

Demystifying Utility

Rate of Return

Ask me anything

Mark Ellis

December 5, 2023



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Ask me anything

- Market conditions
 - More discussion
 - Higher Treasury rates → higher risk premium/ROE
- Utility stock price-ROE correlation
- Use of credit metrics in other states
- Impact of lower ROE
 - Customer costs in the long run
 - Ability to raise capital
- Comparison to other states' ROE
- Adjustment for decoupling or other utility-specific risks/mitigants
- Real-time Q&A

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Head of strategy



Consultant, energy practice



Advisor, project development



MS, Technology & Policy

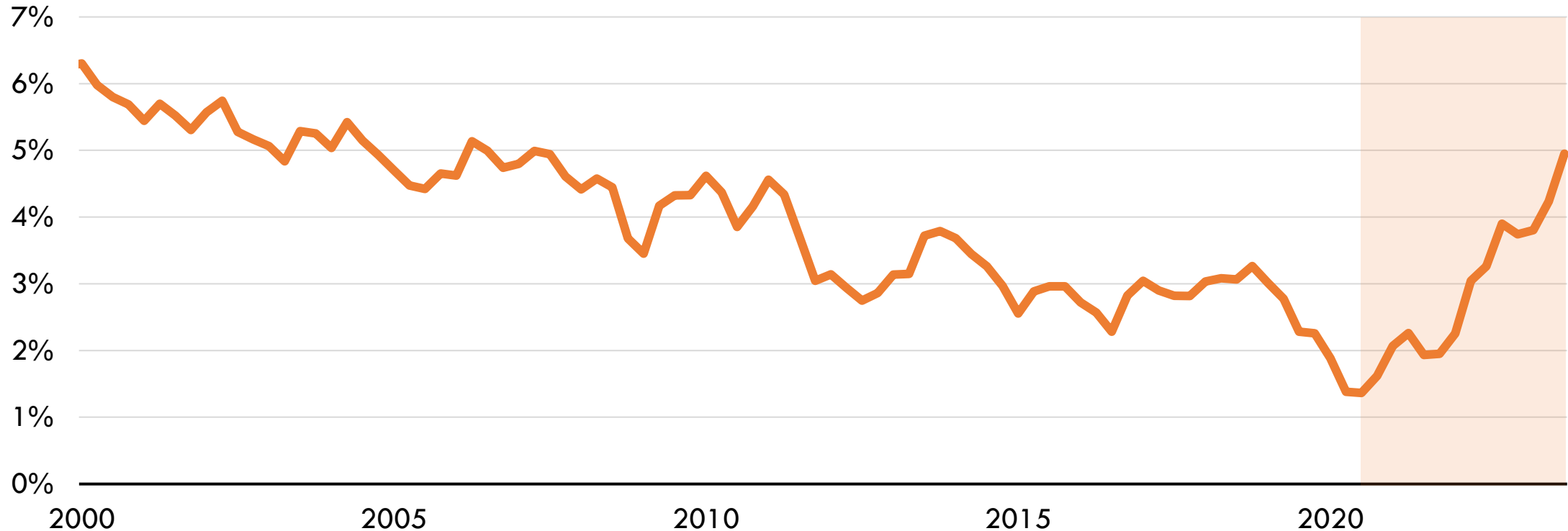


BS, Mechanical Engineering

Market conditions

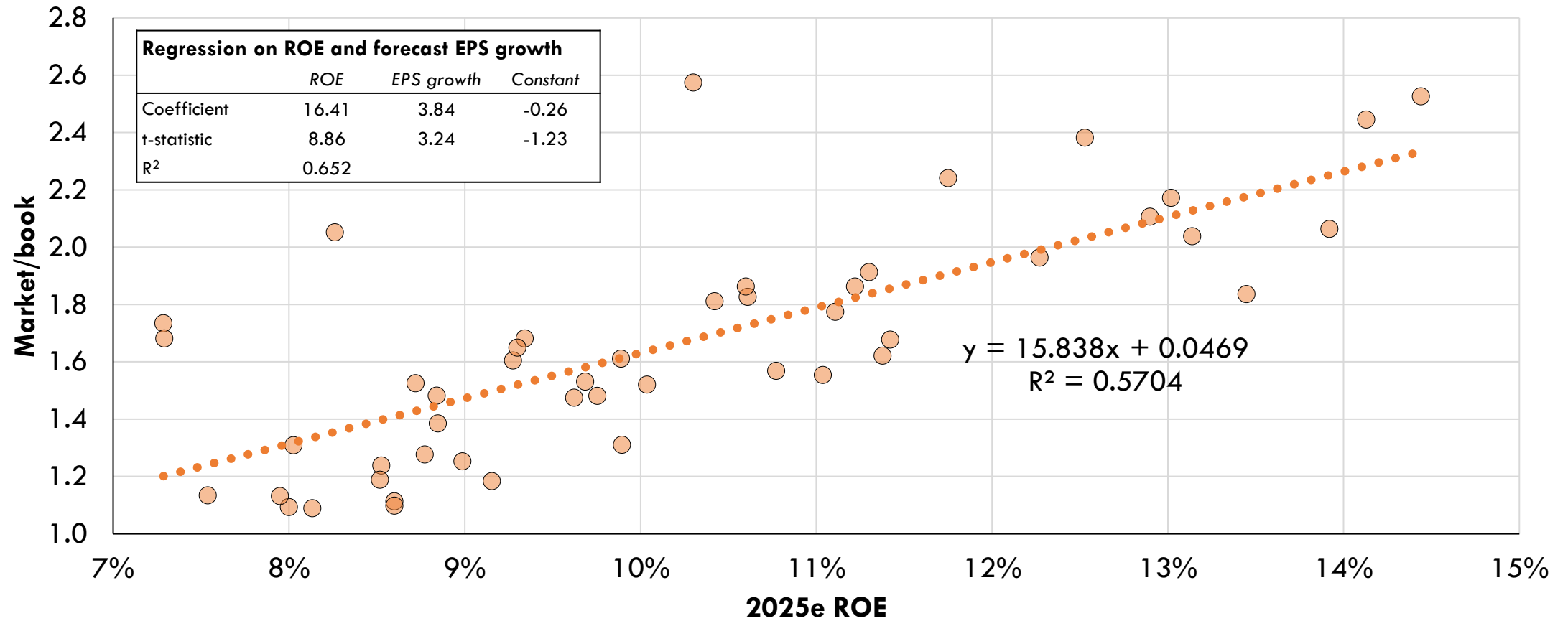
Market conditions: With higher interest rates, expect utilities to ask for higher ROEs

30-year Treasury rate



Utility stock price-ROE correlation

S&P 1500 Utilities ROE-stock price correlation



Use of credit metrics in other states

CFO/debt is the key utility credit metric

CFO pre-WC

- Cash flow from operations before changes in working capital
- Net income + depreciation + deferred taxes

Factors that Could Lead to an Upgrade

- » Credit positive changes in the utility's regulatory framework, including more riders and trackers to reduce regulatory lag and improve cash flow.
- » Increased cash flow, or a reduction in leverage, enabling the company to maintain a ratio of CFO pre-WC to debt of around 25% or above.

Factors that Could Lead to a Downgrade

- » A decline in the credit supportiveness of Duke Carolinas' regulatory relationships in North or South Carolina.
- » Additional capital expenditures or other capital needs that result in a material increase in debt levels or are not recoverable.
- » A ratio of CFO pre-WC to debt, excluding the financial effects of storm cost securitization, remaining below 21% on a sustained basis.

Key Indicators

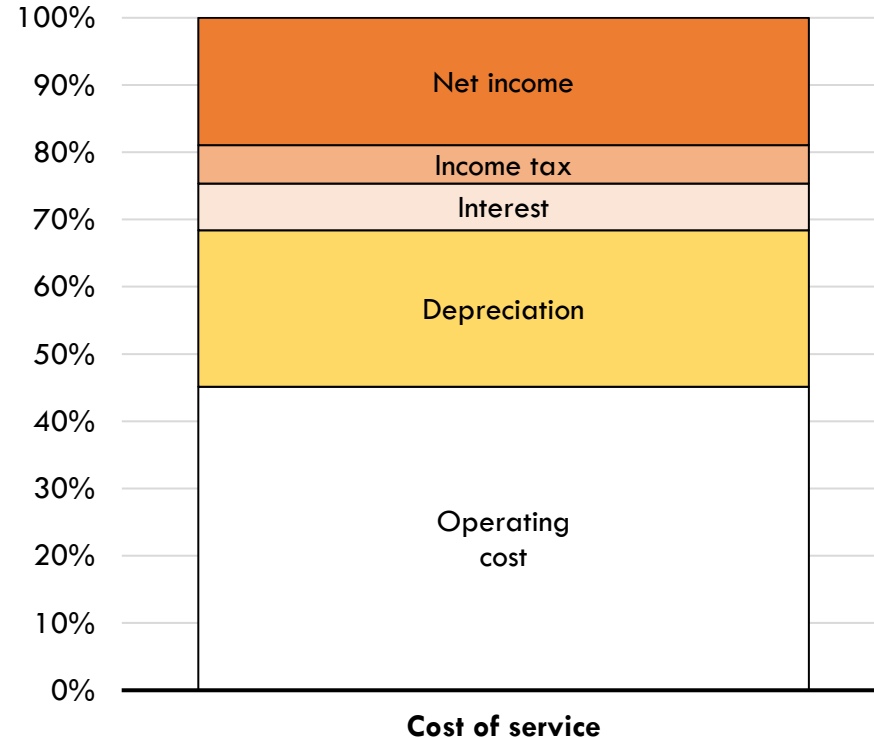
Exhibit 2
Duke Energy Carolinas, LLC [1]

	Dec-18	Dec-19	Dec-20	Dec-21	Dec-22
CFO Pre-W/C + Interest / Interest	6.9x	7.3x	6.2x	6.5x	5.3x
CFO Pre-W/C / Debt	24.5%	25.9%	21.0%	23.0%	16.8%
CFO Pre-W/C – Dividends / Debt	18.1%	23.6%	16.4%	18.6%	16.5%
Debt / Capitalization	43.3%	42.2%	43.1%	43.7%	44.4%

Impact of lower ROE on customer costs

Rate of return (ROR): compensation to investors for risk of investing in utilities

