁸

395 **Q. Do you agree with Ms. Phipps implementation of the CAPM?**

396 A. Not entirely. My primary concern with Ms. Phipps CAPM methodology is that she does
397 not apply standard financial techniques to adjust for financial leverage. As discussed in
398 Section II above, the failure to consider financial leverage results in an inaccurate cost of
399 equity results and downwardly biases her estimates. I also have concerns with Ms.
400 Phipps use of spot government bond yields as of April 21, 2021. As discussed in Section
401 VI below, current government bond yields are near historic lows and are currently
402 downward biased due to quantitative easing and emergency liquidity measures by the
403 U.S. Federal Reserve to support the financial markets.⁴⁹ These programs put downward
404 pressure on long-term government bond yields resulting in a downwardly biased cost of
405 equity estimate for Nicor Gas. I find it more appropriate to use forecasted government
406 bond yields that are expected to prevail during the relevant rate period. This is
407 particularly important as measures of inflation have increased substantially recently. If
408 these trends persist, the yields on U.S. Government bond yields will also increase from
409 recent historic spot yields. I note that Mr. Walters also uses forecasted government bond
410 yields in his CAPM analysis.⁵⁰

⁴⁸ See Section V for further discussion on the ECAPM methodology.

⁴⁹ U.S. Federal Reserve, “Federal Reserve Announces Extensive New Measures to Support the Economy,” Press Release, March 23, 2020; See also Section III of my Direct Testimony.

⁵⁰ Walters Testimony p. 48.

411 Ms. Phipps uses monthly betas in her analysis, which have become much less
412 common. Standard sources such as Bloomberg, Value Line, and Duff & Phelps all rely
413 on weekly betas.

414 **Q. How does Mr. Walters implement the CAPM?**

415 A. Mr. Walters uses a forecasted risk-free rate based on 30-year treasury bonds from *Blue*
416 *Chip Financial Forecasts*.⁵¹ Mr. Walters uses three measurements of beta for his gas
417 utility sample. Two estimates are derived from five-year weekly adjusted betas from
418 Value Line – one using the current beta estimates and the second using a historical
419 average since 2014, and the second is derived from five-year weekly adjusted beta
420 estimates from S&P Market Intelligence.⁵² Mr. Walters uses four estimates of the MRP
421 in his CAPM analysis. The first is a risk-premium-based approach which subtracts
422 expected inflation from the historic average real returns of the market, which results in an
423 MRP of 9.0%.⁵³ He also uses two versions of the DCF model – a constant growth
424 approach and a version of FERC’s two-step DCF methodology. These result in an MRP
425 of 13.7% and 12.39%, respectively.⁵⁴ Lastly, he uses a forward looking MRP of 5.5%
426 from Duff & Phelps.⁵⁵ Mr. Walters then uses his three beta estimates and four MRPs to
427 derive 12 separate CAPM results.⁵⁶ Mr. Walters does not apply standard financial
428 techniques to account for financial leverage nor does he use the ECAPM methodology.

⁵¹ Ibid.

⁵² Ibid., p. 49.

⁵³ Ibid., p. 50.

⁵⁴ Ibid., p. 51-52.

⁵⁵ Ibid., p. 56.

⁵⁶ Ibid., p. 57.

429 **Q. Do you agree with Mr. Walters' implementation of the CAPM?**

430 A. No. Mr. Walters uses three estimates for the average beta of his gas sample. Mr. Walters
431 first estimate is similar to the one used in my CAPM analysis and is based on the current
432 adjusted five-year weekly betas reported by Value Line. However, Mr. Walters' also
433 considered a seven-year average of Value Line betas but provides no basis as to why he
434 chose this time frame to construct his average. Each Value Line beta estimate is derived
435 using five-years of historic data, therefore this average reflects market conditions going
436 back to 2011. This places disproportionate weight on historic financial and economic
437 conditions that do not reflect current market conditions or those that are expected to
438 prevail the relevant rate period. There are several concerns with this approach. First,
439 standard textbooks recommend using a beta estimated over a 2-5 year period, so not only
440 is the 7-year beta out of date, but is also inconsistent with current recommendations in
441 texts such as Brealey, Allen, & Myers and the CFA curriculum.⁵⁷ Mr. Walters' third beta
442 estimates are from S&P Market Intelligence's Beta Generator. Similar to Value Line, Mr.
443 Walters' S&P betas use five years of weekly data. Unlike Value Line, the S&P beta are
444 measured against the S&P 500 and adjusted using the Vasicek method. The Vasicek
445 method weights the raw beta and what is believed to be the true beta according to the
446 relative reliability (e.g., standard error) of the estimates.⁵⁸ While the goal of the Vasicek
447 method is similar to Value Line's Blume adjustment, it requires an estimate of the "true"
448 beta. Herein lies the problem – it is not known what the "true" beta is. Value Line's
449 Blume adjustment in turn takes into account the empirical fact that estimated betas are

⁵⁷ See, for example, Brealey, Myers and Allen 10th Edition (2014), CFA Program Curriculum, 2017, Level II, Volume 4, p. 71.

⁵⁸ O.A. Vasicek, "A Note on Using Cross-Sectional Information in Bayesian Estimation of Security Betas," *Journal of Finance* 28, 1973, pp. 1233-1239.

450 biased and corrects for that bias (up or down) based on Blume’s empirical observations.
451 In short, without a study of the “true” beta, I find the Vasicek adjustment inappropriate
452 and not commonly used in U.S. regulation. For that reason, I prefer to use the commonly
453 relied upon Value Line betas.

454 Mr. Walters also does not use standard financial techniques to adjust for financial
455 leverage. As discussed **Error! Reference source not found.** above, failure to consider
456 financial risk downwardly biases Mr. Walters’ estimates by at least 54 basis points.

457 Mr. Walters’ recommended CAPM result is 9.8%. As discussed earlier, he does
458 not provide an explanation as to how he derives his estimates. When deriving the point
459 estimate from his DCF Model, Mr. Walters relied on the midpoint and median of his
460 model results. Applying the same logic to his CAPM results, the median and midpoint of
461 his CAPM results are 10.08% and 10.25% respectively – both above his recommended
462 CAPM result of 9.8%.

463 2. DCF

464 **Q. How does Ms. Phipps implement the DCF?**

465 A. Ms. Phipps use a single-stage (constant growth) and multi-stage (non-constant growth)
466 DCF Model. Both models rely on quarterly dividend yields, similar to my single-stage
467 and multi-stage DCF Models. Ms. Phipps relies on growth rates provided by Zacks and
468 S&P Market Intelligence.⁵⁹ To estimate the perpetual growth rate in the multi-stage
469 DCF, she uses the forecasted long-term GDP growth rate from EIA and the forecasted
470 long-term inflation rate derived from U.S. Treasury Bonds.⁶⁰ She measures the stock

⁵⁹ Phipps Corrected Testimony, p. 5

⁶⁰ Ibid, pp. 6-8.

