BEFORE THE
MICHIGAN PUBLIC SERVICE COMMISSION

DTE GAS COMPANY	)	**CASE NO. U-20940**
	)	
	)	
	)	

REBUTTAL TESTIMONY
OF
DR. BENTE VILLADSEN

LIST OF TOPICS ADDRESSED:
COST OF COMMON EQUITY CAPITAL

June 23, 2021

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REBUTTAL TESTIMONY OF DR. BENTE VILLADSEN

1   **I.   INTRODUCTION AND SUMMARY**

2   **Q1.   Please state your name, occupation and business address.**

3   A1.   My name is Bente Villadsen and I am a Principal of The Brattle Group, whose business

4   address is One Beacon Street Suite 2600, Boston, MA 02108.

5   **Q2.   Are you the same Bente Villadsen who filed Direct Testimony in this matter?**

6   A2.   Yes.

7   **Q3.   Please provide a glossary of acronyms used in your testimony.**

8   A3.   I frequently use the following acronyms in my testimony:

9   • ATWACC – After tax weighted average cost of capital
10   • CAPM – Capital Asset Pricing Model
11   • DCF – Discounted Cash Flow Model
12   • ECAPM – Empirical Capital Asset Pricing Model
13   • FERC – Federal Energy Regulatory Commission
14   • MISO – Midcontinent Independent System Operator
15   • MRP – Market equity risk premium
16   • NETO – New England Transmission Operators
17   • ROE – Return on equity
18   • SML – Securities Market Line

1   **Q4.   What is the purpose of your rebuttal testimony?**

2   A4.   I have been asked to review and comment on the testimony of Mr. Joseph Ufolla ("Ufolla

3   Testimony") filed on behalf of the Michigan Public Service Commission Staff ("MPSC

4   Staff"), the testimony of Mr. Sebastian Coppola ("Coppola Testimony") filed on behalf of

5   the Michigan Attorney General ("AG"), and the testimony of Ms. Billie S. LaConte

6   ("LaConte Testimony") filed on behalf of the Association of Businesses Advocating Tariff

7   Equity ("ABATE").

8   **Q5.   Is there anything in Messrs. Ufolla, Coppola, or Ms. LaConte's Testimonies that**

9   **caused you to change your recommendation regarding DTE Gas's cost of capital?**

10   A5.   No. Having reviewed Messrs. Ufolla, Coppola, and Ms. LaConte's Testimonies as well as

11   considering the recent changes in economic conditions, I continue to find that my original

12   recommendations for a return on equity ("ROE") of 10.25 percent at a 51.9 percent equity

13   capital structure remains reasonable.

14   **Q6.   Please summarize your testimony.**

15   A6.   Having reviewed the testimonies of Messrs. Ufolla, Coppola, and Ms. LaConte, I

16   summarize my findings as follows:

17   A. The ROEs recommended by Ms. LaConte are far too low and well below that of recently

18   authorized ROEs for other gas utilities. Mr. Uffola's and Mr. Coppola's recommended

19   ROE is also too low and below recently allowed ROEs for gas LDCs.

20   B. There are several reasons why the ROEs recommended by the interveners are

21   unreasonably downward biased:

22   1. Their recommendations fail to take the interaction of financial leverage and ROE into

23   account. Both approaches that I use to consider financial risk—the overall cost of

24   capital and the Hamada method—are standard methodologies taught in finance

25   textbooks and considered in several jurisdictions.

1   2. The interveners fail to consider relevant information about other highly regulated utility

2   companies, such as water utilities that would provide reasonable comparisons in a

3   proxy sample. Investors can and do compare returns across highly regulated utilities

4   and it is difficult to imagine DTE Gas' investors would require a return that is

5   substantially lower than that of highly regulated water utilities with a similar business

6   risk profile.

7   3. The recommendations of Messrs. Ufolla, Coppola, and Ms. LaConte do not reflect DTE

8   Gas' higher level of risk.

9   4. Ms. LaConte selectively picks and chooses which of my inputs she relies upon.

10   Specifically, she relies on the outdated forecast from Blue Chip's October issue, but

11   fails to take the then elevated yield spread into account.

12   5. Mr. Coppola similarly chooses an outdated and downward biased risk-free rate that

13   creates an unreasonably downward bias in his CAPM results.

14   6. All witnesses fail to recognize that the realized risk premium (or the allowed risk

15   premium) and the bond yield are correlated and that the relationship may change over

16   time, so that simple averages fail to capture the currently required ROE.

17 C. I disagree with certain approaches taken by Messrs. Ufolla, Coppola, and Ms. LaConte in

18   implementing their cost of capital models, which downwardly bias their ROE results.

19 D. Finally, I disagree with the suggestion from Mr. Ufolla and Mr. Coppola that DTE Gas'

20   equity percentage is above that of other Gas LDCs. The average allowed equity

21   percentage is in line with DTE Gas' requested equity percentage.

22   In the remainder of this rebuttal testimony, I first discuss the reasonableness of the

23   interveners' recommendations. Second, I comment on Messrs. Ufolla, Coppola, and Ms.

24   LaConte's cost of equity estimation approach. Third, I address the criticism of my

25   estimation approach.

1   **A. SUMMARY OF RECOMMENDATIONS**

2   **Q7.   Please summarize the recommendations.**

3   A7.   Figure R-1 below summarizes Messrs. Ufolla, Coppola, and Ms. LaConte
4   recommendations for the allowed ROE.

Figure R-1: Summary of Recommendations for DTE Gas

	Recommended ROE	Low Range	High Range	Recommended Equity %
Villadsen	10.25%	9.0%	10.25%	51.9%
Ufolla	9.5%	8.9%	9.9%	51%
Coppola	9.5%	8.55%	9.4%	50%
LaConte	9.0%	8.9%	12.2%	n/a

5   Sources: Ufolla Testimony, pp. 11, 6; Coppola Testimony, p. 11; LaConte Testimony, p. 15.

6   I note that Mr. Coppola and I agree to place DTE Gas towards the upper end of the range,
7   while Mr. Ufolla uses a point near the middle of his range. However, Ms. Laconte's
8   recommendation is close to her lower bound. For example, the midpoint of her range is
9   10.5% - - above DTE Gas' requested ROE.

10   **B. THE MPSC STAFF, AG, AND ABATE RECOMMENDATIONS ARE TOO LOW**

11   **Q8.   What is your reaction to Messrs. Ufolla and Coppola, and Ms. LaConte's**
12   **recommended ROEs and capital structures?**

13   A8.   They are simply too low. The 10.25 percent is modestly above that currently allowed DTE
14   Gas and given the economic turmoil during the past year very reasonable. While Ms.
15   LaConte calculates the "Impact of Reducing ROE to National Average Authorized ROE,"
16   she relies on an outdated measure of the average authorized ROE[1]. Specifically, Ms.
17   LaConte uses data for 2020 and ignores the 2021 year-to-date authorized ROEs, which are

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[1]   LaConte Testimony, Exhibit AB-3.

1   higher.[2] Of note, DTE Gas' requested 51.9% equity is in line with the authorized equity

2   percentage granted other gas LDC in 2021.

3   **Q9.   Do you have other reasons that the recommendations are too low?**

4   A9.   Yes. Ms. LaConte states that "All other things being equal, a declining risk-free cost of

5   capital should translate into a correspondingly lower authorized ROE."[3] The problem is

6   that "all other things" are not equal.   Since the DTE Gas' last rate case, we have

7   experienced a pandemic, which has resulted in substantial changes in financial markets and

8   for utilities such as DTE Gas. Notably, utilities systematic risk has increased, and gas

9   utilities have experienced an economic recovery that differs substantially from that of the

10   broader market. As shown in the chart below, the systematic risk of gas utilities has

11   increased substantially since DTE Gas' last rate case. The chart below shows the betas

12   Value Line estimated for gas LDC from 2013 through today.

Figure R- 2
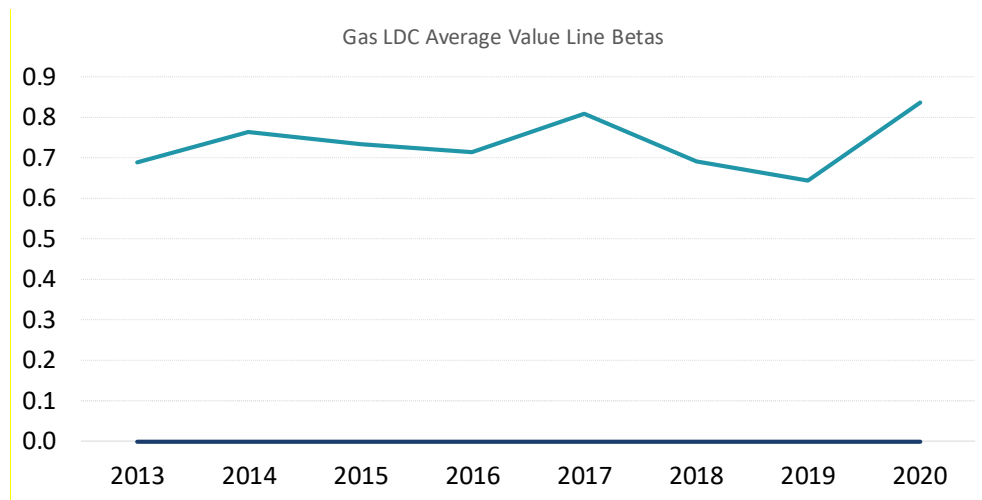
13

14

15   Additionally, I note that the current forecasted market risk premium ("MRP"), i.e., the

16   premium equity requires over and above the risk-free rate, per Bloomberg is about 8%,

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2   S&P Global Intelligence, Rate Case History as of June 14, 2021.