Cost-plus regulation revenue build-up



3 components to ROR calculation

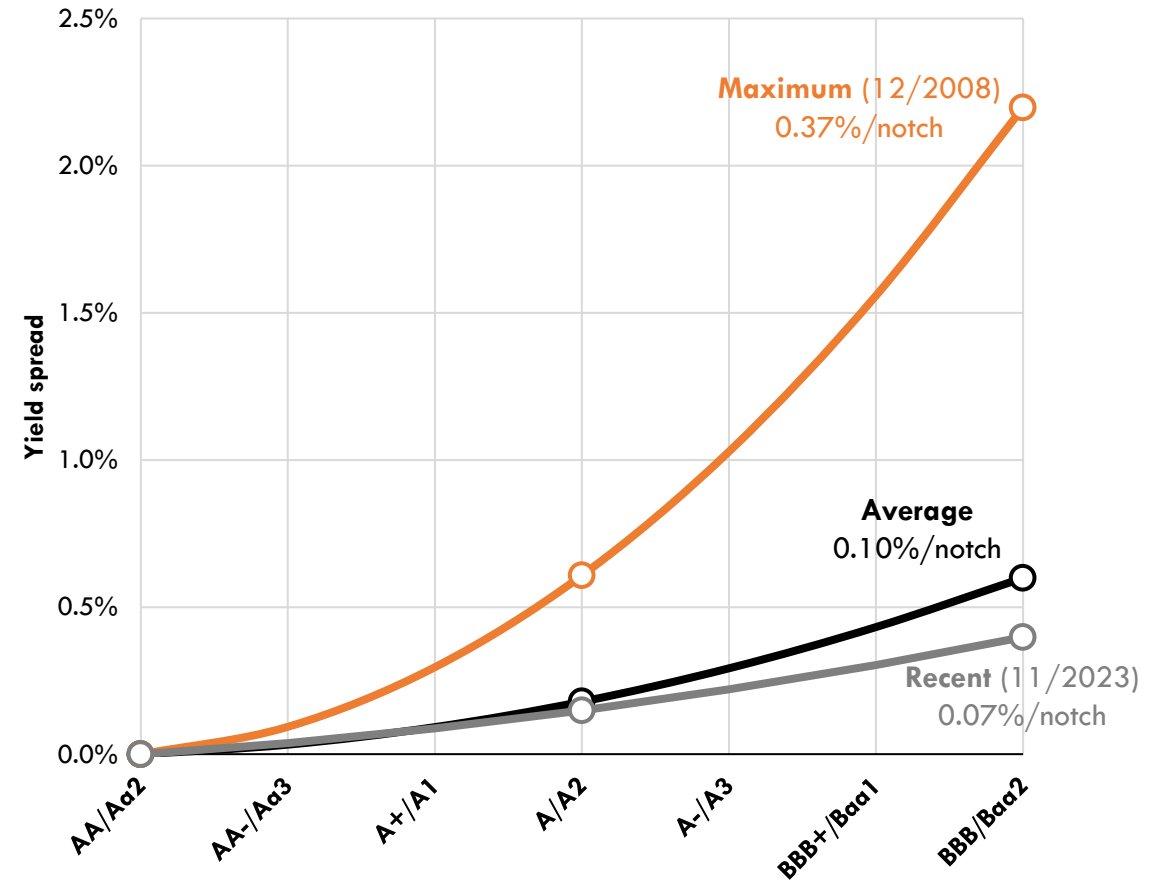
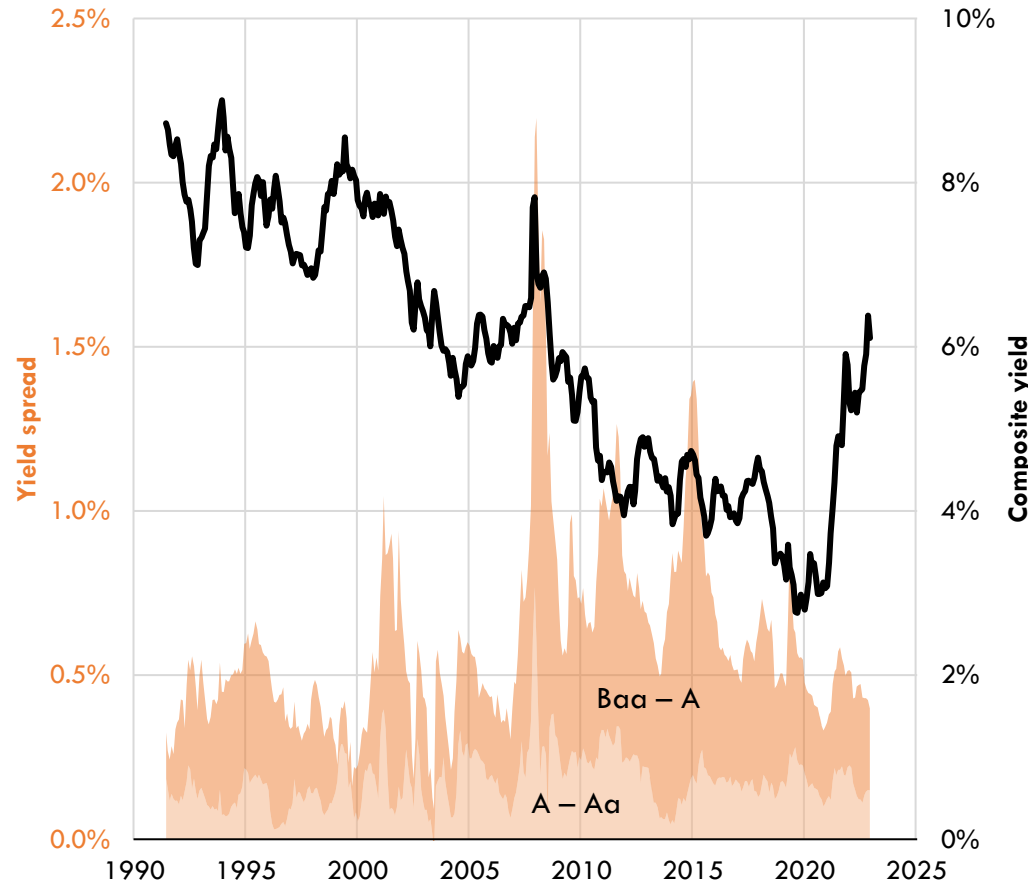
- Equity ratio
- Return on equity
- Cost of debt

$$\text{Net income (profit)} = \text{ROE} \times (\text{rate base} \times \text{equity ratio})$$

“Capital charge”

- Net income
- Income tax
- Interest

Moody's utility bond yield spreads



Source: S&P GMI; monthly averages

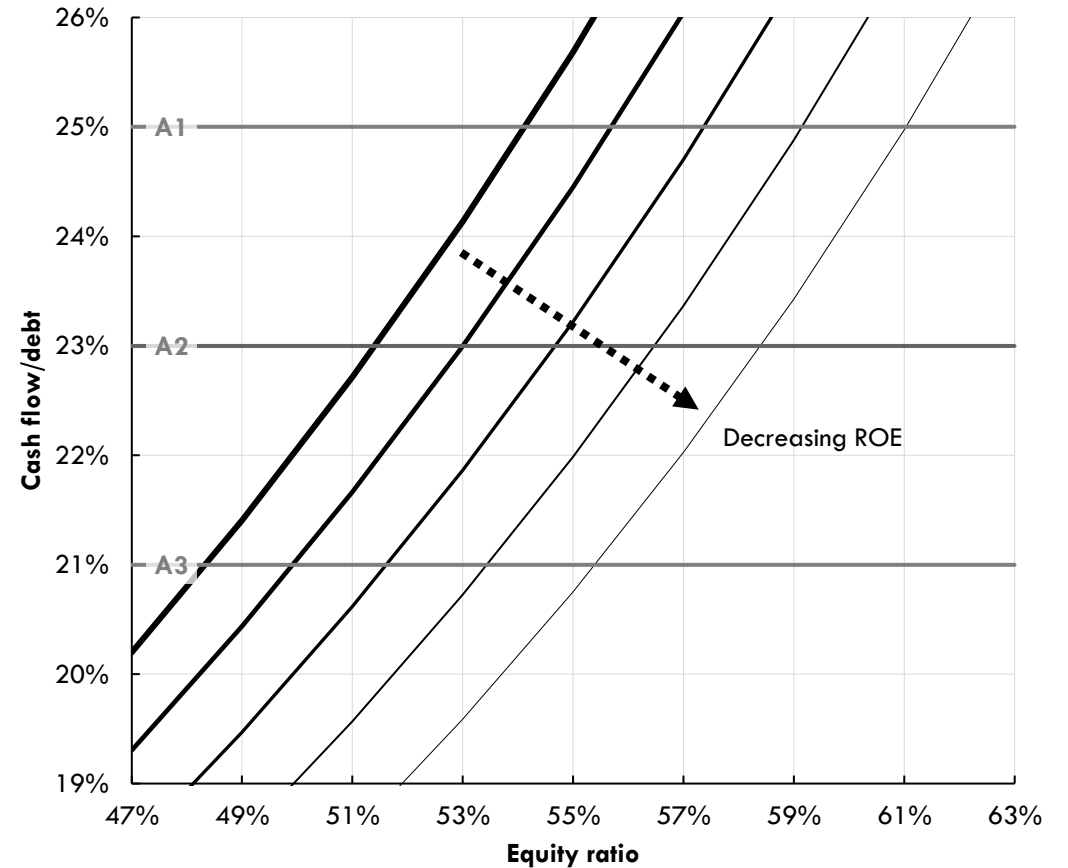
Lower ROE reduces customer rates, even after accounting for changes in COD

Causation	Change	Rate impact	Comment
ROE	-1%	-2.5%	<ul style="list-style-type: none"> Gross up for taxes; pre-tax income ~25% of revenue
↓			
CFO	-5%		<ul style="list-style-type: none"> CFO = net income (~50%) + depreciation + deferred taxes
↓			
CFO/D	-1%		<ul style="list-style-type: none"> ~20% CFO/D; <u>no change in capital structure</u>
↓			
Credit rating	- 1/2 notch		<ul style="list-style-type: none"> 2% CFO/debt per notch
↓			
Interest rate	+0.05%	+0.1%	<ul style="list-style-type: none"> ~0.1% per credit rating notch (A2 to A3) Interest ~8% of revenue Overstated: calculated on outstanding + new
Total		-2.4%	

Impact of lower ROE on ability to raise capital

Higher E/C can compensate for lower ROE

To maintain credit rating at a lower ROE, increase the equity ratio (E/C)



E/C and ROE must be determined jointly

ROE and capital structure scenarios

Percent

Bold: input	ROE	Credit rating	CFO/D	E/C	COD	ROR	Cust. ROR	Savings
<i>Request & sensitivities</i>								
Request	10.40	A2+	24.1	53.0	3.86	7.33	9.00	
Lever up (A3)	10.40	A3	21.0	48.3	3.99	7.09	8.62	-4.3
ROE-1%, E/C request	9.40	A2	23.0	53.0	3.90	6.81	8.33	-7.5
ROE-1%, CFO/D request	9.40	A2+	24.1	54.6	3.86	6.88	8.44	-6.2
<i>ROE = COE</i>								
E/C request	6.40	A3-	19.6	53.0	4.07	5.30	6.34	-29.6
A3	6.28	A3	21.0	55.6	3.99	5.26	6.33	-29.7
A2+	6.08	A2+	24.1	60.6	3.86	5.21	6.33	-29.7
A2	6.14	A2	23.0	58.9	3.90	5.22	6.32	-29.8
A1	6.04	A1	25.0	61.7	3.83	5.19	6.33	-29.7

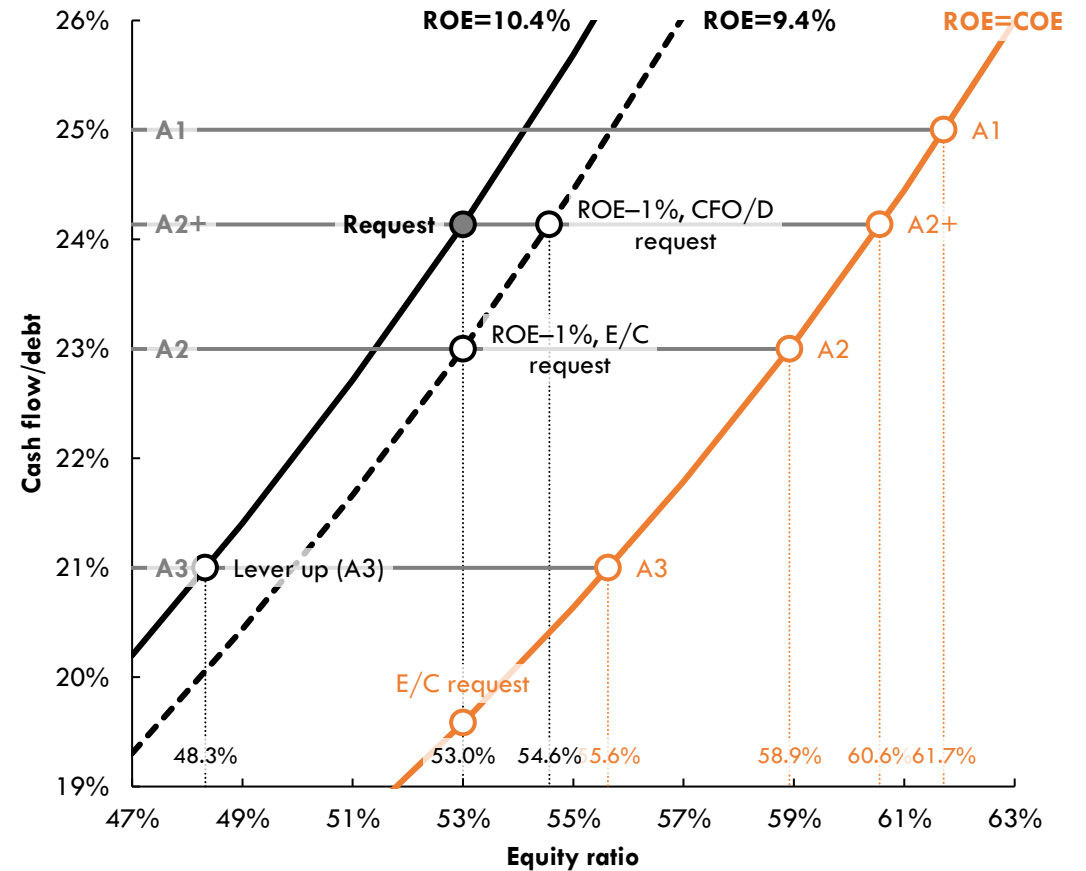
COE varies with E/C

- Unlever proxy group COEs at market equity value:

$$k_u = \frac{E}{C}k_l + \frac{D}{C}r_f$$

- Relever at new E/C

- When ROE = COE, credit rating has minimal impact on customer cost
- Modigliani-Miller: capital structure is irrelevant



What about raising equity?

