PUBLIC DISCLOSURE VERSION
(October 21, 2022 Errata)

BEFORE THE
GEORGIA PUBLIC SERVICE COMMISSION

In the Matter of	)	
	)	
Georgia Power Company's 2022 Rate Case	)	**Docket No. 44280**
	)	
	)	
	)	

DIRECT TESTIMONY OF MARK E. ELLIS

ON BEHALF

OF GEORGIA INTERFAITH POWER & LIGHT

October 20, 2022

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FIGURES AND EXHIBITS (CONTINUED)

Exhibit	**(Attached)**
Exhibit MEE-1. Mark E. Ellis professional background	
Exhibit MEE-2. *Fed. Power Comm'n v. Hope Nat. Gas Co.*, 320 U.S. 591, 603 (1944)	

[*Remainder of page intentionally left blank.*]

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND PROFESSIONAL AFFILIATION.

A. My name is Mark E. Ellis. I am an economic and financial consultant. My business address is 8595 Nottingham Place, La Jolla, CA 92037.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. I am testifying on behalf of Georgia Interfaith Power and Light (GIPL).

Q. DO YOU CERTIFY UNDER PENALTY OF PERJURY THAT, TO THE BEST OF YOUR KNOWLEDGE, THE TESTIMONY YOU WILL GIVE IN THIS PROCEEDING IS TRUE AND CORRECT?

A. Yes.

Q. PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL WORK EXPERIENCE.

A. I graduated from Harvard University with a Bachelor of Science in Mechanical and Materials Sciences and Engineering and from the Massachusetts Institute of Technology with a Master of Science in Technology and Policy.

I have over 25 years of professional experience in the energy industry. Before starting my consulting practice in 2020, I led the strategy function at Sempra Energy for fifteen years. My responsibilities included developing and implementing the enterprise-wide cost of capital estimation process. This critical corporate finance function entailed thorough and ongoing research of the academic and practitioner literature on the historical cost of capital and the various cost of capital estimation methodologies and models; creating a process to estimate, quarterly, the forward-looking, risk-adjusted cost of capital for Sempra's portfolio of companies spanning a variety of geographies and lines of business; and calibrating the results against historical data and reputable, objective third-party estimates.

Previously, I held various positions in strategy, project development, and engineering with McKinsey, ExxonMobil, Southern California Edison, and Sanyo Electric. Last year, I provided expert testimony on behalf of The Utility Reform Network (TURN) before the California Public Utilities Commission in PG&E's application (A.21-20-04-23) for a $7.5-billion wildfire cost securitization. Earlier in 2022, I provided expert testimony on behalf of The Protect Our Communities Foundation (PCF) before the California Public Utilities Commission in the three

California utilities' application (A.21-08-013 et seq.) to suspend the Cost of Capital Mechanism (CCM). I am currently working on or have completed other utility regulatory cases in New Hampshire, Hawaii, Georgia, and Wisconsin. Attachment MEE-1 contains more detail on my background.

A. Summary of Conclusions

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. I have been asked by GIPL to assess Georgia Power Company's (GPC) test year 2023 cost of capital application to analyze and calculate the return on equity (ROE) and equity ratio that are (1) adequate to ensure that GPC, from 2023 to 2025, earns a return on its investments "commensurate with returns on investments in other enterprises having corresponding risk," and (2) "sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital."[1]

Q. GENERALLY, WHAT CONCLUSIONS DO YOU REACH FROM YOUR ANALYSIS AND CALCULATIONS?

A. The Commission can substantially reduce the authorized ROE requested by Georgia Power, and thereby customer costs (by a billion dollars per year), while still enabling Georgia Power to attract debt and equity investment capital, fairly compensate investors for risk, and maintain Georgia Power's current credit rating.

Q. WHAT ARE YOUR RECOMMENDED AUTHORIZED ROE AND EQUITY RATIO?

A. I recommend an authorized return on equity (ROE) equal to Georgia Power's cost of equity (COE) and paired with an equity ratio that, together with my recommended ROE, minimizes customer costs while maintaining Georgia Power's financial integrity, fairly compensating debt and equity investors for risk, and *improving* Georgia Power's credit rating. My recommended authorized ROE is 5.54% at an equity ratio of 61.7%.

[1] *Fed. Power Comm'n v. Hope Nat. Gas Co.*, 320 U.S. 591, 603 (1944) (attached as MEE-2).

B. Summary of Findings

1. Georgia Power's cost of capital testimony employs flawed models and assumptions that systematically produce upwardly biased ROE estimates.

Q. THERE IS A SIGNIFICANT DIFFERENCE BETWEEN YOUR RECOMMENDATIONS AND GEORGIA POWER'S RECOMMENDED ROE AND EQUITY RATIO. HOW DO YOU EXPLAIN THAT?

A. The divergence arises from differences in both the models and input assumptions used to determine our respective ROE and equity recommendations.

Georgia Power's cost of capital expert, Mr. James Coyne, uses four models in developing his recommended return on equity (ROE). Two of those models, the Risk Premium Analysis (RPA) and Expected Earnings Analysis (EEA), both suffer from a severe, invalidating conceptual flaw: they are based on utilities' authorized or forecast *return on equity*, not their actual *cost of equity* (COE), or the "the return *to the equity owner* … commensurate with returns on investments in other enterprises having corresponding risks."[2] Thus, these two models are not commonly used in finance outside of utility regulatory proceedings because they do not actually estimate the *cost* of equity. These models are akin to developing a nutrition recommendation based on what people *actually* eat, not on what they *should* eat to maintain a healthy weight.

The other two models used by Mr. Coyne – the discounted cash flow model (DCF) and capital asset pricing model (CAPM) – are widely used throughout finance to estimate the cost of capital. But Mr. Coyne's implementations of each suffer from numerous flaws which bias his results upward.

In implementing the DCF, Mr. Coyne uses unnecessarily long trailing price histories to calculate the dividend yield, which bias his figures upward, and he assumes demonstrably unrealistic, economically impossible long-term dividend growth rates.

In implementing the CAPM, he uses an interest rate forecast long and widely known to be systematically upwardly biased. He cherry-picks a beta calculation methodology that does not reflect current investor risk perceptions and applies the "Blume" adjustment that is not valid

[2] *Id*. (emphasis added).

for utilities, both of which upwardly bias his results. He fails to examine other, more robust beta estimation methodologies, investigate whether the pandemic-related changes in market conditions and investor perceptions of utility risk were temporary or have been sustained, or compare his results to the long-term history of utility betas.

Mr. Coyne's chosen methodology does not reflect the wide range of ways beta could be estimated, each of which could produce dramatically different results. As Nobel laureate Fischer Black, one of the pioneers of empirical testing of beta and the CAPM, famously admonished, "Watch out for data mining!"[3] – running an analysis several different ways but reporting only the outcomes that support one's conclusions.

To estimate the CAPM market risk premium, Mr. Coyne uses the same flawed implementation of the DCF used for his proxy group, again producing an economically impossible result.

Finally, Mr. Coyne fails to adjust his ROE estimates for differences in equity ratio among the proxy group members, and between the proxy group average and Georgia Power.

Mr. Coyne's capital structure recommendation is similarly deficient. While the testimony of Georgia Power's credit expert, Mr. David M. Fetter, refers to key metrics used in assessing credit quality, Mr. Coyne does not provide any analysis or calculations demonstrating how ROE affects those metrics, and how the impact of ROE on those metrics influences his proposed equity ratio. Regulators in other states have authorized ROEs that are substantially lower than those requested by Georgia Power, with comparable or lower equity ratios, without adversely impacting their utilities' credit ratings, suggesting the Commission can substantially reduce the ROE requested by Georgia Power, and thereby customer costs, while maintaining its credit rating.

[3] Fischer Black, *Beta and Return*, 20(1) J. Portfolio Management 8 (1993) (Available at hhtps://jpm.pm-research.com/content/20/1/8.)

2. More rigorous, fact-based analysis of Georgia Power's COE and credit metrics yields a recommended ROE roughly 50% lower and an equity ratio slightly higher than Georgia Power's proposal.

Q. PLEASE SUMMARIZE THE MAIN FINDINGS OF YOUR ROE ANALYSES FOR GEORGIA POWER.

A. Like Mr. Coyne, I use the DCF and CAPM, two models that are widely used throughout finance, to estimate the cost of capital. Unlike Mr. Coyne, I am careful to use realistic and rigorously supported assumptions about long-term dividend growth rates, current interest rates, and risk profiles and premia.

As I explain in Section III.A below, the equity ratio required to maintain any given level of credit quality depends on the ROE. Consequently, the ROE and equity ratio must be determined jointly. Instead of Mr. Coyne's crude equity ratio peer group comparison, which does not consider the most important metrics of credit quality, I model the inter-relationships between key credit metrics, ROE, and equity ratio to arrive at the optimal equity ratio that minimizes customer costs while meeting the return and credit quality requirements of both equity and debt investors.

Figure 1 summarizes the key findings of my review of Mr. Coyne's analysis, the modifications required to correct its deficiencies, the resulting COE estimates, and my ROE and equity ratio recommendations. More rigorous, fact-based, and accurate analyses result in a substantially lower recommendation for Georgia Power's ROE: 5.54%, roughly one half of Mr. Coyne's recommended 11.00%, and a slightly higher equity ratio, 61.7% vs. Mr. Coyne's 56%.

Based on my analysis of Georgia Power's general rate case filings, its proposed combined rate of return on both debt and equity, grossed up for taxes, accounts for more than 25% of its revenue requirement.[4] My recommended ROE and equity ratio would reduce Georgia Power customer costs by approximately 11%, over $1 billion, per year.

[4] M. Ellis analysis of data in 2022 Rate Case, Georgia Power Document Filing No. 190559, Ex. APA-SPA-ADH-MBR-1, Schedule 1 (June 24, 2022).

Figure 1. Comparison of Coyne and Ellis ROE methodologies and results[5]
Percent

Model	Coyne	Ellis	Comment
DCF	**8.99**	**5.97**	
Dividend yield	3.29	3.36	Coyne: excessively long trailing price histories (up to 180 trading days) introduces upward bias Ellis: one-month trailing price history (~21 trading days)
Constant growth rate	5.61	NA	Coyne: extrapolates DPS using analysts' 3-to-5-year EPS growth forecasts • Economically impossible • Estimates are upwardly biased • Low correlation between EPS and DPS forecasts • Inconsistency between EPS and DCF forecast starting periods • Results are inconsistent with analysts' own return forecasts
Initial growth rate	NA	5.49	Analysts' EPS growth rates for three years to mitigate upward bias
Terminal growth rate	NA	1.57	Based on long-term historical utility DPS growth rate equal to inflation
CAPM	**13.55**	**5.41**	
Risk-free rate (30-year Treasury) • Current • Forecast	 2.72 3.40	 NA 3.56	Coyne: current (30-trading day average) and forecast from source known to provide systematically upwardly biased estimates for decades Ellis: current (one-month trailing average) rate
Beta	0.85-0.88	0.48	Coyne: 5-year weekly; inflated due to early-2020 market turmoil and not reflective of current market conditions Ellis: 5-year monthly; balances long-term historical trend and current market conditions
Market risk premium • Historical • Forward	11.78-12.46 NA 11.78-12.46	3.86 4.86 2.87	Coyne: forward-looking using flawed CG DCF Ellis: average of forward-looking using MS DCF and long-term historical average; MS DCF long-term growth rate equal to pre-capita GDP
Risk Premium Analysis	**10.12**	**NA**	Conceptually invalid: equates COE to ROE
Expected Earnings Analysis	**11.03**	**NA**	Conceptually invalid: equates COE to ROE
Mean – Levered – Unlevered	**10.92** NA	**5.69** 4.78	 59% proxy group average *market* equity ratio
Flotation cost adjustment	**0.08**	**NA**	Conceptually invalid: assumes M/B ratio = 1.0
Equity ratio	**56**	**61.7**	
Relevered COE/ recommended ROE	**11.00**	**5.54**	

[5] 2022 Rate Case Hr'g Tr. Vol. 1 at 659-660 (Sept. 28, 2022); Ex. JMC-4. (Transcripts from the GPC Direct Testimony Hearings on September 28-30, 2022 are marked as Volume 1.)

C. Organization of testimony

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. First, I review a few key conceptual issues related to the cost of capital and capital structure. Next, I provide a detailed assessment of Mr. Coyne's cost of equity estimation methodology and implementation. For the DCF and CAPM, the two of Mr. Coyne's four cost of equity models that are valid, I explain various modifications to his methodology and assumptions to correct for the deficiencies in Mr. Coyne's analyses and then provide the resulting COE estimates. I then apply the capital structure concepts reviewed in the first part of my testimony to determine the optimal equity ratio that minimizes customer costs while satisfying the demands of equity and debt investors. Finally, I estimate the potential savings to customers from adopting my recommended ROE and equity ratio instead of Mr. Coyne's proposal.

II. CONFUSION BETWEEN THE *RATE OF RETURN ON* CAPITAL AND *COST OF* CAPITAL HAS LED TO EXCESSIVE AUTHORIZED RETURNS.

A. *Rate of return on* capital and *cost of* capital are not the same: rate of return on capital is a financial performance metric, whereas cost of capital is the measure of economic cost described in the *Hope* case.

Q. WHAT IS THE OBJECTIVE IN SETTING A UTILITY'S AUTHORIZED RATE OF RETURN?

A. The authorized rate of return is the amount of money, expressed as a percentage of capital invested, that a utility is allowed to recover in customer rates to compensate debt and equity investors for assuming the risks of investing in the utility

The Supreme Court provides the guiding ratemaking principles in its 1944 *Hope Natural Gas* case, in which it directs ratemakers to arrive at "just and reasonable rates" by a "balancing of the investor and the consumer interests."[6] Consumer interests are straightforward: they want to minimize costs and rates. Investors include holders of both the utility's debt and equity. A utility's debt investors expect to receive their contractual interest payments. Debtholders therefore have a "legitimate concern with the financial integrity of the company whose rates are being regulated,"[7] i.e., the utility's credit quality and anticipated ability to fulfill its

[6] 320 U.S. 591, 603.
[7] *Id.*

obligations to debtholders. Equity investors expect a fair return, defined in *Hope* as "commensurate with returns on investments in other enterprises having corresponding risks."[8]

Q. HOW DOES THE RATE OF RETURN ON CAPITAL DIFFER FROM THE COST OF CAPITAL?

A. The rate of return on capital, often shortened to "rate of return," is an accounting metric of financial performance, calculated by dividing the value *returned* to investors – e.g., interest, net income – by the amount of capital invested. The cost of capital is the return investors *expect* on their investment. It is referred to as a "cost" because it reflects what investors demand in return for assuming the risk of the investment and, therefore, what companies must pay for that investment. The *rate of return* on each form of capital, whether calculated retrospectively or estimated prospectively, may or may not equal its respective *cost of capital*.

Q. HOW DOES THE *AUTHORIZED* RATE OF RETURN ON CAPITAL DIFFER FROM THE RATE OF RETURN AND THE COST OF CAPITAL?

A. The *authorized* rate of return refers to a specific use of this accounting metric to determine a utility's revenue requirement and customer rates. According to long-established ratemaking principles, which will be explained in more detail below, the authorized rate of return should be set equal to the cost of capital. Figure 2 summarizes the differences between these three sets of metrics for debt, equity, and the combined return.

[*Remainder of page intentionally left blank.*]

[8] *Id.*

Figure 2. Comparison of terminology: cost of capital, (rate of) return on capital, and authorized rate of return

	Cost	(Rate of) return	Authorized rate of return
Capital	*Cost of capital* Economic concept: payment investors require to assume risk of investment	*(Rate of) return on capital* Accounting concept: measured performance, historical or prospective	*Authorized rate of return* Regulatory concept: profitability benchmark determined by regulators to set utility revenue requirement and customer rates, balancing customer and investor interests
Equity	*Cost of equity (COE)* Forward-looking return, based on *market* value of equity, investors expect in compensation for risk assumed; not directly observable	*(Rate of) return on equity* Profitability metric equal to net income divided by *book* value of equity	*Authorized return on equity (ROE)* Per *Hope*, should equal cost of equity to ensure investors are adequately compensated at minimal customer cost
Debt	*Cost of debt* Forward-looking market-based interest rate on debt with commensurate credit risk, adjusted for *expected* default and liquidity risk	*(Rate of) return on debt* Contractual interest (coupon) rate, adjusted for *actual* default or transaction losses	*Authorized cost of debt* Contractual interest rate; weighted average of current (for existing debt) and expected (for anticipated new debt)

Q. WHAT PRINCIPLES DO YOU USE TO DETERMINE YOUR RECOMMENDED AUTHORIZED RATE OF RETURN?

A. As the National Association of Regulatory Utility Commissioners (NARUC) has explained, "Fundamental financial concepts demonstrate that the fair rate of return to use in ratemaking for a utility is its *cost of capital* in order to achieve the proper balance between customers and investors."[9] Mr. Coyne has also acknowledged, in ROE testimony in other jurisdictions, "that the allowed rate of return should equal the cost of capital."[10] The objective in setting a utility's authorized rate of return should, therefore, be to set the rate of return on each source of capital – debt and equity – as close as possible to the actual cost of each source of capital.

Q. DOES THE APPROACH TO CALCULATING COST OF EQUITY DIFFER FROM THE APPROACH TO CALCULATING COST OF DEBT?

A. Yes. The cost of outstanding debt can be directly determined from its contractual interest rates. Similarly, the cost of debt expected to be issued can be accurately determined from known interest rate indexes for debt of comparable credit quality, such as Moody's utility bond

[9] John D. Quackenbush, *Cost of Capital and Capital Markets: A Primer for Utility Regulators*, Nat'l Ass'n of Regul. Util. Comm's at 10 (2019) (emphasis added) https://bit.ly/3Th1lC8.

[10] Cal. Pub. Util. Comm'n, Docket No. A 22-04-008 et seq., Reporters' Transcript: Virtual Proceeding at 65 (September 12, 2022).

indexes, which, in turn, are based on interest rates directly observed in the market. In contrast, the cost of equity, both existing and to-be-issued, cannot be directly observed and must be estimated using various models.

Q. WHY IS THE DISTINCTION BETWEEN THE COST OF CAPITAL AND RATE OF RETURN IMPORTANT?

A. The cost of capital and rate of return (on capital) are entirely different concepts. The rate of return is a financial performance metric. The cost of capital is an economic concept. Nonetheless, they are frequently referred to interchangeably in utility regulatory proceedings, perhaps in part because finance professionals commonly refer to the cost of capital as the *expected* return (on capital).[11]

The muddling of the difference between the cost of capital and the rate of return is not just of semantic concern, particularly for the cost of equity, which must be estimated using various models rather than directly observed (like the cost of debt).

This confusion between the *cost of* capital and the *return on* capital has infiltrated some of the models commonly used in utility cost of capital proceedings to estimate the cost of equity. These models' apparent influence on regulatory decisions, though, does not make them correct or mean they provide a suitable basis for estimating the cost of equity.

Models that rely exclusively on historical or forecast utility rates of return on equity, without reference to utilities' actual cost of equity, should be rejected outright. Mr. Coyne uses two such models, one relying exclusively on historical authorized ROEs, the other on forecast ROEs. These models incorporate no information about the actual cost of equity and are therefore inherently flawed and produce invalid results. Consistent with the fairness principle described by NARUC, and Mr. Coyne's own statements, only models that estimate the *cost* of equity should be used to determine the authorized ROE.

[11] *See, e.g.*, TIM KOLLER, MARC GOEDHART ET AL., VALUATION, 5TH ED. MCKINSEY & CO. 35 (2010): "The cost of capital is the price charged by investors for bearing the risk that the company's future cash flows may differ from what they anticipate when they make the investment. The cost of capital to a company equals the minimum return that investors expect to earn from investing in the company. That is why the terms *expected return to investors* and *cost of capital* are essentially the same. The cost of capital is also called the discount rate, because you discount future cash flows at this rate when calculating the present value of an investment, to reflect what you will have to pay investors" (emphasis in original).

B. Multiple, diverse sources of evidence demonstrate that utilities' authorized ROEs far exceed their cost of equity.

Q. DO AUTHORIZED ROES REFLECT THE ACTUAL COST OF EQUITY?

A. No. Substantial, robust evidence suggests that authorized ROEs for nearly all U.S. utilities exceed their cost of equity. Georgia Power's ROE follows this national pattern. Below, I provide three diverse analyses that compellingly demonstrate, individually and collectively, the substantial gap between authorized ROEs and utilities' actual cost of equity: expected equity return forecasts produced by investment professionals, utility market-to-book ratios, and the increasing spread between authorized ROEs and interest rates.

1. Investment firms' expected return forecasts for the U.S. equity market as a whole – which is riskier, on average, than utilities – are consistently lower than utilities' authorized ROEs.

Q. ARE THERE OTHER PUBLIC SOURCES FOR COST OF EQUITY ESTIMATES OUTSIDE UTILITY REGULATORY PROCEEDINGS?

A. Utility cost of capital proceedings are not the only purpose for which expected returns on equity are estimated. Investment firms, such as JP Morgan, BlackRock, and T. Rowe Price, regularly publish capital market assumption reports (CMAs) – expected return forecasts for various asset classes. Figure 3 summarizes a survey of U.S. equity market return forecasts published by over thirty firms in 2021.

The CMA forecasts shown in Figure 3 are grouped by assumed investment horizon: less than ten years, ten years (the most common), and more than ten years.[12] The average across the longer-term 10-year and more-than-ten-year horizons, 5.7%, is approximately 40% less than the average ROE authorized for regulated utilities throughout the United States in 2021, 9.5%.[13] Not a single one of the forty-two expected return forecasts that I reviewed[14] is as high as the average ROE yielded by any of Mr. Coyne's models.

[12] Thirty-four CMA reports were reviewed, of which two were excluded due to insufficient data on investment horizon or return type (geometric or arithmetic).

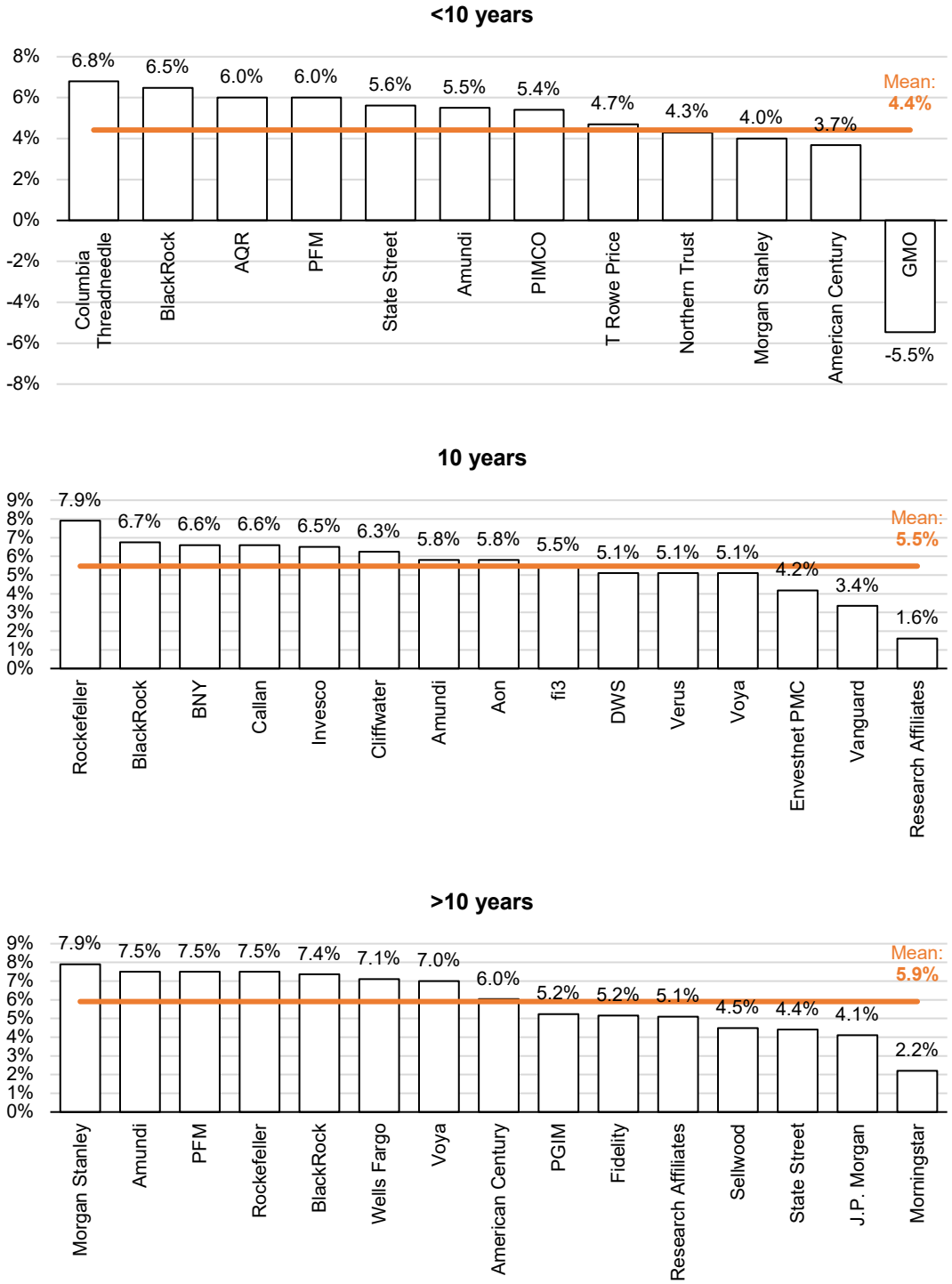
[13] M. Ellis analysis of S&P Global Market Intelligence data, https://www.spglobal.com/marketintelligence/en/ (last accessed October 6, 2022). [Hereinafter referred to as "M. Ellis analysis of S&P GMI data."]

[14] Some CMAs included forecasts for multiple time horizons, so the number of forecasts exceeds the number of reports.

CMA equity market return forecasts are a relevant and useful benchmark for utility ROEs because U.S. utilities, including Georgia Power, are lower-risk – both historically and prospectively – than the market, and therefore investors have *lower* return expectations for utilities than for the market. The fact that authorized utility ROEs are so much higher than the expected returns on the overall market, which is higher risk, is a compelling indicator that authorized ROEs far exceed utility investors' expected returns, i.e., utilities' actual cost of equity.

[*Remainder of page intentionally left blank.*]

Figure 3. U.S. equity market expected returns[15]
Nominal, geometric



[15] M. Ellis analysis of investment firm CMA reports.

2. Market-to-book ratios reveal that utilities' cost of equity is substantially lower than authorized ROEs.

Q. WHAT IS A MARKET-TO-BOOK RATIO?

A. "Market" value refers to the price one must pay to purchase a share of a company's stock at any given time. "Book" value refers to the net equity invested in a company. In general, market value reflects the discounted value of a company's future cash flows, while book value reflects the historical investment in the company. The market-to-book ratio (M/B) is a commonly used financial metric that indicates the amount of shareholder value added in excess of shareholders' return expectations.

Q. HOW DOES A MARKET-TO-BOOK RATIO RELATE TO RETURNS?

A. It is a well understood financial principle that a market-to-book ratio greater than 1.0 indicates the company is expected to earn a return on its investment in excess of the actual cost of capital. A positive net present value (NPV), i.e., the value of a company minus its investments, is the signature indicator of a rate of return that exceeds the cost of capital. NPV is equal to investment multiplied by (M/B – 1.0), so M/B exceeding 1.0 indicates that NPV is positive.

Q. WHAT DO UTILITY STOCK MARKET-TO-BOOK RATIOS REVEAL ABOUT ROES RELATIVE TO UTILITIES' COST OF EQUITY?

A. It has long been recognized that utilities' market-to-book (M/B) ratios provide insight into the relationship between authorized return and the true cost of capital. Legendary regulatory economist Alfred Kahn[16] called attention to this phenomenon over fifty years ago in his 1970 classic, *The Economics of Regulation: Principles and Institutions*:

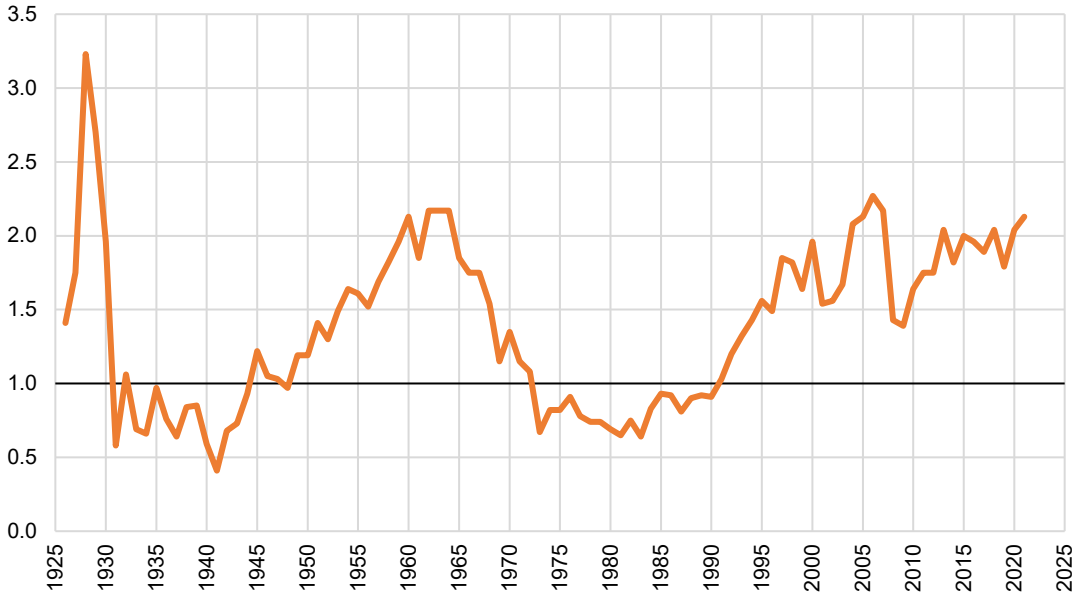
> [T]he sharp appreciation in the prices of public utility stocks, to one and half and then two times their book value during this period, reflected … a growing recognition that the companies in question were in fact being permitted to earn considerably more than their cost of capital. … The source of the discrepancy between market and book value has been that commissions have been allowing *r*'s [returns on equity] in excess of *k* [market cost of equity]; if instead they had set *r* equal to *k*, or proceeded at

[16] *See, e.g.*, Susan Lang, *Economist Alfred Kahn, 'father of airline deregulation' and former presidential adviser, dies at 93*, Cornell Chronicle (December 27, 2010) https://news.cornell.edu/stories/2010/12/alfred-kahn-father-airline-deregulation-dies-93.

> some point to do so … the discrepancy between market and book value … would have disappeared, or would never have arisen.[17]

Kahn was referring to the period of the late 1940s to 1965, but the observation that utilities trade above book value is equally valid today. As seen in Figure 4, the utility sector average M/B ratio has exceeded 1.0 for nearly thirty years and, except for a short period after the global financial crisis, has exceeded 1.5 since 1995.

Figure 4. Utility sector average market-to-book ratio[18]
Year-end



The average of Mr. Coyne's proxy group members' M/B ratios, listed in Figure 4, is even higher, at 2.1.[19] As Kahn observed, the utility sector trading at 1.5 to 2.0 times book value for decades clearly demonstrates that utilities have once again been "permitted to earn considerably more than their cost of capital."

[17] ALFRED KAHN, THE ECONOMICS OF REGULATION: PRINCIPLES AND INSTITUTIONS, MASS. INST. TECH. 48, fn. 60, 50 (1970).
[18] M. Ellis analysis of French Data Library (FDL) data https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html (last accessed October 2, 2022).
[19] M. Ellis analysis of S&P GMI data (last accessed October 2, 2022); M/B ratio is the monthly average for September 2022.

Figure 5. GPC proxy group market-to-book ratio and Value Line return on book equity[20]
September 2022

			Value Line return on book equity (%)		
Utility	**Ticker**	**M/B**	2022	2023	'25-'27
ALLETE	ALE	1.22	8.0	8.0	9.0
Alliant	LNT	2.46	11.0	11.0	11.0
Ameren	AEE	2.37	10.0	10.0	10.5
AEP	AEP	2.12	10.5	10.5	11.0
Duke	DUK	1.69	9.0	9.0	9.5
Edison Int'l	EIX	1.82	11.0	11.0	12.0
Entergy	ETR	1.98	10.5	10.5	11.0
Evergy	EVRG	1.65	8.5	9.0	10.0
Hawaiian Electric	HE	1.87	9.5	9.0	9.5
IDACORP	IDA	2.02	9.0	9.0	9.5
NextEra	NEE	4.61	12.5	11.5	13.5
OGE	OGE	1.90	12.0	12.0	13.0
Portland General	POR	1.63	9.5	9.5	10.0
Xcel	XEL	2.50	9.5	9.5	10.0
Mean		**2.13**	**10.0**	**10.0**	**10.7**

Another commonly referenced textbook on utility regulation, Kolbe, Read, and Hall's *The Cost of Capital: Estimating the Rate of Return for Public Utilities*, recommends using a M/B ratio of 1.0 as a "guide for regulators" in setting the cost of capital:[21]

> The market-to-book ratio expresses the market value of the firm's outstanding common stock to the book value of its equity. If the two are equal the expected return on the book will equal the expected return on the market value of the company, which in turn will equal the cost of capital for a company of that degree of risk.

Kahn and Kolbe, et al., drew their conclusions from the basic financial concept of net present value (NPV) discussed above. Because utilities trade at a premium to book value (i.e., invested capital), they have positive NPVs – prima facie evidence that they are earning more than their cost of capital.

[20] M. Ellis analysis of S&P GMI data (last accessed October 2, 2022); Company Response to STF-BAI-1-1 Attachment Coyne F.

[21] A. LAWRENCE KOLBE, JAMES A. READ, JR., GEORGE R. HALL, THE COST OF CAPITAL: ESTIMATING THE RATE OF RETURN FOR PUB. UTIL., CHARLES RIVER ASSOCIATES, INC. at 25 (1984).

Q. IN PRACTICAL, DOLLARS-AND-CENTS TERMS, WHAT DOES IT MEAN FOR A UTILITY TO HAVE A MARKET VALUE THAT IS HIGHER THAN ITS BOOK VALUE?

A. In practical terms, this means that, for every dollar of equity a utility invests, shareholders receive back not just their investment plus a reasonable return, which would be the case when M/B = 1.0, but additional value equivalent to their equity investment multiplied by (M/B – 1.0). At current M/B ratios near 2.0, authorized ROEs effectively double the value of utilities' equity investments, *on top of* returning their cost of equity. Such high returns are not necessary to attract capital and needlessly increase customer costs.

Q. ARE YOU ABLE TO CALCULATE GEORGIA POWER'S MARKET-TO-BOOK RATIO?

A. Georgia Power is not publicly traded, so its market value is not directly observable. Nonetheless, The Southern Company's market-to-book ratio, averaging 2.82 over the month of September 2022,[22] provides a reasonable estimate.

Q. IS MR. COYNE AWARE OF THE RELATIONSHIP BETWEEN THE MARKET-TO-BOOK RATIO AND RETURNS?

A Yes. Mr. Coyne has acknowledged that a market-to-book ratio greater than 1.0 necessarily implies that investors' expected return, i.e., the cost of equity, is less than their authorized return. In a recent cost of capital proceeding in California, Mr. Coyne testified to the following principles:

- "The terms 'expected return to investors' and 'cost of capital' are essentially the same."[23]
- "The allowed rate of return should equal the cost of capital,"[24] the NARUC fairness principle.
- "A typical [investor] expectation is the utility will earn its allowed return [on book equity]."[25] Mr. Coyne's Expected Earnings Analysis is predicated on this assumption,[26] and the Value Line reports from which the EEA draws

[22] M. Ellis analysis of S&P GMI data (last accessed Oct. 15, 2022).
[23] Cal. Pub. Util. Comm'n, Docket No. A 22-04-008 et seq., Reporters' Transcript: Virtual Proceeding at 62 (September 12, 2022).
[24] *Id*. at 65.
[25] *Id*. at 70.
[26] Ex. JMC-7.

its input assumptions explicitly state that the reports' ROE forecasts are based on allowed returns.[27]

- "[I]nvestors can't buy shares at book value … They [investors] can only buy them [shares of utility stocks] at market value."[28]
- "[M]arket-to-book values [of] electric and gas utilities all hover in around 2.0; although there is variation between companies. It's been a long-term trend towards increasing the market-to-book ratio for utilities."[29]
- It "would be highly unusual" to find "any company in [Mr. Coyne's proxy group] sample that does not have a market value greater than the book value."[30]
- "When market-to-book ratio is greater than 1.0 that means that investors are willing to pay more than book value for the same stream of cash flows."[31]
- "[W]hen an investor pays more for the same stream of cash flows, that necessarily implies a lower return."[32]

The logical conclusions from Mr. Coyne's testimony are that (1) investors' expected returns on *book* equity are based on authorized ROEs (as can be seen in Figure 5, which shows the Value Line ROE data used in Mr. Coyne's EEA; the averages, which range from 10.0% to 10.7%, are in line with the national average ROE authorized for electric utilities in 2020-22, 9.4%[33]); (2) investors pay more than book value when they invest in utilities; (3) investors' expected return on *their* investment, i.e., the cost of equity, must be *less* than the authorized ROE; and (4) according to NARUC's fairness principle, under which the ROE should be set equal to the COE, historical, current, and forecast ROEs, because they systematically exceed the cost of equity, can provide no basis for determining the appropriate authorized ROE.

[*Remainder of page intentionally left blank.*]

[27] *See, e.g.*, Company Response to STF-BAI-1-1 Attachment Coyne F at 5; Value Line, "American Elec. Pwr." at fn. E. (March 11, 2022).
[28] Cal. Pub. Util. Comm'n, Docket No. A 22-04-008 et seq., Reporters' Transcript: Virtual Proceeding at 72 (Sept. 12, 2022).
[29] *Id*. at 73.
[30] *Id*.
[31] *Id*.
[32] *Id*. at 74.
[33] M. Ellis analysis of S&P GMI data.

3. Authorized ROEs and interest rates have diverged without a corresponding increase in utilities' risk profile.

Q. WHY DO REGULATORS APPROVE AUTHORIZED ROES IN EXCESS OF UTILITIES' ACTUAL COST OF EQUITY?

A. A mathematical model called the Pólya urn can provide insight into why regulators have continued to approve authorized ROEs in excess of utilities' actual cost of capital.[34] Historical return on equity decisions can be thought of as balls in an urn. To decide on a new case, the regulator draws a ball from the urn. The ball is then replaced, along with a new ball – representing the current ROE decision – with the same value. This process of sampling-with-replacement-plus-duplication has a self-reinforcing property sometimes called the rich-get-richer or Matthew effect.

Of course, this model is over-simplified because regulators look at other information besides past authorized ROEs. The basic model can be modified to include additional balls in the urn representing new information, such as the estimated current cost of equity. Nonetheless, as long as regulators look at, much less rely on, past ROEs, changes in authorized ROEs will lag changes in the current true cost of equity.

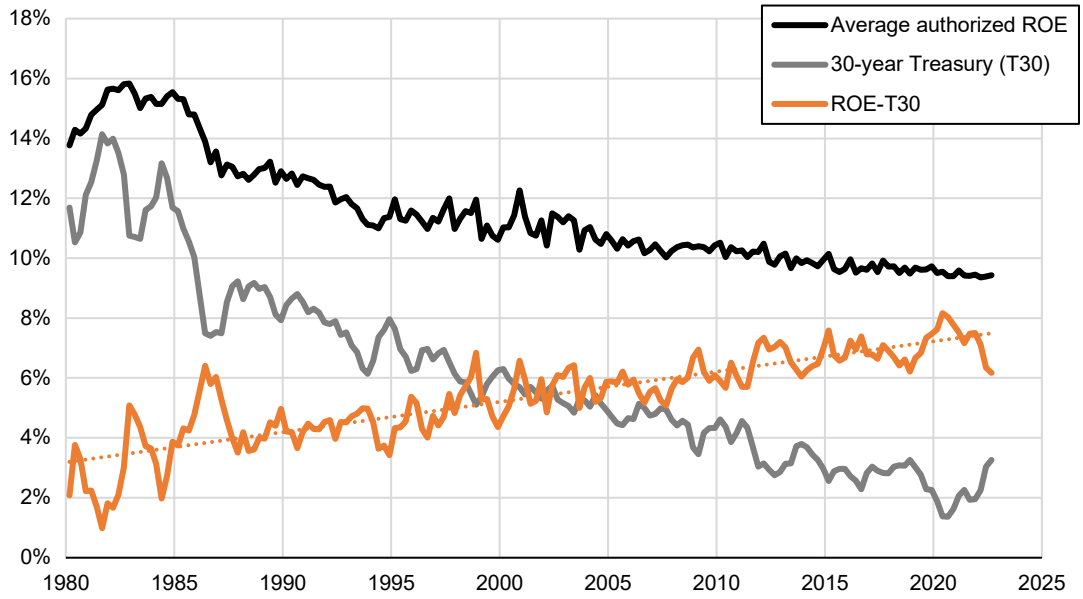
The basic utility regulatory model and risk profile have not changed significantly for decades, so the utility equity risk premium – the spread of the cost of capital over risk-free government interest rates – has remained stable. The Pólya urn model predicts that, in a market in which interest rates and, assuming a relatively stable utility equity risk premium, utilities' cost of equity have been trending downward for decades, authorized ROEs will consistently exceed the actual cost of equity, and the spread will widen over time.