3   LaConte Testimony, p. 8.

1   when adjusted downward to be comparable to a 20-year government bond yield.[4] The

2   development in betas and the forecasted MRP clearly demonstrate that all things are not

3   equal (to pre-pandemic) conditions in financial markets. As I noted in my direct testimony,

4   the government bond yields fell dramatically during the early part of the pandemic,[5] but

5   have since recovered some and are now higher than at the time of the filing of U-20940.[6]

6   As Mr. Ufolla, Mr. Coppola, and Ms. LaConte all recommend a ROE that (1) is below the

7   average allowed gas LDCs in recent months on an equity percentage comparable to that

8   requested by DTE Gas, (2) fail to account for DTE Gas' higher than average risk, and (3)

9   is derived using inputs or methods that downward bias the estimated ROE, I find their

10   recommendations too low. Simply put, I find it is not an appropriate time to reduce DTE

11   Gas' allowed ROE **and** significantly change its equity percentage.

12   **II.   FINANCIAL LEVERAGE MATTERS**

13   **A. PRELIMINARIES**

14   **Q10.   What do you cover in this section of your rebuttal testimony?**

15   A10.   I respond to the critiques and misunderstandings of my direct testimony regarding financial

16   leverage. Specifically, I address the concerns of Messrs. Ufolla, Coppola, and Ms. LaConte

17   regarding the use of the overall cost of capital and the Hamada adjustment to account for

18   financial leverage. I also present the regulatory precedent for taking financial leverage into

19   account. Finally, I assess the impacts on Messrs. Ufolla, Coppola, and Ms. LaConte failure

20   to consider the impact of their capital structure recommendations on the required ROE.

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[4]   Bloomberg assessed as of May 1, 2021 shows a forecasted MRP of 8.52% over the 10-year government
      bond yield for the last two weeks of April, 2021. I adjusted this figure downward by 50 bps to take into
      account the maturity premium of the 20-year government bond yield over the 10-year government bond
      yield. Source: Villadsen Direct, footnote 51.

[5]   Villadsen Direct, p. BV-24.

[6]   For example, I cited the January 26, 2021 yield on 10-year government bonds as 1.05% on p. BV-24 of my
      direct testimony. As of June 11, 2021, the 10-year government bond yield is 1.47% per the Federal Reserve
      FRED; 10-Year Treasury Constant Maturity Rate | FRED | St. Louis Fed (stlouisfed.org))

1   **Q11. Please summarize Messrs. Ufolla, Coppola, and Ms. LaConte testimonies regarding**

2   **financial risk.**

3   A11. Collectively, Messrs. Ufolla, Coppola, and Ms. LaConte take issue with my use of the

4   after-tax weighted average cost of capital ("ATWACC") adjustment[7] and Mr. Coppola and

5   Ms. LaConte also take issue with my use of the textbook Hamada methodology.[8] Specific

6   critiques of the financial risk adjustment fall into the following categories:

7   1. *Regulatory precedent:* Mr. Coppola, and Ms. LaConte argue that the financial risk

8   adjustments lacks regulatory precedent in the U.S.[9] Ms. LaConte incorrectly states

9   that the financial risk adjustment has been rejected by the Commission[10] – the

10   Commission was discussing the ATWACC / ECAPM and not Hamada.[11]

11   2. *Market value vs. book value of capital structure:* Mr. Ufolla asserts that because

12   market weights for equity are typically higher than book value, the after-tax weighted

13   average cost of capital will always result in a higher cost of equity.[12]

14   3. *Overall cost of capital:* Mr. Ufolla incorrectly concludes that the after-tax weighted

15   average cost of capital methodology cannot be used to determine the cost of equity,

16   but instead is only suited for determining the overall cost of capital.[13]

17   4. *"Circular" rate making:* Mr. Coppola asserts without support that "[t]he subsequent

18   calculated ROEs in new rate cases under the after-tax weighted average cost of capital

19   method would then produce even higher awarded ROEs because the after-tax

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[7] Ufolla Testimony, pp. 16-17; Coppola Testimony, p. 78; LaConte Testimony, pp. 36-37.

[8] Coppola Testimony, p. 84; LaConte Testimony, p. 31. Mr. Ufolla does not critique the Hamada methodology.

[9] Coppola testimony, p. 80; LaConte Testimony, p. 37 re. ATWACC. Mr. Ufolla p. 16 notes that the ATWACC has not be been approved by the Commission, but does not discuss the precedence for the Hamada methodology.

[10] LaConte Testimony, p. 39, line 6.

[11] LaConte Testimony, p. 34, lines 10-12 provides a quote from the Notice of Proposal for Decision in U-18999, which makes this clear.

[12] Ufolla Testimony, p. 16-17

[13] Ufolla Testimony, p. 17.

1   weighted average cost of capital would use the higher stock market equity

2   capitalization."[14]

3   **Q12.   What is your reaction to the intervener's critique of your leverage considerations?**

4   A12.   My general reaction to the above critiques is that the interveners disregard basic tenets of

5   financial theory and finance practice by failing to consider the impact of leverage on the

6   cost of equity, thereby creating an unreasonable downward bias in the calculated cost of

7   equity. The specific criticisms the interveners have offered in this case have numerous

8   flaws.

9   First, for the purpose of determining the ROE for DTE Gas or any regulated company, the

10   relevant starting benchmark consists of market data such as the stock prices and estimated

11   market returns to investors in similarly risky companies—i.e. the proxy group. However,

12   the cost of equity that I estimate for the proxy group relies upon market returns (except for

13   the risk premium model) and hence the estimated market returns for any one company

14   cannot be meaningfully compared to those of other companies without accounting for

15   differences in financial risk. Financial risk is measured by financial leverage, which is

16   based on the same measure that was used in developing a cost of equity estimate (i.e.

17   market value). Thus, any cost of equity comparison between companies requires

18   normalizing for capital structure. These principles are not disputed by Messrs. Ufolla,

19   Coppola, and Ms. LaConte. However, what Messrs. Ufolla, Coppola, and Ms. LaConte fail

20   to explicitly account for is the lower financial risk inherent in the estimation of the return

21   on equity using market data than what is captured in DTE Gas' regulatory capital structure.

22   It also appears that Mr. Coppola fails to distinguish between the After-Tax Weighted-

23   Average Cost of Capital ("ATWACC") and the Hamada approach and Ms. LaConte goes

24   a step further and relies on Commission precedence regarding the ATWACC approach to

25   ignore the Hamada method.

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[14]   Coppola Testimony, p. 80.

1   Second, Mr. Coppola's assertion that accounting for financial leverage is "circular"[15] is

2   unsupported and defies financial logic (let alone the fact that adjusting for financial

3   leverage is routine in some regulatory jurisdictions). As discussed below, accounting for

4   financial leverage would not lead to an increase in allowed ROE in future rate cases beyond

5   a one-time adjustment for financial leverage, all else equal.

6   Third, there are numerous regulatory precedents for the application of financial leverage

7   adjustments and the use of the after-tax weighted average cost of capital to determine return

8   on equity, as discussed further below.

9   **Q13.   What exactly has the Commission said about financial leverage in the past?**

10   A13. In 2018, the ALJ in U-18999 stated that the ATWACC had not been adopted by the

11   Commission.[16] Thus, the reference to specific language pertains to a Proposal for Decision

12   and exclusively to the ATWACC approach. The Proposal for Decision does not discuss

13   the Hamada approach in the referenced language. Therefore, it would be wrong to claim

14   that "the Commission has rejected financial risk adjustments in the past" as does Ms.

15   LaConte.[17]

16   **Q14.   How about the notion that financial risk adjustments are not common in US**

17   **regulation?**

18   A14. Mr. Coppola and Ms. LaConte overstate this point. I provided several examples of state

19   regulatory precedents in my response to AGDG-6.189b including the state regulatory

20   commissions in Alabama, California, Florida, and Oregon (attached as Exhibit A-30,

21   Schedule T1). Additionally, I note that In the U.S., the Federal Communications

22   Commission ("FCC"), the Surface Transportation Board ("STB") and the FERC have

23   accepted the use of weighted-average cost of capital methodologies to determine the cost

24   of capital. Specifically, the FCC in a 2016 order acknowledged that it is reasonable (1) to

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[15]   Coppola Testimony, p. 80.

[16]   Notice of Proposal for Decision in U-18999, July 2018, p. 77.

[17]   LaConte Testimony, p. 37.

1   use market values to estimate the capital structure and (2) derive an implied return on equity

2   from the estimated weighted average cost of capital.[18] Thus, the FCC acknowledged that

3   market value capital structures are the relevant measure of leverage and impact the ROE

4   using an approach similar to what I used. The FERC, in Cost of New Entry ("CONE")

5   studies for the PJM,[19] has used the weighted average cost of capital and the Surface

6   Transportation Board calculates the weighted average cost of capital to assess the revenue

7   adequacy for freight railroads.[20]

8   Looking outside the U.S., Mexico's Comisión Reguladora de Energía[21] relies on the

9   Hamada method, while regulators in the U.K., the Netherlands, Australia, and New

10   Zealand rely on a mixture of an after-tax weighted average cost of capital and the Hamada

11   method.[22]

12   **Q15.   Are the methods "unorthodox" in utility regulation?**

13   A15.   No. While not all methods I rely upon are widely used by regulatory commissions, several

14   regulatory entities have found the methods used in financial economics to consider

15   leverage useful. Several of the adoptions are relatively new in that the FERC (for CONE

16   studies) and the FCC only adopted the leverage adjustment within the last five years. Thus,

17   these jurisdictions have moved towards accepting the importance of leverage. The methods

18   are also standard curriculum in finance textbooks and commonly used by practitioners who

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[18]   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.

[19]   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.

[20]   See, for example, Surface Transportation Board, "Docket No. EP 558 (Sub-No. 22)," dated August 5, 2019, p. 15.

[21]   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."

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

1   provide cost of capital measures.[23] Thus, not only is accounting for financial leverage

2   standard in finance textbooks, but it is also standard practice by data providers such as Duff

3   & Phelps.