Sustainable growth DCF with new issuance

$$M = \frac{Br(1 - b)}{k - br - vs}$$

S : new equity issuance rate

v : accretion factor, $1 - \frac{B}{M}$

As long as $v > 0$, i.e.,
 $M/B \geq 1.0$ / $ROE \geq COE$,
issuing new shares increases
the stock price (“accretive” to
existing shareholders)

If $M/B < 1.0$, utility can still
raise equity – just dilutive to
existing shareholders

What about flotation costs?

Sustainable growth DCF with new issuance & flotation cost

$$k = \frac{B}{M}r(1 - b) + br + s \left(1 - \frac{B}{M(1 - f)} \right)$$

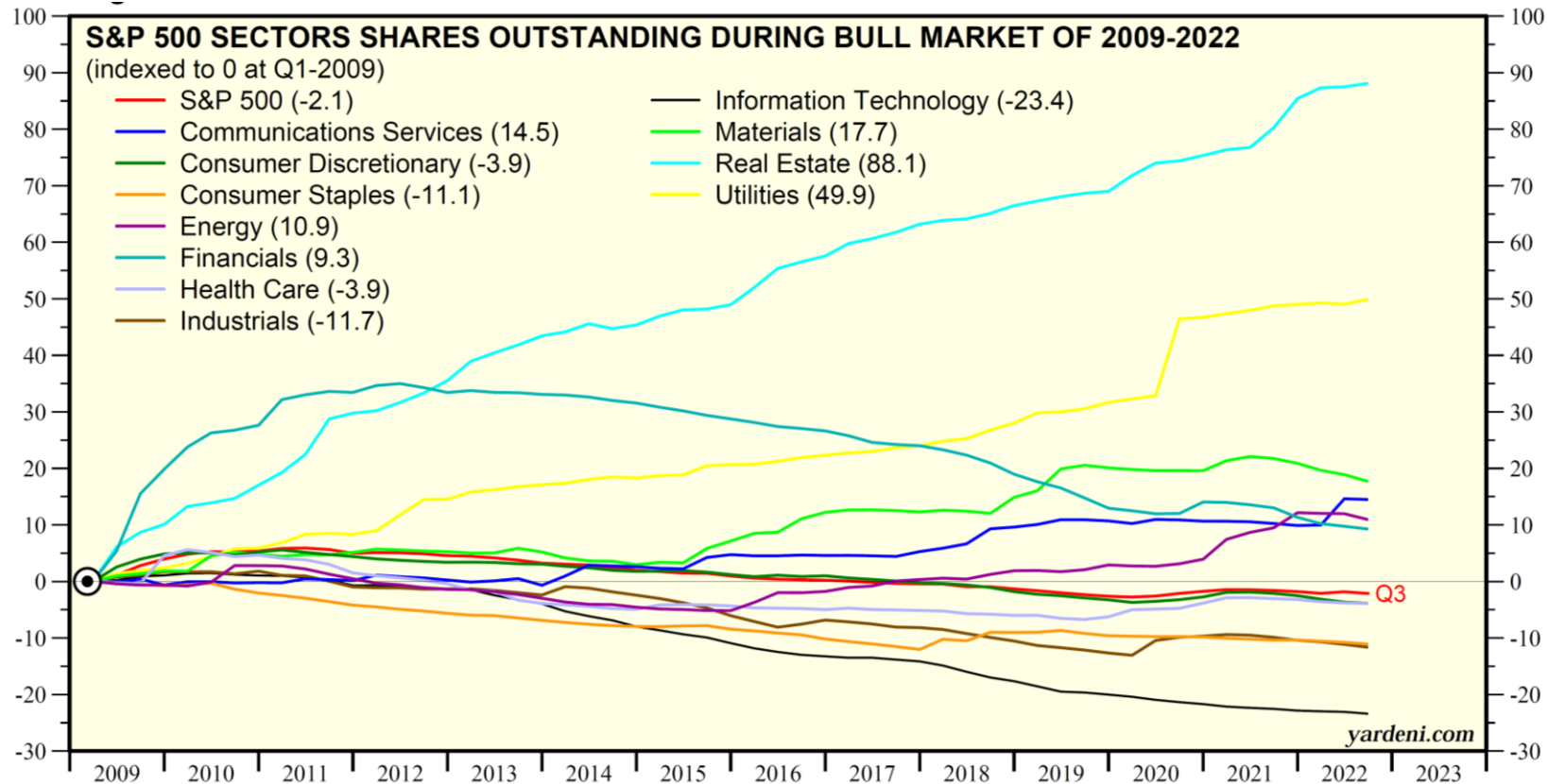
f : flotation cost

As long as $M(1 - f) \geq B$, issuing new shares remains accretive

Even if $M = B$, negligible COE impact:

At $f = 2.5\%$, $s = 2\%$, $\Delta\text{COE} = 0.05\% \ll \text{COE estimate uncertainty}$

Utilities among the heaviest issuers of equity



* Total basic shares outstanding for current S&P 500 companies with data for all periods and adjusted for stock splits and stock dividends.
Source: Yardeni Research and I/B/E/S data by Refinitiv.

If ROE is reduced ...



Rhetoric

Reality

“...we won't be able to raise capital”

- No utility ever denied capital
- Non-utility companies with $M/B < 1.0$ issue equity (e.g., GM)
- Credit addressed through capital structure

“...higher debt costs will swamp ROE savings”

- ROE $\sim 30\%$ tax penalty
- $< 1:1$ interest compensation
- Compensate with higher equity ratio

“...investors will flee our stock”

- Buyer for every seller
- Stock price not a regulatory concern

“...it will disincentivize renewables”

- $ROE \geq COE$ incentivizes *all* capital
- Renewables typically more capital-intensive

Request:

- 5-2. On page 7 of witness Roger A. Morin’s Direct Testimony, he asserts that “low allowed ROEs can increase the future cost of capital and ratepayer costs.” Is witness Morin aware of any empirical data, academic studies (conducted by witness Morin or others), or other evidence that supports this claim with respect to utilities specifically? If so, please provide any and all such supporting evidence.

Response:

The underlying premise of the referenced question and answer is that if a utility is authorized a ROE below the level required by equity investors, the result is a decrease in the utility’s market price per share of common stock, thus increasing the cost of procuring

outlook reflects higher regulatory risk in Arizona. The downgrade on PWCC and its subsidiary reflects the ACC's final order, including lower authorized ROE to 8.7%.....”. (Standard & Poors Ratings Direct, Pinnacle West Capital Corp. Downgraded To 'BBB+', Outlook Negative, On Arizona Rate Reduction, Nov. 9, 2021).

In summarizing its decision to downgrade, Moody’s explained: “The rate case decision will result in a base rate decrease of \$119.8 million and a substantive decline in the authorized ROE to 8.7% from 10%, which is well below the national average of 9.5%. (Moody’s

on capital costs, hence
decision rendered by the
APS) docket. (Docket
Pinnacle West and APS

downgrade and negative

Comparison to other states' ROEs

FERC rejects models that estimate COE from ROE

- ROE/COE distinct
- Circularity
- Not used by investors
- Fail *Hope* standard

116. In particular, the Commission found that the record does not support departing from our traditional use of market-based approaches to determine base ROE.²⁰⁷ The Commission determined that under *Hope*—which declares that “the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks”²⁰⁸—it is appropriate to consider the value of investment that is actually available to an investor in the market. Outside of the unlikely situation in which the market value and book value are exactly equal, investors do not have the opportunity to invest in an enterprise at its book value. Accordingly, the Commission deemed it most appropriate to exclude the Expected Earnings model, which relies on an enterprise’s book value instead of the market value.

117. The Commission explained that the return on book value is not indicative of what return an *investor* requires to invest in the utility’s equity or what return an investor receives on the equity investment, because those returns are determined with respect to the current market price that an investor must pay in order to invest in the equity.²⁰⁹ Specifically, the Commission found that the Expected Earnings model measures returns on book value, without consideration of what market price an investor would have to pay to invest in the relevant company, so it does not accurately measure the investor’s expected returns on its investment, and, therefore, has been “thoroughly discredited.”²¹⁰ In other words, the return on book value does not reflect “the return to the equity owner” that we must ensure is “commensurate with returns on investments in other enterprises,” as *Hope* requires; therefore, the Commission found that this model is not useful in ensuring that these standards are satisfied.²¹¹ Furthermore, the Commission found that there was insufficient record evidence to conclude that investors rely on the Expected Earnings analysis to estimate the opportunity cost of investing in a particular utility.²¹²

118. The Commission also explained that, while it may be true that the Expected Earnings model does not involve the same complexities as the market-based approaches, this is because it does not reflect a utility’s cost of equity.²¹³ Furthermore, applying the

²⁰⁷ *Id.* PP 201, 221.

²⁰⁸ *Hope*, 320 U.S. at 603.

²⁰⁹ Opinion No. 569, 169 FERC ¶ 61,129 at P 202.

²¹⁰ *Id.* PP 205, 221.

²¹¹ *Id.* PP 202, 221-22.

²¹² *Id.* P 210.

²¹³ *Id.* P 204.

Rate of return should equal the cost of capital

NARUC Standard

*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.*



The Federal Power Act provides that any rate or charge made, demanded or received by any public utility for electric energy "that is not just and reasonable is hereby declared to be unlawful." Its primary aim is the protection of consumers from excessive rates and charges. See *Atlantic Refining Co. v. Public Service Comm'n*, [360 U.S. 378, 388-389](#), [79 S.Ct. 1246](#), [3 L.Ed.2d 1312](#) (1959); *FPC v. Hope Natural Gas Co.*, [320 U.S. 591, 610-612](#), [64 S.Ct. 281](#), [88 L.Ed. 333](#) (1944).