The data confirm the Pólya urn model's prediction of such a widening spread between authorized ROEs and the actual cost of equity. Figure 6 shows the quarterly average authorized ROE for all U.S. utilities, the 30-year Treasury rate, and their difference. While interest rates have declined steadily since the mid-1980s, authorized ROEs have not kept pace. As a result, the ROE-Treasury spread has more than tripled, from approximately 2.3% in the early 1980s to 7.1% in the two years through September 2022. It can be estimated from the Pólya urn model

[34] *See, e.g.,* Learning Machines, *The Polya Urn Model: A simple simulation of "The Rich get Richer"* (Sept. 7, 2021) https://blog.ephorie.de/the-polya-urn-model-a-simple-simulation-of-the-rich-get-richer.

described above that, even under conservative assumptions, regulators, on average, assign no more than a 25% weight to the current cost of equity and at least 75% to recent ROEs. No evidence suggests that utilities' risk profile has systematically increased over this period, so setting ROEs higher and higher relative to utilities' actual cost of equity unnecessarily raises rates and costs to customers.

Figure 6. Quarterly average authorized ROE and 30-year Treasury rate[35]



Others have made similar observations about the growing divergence between authorized ROEs and utilities' actual COEs. In a study published in 2019 exploring potential explanations, Carnegie Mellon researchers David Rode and Paul Fischbeck concluded:[36]

[35] M. Ellis analysis of S&P GMI data (last accessed October 6, 2022); Federal Reserve Bank of St. Louis Economic Data (FRED) data (https://fred.stlouisfed.org/categories/115) (last accessed October 6, 2022).

[36] David C. Rode, Paul S. Fishchbeck, *Regulated equity returns: A puzzle*, 133 Energy Pol'y 1, 16 (2019) https://doi.org/10.1016/j.enpol.2019.110891 (emphasis in original).

> It would appear that regulators are authorizing excessive returns on equity to utility investors and that these excess returns translate into tangible profits for utility firms.
> …
> In the end, we may observe simply that what regulators *should* do, what regulators *say* they're doing, and what regulators *actually* do may be three very different things.

An analogy can be drawn between estimating the cost of equity and developing a nutrition recommendation. Looking at *actual* authorized ROEs to estimate the *required* ROE is akin to developing a calorie intake recommendation based on how much people *actually* eat, not what they need to maintain a healthy weight.

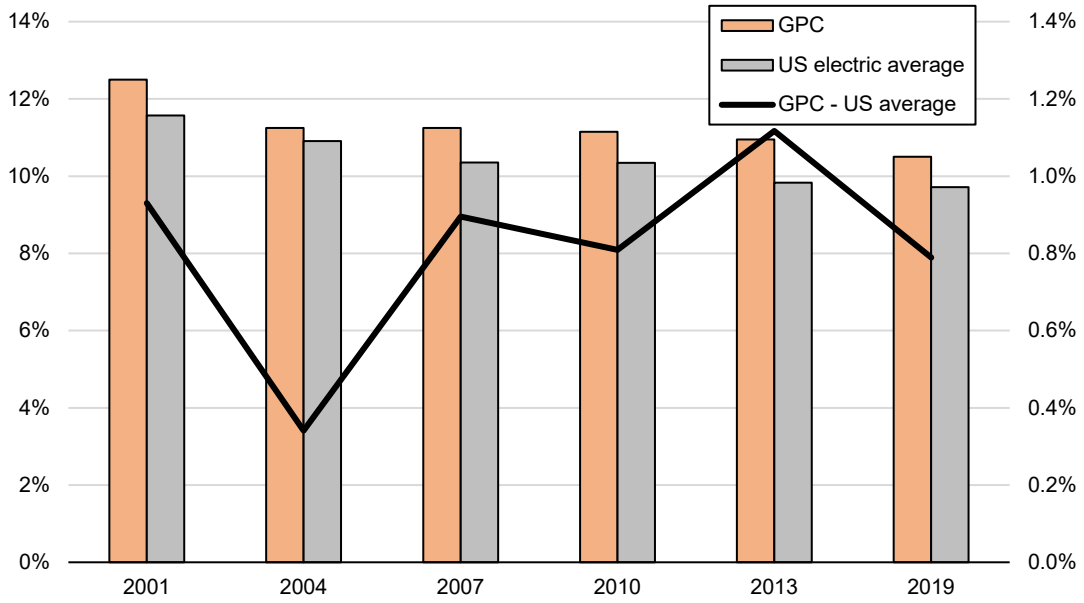
4. <u>These nationwide trends have been even more pronounced for Georgia Power.</u>

Q. DO THESE NATIONAL TRENDS APPLY TO GEORGIA POWER?

A. Yes. Authorized ROEs for Georgia Power have been set substantially higher than the national average authorized ROE for the last two decades, as seen in Figure 7, which shows the difference between GPC's authorized ROEs and the corresponding quarterly national average electric utility authorized ROE in GPC's last five cost of capital authorizations. On average, GPC's authorized ROEs have been 0.8% higher than the national electric utility average.

[*Remainder of page intentionally left blank.*]

Figure 7. GPC and average U.S. electric utility authorized ROE since 2000[37]



III. ROE AND CAPITAL STRUCTURE ARE INTERRELATED AND CANNOT BE DETERMINED SEPARATELY.

A. ROE and capital structure are interrelated through ROE's impact on cash flow.

Q. DOES THE CAPITAL STRUCTURE IMPACT CUSTOMER COSTS?

A. Yes. Capital structure refers to the share of a utility's investment that is funded by debt and equity. Because equity generally has a higher cost than debt, assuming no change in authorized ROE, a higher equity ratio tends to increase customer costs.

Q. DOES THE CAPITAL STRUCTURE IMPACT A UTILITY'S CREDIT QUALITY?

A. Yes. A primary determinant of a company's credit quality – its anticipated ability to repay its debts – is the amount of debt outstanding relative to the total amount of capital, both debt and equity, invested in the company. In general, a higher equity ratio tends to improve a utility's credit quality. Equity ratio is not the only determinant of credit quality, though. As will be explained in more detail below, credit quality is also determined by the amount of cash available to service the debt.

[37] M. Ellis analysis of S&P GMI data (last accessed October 6, 2022).

Q. PLEASE EXPLAIN THE RELATIONSHIP BETWEEN ROE AND CAPITAL STRUCTURE.

A. The testimony of Georgia Power's credit expert, Mr. Steven Fetter, reveals that ROE and capital structure are inextricably linked.

Mr. Fetter describes the importance of the ratio of funds from operations (FFO) to debt in rating agencies' assessments of utility credit quality.[38] FFO and similar cash flow metrics[39] measure the cash available to pay debt interest and principal. What he fails to clarify in his written testimony is that net income is a key component of FFO.[40] Net income, in turn, is the product of rate base, equity ratio, and ROE. Consequently, ROE and equity ratio are key determinants of FFO. During cross-examination, Mr. Fetter acknowledged the relationship between capital structure, ROE, and credit quality:

> Q. [Ms. Whitfield]: On page 14, you talk about key quantitative measures. Specifically, you reference FFO to debt and debt to EBITDA as two core financial ratios that are considered by credit agencies.
>
> A. [Mr. Fetter]: Yes.
>
> Q. Do both of those ratios include inputs that are affected by both capital structure and the return on equity?
>
> A. Well, it certainly factors in the equity/debt split because in one, the debt divides from the bottom and in the other, the debt is divided into by the EBITDA. As far as whether ROE gets factored into this, FFO – ROE ends up resulting in revenues and FFO is a certain measure and EBITDA is an earnings measure. And so ROE would impact those two items.[41]

In the context of the regulatory objective of setting a capital structure that appropriately balances customer and investor interests, as ROE increases, the amount of debt in the capital

[38] 2022 Rate Case Hr'g Tr. Vol. 1 at 799-800 (Sept. 28, 2022).

[39] Mr. Fetter refers to S&P's reliance on FFO; Moody's preferred cash flow metric is cash flow from operations (CFO). *See* GPC data request response STF-NEC-1-1 Attachment AG: Moody's Investors Service, *Georgia Power Company: Update to credit analysis* (October 13, 2021). Mr. Fetter also refers to the debt-to-EBITDA ratio. For utilities, debt-to-EBITDA is less important than FFO/D or CFO/D. For example, the only credit metric cited by Moody's in its "factors that could lead to an upgrade/downgrade" is CFO.

[40] The basic definition of FFO is net income + depreciation and amortization. *See, e.g.*, Corporate Finance Institute, *FFO – Funds from Operations: A measure of cash flow used in real estate* (Dec. 16, 2020) https://corporatefinanceinstitute.com/resources/knowledge/accounting/funds-from-operations-ffo/.

[41] 2022 Rate Case Hr'g Tr. Vol. 1 at 859 (Sept. 28, 2022).

structure can also increase while still maintaining the utility's credit quality; similarly, as the ROE declines, the equity ratio would need to increase to maintain the same creditworthiness.

Curiously, Mr. Coyne's capital structure analysis makes no reference whatsoever to any credit metrics. Instead, he bases his equity ratio recommendation, 56%, solely on a peer comparison.[42]

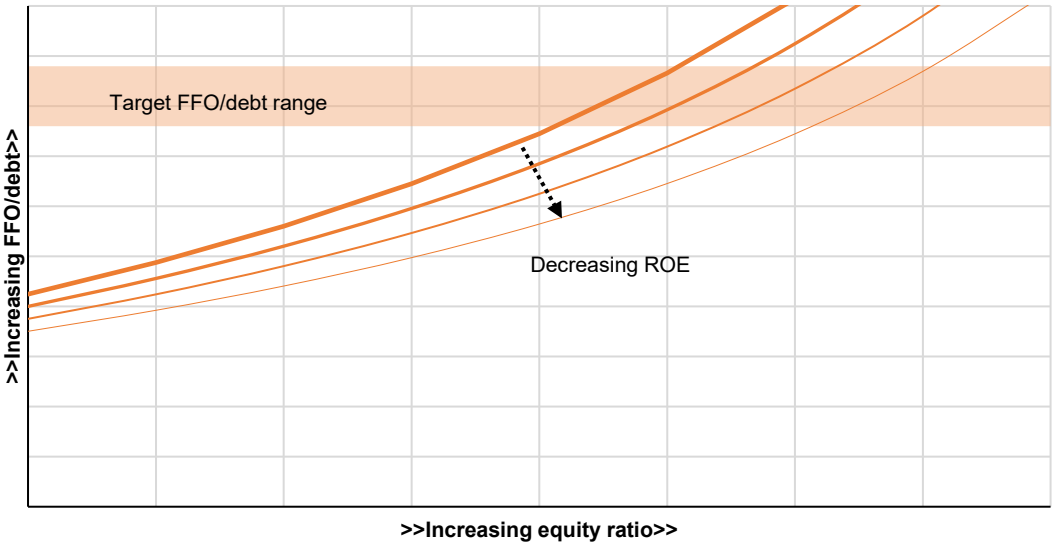
Q. HOW SHOULD A UTILITY'S CAPITAL STRUCTURE BE DETERMINED?

A. The appropriate capital structure can be determined more rigorously by using the analytical methods and metrics employed by credit rating agencies and as described by Mr. Fetter. The level of debt that can be accommodated in the capital structure will vary with ROE, because funds from operation (FFO), a key determinant of a utility's creditworthiness, is based on net income, and net income is based on ROE, for any given credit rating and its corresponding FFO/debt ratio.

Figure 8 illustrates the relationships between equity ratio, ROE, and FFO/debt. The horizontal axis is the equity ratio; the vertical axis is FFO/debt. The light orange horizontal band represents the range of FFO/debt that corresponds to the utility's desired credit rating. The dark orange arcing lines correspond to different levels of authorized ROE, with increasing line thickness representing increasing ROE. Holding the equity ratio constant, FFO/debt declines as the ROE is reduced (moving down from a thicker ROE line to a thinner line). But the decline in FFO/debt when ROE is reduced can be reversed by increasing the equity ratio (moving along the thinner ROE line up and to the right). Any number of combinations of ROE and equity ratio can meet the level of FFO/debt needed to maintain the utility's credit rating. A higher ROE requires less equity to maintain the same FFO/debt and credit rating; a lower ROE can maintain the same FFO/debt and credit rating if it is paired with a higher equity ratio.

[42] 2022 Rate Case Hr'g Tr. Vol. 1 at 672 (Sept. 28, 2022); Ex. JMC-10.

Figure 8. Illustrative relationships between equity ratio, ROE, and FFO/debt



Many observers see utilities' healthy credit ratings and low cost of debt and conclude that the best way to reduce customer costs is to increase the amount of debt in the capital structure. As explained above, current authorized ROEs far exceed utilities' actual cost of equity, so ample scope exists for the Commission to reduce Georgia Power's ROE without adversely affecting its ability to raise equity. At typical utility credit ratings, savings from a lower ROE, after grossing up for taxes, generally more than make up for the incremental cost of any additional equity required in the capital structure. For example, based on analysis of data provided in Moody's October 2021 Georgia Power credit opinion,[43] every 1.0% reduction in ROE reduces total customer costs by approximately 2.0%, *even after* accounting for the approximately 2.0% increase in equity ratio needed to maintain Georgia Power's current cash flow-to-debt ratio.[44]

Total customer costs can be reduced by decreasing the ROE while increasing the equity ratio to maintain the utility's creditworthiness (i.e., its cash flow-to-debt) because the trade-off is not one-for-one. Net income accounts for about 50% of GPC's FFO; other items, such as

[43] M. Ellis analysis of data provided in GPC data request response STF-NEC-1-1 Attachment AG: Moody's Investors Service, *Georgia Power Company: Update to credit analysis* at 10; Ex. 9; Ex. 10 (October 13, 2021).

[44] Moody's preferred cash flow metric is cash flow from operations (CFO), not FFO, and the analysis is based on Moody's CFO/debt data. The basic definition of CFO is net income + depreciation and amortization + changes in working capital, i.e., FFO + changes in working capital. *See* Corporate Finance Institute, *How to Calculate FCFE from CFO?* (Dec. 16, 2020) https://corporatefinanceinstitute.com/resources/knowledge/accounting/how-to-calculate-fcfe-from-cfo/.

depreciation and amortization, account for the rest. Consequently, a relatively large reduction in net income due to a sharp cut in ROE would reduce FFO by roughly half as much in percentage terms. In addition, ROE is grossed-up for taxes, which are not included in FFO, so the savings to customers from a lower ROE is amplified. Rather than "leverage up," i.e., reduce the equity ratio and increase debt, at current ROEs to reduce rates, it is more cost-effective to use any spare credit capacity to reduce the utility's ROE, or even to increase the equity ratio if necessary to maintain a target credit rating, than to increase debt.

Reducing ROE and increasing the equity ratio has the additional benefit of reducing debt-to-capitalization, another key metric used by rating agencies to assess credit quality.[45]

B. Georgia Power's capital structure proposal does not address the interaction between ROE and capital structure.

Q. DOES GEORGIA POWER'S CAPITAL STRUCTURE PROPOSAL TAKE INTO ACCOUNT THE INTERACTION BETWEEN ROE AND CAPITAL STRUCTURE?

A. As Mr. Coyne acknowledged during cross examination, he developed his capital structure recommendation without incorporating the interrelationship between credit quality, ROE, and equity ratio.[46] Neither Mr. Coyne nor Mr. Fetter provides any analysis or calculations demonstrating how FFO/debt interacts with ROE and how that interaction influences GPC's proposed equity ratio. As a result, how much GPC's proposed ROE and/or the equity ratio could be reduced to lower customer costs while still maintaining its desired investment-grade credit rating cannot be assessed from the testimony and data GPC has provided.

GPC's analysis should have included a detailed analysis of the relationships between ROE, equity ratio, and creditworthiness and the impact of different combinations of equity ratio and ROE on customers, lenders, and shareholders so that the Commission could examine the ability of Georgia Power to obtain sufficient capital while minimizing customer costs. The Commission should require Georgia Power to provide a detailed analysis of the relationships between ROE, equity ratio, and creditworthiness so that the Commission possesses the facts it needs to come to fact-based conclusions about Georgia Power's authorized capital structure.

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[45] *See, e.g.*, GPC data request response STF-NEC-1-1 Attachment AG: Moody's Investors Service, *Georgia Power Company: Update to credit analysis* at 3 (October 13, 2021).

[46] 2022 Rate Case Hr'g Tr. Vol. 1 at 764-66 (Sept. 28, 2022). Mr. Coyne acknowledges that his capital structure analysis did not involve any analysis of credit metrics like those cited by Mr. Fetter.

C. Georgia Power's ROE and equity ratio can be modified to reduce customer costs without adversely affecting GPC's ability to raise capital.

Q. CAN GEORGIA POWER'S PROPOSED ROE AND/OR EQUITY RATIO BE MODIFIED IN A WAY THAT REDUCES CUSTOMER RATES WHILE MAINTAINING THEIR CREDITWORTHINESS?

A. Evidence from other states suggests both the ROEs and equity ratios proposed by Georgia Power can be reduced while maintaining their creditworthiness. Figure 9 summarizes recent utility rate cases in which the authorized ROE was 9% or less. All of the equity ratios are below the 56% proposed by Georgia Power, yet all of the companies listed in Figure 9 below nonetheless also have comparable or better credit ratings, maintaining their ability to attract capital.

Figure 9. Recent authorized ROEs at or below 9%[47]

Company	State	Service type	Date	ROE (%)	Equity ratio (%)	Issuer credit rating		
						S&P	Moody's	Fitch
Orange & Rockland	NY	E/G	3/19	9.00	48.0	A-	Baa2	BBB+
Otter Tail Power	SD	E	5/19	8.75	52.9	BBB+	A3	BBB
Consolidated Edison NY	NY	E/G	1/20	8.80	48.0	A-	Baa1	BBB+
Central Maine Power	ME	E	2/20	8.25	50.0	A	A2	BBB+
NY State E&G	NY	E/G	11/20	8.80	48.0	A-	Baa1	BBB+
Rochester G&E	NY	E/G	11/20	8.80	48.0	NR	Baa1	BBB+
Corning Natural Gas	NY	G	5/21	8.80	48.0	NR	NR	NR
El Paso Electric	NM	E	6/21	9.00	49.2	NR	Baa2	BBB
Brooklyn Union Gas	NY	G	8/21	8.80	48.0	BBB+	Baa2	BBB
KeySpan Gas East	NY	G	8/21	8.80	48.0	BBB+	Baa1	BBB+
Arizona Public Service	AZ	E	11/21	8.70	54.7	BBB+	A3	BBB+
Central Hudson G&E	NY	E/G	11/21	9.00	50.0	A-	Baa1	BBB+
Commonwealth Edison	IL	E	12/21	7.36	48.7	BBB+	A3	BBB+
Ameren Illinois	IL	E	12/21	7.36	51.0	BBB+	A3	NR
Niagara Mohawk	NY	E/G	1/22	9.00	48.0	BBB+	Baa1	NR
Green Mountain Power	VT	E	8/22	8.57	50.0	A	NR	NR

[47] M. Ellis analysis of S&P GMI; Moody's (https://www moodys.com/); FitchRatings (https://www fitchratings.com/) (last accessed October 6, 2022).

IV. MR. COYNE EMPLOYS FLAWED MODELS AND ASSUMPTIONS THAT SYSTEMATICALLY PRODUCE UPWARDLY BIASED ROE ESTIMATES FOR GEORGIA POWER.

A. Mr. Coyne's methodology relies, in part, on conceptually flawed models.

Q. HOW DOES MR. COYNE ESTIMATE GEORGIA POWER'S ROE?

A. Mr. Coyne employs four different models to estimate Georgia Power's ROE: (1) constant-growth discounted cash flow model (CG DCF); (2) capital asset pricing model (CAPM); (3) risk premium analysis (RPA); and (4) expected earnings analysis (EEA). In the CG DCF, CAPM, and EEA, Mr. Coyne estimates ROEs for a number of proxy group companies and bases his recommended ROEs on the proxy group average.

Q. WHAT IS YOUR OVERALL ASSESSMENT OF MR. COYNE'S APPROACH?

A. Although two of Mr. Coyne's models, the CG DCF and CAPM, are widely used by financial professionals and utility cost of capital experts to estimate the cost of equity, his implementations are deeply flawed. They rely on unrealistic, systematically upwardly biased assumptions that invalidate their results. I describe these deficiencies in more detail in Sections IV.C and IV.E below.

The other two models, RPA and EEA, while frequently used by utility cost of capital experts, are not commonly used elsewhere in finance outside utility regulatory proceedings, and both suffer a severe, invalidating conceptual flaw.

Q. WHAT IS THE INVALIDATING CONCEPTUAL FLAW IN THE RPA AND EEA?

A. Both the RPA and EEA confuse the cost of equity and the return on equity, estimating the cost of equity from historic or forecast returns on equity. The RPA consists of a linear regression model of historical quarterly-average authorized ROEs against historical quarterly-average 30-year Treasury yield. Mr. Coyne's EEA estimates the cost of equity using ROE forecasts provided by investment research firm Value Line. The primary drivers of Value Line's ROE forecasts for the proxy group companies, in turn, are the companies' most recent authorized ROEs.[48]

Both the RPA and EEA are essentially models of past ROE decisions, not the actual cost of equity. By design, therefore, they repeat the historic overearnings arising from the excess

[48] *See, e.g.,* GPC data request response STF-BAI-1-1 Attachment Coyne F at 5: Value Line, "American Elec. Pwr." (March 11, 2022), fn. E.

ROEs authorized in the past. As explained in Section II.A above, the cost of equity and the return on equity are two entirely different concepts; there is no basis to assume that they will or should be equal. In fact, as explained in Section II.B above, authorized ROEs have diverged dramatically from utilities' actual cost of equity, as reflected in the disparity between authorized ROEs and substantially lower forecast returns for the U.S. equity market as a whole, despite the latter's higher risk; utility market-to-book ratios exceeding 1.0 for decades; and the growing divergence between average authorized ROEs and interest rates. Basing a utility's authorized ROE on historically authorized ROEs without any reference to the *actual cost of equity*, as both the RPA and EEA do, merely perpetuates these errors.

A simple calculation illustrates the EEA's conceptual flaw in equating ROE and COE. ROE is the ratio of earnings to the book value of equity. But investors cannot buy shares at book value; they must pay market value. The market value of the stocks Mr. Coyne chose to include in his peer group tend to trade at a significant premium over book value, currently an average of 2.1x. Mathematically, if investors pay more than book value for the same stream of earnings, their expected return, i.e., the cost of equity, *must* be less than the ROE calculated using the book value.[49] For companies earning just their cost of equity, the *expected* return, i.e., the cost of equity, can be estimated by dividing earnings per share (EPS) by equity book value per share (BVPS).[50] EPS can be expressed as the product of ROE and book value per share, so COE can similarly be expressed as ROE divided by the market-to-book ratio.[51] COEs so calculated are dramatically lower than Mr. Coyne's EEA estimates. For example, Value Line's forecast '25-'27 ROE for Alliant Energy Corporation is 11.0%,[52] and as of September 30, 2022, Alliant's market-to-book ratio was 2.17,[53] so investors' expected return would be

[49] A simple example illustrates why this must be true. Suppose one pays $1 for an investment that guarantees a payment of $0.10 – a return of $0.010/$1.00 = 10% – every year into perpetuity. If instead the initial cost was $2 instead of $1 for the same perpetual stream of $0.10 per year, the return would be $0.10/$2.00 = 5%. If the initial investment for the *identical* cash flow stream is higher, the return is lower.

[50] Aswath Damodaran, *Implied Equity Risk Premium: Principles & Mechanics* at 5 https://pages.stern.nyu.edu/~adamodar/pdfiles/eqnotes/webcasts/ERP/ImpliedERP.pdf (last accessed July 22, 2022).

[51] COE = EPS / stock price = ROE x book value per share / stock price = ROE / M/B.

[52] GPC data request response STF-BAI-1-1 Attachment Coyne F at 2: Value Line, "Alliant Energy" (March 11, 2022).

[53] M. Ellis analysis of S&P GMI (last accessed October 2, 2022).

only approximately 11.0/2.17 = 5.07%.[54] As Kahn explained, and Mr. Coyne has acknowledged (see Section II.B.2 above), M/B ratios greater than 1.0 imply COE is less than ROE. It is simply mathematically impossible for COE to equal ROE when M/B is not equal to 1.0, yet Mr. Coyne's RPA and EEA are nonetheless premised on this mathematical impossibility.

FERC has also recognized the flaws in the RPA and EEA. In Opinion No. 569 (November 2019), FERC rejected the use of both the RPA and EEA to estimate the cost of equity. With regard to the EEA, FERC explained "that relying on the Expected Earnings model would not satisfy the requirements of *Hope*":

> In particular, we find that the record does not support departing from our traditional use of market-based approaches to determine base ROE. Under the market-based approach, the Commission sets a utility's ROE to equal the estimated return that investors would require in order to purchase stock in the utility at its current market price. In *Hope*, the Supreme Court explained that "the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks." In order to determine this, we must analyze the returns that are earned on "investments in other enterprises having corresponding risks," but investors cannot invest in an enterprise at book value and must instead pay the prevailing market price for an enterprise's equity. As a result, the expected return on a utility's book value does not reflect "returns on investments in other enterprises" because book value does not reflect the value of any investment that is available to an investor in the market, outside of the unlikely situation in which market value and book value are exactly equal. Accordingly, *we find that relying on the Expected Earnings model would not satisfy the requirements of* Hope.[55]

FERC initially rejected the RPA for similar reasons:

[54] The EEA suffers other flaws, such as the growth adjustment to book value which does not account for new share issuance, but their effect is minor relative to the central conceptual flaw of confusing ROE and COE.

[55] Ass'n of Bus. Advocating Tariff Equity v. Midcontinent Indep. Sys. Operator, Inc., Docket No. EL14-12-003, Opinion No. 569, 169 FERC at 103 ¶ 61,129 (emphasis added) (2019).

> [T]he Risk Premium model is likely to provide a less accurate current cost of equity estimate than the DCF model or CAPM because it relies on previous ROE determinations, whose resulting ROE may not necessarily be directly determined by a market-based method, whereas the DCF and CAPM methods apply a market-based method to primary data. For example, previous ROE determinations may not involve an explicit determination as to whether an ROE is just and reasonable, but instead focused on whether to allow an ROE incentive adder or were approving a preexisting RTO-wide ROE for a new RTO member. Similarly, many previous ROE determinations used in the Risk Premium model were the product of rate case settlements. Such settlements often involve compromises on a variety of issues present in a rate case, of which the appropriate ROE is only one. Consequently, such settlements could include ROEs that are not representative of the market cost of equity because the ROEs were negotiated above or below that market cost of equity in order to form an overall settlement package, together with negotiated outcomes on other issues, that were acceptable to the parties.[56]

Although FERC subsequently reinstated the RPA in Opinion No. 569-A (May 2020), the D.C. Circuit Court of Appeals found that FERC's reinstatement of the RPA was arbitrary and capricious and has vacated Opinion 569-A.[57]

In the same California cost of capital proceeding referenced in Section II.B.2 above, Mr. Coyne acknowledged that his Risk Premium Analysis and Expected Earnings Analysis are not based on utilities' cost of equity:

[*Remainder of page intentionally left blank.*]

[56] Ass'n of Bus. Advocating Tariff Equity v. Midcontinent Indep. Sys. Operator, Inc., Docket No. EL14-12-003, Opinion No. 569, 169 FERC at 166 ¶ 61,129 (2019).

[57] Van Ness Feldman, LLP, *D.C. Circuit Court of Appeals Decision Puts FERCs Revised Method for ROE Determinations in Question* (August 10, 2022) https://www.vnf.com/dc-circuit-court-of-appeals-decision-puts-fercs-revised-method-for-roe-determinations-in-question.

Q. Isn't it true that two of your models, the risk premium analysis, RPA, and the expected earnings analysis, EEA, are not based on the utilities' actual cost of equity?

A. Yeah.

Q. The RPA is based on historical authorized ROEs; correct?

A. It's based on an historic relationship between allowed return by regulatory commissions and Treasury yields.

Q. The EEA is based on forecast ROEs; correct?

A. Yes. That's based on a forecast of ROEs.[58]

Despite his acknowledgement that ROE systematically exceeds COE, Mr. Coyne's RPA and EEA nonetheless estimate COE based on historical and forecast ROEs – in direct contradiction to the NARUC fairness principle that he has endorsed. For these reasons, the results of Mr. Coyne's EEA and RPA models should be rejected outright.

B. Mr. Coyne fails to account for differences in equity ratios among the proxy group members.

Q. HOW DOES THE EQUITY RATIO AFFECT THE COST OF EQUITY?

A. All else equal, a lower equity ratio tends to raise the cost of equity. This can be understood intuitively. The cash generated by a business is pledged to holders of its debt and equity, with debtholders having first priority. As the equity ratio declines, a smaller share of the cash goes to equity owners. To the extent there is uncertainty in the cash generated, it is amplified by a lower equity ratio, increasing the riskiness of those cash flows. This increased risk is reflected in a higher cost of equity.

The companies in Mr. Coyne's proxy group have different equity ratios, and their average, 53%,[59] is different from the 56% he proposes for Georgia Power, so their costs of equity cannot be used to estimate Georgia Power's under his proposed equity ratio. In addition, Mr. Coyne compares the equity ratios on a book basis; this is incorrect. When determining the cost of capital, the market value of equity should be used.[60]

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[58] Cal. Pub. Util. Comm'n, Docket No. A 22-04-008 et seq., Reporters' Transcript: Virtual Proceeding at 65-66 (September 12, 2022) [edited for clarity].

[59] Ex. JMC-10.

[60] *See, e.g.,* TIM KOLLER, MARC GOEDHART ET AL., VALUATION, 5TH ED. MCKINSEY & CO. 204 (2010): "Where possible, you should estimate *market* values of the elements of the current capital structure" (emphasis added).

I will revisit adjusting the COE model results for differences in equity ratios among the proxy group members, and between the proxy group average and Georgia Power, in Section V.A below.

C. Mr. Coyne's DCF model uses upwardly biased dividend yield calculations and unrealistically extrapolates analyst earnings growth forecasts into perpetuity, producing economically impossible results.

Q. WHAT IS YOUR ASSESSMENT OF MR. COYNE'S DCF MODEL?

A. Mr. Coyne uses the constant-growth version of the DCF model (CG DCF) in his analysis, with a growth rate equal to equity analysts' consensus 3-to-5-year EPS growth rate estimates. The key shortcoming in his implementation of the CG DCF is the assumption that dividends can grow at analysts' estimated EPS growth rates into perpetuity. This economically impossible assumption upwardly biases his results dramatically.

Q. PLEASE DESCRIBE THE CONSTANT-GROWTH DCF MODEL.

A. The constant-growth DCF is based on the well-known and widely used mathematical formula for the value of a growing perpetuity stream of cash flows. It assumes a single, constant rate of cash flow growth. In the constant-growth DCF model used by Mr. Coyne and many other modelers, the cash flows are expected dividends, and the perpetuity value formula can be expressed as:

$$M_0 = D_0 \frac{(1+g)}{(k-g)}$$

where M_0 refers to the current market value (stock price), D_0, the current dividend (typically four times the most recent quarterly payment), g, the forecast perpetuity growth rate, and k, the cost of equity. Rearranging terms, the cost of equity can be expressed as a function of the dividend yield, d ($\frac{M_0}{D_0}$), and growth rate:

$$k = d(1+g) + g$$

In some implementations of the CG DCF, the first-year dividend yield is calculated by multiplying the current yield by $1 + \frac{g}{2}$, instead of $1 + g$, to account for the quarterly, not

annual, payment of dividends. Mr. Coyne uses this approach.[61] Typically, the cost of equity is estimated for each member of the proxy group, with the mean or median reflecting the cost of equity for the target company. Mr. Coyne uses the mean.

The general DCF model, which can allow for varying growth rates over time, is a particularly apt representation of stock returns because its assumptions realistically reflect several key features of share prices and expected returns. First, the DCF model's perpetual cash flow stream assumption mirrors equity's claim on a firm's cash flows into perpetuity. Second, the assumption of steady growth in dividends over time reasonably reflects their much greater stability relative to other potential measures of profitability, like earnings or cash flow. Third, the resulting single discount rate into perpetuity is consistent with the no-arbitrage principle of finance. If investors expected higher (lower) returns in the future, they would impute that into the price today and bid up (down) the price accordingly, such that near-term and long-term returns roughly equilibrate.[62]

But the *constant growth* version of the DCF used by Mr. Coyne is not well-suited for estimating the cost of equity for a utility or any other stock, for two reasons. First, it is not realistic to assume that a utility will maintain its current 3-to-5-year growth rate into perpetuity. At any given time, the 3-to-5-year growth rate will deviate from its long-term trend due to any number of factors, such as weather; economic conditions; new capital projects; regulatory, tax, and other policy changes; and unforeseen events like the Covid-19 pandemic. Second, the results of the CG DCF are particularly sensitive to the perpetuity growth rate assumption. The inaccuracy introduced by assuming a relatively short-term growth rate will be sustained forever invalidates the results of Mr. Coyne's CG DCF. Mr. Coyne's use of analyst estimates, a source

[61] 2022 Rate Case Hr'g Tr. Vol. 1 at 654 (Sept. 28, 2022). It can be demonstrated mathematically that, for dividend yields as of the starting time period of the model (t_0), the common method of using four times the most recent quarterly dividend is already slightly conservative relative to a more accurate quarterly model, and this adjustment is therefore not necessary.

[62] Some equity return projections vary with forecast horizon, generally due to a valuation-reversion assumption in the model, e.g., price-to-earnings ratios returning to their long-term historical average over an initial horizon and remaining at that level afterward. *See, e.g.*, BlackRock Investment Institute, *Capital market assumptions* (2022) https://www.blackrock.com/institutions/en-us/insights/charts/capital-market-assumptions. Whether variation in expected equity returns across different forecast horizons can be estimated with any accuracy is a subject of ongoing debate among academic and investment professionals. Some forecasters assume no mean reversion in their return forecasts. *See, e.g.*, AQR Capital Management, *2014 Capital Market Assumptions for Major Asset Classes* (2014) https://www.aqr.com/Insights/Research/Alternative-Thinking/2014-Capital-Market-Assumptions-for-Major-Asset-Classes).

widely known to be upwardly biased, for his growth rate assumption further invalidates his results.

1. Mr. Coyne's dividend yield calculations use unnecessarily long trailing price histories, introducing upward bias to his estimates.

Q. HOW DOES MR. COYNE CALCULATE THE CURRENT DIVIDEND YIELD?

A. To calculate the dividend yield, Mr. Coyne divides four times the most recent quarterly dividend by the trailing average share price over 30, 90, and 180 trading days.[63]

While it is advisable to use a multi-day average of the share price to reduce the effect of any day-to-day price fluctuations that are not reflective of investors' long-term expectations, *all three* of Mr. Coyne's averages are unnecessarily long. Because share prices have a general tendency to trend upward over time, the longer the backward-looking averaging period, the lower the share price will tend to be, introducing upward bias into the dividend yield. Averaging the most recent month of data, approximately 21 trading days, better balances the competing objectives of mitigating the potential short-term volatility cited by Mr. Coyne and reflecting current investor expectations.

2. Mr. Coyne's perpetuity growth rate is based on analysts' 3-to-5-year growth rate forecasts, producing economically impossible results.

Q. HOW DOES MR. COYNE ESTIMATE EACH PEER UTILITY'S PERPETUITY GROWTH RATE?

A. While estimating the current dividend yield is fairly straightforward (although, as just explained, the potential for bias exists even there), estimating the perpetuity growth rate is more subjective. Mr. Coyne uses analysts' consensus 3-to-5-year estimated earnings-per-share (EPS) growth rate provided by Value Line, Thomson First Call (as reported by Yahoo! Finance),[64] and Zacks.[65]

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[63] 2022 Rate Case Hr'g Tr. Vol. 1 at 653-54 (Sept. 28, 2022).

[64] The providers of EPS estimates have consolidated and changed their names numerous times over the last two decades. First Call was integrated with I/B/E/S in 2000 and discontinued in 2012 (https://libguides mit.edu/c.php?g=387236&p=2626822). I/B/E/S is now provided by Refinitiv (https://www refinitiv.com/en/financial-data/company-data/ibes-estimates). Refinitiv is the source of Yahoo! Finance's estimates (https://help.yahoo.com/kb/finance-for-web/SLN2310 html).

[65] Mr. Coyne's EPS growth rate forecast sources use the following forecast horizons: Value Line, '19-'21 to '25-'27 (*see, e.g.,* STF-BAI-1-1 Attachment Coyne F); Zack's, 3 to 5 years (https://www.zacks.com/stocks/); Yahoo! Finance, next 5 years (https://finance.yahoo.com/).

The DCF is a model of *dividends*, not earnings, so it would be preferable to use explicit dividend-per-share (DPS) forecasts. While some analysts, such as Value Line, provide DPS forecasts, they are less common, so EPS forecast are typically used instead.

Q. IS IT REASONABLE TO ASSUME ANALYSTS' CONSENSUS GROWTH RATES INTO PERPETUITY IN A DCF MODEL?

A. No. There are several problems with using analysts' estimates for the perpetuity growth rate. A wealth of academic research over decades has found that analyst forecasts tend to be optimistic.[66] Several other observations and analyses demonstrate the unreasonableness of using analysts' 3-to-5-year EPS growth rate estimates for the perpetuity dividend growth rate in the constant-growth DCF model.

Q. WHAT IS YOUR FIRST OBSERVATION OR ANALYSIS THAT DEMONSTRATES THE UNREASONABLENESS OF USING ANALYSTS' 3-TO-5-YEAR EPS GROWTH RATE ESTIMATES FOR THE PERPETUITY DIVIDEND GROWTH RATE IN THE CG DCF?

A. It is economically impossible for analyst earnings growth forecasts to be sustained even for one decade, much less into perpetuity. Figure 10 compares the forecast aggregate earnings of the U.S. publicly-traded companies for which analysts provide EPS growth forecasts[67] to forecast U.S. GDP.[68] Currently, these companies' combined earnings are equal to roughly 8% of U.S. GDP. Yet if analysts' growth projections were correct, they would exceed total U.S. GDP in just six years.

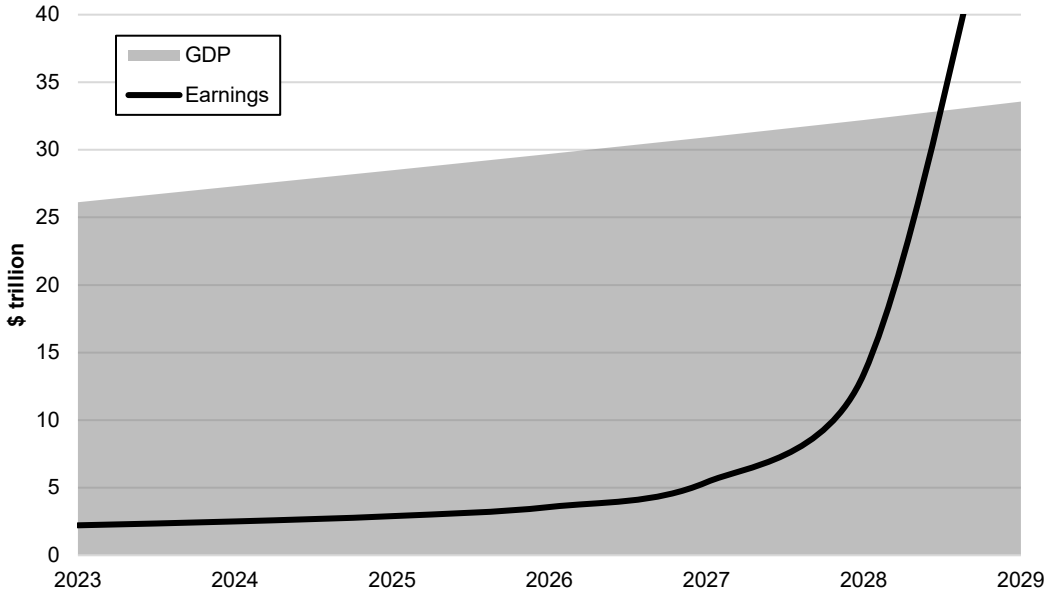
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[66] *See, e.g.,* Marc Goedhart, Rishi Raj, Abjishek Saxena, *Equity analysts: Still too bullish*, McKinsey Quarterly (Apr. 2010), https://www mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/equity-analysts-still-too-bullish. For a more recent example, *see also* Stefano Cassella, Benjamin Golez, Huseyin Gulen, Peter Kelly, *Horizon Bias and the Term Structure of Equity Returns* (Nov. 2021), https://ssrn.com/abstract=3328970.

[67] M. Ellis analysis of S&P GMI data for 1,780 U.S. stocks. Excludes companies with growth rates less than -100%.

[68] Sum of the forecasts for each company. Analysts' EPS estimates and growth rates from S&P GMI as of June 30, 2022. GDP forecast is average of Congressional Budget Office, *The 2022 Long-Term Budget Outlook* (July 2022), https://www.cbo.gov/system/files/2022-07/57054-2022-07-LTBO.xlsx.; Energy Info. Admin., *Annual Energy Outlook 2022 Macroeconomic Indicators* (March 2022), Table 20 https://www.eia.gov/outlooks/aeo/excel/aeotab20.xlsx; Soc. Sec. Admin., *The 2022 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds* (June 2022), Supplemental Single-Year Tables, https://www.ssa.gov/OACT/TR/2022/SingleYearTRTables_TR2022.xlsx.