4   **Q16.   How do you respond to Mr. Ufolla's assertion that because market weight for equity**

5   **typically higher than book value, the overall cost of capital will always result in a**

6   **higher cost of equity?**

7   A16.   Standard cost of equity estimation methods including the capital asset pricing model

8   ("CAPM") and discounted cash flow ("DCF") express a company's cost of equity in

9   percentage terms per dollar of equity at the observed market capital structures. This tells

10   us the unit price of risk, but it is only the correct rate if applied to the corresponding amount

11   of equity. However, cost of service regulation (in Michigan) applies the rate of return to

12   book value and not market value, for good reasons: It is striving to give a fair return on and

13   recovery of the utility's investment costs, not their economic value. If rates of return were

14   awarded against market value, then it would create a circular situation whereby the allowed

15   rate would either boost or suppress the market value gaining the allowance according to

16   whether it was high or low.   This is not the case and therefore Mr. Coppola's concerns are

17   not applicable. Additionally, there are examples of the leverage adjustment reducing the

18   cost of equity.[24]

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[23]   For an example of a commercial data provider's application, see Duff & Phelps, "2020 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.

[24]   See, for example, my adjustment to the risk premium model in Docket No. E-01345A-16-0036 before the Arizona Corporation Commission on behalf of Arizona Public Service. Here the risk premium ROE was reduced from 10.6% to 10.3% due to the higher financial leverage of the sample than APS.

1   **Q17.   What is wrong with Mr. Coppola's assertion of "circularity of the [after tax weighted**
2   **average cost of capital] process"?[25]**

3   A17.   Mr. Coppola's assertion that "the Commission should recognize the inherent circularity of
4   the [after tax weighted average cost of capital] process"[26] is unsupported and wrong. Mr.
5   Coppola posits a "chain reaction" consisting of higher ROEs, higher earnings, higher stock
6   prices, and higher market-to-book ratios, all leading to still higher ROEs in the next rate
7   case. What Mr. Coppola continues to fail to recognize is that this sequence of events does
8   not continuously spiral forward, as he seems to imagine. This is because the market
9   weighted average cost of capital does not change with capital structure and is therefore
10   unaffected by explicit consideration of financial risk. By holding the market weighted
11   average cost of capital constant, all else being equal, a higher stock price would correspond
12   to a <u>lower</u> market return on equity, thus breaking the cycle asserted by Mr. Coppola. This
13   step-down of market returns would offset what would otherwise be increases in regulatory
14   ROEs in future rate cases. The financial risk adjustment is therefore a one-time event, all
15   else being equal. Importantly, this principle of non-circularity is also applicable to the
16   Hamada adjustment.

17   **Q18.   What about Ms. LaConte's assertion that the ATWACC financial risk adjustment**
18   **inflates DTE's ROE by 40 basis points?[27]**

19   A18.   First, the ATWACC adjustment is not an inflation of results, but is instead a simple
20   recognition that DTE Gas is requesting less equity than what is reflected in the sample from
21   which I estimate the ROE. Second, I find it noteworthy that Ms. LaConte points to the
22   estimated ROE of 10.7% for the gas sample[28] prior to any financial risk, yet argues that my
23   recommended ROE of 10.25% is too high. I also find it worth noting that Ms. LaConte
24   states that the Commission has "rejected the financial risk adjustment in the past" as an

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[25]   Coppola Testimony, p. 80.
[26]   *Ibid.*
[27]   LaConte Testimony, p. 36.
[28]   LaConte Testimony, p. 36.

1   argument to reject the Hamada method.   In fact, the Commission was discussing the

2   ATWACC method – not Hamada in the referenced decision.[29]

3   **B. FINANCIAL ECONOMICS**

4   **Q19.   How should capital structure be taken into account with respect to ensuring that the**

5   **allowed returns meet the fair return standard?**

6   A19.   The proportion of debt in the capital structure—also known as financial leverage—

7   influences the risk borne by equity investors. For a given degree of business risk, a higher

8   proportion of debt financing increases the expected variability of equity returns. Thus, to

9   compare the fair returns of two otherwise identical firms, on a risk adjusted basis, the

10   capital structures must be taken into account. For example, if more debt is used, the greater

11   financial risk imposed by the greater financial leverage must be compensated by a

12   commensurately higher expected return on equity. Otherwise, the more leveraged firm will

13   not receive a fair return and will be at a disadvantage in the competition to attract capital

14   in equity markets.

15   **Q20.   Please briefly explain the relationship between leverage and the cost of equity.**

16   A20.   Financial risk or capital structure is a large topic in financial economics. The principle that

17   financial leverage amplifies the variability of equity returns and thereby increases the

18   financial risk to equity investors is a firmly established core principal of corporate finance.

19   It is directly connected to the Modigliani Miller proposition that, except as influenced by

20   the tax-deductibility of debt and the cost of financial distress, the value of a firm's assets

21   is independent of its choice of financing. This intuitive framework means that some

22   measures of the overall cost of capital for firms with comparable systematic business risk

23   should be the same regardless of capital structure,[30] even if the cost of the equity and/or

24   debt components of financing vary in proportion to the degree of financial leverage.

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[29]   See, for example, Decision U-18999.

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

1   It is commonly recognized in finance textbooks that financial leverage impacts the cost of

2   equity for a company. A replication from a standard MBA textbook is provided below:[31]

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.

4   As Professors Berk and DeMarzo further note:

5   The levered equity return equals the unlevered equity return, plus an extra
6   "kick" due to leverage…The amount of additional risk depends on the
7   amount of leverage, measured by the firm's **market value debt-equity**
8   **ratio, D/E**…[32] (emphasis added)

9   This relationship is further illustrated in Figure R-1, reproduced from the seminal textbook

10   *Principles of Corporate Finance* by Brealey, Myers, and Allen. It illustrates that as capital

11   structure shifts to use a greater proportion of lower cost debt financing, the investor

12   required return on equity (and debt, especially at higher leverage ratios) increases to

13   compensate for the greater financial risk, such that the overall required return on assets

14   remain unchanged.

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

[32]   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-1: Illustration of the Modigliani Miller Principle[33]
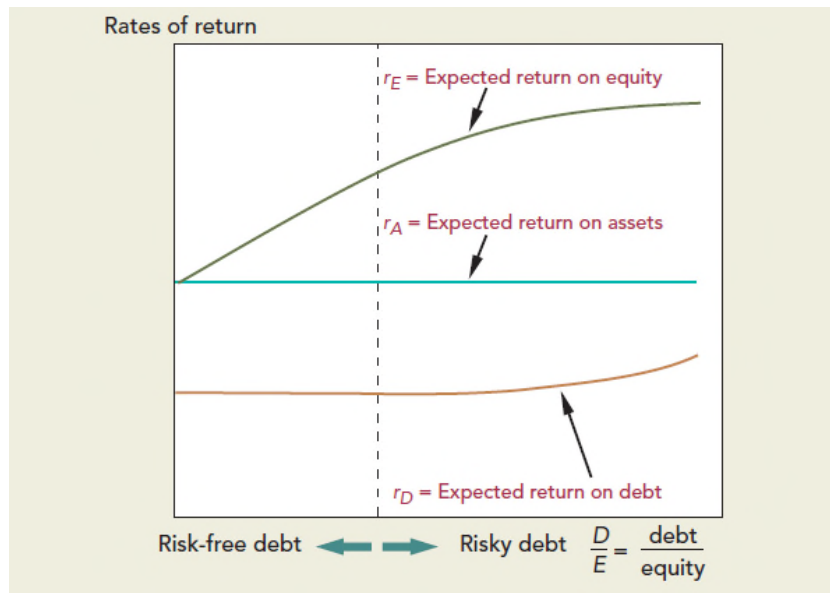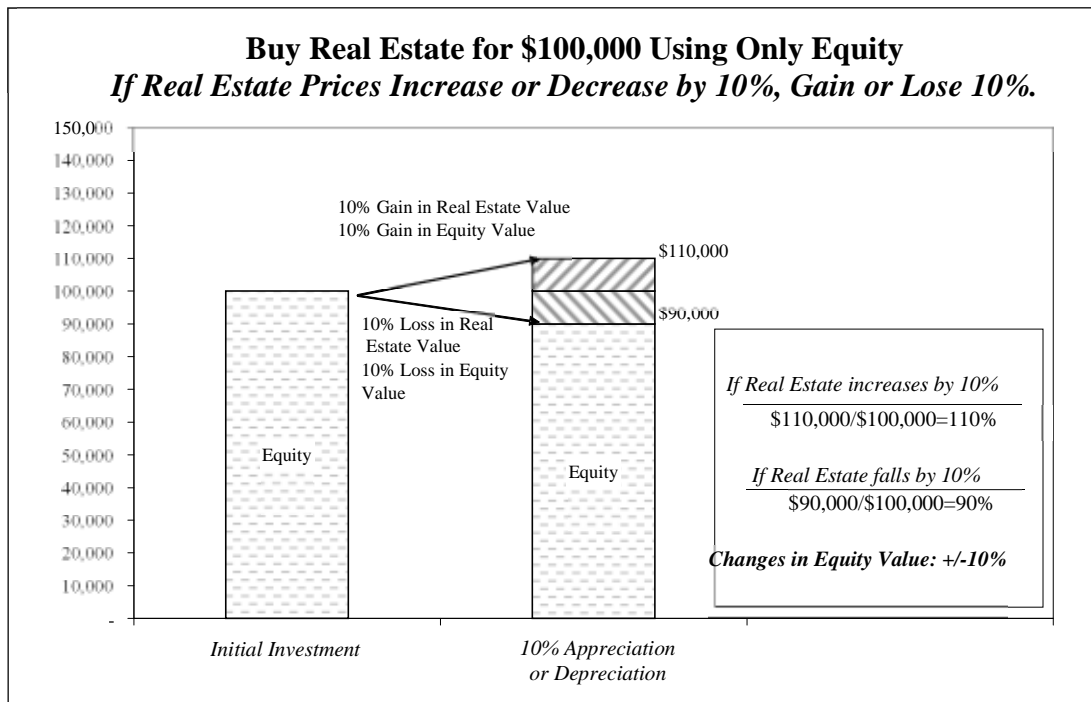

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2   Financial economics simply do not leave any doubt that the cost of equity increases with

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

4   value. I—like other witnesses—estimate the cost of equity using <u>market data</u> in the CAPM

5   and DCF-based models. Since the Risk Premium model is based on book values, the

6   relevant leverage for this methodology is book value based.