Mun. Light Bd., Mass. v. Fed. Power Com'n, 450 F.2d 1341, 1348 (D.C. Cir. 1971)

6:59



ex·ces·sive | ik'sesiv | adjective

• more than is necessary, normal, or desirable; immoderate

New Oxford American Dictionary

Google Suggestions

🔍 excess

COC is the ceiling, not the floor, for ROR

POWER COMM'N v. PIPELINE CO.

cretion for selection of an appropriate rate base. The requirements of "just and reasonable" embrace, among other factors, two phases of the public interest: (1) the investor interest; (2) the consumer interest. The investor interest is adequately served if the utility is allowed the opportunity to earn the cost of the service. That cost has been defined by Mr. Justice Brandeis as follows: "Cost includes not only operating expenses, but also capital charges. Capital charges cover the allowance, by way of interest, for the use of the capital, whatever the nature of the security issued therefor; the allowance for risk incurred; and enough more to attract capital." *Southwestern Bell Telephone Co. v. Public Service Commission, supra*, 262 U. S. at p. 291. Irrespective of what the return may be on "fair value," if the rate permits the company to operate successfully and to attract capital all questions as to "just and reasonable" are at an end so far as the investor interest is concerned. Various routes to that end may be worked

...

velop here. It reemphasizes, however, that the investor interest is not the sole interest for protection. The investor and consumer interests may so collide as to warrant the rate-making body in concluding that a return on historical cost or prudent investment, though fair to investors, would be grossly unfair to the consumers. The

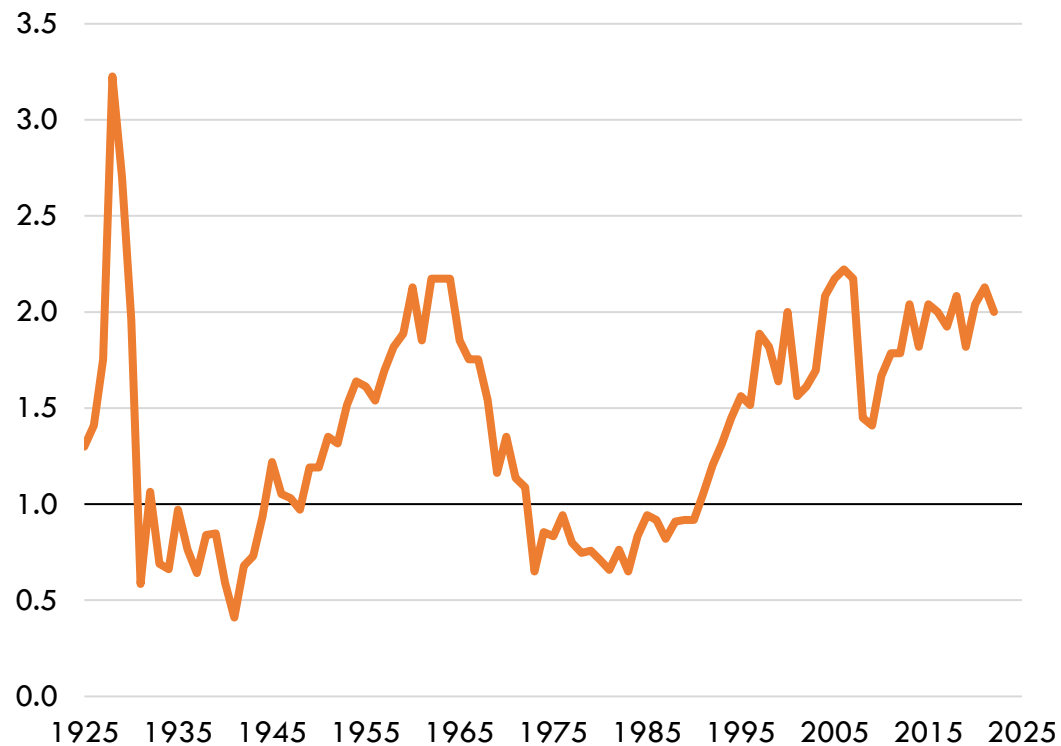
...

the business is capable of earning it. But regulation does not insure that the business shall produce net revenues, nor does the Constitution require that the losses

Market-to-book ratio: unambiguous market feedback on the level of ROEs relative to COE

Average utility market-to-book ratio

End of year



Source: French Data Library

Kahn, *The Economics of Regulation* (1970)

[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 [1950-1970], 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 some point to do so ... the discrepancy between market and book value ... would have disappeared, or would never have arisen.

Adjustment for decoupling or other utility-specific risk factors

Modern Portfolio Theory

Developed by economist Harry Markowitz in the 1950s

Explains portfolios, risk, diversification, and the connections between different securities

Stocks face both:

- Market-wide systematic risk (e.g., interest rates, recessions)
- Stock-specific unsystematic risk (e.g., management changes, poor sales)

Risk of a diverse portfolio of stocks is less than their weighted average, provided the risks of the various stocks are not directly related

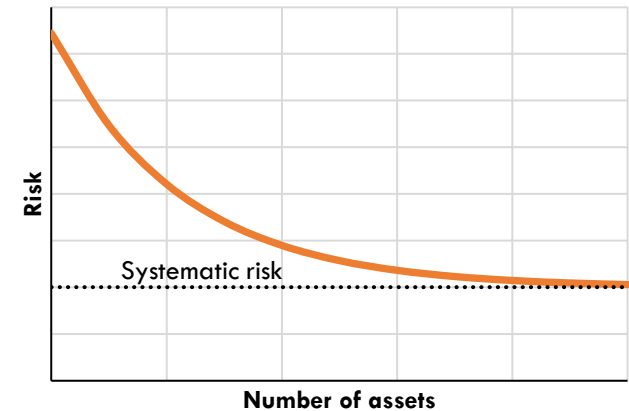
In the market portfolio, asset-specific risk is diversified away, leaving only systematic risk

Because the cost to diversify is minimal, stock prices are bid up to the level where only systematic risk is reflected in the expected return

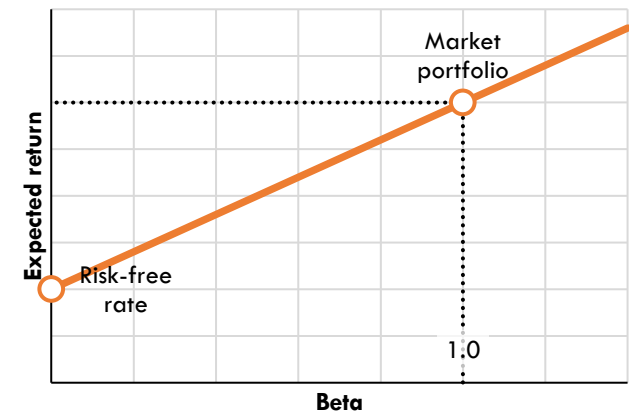
Basis of the CAPM, which estimates the cost of capital from a single risk factor, beta, the degree of correlation with the market

Utility-specific risk factors – e.g., decoupling, deferral – do not affect cost of capital

Diversification



CAPM



Decoupling—Should it Reduce Cost of Equity?

- Cost of equity capital is driven by the **non-diversifiable** volatility in expected cash flows to shareholders (not the utility)
- Decoupling policy does reduce **volatility of revenues** albeit usually with a delay
- Decoupling has no effect on **volatility of costs** and may even increase the volatility of costs if volume affects pricing
- Reduction in volatility does not necessarily translate into a reduction in the cost of equity
 - Some volatility for any company is diversifiable; e.g., weather
 - Only non-diversifiable volatility affects cost of equity; e.g., market-wide movements such as the financial crisis

Modern Portfolio Theory

- Diversification reduces risk
- Investors are compensated only for non-diversifiable risk, because the cost to diversify is negligible

Statistical Tests Show No WACC Reduction from Decoupling

- If decoupling substantially reduced the WACC, then estimated impacts would be negative.
- The study found no statistically significant impact of decoupling
- Discussion:
 - If decoupling does not reduce the WACC, does that indicate it is not valuable?
 - Removes throughput disincentive for energy efficiency
 - May reduce the cost of debt.
 - Reduces debate/controversy about estimates of future sales volumes
- Not clear whether decoupling follows a situation where risk is higher and reduced to normal by decoupling or if decoupling does not affect systematic risk

Source: https://www.brattle.com/wp-content/uploads/2017/10/6049_decoupling_in_the_us_and_its_impact_on_cost_of_capital_and_profit.pdf; https://www.brattle.com/wp-content/uploads/2017/10/6081_effect_of_electric_decoupling_on_the_cost_of_capital.pdf

Other slides

Why advocates should care about ROR

Small changes in ROR have big impact

- Largest opportunity to reduce rates in near and long term
- **High RORs create incentives that “crowd out” other regulatory and public policy goals**

Excess ROEs incentivize excess investment

Two sources of value

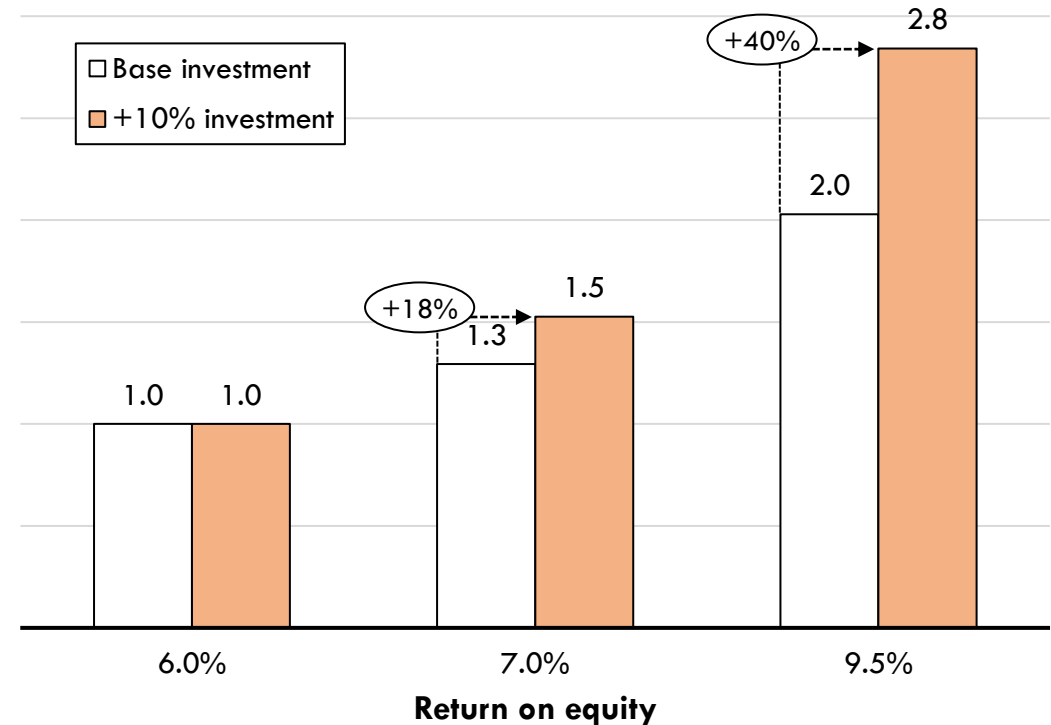
- Investment
- ROE

ROE amplifies the share-price impact of investment

Double whammy to customers

- ROE direct cost
- Indirect, but more consequential, incentive to over-invest

Relative share price at different ROE and investment assumptions



High ROEs “crowd out” other goals

*The flaws of traditional methods of utility regulation generally and rate-making specifically, including **capital bias**, the throughput incentive and inattention to innovation, have been discussed for decades.*

Table 1. Percent of performance goals met, total incentive achieved and contribution to return on equity for PIMs in New York State 2018-2020

PIM categories	Consolidated Edison			Central Hudson Gas & Electric			National Grid		
	2018	2019	2020	2018	2019	2020	2018	2019	2020
Coincident peak demand savings	100%	100%	100%	0%	0%	0%	100%	100%	45%
DER utilization	100%	100%	0%	0%	100%	100%	4%	0%	0%
Energy-efficiency savings	100%	100%	N/A	100%	100%	100%	39%	100%	100%
Energy intensity of residential customers	100%	0%	N/A	0%	0%	0%	69%	0%	0%
Energy intensity of commercial customers	0%	0%	N/A	0%	0%	100%	100%	33%	100%
Energy intensity of multifamily customers	34%	61%	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Beneficial electrification	N/A	N/A	TBD	100%	100%	100%	47%	100%	100%
Customer engagement	N/A	N/A	N/A	0%	0%	0%	N/A	N/A	N/A
Street lighting conversion	N/A	N/A	N/A	N/A	N/A	N/A	0%	65%	22%
Locational system relief value load factor improvement	N/A	N/A	0%	N/A	N/A	N/A	N/A	N/A	N/A
Total incentive Achieved (\$M)	\$27.2	\$36.6	\$11.61	\$0.7	\$1.6	\$2.1	\$11.3	\$12.1	\$12.2
Contribution to ROE	N/A	N/A	N/A	1.4%	3.0%	3.9%	6.4%	6.8%	6.9%

Note: Only outcome-based PIMs are reported. “N/A” means “not available,” which indicates that the utility did not have a PIM for this category or ROE values were unavailable. “TBD” indicates the result has not yet been reported by the utility for this category of PIM.