Figure 10. U.S. stock market forecast earnings vs. forecast GDP



The Research Foundation of CFA Institute has made a similar critique of projecting analysts' estimates beyond their forecast horizon:[69]

> Consensus long-term earnings growth estimates routinely exceed sustainable GDP growth. The current consensus growth rate for earnings on the S&P 500, according to the Zacks Investment Research survey, is 10 percent, which, if we assume a consensus inflation expectation of 2-3 percent, corresponds to 7-8 percent real growth. Real earnings growth of 8 percent is six times the real earnings growth of the past century, however, and three times the consensus long-term GDP growth rate. This growth is not possible.

Mr. Coyne himself has acknowledged the potential unreasonableness of assuming analyst growth rates into perpetuity in his CG DCF model, testifying in a recent rate case, "the Multi-Stage DCF can be used when there is concern that short-term growth rates may not be sustainable over the longer-term."[70]

[69] Robert D. Arnott, *Equity Risk Premium Myths: Rethinking the Equity Risk Premium*, 2011(4) CFA Institute 97 (2011) https://bit.ly/3TjGiig.

[70] New Brunswick Energy and Utilities Board Docket No. 491, Liberty Utilities (Gas New Brunswick), *Prepared Direct Testimony: James M. Coyne*, at 39 (March 2021).

Q. WHAT IS YOUR SECOND OBSERVATION OR ANALYSIS THAT DEMONSTRATES THE UNREASONABLENESS OF USING ANALYSTS' 3-TO-5-YEAR EPS GROWTH RATE ESTIMATES FOR THE PERPETUITY DIVIDEND GROWTH RATE IN THE CG DCF?

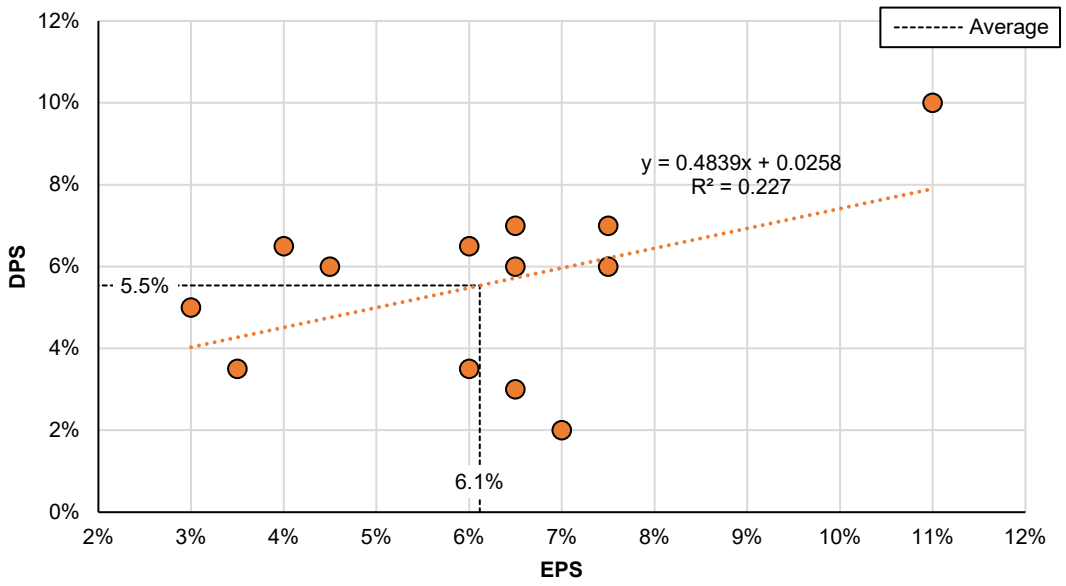
A. Mr. Coyne is correct that "[o]ver the long term … dividend growth can only be sustained by earnings growth,"[71] and EPS and DPS do tend to have similar growth rates over extended, multi-decade periods of time. Nonetheless, EPS growth rates are poor proxies for DPS growth over the 3-to-5-year horizon of analysts' EPS forecasts. This is observed in both forecast and historical data.

Few analysts provide both DPS and EPS projections, but Value Line, one source of Mr. Coyne's growth estimates, does provide both EPS and DPS growth forecasts, and its EPS and DPS projections vary considerably. Figure 11 compares Value Line's forecast EPS and DPS growth rates for the members of Mr. Coyne's proxy group. On average, the DPS growth rate is lower, 5.5% vs 6.1% for EPS; EPS overestimates expected dividend growth, introducing upward bias into Mr. Coyne's DCF results. More importantly, as shown in Figure 11, a cross-plot of Value Line's EPS and DPS growth rate estimates, the correlation between the two sets of numbers is low (R^2 coefficient of 0.23).

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[71] 2022 Rate Case Hr'g Tr. Vol. 1 at 654-55.

Figure 11. Value Line forecast EPS and DPS forecast growth rates[72]

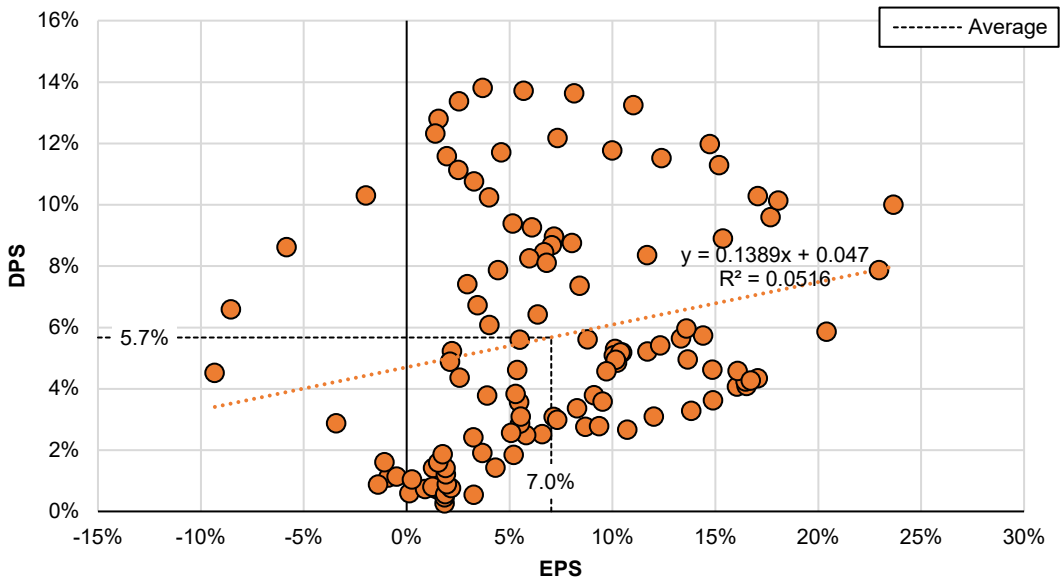


Historically, the variation between EPS and DPS is even greater. Figure 12 compares historical 5-year EPS and DPS growth rates for the S&P 500 from January 1988 through March 2022. Historically, average EPS growth has also been greater than DPS, 7.0% vs. 5.7%, and the correlation between EPS and DPS is even lower than for the forecast growth – R^2 coefficient of just 0.05.

[*Remainder of page intentionally left blank.*]

[72] M. Ellis analysis of data provided in GPC data request response STF-BAI-1-1 Attachment Coyne F: (Value Line reports for each member of Mr. Coyne's proxy group).

Figure 12. Historical S&P 500 EPS and DPS 5-year growth rates[73]



In both the historical and projected data, the average growth rate for EPS is higher than for DPS, seemingly contradicting Mr. Coyne's assertion that "earnings per share [and] dividends per share … grow at the same constant rate."[74] But EPS and DPS do, in fact, grow at roughly the same *compound* rate over the *long term*.[75] Nonetheless, analysts' 3-to-5-year forecast horizons are not long-term, and simply because earnings are more volatile than dividends, the figure reported for EPS growth over analysts' 3-to-5-year forecast period will tend to be higher than DPS, as both the historical growth rates in Figure 12 and the forecast growth rates in Figure 11 demonstrate.

This is due to the mathematical relationship between compound, or *geometric*, and *arithmetic* average growth rates.[76] An illustrative example demonstrates the principle. Suppose both EPS and DPS both grow at a compound average growth rate (CAGR) of 5% over 25 years, but they take different paths to get there. DPS grows at the same 5% every year, or

[73] M. Ellis analysis of data from S&P Dow Jones Indices, *S&P 500 Earning and Estimate Report* (September 30, 2022) https://www.spglobal.com/spdji/en/documents/additional-material/sp-500-eps-est.xlsx.

[74] 2022 Rate Case Hr'g Tr. Vol. 1 at 654.

[75] "Compound" refers to the single, constant growth rate at which an initial value would need to grow to reach a final value. Importantly, the initial value could follow any number of different growth paths to achieve the same compound growth rate. EPS and DPS can have the same compound growth rate over an extended, multi-decade period, but have very different growth rates over the intervening 5-year periods.

[76] *See, e.g.,* Educba, *Difference Between Geometric vs. Arithmetic Mean*, https://www.educba.com/geometric-mean-vs-arithmetic-mean/ (last accessed Oct. 20, 2022).

27.6% over each 5-year period. Annual EPS growth varies between -5% and +15% over each 5-year period, say 15% in the first 5 years, followed by -5%, 0%, 6%, and 10% over the next four 5-year periods. The average of the DPS growth rates over each of the 5-year periods is 5.0%, but the average of the EPS growth rates is 5.2%. The effect is relatively small, but it is another source of upward bias introduced by using EPS growth rates as a proxy for DPS growth.

For the two reasons observed in both forecast and historical data – overestimation on average and low correlation – EPS is a poor proxy for DPS, and it is inappropriate to assume that analysts' relatively short-term EPS growth estimates reasonably reflect investors' DPS growth expectations into perpetuity.

Q. WHAT IS YOUR THIRD OBSERVATION OR ANALYSIS THAT DEMONSTRATES THE UNREASONABLENESS OF USING ANALYSTS' 3-TO-5-YEAR EPS GROWTH RATE ESTIMATES FOR THE PERPETUITY DIVIDEND GROWTH RATE IN THE CG DCF?

A. EPS growth rate horizons are likely not compatible with the CG DCF's forecast horizon. The starting time periods of analysts' estimates are not specified with precision. S&P explains of its estimates:[77]

> Long Term Growth Rate (LTG) is a compound annual growth rate based on current and projected EPS values provided directly by the analysts. … Most analysts define LTG as an estimated average rate of earnings growth for the next 3-5 years. The exact time frame differs from broker to broker. Since the analysts providing LTG may differ from the analysts providing fiscal year estimates and the variation in time periods of 3-5 years, it is not possible to reconcile LTG with fiscal year estimates.

The starting points for Yahoo! Finance's estimates are similarly unknown:[78]

[77] *See* YCharts Financial Glossary, *Long Term Growth Rate*, https://ycharts.com/glossary/terms/eps_est_long_term_growth (last accessed July 22, 2022) (reporting estimates provided by S&P).

[78] *See* Stockopedia Financial Ratio Glossary, *Long Term Growth Forecast*, https://www.stockopedia.com/ratios/long-term-growth-forecast-5107/ (last accessed July 22, 2022) (Referring to Reuters, now Refinitiv, the source of Yahoo! Finance's estimates). *See also,* Yahoo!, *Exchanges and data providers on Yahoo Finance*, https://help.yahoo.com/kb/finance-for-web/SLN2310 html.

> [A]s most analysts do not provide the basis of the calculation of their growth rates, the estimates collected are assumed to include a combination of past and future years with at least one future period included, and are calculated on a compounded annual growth rate (CAGR) basis.

Value Line *does* specify the starting point and forecast horizon of its estimates. Nonetheless, Value Line's growth rate forecast horizons are virtually certain not to be consistent with the dividend yield used in the CG DCF, i.e., the end of the last trading day of the share price averaging period. The starting period for the Value Line growth estimates used by Mr. Coyne, for example, is '19-'21, the midpoint of which, June 2020, is almost three years before the first dividend payment in his DCF model.[79]

EPS can vary significantly from one year to the next, typically much more than the annual variation in DPS. Without knowing the forecast period, it is not possible to determine whether the estimate reflects the growth rate over the three to five years, much less the rate into perpetuity, from the starting point of the CG DCF. Following a year of poor performance, for example, expected growth would be elevated, potentially significantly above what could be sustained long-term.

The incompatibility of the growth estimates can be clearly observed in the data itself. For example, Value Line's growth rate for Edison International is reported as "not meaningful" because the company reported a loss in 2018, the first year of its growth forecast period. Yahoo! Finance's and Zacks's growth rates are both positive, presumably because the starting point of their growth rate forecasts are years in which Edison International reported a profit.[80]

[79] Mr. Coyne calculates average stock prices through April 30, 2022; *see* Ex. JMC-4, fn. 2. The CG DCF assumes annual dividend payments start one year later, or April 30, 2023.
[80] Ex. JMC-4.

Q. WHAT IS YOUR FOURTH OBSERVATION OR ANALYSIS THAT DEMONSTRATES THE UNREASONABLENESS OF USING ANALYSTS' 3-TO-5-YEAR EPS GROWTH RATE ESTIMATES FOR THE PERPETUITY DIVIDEND GROWTH RATE IN THE CG DCF?

A. The expected returns produced by a CG DCF model assuming DPS grows into perpetuity at analysts' 3-to-5-year EPS growth rates are inconsistent with analysts' own expected return forecasts.

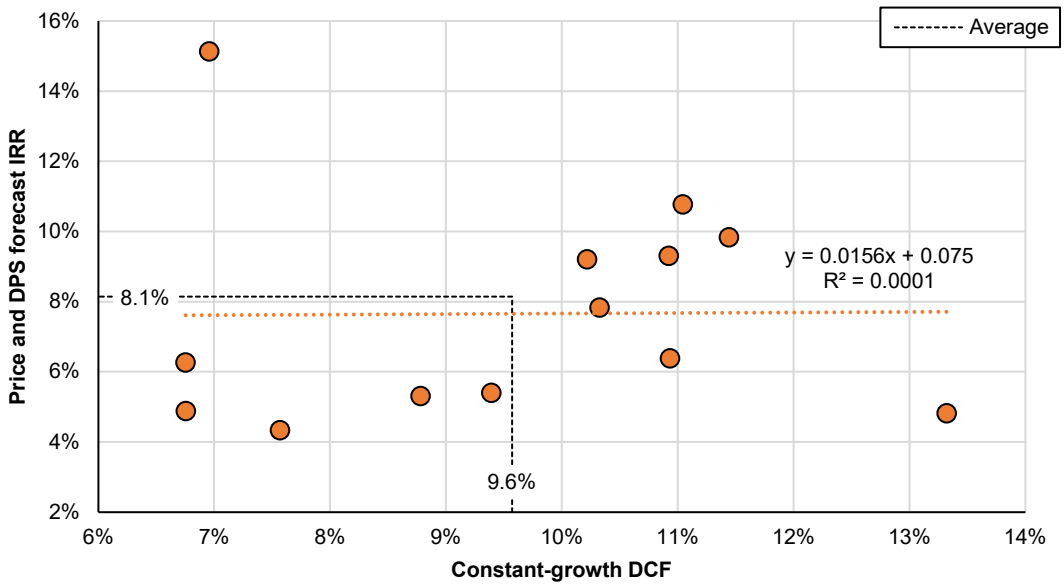
In addition to their EPS and DPS growth rates, Value Line publishes a variety of other forecasts, including for share prices.[81] These forecasts can be used to estimate Value Line's own expected return for each company, which can be compared to the CG DCF results using Value Line's dividend yield and EPS growth rate forecasts in Mr. Coyne's model.[82] Figure 13 compares the results of the two models. The horizontal axis is the COE estimated using Mr. Coyne CG DCF and Value Line's yield and EPS growth rate assumptions; the vertical axis is COE implied by Value Line's own dividend and price forecasts.

On average, the CG DCF COE estimates (9.6%) are significantly higher than the COE implied by Value Line's price and dividend forecast (8.1%). More importantly, there is virtually no correlation between the two sets of model results (R^2 = 0.0). A CG DCF COE based on Value Line's dividend yield and EPS growth bears almost no resemblance to the COE implied in its own dividend and price forecast. The analysts that provide 3-to-5-year EPS growth forecasts clearly do not assume those rates apply to dividends or will be sustained into perpetuity, as Mr. Coyne does. For Mr. Coyne's proxy group, Value Line assumes DPS will grow more slowly, on average, than EPS beyond its forecast horizon.

[81] Value Line reports do not include actual share price forecasts, but EPS and price-earnings multiple (P/E) forecasts. Price can be calculated by multiplying these two figures: P = EPS x P/E. *See* GPC data request response STF-BAI-1-1 Attachment Coyne F (Value Line reports for each member of Mr. Coyne's proxy group).

[82] A simple DCF model can be constructed from Value Line's most recent annual average price (investment), dividend forecast (with missing years interpolated assuming a constant growth rate), and'25-'27 price forecast (exit value). The COE is the internal rate of return (IRR) of this cash flow stream.

Figure 13. COE based on Value Line CG DCF and price and DPS forecast IRR[83]



Q. WHAT IS YOUR FIFTH OBSERVATION OR ANALYSIS THAT DEMONSTRATES THE UNREASONABLENESS OF USING ANALYSTS' 3-TO-5-YEAR EPS GROWTH RATE ESTIMATES FOR THE PERPETUITY DIVIDEND GROWTH RATE IN THE CG DCF?

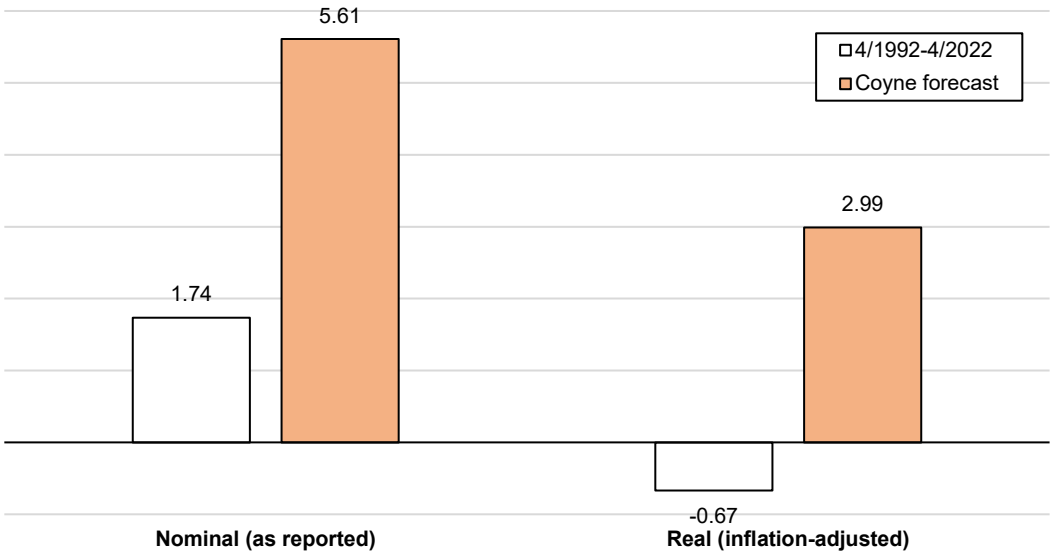
A. Analyst earnings (and, by assumption, dividend) growth forecasts tend to be higher than the companies' long-term historical results, additional evidence that analysts' 3-to-5-year growth forecasts are not sustainable into perpetuity and are therefore unreasonable assumptions in a CG DCF model.

Figure 14 compares the proxy group average growth forecasts to their historical 30-year (1992-2022) DPS compound annual growth rates (CAGR). On average, forecast rates are approximately 4% higher, in both nominal (as reported) and real (inflation-adjusted) terms, than the historical average. The ~4% difference between historical and forecast growth highlights the unreasonableness of assuming analysts' estimates into perpetuity.[84]

[83] M. Ellis analysis of data provided in GPC data request response STF-BAI-1-1 Attachment Coyne F (Value Line reports for each member of Mr. Coyne's proxy group).

[84] Forecast growth rates are adjusted by the monthly average Treasury-TIPS spread for April 2022, 2.54%, to correspond with Mr. Coyne's analysis.

Figure 14. Proxy group average historical and Coyne forecast dividend per share growth[85]
Percent



Q. GIVEN THE NUMEROUS SHORTCOMINGS OF ANALYSTS' FORECASTS, SHOULD THEY BE USED AT ALL IN DCF MODELS?

A. Discounted cash flow models can be a robust approach to estimating expected returns and are widely used throughout finance. The key shortcoming of the constant-growth version of the DCF model – assuming a relatively short-term growth rate into perpetuity – can be easily remedied by assuming that analysts' estimated growth rates apply only for a limited period, after which they converge toward a market- or sector-average terminal growth rate in a multi-stage DCF model (MS DCF), which I describe in more detail in IV.D below. Despite the various deficiencies in analysts' estimates even in the short-term, they are viewed as the best available estimates of near-term investor expectations. That said, relatively little weight should be placed on them in estimating the cost of equity, and the MS DCF model can weight them more appropriately.

[85] M. Ellis analysis of S&P GMI and U.S. Bureau of Labor Statistics (BLS) data (last accessed October 2, 2022); Ex. JMC-4.

3. Mr. Coyne's flawed DCF results should be disregarded.

Q. WHAT IS YOUR CONCLUSION REGARDING MR. COYNE'S DCF RESULTS?

A. Mr. Coyne's DCF model results should be disregarded completely. While, in principle, a constant-growth DCF model could be used to estimate the cost of equity, Mr. Coyne's implementation is deeply flawed. Its dividend yield calculations use excessively long historical price data series, introducing upward bias into the results. More critically, Mr. Coyne's DCF unrealistically assumes analysts' EPS growth estimates are valid for forecasting dividends into perpetuity. Several analyses demonstrate the invalidity of this assumption: the economic impossibility of sustaining EPS growth forecasts even for one decade, much less into perpetuity; the low correlation between analysts' EPS and DPS growth forecasts; the unknown starting period for analyst growth forecasts and therefore likely inconsistency with the DCF model's starting period; the inconsistency between the CG DCF results and analysts' own implied expected return estimates; and the wide disparity between analyst forecasts and utilities' long-term historical DPS growth rates.

D. The Multi-Stage DCF should be used instead of the CG DCF because it allows more realistic cash flow projections, yielding more accurate results.

1. The multi-stage DCF model enhances the CG DCF by allowing different dividend growth rates over time.

Q. WHAT IS THE MULTI-STAGE DCF MODEL?

A. The multi-stage DCF model (MS DCF) enhances the CG DCF by allowing different dividend growth rates over time. As we saw previously, analysts' estimated 3-to-5-year growth rates are too high to be sustained in perpetuity, and may be biased. But analyst estimates should not be ignored completely. Analysts' estimated 3-to-5 year growth rates provide useful information about the relative expected growth across companies. Over the long term though, it is reasonable to assume investors expect growth rates, in real terms, to revert to their long-term historical trends. The MS DCF explicitly models different growth rates over time.

The MS DCF can incorporate any number of stages. For equity valuation, a three-stage model is commonly used, in which the initial stage uses analysts' estimates over their 3-to-5-year forecast horizon, and the terminal stage uses the long-term real historical growth rate plus current long-term inflation expectations. In between lies a transition phase, typically 5 to 15

years, in which the growth rate is the simple average of the initial and terminal rates. The MS DCF model can be expressed as:

$$1 = d\frac{1+g_1}{k-g_1}\left(1-\left(\frac{1+g_1}{1+k}\right)^{t_1}\right) + d\left(\frac{1+g_1}{1+k}\right)^{t_1}\frac{1+g_2}{k-g_2}\left(1-\left(\frac{1+g_2}{1+k}\right)^{t_2}\right) + d\left(\frac{1+g_1}{1+k}\right)^{t_1}\left(\frac{1+g_2}{1+k}\right)^{t_2}\frac{1+g_3}{k-g_3}$$

where d is the current dividend yield; g_1, g_2, and g_3 are the initial, transition, and terminal growth rates, respectively (where $g_2 = \sqrt{(1+g_1)(1+g_3)} - 1$);[86] t_1 and t_2 are the initial and transition stage durations; and k is the cost of equity such that the equation is true. Substantial precedent exists for the MS DCF model, in both its two- and three-stage forms, in both corporate finance and regulatory contexts.[87]

In my implementation of the MS DCF, I assume an initial growth stage of three years – the low end of analysts' EPS growth rate forecast horizon, to mitigate the effect of their upward bias – and a 10-year transition. To account for the quarterly distribution of dividends, I convert the reported rates to quarterly and multiply the number of periods in the initial and transition phases by 4.[88] The dividend yield is the most recent quarterly dividend divided by the average price over December 2021.

2. The MS DCF's initial growth rate can be estimated from analysts' EPS growth forecasts.

Q. HOW DO YOU ESTIMATE THE INITIAL GROWTH RATE FOR THE MS DCF?

A. I use an average of analysts' EPS growth forecasts from S&P Global Market Intelligence (S&P GMI), Yahoo! Finance, and Zacks.

3. The MS DCF's terminal growth rate can be estimated from expected inflation, based on utilities' long-term historical dividend growth.

Q. HOW DO YOU ESTIMATE THE TERMINAL GROWTH RATE FOR THE MS DCF?

A. The terminal growth rate is intended to reflect a sector-wide dividend growth rate toward which all stocks in the peer group are expected to converge over the long term. Figure 15 shows real

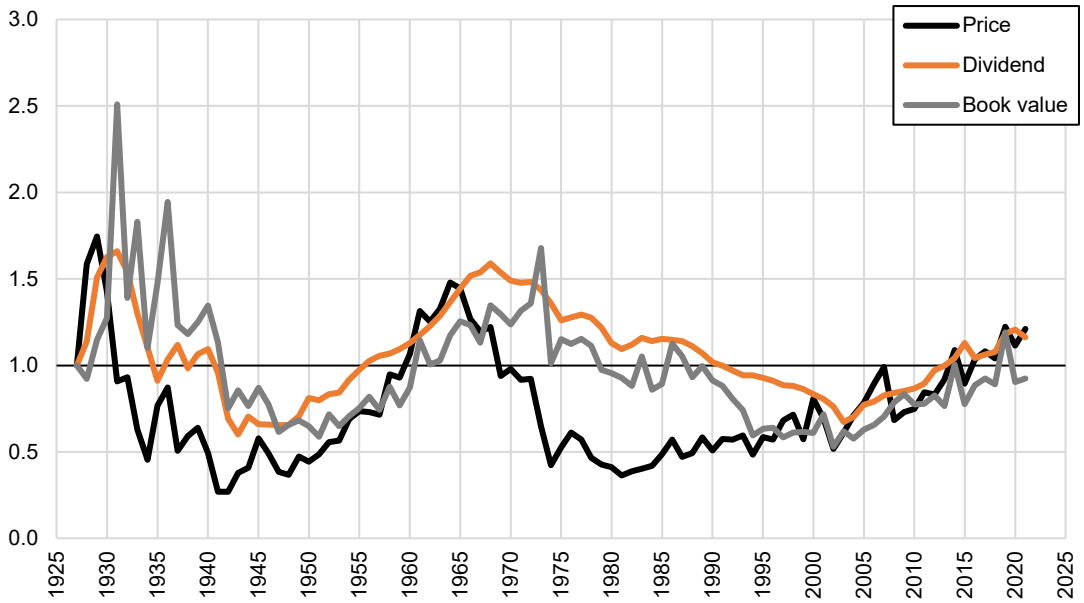
[86] The geometric mean of g_1 and g_3 is used to ensure consistency between annual and quarterly versions of the model.

[87] *See, e.g.,* RICHARD BREALEY, STEWART MYERS, FRANKLIN ALLEN, PRINCIPLES OF CORPORATE FINANCE, MCGRAW HILL/IRWIN 10TH ED. at 83-88 (2010).; Surface Transportation Board, *Use of a multi-stage discounted cash flow model in determining the railroad industry's cost of capital*, 73 Fed. Reg. 47642, 47642-47644 (2008) https://bit.ly/3s9fIMT.

[88] All rates are converted from annual (r_a) to quarterly (r_q) using the formula: $r_q = (1+r_a)^{\frac{1}{4}} - 1$.

utility-sector dividend, price, and book value per share from 1927 through 2020. While there have been periods of growth and decline, the long-term trend for both has been in line with inflation for over 90 years. Based on this long-term history, the terminal growth rate in the MS DCF for the GPC proxy group is assumed to be equal to long-term inflation.

Figure 15. Utility sector real dividend and book value per share, 1927-2021[89]
1927=1.0



For the market as a whole, long-term real DPS growth has tracked GDP per capita, about 1.9% per year.[90] At any given time, some sectors grow faster, some slower. The technology and healthcare industries, for example, have sustained DPS growth rates higher than the market average for decades. Utilities are a mature industry, though, and end-use demand for electricity, gas, and water has grown more slowly than GDP for decades, so it is not unreasonable for utility companies' per-share dividend growth to lag the market as whole. The long-term track record of essentially zero real dividend growth further highlights the unreasonableness of Mr. Coyne's assumption that analyst growth forecasts can be sustained into perpetuity.

[89] M. Ellis analysis of FDL and BLS data (both last accessed October 2, 2022).
[90] *See, e.g.,* ROGER IBBOTSON, JAMES HARRINGTON, STOCKS, BONDS, BILLS, AND INFLATION 2021 SUMMARY EDITION, CFA INSTITUTE RESEARCH FOUNDATION BOOKS at 157-60 (2021) (analysis is for total payout to account for the effect of net stock repurchases).

Q. HOW DO YOU ESTIMATE EXPECTED LONG-TERM INFLATION?

A. For expected long-term inflation, I use Treasury-TIPS spreads. TIPS are Treasury Inflation-Protected Securities, which provide investors a return equivalent to inflation plus the quoted TIPS yield. The difference in yield between Treasurys and TIPS of equal maturity is a current measure of the market's forward-looking inflation expectation over the life of the bonds.

The MS DCF uses inflation for the terminal, not initial or transition, growth rate, so inflation into perpetuity is estimated at the end of the transition phase, not from today. I use the expected inflation, i_{lt}, rate over the period from 20 to 30 years from now, as implied by the difference in the 30-year and 20-year Treasury-TIPS spreads:

$$i_{lt} = \left(\frac{(1+i_{30})^{30}}{(1+i_{20})^{20}}\right)^{\frac{1}{10}} - 1$$

Using average Treasury yields for the month of September 2022, the long-term inflation estimate is 1.45%.[91]

4. The MS DCF produces COE estimates substantially lower than Mr. Coyne's CG DCF.

Q. WHAT ARE YOUR MS DCF COE RESULTS?

A. Figure 16 summarizes the MS DCF results for the GPC proxy group. The average COE for the GPC proxy group is 6.0% – substantially lower than Mr. Coyne's corresponding CG DCF average results of 8%-10%.[92]

[*Remainder of page intentionally left blank.*]

[91] M. Ellis analysis of FRED data (last accessed October 2, 2022).
[92] 2022 Rate Case Hr'g Tr. Vol. 1 at 656 (Sept. 28, 2022).

Figure 16. GPC proxy group multi-stage discounted cash flow COE[93]
As of September 2022

Utility	Price	DPS	Yield %	Initial growth rate (%) S&P GMI	Yahoo!	Zacks	Average	COE %
ALLETE	57.42	2.60	4.53	6.11	8.70	8.15	7.65	8.25
Alliant	60.19	1.71	2.84	6.03	6.30	6.16	6.16	5.50
Ameren	90.72	2.36	2.60	7.25	6.37	7.20	6.94	5.36
AEP	99.21	3.12	3.14	6.25	6.25	6.11	6.20	5.92
Duke	104.95	4.02	3.83	5.64	5.62	6.09	5.78	6.70
Edison Int'l	66.00	2.80	4.24	4.15	4.35	2.97	3.82	6.61
Entergy	113.82	4.04	3.55	6.13	6.19	6.76	6.36	6.50
Evergy	66.72	2.29	3.43	6.37	3.71	5.24	5.11	6.00
Hawaiian Electric	38.13	1.40	3.67	5.28	1.30	2.57	3.05	5.73
IDACORP	107.90	3.00	2.78	4.62	2.70	2.67	3.33	4.78
NextEra	85.43	1.70	1.99	9.88	9.35	9.66	9.63	5.03
OGE	40.35	1.64	4.06	1.50	1.90	3.47	2.29	5.96
Portland General	49.99	1.81	3.62	4.25	3.16	4.63	4.01	5.93
Xcel	72.91	1.95	2.67	6.12	7.04	6.43	6.53	5.37
Mean			**3.36**				**5.49**	**5.97**

Q. DO YOU USE THE MS DCF ELSEWHERE IN YOUR ANALYSIS?

A. Yes. I use it as one of two methods to estimate the market risk premium for the CAPM.

E. Mr. Coyne makes unrealistic, upwardly biased assumptions for all three inputs into his CAPM.

Q. WHAT IS THE CAPITAL ASSET PRICING MODEL?

A. Mr. Coyne's analysis incorporates another well-known COE model, the capital asset pricing model (CAPM). It estimates the cost of equity, k, from the formula:

$$k = r_f + \beta(r_m - r_f)$$

where r_f is the risk-free rate (typically a long-term U.S. Treasury), r_m is the expected return on the market, and β is a measure of risk of the company in question relative to the market. The market risk premium (MRP), the difference between the market return and the risk-free rate, $r_m - r_f$, reflects the additional return investors require as compensation for taking on equity market risk. The CAPM is a simple model of the fundamental financial risk-reward trade-off: investors demand higher returns as risk increases.

[93] S&P GMI; Refinitiv via Yahoo! Finance (https://finance.yahoo.com/); Zacks (https://www.zacks.com/) (last accessed October 2, 2022).

1. The source of Mr. Coyne's risk-free rate assumption has a long and widely known track record of upwardly biased interest rate forecasts.

Q. WHAT RISK-FREE RATE DOES MR. COYNE USE IN HIS CAPM?

A. Mr. Coyne uses the 30-year Treasury (T30). Because the models estimate the expected return on equity, which is a claim on cash flows into perpetuity, the longest-term rate available should be used. The 30-year Treasury is the longest-term risk-free rate, so the T30 is an appropriate term. Mr. Coyne calculates his CAPM COE estimates using both recent historical average and forecast Treasury rates.

Q. DO YOU HAVE ANY CONCERNS WITH MR. COYNE'S RISK-FREE RATE ESTIMATES?

A. Yes, I have two concerns. First, as with the average price calculation for the dividend yield in his DCF model, Mr. Coyne's historical T30 averaging period, 30 days, is too long. Curiously, Mr. Coyne provides no explanation for the use of different averaging periods in the two different models. One month of trading data, typically 20-22 days, is sufficient. Nonetheless, the difference in trailing averaging periods for interest rates generally does not introduce any bias in the results because, unlike stock prices, which tend to exhibit an upward trend over time, daily movements interest rates are random.

Q. WHAT IS YOUR SECOND CONCERN WITH MR. COYNE'S RISK-FREE RATE ESTIMATES?

A. My second concern involves his use of a forecast rate. Using a forecast rate creates inconsistencies with the time horizon of the DCF, which is estimated as of today (or, more precisely, as of the end of the trailing price averaging period). The mathematical formula for the present value of a periodic time series upon which the DCF is based discounts the stream of future cash flows to a "time zero" one period before the first payment. The resulting discount rate is as of that time zero. The first payment in the DCF model is typically assumed to occur one time step from today; therefore, the rate determined by the DCF model is as of today. Using an interest rate expected at some future date in the CAPM produces a COE as of that future date, not today, and that COE is not directly comparable to the DCF's COE.

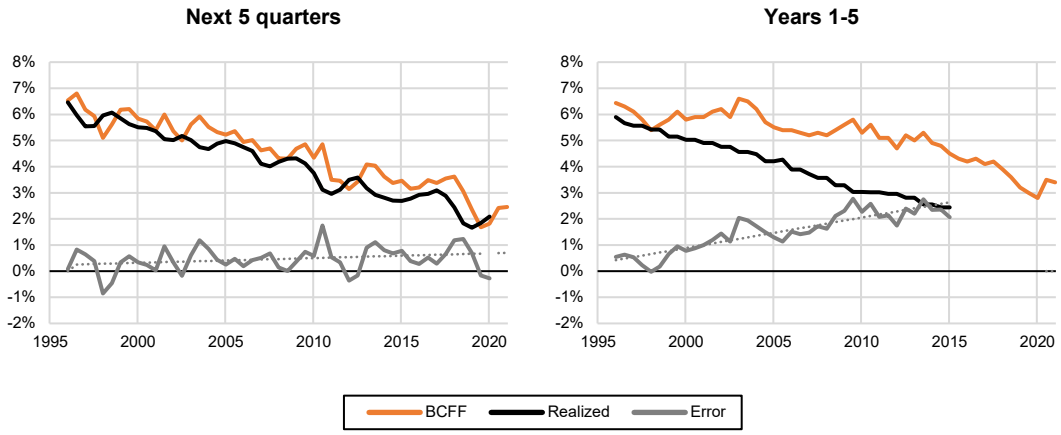
Ignoring the consistency concern, even if we did want to use a forecast rate, in general, commonly available interest rate forecasts are no better predictors of future interest rates than the current market rate. Most importantly, though, I am particularly concerned about Mr.

Coyne's chosen source for his interest rate forecast, Blue Chip Financial Forecasts (BCFF). BCFF's 30-year Treasury forecast has an exceptionally poor track record.

Q. HOW ACCURATE HAVE THE BLUE CHIP FINANCIAL FORECASTS 30-YEAR TREASURY FORECASTS BEEN IN THE PAST/HISTORICALLY?

A. BCFF has a multi-decade track record of producing systematically upwardly-biased forecasts, and the errors have only increased over time. Figure 17 compares the BCFF forecasts used by Mr. Coyne – the average of the next five quarters and years one to five – to their corresponding future average realized rates, going back to BCFF's first long-range forecast in December 1996. The chart shows that BCFF's 30-year Treasury forecasts have consistently overestimated future rates, and the forecast errors have tended to increase over time.

Figure 17. BCFF 30-year Treasury forecast vs. average realized rate[94]



Q. HOW DOES MR. COYNE JUSTIFY HIS USE OF FORECASTS WITH SUCH A POOR TRACK RECORD?

A. Mr. Coyne cites a Massachusetts regulatory decision to argue that "Blue Chip Financial Forecasts is widely relied on by investors and provides a useful proxy for investor expectations for the risk-free rate."[95] BCFF may be relied upon by *some* investors, but no basis exists for Mr. Coyne's claim that BCFF forecasts represent a reasonable proxy for investor expectations.

[94] M. Ellis analysis of BCFF and FRED data. From June 2002 through June 2005, BCFF forecast the long-term average of the 20-year Treasury instead of the 30-year. Those forecasts are used in this analysis and compared to subsequent actual 20-year Treasury rates.

[95] 2022 Rate Case Hr'g Tr. Vol. 1 at 660 (Sept. 28, 2022).

BCFF has no more than a hundred thousand subscribers,[96] less than 0.1% of the hundreds of millions of investors who are exposed to Treasury rates through direct investments or as a benchmark for other investments.[97] Although utility cost of capital experts routinely argue that these forecasts represent the "market's view," 0.1% in no way represents the market. The hundreds of millions of market participants respond to all kinds of information, and the small slice of the market used by Mr. Coyne, via BCFF, does not represent an adequate or reasonably proxy.

Mr. Coyne's argument also implicitly assumes that investors rely *only* on BCFF forecasts, to the exclusion of all other ways that investors might develop their expectations; that they rely on BCFF's forecasts as-is, with no adjustment for their historical inaccuracy; and that investors' only use of the forecasts is for investment decisions. None of Mr. Coyne's assumptions is true. The consistent errors in BCFF forecasts are well-known; the Congressional Budget Office has issued public reports on BCFF's interest rate forecasting errors for nearly twenty years.[98] Many investors undoubtedly take BCFF's forecasts "with a grain of salt" and inform their decisions with other forecasts and information. Finally, BCFF reports include dozens of other forecasts, as well as commentary and analysis. Investors might "rely" on the reports for that other content, not BCFF's interest rate forecasts, per se.

Q. SUPPOSE WE IGNORED THE CONCERN YOU EXPRESSED ABOUT CONSISTENCY WITH THE DCF AND WANTED A FORECAST RISK-FREE INTEREST RATE ASSUMPTION FOR THE CAPM. WHAT SHOULD WE USE?

A. It turns out that current interest rates generally provide an unbiased forecast of future rates. Figure 18 is a cross-plot of the 20-year Treasury rate one year ahead against the current rate. Current interest rates account for approximately 91% of the variation in future interest rates;

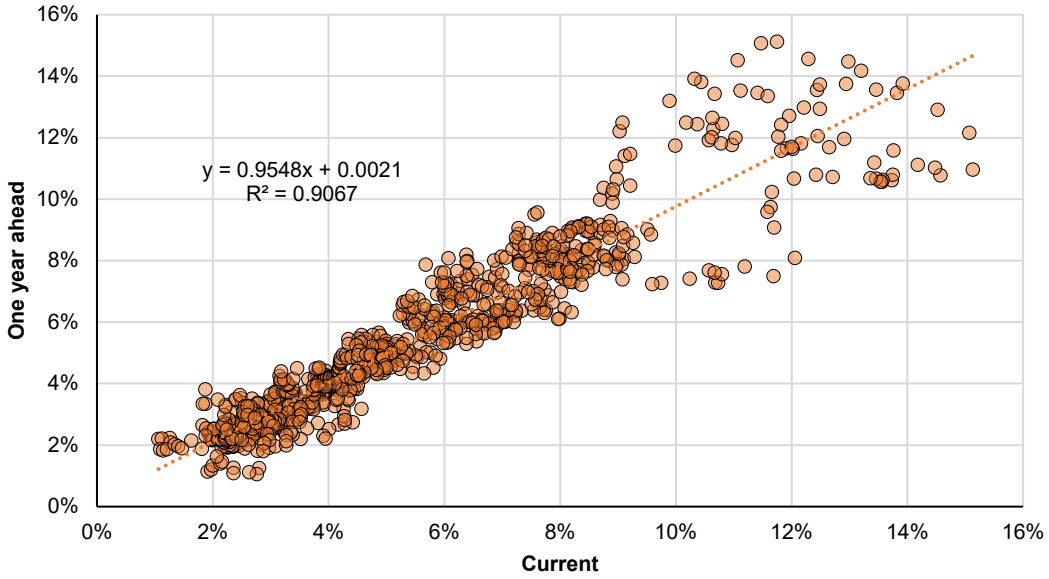
[96] In the 2020 annual report of Wolter Kluwers, BCFF's owner, $905 million of revenue was attributed to the Legal & Regulatory segment, of which BCFF is just 1 of 99 offerings. *See* https://www.wolterskluwer.com/en/legal/our-solutions. BCFF costs approximately $2,500/year. Even assuming BCFF accounts for 10% of segment revenue – roughly ten times the segment average – BCFF has no more than 40,000 subscribers.