7   **Q21.   Could you provide a numerical example to illustrate the impact of financial leverage**

8   **on cost of equity?**

9   A21. Yes. As a simple example, think of an investor who takes money out of her savings and

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

11   estate market booms, then she will realize a gain. However, if the real estate market

12   declines, then she will realize a loss. Figure R-2 below provides an illustration of this:

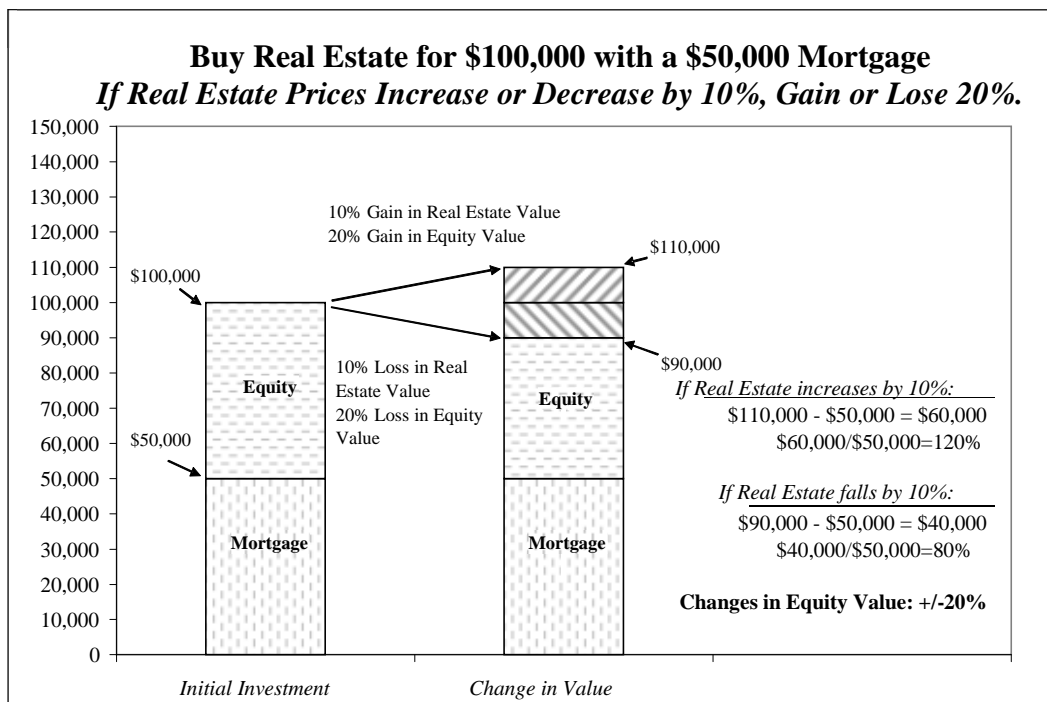[33]   Brealey, Myers, and Allen, *Principles of Corporate Finance*, 10th Ed. (2011), p. 429, Figure 17.2

Figure R-2: Return on an All-Equity Investment

Buy Real Estate for $100,000 Using Only Equity
If Real Estate Prices Increase or Decrease by 10%, Gain or Lose 10%.

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

$110,000

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

$90,000

Equity

Equity

If Real Estate increases by 10%
$110,000/$100,000=110%

If Real Estate falls by 10%
$90,000/$100,000=90%

Changes in Equity Value: +/-10%

Initial Investment

10% Appreciation or Depreciation

1

2   Compare this to the situation illustrated in Figure R-3 below, where the investor finances

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

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

5   equity return is two-times greater than in Figure R-2. The entire fluctuation of 10% from

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

7   ($50,000) for the leveraged investment depicted in Figure R-3 as compared to the all-equity

8      $100,000 investment shown in Figure R-2. The equity return for the leveraged investment

9   goes up or down by 20% in the leverage scenario even though the actual change in the

10   value of the real estate (+/- 10%) is the same as depicted in Figure R-2 for the all-equity

11   investment. The lesson from this example is obvious: debt adds risk because, while there

12   is more potential gain on the equity investment by using debt, there is a higher potential

13   loss on that equity investment that goes with it. This concept is colloquially referred to as

14   "high risk, high reward."

Figure R-3: Return on a Leveraged Equity Investment

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

1

Q22. **Do finance textbooks also address the question of how financial leverage affects the cost of equity?**

A22.   Yes. Standard textbooks on corporate finance provide examples, like the one I presented above, to illustrate how the introduction of debt financing amplifies the variability of equity returns and thus increasing the risk to equity holders which causes them to demand 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*.[34]

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

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

1   *…[L]everage increases the risk of equity even when there is no risk that the*
2   *firm will default.* Thus, while debt may be cheaper when considered on its
3   own, it raises the cost of capital for equity. Considering both sources of
4   capital together, the firm's average cost of capital with leverage is … the
5   same as for the unlevered firm.[35]

6   These statements by preeminent finance scholars in widely used Corporate Finance

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

8   real estate investment example:

9   •   The variability of returns on the asset itself (*e.g.*, the piece of real estate) is unchanged

10   by the introduction of financial leverage, therefore "leverage does not affect the risk

11   or the expected return on the firm's assets." Rather, it is the risk and required returns

12   of the equity and debt financing instruments that are changed by the degree of

13   financial leverage.

14   •   The mechanism by which leverage adds variability to returns is independent of any

15   effect of increased leverage on the risk that the firm will be unable to fulfill its fixed

16   financial obligations, and thus (as Berk and DeMarzo put it) "leverage increases the

17   risk of equity even when there is no risk that the firm will default."

18   **Q23.   Do financial economist recognize the calculation of after-tax weighted-average cost of**

19   **capital based on market values?**

20   A23.   Yes. Looking to the most widely-used MBA textbook by Professor Brealey, Myers, and

21   Allen, they explain that:

22   The formula for the after-tax weighted average cost of capital is[36]

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

---

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

[36]   This specification ignores preferred shares, but such financing could easily be added.

1   where r_D and r_E are the expected rate of return demanded by investors in the

2   firm's debt and equity securities, D and E are the current **market values** of

3   debt and equity and V is the total market value of the firm (V = D + E).[37]

4   Professors Brealey, Myers, and Allen then show that the after-tax weighted average cost

5   of capital is flat over a broad range of capital structures and calculates the cost of equity

6   using the same formula as I do.[38]

7 **Q24.   Do financial economists recognize the Hamada technique?**

8 A24.   Yes. The Technical Appendix (Appendix B) to my direct testimony provides a detailed

9   description of the standard textbook formulas used to implement the Hamada technique for

10   unlevering measured equity betas based on the proxy companies' capital structure to

11   calculate "asset betas" that measure the proxy companies' business risk independent of the

12   financial risk imposed by differing capital structures. I also note that standard MBA

13   textbooks,[39] practitioner texts[40] as well as the CFA manual[41] all describe the Hamada

14   approach and use formula like those relied upon in my direct testimony. Thus, the Hamada

15   method is simply a well-established methodology taught in business schools as well as to

16   CFA applicants.

17 **Q25.   What are the implications for these fundamental financial principles for Messrs.**

18   **Ufolla, Coppola, and Ms. LaConte's ROE results?**

19 A25.   Failing to recognize the impact of financial leverage on the cost of equity results in a non-

20   trivial downward bias in the cost of equity estimates. This can readily be illustrated by

21   looking to the differences in sample betas obtained at an assumed capital structure for the

---

[37]   Brealey, Myers and Allen (2014), p. 501. T_C is the corporate tax rate. (emphasis in original)

[38]   Brealey, Myers and Allen (2014), p. 492.

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

[40]   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.

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

1   proxy group utilizing the same beta at their recommended equity ratio. This is shown in

2   Figure R- 3 below, where I calculate first the asset (or zero debt financing) beta using the

3   betas provided by the interveners along with an assumed market value capital structure for

4   the proxy group. Next, I calculate the re-levered beta that is consistent with an equity ratio

5   of 51.9%. By failing to account for these fundamental financial principles, it is evident that

6   the estimates provided by the interveners are downwardly biased by 36 to 43 basis points.[42]

Figure R- 3: Illustrative Impact of the Leverage Adjustment

	Levered Beta	Assumed Debt Beta	Market Debt	Tax Rate	Market Equity	Asset Beta	Regulatory Debt%	Regulatory Equity %	Equity Beta	MRP (lowest and Highest)		Increase in ROE at Recommended MRP
	[1]	[2]			[3]	[4]	[5]		[6]			[7]
Recommendations												
Coppola Levered Beta	0.88	0.05	44%	25.7%	56%	0.58	48.1%	51.9%	0.94	7.25%		0.43%
LaConte Levered Beta	0.87	0.05	44%	25.7%	56%	0.57	48.1%	51.9%	0.93	6.13%	7.15%	0.36% - 0.42%
Ufolla Levered Beta	0.89	0.05	44%	25.7%	56%	0.58	48.1%	51.9%	0.95	6.26%	7.25%	0.38% - 0.43%

7

8   This approach in is exactly as described in standard textbooks such as Brealey, Myers and

9   Allen (2014), Berg and DeMarzo (2014), and Ross, Westerfield and Jaffe (2013).[43]

10   **Q26.   What do you conclude from the discussions above?**

11   A26.   Overall, I conclude that Messrs. Ufolla, Coppola, and Ms. LaConte's ROE estimates are

12   both inaccurate and unreasonably downward biased by failing to account for financial

13   leverage on the cost of equity utilizing standard and well-recognized financial techniques.

14

---

[42]   I note that the financial risk adjustment is much smaller than in DTE Gas' prior rate case due to the lower
        equity percentage among the peers.