ROE accounts for a large, and rising, share of total rate

Electric utility average rate breakdown

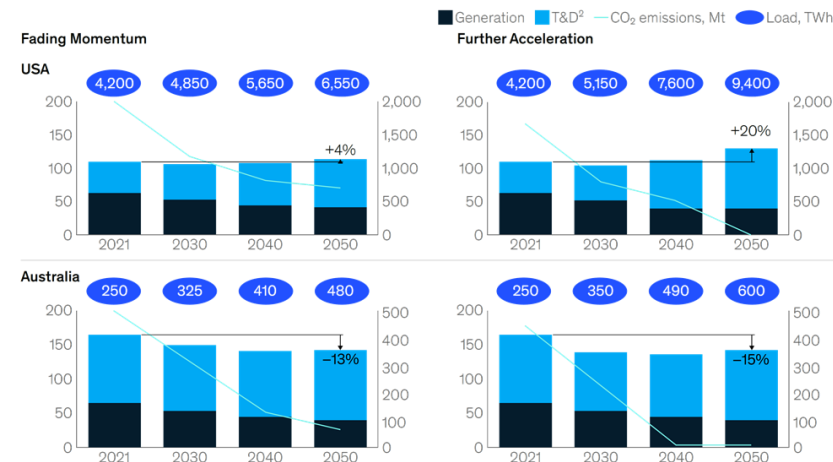
Duke Energy Carolinas example

Percent	Revenue	EBITDA
EBITDA	49	100
– D&A	23	47
EBIT	26	53
– Interest	7	14
EBT (ROE + tax)	19	39

The share of grid cost in total average delivered power costs to customers is expected to increase across scenarios and regions

Delivery costs per MWh are projected to increase to 60–70% of costs by 2050 in the US and Australia

Average system cost of electricity,¹ 2021 \$/MWh



The cost of power generation over time tends to decline in future power systems; however, delivery costs (T&D) per MWh is projected to grow from ~40% in the US to 60–70% of costs by 2050, with a similar outlook in Australia.

Larger T&D investments in faster transition scenarios are partially offset by a higher load in a more electrified economy, but not entirely. Faster transition scenarios' advantage in generation cost reflects the more rapid cost declines for renewables (eg, \$15–20/MWh for solar by 2050). Whereas generation costs decline as the share of low-cost renewables increases (depending on the country), a rise in T&D costs offsets this trend. As a result, aggregate power costs are projected to remain flat in most countries and can potentially rise once power systems approach full decarbonization.

System design choices have a large impact on total costs, including factors such as undergrounding for resiliency, grid modernization to support DERs, and siting of heavy industrial loads (eg, hydrogen or datacenter clusters).

¹Excludes retail margin, VAT, carbon taxes, subsidy recovery, etc. Assumes electrolyzers are co-located with renewables. ² Transmission and distribution; distribution costs are preliminary and most depend upon system planner preference. Source: McKinsey Energy Solutions' Global Energy Perspective 2023

Advocate/intervenor observations

Mindset

- Insufficient appreciation of value at stake in ROR
 - ~10% savings
 - Transform utility incentives/behavior
- Intimidated by finance/details
 - Hesitant to “roll up sleeves”
 - Steep learning curve (but surmountable)
- Insufficient recognition of uniquely broad alignment on ROR

Behavior

- Cursory, not strategic, collaboration on ROR
 - Aware of others filing, but don't jointly plan, allocate resources, cross-examine, etc.
 - Perfunctory, conflicting testimony
- Low subject matter expertise
 - Insufficient cross-examination preparation
 - Ineffective/unpersuasive briefs
- Limited economies of scope across proceedings
 - Learning: knowledge/skill building
 - Codification: model testimony, cross-examination scripts, brief content

With friends like these ...

CG DCF using analyst growth forecasts?

Public Disclosure Version

1 A 13-week average stock price reflects a period that is still short enough to
2 contain data that reasonably reflects current market expectations, but the period is not so
3 short as to be susceptible to market price variations that may not reflect the stock's
4 long-term value. In my judgment, a 13-week average stock price is a reasonable balance
5 between the need to reflect current market expectations and the need to capture sufficient
6 data to smooth out aberrant market movements.

8 Q. What dividend did you use in your constant growth DCF model?

9 A. I used the most recently paid quarterly dividend as reported in *Value Line*.²⁶ This
10 dividend was annualized (multiplied by 4) and adjusted for next year's growth to produce
11 the D_t factor for use in Equation 2 above. In other words, I calculate D_t by multiplying
12 the annualized dividend (D₀) by (1+G).

14 Q. What dividend growth rates did you use in your constant growth DCF model?

15 A. There are several methods that can be used to estimate the expected growth in dividends.
16 However, regardless of the method, to determine the market-required return on common
17 equity, one must attempt to estimate investors' consensus about what the dividend, or
18 earnings growth rate, will be and not what an individual investor or analyst may use to
19 make individual investment decisions.

20 As predictors of future returns, securities analysts' growth estimates have been
21 shown to be more accurate than growth rates derived from historical data.²⁷ That is,
22 assuming the market generally makes rational investment decisions, analysts' growth
23 projections are more likely to influence investors' decisions, which are captured in
24 observable stock prices, than growth rates derived only from historical data.

25 For my constant growth DCF analysis, I have relied on a consensus, or mean, of
26 professional securities analysts' earnings growth estimates as a proxy for investor
27 consensus dividend growth rate expectations. I used the average of analysts' growth rate

²⁶The *Value Line Investment Survey*, July 22, August 12, and September 9, 2022.

²⁷See, e.g., David Gordon, Myron Gordon & Lawrence Gould, "Choice Among Methods of Estimating Share Yield," *The Journal of Portfolio Management*, Spring 1989.

ECAPM?

1 current market conditions. If he were to update his proxy group betas, his average *Value*
2 *Line* betas would decrease from 0.88 to 0.86. He also uses beta coefficients from
3 Bloomberg, resulting in a proxy group average beta of 0.85.

4 D. Empirical Capital Asset Pricing Model

5 Q. DO YOU PERFORM ADDITIONAL CAPM ANALYSES?

6 A. Yes. **The simple CAPM has been criticized for underestimating the ROE for companies
7 with betas less than 1 and overestimating the ROE for companies with betas greater
8 than 1. Therefore, use of the ECAPM has gained popularity as a means to correct this
9 under- or over-estimation problem, by applying an adjustment factor to increase the
10 intercept and reduce its slope.**

11 Q. PLEASE EXPLAIN THE ECAPM THAT YOU USE IN YOUR ANALYSES.

12 A. The ECAPM that I apply includes an adjustment factor "x" as shown in the following
13 modified CAPM equation.

$$K_e = R_f + x(RP) + (1 - x)\beta(RP)$$

14 Where:

15
16 The x-term multiplied by the risk premium increases the intercept (the risk-free
17 rate), while (1-x) decreases the slope of the equation.

18 Q. HOW IS THE VALUE OF x DETERMINED?

19 A. "x" is equal to 0.25, such that (1-x) is 0.75. Therefore, the only difference between the
20 traditional CAPM and the ECAPM is that the beta-adjusted ERP is weighted by 0.75,
21 while the market risk premium is weighted by 0.25, resulting in the following equation.

$$K_e = R_f + 0.25(RP) + 0.75\beta(RP)$$

22 Q. WHAT ARE THE RESULTS OF YOUR ECAPM ANALYSES?

23 A. As shown in Table 6 below, applying the same risk-free rates, market risk premium,
24 and betas from the proxy group, I estimate expected returns ranging from 8.43% to
25 9.84%.

Risk Premium Analysis?

Billie S. LaConte Direct Page 11

1 Q. HAVE YOU REVISED MR. COYNE'S RISK PREMIUM ANALYSIS?

2 A. **Yes, using data provided by Mr. Coyne, I used the long-term average equity risk
3 premium of 6.06% and long-term risk-free rate of 3.4% to derive an estimated ROE of
4 9.46%. The long-term risk premium estimate is calculated using authorized ROEs and
5 the long-term risk-free rate at the time the ROE was authorized. The long-term risk
6 premium estimate recognizes that the risk premium can fluctuate depending on market
7 conditions and investor expectations. Therefore, using the average risk premium over
8 this time-period is a reasonable method to estimate GPC's cost of equity.**

9 Q. HOW DO THE RESULTS OF YOUR RISK PREMIUM ANALYSIS COMPARE TO YOUR CORRECTED RETURN ON EQUITY?

10 A. **While the 9.46% risk premium ROE is slightly below my revised average 9.83% ROE,
11 it provides support that my revised ROE is not too low and provides a reasonable
12 estimate of GPC's ROE.**

14 Flaws with Expected Earnings

15 Q. PLEASE DESCRIBE THE EXPECTED EARNINGS METHODOLOGY.

16 A. The Expected Earnings methodology estimates the cost of equity using projected
17 returns on book equity.

18 Q. WHAT IS MR. COYNE'S ESTIMATED RETURN ON EQUITY USING HIS EXPECTED EARNINGS METHODOLOGY?

19 A. Mr. Coyne's Expected Earnings analysis results in a 11.03% and a 11.08% ROE, based
20 on the mean and median of the results, respectively.

2. Evaluation of Mr. Coyne's ROE Analysis

Why are you even testifying on ROR?

1 equal, using the Company's proposed weighted average cost of capital as the discount
2 rate.

3 Q. WHAT IS YOUR UNDERSTANDING OF THE COMPANY'S PROPOSED ROE?

4
5 A. My understanding is that the Company proposes an ROE of 11 percent. See Direct
6 Testimony of James M. Coyne, page 3, line 19.

7 Q. DOES THE COMMERCIAL GROUP HAVE ANY COMMENTS ON THE COMPANY'S PROPOSED ARP?

8 A. Yes. While optimally the Company's shareholders should bear the risk of regulatory
9 lag contained in the traditional regulatory process, the Commercial Group recognizes
10 that ARPs are typically used by the Commission for ratemaking purposes. As such, for
11 the purposes of this docket, the Commercial Group does not generally oppose the
12 Commission's use of an ARP for ratemaking purposes, subject to the following
13 recommendation and comments to the Commission regarding the proposal.