[97] More than half of U.S. adults and households are invested in the stock market. *See, e.g.*, Kim Parker and Richard Fry, *More than half of U.S. households have some investment in the stock market*, Pew Research Center (March 25, 2020), https://www.pewresearch.org/fact-tank/2020/03/25/more-than-half-of-u-s-households-have-some-investment-in-the-stock-market/; Lydia Saad and Jeffrey Jones, *What Percentage of Americans Owns Stock*, Gallup (May 12, 2022), https://news.gallup.com/poll/266807/percentage-americans-owns-stock.aspx.

[98] *See, e.g.,* Congressional Budget Office, *CBO's Economic Forecasting Record* at 13, 18 (Nov. 2002), https://www.cbo.gov/sites/default/files/107th-congress-2001-2002/reports/11-07-economicforecast.pdf.

for rates two years in the future, current interest rates explain 83% of the variation in future interest rates, and for rates in three years, current interest rates explain 79%. Regardless of the forecast horizon, the current rate is unbiased – exhibiting no tendency to be systematically too high or too low.[99] Similar predictive validity is obtained for 30-year Treasury and corporate bonds.[100]

Figure 18. Twenty-year Treasury rate, one year in the future vs. current[101]
January 1925-September 2022



More intuitively, markets are forward-looking. If investors expect interest rates to rise, their expectations will be incorporated into current yields. Consider the alternative. Suppose an investor expects the yield on the 30-year Treasury to rise from its current ~3% to 4% over the next six months. There is an inverse relationship between a bond's value and a bond's yield; when the yield rises, the value falls, and vice versa. An investor who expects bond yields to rise would not buy a bond today, because to do so would be to invest expecting a loss; better not to buy the bond at all. But market participants *do* buy at the current 3%, implying that the

[99] The bias in a forecast can be assessed from the decomposition of the mean square error into bias, inefficiency, and random variation components. For the 20-year Treasury, bias accounts for less than 0.2% of forecast error at all three forecast horizons. *See, e.g.*, Jacob Mincer and Zarnowitz, *The Evaluation of Economic Forecasts*, Economic Forecasts and Expectations: Analysis of Forecasting Behavior and Performance at 3-46 (NBER, 1969), http://www nber.org/chapters/c1214.

[100] The 20-year Treasury is used here because much more historical data are available.

[101] M. Ellis analysis of FRED data (last accessed October 2, 2022).

market overall does *not* expect rates to rise in the future. Current yields are the best predictor of future yields, especially for longer-term bonds.

The predictive validity of current rates has been acknowledged among utility cost of capital experts. Reviewing the academic research, Roger Morin, author of the frequently cited practitioner text, *New Regulatory Finance*, concludes, "The literature suggests that on balance, the bond market is very efficient in that it is difficult to consistently forecast interest rates with greater accuracy than a no-change [from the current interest rate] model."[102]

BCFF's consistently poor track record, the high predictive validity of current interest rates, and economic intuition are consistent with an extensive body of research on the superiority of simple prediction models to both more complex models and expert judgment.[103]

Current interest rates are the most accurate and unbiased publicly available estimates for future interest rates that I am aware of. Conveniently, using the current rate also entirely skirts the potential concern about horizon inconsistency with the DCF.

2. Mr. Coyne cherry-picks his beta calculation methodology, ignoring the wide variety of valid potential approaches and best practice for choosing among them.

Q. HOW DOES MR. COYNE ESTIMATE THE BETA IN HIS CAPM MODEL?

A. Mr. Coyne uses beta estimates from two different financial data providers, Value Line and Bloomberg. He uses Value Line's betas as reported. Mr. Coyne overrides Bloomberg's default settings and uses only a subset of the beta estimates Bloomberg provides, such that the calculation methodology and resulting beta estimates he reports for Bloomberg are very similar to Value Line's.

Importantly, Mr. Coyne selects two nearly identical beta calculation methodologies among the multitude of methodologies commonly used by practitioners and academics, specifically the two that currently tend to produce the highest results.

Q. HOW DO BLOOMBERG AND VALUE LINE ESTIMATE THEIR BETAS?

A. Both Bloomberg and Value Line estimate beta from the slope of a linear regression model of a stock's returns against the returns of the market overall. Both calculate "raw" betas from a

[102] ROGER A. MORIN, NEW REGULATORY FINANCE, PUB. UTIL. REPORTS at 172 (2006).
[103] *See, e.g.*, DANIEL KAHNEMAN, OLIVIER SIBONY, CASS SUNSTEIN, NOISE: A FLAW IN HUMAN JUDGMENT, HACHETTE BOOK GROUP at 111-147 (2021).

regression of trailing weekly, price-only returns of the stock in question against the corresponding market returns. Both also report "Blume-adjusted" betas – a weighted-average of approximately 2/3 of the raw beta and 1/3 of the market average of 1.0 – to correct for an empirically observed tendency for betas, on average, to regress toward the market mean over time that I discuss in more detail below.[104] Other details of their respective methodologies differ, which is why their beta estimates are not exactly the same even after Mr. Coyne's modifications to Bloomberg's defaults. Figure 19 summarizes the key elements of Value Line's and Bloomberg's beta estimation methodologies.

Figure 19. Value Line and Bloomberg beta estimation methodologies[105]

Parameter	Value Line	Bloomberg (default)
Return frequency	Weekly	Weekly
Trailing history	5 years	2 years
Index	NYSE Composite	S&P 500
Return calculation		
Price-only/total	Price-only	Price-only
Excess/absolute	Absolute	Absolute
Simple/logarithmic	Logarithmic	Simple
Blume adjustment parameters	0.65 x raw + 0.37	None (unadjusted) 2/3 x raw + 1/3
Rounding	Nearest 0.05	None
Updating frequency	Approximately quarterly	Daily

Q. MR. COYNE WRITES, "[I]T IS IMPORTANT TO EMPHASIZE THAT BETA COEFFICIENTS ARE CALCULATED OVER A FIVE-YEAR PERIOD." IS FIVE YEARS OF WEEKLY RETURNS WITH THE BLUME ADJUSTMENT THE ONLY WAY TO CALCULATE BETA?

A. No. Academic studies commonly use five years of *monthly* returns, without the Blume adjustment. Other financial data providers, including some used by Mr. Coyne elsewhere in his analysis, calculate beta using different trailing histories, return frequencies, and without the Blume adjustment. Yahoo! Finance and Zacks – data sources for some of Mr. Coyne's other

[104] Value Line reports only the Blume-adjusted beta. Bloomberg reports both raw and adjusted beta.

[105] Value Line, "Estimation of Beta by Value Line"; Bloomberg Professional Workstation Guide; "BETA, HRA, BETA, HRA, and CORR Calculation FAQs." Simple price-only returns: $r = \frac{P_{t+1}}{P_t} - 1$; logarithmic price-only returns: $r = \ln \frac{P_{t+1}}{P_t}$.

cost of capital analyses[106] – use five years of monthly returns and are unadjusted, like many academic studies. S&P Global Market Intelligence (S&P GMI), another data source frequently cited by Mr. Coyne,[107] reports 1- and 3-year betas using daily returns, also without the Blume adjustment.[108]

Bloomberg's default trailing history is 2 years. Bloomberg allows users to override several of its calculation parameters, such as the trailing history, market index, and return frequency. Bloomberg also reports both raw and adjusted beta by default. Mr. Coyne apparently overrode Bloomberg's default trailing history parameter and simply ignored its raw beta estimates to arrive at the Bloomberg betas used in his CAPM, which are nearly identical to those provided by Value Line.

Figure 20 lists recent betas from S&P GMI, Yahoo! Finance, and Zacks for Mr. Coyne's GPC proxy group. The average betas are 0.43 and 0.76 for S&P GMI using 1 and 3 years of daily returns, and 0.48 for Yahoo! Finance and Zacks, both using 5 years of monthly returns. All four sources' beta estimates are lower than Mr. Coyne's 0.85-0.88 figures.[109]

Figure 20. S&P GMI, Yahoo! Finance, and Zacks betas[110]
As of September 30, 2022

Utility	Ticker	S&P GMI 1-year daily	S&P GMI 3-year daily	Yahoo! Finance 5-year monthly	Zacks 5-year monthly
ALLETE	ALE	0.44	0.88	0.61	0.61
Alliant	LNT	0.39	0.66	0.46	0.47
Ameren	AEE	0.40	0.72	0.36	0.35
AEP	AEP	0.42	0.61	0.34	0.34
Duke	DUK	0.32	0.71	0.35	0.35
Edison Int'l	EIX	0.53	0.82	0.68	0.67
Entergy	ETR	0.42	0.84	0.57	0.57
Evergy	EVRG	0.44	0.84	0.48	0.48
Hawaiian Electric	HE	0.41	0.66	0.32	0.32
IDACORP	IDA	0.38	0.73	0.56	0.56
NextEra	NEE	0.68	0.84	0.46	0.46
OGE	OGE	0.44	0.77	0.65	0.67
Portland General	POR	0.34	0.81	0.52	0.51
Xcel	XEL	0.37	0.68	0.35	0.34
Mean		**0.43**	**0.76**	**0.48**	**0.48**

[106] Mr. Coyne uses Yahoo! Finance and Zacks EPS growth rates in his DCF model. *See* Ex. JMC-4.
[107] *See, e.g.,* Ex. JMC-9.
[108] M. Ellis analysis of S&P GMI data.
[109] Ex. JMC-5.2.
[110] M. Ellis analysis of S&P GMI data; Yahoo! Finance; Zacks.

Q. WHY DO BLOOMBERG AND OTHER FINANCIAL DATA PROVIDERS USE DIFFERENT BETA CALCULATION METHODOLOGIES, PROVIDE MULTIPLE ESTIMATES, AND ALLOW USERS TO OVERRIDE THEIR DEFAULTS?

A. Beta is intended to be a *forward-looking* measure of relative risk, so it is inherently uncertain. It cannot be measured directly (like an interest rate) and is usually estimated from *historical* data, as the slope of the regression of the returns of a stock against the returns of the market over a recently-ended historical period. Estimates based on historical data generally reasonably reflect future expectations, because most companies' risk profiles change slowly over time. Slowly changing risk profiles prove particularly true for the relatively stable and predictable utility sector.

But if a dramatic change in the market or in individual stocks occurs, as in the pandemic-related market turmoil of early 2020, that change will influence the beta estimate for as long as the period of change is included in the trailing data used in the beta calculation, even if investors' risk perceptions have returned to their level prior to the dramatic change. Analysts should always examine whether the change in market conditions was temporary or is sustained. Mr. Coyle's analysis suffers from his failure to examine whether the pandemic-related change in market conditions was temporary or has been sustained.

Q. HOW CAN WE DETERMINE WHETHER THE CHANGE IN INVESTORS' RISK PERCEPTIONS WAS TEMPORARY OR HAS BEEN SUSTAINED?

A. Determining whether the change in investors' risk perception was temporary or has been sustained is typically done by examining how betas calculated using different amounts of trailing data and returns calculated at different frequencies – for example, daily, weekly, or monthly – have changed over time.

Q. IS THE NEED TO ESTIMATE BETA USING DIFFERENT METHODOLOGIES WELL KNOWN?

A. Yes. Utility cost of capital expert witnesses Michael Vilbert and Bente Villadsen have written about the trade-offs of different methodologies, highlighting the need to consider shorter calculation intervals in the wake of abrupt disruptions such as was experienced first during and then immediately after the pandemic-driven bout of market turmoil in early 2020:

> The choices for the interval for the return data and the length of the beta estimation window involve trade-offs between obtaining more observations through the choice of a longer window and/or more frequent return data, ensuring that no structural change has occurred during the estimation window, and avoiding problems due to insufficient trading activity. … Balancing these considerations, economists typically recommend estimating beta using daily, weekly, or monthly returns over the most recent 2- to 5-year period, with weekly being the more common, *except if there are reasons to think that the industry might be subject to recent changes in systematic risk so that the use of a more recent data window is desirable*.[111]

The need to examine beta using different calculation methodologies is also reflected in data providers' offerings. As explained previously, Bloomberg allows users to easily override its default beta calculation parameters. S&P GMI, in addition to reporting betas calculated using 1 and 3 years of trailing data, provides its users with spreadsheet models that allow them to modify all of its beta calculation parameters.

In using both Value *and* Bloomberg betas, Mr. Coyne implicitly acknowledges that no single beta calculation methodology necessarily reflects current investor expectations. But the differences in the Value Line and (modified) Bloomberg beta methodologies he uses are immaterial. Their different market indexes – NYSE Composite for Value Line, S&P 500 for Bloomberg – are nearly perfectly correlated (0.96 correlation[112]), and their slightly different Blume adjustment weights yield differences in beta of 2% or less across the range of typical raw utility betas (0.4-1.0). Mr. Coyne's chosen methodologies hardly reflect the wide range of ways beta could be calculated, each of which could produce dramatically different results. As Nobel laureate Fischer Black, one of the pioneers of empirical testing of beta and the CAPM, famously admonished, "Watch out for data mining!"[113] – running an analysis several different ways but reporting only the outcomes that support one's conclusions.

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[111] BENTE VILLADSEN, MICHAEL J. VILBERT, DAN HARRIS, LAWRENCE KOLBE, RISK AND RETURN FOR REGULATED INDUSTRIES, ACADEMIC PRESS at 73-76 (2017) (emphasis added).

[112] Correlation between five years of weekly, simple, price-only, absolute returns for the S&P 500 and NYSE Composite Indexes, through February 25, 2022. M. Ellis analysis of S&P GMI data.

[113] Fischer Black, *Beta and Return*, 20(1) J. Portfolio Management 8 (1993), https://jpm.pm-research.com/content/20/1/8.

Q. WHICH METHODOLOGICAL DIFFERENCES ACCOUNT FOR THE MOST VARIATION IN BETA ESTIMATES?

A. The largest potential sources of variation in beta estimates arise from their trailing return history duration, return calculation frequency, and Blume adjustment parameters.

Q. HOW DOES THE DURATION OF TRAILING RETURN HISTORY AFFECT BETA ESTIMATES?

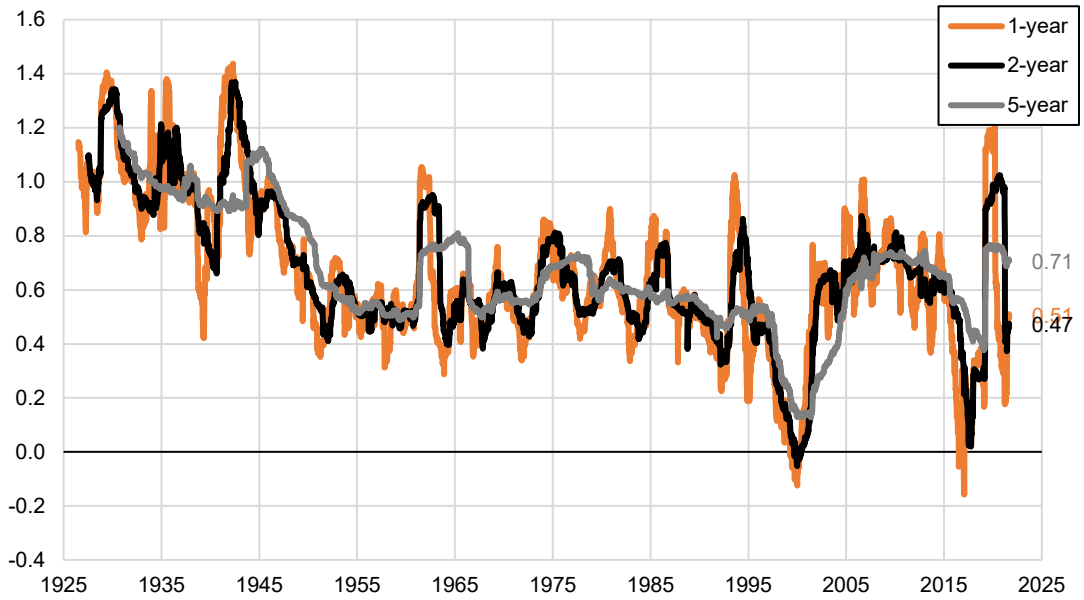
A. Following bouts of high market volatility, such as was experienced in the early days of the pandemic in February and March 2020, betas will be affected as long as the trailing history includes the volatile period, even if market conditions have stabilized. For example, S&P GMI reports unadjusted betas calculated from both 1 and 3 years of daily returns.[114] As of July 27, 2022, the average 1-year beta for the proxy group, which does not include the volatile period, was 0.28; the average 3-year beta, which does include the volatile period, was 0.72.[115] For comparison, on the same day, Yahoo! Finance's and Zacks's group average 5-year unadjusted betas using monthly returns were 0.45.[116]

Figure 21 plots the raw beta for the entire utility sector using 1, 2, and 5 years of weekly returns from June 1926 through May 2022. At any given time, beta can be very sensitive to the trailing history used. As of the end of August 2022, the betas using the 1-, 2-, and 5-year trailing histories were 0.51, 0.47, and 0.71, respectively.

[*Remainder of page intentionally left blank.*]

[114] Personal correspondence with S&P GMI (November 2021).
[115] M. Ellis analysis of S&P GMI data (last accessed October 2, 2022).
[116] M. Ellis analysis of Yahoo! Finance data (last accessed October 2, 2022); Zacks data (last accessed October 2, 2022).

Figure 21. Utility sector raw beta – trailing return history sensitivity[117]
July 1926-August 2022



In general, betas calculated using longer return histories tend to be the more stable over time, as the effect of any short-term period of volatility is reduced by longer surrounding periods of stability. Because utility cost of capital proceedings seek a relatively long-term estimate, it might be tempting to conclude that a longer trailing history is preferred in estimating a utility's beta for purposes of authorizing an ROE. As Vilbert and Villadsen astutely recommend, though, "if there are reasons to think that the industry might be subject to recent changes in systematic risk … the use of a more recent data window is desirable."[118] The current 5-year beta of 0.71, driven by the market turmoil of early 2020, is higher than its historical average since 1955 of approximately 0.55. The 1- and 2-year betas, at 0.51 and 0.47, respectively, are in-line with their long-term historical averages. After the brief period of unusual market volatility in early 2020 not seen since the World War II era, investor perceptions of utility risk quickly settled to their pre-pandemic levels. Because of their shorter trailing histories, the 1- and 2-year betas are more reflective of *current* investor sentiment.

Figure 21 also betrays Mr. Coyne's claim that "the recent movement in betas captures a trend that began five years ago but has been accelerated by the recent market conditions" and

[117] M. Ellis analysis FDL (last accessed July 20, 2022).
[118] BENTE VILLADSEN, MICHAEL J. VILBERT, DAN HARRIS, LAWRENCE KOLBE, RISK AND RETURN FOR REGULATED INDUSTRIES, ACADEMIC PRESS at 73-76 (2017).

that "[t]he substantial increase in Beta coefficients for the proxy group companies represents a significant departure from how investors have typically viewed utilities relative to the broader market and is not just COVID-19 related."[119] Regardless of the duration of the trailing return used, utility sector betas were in a decade-plus-long decline before the pandemic. Once the early-pandemic period of market turmoil fell out of the trailing historical data, as with the 1- and 2-year betas, betas returned to their pre-pandemic levels.

The sharp declines in the 1- and 2-year betas in Figure 21 make it clear that Mr. Coyne's elevated 5-year weekly betas are not valid indicators of current investor expectations but purely artifacts of the inclusion of a transitory and short-term market anomaly.

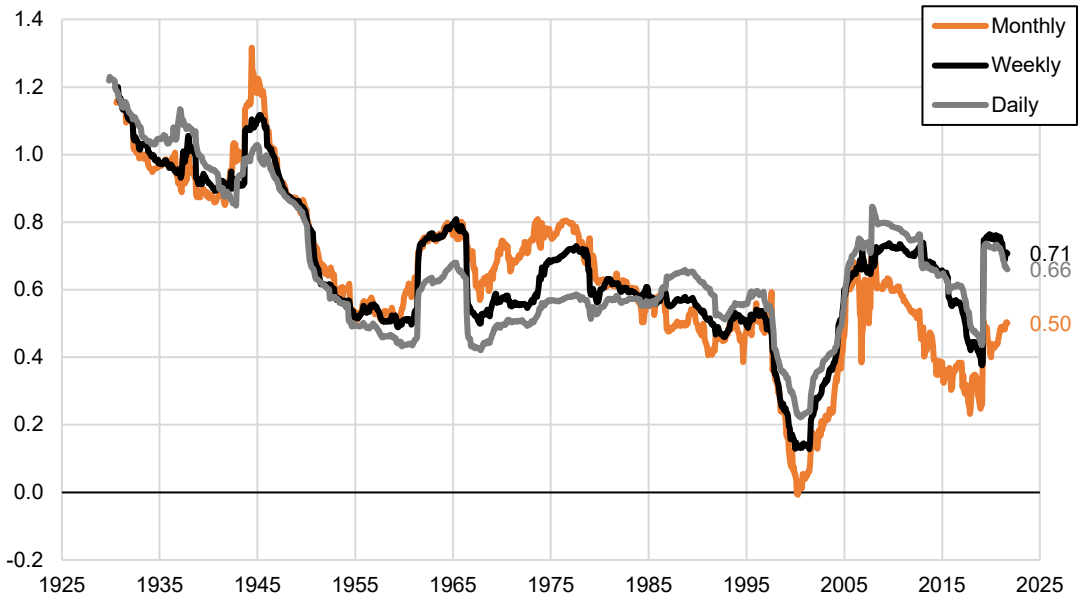
Q. HOW DOES THE FREQUENCY OF RETURN CALCULATION AFFECT BETA ESTIMATES?

A. Figure 22 plots the raw beta for the entire utility sector using 5 years of monthly, weekly, and daily returns from June 1926 through May 2022. As with the trailing history, at any given time, beta can be very sensitive to the return calculation frequency used. As of the end of August 2022, the betas using the monthly, weekly, and daily trailing histories were 0.50, 0.71, and 0.66, respectively. In general, betas tend to be more stable at higher return calculation frequencies. For any given trailing history duration (e.g., 1, 2, or 5 years), shorter return frequencies generate more data for use in the beta calculation: weekly returns generate approximately four times more data than monthly; daily approximately five times more than weekly. As the return frequency increases, any extreme data points are averaged with a larger number of "typical" data points, which tends to mitigate abrupt changes in beta over time.

This finding would tend to recommend using shorter return frequencies, due to their greater stability over time. But the choice of return frequency should reflect the time horizon of the analysis in which the CAPM-derived cost of equity will be used. Utility cost of capital proceedings seek to estimate a cost of equity that applies over a multi-year period. This consideration recommends a longer calculation frequency.

[119] 2022 Rate Case Hr'g Tr. Vol. 1 at 660-61 (Sept. 28, 2022).

Figure 22. Utility sector 5-year raw beta – return calculation frequency sensitivity[120]
July 1926-August 2022



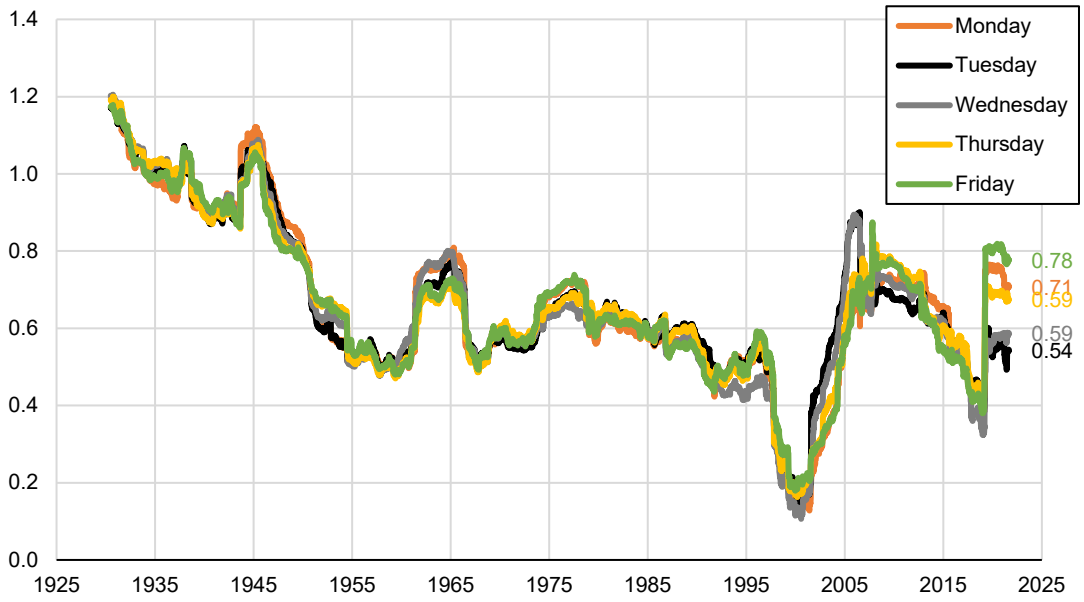
Q. HOW DO OTHER BETA CALCULATION PARAMETERS IMPACT THE VARIATION IN BETA ESTIMATES?

A. Even a beta calculation parameter as seemingly arbitrary as the day of the week on which weekly returns are calculated can materially affect the beta estimate. Figure 23 shows the 5-year trailing beta, i.e., raw Value Line-equivalent, with returns calculated on each weekday. Currently, Friday yields the highest beta, 0.78, but simply changing the calculation day to Tuesday reduces the beta to 0.54, 31% lower. This day-of the-week return calculation effect is only partially mitigated by averaging multiple utilities. The stock prices of individual companies within the sector tend to move together on any given day, so weekly returns calculated on the same day will tend to be similar.

This finding highlights the deficiency in Mr. Coyne's analysis in failing to examine alternative beta calculation methodologies and the potential arbitrariness of his selected methodologies. It also further highlights the need for caution in using the mechanically calculated betas provided by Value Line, Bloomberg, or other financial data providers, particularly betas calculated using weekly returns, without examining how they've changed over time or comparing them to long-term historical averages.

[120] M. Ellis analysis of FDL data (last accessed October 2, 2022).

Figure 23. Utility sector 5-year weekly raw beta – return calculation day sensitivity[121]
July 1926-August 2022



Q. YOU LISTED THE BLUME ADJUSTMENT AS A THIRD SOURCE OF VARIATION IN BETA ESTIMATES. WHAT IS THE ORIGIN OF THE BLUME ADJUSTMENT?

A. The Blume adjustment is based on an analysis conducted by Wharton professor Marshall Blume in the early 1970s. Analyzing beta-sorted portfolios, he found a tendency for betas, on average, to regress toward the market average beta, 1.0, from one time period to the next.[122] Based on this finding, some providers of beta estimates report adjusted betas that are a weighted average of the raw estimate and the market mean. The most common weighting is 2/3 on the raw beta, 1/3 on the market beta (1.0):[123]

$$\beta_{adjusted} = \frac{2}{3}\beta_{raw} + \frac{1}{3}.$$

For stocks with raw betas below 1.0, like most utilities historically, the effect of the adjustment is to increase the beta one-third of the way toward 1.0. For example, a stock with a raw beta of 0.4 would have an adjusted beta of 2/3 x 0.4 + 1/3 = 0.6. For its adjusted beta,

[121] M. Ellis analysis of FDL data (last accessed October 2, 2022).
[122] Marshall E. Blume, *On the Assessment of Risk*, 26:1 J. Finance at 1-10 (1971) https://onlinelibrary.wiley.com/doi/10.1111/j.1540-6261.1971.tb00584.x.
[123] The 2/3 and 1/3 weights are based on the regression coefficients Blume presented in his original paper, which regressed betas in one period against betas in the previous period.

Bloomberg uses the common 2/3 and 1/3 weights. Value Line's weights are similar: 0.67 and 0.35, respectively. Value Line also rounds to the nearest 0.05.[124]

As Vilbert and Villadsen note, "analysts have different views on whether to use raw or adjusted betas,"[125] hence the reporting of unadjusted betas by Bloomberg, S&P GMI, Yahoo! Finance, and Zacks.

Q. IS THE BLUME ADJUSTMENT VALID FOR UTILITIES?

A. No, it is not. The Blume adjustment is based on an observation of the tendency of betas, *on average*, to regress toward 1.0. But not every stock exhibits this tendency. Blume did not investigate whether and how this tendency might vary across stocks with different characteristics.

Rutgers professor Richard Michelfelder investigated the validity of the beta adjustment specifically for utility stocks and found no evidence of the average tendency observed by Blume.[126] This can be clearly seen in Figure 24, which shows the same 7-year monthly beta used by Blume in his original analysis for the entire utility sector going back to 1926. Since the 1950s, the beta for the utility sector as a whole has tended to regress toward 0.50-0.60, not 1.0.[127]

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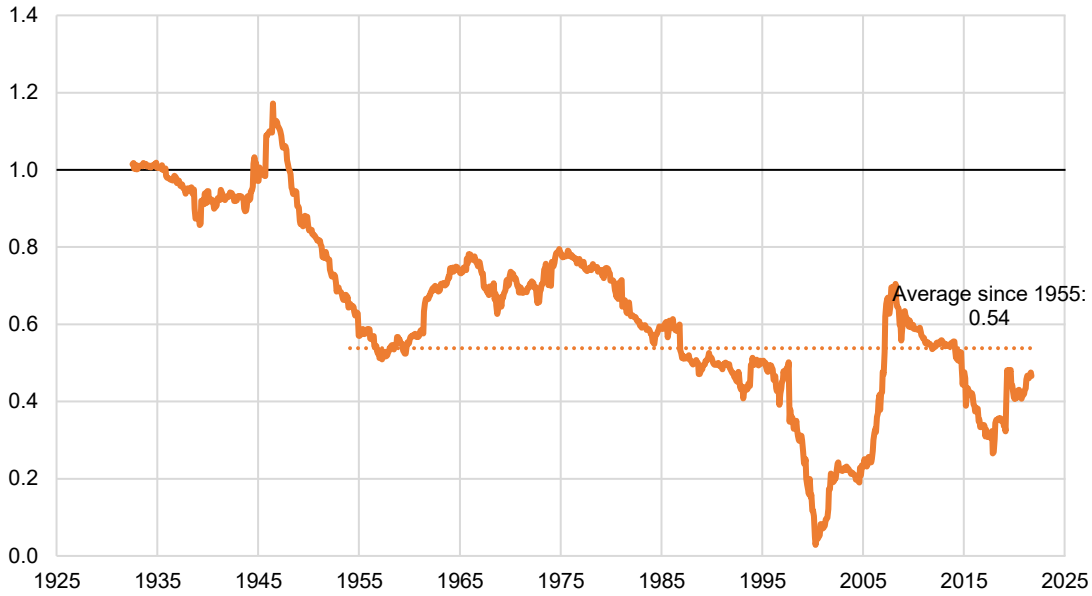
[124] Value Line, "Value Line's Estimation of Beta," personal correspondence (October 6, 2021).

[125] BENTE VILLADSEN, MICHAEL J. VILBERT, DAN HARRIS, LAWRENCE KOLBE, RISK AND RETURN FOR REGULATED INDUSTRIES, ACADEMIC PRESS at 80 (2017).

[126] Richard A. Michelfelder and Panayiotis Theodossiou, *Public Utility Beta Adjustment and Biased Costs of Capital in Public Utility Rate Proceedings*, 26:9 The Electricity Journal at 60-68 (2013).

[127] One might ask whether the utility sector average reflects the tendency of individual utility stocks. Betas are additive, so a tendency for individual utility stocks to regress toward 1.0, on average, would be reflected in the industry beta. Blume used the same logic to extrapolate from the portfolios he analyzed to individual stocks. *See* Eugene F. Fama and Kenneth R. French, *The Capital Asset Pricing Model: Theory and Evidence*, 18:3 J. Economic Perspectives 25, 31 (2004), https://pubs.aeaweb.org/doi/pdfplus/10.1257/0895330042162430.

Figure 24. Utility sector 7-year monthly raw beta[128]
July 1926-August 2022



Blume speculated as to why betas, on average, tend to regress toward 1.0 over time.[129] High-beta firms tend to be newer and smaller; as they mature and grow, they become more risk-averse. In contrast, low-beta firms tend to run out of low-risk investment opportunities and must accept more risk to stay in business. Neither of these causal explanations applies to utility operating companies, like Georgia Power and the publicly traded members of the GPC proxy group. They are large and mature, and their investments tend to have consistently low risk profiles over time. These attributes combine to keep utilities' betas sustainably and significantly below 1.0.

Empirical analysis specifically investigating utility betas, grounded in sound economic reasoning, demonstrates that utility betas do not have a tendency to regress toward the market average and therefore should not be Blume-adjusted.[130]

[128] Market capitalization-weighted average of all NYSE-, AMEX-, or NASDAQ-listed utilities. M. Ellis analysis of FDL data.
[129] Marshall E. Blume, *Betas and Their Regression Tendencies*, 30:3 The Journal of Finance 785-795 (1975), https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1540-6261.1975.tb01850.x.
[130] Blume used mean squared error (MSQ) to assess the accuracy of his adjustment. It can be shown that the standard 2/3 and 1/3 weights increase the MSQ for utility betas by approximately 35%.

Q. WHAT ARE YOUR CONCLUSIONS ABOUT MR. COYNE'S CHOICE OF BETA ESTIMATION METHODOLOGY?

A. The variation in the three most recent beta estimates in Figure 21 suggests we should not unthinkingly use the most recent trailing betas from Value Line, Bloomberg, or any other data provider. It's important to keep in mind that all methodologies are intended to produce *estimates of investors' future expectations*. The elevated current 5-year betas used by Mr. Coyne are artifacts of arbitrary choices of calculation period; there is no reason to believe they reflect investors' current long-term expectations.

The seven-week bout of market volatility in early 2020 was an anomaly, and investor perceptions of utility risk quickly returned to their pre-pandemic levels. The 5-year return history used in Mr. Coyne's beta estimates does not accurately reflect current investor sentiment.

The betas used by Mr. Coyne are inflated because they are (1) Blume-adjusted and (2) incorporate an anomalous period that does not reflect investors' *current, long-term* expectations.

3. Mr. Coyne estimates his market risk premium using a constant-growth DCF model with the same flawed perpetuity growth assumption as his proxy group DCF analysis.

Q. HOW DOES MR. COYNE ESTIMATE THE THIRD ASSUMPTION IN THE CAPM, THE MARKET RISK PREMIUM?

A. Mr. Coyne estimates the market risk premium (MRP) using the same constant-growth discounted cash flow model he uses for the proxy group in his DCF analysis. As detailed in Section IV.C.2 above, Mr. Coyne's fatally flawed implementation of the CG DCF erroneously assumes analysts' 3-to-5-year EPS growth estimates can be sustained into perpetuity, a deficiency of which he is aware. This assumption is invalid for several reasons, perhaps the most compelling of which is that it is simply economically impossible for the market to sustain analysts' forecast growth rates for even a decade, much less forever. Since 1926, U.S. stock market dividend growth has averaged 4.9% (1.9% in real terms)[131] – roughly 40% of the 12.4%-14.2% range assumed by Mr. Coyne.[132] The market has never sustained 12.4% dividend

[131] M. Ellis analysis of FDL data (last accessed October 2, 2022).
[132] Ex. JMC-5.1.

growth for even seven years, much less into perpetuity – certainly raising a legitimate "concern that short term growth rates may not be sustainable over the longer-term." Mr. Coyne nonetheless ignores his own advice and uses the constant growth DCF to estimate his CAPM MRP. Consequently, Mr. Coyne's MRP results beggar belief: at 11.8%-12.5%, they are roughly 2.5 times the long-term historical average of approximately 5%.

4. Mr. Coyne's flawed CAPM results should be disregarded.

Q. WHAT IS YOUR OVERALL ASSESSMENT OF THE CAPM AND MR. COYNE'S IMPLEMENTATION OF IT?

A. The CAPM is conceptually sound and one of the most widely used COE models in corporate finance. But Mr. Coyne's implementation choices – a forecast, not current, risk-free interest rate; a cherry-picked adjusted beta that is not reflective of current market conditions or utilities' long term risk profile; and a flawed MRP model – yields systematically upwardly-biased results. His flawed CAPM results should be disregarded.

F. Implementing the CAPM with more rigorously estimated assumptions produces substantially lower COE estimates.

Q. PLEASE EXPLAIN YOUR IMPLEMENTATION OF THE CAPM.

A. There are three components to the CAPM: the risk-free rate, beta, and the market risk premium. For the risk-free rate I use the current, not forecast, 30-year Treasury rate.

As explained above in Section IV.E.2, beta is the most subjective of the three CAPM parameters, and no single calculation methodology produces the most reasonable estimates in all market conditions. Based on my review of the latest research literature, I use the betas provided by Yahoo! Finance, calculated using five years of monthly returns. Five-year monthly betas are consistent with cost of capital proceedings' objective of estimating a multi-year cost of equity, and their current values strike a reasonable balance between current market sentiment and the long-term historical average for utilities.

I estimate the market risk-premium from the average of the long-term historical trend and a forward-looking estimate calculated using the MS DCF.

1. The risk-free rate, one of the three CAPM inputs, should be estimated from the current, not forecast, interest rate.

Q. HOW DO YOU ESTIMATE THE RISK-FREE RATE?

A. Like Mr. Coyne, I use the 30-year Treasury. I use the most recent full-month average 30-year Treasury rate, for September 2022, of 3.56%. As explained above in Section IV.E.1, current market interest rates provide an unbiased estimate of future rates and are generally superior to publicly available "expert" forecasts.

2. Betas calculated using five years of monthly returns are consistent with the objective of a cost of capital proceeding and strike an appropriate balance between recent market conditions and utilities' long-term historical risk profile.

Q. HOW DO YOU ESTIMATE BETA?

A. As explained in Section IV.E.2 above, no single, widely used approach to estimating beta exists. Beta estimates can vary substantially depending, in particular, on the historical trailing period used, return calculation frequency, and adjustment for long-term trend reversion. I use 5-year monthly betas such as those provided by Yahoo! Finance and Zacks and commonly used in academic studies. Five-year betas using monthly returns are consistent with cost of capital proceedings' objective of estimating a multi-year expected cost of equity. The current average of 0.48 for the GPC proxy group, shown in Figure 20, strikes an appropriate balance between the long-term historical range 0.5-0.6 and current subdued investor perceptions of risk, as reflected in 1-year betas using daily returns of approximately 0.4.

3. The market risk premium estimate should reflect both current market conditions and the long-term historical trend.

Q. WHY CAN'T WE JUST LOOK UP THE MRP LIKE, SAY, WE CAN LOOK UP A STOCK PRICE OR INTEREST RATE?

A. The market risk premium is the difference between investors' expectations of future stock returns and the risk-free (interest) rate. While interest rates are directly observable, expected future market returns are not. The MRP must therefore be estimated. A historical average is a useful check for reasonableness, but the cliché, "past performance is no guarantee of future results," applies. Instead, analysts use a variety of models and input assumptions to estimate the MRP.

Q. HOW DO YOU ESTIMATE THE MARKET RISK PREMIUM?

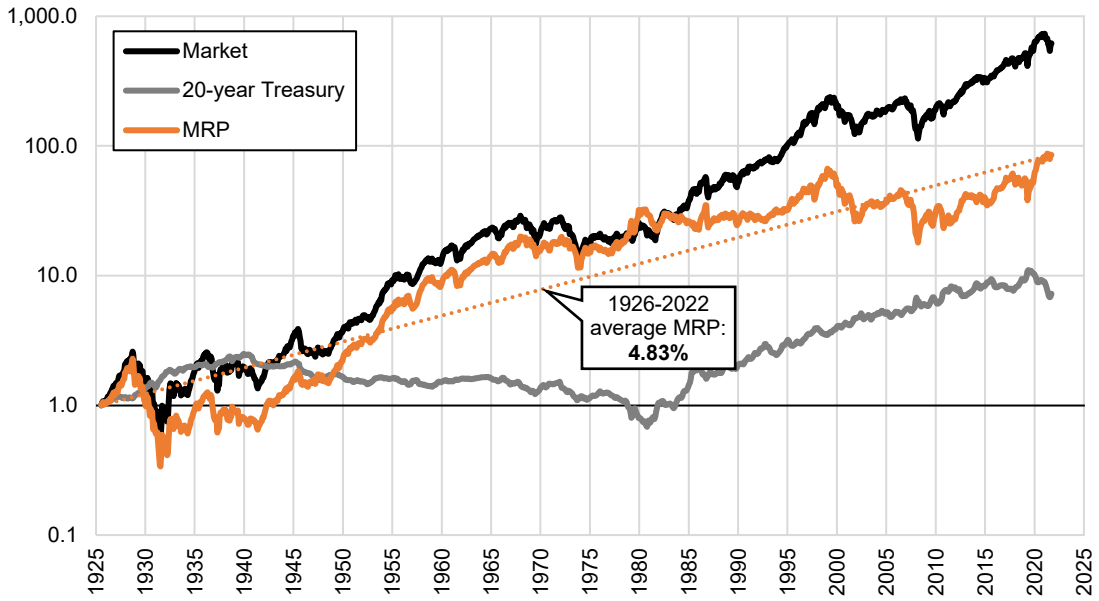
A. I use the average of two methods, one historical, the other forward-looking.