471 price of her proxy sample at market close on April 21, 2021.⁶¹ Finally, Ms. Phipps notes
472 that she does not rely on the results of her non-constant growth DCF (NCDCF) model to
473 determine an appropriate ROE for Nicor Gas.⁶²

474 **Q. Do you agree with Ms. Phipps' implementation of the DCF Models?**

475 A. Not entirely. Ms. Phipps utilizes growth rates sourced from Zacks and S&P Market
476 Intelligence. I prefer to use consensus forecasts from IBES to avoid overlap in equity
477 analysts' opinions and ensure up-to-date estimates (on occasion Zacks forecasts are
478 dated). Zacks and S&P Market Intelligence relies on averages of estimates provided by
479 equity analysts to publish a "consensus" forecast. Since some equity analysts may
480 provide their estimates to multiple financial data providers, averaging across multiple
481 consensus based services will overly weight the estimates of certain analysts. This will
482 bias Ms. Phipps' growth estimates to the degree that these equity analysts' estimates are
483 higher or lower than the consensus average.

484 I also have concerns with Ms. Phipps using stock prices as of market close on a
485 single day. Given the on-going uncertainty in the market, using a short duration
486 average—for example, 15 days as I did in my DCF methodology—is a more conservative
487 approach and reduce measurement error due to any single-day event in the market.⁶³

488 As with the CAPM approach, Ms. Phipps does not make any standard adjustments
489 for financial leverage amongst her sample companies. Lastly, I agree with Ms. Phipps
490 for not relying on the results from the NCDCF model. As discussed in my Direct
491 Testimony, the DCF model require forecasted growth rates that are based on stable

⁶¹ Ibid. p. 9.

⁶² Ibid. p. 11.

⁶³ I note that Mr. Walters also uses a recent average to estimate dividend yields in his DCF analysis.

492 economic conditions to satisfy the constant dividend growth assumption. Dividend yields
493 may be faster at reflecting market uncertainty than growth rate estimates from equity
494 analysts. Therefore, the single-stage growth estimate should be given more weight at the
495 current time.

496 **Q. How does Mr. Walters implement the DCF?**

497 A. Mr. Walters also use a single-stage (constant growth) and multi-stage DCF Model. Both
498 of his models rely on quarterly dividend yields, similar to my single-stage and multi-stage
499 DCF Models. Mr. Walters calculates an average growth rate using data from Zacks, S&P
500 Market Intelligence, and Yahoo! Finance.⁶⁴ Mr. Walters relies on the *Blue Chip*
501 *Economic Indicators* long term nominal GDP forecast of 4.10% for his perpetual growth
502 rate, which is the same estimate I use in my multi-stage DCF analysis. Finally, he uses
503 the average weekly high and low stock prices of his proxy companies in the 13-week
504 period ending March 26, 2021.⁶⁵

505 **Q. Do you agree with Mr. Walters' implementation of the DCF?**

506 A. No. Similar to Ms. Phipps, Mr. Walters relies on growth rates sourced from Zacks, S&P
507 Market Intelligence, and Yahoo! Finance. Therefore, his DCF result suffers from the
508 same biases as Ms. Phipps in that his average growth rates overweight estimates from
509 certain analysts and some forecasts may be dated. Mr. Walters also introduces
510 unnecessary volatility into his average stock price by taking the high and low price over a
511 13-week period. Market volatility (as measured by VIX) has spiked several times during
512 this time period, notably at the end of January when VIX reached 37.21 (see Figure R-9).

⁶⁴ Walters Testimony, p. 29.

⁶⁵ Ibid. p. 39.

513 Using a closing stock price over a shorter-time period would accomplish the same goal
514 but introduce significantly less noise into Mr. Walters’ average stock prices. Similar to
515 his CAPM Model, he does not make any standard adjustments for financial leverage.

516 Lastly, Mr. Walters is also at odds with Ms. Phipps and myself in that he includes
517 the results from multi-stage DCF Model when deriving his point estimates. The results
518 from Mr. Walters multi-stage DCF Model are unreasonably low (8.43% and 8.32%) –
519 approximately 100 basis points below the recently allowed authorized ROE shown in
520 Table 1 of Mr. Walters’ testimony and well below the lower bound recommended by Ms.
521 Phipps and myself.⁶⁶ Had Mr. Walters relied on his constant growth model only, as do
522 Ms. Phipps and I, his DCF estimate would be 9.57% to 9.66%.

523 3. RISK PREMIUM

524 **Q. How does Mr. Walters implement his Risk Premium Model?**

525 A. Mr. Walters calculates two risk premium estimates. The first is based on the difference
526 between authorized ROEs of natural gas utilities and U.S. treasury bonds, using data
527 since January 1986. In the second approach, the difference is based on the authorized
528 ROE and current “A” rated utility bond yields from Moody’s.⁶⁷ Mr. Walters examines
529 several time periods (5-year and 10-year rolling averages) from 1986 through 2020 to
530 account for changing market conditions.⁶⁸ Ultimately, he recommends an ROE based on
531 the most recent five-year average risk premium relative to utility bonds and US
532 treasuries.⁶⁹

⁶⁶ Walters Testimony, p. 5.

⁶⁷ Ibid., p. 41.

⁶⁸ Id.

⁶⁹ Ibid., p. 45.

533 **Q. Do you agree with Mr. Walters' implementation of the Risk Premium Model?**

534 A. No. Mr. Walters relies on historic utility bond performance to inform his point
535 recommendation. The historic utility bond data include utilities other than natural gas
536 utilities, which makes the results of his Risk Premium model not comparable to the
537 results of his CAPM or DCF Models – at least not without putting the results in the
538 proper context of the underlying sample.⁷⁰

539 **Q. With reasonable modifications to Mr. Walters' implementation, what are his**
540 **results?**

541 A. As noted above, the average, median, midpoint for his CAPM range from 9.9% to
542 10.25%, while his constant growth DCF range from approximately 9.6% to 9.7%. Thus,
543 his results are very much in line with those of Ms. Phipps once outliers are ignored. For
544 example, looking to the midpoint of the two ranges above, the range becomes 9.65% to
545 10.1%.

546 **Q. Lastly, please address the issue of flotation costs for Nicor Gas.**

547 A. Ms. Phipps refer to the Commission's past rejection of "generalized flotation cost
548 adjustments" as a reason to reject the 10 bps I calculated.⁷¹ As noted in my Direct
549 Testimony

550 I generally recommend that flotation costs be treated similar to any other
551 cost of running the business and therefore recovered in rates over an
552 appropriate period of time, so that Nicor Gas be allowed to recover
553 flotation costs similar to how it recovers the cost of issuing debt.⁷²

⁷⁰ IIEC CUB Exhibit 2.8-2.12 and Figure 1.xlsx

⁷¹ Phipps Corrected Testimony, p. 54.

⁷² Villadsen Direct Testimony, p. 67-68.