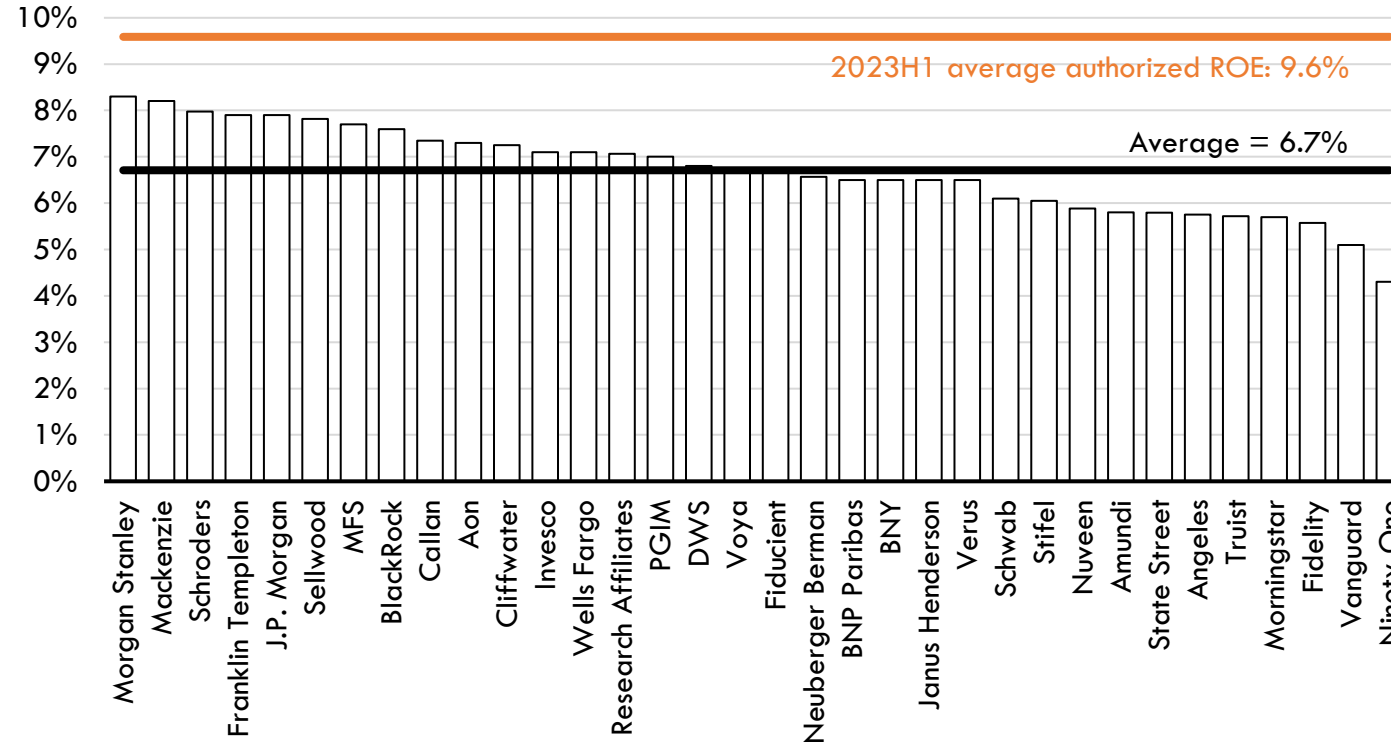
14 Q. WHAT IS THE COMMERCIAL GROUP'S RECOMMENDATION?

15 A. At the Company's proposed ROE and revenue requirement, the Commercial Group
16 **does not oppose the Company's proposed ROE band of 9.5 percent to 12 percent, which**
17 **is a range of 150 basis points below the proposed ROE of 11 percent to 100 basis points**
18 **above the proposed ROE. If the Commission approves a lower ROE in this docket than**
19 **that proposed by the Company, the Commission should contemporaneously reduce the**
20 **low and high band boundaries and maintain the basis point spread of the band around**
21 **the approved ROE. As an example, if the Commission approves an ROE of 10 percent,**
22

“Utilityland” ROEs are out of touch with the rest of the financial universe

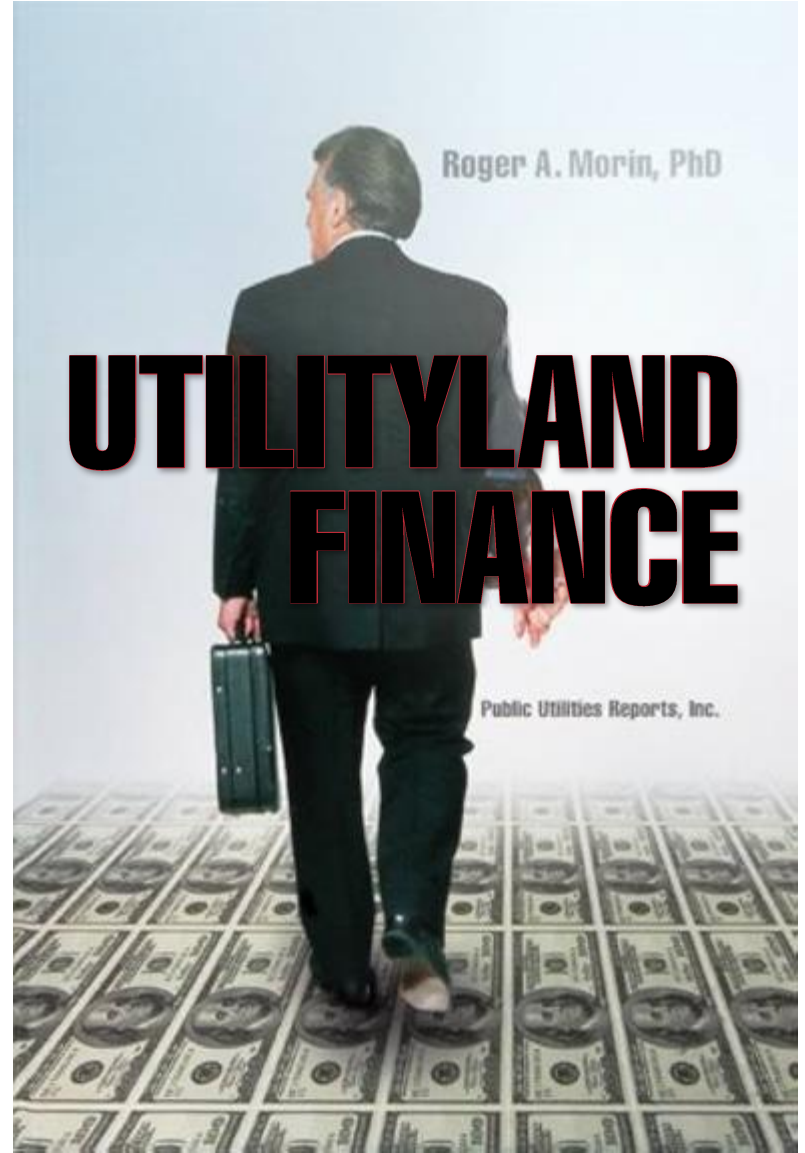
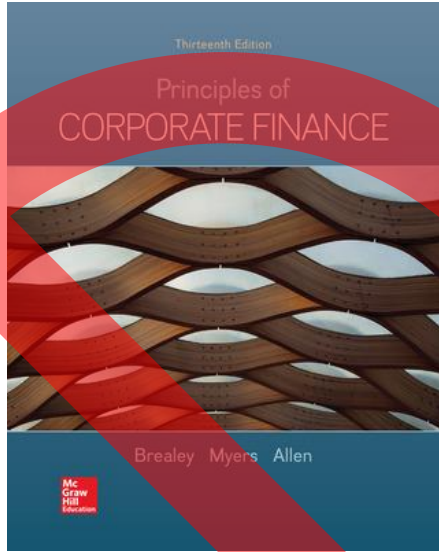
Spring 2023 long-term (10+ years) US equity return forecast

Nominal, geometric



Investment firm long-term market return forecasts universally lower than utility authorized ROEs

Lower-risk utility returns should be less than market



What we can do differently

Strategy: increase *effectiveness*

- Prioritization
 - Focus on ROR
 - “In it to win it”
- Collaboration *within* cases
 - “Strange bedfellows”
 - Friendly cross-examination
- Coordination *across* cases
 - Within state
 - Across states

Tactics: increase *efficiency*

- Resource allocation
 - Pool budgets: single, high-quality expert
- Education
 - Training
 - “Roll up our sleeves”
 - Learn by doing
 - Sharing (community of practice)
- Codification of knowledge
 - Testimony
 - Cross-examination scripts
 - Brief content

Today's conversation

**We need to
change how we
respond to ROR
filings**

- Focus: “in it to win it”
- Joint legal-finance teams: “roll up our sleeves”
- Pool resources
- Consistency across cases
- Codify content

Why?

- Excessive returns “crowd out” other priorities
- Huge value at stake (~10% savings)
- Utilities abuse process, mislead regulators

Coordination can reduce intervenor costs by 70%+

California example with 5 intervenors

\$

	2019		2024e (1.25x 2019)		2024e single expert/ advocate	
	Total	Average	Total	Average	Total	Savings
Attorneys	467,194	93,439	583,992	116,798	116,798	-80%
Experts	307,035	61,407	383,794	76,759	153,518	-60%
Staff	8,999	1,800	11,248	2,250	2,250	-80%
Expenses	10,254	2,051	12,817	2,563	2,563	-80%
Total	793,482	158,696	991,852	198,370	275,129	-72%

Assumption: expert at 2x ordinary cost (comparable to utilities)

What I am doing: three-pronged approach

Better testimony

New evidence & analyses

Utility insider perspective

More thorough, rigorous

Intervenor education

Prioritization

Coordination and collaboration

Codification

Community of practice

Exploring legal redress

Anti-trust

- Expert cartel
- Price collusion

Fraud: knowingly submitting false testimony

Procedural violations

- Arbitrary and capricious
- Failure to consider relevant factors/evidence
- Violation of statutory requirement (ROR=COC)

Overturning of *Chevron* deference

We want your input! – Q&A

Questions for your consideration (don't have to answer now)

Why is ROR not a higher priority?

- What would it take to become a higher priority?

How accurate is our diagnosis of the problem?

- What's incorrect?
- What's missing?

What would you want to know or see to get on board?

How feasible is our proposed solution?

- Execution
- Outcome

What are your *specific* concerns?

- Individual
- Organizational
- Jurisdiction

What are your questions?

Look for a follow-up email

And some asks...

Help exploring legal redress

Thought partners

Introductions to legal experts/attorneys

- Class action/plaintiff
- Constitutional
- Regulatory

What are the best format, venue, and content to continue the conversation?

Videos, blog posts, white papers, webinars, other?

Websites, social media platforms?

Issue, topics, questions?

Feel free to reach out!