Q. HOW DO YOU ESTIMATE THE HISTORICAL MARKET RISK PREMIUM?

A. I use the long-term historical difference in the average real total returns on the market and long-term Treasury bond.[133]

Figure 25 shows the long-term historical real returns on the market and 20-year Treasury bonds, as well as the implied MRP, from June 1926 through August 2022. Over the last 96+ years, stocks have outperformed 20-year Treasurys by 4.83% per year.

Figure 25. Market, 20-year Treasury, and MRP real total return index[134]
June 1926=1.0 (log scale)



The historical MRP is calculated using 20-year Treasury data because that is the most extensive Treasury bond data set available.[135] Because I use the 30-year Treasury in my CAPM

[133] Total bond return is the monthly interest (the yield divided by 12) plus any capital gain or loss, estimated as the change in value from discounting the remaining interest payments (i.e., the previous time period's interest rate) and outstanding principal at the current time period's interest rate. This method is widely used, for example, by NYU finance professor Aswath Damodaran (*see, e.g.,* http://people.stern nyu.edu/adamodar/pc/datasets/histretSP.xls) and UCLA finance professor Ivo Welch (*see, e.g.,* Ivo Welch, *A Different Way to Estimate the Equity Premium (for CAPM and One-Factor Model Use Only)*, (2008) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1077876).

[134] M. Ellis analysis of FDL data (last accessed October 2, 2022).

[135] The early historical monthly data available for long-term Treasurys is not specifically for the 20-year. A simple regression model is used to adjust the long-term Treasury data to estimate the 20-year yield.

analysis, though, the premium is reduced by the current difference in the inflation-adjusted 20- and 30-year Treasurys (TIPS), 0.08%, for a 30-year real MRP of 4.75%. Adjusted for the 30-year inflation rate estimated from the Treasury-TIPS spread, 2.24%, the nominal MRP is 4.86%.

Q. HOW DO YOU ESTIMATE THE FORWARD-LOOKING MRP?

A. I apply the same multi-stage DCF model I use for the GPC proxy group to the market as a whole, represented by the S&P 500 Index, and subtract the current 30-year Treasury.

Q. HOW DO YOU ESTIMATE THE CURRENT DIVIDEND YIELD FOR THE S&P 500 INDEX?

A. I use the same methodology I use for the proxy group members: the most recent dividend paid, through September 30, 2022, divided by the average price of the index over the month of September 2022. The current annualized yield is 1.73%.[136]

Q. HOW DO YOU ESTIMATE THE INITIAL GROWTH RATE FOR THE S&P 500 INDEX?

A. I use the weekly estimate provided in S&P's weekly S&P 500 earnings and estimate report. I use this source because it is publicly available, well-known, frequently updated, and produced by the party with the most intimate knowledge of the index. As of September 30, 2022, S&P's estimate for the S&P 500 Index's 3-to-5-year growth rate is 13.6%.[137]

Q. HOW DO YOU ESTIMATE THE TERMINAL GROWTH RATE FOR THE S&P 500 INDEX?

A. Many analysts incorrectly assume long-term dividend growth equal to nominal GDP growth. Historically, per-share payout growth, whether measured as dividends or dividends plus net share buybacks, has tracked GDP per capita.[138] I assume a terminal growth rate based on forecast real long-term per-capita GDP plus the current market forecast for long-term inflation, estimated as described in Section IV.D.3.

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[136] M. Ellis analysis of S&P GMI data (last accessed October 2, 2022).

[137] S&P Dow Jones Indices, S&P 500 Earning and Estimate Report (September 30, 2022), https://www.spglobal.com/spdji/en/documents/additional-material/sp-500-eps-est.xlsx (last accessed October 2, 2022).

[138] *See, e.g.,* ROGER IBBOTSON, JAMES HARRINGTON, STOCKS, BONDS, BILLS, AND INFLATION 2021 SUMMARY EDITION, CFA INSTITUTE RESEARCH FOUNDATION BOOKS at 157-60 (2021) (Analysis is for total payout to account for the effect of net stock repurchases).

For long-term per-capita GDP growth, I use the average of the most recent long-term CPI-adjusted forecasts from three government agencies: the Congressional Budget Office (CBO),[139] the Energy Information Administration (EIA),[140] and the Social Security Administration (SSA).[141] I use the compound annual growth rate from 2042 to remove any near-term transitory effects, such as post-Covid economic recovery, and to align with the time period used to estimate long-term inflation (years 21 through 30 from today).

TIPS payouts are tied to CPI, so the Treasury-TIPS spread provides a forecast of *consumer* price inflation. In contrast, real GDP forecasts are deflated by the GDP deflator, which reflects the prices of all domestic expenditures, including by businesses and government. For consistency with the CPI forecast derived from the Treasury-TIPS spread, which reflects only the prices paid by consumers, I use each agency's nominal GDP forecast deflated by its CPI forecast, rather than its GDP deflator forecast. Figure 26 summarizes the three agencies' real long-term per-capita GDP forecasts.

Figure 26. Real long-term per-capita GDP forecasts
Percent

		GDP				Nominal		CPI-deflated
Forecast	**Horizon**	Real	Deflator	Nominal	Population	**GDP pc**	**CPI**	**GDP pc**
CBO	2052	1.52	2.00	3.55	0.24	3.30	2.26	1.02
EIA	2050	1.99	2.28	4.32	0.33	3.98	2.40	1.55
SSA[142]	2100	NA	NA	4.09	0.42	3.65	2.40	1.22
Mean		1.76	2.14	3.99	0.33	3.64	2.35	1.26
+ Treasury-TIPS long-term inflation						**2.85**	1.57	

The average of the CBO, EIA, and SSA (the agencies) CPI-deflated long-term per-capita GDP growth rates is 1.26%. Adding the same long-term inflation expectation, 1.57%, used to estimate the terminal growth rate in the proxy group MS DCF in Section IV.D.3 above gives a nominal rate of 2.85%.[143] The corresponding average of the CBO, EIA, and SSA long-term

[139] Congressional Budget Office, *The 2022 Long-Term Budget Outlook*, (July 2022), https://www.cbo.gov/system/files/2022-07/57054-2022-07-LTBO.xlsx.
[140] Energy Info. Admin., *Annual Energy Outlook 2022*, (March 2022), https://www.eia.gov/outlooks/aeo/excel/aeotab20.xlsx.
[141] Soc. Sec. Admin., *The 2022 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds*, (June 2022) (https://www.ssa.gov/OACT/TR/2022/SingleYearTRTables_TR2022.xlsx).
[142] SSA does not forecast real GDP or the GDP deflator, only nominal GDP and CPI.
[143] Because these are compound growth rates, the geometric sum is used, $(1+g)(1+i)-1$.

per-capita nominal GDP growth rates is 3.64%. I use the market-implied long-term inflation rate rather than the agencies' for two reasons. First, although all three forecasts are the agencies' most recent, they are stale in comparison to the September 2022 average Treasury rates used to estimate inflation. Second, as demonstrated by the analysis of BCFF forecasts, market-derived data are generally considered less biased and more accurate indicators of investor expectations than expert forecasts.

Q. WHAT IS YOUR FORWARD-LOOKING MRP?

A. The S&P 500 MS DCF yields a forecast return of 6.43%. This result is consistent with the buy-side equity return forecasts summarized in Figure 3, which average 5.9% over the 10+-year horizon. Subtracting the current T30, 3.57%, gives an MRP of 2.87%.

Q. AND YOUR COMBINED MRP?

A. The average of my historical (4.86%) and forward-looking (2.87%) MRPs is 3.86%.

4. Implementing the CAPM with more rigorously estimated parameters yields COE estimates approximately one-third of Mr. Coyne's values.

Q. WHAT ARE THE RESULTS OF YOUR CAPM ANALYSIS?

A. The Yahoo! Finance and Zacks 5-year monthly betas for the GPC proxy group, listed in Figure 20, are both 0.48. The corresponding COE is 5.41%,[144] approximately 40% of the 13.55% average of Mr. Coyne's estimates.[145]

Q. RECENT UTILITY BOND YIELDS ARE CLOSE TO, AND EVEN EXCEED, YOUR MS DCF AND CAPM RESULTS, 5.97% AND 5.41%, RESPECTIVELY. SHOULDN'T THE PREMIUM OVER BOND YIELDS BE GREATER?

A. To compare my COE results to utility bond yields, we must use the monthly average yield that corresponds to the proxy group's average credit-rating, Baa1, for September 2022,[146] the averaging period of the inputs to my MS DCF and CAPM. Moody's provides several widely referenced utility bond yield indexes, but not specifically for Baa1-rated utility bonds. Nonetheless, the Baa1 yield can be estimated by interpolating between Moody's Baa and A

[144] COE = 3.57% + 0.48 x 3.86% = 5.41%
[145] 2022 Rate Case Hr'g Tr. Vol. 1 at 662 (Sept. 28, 2022).
[146] M. Ellis analysis of S&P GMI data (last accessed October 16, 2022). S&P credit ratings are used; it is assumed that, on average, the ratings are comparable to Moody's.

monthly average utility bond yields for September 2022, 2/3 x 5.61% + 1/3 x 5.28% = 5.50% – higher than my CAPM result of 5.41%.[147]

But a utility COE estimate – an expected return on equity – cannot be directly compared to the corresponding utility bond yield. Reported bond yields are yields to maturity, assuming no default. Default risk for bonds with a Baa1 rating reduces their expected returns by approximately 0.46%. Similarly, bonds are not as liquid as stocks and attract a liquidity premium of approximately 0.33%.[148] Deducting the default and liquidity premia from the Baa1 utility bond yield to maturity reduces it to approximately 4.74%, 1.24% and 0.67% lower than my MS DCF and CAPM COE estimates, respectively.

There is no hard-and-fast rule for what the spread of equity returns over the corresponding cost of debt should be. My MS DCF and CAPM results are consistent with my forward-looking MRP and beta estimates, third-party forecasts for total market returns, and the widely recognized low risk profile of utilities.

G. Mr. Coyne's flotation cost adjustment is not analytically sound and is therefore unwarranted.

Q. MR. COYNE ADDS A FLOTATION COST ADJUSTMENT TO HIS ROE MODEL RESULTS. IS A FLOTATION COST ADJUSTMENT WARRANTED?

A. No. A flotation cost adjustment is not warranted. Mr. Coyne cites Roger Morin's *New Regulatory Finance* in support of adding a flotation cost adjustment,[149] but the application of the flotation cost adjustment provided in Morin's book is conceptually flawed. The math relied on by Mr. Coyne for his recommendation shows that shareholders make money from the issuance of new stock, so flotation cost adjustments are especially inappropriate.

[147] The ratings of Moody's A- and Baa-rated utility bond indexes are comparable to Moody's A2 and Baa2 ratings, respectively. The intermediate ratings are A3 and Baa1, so Georgia Power's Baa1 rating falls two-thirds of the way between A and Baa.

[148] Wolfgang Bühler and Monika Trapp, *Time-Varying Credit Risk and Liquidity Premia in Bond and CDS Markets*, CFR Working Papers 09-13, University of Cologne, Centre for Financial Research at 37 (2008), https://www.fdic.gov/analysis/cfr/2008/april/trapp-buhler.pdf.

[149] 2022 Rate Case Hr'g Tr. Vol. 1 at 669 (Sept. 28, 2022).

Mr. Morin's flotation cost adjustment assumes that the market price of the equity issued is equal to book value.[150] But, as shown in Figure 4 above, the average market-to-book ratio of the GPC proxy group is 2.1. As implied by the very formula provided by Mr. Morin, when the market price is greater than book value, new equity issuance is accretive to existing shareholders – that is, a share of the proceeds of the new issuance accrues to them.[151]

Morin derives the flotation cost adjustment from the formula for the extended DCF model under the assumption of continuous external stock financing:

$$k = \frac{D_1}{P} + br + sv,$$

where b is the earnings retention ratio, r is ROE, s is the annual rate of new equity issuance (expressed as a share of existing book equity), and v is the accretion factor, equal to $1 - \frac{B}{P}$. He then adjusts P for flotation costs, f, so that $1 - \frac{B}{P(1-f)}$.[152] But as long as $(1 - f)$ exceeds $\frac{B}{P}$, i.e., the reciprocal of the market-to-book ratio, existing shareholders *gain* from new share issuance. Mr. Coyne estimates flotation costs to be 2.47%, so $1 - f = 0.98$, much greater than the reciprocal of the GPC proxy group average M/B ratio, 1/2.1 = 0.48.

Q. UNDER THE NARUC FAIRNESS PRINCIPLE, ROE SHOULD EQUAL THE ACTUAL COST OF EQUITY. THIS WOULD IMPLY THAT THE MARKET-TO-BOOK RATIO EQUALS 1.0, IN WHICH CASE NEW EQUITY ISSUANCE WOULD NOT BE ACCRETIVE. IF THE COMMISSION ADHERES TO THE NARUC FAIRNESS PRINCIPLE, SHOULD ROE BE ADJUSTED FOR FLOTATION COSTS?

A. No. Even if the M/B ratio is equal to 1.0, there is no reason to adjust the ROE for new equity issuance costs.

Purchasers of the newly issued equity know that a portion of proceeds will cover transaction costs, and the offering price reflects this information. There is no need to compensate new investors for issuance costs, which they knowingly pay when they purchase new shares, with an adjustment to the ROE. Similarly, existing shareholders know that the company may issue new equity over time. These costs, and their potential effect on expected

[150] ROGER A. MORIN, NEW REGULATORY FINANCE, PUB. UTIL. REPORTS at 328 (2006): "If P_0 is regarded as the proceeds per share actually received by the company from which dividends and earnings will be generated, that is, [if] P_0 equals B_0, the book value per share, …"

[151] MYRON J. GORDON, THE COST OF CAPITAL TO A PUBLIC UTILITY at 31-32 (1974).

[152] ROGER A. MORIN, NEW REGULATORY FINANCE, PUB. UTIL. REPORTS at 332-33 (2006).

returns, are likewise reflected in investors' willingness to buy, hold, or sell shares that determines share prices.

Mr. Coyne's flotation cost adjustment is small and is overwhelmed by the imprecision in his models. At 0.08%, it amounts to less than 2% of the 8.99%-13.55% range of Mr. Coyne's base ROE results.[153] To add a flotation cost adjustment is akin to the elementary school student, who, upon being asked what they learned during a field trip to the science museum, proudly says, "Earth is 4.5 billion years and [glancing at a clock] six hours and forty-three minutes old."

Mr. Coyne's flotation cost adjustment is conceptually flawed and not materially significant. It should be disregarded.

V. GEORGIA POWER'S ROE AND EQUITY RATIO SHOULD OPTIMALLY BALANCE CUSTOMER AND INVESTOR INTERESTS.

A. COE model results must be adjusted for differences in equity ratio.

Q. IN SECTION IV.B ABOVE, YOU DISCUSSED ADJUSTING COE MODEL RESULTS FOR DIFFERENCES IN EQUITY RATIOS AMONG THE PROXY GROUP MEMBERS. HOW DO YOU DO THAT?

A. The MS DCF and CAPM yield levered costs of equity. To account for differences in capital structure among the proxy group members, the COE results are unlevered to estimate the cost of equity assuming 100% equity financing.[154] The unlevered cost of equity, k_u, is typically expressed as an adjustment to beta in the CAPM:

$$k_u = r_f + \beta_u(r_m - r_f),$$[155]

where the unlevered beta, β_u, is expressed in terms of the levered equity beta, β_e:

[153] 2022 Rate Case Hr'g Tr. Vol. 1 at 668 (Sept. 28, 2022).

[154] The unlevered cost of equity differs from the weighted average cost of capital ("WACC"). The unlevered cost of capital assumes 100% equity financing; the WACC assumes the company's current capital structure. While under the Modigliani and Miller theorem of capital structure independence, the cost of capital should be the same regardless of capital structure, the WACC typically overstates the unlevered cost of equity because the *expected* return on corporate debt is lower than the yield due to default and liquidity risk.

[155] *See, e.g.*, ASWATH DAMODARAN, DAMODARAN ON VALUATION: SECURITY ANALYSIS FOR INVESTMENT AND CORPORATE FINANCE, WILEY 2ND ED. at 129 (2006).

$$\beta_u = \frac{E}{D+E}\beta_e.$$[156]

For consistency and comparability, I apply the same methodology – unlevering relative to the risk-free rate, not the company's cost of debt – to the MS DCF model results:

$$k_u = r_f + \frac{E}{D+E}\beta_l(r_m - r_f)$$

$$k_e - r_f = \beta_l(r_m - r_f)$$

$$k_u = r_f + \frac{E}{D+E}(k_e - r_f)$$

$$k_u = \frac{D}{D+E}r_f + \frac{E}{D+E}k_e,$$

where D and E refer to debt and equity, respectively. Best practice is to use market, not book, values for both debt and equity as market reflects investors' actual exposure; they buy and sell securities at market value, not book.[157] Market values for the debt carried by the proxy group members are not readily available, though, so book value is assumed.

[*Remainder of page intentionally left blank.*]

[156] Unlevered beta is sometimes adjusted for taxes (the "Hamada" adjustment). As explained in Damondaran in *Valuation*, when the capital structure is constant over time, as it is with utilities, then the value of tax shields tracks the value of operating assets. Thus, the risk of tax shields will mirror the risk of operating assets and have the same discount rate, i.e., the unlevered cost of equity. *Id*. at 790-93.

[157] *See, e.g.,* TIM KOLLER, MARC GOEDHART ET AL., VALUATION, 5TH ED. MCKINSEY & CO. 35 at 204 (2010): "Where possible, you should estimate *market* values of the elements of the current capital structure" (emphasis added).

Figure 27. Proxy group levered COEs, equity ratios, and unlevered COEs[158]
Percent, as of September 2022

	Levered COE				
Utility	MSDCF	CAPM	Average	**Equity ratio**	**Unlevered COE**
ALLETE	8.25	5.92	7.08	56	5.52
Alliant	5.50	5.36	5.43	65	4.78
Ameren	5.36	4.93	5.15	61	4.53
AEP	5.92	4.87	5.40	57	4.61
Duke	6.70	4.91	5.81	52	4.73
Edison Int'l	6.61	6.17	6.39	42	4.75
Entergy	6.50	5.76	6.13	47	4.76
Evergy	6.00	5.41	5.71	56	4.77
Hawaiian Electric	5.73	4.80	5.26	62	4.62
IDACORP	4.78	5.72	5.25	74	4.81
NextEra	5.03	5.34	5.18	71	4.71
OGE	5.96	6.11	6.03	62	5.09
Portland General	5.93	5.55	5.74	56	4.78
Xcel	5.37	4.89	5.13	61	4.52
Mean	**5.97**	**5.41**	**5.69**	**59**	**4.78**
Standard deviation	*0.87*	*0.48*	*0.57*		*0.25*
High	*8.25*	*6.17*	*7.08*		*5.52*
Low	*4.78*	*4.80*	*5.13*		*4.52*
High – low	*3.47*	*1.37*	*1.95*		*1.00*

The variation in the unlevered COE estimates is much lower than in the levered COEs, with approximately half the standard deviation (0.25 vs 0.57) and range (1.00 vs. 1.95). The underlying businesses of the proxy group members are very similar, so their risk profiles and corresponding overall costs of capital are expected to be similar as well. Their equity ratios vary considerably, though, from 42% to 74%, which introduces variation in their levered costs of equity. This variation due to differences in equity ratios makes levered COEs an inappropriate basis for determining the ROE of a target company, like Georgia Power, which will likely have a different equity ratio.

Q. HOW DO YOU USE THE PROXY GROUP AVERAGE UNLEVERED COE TO DETERMINE YOUR RECOMMENDATION FOR GEORGIA POWER'S ROE, WHICH IS LEVERED?

A. The unlevered COE is "relevered" using the same formula described above, the terms of which can be rearranged as:

$$k_e = \frac{D+E}{E} k_u + \frac{D+E}{D} r_f.$$

[158] M. Ellis analysis of S&P GMI data; market equity ratio based on September 2022 average.

In Section III above, I explained that the equity ratio depends on ROE. ROE, in turn, depends on the equity ratio. They can be determined jointly, in an iterative calculation process that is easily performed in common spreadsheet software like Microsoft Excel or Google Sheets.

B. ROE and equity ratio should be optimized to minimize customer costs while meeting investor requirements.

Q. IN SECTION III.A ABOVE, YOU PROVIDED AN ILLUSTRATIVE ANALYSIS OF THE INTER-RELATIONSHIPS BETWEEN EQUITY RATIO, ROE, AND CREDIT QUALITY. CAN YOU CONDUCT THAT ANALYSIS SPECIFICALLY FOR GEORGIA POWER?

A. Yes. Such an analysis can be conducted for Georgia Power using data provided in Moody's most recent credit update.[159]

Figure 28 applies the analysis illustrated in Figure 8 above to the financial data provided in Moody's October 2021 credit update for Georgia Power. As before, different levels of ROE are represented by the upward curving lines. As the equity ratio increases along the horizontal axis, so does the cash flow-to-debt ratio, depicted on the vertical axis. Here, cash flow from operations (CFO) is used instead of FFO, for consistency with Moody's preferred metric.[160] Black dashed horizontal lines have been added at the CFO/debt levels that correspond to potential target credit ratings: Georgia Power's current Baa1 ([redacted]% CFO/debt) and an upgrade to A3 ([redacted]%).[161]

The dark gray dot on the upper of the two ROE arcs represents Georgia Power's proposed 11.00% ROE and 56% equity ratio. The corresponding CFO/debt ratio is indicated by the

[159] GPC data request response STF-NEC-1-1 Attachment AG: Moody's Investors Service, "Georgia Power Company: Update to credit analysis" (October 13, 2021). Data from Moody's is used, not the financial data in GPC's regulatory filing, because Moody's makes various adjustments to GPC's reported financials that are not explained in sufficient detail to replicate using GPC's data.

[160] *See* GPC data request response STF-NEC-1-1 Attachment AG: Moody's Investors Service, *Georgia Power Company: Update to credit analysis* (October 13, 2021). Moody's preferred cash flow metric is cash flow from operations (CFO), not FFO, and the analysis is based on Moody's CFO/debt data. The basic definition of CFO is net income + depreciation and amortization + changes in working capital, i.e., FFO + changes in working capital. *See* Corporate Finance Institute, *How to Calculate FCFE from CFO?* (Dec. 16, 2020) https://corporatefinanceinstitute.com/resources/knowledge/accounting/how-to-calculate-fcfe-from-cfo/.

[161] In the Moody's credit analysis provided in GPC data request Trade Secret response STF-NEC-1-1 Attachment AG, Moody's provides CFO/debt thresholds for up- and downgrades of [redacted]% and [redacted]%, respectively. The threshold for GPC's current rating is estimated as the midpoint, [redacted]5%.

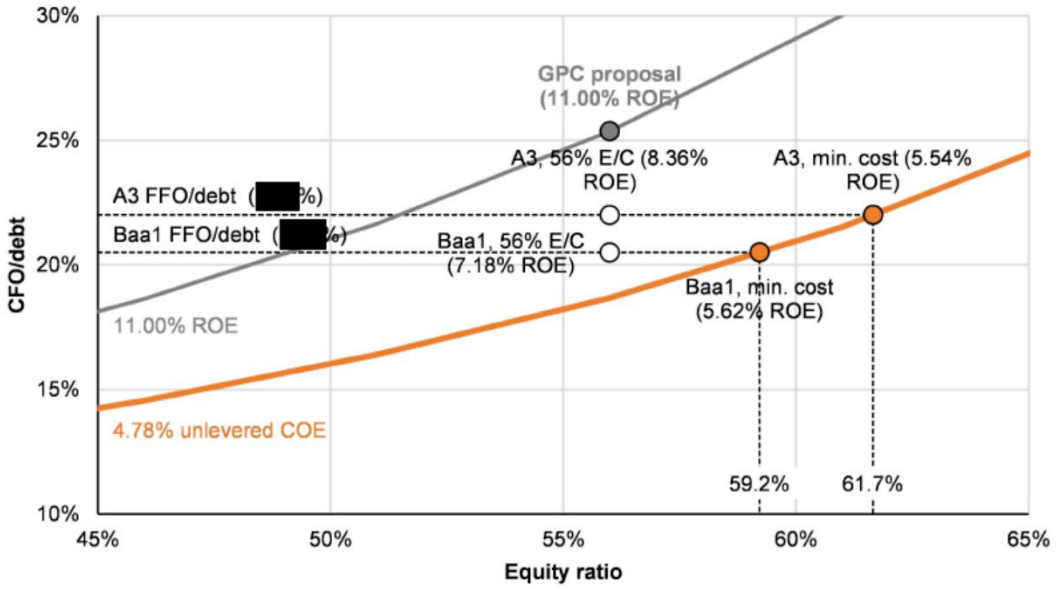
height of the dot on the vertical axis, [redacted]% – well above the [redacted]% required to maintain Georgia Power's current Baa1 credit rating. Either or both of Georgia Power's proposed ROE and equity ratio can be reduced to lower customer costs while still satisfying investor demands.

The lower of the two ROE arcs represents Georgia Power's 4.78% unlevered (100% equity) COE. As discussed previously, the corresponding levered ROE will increase as the equity ratio declines. To maintain Georgia Power's current Baa1 rating would require an equity ratio of 59.2%, slightly higher than GPC's proposal, and an ROE of 5.62%. If instead a higher A3 credit rating is targeted, the equity ratio and ROE would need to be 61.7% and 5.54%, respectively. The trade-off, in terms of customer costs, associated with these higher equity ratios will be quantified below.

The two white dots immediately below GPC's proposal illustrate scenarios in which an equity ratio constraint is imposed, here equal to GPC's proposed 56%. To maintain target credit ratings of Baa1 or A3, the ROE would need to be increased to 7.18% and 8.36%, respectively. The trade-off, in terms of customer costs, associated with an equity ratio constraint will also be quantified below.

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Figure 28. Relationship between equity ratio, ROE, and credit quality for Georgia Power



C. An optimized ROE and equity ratio can significantly reduce customer costs while meeting the demands of both equity and debt investors.

Q. HOW WOULD AN OPTIMIZED ROE AND EQUITY RATIO IMPACT CUSTOMER COSTS?

A. Figure 29 compares the revenue requirement (pre-tax) weighted average rate of return for the five scenarios depicted in Figure 28. The ROE optimized for a Baa1 rating, 5.62%, is 49% lower than Mr. Coyne's proposed ROE of 11.00% (line 2). Even with the higher 59.2% equity ratio, after grossing up for taxes, the revenue requirement ROR, 5.92%, is 40% lower than GPC's 9.83% (lines 6-7). If a higher A3 credit rating is targeted, the additional cost of the required higher 61.7% equity ratio is almost completely offset by the lower levered ROE of 5.54%,[162] and the revenue requirement ROR increases only slightly to 5.95%.

Figure 29 also shows the average annual total revenue requirement under each of the five scenarios (line 8). Based on analysis of Georgia Power's general rate case filings, its proposed combined rate of return for both debt and equity, the latter grossed up for taxes, accounts for

[162] It is assumed that there is no change in the cost of debt at the higher A1 credit rating over the 2023-25 period. New issuance accounts for approximately 18% of Georgia Power's net long-term debt at the end of 2025. The difference in yield between A3- and Baa1-rated utility bonds is approximately 0.11%. The change in interest costs would therefore be approximately 18% x 0.11% = 0.02% by the end of the forecast period. M. Ellis analysis of data in Ex. APA SPA ADH MBR-3, Schedule 3, Workpaper 4.

more than 25% of its revenue requirement.[163] The total revenue requirement under GPC's proposal averages $9.14 billion per year from 2023 through 2025. Optimized ROEs and equity ratios, under either the Baa1 or A3 target credit rating, reduce total customer costs by over 11% (line 10) or more than $1.0 billion per year (line 9).

An equity ratio constraint would impose fairly substantial costs on customers, increasing the revenue requirement ROR to 6.96% and 7.84% under Baa1 and A3 credit rating targets, respectively – an increase of nearly 100 and 200 basis points relative to the corresponding minimum-cost scenarios. While total customer costs are lower than under GPC's proposal, they are only 50% to 70% of the reduction without an equity ratio constraint. These results further demonstrate the flaw in the "leverage up" (reduce the equity ratio) argument described in Section III.A above. It is much more cost effective to use any spare credit capacity to reduce ROE than to increase debt.

Figure 29. Revenue requirement (pre-tax) rate of return under different weighted under GPC proposal, minimum cost, and equity ratio constraint scenarios
Percent (except lines 8 and 9)

		GPC proposal	Minimum cost		Equity ratio constraint	
			Baa1	A3	Baa1C	A3
1	Equity ratio	56.0	59.2	61.7	56.0	56.0
2	ROE	11.00	5.62	5.54	7.18	8.36
3	Cost of debt	3.59	3.59	3.59	3.59	3.59
4	Rate of return	7.74	4.79	4.79	5.60	6.26
5	Tax rate	25.3	25.3	25.3	25.3	25.3
6	**Rev. requirement rate**	**9.83**	**5.92**	**5.95**	**6.96**	**7.84**
7	*ΔGPC proposal*		*-40*	*-39*	*-29*	*-20*
8	**Rev. requirement ($ B)**	**9.14**	**8.09**	**8.10**	**8.37**	**8.61**
9	Customer savings ($ billion per year)		-1.05	-1.04	-0.77	-0.53
10	*ΔGPC proposal*		*-11.5%*	*-11.4%*	*-8.4%*	*-5.8%*

Q. WHAT ARE THE IMPLICATIONS OF AN OPTIMIZED ROE AND EQUITY RATIO ON RESIDENTIAL CUSTOMER BILLS?

A. Average residential customer bills can be estimated from Georgia Power's total retail base rate revenue and sales of electricity forecast for the 12 months ending July 31, 2023,[164] and Budget

[163] M. Ellis analysis of data in Ex. APA-SPA-ADH-MBR-1, Schedule 1.
[164] 2022 Rate Case, Georgia Power Document Filing No. 190559, App. Ex. 1-2 Workpaper 1 (June 24, 2022).

2022 Load and Energy Forecast customer count projection.[165] Assuming the 11% cost reduction under either of the optimized ROE/equity ratio scenarios applies uniformly across customer classes, Georgia Power residential customers would save approximately $135 per year.

Q. WHAT ARE YOUR ROE AND EQUITY RATIO RECOMMENDATIONS FOR GEORGIA POWER?

A. I recommend the A3 target credit rating scenario for Georgia Power, 5.54% ROE and 61.7% equity ratio, for several reasons. Both the A3 and Baa1 scenarios are consistent with the Supreme Court's guidance provided in *Hope Natural Gas* to set "just and reasonable rates" through a "balancing of the investor and the consumer interests." In contrast, Mr. Coyne's recommendation and the two equity ratio-constrained scenarios are overly generous to investors at the expense of customers and therefore fail the *Hope* standard.

The A3 and Baa1 scenarios have the same estimated cost to customers over the 2023-25 timeframe. This is largely because the analysis assumes the improved credit rating does not materially reduce Georgia Power's average cost of debt during the 2023-25 timeframe. Beyond 2025, though, the average cost of debt would be materially lower under the A3 scenario, reducing customer costs relative to the Baa1 scenario. Figure 30 summarizes my COE analysis and ROE and equity ratio recommendations.

[*Remainder of page intentionally left blank.*]

[165] 2022 IRP, Georgia Power Document Filing No. 188519, PD Vol. 1, 4 PD Load and Energy Forecast, PD B2022 Load and Energy Forecast 2022 to 2041 at 18, Section 2 (January 31, 2022).

Figure 30. Summary of Georgia Power COE analysis and recommended ROE and equity ratio
Percent

Model	COE	Key assumptions
DCF	**5.97**	
Dividend yield	3.36	Most recent quarterly dividend divided by one-month trailing price history (~21 trading days)
Initial growth rate	5.49	Analysts' EPS growth rates for three years to mitigate upward bias
Terminal growth rate	1.57	Based on long-term historical utility DPS growth rate equal to inflation
CAPM	**5.41**	
Risk-free rate	3.56	Current (one-month trailing average) 30-year Treasury
Beta	0.48	5-year monthly balances long-term historical trend and current market conditions
Market risk premium • Historical • Forward	3.86 4.86 2.87	Average of forward-looking using MS DCF and long-term historical average; MS DCF long-term growth rate equal to pre-capita GDP
Mean COE – Levered	**5.69**	
– Unlevered	4.78	59% proxy group average *market* equity ratio
Equity ratio	**61.7**	
Relevered COE/ recommended ROE	**5.54**	

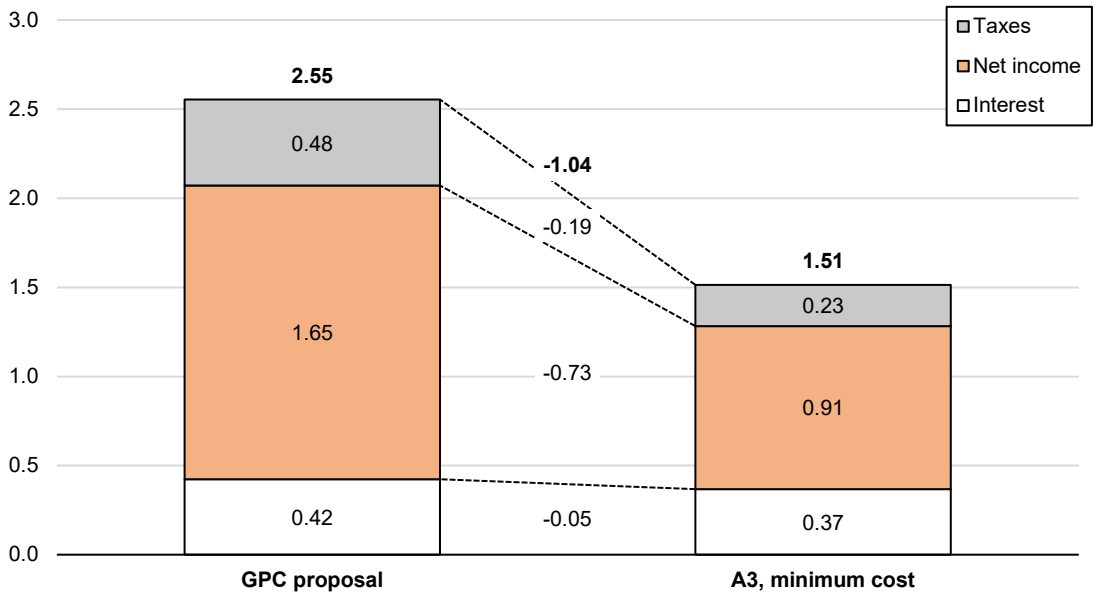
Q. IF THE COMMISSION ADOPTS YOUR ROE AND EQUITY RATIO RECOMMENDATIONS, HOW WOULD THE SOUTHERN COMPANY'S SHAREHOLDERS BE AFFECTED?

A. ROEs in excess of the cost of equity resembles a zero-sum game, with the interests of shareholders and customers in direct opposition. If the Commission adopted my recommended ROE and equity ratio, I would expect The Southern Company share price to experience a one-time downward adjustment as investors reset their expectations about future returns. Southern would still be able to access the equity markets, because Georgia Power's ROE, based on its actual cost of equity, i.e., investors' *expected* return,[166] would be sufficient to satisfy investors' demands. Investors who purchase shares after the one-time adjustment would earn returns comparable to the return current Southern shareholders expect.

[166] "Cost of equity" and "*expected* return on equity" are synonymous. *See supra* footnote 11.

I said that ROE above the cost of equity *resembles* a zero-sum game between shareholders and customers. It is not quite zero-sum between these two parties, though, because there is a third party: the tax authorities. ROE is grossed-up for taxes; to the extent ROE is reduced, taxes are also reduced. In aggregate, a lower ROE provides approximately one-third more benefit to customers than shareholders lose in foregone profit.[167] As shown in Figure 31, of the $1.04-billion reduction in revenue requirement return under the A3 scenario (Figure 29, line 9), the decline in Georgia Power's net income accounts for $740 million; $190 million is foregone taxes, of which approximately $150 million (77.5%) is Federal.[168]

Figure 31. Interest, ROE, and income tax revenue requirement under GPC proposal and A3 minimum cost scenario
$ billion



It is important to recognize that *Hope* established that regulators are not obligated to maintain utility stock market valuations, and that such an obligation would make a nonsense of regulators' consumer protection mandate:

> Ratemaking is indeed but one species of price-fixing. The fixing of prices, like other applications of the police power, may reduce the value of the property which is being regulated. But the fact

[167] Georgia Power's marginal tax rate is approximately 25%. The tax gross-up is 1/(1 – 25%) = $1^{1}/_{3}$. *See* Ex. APA-SPA-ADH-MBR-1, Schedule 1 Total Company.

[168] Georgia corporate income tax rate of 5.75%, Federal, 21%. After deducting state taxes, the net Federal rate is (1 – 5.75%) x 21% = 19.79%; 19.79% / (19.79% + 5.75%) = 77.49%.

> that the value is reduced does not mean that the regulation is invalid. It does, however, indicate that "fair value" is the end product of the process of ratemaking, not the starting point, as the Circuit Court of Appeals held. The heart of the matter is that rates cannot be made to depend upon "fair value" when the value of the going enterprise depends on earnings under whatever rates may be anticipated.[169]

The impact on Southern's stock price should not factor at all into the Commission's determination of the appropriate ROE and equity ratio.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

[*Remainder of page intentionally left blank.*]

[169] 320 U.S. 591, 601.

Exhibit MEE-1

Georgia Power 2022 Rate Case – 44280

Georgia Interfaith Power & Light

MARK E. ELLIS

La Jolla, CA | mark.edward.ellis@gmail.com | 619-507-8892 | https://www.linkedin.com/in/mark-edward-ellis

SUMMARY

Mark E. Ellis is a former utility executive now working as an independent consultant and testifying expert in finance and economics in utility regulatory proceedings.

Before establishing his own consultancy, Mark led the strategy function at Sempra Energy (parent of SDG&E and SoCalGas) for fifteen years. Previously, he worked as a consultant in McKinsey's energy practice, in international project development for ExxonMobil, and in industrial demand-side management for Southern California Edison. He has an MS from MIT's Technology and Policy Program, where he focused on utility policy and conducted research in the MIT Energy Lab, and a BS in mechanical engineering from Harvard.

EXPERT TESTIMONY

Client	Utility	Description	Docket No.	Date
Southern Environmental Law Center	Georgia Power	Cost of capital	44280	8/22-ongoing
Clean Wisconsin	Wisconsin Electric Power, Wisconsin Gas	Cost of capital	5-UR-110	9/22-ongoing
The Protect Our Communities Foundation	Pacific Gas & Electric, San Diego Gas & Electric, Southern California Gas	Cost of capital	A.22-04-008, et seq.	4/22-ongoing
The Utility Reform Network	Pacific Gas & Electric	Wildfire liability self-insurance	A.21-06-021	11/21-ongoing
The Protect Our Communities Foundation	Pacific Gas & Electric, San Diego Gas & Electric, Southern California Edison	Cost of capital	A.21-08-013 et seq.	11/21-ongoing
New Hampshire Department of Energy	Aquarion Water Company of New Hampshire	Cost of capital	DW 20-184	6/21-ongoing
The Utility Reform Network	Pacific Gas & Electric	$7.5-billion wildfire cost securitization	A.20-04-023	6/20-2/21

EMPLOYMENT

Company	Title	Location	Date
Self-employed	Independent consultant and testifying expert	La Jolla, CA	2019-present
Sempra Energy	Chief of Corporate Strategy	San Diego, CA	2004-2019
McKinsey & Company	Engagement Manager	Houston, TX	2000-03
ExxonMobil	Venture Development Advisor	Houston, TX	1996-2000
MIT Energy Laboratory	Research Assistant	Cambridge, MA	1994-96
Southern California Edison	Staff Engineer	Irwindale, CA	1994
Sanyo Electric Company	Research Engineer	Osaka, Japan	1992-93
Los Angeles Department of Water & Power	Seasonal Waterworks Laborer	Chatsworth, CA	1988

MARK E. ELLIS

Independent consultant and testifying expert in utility finance and economics

START-UP

Organization	Title	Description	Date
Gridware	Advisor	Y Combinator graduate developing wildfire prevention technology for electric utilities	2021-present
GATEMatrices	CEO & Founder	Created iOS app to prepare elementary-school children for gifted-and-talented education program admission tests	2013-present
Apertur	CEO & Founder	Created a technology-enabled professional development platform of workshops, assessments, toolkit, and apps to help organizations improve their culture and decision-making by reducing cognitive bias	2013-2020
Climate Policy Initiative	Power Program Director	Climate change policy advisory non-profit funded by George Soros	2010-13

NON-PROFIT BOARD

Organization	Date	Organization	Date
Harvard Club of San Diego	2015-17	Chabad Hebrew Academy	2007-14
Congregation Adat Yeshurun	2005-12	San Diego Agency for Jewish Education	2005-07

EDUCATION

Institution	Degree	Date
Massachusetts Institute of Technology	MS, Technology and Policy	1996
Harvard University	BS, *magna cum laude,* Mechanical and Materials Sciences and Engineering	1992

Exhibit MEE-2

Georgia Power 2022 Rate Case – 44280

Georgia Interfaith Power & Light

and Mr. Justice JACKSON concur in the result on the authority of Morton Salt Co. v. G. S. Suppiger Co., 314 U.S. 488, 62 S.Ct. 402, 86 L.Ed. 363.