[43]   Brealey, Myers and Allen (2014), pp. 492-493, Berk and DeMarzo (2014) pp. 415-417, Ross, Westerfield
        and Jaffe (2013), pp. 571-573. In all cases, they apply the Hamada method to the market value capital
        structure.

1   **III.   OTHER RISK MATTERS**

2   **Q27.   Please summarize Ms. LaConte's argument related to DTE Gas' Adjustment**
3   **Clauses?**

4   A27.   Ms. LaConte asserts that DTE Gas has a lower level of financial risk due to its

5   piecemeal cost recovery clauses and revenue decoupling that adjust rates
6   automatically outside of base rate cases.[44]

7   Ms. LaConte states that such "risk-reducing measures [available to DTE] support a
8   reduction to DTE's current authorized ROE…"[45]

9   **Q28.   How do you respond to these arguments?**

10   A28.   Ms. LaConte's arguments are misguided. Adjustment clauses are common regulatory
11   mechanisms utilized to reduce regulatory lag and allow utilities to recover costs on a timely
12   basis. Like many utilities, DTE Gas benefits from supportive regulatory policies such as
13   forward test years, revenue decoupling, and adjustment clauses, which reduce the risk of
14   regulatory lag. In fact, the number of adjustment clauses awarded to DTE Gas is in line
15   with number of adjustment clauses awarded to other Michigan utilities. As discussed in
16   the response to RCGDG-3.24d (attached as Exhibit A-30, Schedule T2_CONFIDENTIAL)
17   and summarized in Figure R-4 below, DTE Gas' adjustment clauses are in line with those
18   available to other gas LDCs. Only two of the gas LDCs has fewer adjustment mechanisms
19   than DTE Gas. Northwest Natural has a decoupling mechanism in Oregon (the majority
20   of its operations), but no infrastructure adjustment clause. Chesapeake Utilities have
21   infrastructure adjustment mechanisms in both their jurisdictions (Delaware and Florida),
22   but no decoupling mechanism. Many of the comparable utilities have many adjustment
23   mechanisms. Hence they are no different from DTE Gas.

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[44]   LaConte Testimony, p. 9.

[45]   Id., p. 11.

Figure R-4: Regulatory Adjustment Clauses

	Sample	Fuel	Infrastructure	Decoupling
ATO	Atmos Energy	KS, KY, TN	KS, KY, TN, TX	KS, KY, LS, MS, TN, TX
CPK	Chesapeake Utilities		DE, FL	
NJR	New Jersey Resources	NJ	NJ	NJ
NI	NiSource Inc.	IN, KY	IN, KY, MD, MA, OH, PA, VA	KY, MA, OH, VA
NWN	Northwest Natural			OR
OGS	ONE Gas Inc.	KS	KS, TX	KS, OK, TX
SJI	South Jersey Inds.	NJ	NJ	
SWX	Southwest Gas		NV	AZ, CA, NV
SR	Spire Inc.	MO	MO	AL, MO
	DTE Gas		MI	MI

1

2 **IV. WATER UTILITIES IN PROXY SAMPES**

3 **Q29. Did Messrs. Ufolla, Coppola, and Ms. LaConte consider companies other than**
4 **natural gas utilities in their proxy sample?**

5 A29. No. Messrs. Ufolla, Coppola, and Ms. LaConte did not consider water utilities or other
6 companies not included in Value Line's "natural gas utilities industries" segment.

7 **Q30. What criticisms did Messrs. Ufolla, Coppola, and Ms. LaConte raise concerning your**
8 **inclusion of water utilities in your proxy group?**

9 A30. Mr. Ufolla's stated that the water utilities included in my proxy sample "are not as similar
10 to DTE Gas as other gas companies are."[46] Mr. Coppola's states that

11   Gas companies are subject to volatility in natural gas prices, state mandated
12   energy conservation programs, and risk of gas explosions, among other
13   unique factors affecting the gas industry. On the other hand, water utilities
14   do not face the same water supply price volatility, and with the exception of

---

[46]   Ufolla Testimony, p. 14.

1   arid areas on the West Coast, do not have state mandated water conservation
2   programs or similar risks as gas utilities.[47]

3   Ms. LaConte simply criticizes the water utilities as they "do not have similar business
4   operations to a natural gas utility."[48]

5   **Q31.   How do you respond to these criticisms regarding the inclusion of water utilities in**
6   **your proxy group?**

7   A31.   As discussed extensively in my Direct Testimony I developed my proxy group utilizing
8   companies with similar business risk profiles as DTE Gas, namely their operations are
9   concentrated in regulated industries or have similar lines of business and/or business
10   environments.[49] The companies in my proxy group also share many characteristics with
11   DTE Gas, namely (a) in most jurisdictions, natural gas and water utilities share the same
12   regulators;[50] (b) both have networked assets; (c) both have obligations to serve; (d) both
13   industries serve a mixture of residential, commercial, and industrial customers, and, (e)
14   both industries are capital intensive. I continue to find that water utilities provide a relevant
15   proxy for the risk profile of natural gas utilities including DTE Gas.

16   As for Mr. Coppola's assertion that gas companies are subject to volatility in gas prices,
17   conservation programs and risks associated with gas explosion similar risks are faces by
18   many water utilities. For example, four (American States, American Water, California
19   Water and SJW Group) of my six water utilities operate in California, where water
20   conservation programs are in place in the form of both tiered rates, conservation targets,
21   and water restrictions. Additionally, several water utilities (e.g., American Water in
22   California) have water supply contracts that resemble gas purchase agreements.[51] For
23   water utilities that operate their own wells, supply risk is material in parts of the west,

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[47]   Coppola Testimony, p. 74.

[48]   LaConte Testimony, p. 20.

[49]   Villadsen Direct Testimony p. 38.

[50]   I recognize that the Commission does not regulate water utilities, but in 43 of the 50 states the same
       commissions that regulate electric and gas utilities also regulate water utilities.

[51]   See, for example, American Water Works 2020 10-K, p. 12.

1   where four of the six water utilities operate (American States, American Water, California

2   Water and SJW Group have operations in California and/or Texas). Lastly, while water

3   utilities are not subject to explosions on their pipeline system, the risks associated with

4   drinking water contamination or wastewater spills are substantial. For example, the impact

5   of the drinking water contamination in Flint, Michigan caused both a health crisis[52] and

6   material financial damage.[53] As the other witnesses do not go into details regarding the

7   lack of comparability (other than they are relatively small), I shall not address this issue

8   further. However, I note that the average asset beta for the water utilities is 0.60, while the

9   average asset beta for the gas LDCs is 0.62.[54] Thus, the systematic risk of the assets, as

10   measured by beta, is similar.

11

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[52]   For background, see https://www.npr.org/sections/thetwo-way/2016/04/20/465545378/lead-laced-water-in-flint-a-step-by-step-look-at-the-makings-of-a-crisis

[53]   Since 2016, the EPA has been monitoring Flint's drinking water system and $100 million was awarded to upgrade Flint's infrastructure. See https://www.epa.gov/flint

[54]   See Schedule D5.12.

1 **V.   MESSRS. UFOLLA, COPPOLA, AND MS. LACONTES APPROACHES TO COST**
2 **OF EQUITY ESTIMATION**

3   **A. OVERALL APPROACH**

4 **Q32. How do Messrs. Ufolla, Coppola, and Ms. LaConte approach estimating the cost of**
5 **equity for DTE Gas?**

6 A32. Messrs. Ufolla, Coppola, and Ms. LaConte each select a proxy group of natural gas utilities,
7   similar to the natural gas utilities I consider in my sample. As previously discussed in
8   Section IV, none of the other witnesses considered other highly regulated utilities, such as
9   water utilities, in their proxy groups. After determining their proxy group, each witness
10   utilized versions of the CAPM, DCF, and Risk Premium models to estimate a return on
11   equity for DTE Gas. As discussed in Section II, neither Messrs. Ufolla, Coppola, nor Ms.
12   LaConte utilized standard financial techniques to consider the impacts of financial leverage
13   in their analyses.

14   **B. SAMPLE SELECTION**

15 **Q33. What are the differences between Messrs. Ufolla, Coppola, and Ms. LaConte's proxy**
16 **groups and your proxy group?**

17 A33. As all witnesses exclude the water utilities the samples are much smaller and hence, from
18   a statistical perspective, has (ex ante) less predictive power. Focusing on the gas LDC
19   samples, the sample that Mr. Ufolla considers is largely consistent with the gas utilities
20   that I consider, except Mr. Ufolla disregards Chesapeake Utilities for having a below
21   investment grade credit rating from Moody's and also includes UGI.[55] The reason for the
22   exclusion of Chesapeake is puzzling as Moody's website as of June 14, 2021 shows no
23   credit rating for Chesapeake Utilities.[56] I have found no evidence of the company having
24   a below investment grade ratings from Moody's. Instead, I find that they are currently not
25   rated by S&P or Moody's. As for the inclusion of UGI, I note that propane accounts for

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[55] Ufolla Testimony, p. 14.

[56] Neither Moody's website (www.moodys.com) nor Chesapeake Utilities Corporation 2019 10-K provides a
credit rating for CPK.

1   29.3% of income, international for 32.5, gas utilities for 25.6%, and midstream for 17.3%

2   of income. Thus, the revenue of gas utilities is less than 1/3 of the company's income. Mr.