Mark Ellis

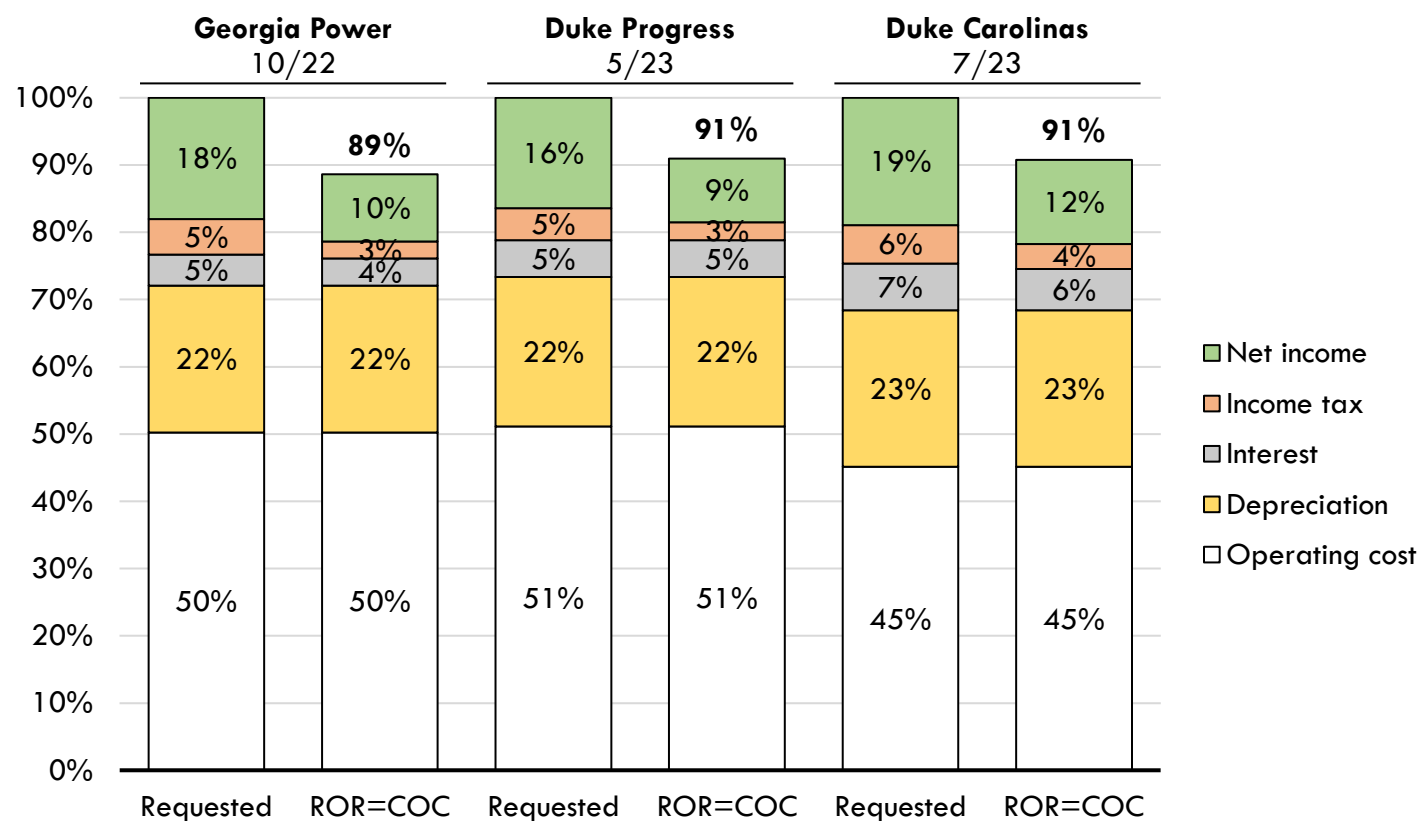
mark.edward.ellis@gmail.com

619-507-8892

Appendix

Aligning ROR with COC reduces rates ~10%

Revenue requirement requested in recent rate cases

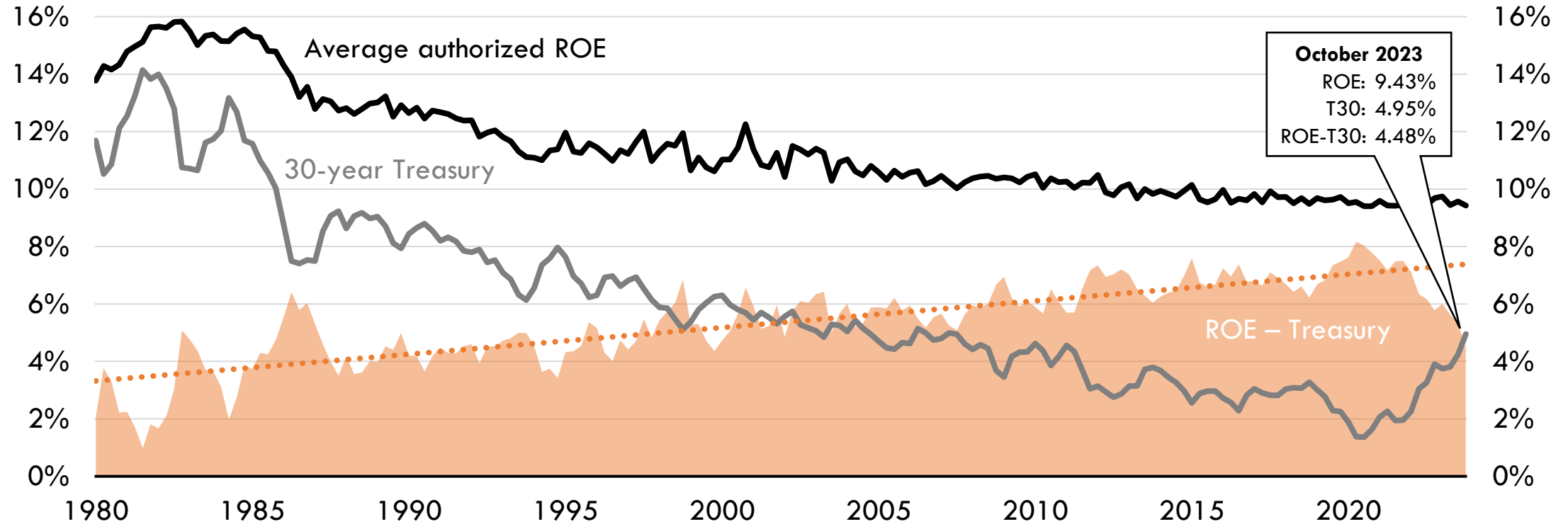


Does any other issue have the potential to reduce rates by 10%?

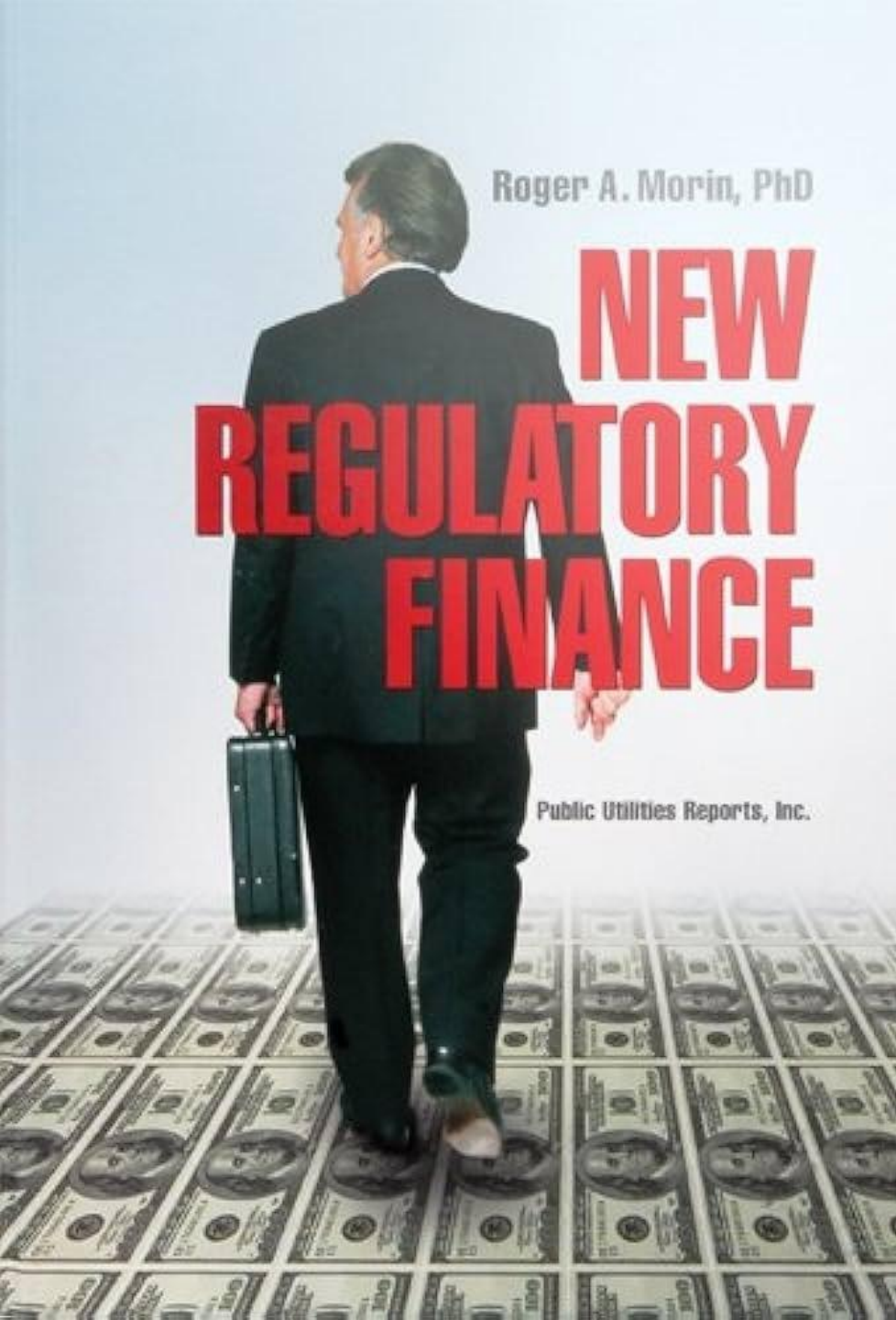
Trillions of dollars invested in energy transition would go ~20% further

ROE-Treasury spread has widened for decades

Authorized ROE vs. 30-year Treasury



Source: Regulatory Research Associates; St. Louis Fed; M. Ellis analysis



Utility expert cartel

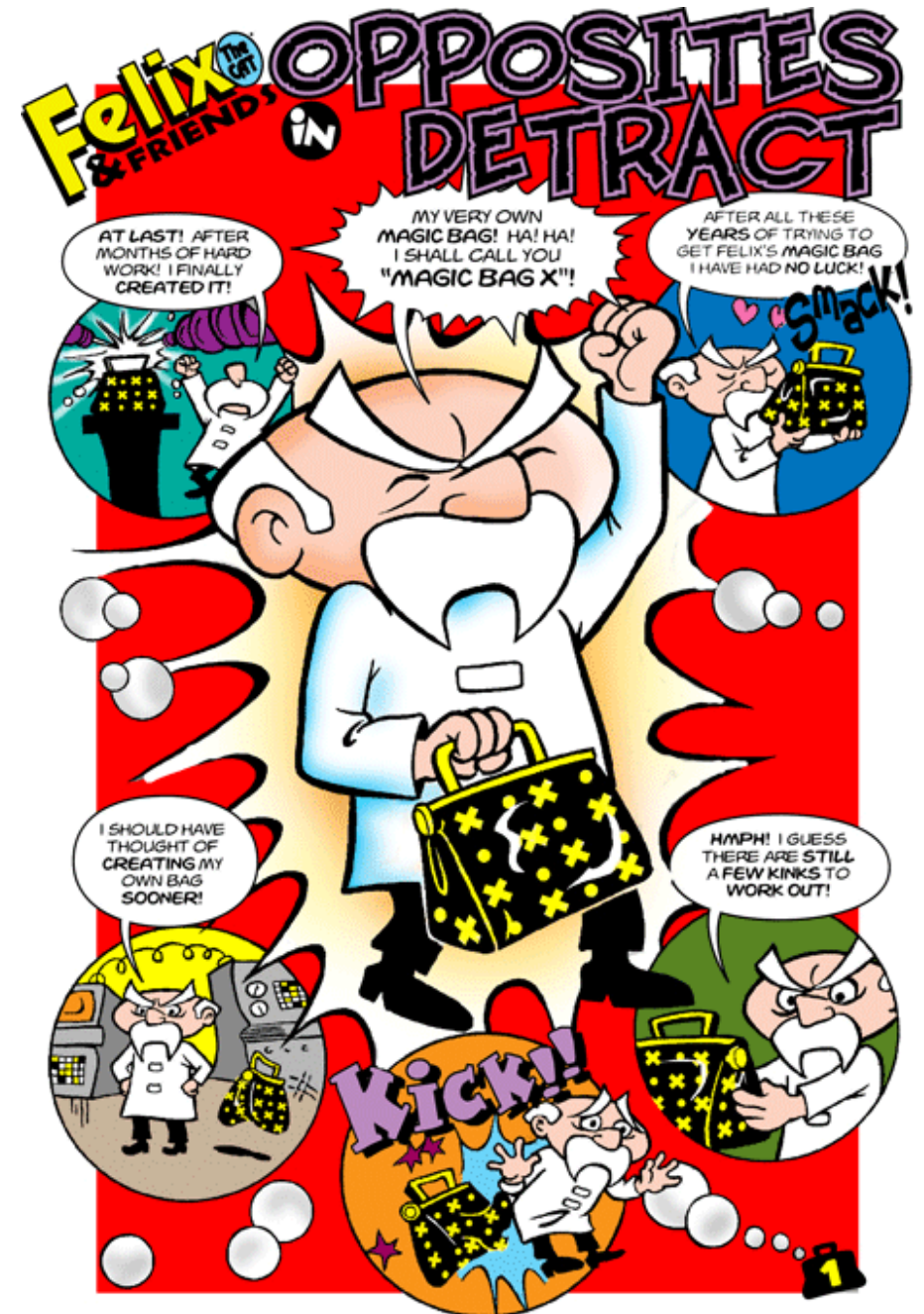


FINCAP



Parable of *Felix and Magic Bag X*

Magic Bag X was created [by **The Professor** (real name: Professor Nutty Nut-Meg)] as a copy of Felix's Magic Bag, but **ended up being its opposite**, and created a portal to Dimension X, a world inhabited by an evil Felix-X. The inhabitants of this world were destroyed when Magic Bag X was [destroyed].