320 U.S. 591

FEDERAL POWER COMMISSION et al. v. HOPE NATURAL GAS CO.

CITY OF CLEVELAND v. SAME.

Nos. 34 and 35.

Argued Oct. 20, 21, 1943.

Decided Jan. 3, 1944.

1. Public service commissions ⇐7

Rate-making is only one species of price-fixing, which, like other applications of the police power, may reduce the value of the property regulated, but that does not render the regulation invalid.

2. Public service commissions ⇐7

Rates cannot be made to depend upon fair value, which is the end product of the process of rate-making and not the starting point, when the value of the going enterprise depends on earnings under whatever rates may be anticipated.

3. Gas ⇐14(1)

The rate-making function of the Federal Power Commission under the Natural Gas Act involves the making of pragmatic adjustments, and the Commission is not bound to the use of any single formula or combination of formulae in determining rates. Natural Gas Act, §§ 4(a), 5(a), 6, 15 U.S.C.A. §§ 717c(a), 717d(a), 717e.

4. Gas ⇐14(1)

When order of Federal Power Commission fixing natural gas rates is challenged in the courts, the question is whether order viewed in its entirety meets the requirements of the Natural Gas Act. Natural Gas Act, §§ 4(a), 5(a), 6, 19(b), 15 U.S.C.A. §§ 717c(a), 717d(a), 717e, 717r(b).

5. Gas ⇐14(1)

Under the statutory standard that natural gas rates shall be "just and reasonable" it is the result reached and not the method employed that is controlling. Natural Gas Act §§ 4(a), 5(a), 15 U.S.C.A. §§ 717c(a), 717d(a).

6. Gas ⇐14(1)

If the total effect of natural gas rates fixed by Federal Power Commission cannot be said to be unjust and unreasonable, judicial inquiry under the Natural Gas Act is at an end. Natural Gas Act, §§ 4(a), 5(a), 6, 19(b), 15 U.S.C.A. §§ 717c(a), 717d(a), 717e, 717r(b).

7. Gas ⇐14(1)

An order of the Federal Power Commission fixing rates for natural gas is the product of expert judgment, which carries a presumption of validity, and one who would upset the rate must make a convincing showing that it is invalid because it is unjust and unreasonable in its consequences. Natural Gas Act, §§ 4(a), 5(a), 6, 19(b), 15 U.S.C.A. §§ 717c(a), 717d(a), 717e, 717r(b).

8. Gas ⇐14(1)

The fixing of just and reasonable rates for natural gas by the Federal Power Commission involves a balancing of the investor and the consumer interests. Natural Gas Act, §§ 4(a), 5(a), 15 U.S.C.A. §§ 717c(a), 717d(a).

9. Gas ⇐14(1)

As respects rates for natural gas, from the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business, which includes service on the debt and dividends on stock, and by such standard the return to the equity owner should be commensurate with the terms on investments in other enterprises having corresponding risks, and such returns should be sufficient to assure confidence in the financial integrity of the enterprise so as to maintain its credit and to attract capital. Natural Gas Act, §§ 4(a), 5(a), 15 U.S.C.A. §§ 717c(a), 717d(a).

10. Gas ⇐14(1)

The fixing by the Federal Power Commission of a rate of return that permitted a natural gas company to earn $2,191,314 annually was supported by substantial evidence. Natural Gas Act, §§ 4(a), 5(a), 6, 19(b), 15 U.S.C.A. §§ 717c(a), 717d(a), 717e, 717r(b).

11. Gas ⇐14(1)

Rates which enable a natural gas company to operate successfully, to maintain its financial integrity, to attract capital and to compensate its investors for the risks assumed cannot be condemned as invalid, even though they might produce only a meager return on the so-called "fair value" rate base. Natural Gas Act, §§ 4(a), 5(a), 6, 19(b), 15 U.S.C.A. §§ 717c(a), 717d(a), 717e, 717r(b).

12. Gas ⇐14(1)

A return of only 3 27/100 per cent. on alleged rate base computed on reproduction cost new to natural gas company earning an annual average return of about 9 per cent. on average investment and satisfied with existing gas rates suggests an inflation of the base on which the rate had been computed, and justified Federal Power Commission in rejecting reproduction cost as the measure of the rate base. Natural Gas Act, §§ 4(a), 5(a), 15 U.S.C.A. §§ 717c (a), 717d(a).

13. Gas ⇐14(1)

There is no constitutional requirement that owner who engages in a wasting-asset business of limited life shall receive at the end more than he has put into it, and such rule is applicable to a natural gas company since the ultimate exhaustion of its supply of gas is inevitable. Natural Gas Act, §§ 4(a), 5(a), 6, 19(b), 15 U.S.C.A. §§ 717c (a), 717d(a), 717e, 717r(b).

14. Gas ⇐14(1)

In fixing natural gas rate the basing of annual depreciation on cost is proper, since by such procedure the utility is made whole and the integrity of its investment is maintained, and no more is required. Natural Gas Act, §§ 4(a), 5(a), 6, 19(b), 15 U.S. C.A. §§ 717c(a), 717d(a), 717e, 717r(b).

15. Gas ⇐14(1)

There are no constitutional requirements more exacting than the standards of the Natural Gas Act which are that gas rates shall be just and reasonable, and a rate order which conforms with the act is valid. Natural Gas Act, §§ 4(a), 5(a), 6, 19(b), 15 U.S.C.A. §§ 717c(a), 717d(a), 717e, 717r(b).

16. Commerce ⇐13

The purpose of the Natural Gas Act was to provide through the exercise of the national power over interstate commerce an agency for regulating the wholesale distribution to public service companies of natural gas moving in interstate commerce not subject to certain types of state regulation, and the act was not intended to take any authority from state commissions or to usurp state regulatory authority. Natural Gas Act, § 1 et seq., 15 U.S.C.A. § 717 et seq.

17. Mines and minerals ⇐92

Under the Natural Gas Act, the Federal Power Commission has no authority over the production or gathering of natural gas. Natural Gas Act, § 1(b), 15 U.S.C.A. § 717(b).

18. Gas ⇐14(1)

The primary aim of the Natural Gas Act was to protect consumers against exploitation at the hands of natural gas companies and holding companies owning a majority of the pipe-line mileage which moved gas in interstate commerce and against which state commissions, independent producers and communities were growing quite helpless. Natural Gas Act, §§ 4, 6–10, 14, 15 U.S.C.A. §§ 717c, 717e–717i, 717m.

19. Gas ⇐14(1)

Apart from the express exemptions contained in § 7 of the Natural Gas Act considerations of conservation are material where abandonment or extensions of facilities or service by natural gas companies are involved, but exploitation of consumers by private operators through maintenance of high rates cannot be continued because of the indirect benefits derived therefrom by a state containing natural gas deposits. Natural Gas Act, §§ 4, 5, and § 7, as amended, 15 U.S.C.A. §§ 717c, 717d, 717f.

20. Commerce ⇐13

A limitation on the net earnings of a natural gas company from its interstate business is not a limitation on the power of the producing state, either to safeguard its tax revenues from such industry, or to protect the interests of those who sell their gas to the interstate operator, particularly where the return allowed the company by the Federal Power Commission was a net return after all such charges. Natural Gas Act, §§ 4, 5, and § 7, as amended, 15 U.S. C.A. §§ 717c, 717d, 717f.

21. Gas ⇐14(1)

The Natural Gas Act granting Federal Power Commission power to fix "just and reasonable rates" does not include the power to fix rates which will disallow or dis-

courage resales for industrial use. Natural Gas Act, §§ 4(a), 5(a), 15 U.S.C.A. §§ 717c (a), 717d(a).

See Words and Phrases, Permanent Edition, for all other definitions of "Just and Reasonable Rates".

22. Gas ⇐14(1)

The wasting-asset nature of the natural gas industry does not require the maintenance of the level of rates so that natural gas companies can make a greater profit on each unit of gas sold. Natural Gas Act, §§ 4(a), 5(a), 15 U.S.C.A. §§ 717c(a), 717d (a).

23. Courts ⇐383(1)

Where the Federal Power Commission made no findings as to any discrimination or unreasonable differences in rates, and its failure was not challenged in the petition to review, and had not been raised or argued by any party, the problem of discrimination was not open to review by the Supreme Court on certiorari. Natural Gas Act, § 4(b), 15 U.S.C.A. § 717c(b).

24. Constitutional law ⇐74

Congress has entrusted the administration of the Natural Gas Act to the Federal Power Commission and not to the courts, and apart from the requirements of judicial review, it is not for the Supreme Court to advise the Commission how to discharge its functions. Natural Gas Act, §§ 1 et seq., 19(b), 15 U.S.C.A. §§ 717 et seq., 717r(b).

25. Gas ⇐14(1)

Under the Natural Gas Act, where order sought to be reviewed does not of itself adversely affect complainant but only affects his rights adversely on the contingency of future administrative action, the order is not reviewable, and resort to the courts in such situation is either premature or wholly beyond the province of such courts. Natural Gas Act, § 19(b), 15 U.S. C.A. § 717r(b).

26. Gas ⇐14(1)

Findings of the Federal Power Commission on lawfulness of past natural gas rates, which the Commission was without power to enforce, were not reviewable under the Natural Gas Act giving any "party aggrieved" by an order of the Commission the right of review. Natural Gas Act, § 19(b), 15 U.S.C.A. § 717r(b).

See Words and Phrases, Permanent Edition, for all other definitions of "Party Aggrieved".

Mr. Justice REED, Mr. Justice FRANKFURTER and Mr. Justice JACKSON, dissenting.

On Writs of Certiorari to the United States Circuit Court of Appeals for the Fourth Circuit.

Separate proceedings before the Federal Power Commission by such Commission, by the City of Cleveland and the City of Akron, and by Pennsylvania Public Utility Commission wherein the State of West Virginia and its Public Service Commission were permitted to intervene concerning rates charged by Hope Natural Gas Company which were consolidated for hearing. An order fixing rates was reversed and remanded with directions by the Circuit Court of Appeals, 134 F.2d 287, and Federal Power Commission, City of Akron and Pennsylvania Public Utility Commission in one case and the City of Cleveland in another bring certiorari.

Reversed.

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Mr. Francis M. Shea, Asst. Atty. Gen., for petitioners Federal Power Com'n and others.

Mr. Spencer W. Reeder, of Cleveland, Ohio, for petitioner City of Cleveland.

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Mr. William B. Cockley, of Cleveland, Ohio, for respondent.

Mr. M. M. Neely, of Charleston, W. Va., for State of West Virginia, as amicus curiæ by special leave of Court.

Mr. Justice DOUGLAS delivered the opinion of the Court.

The primary issue in these cases concerns the validity under the Natural Gas Act of 1938, 52 Stat. 821, 15 U.S.C. § 717 et seq., 15 U.S.C.A. § 717 et seq., of a rate order issued by the Federal Power Commission reducing the rates chargeable by Hope Natural Gas Co., 44 P.U.R.,N.S., 1. On a petition for review of the order made pursuant to § 19(b) of the Act, the

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Circuit Court of Appeals set it aside, one judge dissenting. 4 Cir., 134 F.2d 287. The cases

are here on petitions for writs of certiorari which we granted because of the public importance of the questions presented. City of Cleveland v. Hope Natural Gas Co., 319 U.S. 735, 63 S.Ct. 1165.

Hope is a West Virginia corporation organized in 1898. It is a wholly owned subsidiary of Standard Oil Co. (N.J.). Since the date of its organization, it has been in the business of producing, purchasing and marketing natural gas in that state.[1] It sells some of that gas to local consumers in West Virginia. But the great bulk of it goes to five customer companies which receive it at the West Virginia line and distribute it in Ohio and in Pennsylvania.[2] In July, 1938, the cities of Cleveland and Akron filed complaints with the Commission charging that the rates collected by Hope from East Ohio Gas Co. (an affiliate of Hope which distributes gas in Ohio) were excessive and unreasonable. Later in 1938 the Commission on its own motion instituted an investigation to determine the reasonableness of all of Hope's interstate rates. In March

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1939 the Public Utility Commission of Pennsylvania filed a complaint with the Commission charging that the rates collected by Hope from Peoples Natural Gas Co. (an affiliate of Hope distributing gas in Pennsylvania) and two non-affiliated companies were unreasonable. The City of Cleveland asked that the challenged rates be declared unlawful and that just and reasonable rates be determined from June 30, 1939 to the date of the Commission's order. The latter finding was requested in aid of state regulation and to afford the Public Utilities Commission of Ohio a proper basis for disposition of a fund collected by East Ohio under bond from Ohio consumers since June 30, 1939. The cases were consolidated and hearings were held.

On May 26, 1942, the Commission entered its order and made its findings. Its order required Hope to decrease its future interstate rates so as to reflect a reduction, on an annual basis of not less than $3,609,857 in operating revenues. And it established "just and reasonable" average rates per m. c. f. for each of the five customer companies.[3] In response to the prayer of the City of Cleveland the Commission also made findings as to the lawfulness of past rates, although concededly it had no authority under the Act to fix past rates or to award reparations. 44 P.U.R.,N.S., at page 34. It found that the rates collected by Hope from East Ohio were unjust, unreasonable, excessive and therefore unlawful, by $830,892 during 1939, $3,219,551 during 1940, and $2,815,789 on an annual basis since 1940. It further found that just, reasonable, and lawful rates for gas sold by Hope to East Ohio for resale for ultimate public consumption were those required

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to produce $11,528,608 for 1939, $11,507,185 for 1940 and $11,910,947 annually since 1940.

The Commission established an interstate rate base of $33,712,526 which, it found, represented the "actual legitimate cost" of the company's interstate property less depletion and depreciation and plus unoperated acreage, working capital and future net capital additions. The Commission, beginning with book cost, made

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[1] Hope produces about one-third of its annual gas requirements and purchases the rest under some 300 contracts.

[2] These five companies are the East Ohio Gas Co., the Peoples Natural Gas Co., the River Gas Co., the Fayette County Gas Co., and the Manufacturers Light & Heat Co. The first three of these companies are, like Hope, subsidiaries of Standard Oil Co. (N. J.). East Ohio and River distribute gas in Ohio, the other three in Pennsylvania. Hope's approximate sales in m. c. f. for 1940 may be classified as follows:

Local West Virginia sales	11,000,000
East Ohio	40,000,000
Peoples	10,000,000
River	400,000
Fayette	860,000
Manufacturers	2,000,000

Hope's natural gas is processed by Hope Construction & Refining Co., an affiliate, for the extraction of gasoline and butane. Domestic Coke Corp., another affiliate, sells coke-oven gas to Hope for boiler fuel.

[3] These required minimum reductions of 7¢ per m. c. f. from the 36.5¢ and 35.5¢ rates previously charged East Ohio and Peoples, respectively, and 3¢ per m. c. f. from the 31.5¢ rate previously charged Fayette and Manufacturers.

certain adjustments not necessary to relate here and found the "actual legitimate cost" of the plant in interstate service to be $51,957,416, as of December 31, 1940. It deducted accrued depletion and depreciation, which it found to be $22,328,016 on an "economic-service-life" basis. And it added $1,392,021 for future net capital additions, $566,105 for useful unoperated acreage, and $2,125,000 for working capital. It used 1940 as a test year to estimate future revenues and expenses. It allowed over $16,000,000 as annual operating expenses—about $1,300,000 for taxes, $1,460,000 for depletion and depreciation, $600,000 for exploration and development costs, $8,500,000 for gas purchased. The Commission allowed a net increase of $421,160 over 1940 operating expenses, which amount was to take care of future increase in wages, in West Virginia property taxes, and in exploration and development costs. The total amount of deductions allowed from interstate revenues was $13,495,584.

Hope introduced evidence from which it estimated reproduction cost of the property at $97,000,000. It also presented a so-called trended "original cost" estimate which exceeded $105,000,000. The latter was designed "to indicate what the original cost of the property would have been if 1938 material and labor prices had prevailed throughout the whole period of the piece-meal construction of the company's property since 1898." 44 P.U.R.,N.S., at pages 8, 9. Hope estimated by the "per cent condition" method accrued depreciation at about 35% of

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reproduction cost new. On that basis Hope contended for a rate base of $66,000,000. The Commission refused to place any reliance on reproduction cost new, saying that it was "not predicated upon facts" and was "too conjectural and illusory to be given any weight in these proceedings." Id., 44 P. U.R.,N.S., at page 8. It likewise refused to give any "probative value" to trended "original cost" since it was "not founded in fact" but was "basically erroneous" and produced "irrational results." Id., 44 P.U.R.,N.S., at page 9. In determining the amount of accrued depletion and depreciation the Commission, following Lindheimer v. Illinois Bell Telephone Co., 292 U.S. 151, 167-169, 54 S.Ct. 658, 664–666, 78 L.Ed. 1182; Federal Power Commission v. Natural Gas Pipeline Co., 315 U.S. 575, 592, 593, 62 S.Ct. 736, 745, 746, 86 L.Ed. 1037, based its computation on "actual legitimate cost". It found that Hope during the years when its business was not under regulation did not observe "sound depreciation and depletion practices" but "actually accumulated an excessive reserve"[4] of about $46,000,000. Id., 44 P.U.R.,N.S., at page 18. One member of the Commission thought that the entire amount of the reserve should be deducted from "actual legitimate cost" in determining the rate base.[5] The majority of the

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Commission concluded, however, that where, as here, a business is brought under regulation for the first time and where incorrect depreciation and depletion practices have prevailed, the deduction of the reserve requirement (actual existing depreciation and depletion) rather than the excessive reserve should be made so as to

[4] The book reserve for interstate plant amounted at the end of 1938 to about $18,000,000 more than the amount determined by the Commission as the proper reserve requirement. The Commission also noted that "twice in the past the company has transferred amounts aggregating $7,500,000 from the depreciation and depletion reserve to surplus. When these latter adjustments are taken into account, the excess becomes $25,500,000, which has been exacted from the ratepayers over and above the amount required to cover the consumption of property in the service rendered and thus to keep the investment unimpaired." 44 P.U.R., N.S., at page 22.

[5] That contention was based on the fact that "every single dollar in the depreciation and depletion reserves" was taken "from gross operating revenues whose only source was the amounts charged customers in the past for natural gas. It is, therefore, a fact that the depreciation and depletion reserves have been contributed by the customers and do not represent any investment by Hope." Id., 44 P.U.R.,N.S., at page 40. And see Railroad Commission v. Cumberland Tel. & T. Co., 212 U.S. 414, 424, 425, 29 S. Ct. 357, 361, 362, 53 L.Ed. 577; 2 Bonbright, Valuation of Property (1937), p. 1139.

Mark E. Ellis Direct Testimony, on behalf of GIPL
GPSC Docket No. 44280
Exhibit MEE-2 | Page 6 of 36

lay "a sound basis for future regulation and control of rates." Id., 44 P.U.R.,N. S., at page 18. As we have pointed out, it determined accrued depletion and depreciation to be $22,328,016; and it allowed approximately $1,460,000 as the annual operating expense for depletion and depreciation.[6]

Hope's estimate of original cost was about $69,735,000—approximately $17,000,000 more than the amount found by the Commission. The item of $17,000,000 was made up largely of expenditures which prior to December 31, 1938, were charged to operating expenses. Chief among those expenditures was some $12,600,000 expended

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in well-drilling prior to 1923. Most of that sum was expended by Hope for labor, use of drilling-rigs, hauling, and similar costs of well-drilling. Prior to 1923 Hope followed the general practice of the natural gas industry and charged the cost of drilling wells to operating expenses. Hope continued that practice until the Public Service Commission of West Virginia in 1923 required it to capitalize such expenditures, as does the Commission under its present Uniform System of Accounts.[7] The Commission refused to add such items to the rate base stating that "No greater injustice to consumers could be done than to allow items as operating expenses and at a later date include them in the rate base, thereby placing multiple charges upon the consumers." Id., 44 P.U.R.,N.S., at page 12. For the same reason the Commission excluded from the rate base about $1,600,000 of expenditures on properties which Hope acquired from other utilities, the latter having charged those payments to operating expenses. The Commission disallowed certain other overhead items amounting to over $3,000,000 which also had been previously charged to operating expenses. And it refused to add some $632,000 as interest during construction since no interest was in fact paid.

Hope contended that it should be allowed a return of not less than 8%. The Commission found that an 8% return would be unreasonable but that 6½% was a fair rate of return. That rate of return, applied to the rate base of $33,712,526, would produce $2,191,314 annually, as compared with the present income of not less than $5,801,171.

The Circuit Court of Appeals set aside the order of the Commission for the following reasons. (1) It held that the rate base should reflect the "present fair value" of the

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property, that the Commission in determining the "value" should have considered reproduction cost and trended original cost, and that "actual legitimate cost" (prudent investment) was not the proper measure of "fair value" where price levels had changed since the investment. (2) It concluded that the well-drilling costs and overhead items in the amount of some $17,000,000 should have been included in the rate base. (3) It held that accrued depletion and depreciation and the annual allowance for that expense should be computed on the basis of "present fair value" of the property not on the basis of "actual legitimate cost".

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[6] The Commission noted that the case was "free from the usual complexities involved in the estimate of gas reserves because the geologists for the company and the Commission presented estimates of the remaining recoverable gas reserves which were about one per cent apart." 44 P.U.R.,N.S., at pages 19, 20.

The Commission utilized the "straight-line-basis" for determining the depreciation and depletion reserve requirements. It used estimates of the average service lives of the property by classes based in part on an inspection of the physical condition of the property. And studies were made of Hope's retirement experience and maintenance policies over the years. The average service lives of the various classes of property were converted into depreciation rates and then applied to the cost of the property to ascertain the portion of the cost which had expired in rendering the service.

The record in the present case shows that Hope is on the lookout for new sources of supply of natural gas and is contemplating an extension of its pipe line into Louisiana for that purpose. The Commission recognized in fixing the rates of depreciation that much material may be used again when various present sources of gas supply are exhausted, thus giving that property more than scrap value at the end of its present use.

[7] See Uniform System of Accounts prescribed for Natural Gas Companies effective January 1, 1940, Account No. 332.1.

The Circuit Court of Appeals also held that the Commission had no power to make findings as to past rates in aid of state regulation. But it concluded that those findings were proper as a step in the process of fixing future rates. Viewed in that light, however, the findings were deemed to be invalidated by the same errors which vitiated the findings on which the rate order was based.

Order Reducing Rates. Congress has provided in § 4(a) of the Natural Gas Act that all natural gas rates subject to the jurisdiction of the Commission "shall be just and reasonable, and any such rate or charge that is not just and reasonable is hereby declared to be unlawful." Sec. 5(a) gives the Commission the power, after hearing, to determine the "just and reasonable rate" to be thereafter observed and to fix the rate by order. Sec. 5(a) also empowers the Commission to order a "decrease where existing rates are unjust * * * unlawful, or are not the lowest reasonable rates." And Congress has provided in § 19(b) that on review of these rate orders the "finding of the Commission as to the facts, if supported by substantial evidence, shall be conclusive." Congress, however, has provided no formula by which the "just and reasonable" rate is to be determined. It has not filled in the

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details of the general prescription [8] of § 4(a) and § 5(a). It has not expressed in a specific rule the fixed principle of "just and reasonable".

[1, 2] When we sustained the constitutionality of the Natural Gas Act in the Natural Gas Pipeline Co. case, we stated that the "authority of Congress to regulate the prices of commodities in interstate commerce is at least as great under the Fifth Amendment as is that of the states under the Fourteenth to regulate the prices of commodities in intrastate commerce." 315 U.S. at page 582, 62 S.Ct. at page 741, 86 L.Ed. 1037. Rate-making is indeed but one species of price-fixing. Munn v. Illinois, 94 U.S. 113, 134, 24 L.Ed. 77. The fixing of prices, like other applications of the police power, may reduce the value of the property which is being regulated. But the fact that the value is reduced does not mean that the regulation is invalid. Block v. Hirsh, 256 U.S. 135, 155–157, 41 S.Ct. 458, 459, 460, 65 L.Ed. 865, 16 A.L.R. 165; Nebbia v. New York, 291 U.S. 502, 523–539, 54 S.Ct. 505, 509–517, 78 L.Ed. 940, 89 A.L.R. 1469, and cases cited. It does, however, indicate that "fair value" is the end product of the process of rate-making not the starting point as the Circuit Court of Appeals held. The heart of the matter is that rates cannot be made to depend upon "fair value" when the value of the going enterprise depends on earnings under whatever rates may be anticipated.[9]

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[3-7] We held in Federal Power Commission v. Natural Gas Pipeline Co., supra, that the Commission was not bound to the use of any single formula or combination of formulae in determining rates. Its rate-making function, moreover, involves the making of "pragmatic adjustments." Id., 315 U.S. at page 586, 62 S.Ct. at page 743, 86 L.Ed. 1037. And when the Commission's order is challenged in the courts, the question is whether that order "viewed in its entirety" meets the requirements of the Act. Id., 315 U.S. at page 586, 62 S.Ct. at page 743, 86 L.Ed. 1037. Under the statutory standard of "just and reasonable" it is the result reached not the method employed which is controlling. Cf. Los Angeles Gas & Electric Corp. v. Railroad

[8] Sec. 6 of the Act comes the closest to supplying any definite criteria for rate making. It provides in subsection (a) that, "The Commission may investigate and ascertain the actual legitimate cost of the property of every natural-gas company, the depreciation therein, and, when found necessary for rate-making purposes, other facts which bear on the determination of such cost or depreciation and the fair value of such property." Subsection (b) provides that every natural-gas company on request shall file with the Commission a statement of the "original cost" of its property and shall keep the Commission informed regarding the "cost" of all additions, etc.

[9] We recently stated that the meaning of the word "value" is to be gathered "from the purpose for which a valuation is being made. Thus the question in a valuation for rate making is how much a utility will be allowed to earn. The basic question in a valuation for reorganization purposes is how much the enterprise in all probability can earn." Institutional Investors v. Chicago, M., St. P. & P. R. Co., 318 U.S. 523, 540, 63 S.Ct. 727, 738.

Commission, 289 U.S. 287, 304, 305, 314, 53 S.Ct. 637, 643, 644, 647, 77 L.Ed. 1180; West Ohio Gas Co. v. Public Utilities Commission (No. 1), 294 U.S. 63, 70, 55 S.Ct. 316, 320, 79 L.Ed. 761; West v. Chesapeake & Potomac Tel. Co., 295 U.S. 662, 692, 693, 55 S.Ct. 894, 906, 907, 79 L.Ed. 1640 (dissenting opinion). It is not theory but the impact of the rate order which counts. If the total effect of the rate order cannot be said to be unjust and unreasonable, judicial inquiry under the Act is at an end. The fact that the method employed to reach that result may contain infirmities is not then important. Moreover, the Commission's order does not become suspect by reason of the fact that it is challenged. It is the product of expert judgment which carries a presumption of validity. And he who would upset the rate order under the Act carries the heavy burden of making a convincing showing that it is invalid because it is unjust and unreasonable in its consequences. Cf. Railroad Commission v. Cumberland Tel. & T. Co., 212 U.S. 414, 29 S.Ct. 357, 53 L.Ed. 577; Lindheimer v. Illinois Bell Tel. Co., supra, 292 U.S. at pages 164, 169, 54 S.Ct. at pages 663, 665, 78 L.Ed. 1182; Railroad Commission v. Pacific Gas & E. Co., 302 U.S. 388, 401, 58 S.Ct. 334, 341, 82 L.Ed. 319.

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[8, 9] The rate-making process under the Act, i. e., the fixing of "just and reasonable" rates, involves a balancing of the investor and the consumer interests. Thus we stated in the Natural Gas Pipeline Co. case that "regulation does not insure that the business shall produce net revenues." 315 U.S. at page 590, 62 S.Ct. at page 745, 86 L.Ed. 1037. But such considerations aside, the investor interest has a legitimate concern with the financial integrity of the company whose rates are being regulated. From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock. Cf. Chicago & Grand Trunk R. Co. v. Wellman, 143 U.S. 339, 345, 346, 12 S.Ct. 400, 402, 36 L.Ed. 176. By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital. See State of Missouri ex rel. Southwestern Bell Tel. Co. v. Public Service Commission, 262 U.S. 276, 291, 43 S.Ct. 544, 547, 67 L.Ed. 981, 31 A.L.R. 807 (Mr. Justice Brandeis concurring). The conditions under which more or less might be allowed are not important here. Nor is it important to this case to determine the various permissible ways in which any rate base on which the return is computed might be arrived at. For we are of the view that the end result in this case cannot be condemned under the Act as unjust and unreasonable from the investor or company viewpoint.

We have already noted that Hope is a wholly owned subsidiary of the Standard Oil Co. (N. J.). It has no securities outstanding except stock. All of that stock has been owned by Standard since 1908. The par amount presently outstanding is approximately $28,000,000 as compared with the rate base of $33,712,526 established by

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the Commission. Of the total outstanding stock $11,000,000 was issued in stock dividends. The balance, or about $17,000,000, was issued for cash or other assets. During the four decades of its operations Hope has paid over $97,000,000 in cash dividends. It had, moreover, accumulated by 1940 an earned surplus of about $8,000,000. It had thus earned the total investment in the company nearly seven times. Down to 1940 it earned over 20% per year on the average annual amount of its capital stock issued for cash or other assets. On an average invested capital of some $23,000,000 Hope's average earnings have been about 12% a year. And during this period it had accumulated in addition reserves for depletion and depreciation of about $46,000,000. Furthermore, during 1939, 1940 and 1941, Hope paid dividends of 10% on its stock. And in the year 1942, during about half of which the lower rates were in effect, it paid dividends of 7½%. From 1939-1942 its earned surplus increased from $5,250,000 to about $13,700,000, i. e., to almost half the par value of its outstanding stock.

As we have noted, the Commission fixed a rate of return which permits Hope to earn $2,191,314 annually. In determining that amount it stressed the importance of maintaining the financial integrity of the

company. It considered the financial history of Hope and a vast array of data bearing on the natural gas industry, related businesses, and general economic conditions. It noted that the yields on better issues of bonds of natural gas companies sold in the last few years were "close to 3 per cent", 44 P.U.R.,N.S., at page 33. It stated that the company was a "seasoned enterprise whose risks have been minimized" by adequate provisions for depletion and depreciation (past and present) with "concurrent high profits", by "protected established markets, through affiliated distribution companies, in populous and industralized areas", and by a supply of gas locally to meet all requirements,

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"except on certain peak days in the winter, which it is feasible to supplement in the future with gas from other sources." Id., 44 P.U.R.,N.S., at page 33. The Commission concluded, "The company's efficient management, established markets, financial record, affiliations, and its prospective business place it in a strong position to attract capital upon favorable terms when it is required." Id., 44 P.U.R., N.S., at page 33.

[10-12] In view of these various considerations we cannot say that an annual return of $2,191,314 is not "just and reasonable" within the meaning of the Act. Rates which enable the company to operate successfully, to maintain its financial integrity, to attract capital, and to compensate its investors for the risks assumed certainly cannot be condemned as invalid, even though they might produce only a meager return on the so-called "fair value" rate base. In that connection it will be recalled that Hope contended for a rate base of $66,000,000 computed on reproduction cost new. The Commission points out that if that rate base were accepted, Hope's average rate of return for the four-year period from 1937-1940 would amount to 3.27%. During that period Hope earned an annual average return of about 9% on the average investment. It asked for no rate increases. Its properties were well maintained and operated. As the Commission says such a modest rate of 3.27% suggests an "inflation of the base on which the rate has been computed." Dayton Power & Light Co. v. Public Utilities Commission, 292 U.S. 290, 312, 54 S.Ct. 647, 657, 78 L. Ed. 1267. Cf. Lindheimer v. Illinois Bell Tel. Co., supra, 292 U.S. at page 164, 54 S.Ct. at page 663, 78 L.Ed. 1182. The incongruity between the actual operations and the return computed on the basis of reproduction cost suggests that the Commission was wholly justified in rejecting the latter as the measure of the rate base.

In view of this disposition of the controversy we need not stop to inquire whether the failure of the Commission to add the $17,000,000 of well-drilling and other costs to

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the rate base was consistent with the prudent investment theory as developed and applied in particular cases.

[13-15] Only a word need be added respecting depletion and depreciation. We held in the Natural Gas Pipeline Co. case that there was no constitutional requirement "that the owner who embarks in a wasting-asset business of limited life shall receive at the end more than he has put into it." 315 U.S. at page 593, 62 S.Ct at page 746, 86 L.Ed. 1037. The Circuit Court of Appeals did not think that that rule was applicable here because Hope was a utility required to continue its service to the public and not scheduled to end its business on a day certain as was stipulated to be true of the Natural Gas Pipeline Co. But that distinction is quite immaterial. The ultimate exhaustion of the supply is inevitable in the case of all natural gas companies. Moreover, this Court recognized in Lindheimer v. Illinois Bell Tel. Co., supra, the propriety of basing annual depreciation on cost.[10] By such a procedure the

[10] Chief Justice Hughes said in that case (292 U.S. at pages 168, 169, 54 S.Ct. at page 665, 78 L.Ed. 1182): "If the predictions of service life were entirely accurate and retirements were made when and as these predictions were precisely fulfilled, the depreciation reserve would represent the consumption of capital, on a cost basis, according to the method which spreads that loss over the respective service periods. But if the amounts charged to operating expenses and credited to the account for depreciation reserve are excessive, to that extent subscribers for the telephone service are required to provide, in effect, capital contributions, not to make good losses incurred by the utility in the service rendered and thus to keep its investment un-

utility is made whole and the integrity of its investment maintained.[11] No more is required.[12] We cannot approve the contrary holding

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of United Railways & Electric Co. v. West, 280 U.S. 234, 253, 254, 50 S.Ct. 123, 126, 127, 74 L.Ed. 390. Since there are no constitutional requirements more exacting than the standards of the Act, a rate order which conforms to the latter does not run afoul of the former.

The Position of West Virginia. The State of West Virginia, as well as its Public Service Commission, intervened in the proceedings before the Commission and participated in the hearings before it. They have also filed a brief amicus curiae here and have participated in the argument at the bar. Their contention is that the result achieved by the rate order "brings consequences which are unjust to West Virginia and its citizens" and which "unfairly depress the value of gas, gas lands and gas leaseholds, unduly restrict development of their natural resources, and arbitrarily transfer their properties to the residents of other states without just compensation therefor."

West Virginia points out that the Hope Natural Gas Co. holds a large number of leases on both producing and unoperated properties. The owner or grantor receives from the operator or grantee delay rentals as compensation for postponed drilling. When a producing well is successfully brought in, the gas lease customarily continues indefinitely for the life of the field. In that case the operator pays a stipulated gas-well rental or in some cases a gas royalty equivalent to one-eighth of the gas marketed.[13] Both the owner and operator have valuable property interests in the gas which are separately taxable under West Virginia law. The contention is that the reversionary interests in the leaseholds should be represented in the rate proceedings since it is their gas which is being sold in interstate

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commerce. It is argued, moreover, that the owners of the reversionary interests should have the benefit of the "discovery value" of the gas leaseholds, not the interstate consumers. Furthermore, West Virginia contends that the Commission in fixing a rate for natural gas produced in that State should consider the effect of the rate order on the economy of West Virginia. It is pointed out that gas is a wasting asset with a rapidly diminishing supply. As a result West Virginia's gas deposits are becoming increasingly valuable. Nevertheless the rate fixed by the Commission reduces that value. And that reduction, it is said, has severe repercussions on the economy of the State. It is argued in the first place that as a result of this rate reduction Hope's West Virginia property taxes may be decreased in view of the relevance which earnings have under West Virginia law in the assessment of property for tax purposes.[14] Secondly, it is pointed out that West Virginia has a production tax[15] on the "value" of the gas exported from the State. And we are told that for purposes of that tax "value" becomes under West Virginia law "practically the substantial equivalent of market value." Thus West Virginia argues that undervaluation of Hope's gas leaseholds will cost the State many thousands of dollars in taxes. The effect, it is urged, is to impair West Virginia's tax structure for the benefit of Ohio and Pennsylvania consumers. West Virginia emphasizes, moreover, its deep interest in the conservation of its natural resources including its natural gas. It says that a reduction of the value of these leasehold values will jeopardize these conservation policies in three respects: (1)

impaired, but to secure additional plant and equipment upon which the utility expects a return."

[11] See Mr. Justice Brandeis (dissenting) in United Railways & Electric Co. v. West, 280 U.S. 234, 259–288, 50 S.Ct. 123, 128–138, 74 L.Ed. 390, for an extended analysis of the problem.

[12] It should be noted that the Act provides no specific rule governing depletion and depreciation. Sec. 9(a) merely states that the Commission "may from time to time ascertain and determine, and by order fix, the proper and adequate rates of depreciation and amortization of the several classes of property of each natural-gas company used or useful in the production, transportation, or sale of natural gas."

[13] See Simonton, The Nature of the Interest of the Grantee Under an Oil and Gas Lease (1918), 25 W.Va.L.Quar. 295.

[14] West Penn Power Co. v. Board of Review, 112 W.Va. 442, 164 S.E. 862.

[15] W.Va.Rev.Code of 1943, ch. 11, Art. 13, §§ 2a, 3a.

exploratory development of new fields will be discouraged; (2) abandonment of low-yield high-cost marginal wells will be hastened; and (3) secondary recovery of oil will be hampered.

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Furthermore, West Virginia contends that the reduced valuation will harm one of the great industries of the State and that harm to that industry must inevitably affect the welfare of the citizens of the State. It is also pointed out that West Virginia has a large interest in coal and oil as well as in gas and that these forms of fuel are competitive. When the price of gas is materially cheapened, consumers turn to that fuel in preference to the others. As a result this lowering of the price of natural gas will have the effect of depreciating the price of West Virginia coal and oil.

West Virginia insists that in neglecting this aspect of the problem the Commission failed to perform the function which Congress entrusted to it and that the case should be remanded to the Commission for a modification of its order.[16]

We have considered these contentions at length in view of the earnestness with which they have been urged upon us. We have searched the legislative history of the Natural Gas Act for any indication that Congress entrusted to the Commission the various considerations which West Virginia has advanced here. And our conclusion is that Congress did not.

[16, 17] We pointed out in Illinois Natural Gas Co. v. Central Illinois Public Service Co., 314 U.S. 498, 506, 62 S.Ct. 384, 387, 86 L.Ed. 371, that the purpose of the Natural Gas Act was to provide, "through the exercise of the national power over interstate commerce, an agency for regulating the wholesale distribution to public service companies of natural gas moving interstate, which this Court had declared to be interstate commerce not subject to certain types of state regulation." As stated in the House Report the "basic purpose" of this legislation was "to occupy" the field in which such cases as State of Missouri v.

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Kansas Natural Gas Co., 265 U.S. 298, 44 S.Ct. 544, 68 L.Ed. 1027, and Public Utilities Commission v. Attleboro Steam & Electric Co., 273 U.S. 83, 47 S.Ct. 294, 71 L.Ed. 549, had held the States might not act. H.Rep. No. 709, 75th Cong., 1st Sess., p. 2. In accomplishing that purpose the bill was designed to take "no authority from State commissions" and was "so drawn as to complement and in no manner usurp State regulatory authority." Id., p. 2. And the Federal Power Commission was given no authority over the "production or gathering of natural gas." § 1(b).

[18] The primary aim of this legislation was to protect consumers against exploitation at the hands of natural gas companies. Due to the hiatus in regulation which resulted from the Kansas Natural Gas Co. case and related decisions state commissions found it difficult or impossible to discover what it cost interstate pipe-line companies to deliver gas within the consuming states; and thus they were thwarted in local regulation. H.Rep., No. 709, supra, p. 3. Moreover, the investigations of the Federal Trade Commission had disclosed that the majority of the pipe-line mileage in the country used to transport natural gas, together with an increasing percentage of the natural gas supply for pipe-line transportation, had been acquired by a handful of holding companies[17]. State commissions, independent producers, and communities having or seeking the service were growing quite helpless against these combinations.[18] These were the types of problems with which those participating in the hearings were pre-occupied.[19] Congress addressed itself to those specific evils.

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The Federal Power Commission was giv-

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16 West Virginia suggests as a possible solution (1) that a "going concern value" of the company's tangible assets be included in the rate base and (2) that the fair market value of gas delivered to customers be added to the outlay for operating expenses and taxes.

17 S.Doc. 92, Pt. 84-A, ch. XII, Final Report, Federal Trade Commission to the Senate pursuant to S.Res.No. 83, 70th Cong., 1st Sess.