554 I maintain that position. It is important for the utility to recover costs associated
555 with the recovery of equity and as noted in my direct the specific calculation I presented
556 was one potential method.

557 **IV. WATER UTILITIES IN PROXY GROUPS**

558 **Q. Did Ms. Phipps or Mr. Walters consider companies other than natural gas utilities**
559 **in their proxy sample?**

560 A. No. Ms. Phipps and Mr. Walters only considered natural gas utilities in their proxy
561 sample.⁷³

562 **Q. What criticisms did Ms. Phipps and Mr. Walters raise regarding including water**
563 **utilities in your proxy group?**

564 A. Ms. Phipps asserts that water utilities do not face comparable risk to that of Nicor Gas.
565 Ms. Phipps points to water utility's higher common equity ratios, higher credit ratings,
566 and lower betas as evidence of lower risks.⁷⁴ Mr. Walters asserts that only companies
567 within the same industry as Nicor Gas are suitable proxy companies, that water utilities
568 are exposed to different risks, and are thinly traded with less analyst coverage relative to
569 gas utilities.⁷⁵

570 **Q. How do you respond to these criticisms regarding the inclusion of water utilities in**
571 **your proxy group?**

572 A. As discussed extensively in my Direct Testimony, I developed my proxy groups using
573 companies that share similar business risk profiles. Namely, I start with proxy companies

⁷³ Phipps Corrected Testimony, p. 2-3; Walters Testimony, p. 25.

⁷⁴ Phipps Corrected Testimony p. 34.

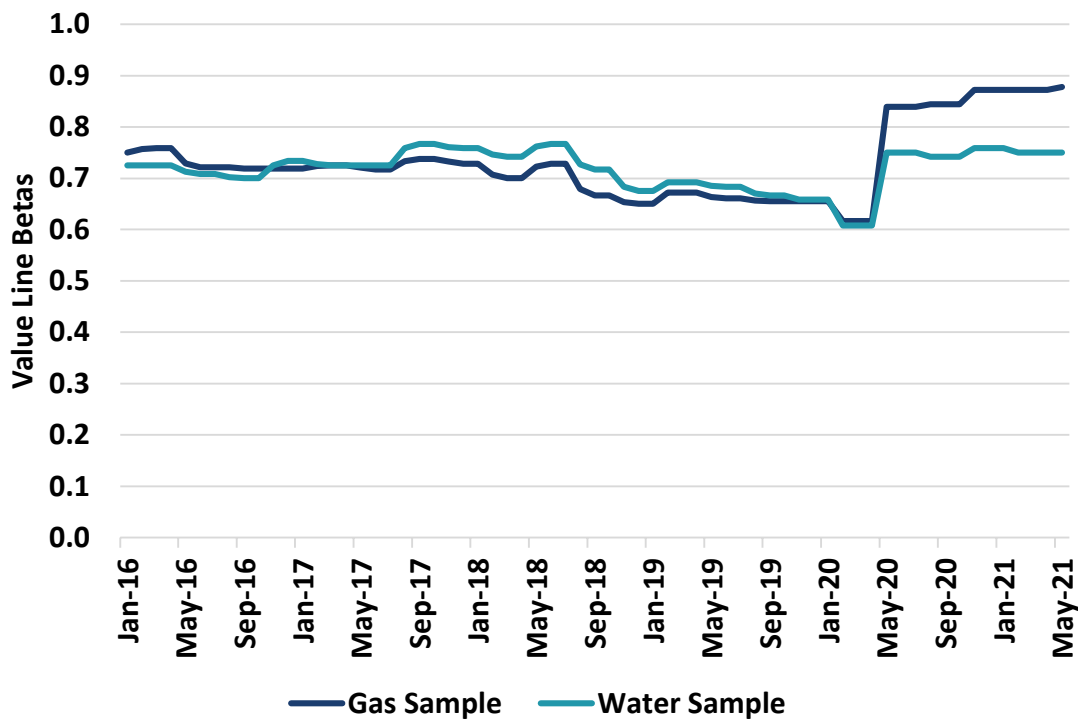
⁷⁵ Walters Testimony, p. 71.

574 that operate in regulated industries or have similar lines of business or business
575 environments as Nicor Gas. Water utilities are appropriate proxy companies as they are
576 highly regulated and provide commodity services to end-users. Comparing the
577 operations of gas utilities and water utilities, both serve customers through a network of
578 pipes; both are highly regulated (in most states by the same Commission); both water
579 utilities and gas utilities are currently undertaking substantial investment in pipe
580 replacement programs; and water utilities generally have had stable credit ratings similar
581 to those of gas utilities. I continue to find that water utilities provide a relevant proxy for
582 the risk profile of natural gas utilities, including Nicor Gas.

583 Ms. Phipps does not dispute that the regulated business operations of gas and
584 water utilities are similar. Instead, Ms. Phipps points to three financial metrics to assert
585 that water utilities are of lower risk. First, Ms. Phipps incorrectly concludes that water
586 utilities are of lower risk because they have lower betas than gas utilities. However,
587 historically water utilities have betas that are in line with or even *higher* than natural gas
588 utilities as shown below in Figure R-5. Only since the uncertainties in the financial
589 markets due to COVID-19 pandemic began have betas for gas utilities been consistently
590 higher than betas for water utilities. Additionally, the risk of the underlying assets are
591 better measured by asset betas than by equity betas and those are quite comparable with
592 differences of only 0.01 to 0.03 as shown in Ex. 14.3, page 31.

593
594

FIGURE R-5: HISTORICAL GAS AND WATER UTILITY BETAS FROM VALUE LINE



Source: Value Line, accessed May 20, 2021.

595 Ms. Phipps asserts that water utilities are less risky because they have a higher
596 common equity ratio. I note that here, Ms. Phipps agrees with the argument that the
597 amount of financial leverage (that is, the amount of debt and equity in the capital
598 structure) impacts the risk of a company and is relevant when determining the cost of
599 equity and the asset beta. The differences in common equity ratios (i.e. capital structure),
600 can be adjusted for using standard financial techniques such as the after-tax weighted
601 average cost of capital (ATWACC) or Hamada adjustment taught in MBA textbooks, the
602 CFA curriculum, and used in other regulatory settings (See Section II above). Finally,
603 Ms. Phipps' assertion that the difference in average credit rating between my natural gas

604 and water utility proxy samples is small (A versus A-, respectively)⁷⁶ and therefore not a
605 strong argument for disregarding the sample.