3   Coppola similarly excluded Chesapeake, but notes its revenue of $500 million as the

4   reason. [57] Mr. Coppola provides no reasoning why a company should be excluded for

5   having revenues of $500 million. Furthermore, Mr. Coppola includes Northwest Natural

6   in his proxy group, which had annual revenues of about $700 million.[58]

7   Ms. LaConte's proxy group is even smaller with only 5 utilities. Ms. LaConte also starts

8   with companies classified as natural gas utilities by Value Line. She then excludes

9   companies based on a consistent dividend history; coverage by multiple equity analysts;

10   greater than 50% of revenues from natural gas operations; positive earnings estimates from

11   Value Line, Yahoo! Finance, and/or Zack's Investment Research; and no merger or

12   acquisition activities in the prior six months.[59]

13   **Q34.   Do you agree with Mr. Ufolla's, Mr. Coppola's and Ms. LaConte's selection of a proxy**

14   **group?**

15   A34.   No. While I agree that it is important to include companies with a large amount of

16   regulatory operations in the sample, I focus on the asset composition because assets

17   ultimately are what the Commission regulates. Regulated utilities are capital intensive

18   entities that operate long-lived assets. Income and revenue even more so can vary

19   substantially year over year and therefore this measurement may cause an entity to switch

20   industry from year to year. This is even more problematic if a single year of revenue or

21   operating income is used as is the case for Mr. Coppola.[60] It is also worth noting that

22   Chesapeake Utilities "must maintain an aggregate net book value in [its] regulated business

23   assets of at least 50.0 percent of [the Company's] consolidated total assets"[61] to meet its

---

[57]   Coppola Testimony, p. 73.

[58]   Villadsen Testimony, Figure 11, p. 40.

[59]   LaConte Testimony p. 20.

[60]   Coppola Testimony, Exhibit AG-28, p. 1 of 1.

[61]   Chesapeake Utilities 2019 10-K, p. 35.

1   debt covenants. Thus, Chesapeake Utilities' lenders are concerned about assets – not

2   revenue or income.

3   As for Ms. LaConte's proxy group, it is simply too small. With only five companies, the

4   statistical precision is very low. She eliminates Chesapeake for low revenue from regulated

5   gas activities – yet Chesapeake Utilities has 72.3% regulated revenue per Value Line.[62]

6   She eliminates New Jersey Resources for the same reason – New Jersey Resources 2020

7   10-K reports $3,593 million of gas utility distribution assets and a total of 5,425 million in

8   assets,[63] so that gas distribution is approximately 2/3 of total assets. She eliminates

9   Northwest Natural for its purchase of Suncadia Water. However, all of Northwest

10   Natural's water assets account for about $111 million, while the natural gas assets account

11   for about $2.3 billion,[64] so total water assets are less than five percent. Clearly Suncadia

12   Water is a very small fraction of Northwest Natural's operations. Lastly, Ms. Laconte

13   eliminates Southwest Gas for having too little revenue from natural gas operations – yet,

14   Southwest Gas reports a natural gas utility rate base of about $3.8 billion (excluding the

15   Paiute Pipeline) and net assets of about $6.1 billion.[65] Thus, clearly the majority of

16   Southwest Gas' assets are devoted to regulated natural gas operations. For these reasons,

17   it is inappropriate for Ms. LaConte to eliminate nearly half of the gas LDCs that could be

18   used to benchmark DTE Gas' cost of equity.

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

20   *CAPM*

21 **Q35.** **How do Messrs. Ufolla, Coppola, and Ms. LaConte implement the CAPM?**

22 A35. All three witnesses use a forecasted risk-free rate based on long-term government bond

23   yields are current beta estimates based on Value Line data. Messrs. Ufolla, Coppola, and

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[62] Value Line Investment Survey, Chesapeake Utilities, May 28, 2021.

[63] New Jersey Resources, 2021 Q1 p. 42.

[64] Northwest Natural, Investor Presentation, June 2021 Conferences.

[65] Southwest Gas, "AGA Financial Forum," May 19-20, 2021 and Southwest Gas 2020 10-K, p. 25 (Balance Sheet).

1   Ms. LaConte used historic market equity risk premiums (MRP) in their analysis, however

2   Mr. Ufolla and Ms. LaConte also considers a forecasted MRP.

3   **Q36.   What estimates for the projected risk-free rate do the other witnesses rely on?**

4   A36.   Mr. Ufolla relied on projected treasury bond yields from IHS Markit over the last quarter

5   to derive a projected risk-free of 2.383% for 2022.[66] Similarly, Ms. LaConte uses the

6   projected 30-year U.S. Treasury bond yield of 2.1%.[67] Mr. Coppola also relied on a

7   forecasted risk-free rate – in his case 2.75%.[68] I agree with the witnesses that a forecasted

8   risk-free rate based on long-term Treasury bond yields is appropriate.

9   **Q37.   Do you agree with Mr. Ufolla's implementation of the CAPM?**

10 A37.   No. My primary concern with Mr. Ufolla's CAPM implementation is his failure to consider

11   the impact financial leverage has on the cost of equity. As discussed extensively in Section

12   II, the failure to consider financial leverage results in an inaccurate cost of equity estimate

13   which does not meet the fair return standard, particularly the comparability aspect. I am

14   also concerned that Mr. Ufolla's forecasted MRP is only 6.26 percent because Bloomberg

15   currently forecast a MRP above 8% and as of April 30, 2021, the methodology FERC

16   applies to determine the MRP results in a MRP of 9.6 percent using Value Line growth

17   rates and 10.86 percent using IBES growth rates.[69] Thus, the 6.26 percent reported by Mr.

18   Ufolla are below the measures from other sources. I therefore find that Mr. Ufolla's

19   forecasted CAPM results should be ignored.

20 **Q38.   Do you agree with Mr. Coppola's implementation of the CAPM?**

21 A38.   Not entirely. I have two concerns. My main concern with Mr. Coppola's implementation

22   of the CAPM is his failure to recognize the importance of financial risk. Second, I disagree

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[66]   Ufolla Testimony, p. 18.

[67]   LaConte Testimony, p. 23.

[68]   Coppola Testimony, AG-26.

[69]   See Exhibit A-30, Schedule T3 and T4 for details.

1   with his exclusive reliance on historical data only for the MRP.[70] I do not understand Mr.

2   Coppola's critique of my derivation of the FERC MRP.[71] Specifically, I relied on the

3   FERC methodology to determine what the FERC would have assessed the MRP at as of

4   the time of my testimony. Per the FERC decisions, companies with negative growth rates,

5   growth rates above 20% as well as companies that do not pay dividend are excluded,[72] so

6   that was the approach I followed. As noted in my direct testimony, it directionally

7   indicated a higher MRP than the historical MRP. As noted above, a current implementation

8   of the FERC methodology results in a MRP of no less than 9.6%, so using Mr. Coppola's

9   risk-free rate and beta,[73] I find a ROE of 11.2% ($2.75\% + 0.88 \times 9.6\% = 11.2\%$) - well

10   above the requested 10.25 percent.

11 **Q39. Do you agree with Ms. LaConte's implementation of the CAPM?**

12 A39.   My main concern with Ms. LaConte's analyses is that she also ignores the impacts of

13   financial leverage in her implementation of the CAPM. Secondly, Ms. LaConte's 2.15%

14   estimate of the risk-free rate is not only the lowest amongst the witnesses, but also is

15   selective. Specifically, Ms. LaConte relies on the data I obtained from Blue Chip as of

16   October 2020 for the risk-free rate, but fails to recognize that at that time the spread

17   between the utility bond yield and government bond yields was elevated, so that it would

18   be appropriate to normalize the risk-free rate. I did so by adding 25 bps to the forecasted

19   risk-free rate. It would be appropriate for Ms. LaConte to either use current forecasts for

20   the risk-free rate or to consider the elevated yield spread as of the time of her data. Using

21   current Blue Chip forecasts for the 2022 10-year government bond yield and adding Ms.

22   LaConte's maturity premium, I obtain a risk-free rate of 2.65% ($2.1\% + 0.55\%$).[74] This

23   would increase Ms. LaConte's CAPM estimates by 55 bps.

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[70]   Coppola Testimony, p. 72.

[71]   Coppola Testimony, p. 85-86.

[72]   171 FERC ¶ 61,155, Docket No. PL19-4-000, "Policy Statement on Determining Return on Equity for Natural Gas and Oil Pipelines," issued May 21, 2020.

[73]   Coppola Testimony p. 83.

[74]   Blue Chip Economic Indicators, May 10, 2021, p. 3 and LaConte Testimony, p. 24.

1   **Q40.   Based on the discussion above, do you have any comments on Mr. Ufolla's, Mr.**

2   **Coppola's and Ms. LaConte's CAPM results?**

3   A40.   Yes. Based on the discussion above, I find that Mr. Ufolla's implementation of the CAPM

4   results in a ROE that is at least 43 bps too low (not taking into account Mr. Ufolla's

5   relatively low risk-free rate). Additionally, the risk-free rate of 2.38% is low compared to

6   today's forecast of about 2.6% for the 20-year yield. Similarly, Mr. Coppola's CAPM

7   estimates are at least 43 bps points too low due to the lack of financial risk considerations.

8   Finally, Ms. LaConte's CAPM estimates are seriously downward biased for several

9   reasons: (i) she relies on an outdated historical MRP of 7.15% as opposed to the more

10   current figure of 7.25%, (ii) she uses a downward biased risk-free rate and (iii) she does

11   not recognize the importance of financial leverage. The outdated risk-free rate downward

12   biases her results by 55 bps, while the lack of financial leverage downward biases her

13   results by 43 bps.

14   Overall the CAPM results would more appropriately be presented as:

Figure R- 5: Ufolla, Coppola and LaConte Corrected CAPM

	Ufolla	Coppola	LaConte
Estimated CAPM ROE	8.87%	9.14%	8.32%
Downward Bias	0.43%	0.43%	0.55% + 0.43
Revised Estimate	9.3%	9.57%	9.3%

15   Simply put, even if I ignore the currently very high estimates of the MRP, the appropriate

16   measure of the CAPM-based ROE is substantially higher than indicated by Mr. Ufolla, Mr.

17   Coppola and Ms. LaConte.

18   *DCF*

19   **Q41.   How do. Messrs. Ufolla, Coppola, and Ms. LaConte implement the DCF model?**

1   A41.   Messrs. Ufolla, Coppola, and Ms. LaConte use differing versions of the DCF model with

2   Ms. Ufolla and Mr. Ufolla rely on an annualized the single stage (constant growth) DCF,

3   while Ms. LaConte Mr. Coppola the single-stage (constant growth) DCF model, as do I.