18 S.Doc. 92, Pt. 84-A, chs. XII, XIII, op. cit., supra, note 17.

19 See Hearings on H.R. 11662, Subcommittee of House Committee on Interstate & Foreign Commerce, 74th Cong., 2d Sess.; Hearings on H.R. 4008, House Committee on Interstate & Foreign Commerce, 75th Cong., 1st Sess.

en broad powers of regulation. The fixing of "just and reasonable" rates (§ 4) with the powers attendant thereto[20] was the heart of the new regulatory system. Moreover, the Commission was given certain authority by § 7(a), on a finding that the action was necessary or desirable "in the public interest," to require natural gas companies to extend or improve their transportation facilities and to sell gas to any authorized local distributor. By § 7(b) it was given control over the abandonment of facilities or of service. And by § 7(c), as originally enacted, no natural gas company could undertake the construction or extension of any facilities for the transportation of natural gas to a market in which natural gas was already being served by another company, or sell any natural gas in such a market, without obtaining a certificate of public convenience and necessity from the Commission. In passing on such applications for certificates of convenience and necessity the Commission was told by § 7(c), as originally enacted, that it was "the intention of Congress that natural gas shall be sold in interstate commerce for resale for ultimate public consumption for domestic, commercial, industrial, or any other use at the lowest possible reasonable rate consistent with the maintenance of adequate service in the public interest." The latter provision was deleted from § 7(c) when that subsection was amended by the Act of February 7, 1942, 56 Stat. 83. By that amendment limited grandfather rights were granted companies desiring to extend their facilities and services over the routes or within the area which they were already serving. Moreover, § 7(c) was broadened so as to require certificates

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of public convenience and necessity not only where the extensions were being made to markets in which natural gas was already being sold by another company but in other situations as well.

[19] These provisions were plainly designed to protect the consumer interests against exploitation at the hands of private natural gas companies. When it comes to cases of abandonment or of extensions of facilities or service, we may assume that, apart from the express exemptions[21] contained in § 7, considerations of conservation are material to the issuance of certificates of public convenience and necessity. But the Commission was not asked here for a certificate of public convenience and necessity under § 7 for any proposed construction or extension. It was faced with a determination of the amount which a private operator should be allowed to earn from the sale of natural gas across state lines through an established distribution system. Secs. 4 and 5, not § 7, provide the standards for that determination. We cannot find in the words of the Act or in its history the slightest intimation or suggestion that the exploitation of consumers by private operators through the maintenance of high rates should be allowed to continue provided the producing states obtain indirect benefits from it. That apparently was the Commission's view of the matter, for the same arguments advanced here were presented to the Commission and not adopted by it.

We do not mean to suggest that Congress was unmindful of the interests of the producing states in their natural gas supplies when it drafted the Natural Gas Act. As we have said, the Act does not intrude on the domain traditionally reserved for control by state commissions; and the Federal Power Commission was given no authority over

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"the production or gathering of natural gas." § 1(b). In addition, Congress recognized the legitimate interests of the States in the conservation of natural gas. By § 11 Congress instructed the Commission to make reports on compacts between two or more States dealing with the conservation, production and transportation of natural gas.[22] The Commission was also

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[20] The power to investigate and ascertain the "actual legitimate cost" of property (§ 6), the requirement as to books and records (§ 8), control over rates of depreciation (§ 9), the requirements for periodic and special reports (§ 10), the broad powers of investigation (§ 14) are among the chief powers supporting the rate making function.

[21] Apart from the grandfather clause contained in § 7(c), there is the provision of § 7(f) that a natural gas company may enlarge or extend its facilities with the "service area" determined by the Commission without any further authorization.

[22] See P.L. 117, approved July 7, 1943, 57 Stat. 383 containing an "Interstate

directed to recommend further legislation appropriate or necessary to carry out any proposed compact and "to aid in the conservation of natural-gas resources within the United States and in the orderly, equitable, and economic production, transportation, and distribution of natural gas." § 11(a). Thus Congress was quite aware of the interests of the producing states in their natural gas supplies.[23] But it left the protection of

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those interests to measures other than the maintenance of high rates to private companies. If the Commission is to be compelled to let the stockholders of natural gas companies have a feast so that the producing states may receive crumbs from that table, the present Act must be redesigned. Such a project raises questions of policy which go beyond our province.

[20] It is hardly necessary to add that a limitation on the net earnings of a natural gas company from its interstate business is not a limitation on the power of the producing state either to safeguard its tax revenues from that industry[24] or to protect the interests of those who sell their gas to the interstate operator.[25] The return which

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Compact to Conserve Oil and Gas" between Oklahoma, Texas, New Mexico, Illinois, Colorado, and Kansas.

[23] As we have pointed out, § 7(c) was amended by the Act of February 7, 1942, 56 Stat. 83, so as to require certificates of public convenience and necessity not only where the extensions were being made to markets in which natural gas was already being sold by another company but to other situations as well. Considerations of conservation entered into the proposal to give the Act that broader scope. H.Rep.No. 1290, 77th Cong. 1st Sess., pp. 2, 3. And see Annual Report, Federal Power Commission (1940) pp. 79, 80; Baum, The Federal Power Commission and State Utility Regulation (1942), p. 261.

The bill amending § 7(c) originally contained a subsection (h) reading as follows: "Nothing contained in this section shall be construed to affect the authority of a State within which natural gas is produced to authorize or require the construction or extension of facilities for the transportation and sale of such gas within such State: Provided, however, That the Commission, after a hearing upon complaint or upon its own motion, may by order forbid any intrastate construction or extension by any natural-gas company which it shall find will prevent such company from rendering adequate service to its customers in interstate or foreign commerce in territory already being served." See Hearings on H.R. 5249, House Committee on Interstate & Foreign Commerce, 77th Cong., 1st Sess., pp. 7, 11, 21, 29, 32, 33. In explanation of its deletion the House Committee Report stated, pp. 4, 5: "The increasingly important problems raised by the desire of several States to regulate the use of the natural gas produced therein in the interest of consumers within such States, as against the Federal power to regulate interstate commerce in the interest of both interstate and intrastate consumers, are deemed by the committee to warrant further intensive study and probably a more retailed and comprehensive plan for the handling thereof than that which would have been provided by the stricken subsection."

[24] We have noted that in the annual operating expenses of some $16,000,000 the Commission included West Virginia and federal taxes. And in the net increase of $421,160 over 1940 operating expenses allowed by the Commission was some $80,000 for increased West Virginia property taxes. The adequacy of these amounts has not been challenged here.

[25] The Commission included in the aggregate annual operating expenses which it allowed some $8,500,000 for gas purchased. It also allowed about $1,400,000 for natural gas production and about $600,000 for exploration and development.

It is suggested, however, that the Commission in ascertaining the cost of Hope's natural gas production plant proceeded contrary to § 1(b) which provides that the Act shall not apply to "the production or gathering of natural gas". But such valuation, like the provisions for operating expenses, is essential to the rate-making function as customarily performed in this country. Cf. Smith, The Control of Power Rates in the United States and England (1932), 159 The Annals 101. Indeed § 14(b) of the Act gives the Commission the power to "determine the propriety and reasonableness of the inclusion in operating expenses, capital, or surplus of all delay rentals or other forms of rental or compensation for unoperated lands and leases."

the Commission
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allowed was the net return after all such charges.

It is suggested that the Commission has failed to perform its duty under the Act in that it has not allowed a return for gas production that will be enough to induce private enterprise to perform completely and efficiently its functions for the public. The Commission, however, was not oblivious of those matters. It considered them. It allowed, for example, delay rentals and exploration and development costs in operating expenses.[26] No serious attempt has been made here to show that they are inadequate. We certainly cannot say that they are, unless we are to substitute our opinions for the expert judgment of the administrators to whom Congress entrusted the decision. Moreover, if in light of experience they turn out to be inadequate for development of new sources of supply, the doors of the Commission are open for increased allowances. This is not an order for all time. The Act contains machinery for obtaining rate adjustments. § 4.

[21,22] But it is said that the Commission placed too low a rate on gas for industrial purposes as compared with gas for domestic purposes and that industrial uses should be discouraged. It should be noted in the first place that the rates which the Commission has fixed are Hope's interstate wholesale rates to distributors not interstate rates to industrial users[27] and domestic consumers. We hardly

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can assume, in view of the history of the Act and its provisions, that the resales intrastate by the customer companies which distribute the gas to ultimate consumers in Ohio and Pennsylvania are subject to the rate-making powers of the Commission.[28] But in any event those rates are not in issue here. Moreover, we fail to find in the power to fix "just and reasonable" rates the power to fix rates which will disallow or discourage resales for industrial use. The Committee Report stated that the Act provided "for regulation along recognized and more or less standardized lines" and that there was "nothing novel in its provisions". H.Rep. No.709, supra, p. 3. Yet if we are now to tell the Commission to fix the rates so as to discourage particular uses, we would indeed be injecting into a rate case a "novel" doctrine which has no express statutory sanction. The same would be true if we were to hold that the wasting-asset nature of the industry required the maintenance of the level of rates so that natural gas companies could make a greater profit on each unit of gas sold. Such theories of rate-making for this industry may or may not be desirable. The difficulty is that § 4(a) and § 5(a) contain only the conventional standards of rate-making for natural gas companies.[29] The
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Act of February 7, 1942, by broadening § 7 gave the Commission some additional authority to deal with the conservation aspects of the problem.[30] But § 4(a) and § 5(a) were not changed. If the stand-

[26] See note 25, supra.

[27] The Commission has expressed doubts over its power to fix rates on "direct sales to industries" from interstate pipelines as distinguished from "sales for resale to the industrial customers of distributing companies." Annual Report, Federal Power Commission (1940), p. 11.

[28] Sec. 1(b) of the Act provides: "The provisions of this Act shall apply to the transportation of natural gas in interstate commerce, to the sale in interstate commerce of natural gas for resale for ultimate public consumption for domestic, commercial, industrial, or any other use, and to natural-gas companies engaged in such transportation or sale, but shall not apply to any other transportation or sale of natural gas or to the local distribution of natural gas or to the facilities used for such distribution or to the production or gathering of natural gas." And see § 2(6), defining a "natural-gas company", and H.Rep.No. 709, supra, pp. 2, 3.

[29] The wasting-asset characteristic of the industry was recognized prior to the Act as requiring the inclusion of a depletion allowance among operating expenses. See Columbus Gas & Fuel Co. v. Public Utilities Commission, 292 U.S. 398, 404, 405, 54 S.Ct. 763, 766, 767, 78 L.Ed. 1327, 91 A.L.R. 1403. But no such theory of rate-making for natural gas companies as is now suggested emerged from the cases arising during the earlier period of regulation.

[30] The Commission has been alert to the problems of conservation in its administration of the Act. It has indeed suggested that it might be wise to re-

ard of "just and reasonable" is to sanction the maintenance of high rates by a natural gas company because they restrict the use of natural gas for certain purposes, the Act must be further amended.

[23, 24] It is finally suggested that the rates charged by Hope are discriminatory as against domestic users and in favor of industrial users. That charge is apparently based on § 4(b) of the Act which forbids natural gas companies from maintaining "any unreasonable difference in rates, charges, service, facilities, or in any other respect, either as between localities or as between classes of service." The power of the Commission to eliminate any such unreasonable differences or discriminations is plain. § 5(a). The Commission, however, made no findings under § 4(b). Its failure in that regard was not challenged in the petition to review. And it has not been raised or argued here by any party. Hence the problem of discrimination has no proper place in the present decision. It will be time enough to pass on that issue when it is presented to us. Congress has entrusted the administration of the Act to the Commission not to the courts. Apart from the requirements of judicial review it is not

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for us to advise the Commission how to discharge its functions.

Findings as to the Lawfulness of Past Rates. As we have noted, the Commission made certain findings as to the lawfulness of past rates which Hope had charged its interstate customers. Those findings were made on the complaint of the City of Cleveland and in aid of state regulation. It is conceded that under the Act the Commission has no power to make reparation orders. And its power to fix rates admittedly is limited to those "to be thereafter observed and in force." § 5(a). But the Commission maintains that it has the power to make findings as to the lawfulness of past rates even though it has no power to fix those rates.[31] However that may be, we do not think that these findings were reviewable under § 19(b) of the Act. That section gives any party "aggrieved by an order" of the Commission a review "of such order" in the circuit court of appeals for the circuit where the natural gas company is located or has its principal place of business or in the United States Court of Appeals for the District of Columbia. We do not think that the findings in question fall within that category.

[25, 26] The Court recently summarized the various types of administrative action or determination reviewable as orders under the Urgent Deficiencies Act of October 22,

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1913, 28 U.S.C. §§ 45, 47a, 28 U.S.C.A. §§ 45, 47a, and kindred statutory provisions. Rochester Tel. Corp. v. United States, 307 U.S. 125, 59 S.Ct. 754, 83 L.Ed. 1147. It was there pointed out that where "the order sought to be reviewed does not of itself adversely affect complainant but only affects his rights adversely on the contingency of future administrative action", it is not reviewable. Id., 307 U.S. at page 130, 59 S.Ct. at page 757, 83 L.Ed. 1147. The Court said, "In view of traditional conceptions of federal judicial power, resort to the courts in these situations is either premature or wholly beyond their province." Id., 307

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strict the use of natural gas "by functions rather than by areas." Annual Report (1940) p. 79.

The Commission stated in that connection that natural gas was particularly adapted to certain industrial uses. But it added that the general use of such gas "under boilers for the production of steam" is "under most circumstances of very questionable social economy." Ibid.

[31] The argument is that § 4(a) makes "unlawful" the charging of any rate that is not just and reasonable. And § 14(a) gives the Commission power to investigate any matter "which it may find necessary or proper in order to determine whether any person has violated" any provision of the Act. Moreover, § 5(b) gives the Commission power to investigate and determine the cost of production or transportation of natural gas in cases where it has "no authority to establish a rate governing the transportation or sale of such natural gas." And § 17 (c) directs the Commission to "make available to the several State commissions such information and reports as may be of assistance in State regulation of natural-gas companies." For a discussion of these points by the Commission see 44 P.U.R.,N.S., at pages 34, 35.

U.S. at page 130, 59 S.Ct. at page 757, 83 L.Ed. 1147. And see United States v. Los Angeles & S. L. R. Co., 273 U.S. 299, 309, 310, 47 S.Ct. 413, 414, 415, 71 L.Ed. 651; Shannahan v. United States, 303 U.S. 596, 58 S.Ct. 732, 82 L.Ed. 1039. These considerations are apposite here. The Commission has no authority to enforce these findings. They are "the exercise solely of the function of investigation." United States v. Los Angeles & S. L. R. Co., supra, 273 U.S. at page 310, 47 S.Ct. at page 414, 71 L.Ed. 651. They are only a preliminary, interim step towards possible future action—action not by the Commission but by wholly independent agencies. The outcome of those proceedings may turn on factors other than these findings. These findings may never result in the respondent feeling the pinch of administrative action.

Reversed.

Mr. Justice ROBERTS took no part in the consideration or decision of this case.

Opinion of Mr. Justice BLACK and Mr. Justice MURPHY.

We agree with the Court's opinion and would add nothing to what has been said but for what is patently a wholly gratuitous assertion as to Constitutional law in the dissent of Mr. Justice FRANKFURTER. We refer to the statement that "Congressional acquiescence to date in the doctrine of Chicago, etc., R. Co. v. Minnesota, supra [134 U.S. 418, 10 S.Ct. 462, 702, 33 L.Ed. 970], may fairly be claimed." That was the case in which a majority of this Court was finally induced to expand the meaning

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of "due process" so as to give courts power to block efforts of the state and national governments to regulate economic affairs. The present case does not afford a proper occasion to discuss the soundness of that doctrine because, as stated in Mr. Justice FRANKFURTER'S dissent, "That issue is not here in controversy." The salutary practice whereby courts do not discuss issues in the abstract applies with peculiar force to Constitutional questions. Since, however, the dissent adverts to a highly controversial due process doctrine and implies its acceptance by Congress, we feel compelled to say that we do not understand that Congress voluntarily has acquiesced in a Constitutional principle of government that courts, rather than legislative bodies, possess final authority over regulation of economic affairs. Even this Court has not always fully embraced that principle, and we wish to repeat that we have never acquiesced in it, and do not now. See Federal Power Commission v. Natural Gas Pipeline Co., 315 U.S. 575, 599-601, 62 S.Ct. 736, 749, 750, 86 L.Ed. 1037.

Mr. Justice REED, dissenting.

This case involves the problem of rate making under the Natural Gas Act. Added importance arises from the obvious fact that the principles stated are generally applicable to all federal agencies which are entrusted with the determination of rates for utilities. Because my views differ somewhat from those of my brethren, it may be of some value to set them out in a summary form.

The Congress may fix utility rates in situations subject to federal control without regard to any standard except the constitutional standards of due process and for taking private property for public use without just compensation. Wilson v. New, 243 U.S. 332, 350, 37 S.Ct. 298, 302, 61 L.Ed. 755, L.R.A.1917E, 938, Ann.Cas.1918A, 1024. A Commission, however, does not have this freedom of action. Its powers are limited not only by the constitutional standards but also by the standards of the delegation. Here the standard added by the Natural Gas Act is that the rate be "just

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and reasonable."[1] Section 6[2]

[1] Natural Gas Act, § 4(a), 52 Stat. 821, 822, 15 U.S.C. § 717c (a), 15 U.S.C.A. § 717c(a).

[2] 52 Stat. 821, 824, 15 U.S.C. § 717e, 15 U.S.C.A. § 717e:

"(a) The Commission may investigate and ascertain the actual legitimate cost of the property of every natural-gas company, the depreciation therein, and, when found necessary for rate-making purposes, other facts which bear on the determination of such cost or depreciation and the fair value of such property.

"(b) Every natural-gas company upon request shall file with the Commission

throws additional light on the meaning of these words.

When the phrase was used by Congress to describe allowable rates, it had relation to something ascertainable. The rates were not left to the whim of the Commission. The rates fixed would produce an annual return and that annual return was to be compared with a theoretical just and reasonable return, all risks considered, on the fair value of the property used and useful in the public service at the time of the determination.

Such an abstract test is not precise. The agency charged with its determination has a wide range before it could properly be said by a court that the agency had disregarded statutory standards or had confiscated the property of the utility for public use. Cf. Chicago, M. & St. P. R. Co. v. Minnesota, 134 U.S. 418, 461–466, 10 S.Ct. 462, 702, 703–705, 33 L.Ed. 970, dissent. This is as Congress intends. Rates are left to an experienced agency particularly competent by training to appraise the amount required.

The decision as to a reasonable return had not been a source of great difficulty, for borrowers and lenders reached such agreements daily in a multitude of situations; and although the determination of fair value had been troublesome, its essentials had been worked out in fairness to investor and consumer by the time of the enactment

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of this Act. Cf. Los Angeles G. & E. Corp. v. Railroad Comm., 289 U.S. 287, 304 et seq., 53 S.Ct. 637, 643 et seq., 77 L.Ed. 1180. The results were well known to Congress and had that body desired to depart from the traditional concepts of fair value and earnings, it would have stated its intention plainly. Helvering v. Griffiths, 318 U.S. 371, 63 S.Ct. 636.

It was already clear that when rates are in dispute, "earnings produced by rates do not afford a standard for decision." 289 U.S. at page 305, 53 S.Ct. at page 644, 77 L.Ed. 1180. Historical cost, prudent investment and reproduction cost [3] were all relevant factors in determining fair value. Indeed, disregarding the pioneer investor's risk, if prudent investment and reproduction cost were not distorted by changes in price levels or technology, each of them would produce the same result. The realization from the risk of an investment in a speculative field, such as natural gas utilities, should be reflected in the present fair value.[4] The amount of evidence to be admitted on any point was of course in the agency's reasonable discretion, and it was free to give its own weight to these or other factors and to determine from all the evidence its own judgment as to the necessary rates.

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I agree with the Court in not imposing a rule of prudent investment alone in determining the rate base. This leaves the Commission free, as I understand it, to use any available evidence for its finding of fair value, including both prudent investment and the cost of installing at the present time an efficient system for furnishing the needed utility service.

My disagreement with the Court arises primarily from its view that it makes no

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an inventory of all or any part of its property and a statement of the original cost thereof, and shall keep the Commission informed regarding the cost of all additions, betterments, extensions, and new construction."

[3] "Reproduction cost" has been variously defined, but for rate making purposes the most useful sense seems to be, the minimum amount necessary to create at the time of the inquiry a modern plant capable of rendering equivalent service. See I Bonbright, Valuation of Property (1937) 152. Reproduction cost as the cost of building a replica of an obsolescent plant is not of real significance.

"Prudent investment" is not defined by the Court. It may mean the sum originally put in the enterprise, either with or without additional amounts from excess earnings reinvested in the business.

[4] It is of no more than bookkeeping significance whether the Commission allows a rate of return commensurate with the risk of the original investment or the lower rate based on current risk and a capitalization reflecting the established earning power of a successful company and the probable cost of duplicating its services. Cf. American T. & T. Co. v. United States, 299 U.S. 232, 57 S.Ct. 170, 81 L.Ed. 142. But the latter is the traditional method.

difference how the Commission reached the rate fixed so long as the result is fair and reasonable. For me the statutory command to the Commission is more explicit. Entirely aside from the constitutional problem of whether the Congress could validly delegate its rate making power to the Commission, in toto and without standards, it did legislate in the light of the relation of fair and reasonable to fair value and reasonable return. The Commission must therefore make its findings in observance of that relationship.

The Federal Power Commission did not, as I construe their action, disregard its statutory duty. They heard the evidence relating to historical and reproduction cost and to the reasonable rate of return and they appraised its weight. The evidence of reproduction cost was rejected as unpersuasive, but from the other evidence they found a rate base, which is to me a determination of fair value. On that base the earnings allowed seem fair and reasonable. So far as the Commission went in appraising the property employed in the service, I find nothing in the result which indicates confiscation, unfairness or unreasonableness. Good administration of rate making agencies under this method would avoid undue delay and render revaluations unnecessary except after violent fluctuations of price levels. Rate making under this method has been subjected to criticism. But until Congress changes the standards for the agencies, these rate making bodies should continue the conventional theory of rate

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making. It will probably be simpler to improve present methods than to devise new ones.

But a major error, I think was committed in the disregard by the Commission of the investment in exploratory operations and other recognized capital costs. These were not considered by the Commission because they were charged to operating expenses by the company at a time when it was unregulated. Congress did not direct the Commission in rate making to deduct from the rate base capital investment which had been recovered during the unregulated period through excess earnings. In my view this part of the investment should no more have been disregarded in the rate base than any other capital investment which previously had been recovered and paid out in dividends or placed to surplus. Even if prudent investment throughout the life of the property is accepted as the formula for figuring the rate base, it seems to me illogical to throw out the admittedly prudent cost of part of the property because the earnings in the unregulated period had been sufficient to return the prudent cost to the investors over and above a reasonable return. What would the answer be under the theory of the Commission and the Court, if the only prudent investment in this utility had been the seventeen million capital charges which are now disallowed?

For the reasons heretofore stated, I should affirm the action of the Circuit Court of Appeals in returning the proceeding to the Commission for further consideration and should direct the Commission to accept the disallowed capital investment in determining the fair value for rate making purposes.

Mr. Justice FRANKFURTER, dissenting.

My brother JACKSON has analyzed with particularity the economic and social aspects of natural gas as well as

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the difficulties which led to the enactment of the Natural Gas Act, especially those arising out of the abortive attempts of States to regulate natural gas utilities. The Natural Gas Act of 1938 should receive application in the light of this analysis, and Mr. Justice JACKSON has, I believe, drawn relevant inferences regarding the duty of the Federal Power Commission in fixing natural gas rates. His exposition seems to me unanswered, and I shall say only a few words to emphasize my basic agreement with him.

For our society the needs that are met by public utilities are as truly public services as the traditional governmental functions of police and justice. They are not less so when these services are rendered by private enterprise under governmental regulation. Who ultimately determines the ways of regulation, is the decisive aspect in the public supervision of privately-owned utilities. Foreshadowed nearly sixty years ago, Railroad Commission Cases (Stone v. Farmers' Loan & Trust Co.), 116 U.S. 307, 331, 6 S.Ct. 334, 344, 388, 1191, 29 L.Ed. 636, it was decided more than fifty

years ago that the final say under the Constitution lies with the judiciary and not the legislature. Chicago, etc., R. Co. v. Minnesota, 134 U.S. 418, 10 S.Ct. 462, 702, 33 L.Ed. 970.

While legal issues touching the proper distribution of governmental powers under the Constitution may always be raised, Congressional acquiescence to date in the doctrine of Chicago, etc., R. Co. v. Minnesota, supra, may fairly be claimed. But in any event that issue is not here in controversy. As pointed out in the opinions of my brethren, Congress has given only limited authority to the Federal Power Commission and made the exercise of that authority subject to judicial review. The Commission is authorized to fix rates chargeable for natural gas. But the rates that it can fix must be "just and reasonable". § 5 of the Natural Gas Act, 15 U.S.C. § 717d, 15 U.S.C.A. § 717d. Instead of making the Commission's rate determinations final, Congress

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specifically provided for court review of such orders. To be sure, "the finding of the Commission as to the facts, if supported by substantial evidence" was made "conclusive", § 19 of the Act, 15 U.S.C. § 717r; 15 U.S.C.A. § 717r. But obedience of the requirement of Congress that rates be "just and reasonable" is not an issue of fact of which the Commission's own determination is conclusive. Otherwise, there would be nothing for a court to review except questions of compliance with the procedural provisions of the Natural Gas Act. Congress might have seen fit so to cast its legislation. But it has not done so. It has committed to the administration of the Federal Power Commission the duty of applying standards of fair dealing and of reasonableness relevant to the purposes expressed by the Natural Gas Act. The requirement that rates must be "just and reasonable" means just and reasonable in relation to appropriate standards. Otherwise Congress would have directed the Commission to fix such rates as in the judgment of the Commission are just and reasonable; it would not have also provided that such determinations by the Commission are subject to court review.

To what sources then are the Commission and the courts to go for ascertaining the standards relevant to the regulation of natural gas rates? It is at this point that Mr. Justice JACKSON'S analysis seems to me pertinent. There appear to be two alternatives. Either the fixing of natural gas rates must be left to the unguided discretion of the Commission so long as the rates it fixes do not reveal a glaringly bad prophecy of the ability of a regulated utility to continue its service in the future. Or the Commission's rate orders must be founded on due consideration of all the elements of the public interest which the production and distribution of natural gas involve just because it is natural gas. These elements are reflected in the Natural Gas Act, if that Act be applied as an entirety. See, for

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instance, §§ 4(a) (b) (c) (d), 6, and 11, 15 U.S.C. §§ 717c (a) (b) (c) (d), 717e, and 717j, 15 U.S.C.A. §§ 717c (a–d), 717e, 717j. Of course the statute is not concerned with abstract theories of rate-making. But its very foundation is the "public interest", and the public interest is a texture of multiple strands. It includes more than contemporary investors and contemporary consumers. The needs to be served are not restricted to immediacy, and social as well as economic costs must be counted.

It will not do to say that it must all be left to the skill of experts. Expertise is a rational process and a rational process implies expressed reasons for judgment. It will little advance the public interest to substitute for the hodge-podge of the rule in Smyth v. Ames, 169 U.S. 466, 18 S.Ct. 418, 42 L.Ed. 819, an encouragement of conscious obscurity or confusion in reaching a result, on the assumption that so long as the result appears harmless its basis is irrelevant. That may be an appropriate attitude when state action is challenged as unconstitutional. Cf. Driscoll v. Edison Light & Power Co., 307 U.S. 104, 59 S.Ct. 715, 83 L.Ed. 1134. But it is not to be assumed that it was the design of Congress to make the accommodation of the conflicting interests exposed in Mr. Justice JACKSON'S opinion the occasion for a blind clash of forces or a partial assessment of relevant factors, either before the Commission or here.

The objection to the Commission's action is not that the rates it granted were too low but that the range of its vision was too narrow. And since the issues before the Commission involved no less than the

total public interest, the proceedings before it should not be judged by narrow conceptions of common law pleading. And so I conclude that the case should be returned to the Commission. In order to enable this Court to discharge its duty of reviewing the Commission's order, the Commission should set forth with explicitness the criteria by which it is guided

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in determining that rates are "just and reasonable", and it should determine the public interest that is in its keeping in the perspective of the considerations set forth by Mr. Justice JACKSON.

By Mr. Justice JACKSON.

Certainly the theory of the court below that ties rate-making to the fair-value-reproduction-cost formula should be overruled as in conflict with Federal Power Commission v. Natural Gas Pipeline Co.[1] But the case should, I think, be the occasion for reconsideration of our rate-making doctrine as applied to natural gas and should be returned to the Commission for further consideration in the light thereof.

The Commission appears to have understood the effect of the two opinions in the Pipeline case to be at least authority and perhaps direction to fix natural gas rates by exclusive application of the "prudent investment" rate base theory. This has no warrant in the opinion of the Chief Justice for the Court, however, which released the Commission from subservience to "any single formula or combination of formulas" provided its order, "viewed in its entirety, produces no arbitrary result." 315 U.S. at page 586, 62 S.Ct. at page 743, 86 L.Ed. 1037. The minority opinion I understood to advocate the "prudent investment" theory as a sufficient guide in a natural gas case. The view was expressed in the court below that since this opinion was not expressly controverted it must have been approved.[2] I disclaim this imputed

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approval with some particularity, because I attach importance at the very beginning of federal regulation of the natural gas industry to approaching it as the performance of economic functions, not as the performance of legalistic rituals.

I.

Solutions of these cases must consider eccentricities of the industry which gives rise to them and also to the Act of Congress by which they are governed.

The heart of this problem is the elusive, exhaustible, and irreplaceable nature of natural gas itself. Given sufficient money, we can produce any desired amount of railroad, bus, or steamship transportation, or communications facilities, or capacity for generation of electric energy, or for the manufacture of gas of a kind. In the service of such utilities one customer has little concern with the amount taken by another, one's waste will not deprive another, a volume of service can be created equal to demand, and today's demands will not exhaust or lessen capacity to serve tomorrow. But the wealth of Midas and the wit of man cannot produce or reproduce a natural gas field. We cannot even reproduce the gas, for our manufactured product has only about half the heating value per unit of nature's own.[3]

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1 315 U.S. 575, 62 S.Ct. 736, 86 L.Ed. 1037.

2 Judge Dobie, dissenting below, pointed out that the majority opinion in the Pipeline case "contains no express discussion of the Prudent Investment Theory" and that the concurring opinion contained a clear one, and said, "It is difficult for me to believe that the majority of the Supreme Court, believing otherwise, would leave such a statement unchallenged." [134 F.2d 287, 312.] The fact that two other Justices had as matter of record in our books long opposed the reproduction cost theory of rate bases and had commented favorably on the prudent investment theory may have influenced that conclusion. See opinion of Mr. Justice Frankfurter in Driscoll v. Edison Light & Power Co., 307 U.S. 104, 122, 59 S.Ct. 715, 724, 83 L.Ed. 1134, and my brief as Solicitor General in that case. It should be noted, however, that these statements were made, not in a natural gas case, but in an electric power case—a very important distinction, as I shall try to make plain.

3 Natural gas from the Appalachian field averages about 1050 to 1150 B.T.U. content, while by-product manufactured gas is about 530 to 540. Moody's Manual of Public Utilities (1943) 1350; Youngberg, Natural Gas (1930) 7.

Natural gas in some quantity is produced in twenty-four states. It is consumed in only thirty-five states, and is

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available only to about 7,600,000 consumers.[4] Its availability has been more localized than that of any other utility service because it has depended more on the caprice of nature.

The supply of the Hope Company is drawn from that old and rich and vanishing field that flanks the Appalachian mountains. Its center of production is Pennsylvania and West Virginia, with a fringe of lesser production in New York, Ohio, Kentucky, Tennessee, and the north end of Alabama. Oil was discovered in commercial quantities at a depth of only 69½ feet near Titusville, Pennsylvania, in 1859. Its value then was about $16 per barrel.[5] The oil branch of the petroleum industry went forward at once, and with unprecedented speed. The area productive of oil and gas was roughed out by the drilling of over 19,000 "wildcat" wells, estimated to have cost over $222,000,000. Of these, over 18,000 or 94.9 per cent, were "dry holes." About five per cent, or 990 wells, made discoveries of commercial importance, 767 of them resulting chiefly in oil and 223 in gas only.[6] Prospecting for many years was a search for oil, and to strike gas was a misfortune. Waste during this period and even later is appalling. Gas was regarded as having no commercial value until about 1882, in which year the total yield was valued only at about $75,000.[7] Since then, contrary to oil, which has become cheaper gas in this field has pretty steadily advanced in price.

While for many years natural gas had been distributed on a small scale for lighting,[8] its acceptance was slow,

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facilities for its utilization were primitive, and not until 1885 did it take on the appearance of a substantial industry.[9] Soon monopoly of production or markets developed.[10] To get gas from the mountain country, where it was largely found, to centers of population, where it was in demand, required very large investment. By ownership of such facilities a few corporate systems, each including several companies, controlled access to markets. Their purchases became the dominating factor in giving a market value to gas produced by many small operators. Hope is the market for over 300 such operators. By 1928 natural gas in the Appalachian field commanded an average price of 21.1 cents per m.c.f. at points of production and was bringing 45.7 cents at points of consumption.[11] The companies which controlled markets, however, did not rely on gas purchases alone. They acquired and held in fee or leasehold great acreage in territory proved by "wildcat" drilling. These large marketing system companies as well as many small independent owners and operators have carried on the commercial development of proved territory. The development risks appear from the estimate that up to 1928, 312,318 proved area wells had been sunk in the Appalachian field of which 48,962, or 15.7 per cent, failed to produce oil or gas in commercial quantity.[12]

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With the source of supply thus tapped to serve centers of large demand, like Pittsburgh, Buffalo, Cleveland, Youngstown, Akron, and other industrial communities, the distribution of natural gas fast became big business. Its advantages as a

[4] Sen.Rep. No. 1162, 75th Cong., 1st Sess., 2.

[5] Arnold and Kemnitzer, Petroleum in the United States and Possessions (1931) 78.

[6] Id. at 62-63.

[7] Id. at 61.

[8] At Fredonia, New York, in 1821, natural gas was conveyed from a shallow well to some thirty people. The lighthouse at Barcelona Harbor, near what is now Westfield, New York, was at about that time and for many years afterward lighted by gas that issued from a crevice. Report on Utility Corporations by Federal Trade Commission, Sen.Doc. 92, Pt. 84-A, 70th Cong., 1st Sess., 8-9.

[9] In that year Pennsylvania enacted "An Act to provide for the incorporation and regulation of natural gas companies." Penn.Laws 1885, No. 32, 15 P.S. § 1981 et seq.

[10] See Steptoe and Hoffheimer's Memorandum for Governor Cornwell of West Virginia (1917) 25 West Virginia Law Quarterly 257; see also Report on Utility Corporations by Federal Trade Commission, Sen.Doc. No. 92, Pt. 84-A, 70th Cong., 1st Sess.

[11] Arnold and Kemnitzer, Petroleum in the United States and Possessions (1931) 73.

[12] Id. at 63.

fuel and its price commended it, and the business yielded a handsome return. All was merry and the goose hung high for consumers and gas companies alike until about the time of the first World War. Almost unnoticed by the consuming public, the whole Appalachian field passed its peak of production and started to decline. Pennsylvania, which to 1928 had given off about 38 per cent of the natural gas from this field, had its peak in 1905; Ohio, which had produced 14 per cent, had its peak in 1915; and West Virginia, greatest producer of all, with 45 per cent to its credit, reached its peak in 1917.[13]

Western New York and Eastern Ohio, on the fringe of the field, had some production but relied heavily on imports from Pennsylvania and West Virginia. Pennsylvania, a producing and exporting state, was a heavy consumer and supplemented her production with imports from West Virginia. West Virginia was a consuming state, but the lion's share of her production was exported. Thus the interest of the states in the North Appalachian supply was in conflict.

Competition among localities to share in the failing supply and the helplessness of state and local authorities in the presence of state lines and corporate complexities is a part of the background of federal intervention in the industry.[14] West Virginia took the boldest measure. It legislated a priority in its entire production in favor of its own inhabitants. That was frustrated by an injunction

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from this Court.[15] Throughout the region clashes in the courts and conflicting decisions evidenced public anxiety and confusion. It was held that the New York Public Service Commission did not have power to classify consumers and restrict their use of gas.[16] That Commission held that a company could not abandon a part of its territory and still serve the rest.[17] Some courts admonished the companies to take action to protect consumers.[18] Several courts held that companies, regardless of failing supply, must continue to take on customers, but such compulsory additions were finally held to be within the Public Service Commission's discretion.[19] There were attempts to throw up franchises and quit the service, and municipalities resorted to the courts with conflicting results.[20] Public service commissions of consuming states were handicapped, for they had no control of the supply.[21]

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13 Id. at 64.

14 See Report on Utility Corporations by Federal Trade Commission, Sen.Doc. No. 92, Pt. 84-A, 70th Cong., 1st Sess.

15 Commonwealth of Pennsylvania v. West Virginia, 262 U.S. 553, 43 S.Ct. 658, 67 L.Ed. 1117, 32 A.L.R. 300. For conditions there which provoked this legislation, see 25 West Virginia Law Quarterly 257.

16 People ex rel. Pavilion Natural Gas Co. v. Public Service Commission, 188 App.Div. 36, 176 N.Y.S. 163.

17 Village of Falconer v. Pennsylvania Gas Company, 17 State Department Reports, N. Y., 407.

18 See, for example, Public Service Commission v. Iroquois Natural Gas Co., 108 Misc. 696, 178 N.Y.S. 24; Park Abbott Realty Co. v. Iroquois Natural Gas Co., 102 Misc. 266, 168 N.Y.S. 673; Public Service Commission v. Iroquois Natural Gas Co., 189 App.Div. 545, 179 N.Y. S. 230.

19 People ex rel. Pennsylvania Gas Co. v. Public Service Commission, 196 App. Div. 514, 189 N.Y.S. 478.

20 East Ohio Gas Co. v. Akron, 81 Ohio St. 33, 90 N.E. 40, 26 L.R.A.,N.S., 92, 18 Ann.Cas. 332; Village of Newcomerstown v. Consolidated Gas Co., 100 Ohio St. 494, 127 N.E. 414; Gress v. Village of Ft. Laramie, 100 Ohio St. 35, 125 N.E. 112, 8 A.L.R. 242; City of Jamestown v. Pennsylvania Gas Co., D. C., 263 F. 437; Id., D.C., 264 F. 1009. See, also, United Fuel Gas Co. v. Railroad Commission, 278 U.S. 300, 308, 49 S.Ct. 150, 152, 73 L.Ed. 390.

21 The New York Public Service Commission said: "While the transportation of natural gas through pipe lines from one state to another state is interstate commerce * * *, Congress has not taken over the regulation of that particular industry. Indeed, it has expressly excepted it from the operation of the Interstate Commerce Commissions Law (Interstate Commerce Commissions Law, section 1). It is quite clear, therefore, that this Commission can not require a Pennsylvania corporation producing gas in Pennsylvania to transport it and deliver it in the State of New York, and that the Interstate Commerce Commission is likewise powerless. If

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Shortages during World War I occasioned the first intervention in the natural gas industry by the Federal Government. Under Proclamation of President Wilson the United States Fuel Administrator took control, stopped extensions, classified consumers and established a priority for domestic over industrial use.[22] After the war federal control was abandoned. Some cities once served with natural gas became dependent upon mixed gas of reduced heating value and relatively higher price.[23]

Utilization of natural gas of highest social as well as economic return is domestic use for cooking and water
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heating, followed closely by use for space heating in homes. This is the true public utility aspect of the enterprise, and its preservation should be the first concern of regulation. Gas does the family cooking cheaper than any other fuel.[24] But its advantages do not end with dollars and cents cost. It is delivered without interruption at the meter as needed and is paid for after it is used. No money is tied up in a supply, and no space is used for storage. It requires no handling, creates no dust, and leaves no ash. It responds to thermostatic control. It ignites easily and immediately develops its maximum heating capacity. These incidental advantages make domestic life more liveable.

Industrial use is induced less by these qualities than by low cost in competition with other fuels. Of the gas exported from West Virginia by the Hope Company a very substantial part is used by industries. This wholesale use speeds exhaustion of supply and displaces other fuels. Coal miners and the coal industry, a large part of whose costs are wages, have complained of unfair competition from low-priced industrial gas produced with relatively little labor cost.[25]

Gas rate structures generally have favored industrial users. In 1932, in Ohio, the average yield on gas for domestic consumption was 62.1 cents per m.c.f. and on industrial,
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38.7. In Pennsylvania, the figures were 62.9 against 31.7. West Virginia showed the least spread, domestic consumers paying 36.6 cents; and industrial, 27.7.[26] Although this spread is less than

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there exists such a power, and it seems that there does, it is a power vested in Congress and by it not yet exercised. There is no available source of supply for the Crystal City Company at present except through purchasing from the Potter Gas Company. It is possible that this Commission might fix a price at which the Potter Gas Company should sell if it sold at all, but as the Commission can not require it to supply gas in the State of New York, the exercise of such a power to fix the price, if such power exists, would merely say, sell at this price or keep out of the State." Lane v. Crystal City Gas Co., 8 New York Public Service Comm.Reports, Second District, 210, 212.

[22] Proclamation by the President of September 16, 1918; Rules and Regulations of H. A. Garfield, Fuel Administrator, September 24, 1918.

[23] For example, the Iroquois Gas Corporation which formerly served Buffalo, New York, with natural gas ranging from 1050 to 1150 b.t.u. per cu. ft., now mixes a by-product gas of between 530 and 540 b.t.u. in proportions to provide a mixed gas of about 900 b.t.u. per cu. ft. For space heating or water heating its charges range from 65 cents for the first m.c.f. per month to 55 cents for all above 25 m.c.f. per month. Moody's Manual of Public Utilities (1943) 1350.

[24] The United States Fuel Administration made the following cooking value comparisons, based on tests made in the Department of Home Economics of Ohio State University:

Natural gas at 1.12 per M. is equivalent to coal at $6.50 per ton.
Natural gas at 2.00 per M. is equivalent to gasoline at 27¢ per gal.
Natural gas at 2.20 per M. is equivalent to electricity at 3¢ per k.w.h.
Natural gas at 2.40 per M. is equivalent to coal oil at 15¢ per gal.