606 Mr. Walters provides no basis for his claim that water utilities are thinly traded
607 stocks. First, the real issue with thin trading is whether the stock price does not reflect an
608 efficient market, so that estimates of, for example, beta are biased. Second, the
609 measurement of efficiency is murky, but courts have looked to, for example, the five
610 *Cammer* factors: (i) average weekly trading volume, (ii) the number of analysts'
611 following the stock, (iii) the presence of market makers or arbitrageurs, (iv) the
612 company's eligibility to file a Form S-3 Registration Statement, and (v) a cause-and-
613 effect relationship, over time, between unexpected corporate events or financial releases
614 and an immediate response in stock price.⁷⁷ Looking at the readily quantifiable
615 measures: (i), (ii) and (iv), I find that all companies (natural gas and water) are trading
616 multiple times on a daily basis and all but York Water exceeds 50,000 trades,⁷⁸ that water
617 and gas utilities have a similar number of analysts following them and all in either group
618 are eligible to file the S-3 registration form. Thus, based on the readily measurable
619 *Cammer* factors neither the natural gas nor the water utilities exhibit evidence of trading
620 in an inefficient market. As shown in the Figure R-6 below, the average daily volume of
621 stock trades for the gas and water utility samples are above 10,000 except for York

⁷⁶ Villadsen Direct Testimony Figure 11 and Figure 12.

⁷⁷ NERA, "Do Courts Count *Cammer* Factors?" August 7, 2012.

⁷⁸ Finance literature considers stocks to be liquid when investors can readily buy or sell shares. The lowest trading volume (for York Water) is about 5,000 shares a day and the average for the water companies is over 50,000 shares a day – comparable to that of ONE Gas and Spire and well above that of Northwest Natural. Thus, there is no reason to consider the water utilities low trading stock.

622 Water, the average number of analysts is similar, and all have the eligibility to file the S-3
 623 registration form.⁷⁹

624 **FIGURE R-6: MEASURABLE CAMMER FACTORS**

Company	Proxy Group	Average Weekly Trading Volume	S-3 Registration
[1]	[2]	[3]	[4]
Atmos Energy	Gas	759,099	Yes
Chesapeake Utilities	Gas	58,811	Yes
New Jersey Resources	Gas	393,265	Yes
NiSource Inc.	Gas	3,372,537	Yes
Northwest Natural	Gas	150,211	Yes
ONE Gas Inc.	Gas	281,471	Yes
South Jersey Inds.	Gas	1,208,160	Yes
Southwest Gas	Gas	391,434	Yes
Spire Inc.	Gas	264,745	Yes
Amer. States Water	Water	190,742	Yes
Amer. Water Works	Water	980,926	Yes
California Water	Water	200,161	Yes
Middlesex Water	Water	61,331	Yes
SJW Group	Water	73,596	Yes
York Water Co. (The)	Water	25,687	Yes

Sources and notes:

[1]: Bloomberg accessed on 5/19/2021, data as of 5/15/2021.

[2]: SEC EDGAR, accessed 5/19/2021

625 **V. RESPONSE TO CRITIQUES OF ECAPM**

626 **Q. What critiques do Ms. Phipps and Mr. Walters make regarding your use of the**
 627 **ECAPM methodology?**

628 A. Ms. Phipps and Mr. Walters argue that using adjusted betas in the ECAPM methodology
 629 is not appropriate and renders the results from my ECAPM analysis “meaningless.”⁸⁰ Ms.
 630 Phipps incorrectly interprets the results of Litzenberger, et al. and argues that adjusted

⁷⁹ See also Villadsen Exhibit 14.3, BV-5. I note that York Water, Middlesex Water, and Chesapeake Utilities do not have growth estimates from Thomas Reuters IBES but do have growth estimates from Value Line.

⁸⁰ Phipps Corrected Testimony, pp. 52-53; Walters Testimony, p. 74.

631 betas fully address the discrepancy between the theoretically predicted and empirically
632 observed relationship between risk and return; therefore, including adjusting betas in the
633 ECAPM is redundant and upwardly biases the cost of equity estimates. Mr. Walters also
634 argues that the use of adjusted betas in ECAPM is inconsistent with the academic
635 literature and not been accepted by the Commission previously.⁸¹

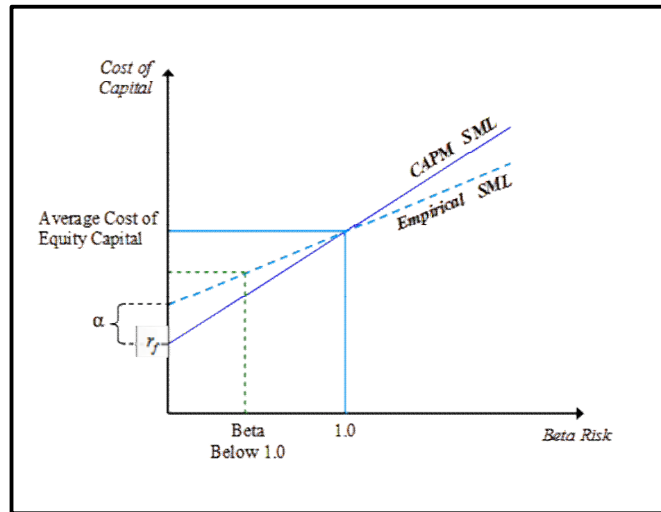
636 **Q. How do you respond to the argument that the simultaneous use of the ECAPM and**
637 **adjusted beta leads to biased results?**

638 A. I disagree. Ms. Phipps and Mr. Walters are concerned that I use ECAPM in combination
639 with Value Line betas, which are adjusted using the Blume Adjustment. They believe the
640 adjustment is inappropriate. However, the Blume Adjustment and the ECAPM are two
641 fundamentally different and complementary adjustments and both are well supported by
642 the academic literature. The reason for these necessary adjustments can be shown by
643 reference to Figure R-7 below, which illustrates the empirical security market line
644 (“SML”). The adjustment to beta corrects the estimate of the relative risk of the
645 company, which is measured along the horizontal axis of the SML. The ECAPM adjusts
646 the risk-return tradeoff (i.e., the slope) in the SML, which is on the vertical axis. In other
647 words, the expected return (measured on the vertical axis) for a given level of risk
648 (measured on the horizontal axis) is different from the predictions of the theoretical
649 CAPM. Getting the relative risk of the investment correct does not adjust for the slope of
650 the SML, nor does adjusting the slope correct for errors in the estimation of **relative risk**.

⁸¹ Walters Testimony, p. 75.

651

FIGURE R-7: THE EMPIRICAL SECURITY MARKET LINE



652

Importantly, the Blume adjustment has the effect of moving the beta along the x-

653

axis whereas the ECAPM is using the y-axis. The Value Line relied upon method to

654

make betas more precise was developed by Professor Blume.⁸² As shown in Professor

655

Blume's paper, it is possible to apply a consistent adjustment procedure to historical betas

656

that increased the accuracy in *forecasting* realized betas. Essentially, Professor Blume's

657

adjustment transforms a historical beta into a better estimate of expected future beta. It is

658

this expected "true" beta that drives investors' expected returns according to the CAPM

659

The backward-looking empirical tests of the CAPM that gave rise to the ECAPM

660

did not suffer from bias in the measurement of betas as do a forward-looking use.