4   **Q42.   Do you agree with Mr. Ufolla's implementation of the DCF?**

5   A42.   No. First, Mr. Ufolla fails to account for the full growth rate in his calculation of the

6   expected dividend yield. In his implementation, he calculates the dividend yield (D_1/P_0) as

7
$$\frac{D_1}{P_0} = D_0 \times (1 + 0.5g)/P_0$$

8   Where D_t is the dividend at time t, P_t is the price at time t and g is the growth rate.[75] This

9   0.5 growth rate adjustment factor implies an assumption that dividends are paid quarterly,

10   but are grown on an annual basis with growth occurring on average during the middle of

11   each year. However, the full amount of the "adjusted" dividend is still assumed to reach

12   investors at the end of the first year. By delaying the growth and timing of dividends, Mr.

13   Ufolla's use of a 0.5 growth rate adjustment in the annualized model artificially lowers his

14   ROE estimate. I find it noteworthy that Mr. Ufolla cites the FERC for this precedence –

15   yet ignores the FERC precedence for the calculation of the forecasted MRP. The use of

16   0.5g rather than g results in a downward bias of the DCF results of about 10 basis points.

17   However, the largest issue is the lack of any consideration of financial leverage.

18   **Q43.   How about Mr. Coppola's implementation of the DCF?**

19   A43.   Mr. Coppola also relies upon an annualized version of the DCF model, which delays the

20   estimated payment of dividends to investors, which underestimates the cost of equity. I

21   find it puzzling that Mr. Coppola critique the FERC MRP calculation for excluding high

22   and low outliers yet Mr. Coppola chooses to ignore NiSource's growth rate in his

23   calculation as the earnings growth exceeds 10%.[76] Had Mr. Coppola included NiSource's

24   growth as of February 26, 2021, his DCF estimate for the ROE would increase to 9.76%.

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[75]   Ufolla Testimony, Exhibit S-4, Schedule D-5.

[76]   Coppola Testimony, AG-25.

1   Thus, the exclusion of NiSource in this one calculation downward biases Mr. Coppola's

2   ROE estimate. I

3 **Q44. Do you have any comments regarding Ms. LaConte's implementation of the DCF?**

4 A44.   I note that Ms. LaConte's "Mean Analyst ROE" estimate based on the single stage DCF

5   results in a ROE of 10.12%. I also note that Ms. LaConte models the multi-stage DCF as

6   being 200 years rather than infinity and obtain results between 7.8% and 8.8%. These

7   results from the multi-stage DCF are simply too low and should be assigned no or very

8   little weight. Instead, Ms. LaConte weigh the multi-stage DCF results by 1/3, the single

9   stage DCF by 1/3, CAPM by 2/9 and the risk premium model by 1/9.[77]   Given the

10   circumstances, I recommend relying predominantly on the single-stage DCF of 10.12% as

11   did Mr. Ufolla.

12 **Q45. What would be a reasonable DCF-based ROE for Mr. Ufolla, Mr. Coppola, and Ms.**

13   **LaConte?**

14 A45.   First, had Mr. Coppola not eliminated NiSource from the one calculation, his DCF-based

15   results would increase by about 36 bps to 9.76%. Ms. Laconte's single-stage mean DCF

16   is 10.12% which is a reasonable estimate. Lastly, I note that neither witness accounted for

17   financial leverage, which unreasonably downward biases the results.

18

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[77]   LaConte Testimony, AB-4 through AB-6.

1   *Risk Premium Model*

2   **Q46. Please summarize the Risk Premium model implemented by Messrs. Ufolla, Coppola,**
3   **and Ms. LaConte?**

4   A46.   Mr. Ufolla calculates three risk premium estimates. Two approaches examine the spread
5   between natural gas utility equity returns and utility bond returns and a third approach
6   examines the spread between utility equity returns and U.S. Treasury bond returns.[78] Mr.
7   Ufolla finds ROE estimates of 7.13% to 7.69% based on these approaches.

8   Mr. Coppola uses the realized market return from 1955 to 2020 and the yield on A-rated
9   utility bonds to derive his risk premium result. Specifically, he uses the realized market
10   return on gas distribution utilities for the period 1955-2000 and the Dow Jones Utility Index
11   for the period 2001-2020. Based on this data Mr. Coppola calculated the risk premium as
12   the difference between the market return and the yield on A-rated utility bonds and finds a
13   risk premium based ROE of 8.55%.[79]

14   Ms. LaConte estimates the ROE by combining a risk-free rate of 2.1% with the average
15   historical difference between authorized return on equity and the risk-free rate at the time
16   of the decision (as represented by the 30-year government bond yield). Using data from
17   1990 to 2020, Ms. Laconte arrives at a ROE estimate of 7.79%.[80]

18 **Q47. Do you agree with Mr. Ufolla's implementation of the Risk Premium model?**

19 A47.   No. Mr. Ufolla looks to the "gas utility realized market return average" for the period 1955-
20   2019" and subtracts from that a bond yield over the same period to determine a premium
21   over the bond yield.[81] The problem with this approach is that the risk premium does not

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[78]   Ufolla Testimony, Exhibit S-4, Schedule D-5.
[79]   Coppola Testimony, p. 89 and Workpaper AG-27b.
[80]   LaConte Testimony, AB-10.
[81]   Ufolla Testimony, Exhibit S-4, D-5.

1   stay constant as the bond yield (utility or government) changes.[82] To the extent that the risk

2   premium increases when the bond yield declines, which is consistent with the results of

3   Duarte and Rosa (see figure 10 in my direct), the risk premium results will be downward

4   biased during times of low bond yields. This is especially true if the low bond yields do

5   not reflect market fundamentals but rather monetary policy. For these reasons, Mr. Ufolla's

6   Risk Premium model should be disregarded.

7   **Q48.   Do you agree with Mr. Coppola's implementation of the Risk Premium model?**

8   A48.   No. There are multiple problems with Mr. Coppola's risk premium model. Like that of

9   Mr. Ufolla and Ms. LaConte, Mr. Coppola fails to account for the correlation between the

10   bond yield and the earned return. He also ignores the fact that the relationship changes

11   over time as illustrated in my direct testimony p. 57. This fact is also evident from Mr.

12   Coppola's data. For example, the average premium over A-rated bonds was 3.15% for the

13   period 1955-1987 and 4.79% for the period 1988-2020.[83]

14   Further, Mr. Coppola is relying on data from The Mergent Public Utility Manual for the

15   period 1955-2000 and the Dow Jones Utility Index for the period 2001-2020. These

16   sources are not truly comparable in that the Dow Jones Utility Index includes many

17   companies that are not gas utilities. While the exact composition changes over time, I note

18   that as of October 27, 2020, the index included 15 companies of which only one, Atmos

19   Energy Corporation, was a gas utility.[84]   Without accounting for changes in the

20   composition of the market returns relied upon and the relationship to the bond yield, Mr.

21   Coppola's risk premium model should be ignored.

22   **Q49.   Do you agree with Ms. LaConte's implementation of the Risk Premium model?**

23   A49.   No. Ms. LaConte fails to recognize that the risk premium and the government bond yields

24   are inversely correlated, so that a decline in the risk-free rate leads to an increase in the

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[82]   See Villadsen Direct, pp. BV-55 to BV-57 as well as Figure 10, p. BV-35.

[83]   Coppola Testimony, Workpaper AG-27b, page 1 of 2.

[84]   Dow Jones Utility Average - Wikipedia

1   allowed ROE - - because the ROE does not follow the risk-free rate one-for-one. Further,

2   Ms. LaConte relies on a risk-free rate of 2.1% but (i) previously used a forecasted risk-free

3   rate of 2.15% and (ii) downward biased her risk-free rate as she relied on outdated figures

4   and ignored the elevated yield spread at the date of her relied upon rate. For these reasons

5   Ms. LaConte's risk premium model should be ignored.

6   *Conclusions Regarding Model Implementations*

7 **Q50.   What do you conclude regarding Messrs. Ufolla, Coppola, and Ms. LaConte model**

8   **implementations?**

9 A50.   First, I reiterate my arguments from Section IV that other highly regulated companies, such

10   as water utilities provide relevant comparisons for DTE Gas. I also object to the

11   unnecessary and inconsistent application of restrictions when screening for proxy group

12   companies. This has resulted in the elimination of companies such as Chesapeake Utilities

13   from Mr. Ufolla's and Mr. Coppola's proxy groups despite the company's size being

14   equivalent to other proxy companies and its debt being priced similar to other investment

15   grade utilities. I also object to Mr. Coppola's and Ms. LaConte's focus on regulated

16   revenues to eliminate companies when regulated assets is a more appropriate metric for

17   comparing business risk.

18   Second, I find it necessary to use current data or at least data that takes into account the

19   market conditions that existed at the time of their derivation. For that reason, Ms.

20   LaConte's unreasonably low risk-free rate should be ignored.

21   Thirdly, none of the witnesses considered financial leverage in their analysis. As discussed

22   in Section II, account for financial leverage is a standard financial technique taught in MBA

23   textbooks, the CFA program, and used in other regulatory jurisdictions. While the impact

24   of this is lower than in recent proceedings, it does downward bias the results.

25   Fourth, neither Mr. Ufolla, Mr. Coppola or Ms. LaConte takes the correlation between the

26   market return on equity / allowed ROEs and bond yields into account, which downward

27   biases the risk premium results when bond yields are at or near record low.

1   Lastly, based on my analysis of the calculations of the Ufolla, Coppola, and LaConte
2   testimonies, I find that their implementation of the models downward bias the cost of equity
3   by at least the amounts in Figure R-6 below.

Figure R-6: Appropriate ROE Results

	Ufolla	Coppola	LaConte
Reasonable CAPM	9.3%	9.5%	9.3%
Reasonable DCF	11.31%	9.76%	10.12%
Risk Premium	ignore	ignore	ignore
Average	10.31%	9.63%	9.71%

4   Importantly, the revised figure in Figure R-6 above overlaps my range of 9¼ to 10¼percent
5   for the gas LDC sample with the adjusted ROE for Mr. Ufolla supporting a ROE of 10.25%
6   as does the high end of Ms. LaConte's adjusted results.