Use and Conservation of Natural Gas, issued by U. S. Fuel Administration (1918) 5.

[25] See Brief on Behalf of Legislation Imposing an Excise Tax on Natural Gas, submitted to N. R. A. by the United Mine Workers of America and the National Coal Association.

[26] Brief of National Gas Association and United Mine Workers, supra, note 26, pp. 35, 36, compiled from Bureau of Mines Reports.

in other parts of the United States,[27] it can hardly be said to be self-justifying. It certainly is a very great factor in hastening decline of the natural gas supply.

About the time of World War I there were occasional and short-lived efforts by some hard-pressed companies to reverse this discrimination and adopt graduated rates, giving a low rate to quantities adequate for domestic use and graduating it upward to discourage industrial use.[28]

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These rates met opposition from industrial sources, of course, and since diminished revenues from industrial sources tended to increase the domestic price, they met little popular or commission favor. The fact is that neither the gas companies nor the consumers nor local regulatory bodies can be depended upon to conserve gas. Unless federal regulation will take account of conservation, its efforts seem, as in this case, actually to constitute a new threat to the life of the Appalachian supply.

II.

Congress in 1938 decided upon federal regulation of the industry. It did so after an exhaustive investigation of all aspects including failing supply and competition for the use of natural gas intensified by growing scarcity.[29] Pipelines from the Appalachian area to markets were in the control of a handful of holding company systems.[30] This created a highly concentrated control of the producers' market and of the consumers' supplies. While holding companies dominated both production and distribution they segregated those activities in separate

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subsidiaries,[31] the effect of which, if not the purpose, was to isolate

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[27] From the source quoted in the preceding note the spread elsewhere is shown to be:

State	*Industrial*	*Domestic*
Illinois	29.2	1.678
Louisiana	10.4	59.7
Oklahoma	11.2	41.5
Texas	13.1	59.7
Alabama	17.8	1.227
Georgia	22.9	1.043

[28] In Corning, New York, rates were initiated by the Crystal City Gas Company as follows: 70¢ for the first 5,000 cu. ft. per month; 80¢ from 5,000 to 12,000; $1 for all over 12,000. The Public Service Commission rejected these rates and fixed a flat rate of 58¢ per m.c.f. Lane v. Crystal City Gas Co., 8 New York Public Service Comm. Reports, Second District, 210.

The Pennsylvania Gas Company (National Fuel Gas Company group) also attempted a sliding scale rate for New York consumers, net per month as follows: First 5,000 feet, 35¢; second 5,000 feet, 45¢; third 5,000 feet, 50¢; all above 15,000, 55¢. This was eventually abandoned, however. The company's present scale in Pennsylvania appears to be reversed to the following net monthly rate; first 3 m.c.f., 75¢; next 4 m.c.f., 60¢; next 8 m.c.f., 55¢; over 15 m.c.f., 50¢. Moody's Manual of Public Utilities (1943) 1350. In New York it now serves a mixed gas.

For a study of effect of sliding scale rates in reducing consumption see 11 Proceedings of Natural Gas Association of America (1919) 287.

[29] See Report on Utility Corporations by Federal Trade Commission, Sen. Doc. 92, Pt. 84-A, 70th Cong., 1st Sess.

[30] Four holding company systems control over 55 per cent of all natural gas transmission lines in the United States. They are Columbia Gas and Electric Corporation, Cities Service Co., Electric Bond and Share Co., and Standard Oil Co. of New Jersey. Columbia alone controls nearly 25 per cent, and fifteen companies account for over 80 per cent of the total. Report on Utility Corporations by Federal Trade Commission, Sen. Doc. 92, Pt. 84-A, 70th Cong., 1st Sess., 28.

In 1915, so it was reported to the Governor of West Virginia, 87 per cent of the total gas production of that state was under control of eight companies. Steptoe and Hoffheimer, Legislative Regulation of Natural Gas Supply in West Virginia, 17 West Virginia Law Quarterly 257, 260. Of these, three were subsidiaries of the Columbia system and others were subsidiaries of larger systems. In view of inter-system sales and interlocking interests it may be doubted whether there is much real competition among these companies.

[31] This pattern with its effects on local regulatory efforts will be observed in our decisions. See United Fuel Gas Co. v. Railroad Commission, 278 U.S. 300, 49 S.Ct. 150, 73 L.Ed. 390; United Fuel Gas Co. v. Public Service Commission, 278 U.S. 322, 49 S.Ct. 157, 73 L.Ed. 402; Dayton Power & Light v. Public Utilities Commission, 292 U.S. 290, 54 S.Ct. 647, 78 L.Ed. 1267; Columbus Gas & Fuel Co. v. Public Utilities Commission,

some end of the business from the reach of any one state commission. The cost of natural gas to consumers moved steadily upwards over the years, out of proportion to prices of oil, which, except for the element of competition, is produced under somewhat comparable conditions. The public came to feel that the companies were exploiting the growing scarcity of local gas. The problems of this region had much to do with creating the demand for federal regulation.

The Natural Gas Act declared the natural gas business to be "affected with a *public interest*," and its regulation "necessary in the *public interest*."[32] Originally, and at the time this proceeding was commenced and tried, it also declared "the intention of Congress that natural gas shall be sold in interstate commerce for resale for ultimate public consumption for domestic, commercial, industrial, or any other use at the lowest possible reasonable rate *consistent with the maintenance of adequate service in the public interest*."[33] While this was later dropped, there is nothing to indicate that it was not and is not still an accurate statement of purpose of the Act. Extension or improvement of facilities may be ordered when "necessary or desirable in the public interest," abandonment of facilities may be ordered when the supply is "depleted to the extent that the continuance of service is unwarranted, or that the *present or future public convenience or necessity*

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permit" abandonment and certain extensions can only be made on finding of "the *present or future* public convenience and necessity."[34] The Commission is required to take account of the ultimate use of the gas. Thus it is given power to suspend new schedules as to rates, charges, and classification of services except where the schedules are for the sale of gas "for resale for industrial use only,"[35] which gives the companies greater freedom to increase rates on industrial gas than on domestic gas. More particularly, the Act expressly forbids any undue preference or advantage to any person or "*any unreasonable difference in rates* * * * either as between localities *or as between classes of service*."[36] And the power of the Commission expressly includes that to determine the "just and reasonable *rate, charge, classification, rule, regulation, practice, or contract* to be thereafter observed and in force."[37]

In view of the Court's opinion that the Commission in administering the Act may ignore discrimination, it is interesting that in reporting this Bill both the Senate and the House Committees on Interstate Commerce pointed out that in 1934, on a nationwide average the price of natural gas per m.c.f. was 74.6 cents for domestic use, 49.6 cents for commercial use, and 16.9 for industrial use.[38] I am not ready to think that supporters of a bill called attention to the striking fact that householders were being charged five times as much for their gas as industrial users only as a situation which the Bill would do nothing to remedy. On the other hand the Act gave to the Commission what the Court aptly describes as "broad powers of regulation."

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III.

This proceeding was initiated by the Cities of Cleveland and Akron. They alleged that the price charged by Hope for natural gas "for resale to domestic, commercial and small industrial consumers in Cleveland and elsewhere is excessive, unjust, unreasonable, greatly in excess of the price charged by Hope to nonaffiliated companies at wholesale for resale to domestic, commercial and small industrial consumers, and *greatly in excess of the price charged by Hope to East Ohio for resale to certain favored industrial consumers in Ohio, and therefore is further unduly discriminatory between consumers and between classes of service*" (italics supplied). The company answered admitting differences in prices to affiliated and nonaffiliated companies and justifying them by differences in conditions of de-

292 U.S. 398, 54 S.Ct. 763, 78 L.Ed. 1327, 91 A.L.R. 1403, and the present case.

[32] 15 U. S. C. § 717(a), 15 U.S.C.A. § 717(a). (Italics supplied throughout this paragraph.)

[33] § 7(c), 52 Stat. 825, 15 U.S.C.A. § 717f(c).

[34] 15 U. S. C. § 717f, 15 U.S.C.A. § 717f.

[35] Id., § 717c(e).

[36] Id., § 717c(b).

[37] Id., § 717d(a).

[38] Sen. Rep. No. 1162, 75th Cong., 1st Sess. 2.

livery. As to the allegation that the contract price is "greatly in excess of the price charged by Hope to East Ohio for resale to certain favored industrial consumers in Ohio," Hope did not deny a price differential, but alleged that industrial gas was not sold to "favored consumers" but was sold under contract and schedules filed with and approved by the Public Utilities Commission of Ohio, and that certain conditions of delivery made it not "unduly discriminatory."

The record shows that in 1940 Hope delivered for industrial consumption 36,523,792 m.c.f. and for domestic and commercial consumption, 50,343,652 m.c.f. I find no separate figure for domestic consumption. It served 43,767 domestic consumers directly, 511,521 through the East Ohio Gas Company, and 154,043 through the Peoples Natural Gas Company, both affiliates owned by the same parent. Its special contracts for industrial consumption, so far as appear, are confined to about a dozen big industries.

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Hope is responsible for such discrimination as exists in favor of these few industrial consumers. It controls both the resale price and use of industrial gas by virtue of the very interstate sales contracts over which the Commission is exercising its jurisdiction.

Hope's contract with East Ohio Company is an example. Hope agrees to deliver, and the Ohio Company to take, "(a) all natural gas requisite for the supply of the domestic consumers of the Ohio Company; (b) such amounts of natural gas as may be requisite to fulfill contracts made with the consent and approval of the Hope Company by the Ohio Company, or companies which it supplies with natural gas, for the sale of gas upon special terms and conditions for manufacturing purposes." The Ohio company is required to read domestic customers' meters once a month and meters of industrial customers daily and to furnish all meter readings to Hope. The Hope Company is to have access to meters of all consumers and to all of the Ohio Company's accounts. The domestic consumers of the Ohio Company are to be fully supplied in preference to consumers purchasing for manufacturing purposes and "Hope Company can be required to supply gas to be used for manufacturing purposes only where the same is sold under special contracts which have first been submitted to and approved in writing by the Hope Company and which expressly provide that natural gas will be supplied thereunder only in so far as the same is not necessary to meet the requirements of domestic consumers supplied through pipe lines of the Ohio Company." This basic contract was supplemented from time to time, chiefly as to price. The last amendment was in a letter from Hope to East Ohio in 1937. It contained a special discount on industrial gas and a schedule of special industrial contracts, Hope reserving the right to make eliminations therefrom and agreeing that others might be added from time to

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time with its approval in writing. It said, "It is believed that the price concessions contained in this letter, *while not based on our costs,* are under certain conditions, to our mutual advantage in maintaining and building up the volumes of gas sold by us [italics supplied]." [39]

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[39] The list of East Ohio Gas Company's special industrial contracts thus expressly under Hope's control and their demands are as follows:

Ordinary Daily Requirements. *Customer*	
Republic Steel Corporation	15,000,000 cu. ft.
Otis Steel Company	10,000,000
Timken Roller Bearing Co.	7,500,000
Youngstown Sheet & Tube Co.	7,000,000
U. S. Steel Corp.—Subsidiaries	6,500,000
General Electric Company	2,500,000
Pittsburgh Plate Glass Co.	2,000,000
Niles Rolling Mill Company	1,500,000
Chase Brass & Copper Company	700,000
U. S. Aluminum Company	400,000
Mahoning Valley Steel Company	400,000
Babcock & Wilcox Company	400,000
Canton Stamping & Enameling Co.	350,000

The Commission took no note of the charges of discrimination and made no disposition of the issue tendered on this point. It ordered a flat reduction in the price per m.c.f. of all gas delivered by Hope in interstate commerce. It made no limitation, condition, or provision as to what classes of consumers should get the benefit of the reduction. While the cities have accepted and are defending the reduction, it is my view that the discrimination of which they have complained is perpetuated and increased by the order of the Commission and that it violates the Act in so doing.

The Commission's opinion aptly characterizes its entire objective by saying that "bona fide investment figures now become all-important in the regulation of rates." It should be noted that the all-importance of this theory is not the result of any instruction from Congress. When the Bill to regulate gas was first before Congress it contained

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the following: "In determining just and reasonable rates the Commission shall fix such rate as will allow a fair return upon the actual legitimate prudent cost of the property used and useful for the service in question." H. R. 5423, 74th Cong., 1st Sess. Title III, § 312(c). Congress rejected this language. See H. R. 5423, § 213 [211(c)], and H. R. Rep. No. 1318, 74th Cong., 1st Sess. 30.

The Commission contends nevertheless that the "all important" formula for finding a rate base is that of prudent investment. But it excluded from the investment base an amount actually and admittedly invested of some $17,000,000. It did so because it says that the Company recouped these expenditures from customers before the days of regulation from earnings above a fair return. But it would not apply all of such "excess earnings" to reduce the rate base as one of the Commissioners suggested. The reason for applying excess earnings to reduce the investment base roughly from $69,000,000 to $52,000,000 but refusing to apply them to reduce it from that to some $18,000,000 is not found in a difference in the character of the earnings or in their reinvestment. The reason assigned is a difference in bookkeeping treatment many years before the Company was subject to regulation. The $17,000,000, reinvested chiefly in well drilling, was treated on the books as expense. (The Commission now requires that drilling costs be carried to capital account.) The allowed rate base thus actually was determined by the Company's bookkeeping, not its investment. This attributes a significance to formal classification in account keeping that seems inconsistent with rational rate regulation.[40] Of

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course, the

[40] To make a fetish of mere accounting is to shield from examination the deeper causes, forces, movements, and conditions which should govern rates. Even as a recording of current transactions, bookkeeping is hardly an exact science. As a representation of the condition and trend of a business, it uses symbols of certainty to express values that actually are in constant flux. It may be said that in commercial or investment banking or any business extending credit success depends on knowing what not to believe in accounting. Few concerns go into bankruptcy or reorganization whose books do not show them solvent and often even profitable. If one cannot rely on accountancy accurately to disclose past or current conditions of a business, the fallacy of using it as a sole guide to future price policy ought to be apparent. However, our quest for certitude is so ardent that we pay an irrational reverence to a technique which uses symbols of certainty, even though experience again and again warns us that they are delusive. Few writers have ventured to challenge this American idolatry, but see Hamilton, Cost as a standard for Price, 4 Law and Contemporary Problems 321, 323-25. He observes that "As the apostle would put it, accountancy is all things to all men. * * * Its purpose determines the character of a system of accounts." He analyzes the hypothetical character of accounting and says "It was no eternal mold for pecuniary verities handed down from on high. It was—like logic or algebra, or the device of analogy in the law—an ingenious contrivance of the human mind to serve a limited and practical purpose." "Accountancy is far from being a pecuniary expression of all that is industrial reality. It is an instrument, highly selective in its application, in the service of the institution of money making." As to capital account he observes "In an enterprise in lusty competition with others of its kind, survival is the thing and the system of accounts has its focus in solvency. * * * Accordingly depreciа-

Commission would not and should not allow a rate base to be inflated by bookkeeping which had improperly capitalized expenses. I have doubts about resting public regulation upon any rule that is to be used or not depending on which side it favors.

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The Company on the other hand, has not put its gas fields into its calculations on the present-value basis, although that, it contends, is the only lawful rule for finding a rate base. To do so would result in a rate higher than it has charged or proposes as a matter of good business to charge.

The case before us demonstrates the lack of rational relationship between conventional rate-base formulas and natural gas production and the extremities to which regulating bodies are brought by the effort to rationalize them. The Commission and the Company each stands on a different theory, and neither ventures to carry its theory to logical conclusion as applied to gas fields.

IV.

This order is under judicial review not because we interpose constitutional theories between a State and the business it seeks to regulate, but because Congress put upon the federal courts a duty toward administration of a new federal regulatory Act. If we are to hold that a given rate is reasonable just because the Commission has said it was reasonable, review becomes a costly, time-consuming pageant of no practical value to anyone. If on the other hand we are to bring judgment of our own to the task, we should for the guidance of the regulators and the regulated reveal something of the philosophy, be it legal or economic or social, which guides us. We need not be slaves to a formula but unless we can point out a rational way of reaching our conclusions they can only be accepted as resting on intuition or predilection. I must admit that I possess no instinct by which to know the "reasonable" from the "unreasonable" in prices and must seek some conscious design for decision.

The Court sustains this order as reasonable, but what makes it so or what could possibly make it otherwise,

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I cannot learn. It holds that: "it is the result reached not the method employed which is controlling"; "the fact that the method employed to reach that result may contain infirmities is not then important" and it is not "important to this case to determine the various permissible ways in which any rate base on which the return is computed might be arrived at." The Court does lean somewhat on considerations of capitalization and dividend history and requirements for dividends on outstanding stock. But I can give no real weight to that for it is generally and I think deservedly in discredit as any guide in rate cases.[41]

Our books already contain so much talk of methods of rationalizing rates that we must appear ambiguous if we announce results without our working methods. We are confronted with regulation of a unique type of enterprise which I think requires considered rejection of much conventional utility doctrine and adoption of concepts of "just and reasonable" rates and practices and of the "public interest" that will take account of the peculiarities of the business.

The Court rejects the suggestions of this opinion. It says that the Committees in reporting the bill which became the Act said it provided "for regulation along recognized and more or less standardized lines" and that there was "nothing novel in its provisions." So saying it sustains a rate calculated on a novel variation of a rate base theory which itself had at the time of enactment of the legislation been recognized only in dissenting opinions. Our difference seems to be between unconscious innovation,[42] and the purposeful

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tion, obsolescence, and other factors which carry no immediate threat are matters of lesser concern and the capital account is likely to be regarded as a secondary phenomenon. * * * But in an enterprise, such as a public utility, where continued survival seems assured, solvency is likely to be taken for granted. * * * A persistent and ingenious attention is likely to be directed not so much to securing the upkeep of the physical property as to making it certain that capitalization fails in not one whit to give full recognition to every item that should go into the account."

[41] See 2 Bonbright, Valuation of Property (1937) 1112.

[42] Bonbright says, "* * * the vice of

and deliberate innovation I
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would make to meet the necessities of regulating the industry before us.

Hope's business has two components of quite divergent character. One, while not a conventional common-carrier undertaking, is essentially a transportation enterprise consisting of conveying gas from where it is produced to point of delivery to the buyer. This is a relatively routine operation not differing substantially from many other utility operations. The service is produced by an investment in compression and transmission facilities. Its risks are those of investing in a tested means of conveying a discovered supply of gas to a known market. A rate base calculated on the prudent investment formula would seem a reasonably satisfactory measure for fixing a return from that branch of the business whose service is roughly proportionate to the capital invested. But it has other consequences which must not be overlooked. It gives marketability and hence "value" to gas owned by the company and gives the pipeline company a large power over the marketability and hence "value" of the production of others.

The other part of the business—to reduce to possession an adequate supply of natural gas—is of opposite character, being more erratic and irregular and unpredictable in relation to investment than any phase of any other utility business. A thousand feet of gas captured and severed from real estate for delivery to consumers is recognized under our law as property of much the same nature as a ton of coal, a barrel of oil, or a yard of sand. The value to be allowed for it is the real battleground between the investor and consumer. It is from this part of the business that the chief difference between the parties as to a proper rate base arises.

Is it necessary to a "reasonable" price for gas that it be anchored to a rate base of any kind? Why did courts in the first place begin valuing "rate bases" in order to "value" something else? The method came into vogue
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in fixing rates for transportation service which the public obtained from common carriers. The public received none of the carriers' physical property but did make some use of it. The carriage was often a monopoly so there were no open market criteria as to reasonableness. The "value" or "cost" of what was put to use in the service by the carrier was not a remote or irrelevant consideration in making such rates. Moreover the difficulty of appraising an intangible service was thought to be simplified if it could be related to physical property which was visible and measurable and the items of which might have market value. The court hoped to reason from the known to the unknown. But gas fields turn this method topsy turvy. Gas itself is tangible, possessible, and does have a market and a price in the field. The value of the rate base is more elusive than that of gas. It consists of intangibles—leaseholds and freeholds—operated and unoperated—of little use in themselves except as rights to reach and capture gas. Their value lies almost wholly in predictions of discovery, and of price of gas when captured, and bears little relation to cost of tools and supplies and labor to develop it. Gas is what Hope sells and it can be directly priced more reasonably and easily and accurately than the components of a rate base can be valued. Hence the reason for resort to a roundabout way of rate base price fixing does not exist in the case of gas in the field.

But if found, and by whatever method found, a rate base is little help in determining reasonableness of the price of gas. Appraisal of present value of these intangible rights to pursue fugitive gas depends on the value assigned to the gas when captured. The "present fair value" rate base, generally in ill repute,[43] is not even

traditional law lies, not in its adoption of excessively rigid concepts of value and rules of valuation, but rather in its tendency to permit shifts in meaning that are inept, or else that are ill-defined because the judges that make them will not openly admit that they are doing so." Id., 1170.

[43] "The attempt to regulate rates by reference to a periodic or occasional reappraisal of the properties has now been tested long enough to confirm the worst fears of its critics. Unless its place is taken by some more promising scheme of rate control, the days of private ownership under government regulation may be numbered." 2 Bonbright, Valuation of Property (1937) 1190.

urged by the gas company for valuing its fields.

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The prudent investment theory has relative merits in fixing rates for a utility which creates its service merely by its investment. The amount and quality of service rendered by the usual utility will, at least roughly, be measured by the amount of capital it puts into the enterprise. But it has no rational application where there is no such relationship between investment and capacity to serve. There is no such relationship between investment and amount of gas produced. Let us assume that Doe and Roe each produces in West Virginia for delivery to Cleveland the same quantity of natural gas per day. Doe, however, through luck or foresight or whatever it takes, gets his gas from investing $50,000 in leases and drilling. Roe drilled poorer territory, got smaller wells, and has invested $250,000. Does anybody imagine that Roe can get or ought to get for his gas five times as much as Doe because he has spent five times as much? The service one renders to society in the gas business is measured by what he gets out of the ground, not by what he puts into it, and there is little more relation between the investment and the results than in a game of poker.

Two-thirds of the gas Hope handles it buys from about 340 independent producers. It is obvious that the principle of rate-making applied to Hope's own gas cannot be applied, and has not been applied, to the bulk of the gas Hope delivers. It is not probable that the investment of any two of these producers will bear the same ratio to their investments. The gas, however, all goes to the same use, has the same utilization value and the same ultimate price.

To regulate such an enterprise by undiscriminatingly transplanting any body of rate doctrine conceived and

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adapted to the ordinary utility business can serve the "public interest" as the Natural Gas Act requires, if at all, only by accident. Mr. Justice Brandeis, the pioneer juristic advocate of the prudent investment theory for man-made utilities, never, so far as I am able to discover, proposed its application to a natural gas case. On the other hand, dissenting in Commonwealth of Pennsylvania v. West Virginia, he reviewed the problems of gas supply and said, "In no other field of public service regulation is the controlling body confronted with factors so baffling as in the natural gas industry, and in none is continuous supervision and control required in so high a degree." 262 U.S. 553, 621, 43 S.Ct. 658, 674, 67 L.Ed. 1117, 32 A.L.R. 300. If natural gas rates are intelligently to be regulated we must fit our legal principles to the economy of the industry and not try to fit the industry to our books.

As our decisions stand the Commission was justified in believing that it was required to proceed by the rate base method even as to gas in the field. For this reason the Court may not merely wash its hands of the method and rationale of rate making. The fact is that this Court, with no discussion of its fitness, simply transferred the rate base method to the natural gas industry. It happened in Newark Natural Gas & Fuel Co. v. City of Newark, Ohio, 1917, 242 U.S. 405, 37 S.Ct. 156, 157, 61 L.Ed. 393, Ann.Cas.1917B, 1025, in which the company wanted 25 cents per m.c.f., and under the Fourteenth Amendment challenged the reduction to 18 cents by ordinance. This Court sustained the reduction because the court below "gave careful consideration to the questions of the value of the property * * * at the time of the inquiry," and whether the rate "would be sufficient to provide a fair return on the value of the property." The Court said this method was "based upon principles thoroughly established by repeated decisions of this court," citing many cases, not one of which involved natural gas or a comparable wasting natural resource. Then came issues as to state power to

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regulate as affected by the commerce clause. Public Utilities Commission v. Landon, 1919, 249 U.S. 236, 39 S.Ct. 268, 63 L.Ed. 577; Pennsylvania Gas Co. v. Public Service Commission, 1920, 252 U.S. 23, 40 S.Ct. 279, 64 L.Ed. 434. These questions settled, the Court again was called upon in natural gas cases to consider state rate-making claimed to be invalid under the Fourteenth Amendment. United Fuel Gas Co. v. Railroad Commission of Kentucky, 1929, 278 U.S. 300, 49 S.Ct. 150, 73 L.Ed. 390; United Fuel Gas Company v. Public Service Commission of West Virginia, 1929, 278 U.S. 322, 49 S.Ct. 157, 73 L.Ed. 402. Then, as now, the differences were "due

chiefly to the difference in value ascribed by each to the gas rights and leaseholds." 278 U.S. 300, 311, 49 S.Ct. 150, 153, 73 L.Ed 390. No one seems to have questioned that the rate base method must be pursued and the controversy was as to what rate base must be used. Later the "value" of gas in the field was questioned in determining the amount a regulated company should be allowed to pay an affiliate therefor—a state determination also reviewed under the Fourteenth Amendment. Dayton Power & Light Co. v. Public Utilities Commission of Ohio, 1934, 292 U.S. 290, 54 S.Ct. 647, 78 L.Ed. 1267; Columbus Gas & Fuel Co. v. Public Utilities Commission of Ohio, 1934, 292 U.S. 398, 54 S.Ct. 763, 78 L.Ed. 1327, 91 A.L.R. 1403. In both cases, one of which sustained, and one of which struck down a fixed rate the Court assumed the rate base method, as the legal way of testing reasonableness of natural gas prices fixed by public authority, without examining its real relevancy to the inquiry.

Under the weight of such precedents we cannot expect the Commission to initiate economically intelligent methods of fixing gas prices. But the Court now faces a new plan of federal regulation based on the power to fix the price at which gas shall be allowed to move in interstate commerce. I should now consider whether these rules devised under the Fourteenth Amendment are the exclusive tests of a just and reasonable rate under the federal statute, inviting reargument directed to that point

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if necessary. As I see it now I would be prepared to hold that these rules do not apply to a natural gas case arising under the Natural Gas Act.

Such a holding would leave the Commission to fix the price of gas in the field as one would fix maximum prices of oil or milk or coal, or any other commodity. Such a price is not calculated to produce a fair return on the synthetic value of a rate base of any individual producer, and would not undertake to assure a fair return to any producer. The emphasis would shift from the producer to the product, which would be regulated with an eye to average or typical producing conditions in the field.

Such a price fixing process on economic lines would offer little temptation to the judiciary to become back seat drivers of the price fixing machine. The unfortunate effect of judicial intervention in this field is to divert the attention of those engaged in the process from what is economically wise to what is legally permissible. It is probable that price reductions would reach economically unwise and self-defeating limits before they would reach constitutional ones. Any constitutional problems growing out of price fixing are quite different than those that have heretofore been considered to inhere in rate making. A producer would have difficulty showing the invalidity of such a fixed price so long as he voluntarily continued to sell his product in interstate commerce. Should he withdraw and other authority be invoked to compel him to part with his property, a different problem would be presented.

Allowance in a rate to compensate for gas removed from gas lands, whether fixed as of point of production or as of point of delivery, probably best can be measured by a functional test applied to the whole industry. For good or ill we depend upon private enterprise to exploit these natural resources for public consumption. The function which an allowance for gas in the field should perform

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for society in such circumstances is to be enough and no more than enough to induce private enterprise completely and efficiently to utilize gas resources, to acquire for public service any available gas or gas rights and to deliver gas at a rate and for uses which will be in the future as well as in the present public interest.

The Court fears that "if we are now to tell the Commission to fix the rates so as to discourage particular uses, we would indeed be injecting into a rate case a 'novel' doctrine * * *." With due deference I suggest that there is nothing novel in the idea that any change in price of a service or commodity reacts to encourage or discourage its use. The question is not whether such consequences will or will not follow; the question is whether effects must be suffered blindly or may be intelligently selected, whether price control shall have targets at which it deliberately aims or shall be handled like a gun in the hands of one who does not know it is loaded.

We should recognize "price" for what it is—a tool, a means, an expedient. In pub-

lic hands it has much the same economic effects as in private hands. Hope knew that a concession in industrial price would tend to build up its volume of sales. It used price as an expedient to that end. The Commission makes another cut in that same price but the Court thinks we should ignore the effect that it will have on exhaustion of supply. The fact is that in natural gas regulation price must be used to reconcile the private property right society has permitted to vest in an important natural resource with the claims of society upon it—price must draw a balance between wealth and welfare.

To carry this into techniques of inquiry is the task of the Commissioner rather than of the judge, and it certainly is no task to be solved by mere bookkeeping but requires the best economic talent available. There would doubtless be inquiry into the price gas is bringing in the

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field, how far that price is established by arms' length bargaining and how far it may be influenced by agreements in restraint of trade or monopolistic influences. What must Hope really pay to get and to replace gas it delivers under this order? If it should get more or less than that for its own, how much and why? How far are such prices influenced by pipe line access to markets and if the consumers pay returns on the pipe lines how far should the increment they cause go to gas producers? East Ohio is itself a producer in Ohio.[44] What do Ohio authorities require Ohio consumers to pay for gas in the field? Perhaps these are reasons why the Federal Government should put West Virginia gas at lower or at higher rates. If so what are they? Should East Ohio be required to exploit its half million acres of unoperated reserve in Ohio before West Virginia resources shall be supplied on a devalued basis of which that State complains and for which she threatens measures of self keep? What is gas worth in terms of other fuels it displaces?

A price cannot be fixed without considering its effect on the production of gas. Is it an incentive to continue to exploit vast unoperated reserves? Is it conducive to deep drilling tests the result of which we may know only after trial? Will it induce bringing gas from afar to supplement or even to substitute for Appalachian gas?[45] Can it be had from distant fields as cheap or cheaper? If so, that competitive potentiality is certainly a relevant consideration. Wise regulation must also consider, as a private buyer would, what alternatives the producer has

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if the price is not acceptable. Hope has intrastate business and domestic and industrial customers. What can it do by way of diverting its supply to intrastate sales? What can it do by way of disposing of its operated or reserve acreage to industrial concerns or other buyers? What can West Virginia do by way of conservation laws, severance or other taxation, if the regulated rate offends? It must be borne in mind that while West Virginia was prohibited from giving her own inhabitants a priority that discriminated against interstate commerce, we have never yet held that a good faith conservation act, applicable to her own, as well as to others, is not valid. In considering alternatives, it must be noted that federal regulation is very incomplete, expressly excluding regulation of "production or gathering of natural gas," and that the only present way to get the gas seems to be to call it forth by price inducements. It is plain that there is a downward economic limit on a safe and wise price.

But there is nothing in the law which compels a commission to fix a price at that "value" which a company might give to its product by taking advantage of scarcity, or monopoly of supply. The very purpose of fixing maximum prices is to take away from the seller his opportunity to get all that otherwise the market would award him for his goods. This is a constitutional use of the power to fix maximum prices, Block

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44 East Ohio itself owns natural gas rights in 550,600 acres, 518,526 of which are reserved and 32,074 operated, by 375 wells. Moody's Manual of Public Utilities (1943) 5.

45 Hope has asked a certificate of convenience and necessity to lay 1140 miles of 22-inch pipeline from Hugoton gas fields in southwest Kansas to West Virginia to carry 285 million cu. ft. of natural gas per day. The cost was estimated at $51,000,000. Moody's Manual of Public Utilities (1943) 1760.

v. Hirsh, 256 U.S. 135, 41 S.Ct. 458, 65 L.Ed. 865, 16 A.L.R. 165; Marcus Brown Holding Co. v. Feldman, 256 U.S. 170, 41 S.Ct. 465, 65 L.Ed. 877; International Harvester Co. v. Kentucky, 234 U.S. 216, 34 S.Ct. 853, 58 L.Ed. 1284; Highland v. Russell Car & Snow Plow Co., 279 U.S. 253, 49 S.Ct. 314, 73 L.Ed. 688, just as the fixing of minimum prices of goods in interstate commerce is constitutional although it takes away from the buyer the advantage in bargaining which market conditions would give him. United States v. Darby, 312 U.S. 100, 657, 61 S.Ct. 451, 85 L.Ed. 609, 132 A.L.R. 1430; Mulford v. Smith, 307 U.S. 38, 59 S.Ct. 648, 83 L.Ed. 1092; United States v. Rock Royal Co-operative, Inc., 307 U.S. 533, 59 S.Ct. 993, 83 L.Ed. 1446; Sunshine Anthracite Coal Co. v. Adkins, 310 U.S. 381, 60 S.Ct. 907, 84 L.Ed. 1263. The Commission has power to fix

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a price that will be both maximum and minimum and it has the incidental right, and I think the duty, to choose the economic consequences it will promote or retard in production and also more importantly in consumption, to which I now turn.

If we assume that the reduction in company revenues is warranted we then come to the question of translating the allowed return into rates for consumers or classes of consumers. Here the Commission fixed a single rate for all gas delivered irrespective of its use despite the fact that Hope has established what amounts to two rates —a high one for domestic use and a lower one for industrial contracts.[46] The Commission can fix two prices for interstate gas as readily as one—a price for resale to domestic users and another for resale to industrial users. This is the pattern Hope itself has established in the very contracts over which the Commission is expressly given jurisdiction. Certainly the Act is broad enough to permit two prices to be fixed instead of one, if the concept of the "public interest" is not unduly narrowed.

The Commission's concept of the public interest in natural gas cases which is carried today into the Court's opinion was first announced in the opinion of the majority in the Pipeline case. It enumerated only two "phases of the public interest: (1) the investor interest; (2) the consumer interest," which it emphasized to the exclusion of all others. 315 U.S. 575, 606, 62 S.Ct. 736, 753, 86 L.Ed. 1037. This will do well enough in dealing with railroads or utilities supplying manufactured gas, electric, power, a communications service or transportation, where utilization of facilities does not impair their future usefulness. Limitation of supply, however, brings into a natural gas case another phase of the public interest that to my mind overrides both the owner

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and the consumer of that interest. Both producers and industrial consumers have served their immediate private interests at the expense of the long-range public interest. The public interest, of course, requires stopping unjust enrichment of the owner. But it also requires stopping unjust impoverishment of future generations. The public interest in the use by Hope's half million domestic consumers is quite a different one from the public interest in use by a baker's dozen of industries.

Prudent price fixing it seems to me must at the very threshold determine whether any part of an allowed return shall be permitted to be realized from sales of gas for resale for industrial use. Such use does tend to level out daily and seasonal peaks of domestic demand and to some extent permits a lower charge for domestic service. But is that a wise way of making gas cheaper when, in comparison with any substitute, gas is already a cheap fuel? The interstate sales contracts provide that at times when demand is so great that there is not enough gas to go around domestic users shall first be served. Should the operation of this preference await the day of actual shortage? Since the propriety of a preference seems conceded, should it not operate to prevent the coming of a shortage as well as to mitigate its effects? Should industrial use jeopardize tomorrow's service to householders any more than today's? If, however, it is decided to cheapen domestic use by resort to industrial sales, should they be limited to the few uses

[46] I find little information as to the rates for industries in the record and none at all in such usual sources as Moody's Manual.

for which gas has special values or extend also to those who use it only because it is cheaper than competitive fuels? [47] And how much cheaper should industrial
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gas sell than domestic gas, and how much advantage should it have over competitive fuels? If industrial gas is to contribute at all to lowering domestic rates, should it not be made to contribute the very maximum of which it is capable, that is, should not its price be the highest at which the desired volume of sales can be realized?

If I were to answer I should say that the household rate should be the lowest that can be fixed under commercial conditions that will conserve the supply for that use. The lowest probable rate for that purpose is not likely to speed exhaustion much, for it still will be high enough to induce economy, and use for that purpose has more nearly reached the saturation point. On the other hand the demand for industrial gas at present rates already appears to be increasing. To lower further the industrial rate is merely further to subsidize industrial consumption and speed depletion. The impact of the flat reduction
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of rates ordered here admittedly will be to increase the industrial advantages of gas over competing fuels and to increase its use. I think this is not, and there is no finding by the Commission that it is, in the public interest.

There is no justification in this record for the present discrimination against domestic users of gas in favor of industrial users. It is one of the evils against which the Natural Gas Act was aimed by Congress and one of the evils complained of here by Cleveland and Akron. If Hope's revenues should be cut by some $3,600,000 the whole reduction is owing to domestic users. If it be considered wise to raise part of Hope's revenues by industrial purpose sales, the utmost possible revenue should be raised from the least consumption of gas. If competitive relationships to other fuels will permit, the industrial price should be substantially advanced, not for the benefit of the Company, but the increased revenues from the advance should be applied to reduce domestic rates. For in my opinion the "public interest" requires that the great volume of gas now being put to uneconomic industrial use should either be saved for its more important future domestic use or the present domestic user should have the full benefit of its exchange value in reducing his present rates.

Of course the Commission's power directly to regulate does not extend to the fixing of rates at which the local company shall sell to consumers. Nor is such power required to accomplish the purpose. As already pointed out, the very contract the Commission is altering classifies the gas according to the purposes for which it is to be resold and provides differentials between the two classifications. It would only be necessary for the Commission to order

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[47] The Federal Power Commission has touched upon the problem of conservation in connection with an application for a certificate permitting construction of a 1500-mile pipeline from southern Texas to New York City and says: "The Natural Gas Act as presently drafted does not enable the Commission to treat fully the serious implications of such a problem. The question should be raised as to whether the proposed use of natural gas would not result in displacing a less valuable fuel and create hardships in the industry already supplying the market, while at the same time rapidly depleting the country's natural-gas reserves. Although, for a period of perhaps 20 years, the natural gas could be so priced as to appear to offer an apparent saving in fuel costs, this would mean simply that social costs which must eventually be paid had been ignored.

"Careful study of the entire problem may lead to the conclusion that use of natural gas should be restricted by functions rather than by areas. Thus, it is especially adapted to space and water heating in urban homes and other buildings and to the various industrial heat processes which require concentration of heat, flexibility of control, and uniformity of results. Industrial uses to which it appears particularly adapted include the treating and annealing of metals, the operation of kilns in the ceramic, cement, and lime industries, the manufacture of glass in its various forms, and use as a raw material in the chemical industry. General use of natural gas under boilers for the production of steam is, however, under most circumstances of very questionable social economy." Twentieth Annual Report of the Federal Power Commission (1940) 79.

that all gas supplied under paragraph (a) of Hope's contract with the East Ohio Company shall be

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at a stated price fixed to give to domestic service the entire reduction herein and any further reductions that may prove possible by increasing industrial rates. It might further provide that gas delivered under paragraph (b) of the contract for industrial purposes to those industrial customers Hope has approved in writing shall be at such other figure as might be found consistent with the public interest as herein defined. It is too late in the day to contend that the authority of a regulatory commission does not extend to a consideration of public interests which it may not directly regulate and a conditioning of its orders for their protection. Interstate Commerce Commission v. Railway Labor Executives Ass'n, 315 U.S. 373, 62 S.Ct. 717, 86 L.Ed. 904; United States v. Lowden, 308 U.S. 225, 60 S.Ct. 248, 84 L.Ed. 208.

Whether the Commission will assert its apparently broad statutory authorization over prices and discriminations is, of course, its own affair, not ours. It is entitled to its own notion of the "public interest" and its judgment of policy must prevail. However, where there is ground for thinking that views of this Court may have constrained the Commission to accept the rate-base method of decision and a particular single formula as "all important" for a rate base, it is appropriate to make clear the reasons why I, at least, would not be so understood. The Commission is free to face up realistically to the nature and peculiarity of the resources in its control, to foster their duration in fixing price, and to consider future interests in addition to those of investors and present consumers. If we return this case it may accept or decline the proffered freedom. This problem presents the Commission an unprecedented opportunity if it will boldly make sound economic considerations, instead of legal and accounting theories, the foundation of federal policy. I would return the case to the Commission and thereby be clearly quit of what now may appear to be some responsibility for perpetrating a shortsighted pattern of natural gas regulation.

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UNITED STATES v. LAUDANI.

No. 71.

Argued and Submitted Dec. 16, 1943.

Decided Jan. 3, 1944.

1. Master and servant ⇐84

The purpose of the Kick Back Racket Act is to protect not only the legal form of employment contracts, but the substantive rights of workers to receive the benefit of wage schedules provided by Congress, except where diverted under authority of law or the workers' voluntary agreements. Kick Back Racket Act § 1, 40 U.S.C.A. § 276b.

2. Master and servant ⇐84

The Kick Back Racket Act, providing that "whoever" induces any person employed on any federally financed work to surrender part of wages by threat of dismissal shall be fined, etc., includes a foreman with authority to hire and discharge. Kick Back Racket Act § 1, 40 U.S.C.A. § 276b.

See Words and Phrases, Permanent Edition, for all other definitions of "Whoever".

On Writ of Certiorari to the United States Circuit Court of Appeals for the Third Circuit.

Convictions of Frank Laudani of violations of the Anti-Kickback Act were reversed by the Circuit Court of Appeals, which directed that the indictments be quashed, 134 F.2d 847, and the United States of America brings certiorari.

Reversed and remanded to the Circuit Court of Appeals for consideration and disposition of other questions.

Mr. Chester T. Lane, of Washington, D. C., for petitioner.

Mr. Harold Simandl, of Newark, N. J., for respondent.

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Mr. Justice BLACK delivered the opinion of the Court.

Indictments returned in a United States District Court in New Jersey charged that