661

Researchers plotted realized stock portfolio returns against betas measured *over the same*

662

time period to produce plots such as Figure R-8 below, which comes from the 2004 paper

663

by Professors Eugene Fama and Kenneth French.⁸³ The fact that betas and returns were

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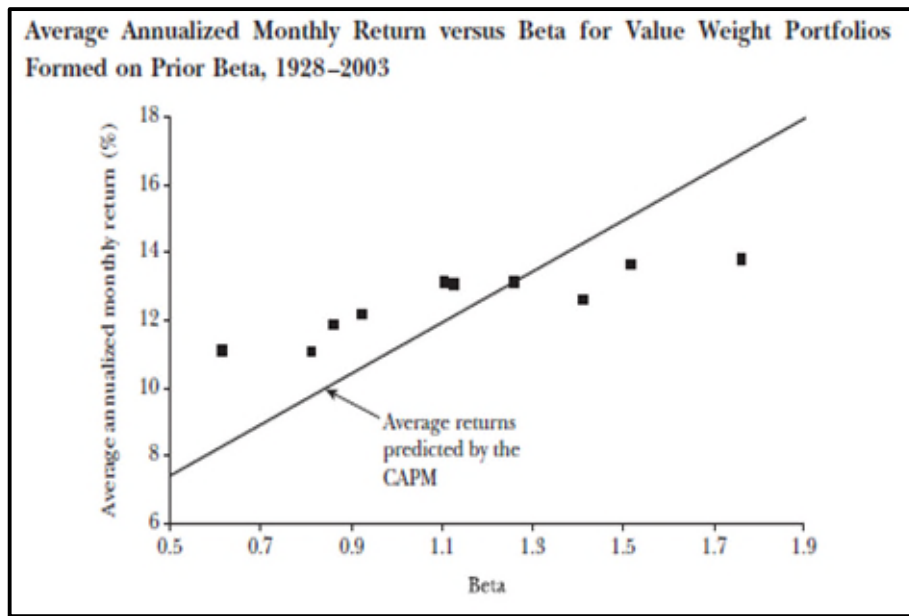
measured contemporaneously means that the betas used in the tests were *already the best*

⁸² Blume, Marshall E. (1971), "On the Assessment of Risk," *The Journal of Finance*, 26, p. 1-10.

⁸³ Fama, Eugene F. & French, Kenneth R. (2004), "The Capital Asset Pricing Model: Theory and Evidence," *Journal of Economic Perspectives*, 18(3), p. 25-46.

665 possible measure of the “true” systematic risk over the relevant time period. In other
666 words, no adjustments were needed for these betas. Despite this, researchers observed
667 that the risk-return trade-off predicted by the CAPM was too steep to accurately explain
668 the realized returns. As explained above the ECAPM explicitly corrects for this empirical
669 observation.

670 **FIGURE R-8: EVIDENCE FROM EMPIRICAL TEST OF CAPM⁸⁴**



671 **Q. Did the empirical tests that gave rise to the ECAPM use raw betas in their analyses?**
672 **A.** They did. However, this is simply because the researchers were able to measure raw
673 betas and realized returns from the same historical period. In other words, no adjustment
674 to the raw beta was necessary to evaluate the market return realized for the same
675 historical period – that is different from using betas to determine the cost of equity for
676 future periods. Hence, the raw betas they measured accurately captured the systematic
677 risk that impacted the returns they measured. In a sense, the measured betas and realized

⁸⁴ Ibid., p. 33

678 returns were already contemporaneous in the tests of the CAPM that identified the effect
679 shown in Figure R-7 and Figure R-8 above.

680 This is explicit in the article by Litzenberger et al.,⁸⁵ who explain (on page 376)
681 that the estimate of “alpha” they obtain when using historical (i.e., “raw”) betas is a linear
682 combination of the alpha that would be obtained with a perfect estimate of “true” beta
683 and the weighting factor employed in the Blume “global adjustment” procedure, which
684 they describe with the equation $\beta_i = \omega\beta_{i(historical)} + (1 - \omega)$. Using the equations that
685 the authors present along with their results presented in the “Raw Betas” panel of Table 1
686 (on page 380 of the paper), it is possible to derive the estimate of alpha implied for use of
687 Blume adjusted beta with $\omega = 0.67$:

$$688 \quad a = a' - b' \left(\frac{1 - \omega}{\omega} \right) = 0.326 - 0.330 \left(\frac{0.33}{0.67} \right) = 0.163$$

689 In other words, the results of Litzenberger et. al.’s study is consistent with an
690 ECAPM alpha factor of approximately 2.0% when applying Blume-adjusted betas.⁸⁶ In
691 that light my use of an alpha factor of 1.5% is conservative.

692 **Q. How do you respond that the Commission has not previously accepted the use of**
693 **adjusted betas in the ECAPM?**

694 A. First, I believe that the Commission should be presented with the best possible analysis
695 regardless even if the Commission has not previously accepted the simultaneous use of
696 adjusted betas and ECAPM. Second, there certainly are regulatory commissions that

⁸⁵ Robert Litzenberger, Krishna Ramaswamy and Howard Sosin, “On the CAPM Approach to the Estimation of a Public Utility’s Cost of Equity Capital,” *Journal of Finance*, vol 35, 1979.

⁸⁶ Since Litzenberger, et. al. used monthly return data, their monthly alpha estimate of 0.163% corresponds to $(1.00163)^{12}-1=1.97\%$ when annualized.

697 have adopted the ECAPM methodology. Examples include the Mississippi Public Service
698 Commission⁸⁷ and the New York State Public Service Commission.⁸⁸ Also, the Alabama
699 Public Service Commission recognized the methodology.⁸⁹ Importantly, all of these
700 regulators rely on the ECAPM in conjunction with adjusted betas and the California
701 Public Utilities Commission did not distinguish between CAPM and ECAPM when
702 reporting results.⁹⁰ This list is not exhaustive as many commissions review the evidence
703 before them, based on which they decide on an allowed return without explicitly
704 accepting or rejecting any specific methodology.

705 **Q. What do you conclude regarding the ECAPM?**

706 A. For the reasons discussed above, the ECAPM has merit and there is no double-counting
707 in using adjusted betas in the ECAPM. Not only is the ECAPM of merit, but failing to
708 consider the results will downward bias the results by approximately half a percent.

709 **Q. Do you have any other comments on the submissions of Staff or IIEC-CUB?**

710 A. Yes. Neither party include flotation costs. However, it is important the Nicor Gas be
711 allowed to recover costs associated with raising capital. Consequently, I continue to find
712 it appropriate to include flotation costs.

713 **Q. Does the fact that you have not addressed all criticisms of your testimony mean that
714 you agree with those criticisms?**

715 A. No.

⁸⁷ Mississippi Power, PEP-5A, p. 24.

⁸⁸ NY PSC Case 19-E-0065, Staff Finance Panel Testimony, May 2019, p. 141.

⁸⁹ Alabama Public Service Commission, "Report and Order in Dockets 18117 and 18416," August 21, 2013, p. 13.

⁹⁰ California Public Utilities Commission, "Decision 19-12-056," December 19, 2019.