7   **Q51. Do you have other comments on the results obtained by other witnesses?**

8   A51. Yes. I note that the witnesses largely ignored the risks associated with DTE Gas' higher
9   than average capital intensity and capital expenditures.

10   **VI.   RESPONSE TO CRITIQUE OF ECAPM**

11   **Q52. Are there other issues you want to respond to in this rebuttal testimony?**

12   A52. Yes. In addition to the topics addressed above, I address the critique of using an Empirical
13   Capital Asset Pricing Model ("ECAPM"). As noted by Mr. Ufolla, the "ECAPM
14   adjustment [is] much smaller than usual"[85] as betas have increased. Therefore, my
15   responses shall be brief.

16   I respond to (i) the Coppola and Ufolla Testimonies' argument that the ECAPM is
17   unnecessary because most witnesses uses a long-term risk-free rate,[86] (ii) the LaConte and

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[85]   Ufolla Testimony, p. 22.
[86]   Coppola Testimony, p. 87, Ufolla Testimony, p. 23.

1   Ufolla Testimonies critique that the ECAPM is not needed when using adjusted betas,[87]

2   and (iii) the Coppola Testimony's argument that the ECAPM methodology is not widely

3   accepted.[88]

4   **Q53.   How do you respond to the argument that the ECAPM is unnecessary because**

5   **witnesses use long-term risk-free rates?**

6   A53.   I disagree. I choose an alpha value in the lower half of that range, in part, to take into

7   account the use of long-term risk-free rates. Addressing Mr. Coppola's statement that "the

8   classic CAPM typically uses short-term treasury rates as the risk-free rate,"[89] I take the use

9   of the long-term risk-free rate into account as it reduces the size of the alpha parameter –

10   the average estimated by researchers cited in my appendix was 4.45%; yet my estimate was

11   only 1.5% and thus allowing for a maturity premium of almost 300 bps; well above the

12   current and historical difference between, for example the yield on 20-year government

13   bonds and 90-day treasury notes.[90]

14   **Q54.   What about the argument that the use of the simultaneous use of the ECAPM and**

15   **adjusted betas lead to biased results?**

16   A54.   Mr. Ufolla and Ms. LaConte are concerned that I use ECAPM in combination with Value

17   Line betas, which are subject to the Blume adjustment.[91] They believe the adjustment is

18   inappropriate. However, the Blume adjustment and the ECAPM are two fundamentally

19   different and complementary adjustments and both are well supported by the academic

20   literature. The reason for these necessary adjustments can be shown by reference to, which

21   illustrates the empirical security market line ("SML"). The adjustment to beta corrects the

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[87]   Ufolla Testimony, pp. 22-23, LaConte Testimony, p. 43.

[88]   Coppola Testimony, pp. 87.

[89]   Coppola Testimony, p. 87.

[90]   In comparison, the historical maturity premium for 20-year risk-free treasury bonds over 90-day treasury bills for the longest period I have access to (April 1953 through May 2021) is 1.68% while the average for the period 1953 – 1991 (the period covered by the articles) is lower at 1.16%. Source: Federal Reserve, FRED.

[91]   Ufolla Testimony, pp. 22, LaConte Testimony, p. 34.

1   estimate of the relative risk of the company, which is measured along the horizontal axis

2   of the SML. The ECAPM adjusts the risk-return tradeoff (i.e., the slope) in the SML, which

3   is on the vertical axis. In other words, the expected return (measured on the vertical axis)

4   for a given level of risk (measured on the horizontal axis) is different from the predictions

5   of the theoretical CAPM. Getting the relative risk of the investment correct does not adjust

6   for the slope of the SML, nor does adjusting the slope correct for errors in the estimation

7   **of relative risk.**

Figure R-4: The Empirical Security Market Line
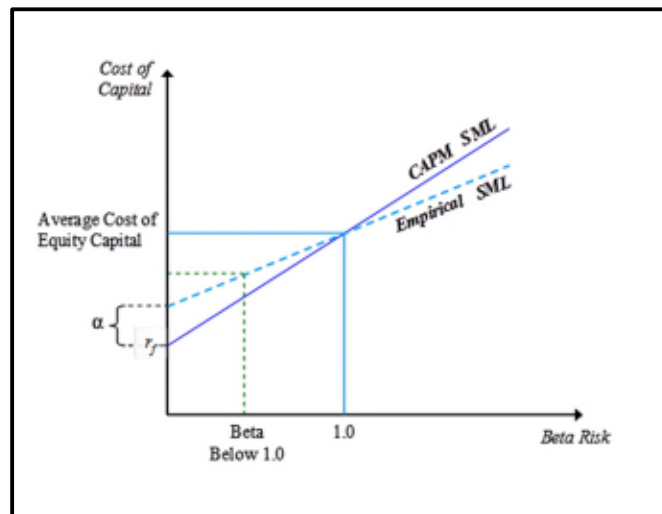
8   Importantly, the Blume adjustment has the effect of moving the beta along the x-axis

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

10   more precise was developed by Professor Blume.[92] As shown in Professor Blume's paper,

11   it is possible to apply a consistent adjustment procedure to historical betas that increased

12   the accuracy in *forecasting* realized betas. Essentially, Professor Blume's adjustment

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

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

15   The backward-looking empirical tests of the CAPM that gave rise to the ECAPM did not

16   suffer from bias in the measurement of betas as do a forward-looking use. Researchers

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

1   plotted realized stock portfolio returns against betas measured *over the same time period*

2   to produce plots such as Figure R-5 below, which comes from the 2004 paper by Professors

3   Eugene Fama and Kenneth French.[93] The fact that betas and returns were measured

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

5   *measure* of the "true" systematic risk over the relevant time period. In other words, no

6   adjustments were needed for these betas. Despite this, researchers observed that the risk-

7   return trade-off predicted by the CAPM was too steep to accurately explain the realized

8   returns. As explained above the ECAPM explicitly corrects for this empirical observation.

Figure R-5: Evidence from Empirical Tests of the CAPM[94]
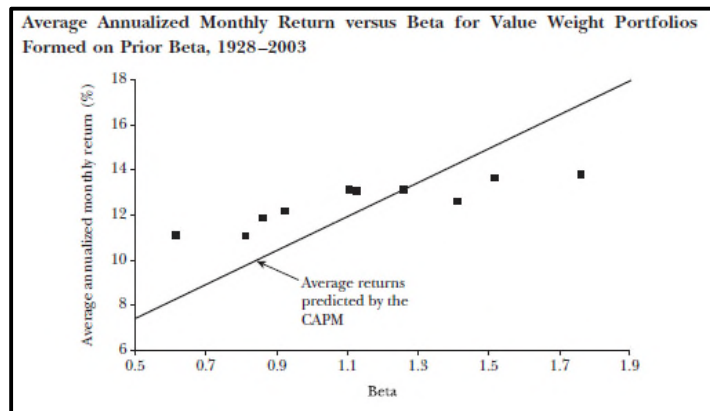
9 **Q55.** **Did the empirical tests that gave rise to the ECAPM use raw betas in their analyses?**

10 A55.   They did. However, this is simply because the researchers were able to measure raw betas

11   and realized returns from the same historical period. In other words, no adjustment to the

12   raw beta was necessary to evaluate the market return realized for the same historical period

13   – that is different from using betas to determine the cost of equity for future periods. Hence,

14   the raw betas they measured accurately captured the systematic risk that impacted the

15   returns they measured. In a sense, the measured betas and realized returns were already

16   contemporaneous in the tests of the CAPM.

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

[94]   *Id.,* p. 33.

1   This is explicit in the article by Litzenberger et al.,[95] who explain (on page 376) that the

2   estimate of "alpha" they obtain when using historical (i.e., "raw") betas is a linear

3   combination of the alpha that would be obtained with a perfect estimate of "true" beta and

4   the weighting factor employed in the Blume "global adjustment" procedure, which they

5   describe with the equation $\beta_i = \omega\beta_{i(historical)} + (1-\omega)1$. Using the equations that the

6   authors present along with their results presented in the "Raw Betas" panel of Table 1 (on

7   page 380 of the paper), it is possible to derive the estimate of alpha implied for use of

8   Blume adjusted beta with $\omega = 0.67$:

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

10   In other words, the results of Litzenberger et. al.'s study is consistent with an ECAPM

11   alpha factor of approximately 2.0% when applying Blume-adjusted betas.[96] In that light

12   my use of an alpha factor of 1.5% is conservative.

13   **Q56.   How about the argument that the ECAPM is not widely used in regulatory**

14   **proceedings?**

15   A56.   First, I believe the Commission should be presented with the best possible analysis

16   regardless of whether the analysis is "widely used" by regulators. Second, there certainly

17   are regulatory commissions that have adopted the ECAPM methodology. Examples

18   include the Mississippi Public Service Commission[97] and the New York State Public

19   Service Commission.[98] Importantly, all of these regulators rely on the ECAPM in

20   conjunction with adjusted betas and the California Public Utilities Commission did not

21   distinguish between CAPM and ECAPM when reporting results.[99] This list is not

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[95]   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.

[96]   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.

[97]   Mississippi Power, PEP-5A, p. 24.

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

[99]   California Public Utilities Commission, "Decision 19-12-056," December 19, 2019.

1   exhaustive as many commissions review the evidence before them, based on which they

2   decide on an allowed return without explicitly accepting or rejecting any specific

3   methodology.

4   **Q57.   What do you conclude regarding the ECAPM?**

5   A57.   For the reasons discussed above, the ECAPM has merit and there is no double-counting in

6   using adjusted betas in the ECAPM. Not only is the ECAPM of merit, but failing to

7   consider the results will unreasonably downward bias the results by approximately half a

8   percent.

9   **Q58.   Does the fact that you have not addressed all criticisms of your testimony mean that**

10   **you agree with those criticisms?**

11   A58.   No.

12   **Q59.   Does this conclude your rebuttal testimony?**

13   A59.   Yes.