716 **VI. CAPITAL MARKETS UPDATE**

717 **Q. What has changed since you filed your Direct Testimony?**

718 A. Since filing my Direct Testimony, long standing economic uncertainties weighted on
719 capital markets have subsided somewhat. Mr. Walters acknowledge the impact of
720 COVID-19 on utilities and their customers⁹¹ but does not discuss the impact on financial
721 markets in detail. It is, however, a key factor for the current level of government
722 intervention in the economy and therefore a major determinant for the level of the risk-
723 free rate, market volatility, and economic performance in general.

724 Vaccines are now being widely distributed across the U.S. and portions of the
725 economy are beginning to fully reopen as social distancing measures are relaxed.⁹²
726 According to the U.S. Bureau of Economic Analysis, real GDP grew by 6.4% in the first
727 quarter of 2021.⁹³

728 Since January 2021, several government assistance programs were passed, which
729 intended to stimulate the U.S. economy. In early March, the Government passed a \$1.9
730 trillion American Rescue Plan which provided direct economic impact payments and
731 extended unemployment benefits.⁹⁴ Other programs, such as the Paycheck Protection
732 Program continued to disburse aid to businesses. This infusion of cash into the economy
733 has created concerns about inflation. The Consumer Price Index, a common measure of

⁹¹ Walters Testimony, p. 20.

⁹² I note that there are still concerns more globally about vaccine distribution and the spread of novel variants of the COVID-19 virus.

⁹³ U.S. Bureau of Economic Analysis, "Gross Domestic Product, First Quarter 2021," April 29, 2021, accessed May 24, 2021, <https://www.bea.gov/news/blog/2021-04-29/gross-domestic-product-first-quarter-2021>

⁹⁴ Alan Fram, "Congress Oks \$1.9T virus relief bill in win for Biden, Dems," *Associated Press*, March 11, 2021, accessed May 24, 2021, <https://apnews.com/article/joe-biden-bills-legislation-coronavirus-pandemic-7eb383e58c8fcf50f6f586b6d5cfc523>

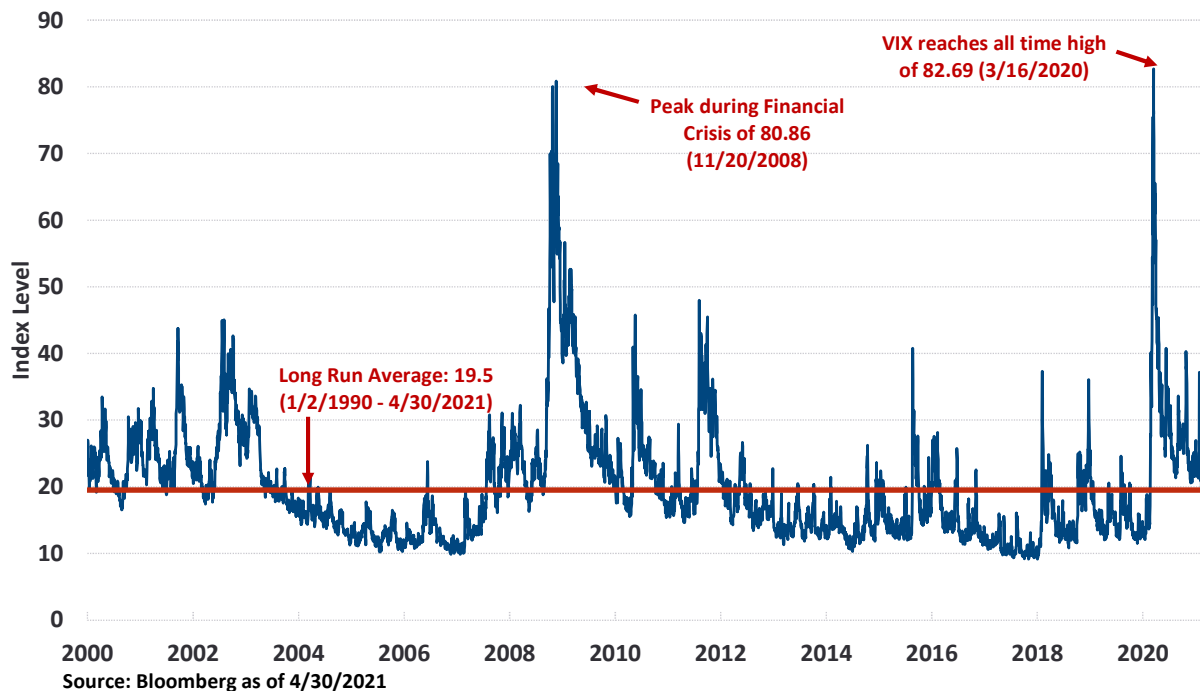
734 inflation, increased by 4.2% from April 2020 to April 2021 – the largest 12-month
735 increase since September 2008.⁹⁵ Rising inflation is introducing new uncertainties to the
736 financial markets and increasing the return required by investors to hold risky assets.
737 Specifically, because the allowed ROE is a nominal return, an increase in inflation would
738 result in the value of any allowed ROE being reduced. Thus, with the risk of inflation
739 increasing, there is an increased risk that the allowed ROE will be downward biased
740 within a relatively short time; e.g., a year.

741 **Q. How have recent global events impacted capital markets and the economy?**

742 A. Over the past several months, vaccines have become widely accessible throughout the
743 U.S., which has allowed portions of the economy to fully re-open. At the same time,
744 concerns about global vaccine distribution, novel COVID-19 variants, and inflation are
745 presenting new financial and economic uncertainties. As a result, the premium that
746 investors require to hold risky assets remain elevated, especially when measured on
747 forward-looking methodologies that estimate expected market returns. The VIX, which
748 measures near-term volatility in the market, reached an all-time high of 82.69 in March
749 2020 at the height of the pandemic. However, the VIX has recently retreated to its long-
750 term average or slightly below--between 16.25 and 37.21--with the highest level seen on
751 January 27, 2021.⁹⁶

⁹⁵ U.S. Bureau of Labor Statistics, “Consumer Price Index up 4.2% from April 2020 to April 2021,” May 19, 2021, accessed May 24, 2021, <https://www.bls.gov/opub/ted/2021/consumer-price-index-up-4-2-percent-from-april-2020-to-april-2021.htm>.

⁹⁶ Bloomberg accessed May 24, 2021 and Cboe VIX, accessed May 24, 2021, https://www.cboe.com/tradable_products/vix/vix_historical_data/

FIGURE R-9: VIX

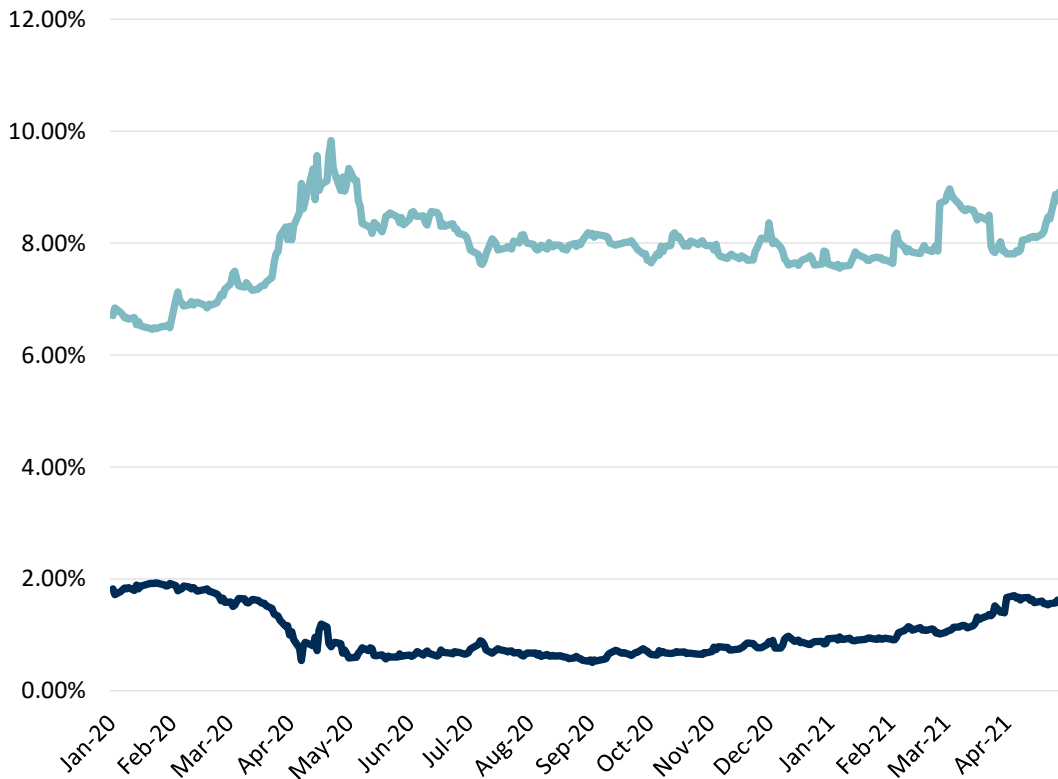
753

754 Other measures of investor risk, such as Bloomberg’s forward looking market risk
 755 premium remain elevated relative to pre-pandemic levels. Bloomberg’s estimate of the
 756 market equity risk premium for the U.S. increased to 8.95% as of the end of April, which
 757 is the highest level since March 2020. At the time of my Direct Testimony, Bloomberg’s
 758 MRP was 7.85%.⁹⁷ Bloomberg’s MRP estimate remains elevated relative to pre-
 759 pandemic levels, even as 10-Year U.S. Treasury yields increase (see Figure R-10 below).
 760 The lingering uncertainty in the market is further evidenced by the market equity risk
 761 premium measured using FERC’s methodology, which has increased to 11.17% as of
 762 April 30, 2021.

⁹⁷ Bloomberg MRP estimates are measured relative to a 10-Year U.S. Treasury bond yield.

763
764

FIGURE R-10: BLOOMBERG’S DAILY MARKET EQUITY RISK PREMIUM AND RISK FREE RATE



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766

Source: Bloomberg accessed May 24, 2021, data through April 30, 2021.

767

Yields on U.S. Government remain near historic lows despite improvements since

768

the historic low levels in 2020. (see Figure R-12 below). Yields on 10-year U.S.

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Treasury bonds are currently at 1.63%.⁹⁸ At the time of my Direct Testimony, yields were

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on 10-year U.S. Treasury Bonds were at 0.95%.⁹⁹ Accommodative Monetary Policy,

771

such as the Federal Reserve’s quantitative easing program, continues to put downward

772

pressure on interest rates to support the financial markets and stimulate the economy.¹⁰⁰

⁹⁸ U.S. Department of Treasury, Daily Treasury Yield Curve Rates, accessed May 24, 2021, data as of May 21, 2021. <https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yield>

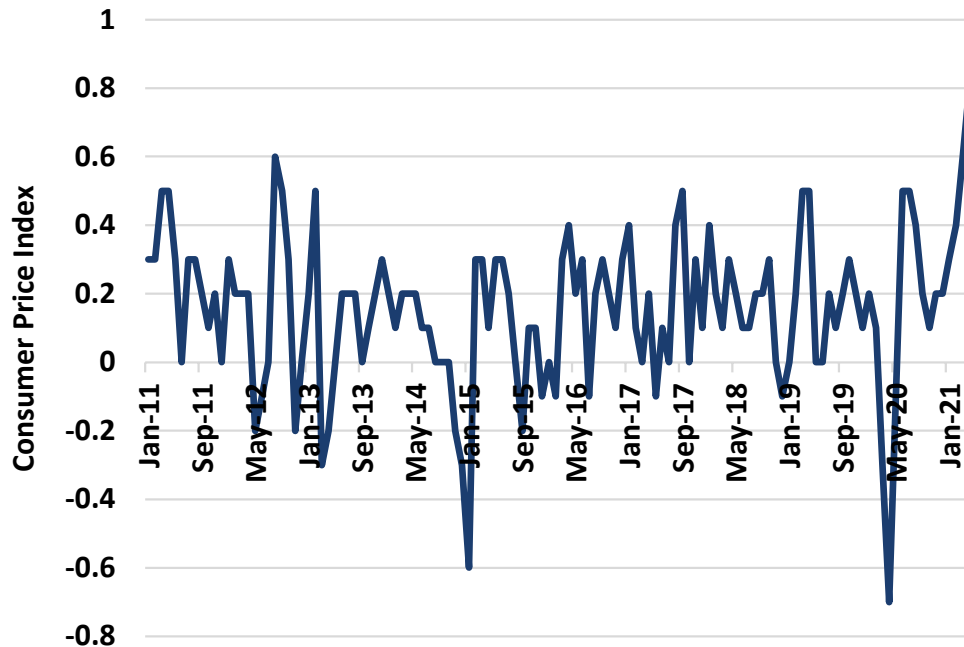
⁹⁹ Villadsen Direct Testimony

¹⁰⁰ U.S. Federal Reserve, “Federal Reserve Press Release,” April 28, 2021, <https://www.federalreserve.gov/monetarypolicy/files/monetary20210428a1.pdf>

773 In the past year, several measures have been passed to provide direct aid to
774 households and businesses across the U.S. This infusion of cash into the economy and the
775 initial re-opening of the economy has led to a substantial increase in inflation over a
776 relatively short period of time. Since the time of my Direct Testimony, the Consumer
777 Price Index (CPI) increased from 0.3(January 2021) to 0.8 (April 2021).¹⁰¹ As noted
778 previously, the CPI has increased 4.2% in the past 12 months – the largest 12 month
779 increase since 2008.¹⁰² As shown in Figure R-11 below, the CPI is currently higher than
780 at any time in the past 10 years. If rising inflation trends persist, utilities will face
781 increasing cost recovery risks to the extent that actual costs exceed those measured by a
782 utility during its test period.

¹⁰¹ U.S. Bureau of Labor Statistics, CPI for All Urban Consumers 1 Month Change, Series ID CUSR0000SA0, accessed May 24, 2021, https://data.bls.gov/timeseries/CUSR0000SA0&output_view=pct_1mth

¹⁰² U.S. Bureau of Labor Statistics, “Consumer Price Index up 4.2% from April 2020 to April 2021,” May 19, 2021, accessed May 24, 2021, <https://www.bls.gov/opub/ted/2021/consumer-price-index-up-4-2-percent-from-april-2020-to-april-2021.htm>.

FIGURE R-11: CONSUMER PRICE INDEX (ALL URBAN CONSUMERS)

784

785 **Q. What are the expectations going forward?**

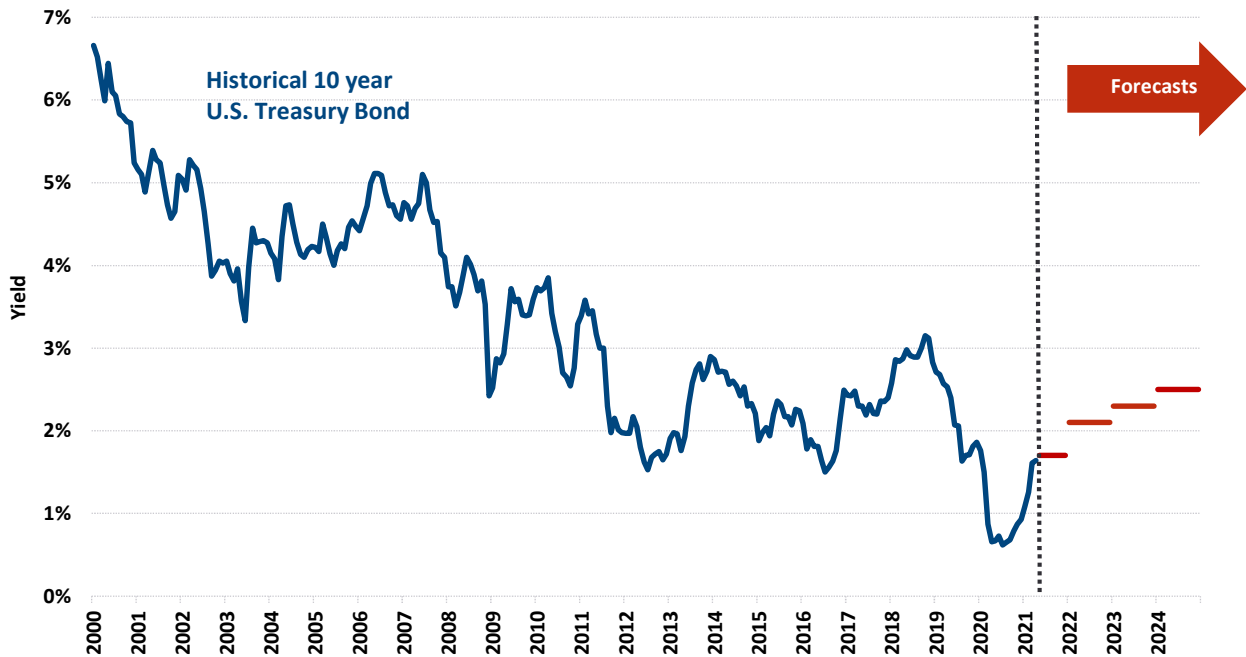
786 A. The impact on the economy and unemployment will depend on how long the economy
 787 remains partially shut down, but the economy is expected to continue to recover in mid-
 788 2021 based on recent forecasts. Recent surveys by economists, such as *Blue Chip*
 789 *Economic Indicators* (“BCEI”) survey, indicate that U.S. real GDP will increase by 6.6%
 790 in 2021 and 4.4% in 2022 for a nominal GDP growth of about 9% and 7%,
 791 respectively.¹⁰³ In August 2020, the Federal Reserve announced a policy change
 792 whereby they would target inflation of 2% on average, noting that the Federal Reserve
 793 would hold overnight borrowing interest rates lower for longer.¹⁰⁴ Recent projections

¹⁰³ Wolters Kluwer Blue Chip Economic Indicators, May 2021, p. 2-3

¹⁰⁴ U.S. Federal Reserve, “Federal Open Market Committee announces approval of updates to its Statement on Longer-Run Goals and Monetary Policy Strategy,” August 27, 2020, accessed March 2, 2021, <https://www.federalreserve.gov/newsevents/pressreleases/monetary20200827a.htm>.

794 from the FOMC clarified that policy rates will remain at current levels through at least
 795 2023¹⁰⁵ and will continue its quantitative easing programs until economic conditions
 796 improve.¹⁰⁶ This will likely continue to exert downward pressure on interest rates over
 797 the near to medium term. *Blue Chip Economic Indicators* forecasts 10-year U.S.
 798 Government bond yields to average 1.7% in 2021 and 2.1% in 2022 (see Figure R-12
 799 below).¹⁰⁷

800 **FIGURE R-12: HISTORICAL AND PROJECTED 10-YEAR TREASURY BOND YIELDS**



Source: Historic data from Bloomberg accessed May 24, 2021, data through April 30, 2021; Forecasts from Blue Chip Economic Indicators March 2021 and May 2021.

¹⁰⁵ U.S. Federal Reserve, “March 17, 2021: FOMC Projections materials, accessible version,” March 17, 2021, <https://www.federalreserve.gov/monetarypolicy/fomcprojt20210317.htm>.

¹⁰⁶ U.S. Federal Reserve, “Federal Reserve Press Release,” April 28, 2021, <https://www.federalreserve.gov/monetarypolicy/files/monetary20210428a1.pdf>

¹⁰⁷ Wolters Kluwer Blue Chip Economic Indicators, May 2021, p. 2-3

801 **Q. How does this affect the cost of equity estimation for Nicor Gas?**

802 A. As stated in my Direct Testimony, the cost of equity and capital structure set forth in this
803 proceeding are expected to be in effect beyond the current extraordinary impacts of the
804 COVID-19 pandemic. Consequently, the analysis and recommendations should reflect
805 expected market conditions that will prevail over the relevant rate period and not
806 exclusively current market conditions. As discussed above, many of the inputs to the cost
807 of equity estimation methodologies currently remain at unprecedented levels. Relying
808 only on current economic and financial conditions to estimate Nicor Gas' cost of equity
809 would unfairly lock Nicor Gas and their customers into the current economic and
810 financial environment and would not provide a fair return. The current financial and
811 economic conditions continue to create an exorbitant amount of uncertainty about the
812 future.

813 **VII. CONCLUSION**

814 **Q. Does this conclude your rebuttal testimony?**

815 A. Yes.