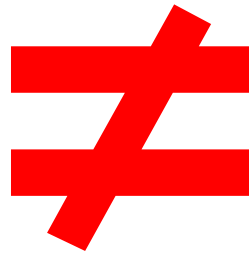


Trick 1: Conflating ROE/COE

Cost of equity (COE)

Cost in market

- Opportunity cost
- *Expected* return



Return on equity (ROE)

Earned on book value

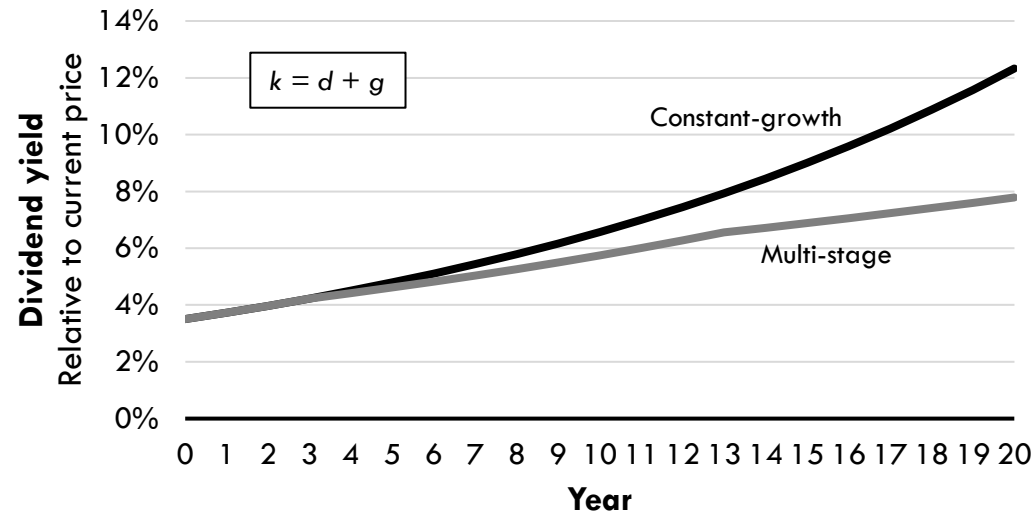
- Authorized
- Realized

Q: If ROEs don't give us guidance on COE, what should we use?

A: *Market-based* models

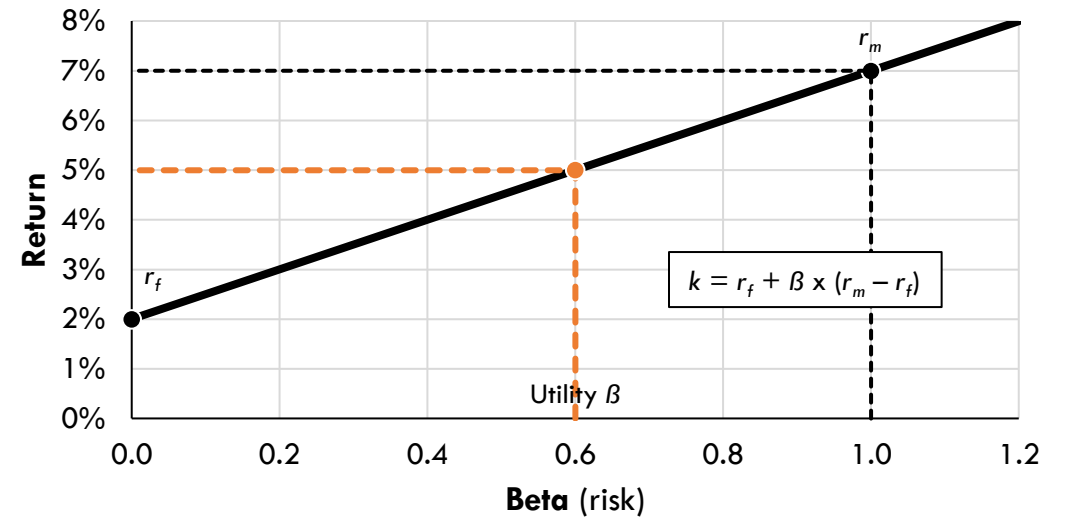
Market-based COE models

Discounted cash flow (DCF)



- Expected return implied by current stock price & forecast dividends
- Widely used by investment professionals

Capital asset pricing model (CAPM)



- Compensation for risk: risk-free rate + risk factor (β) x market risk premium ($r_m - r_f$)
- Widely used in corporate finance

Trick 2: DCF – assuming analysts’ “long-term” growth rate into perpetuity

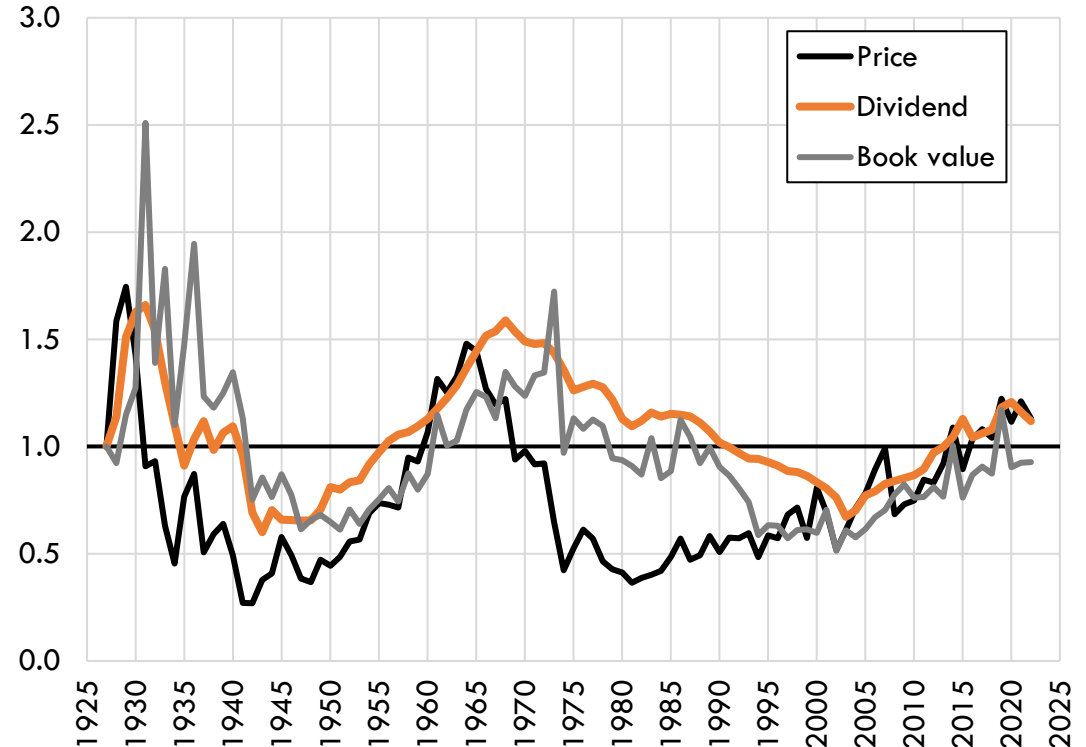
DCF model heavily influenced by assumed growth rate

Utility experts assume Wall Street equity analysts’ “long-term” EPS growth forecasts, ~6.5%, into perpetuity

Utility growth tracks inflation, <3%, over long term

- Historically, market tracks GDP/capita
- Intuitively, some sectors higher (e.g., technology), some lower (e.g., utilities)

Utility real price, dividend, and book value per share
1927=1.0

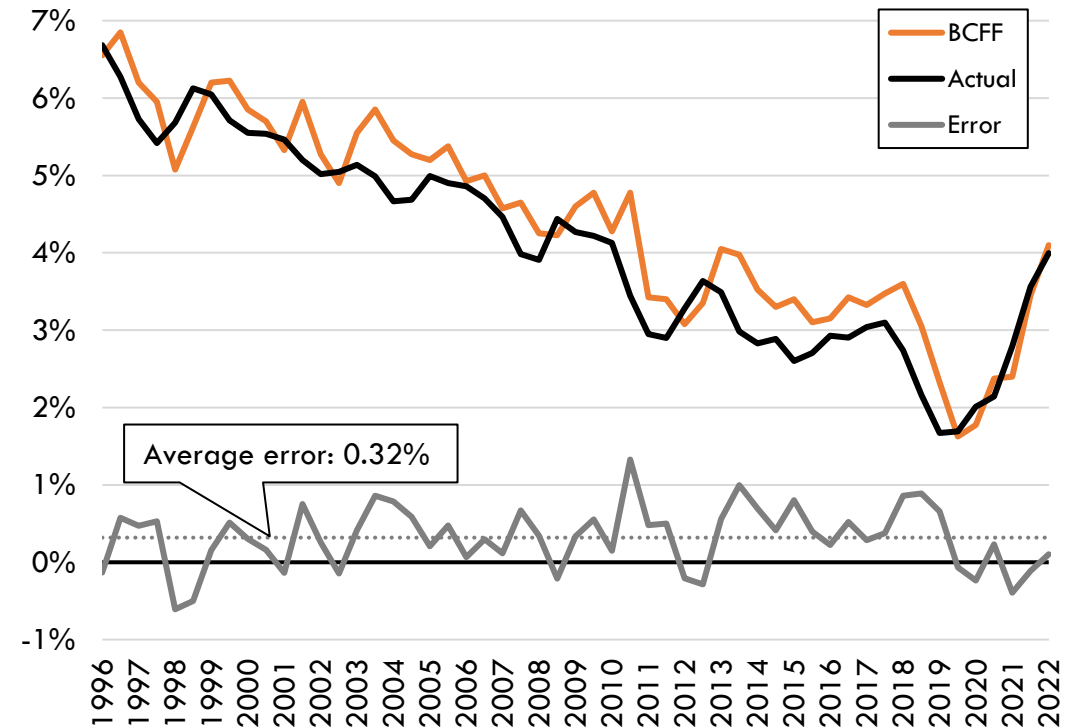


Trick 3: CAPM – forecast, not current, risk-free rate

Utility experts often use forecast risk-free rate, typically Blue Chip Financial Forecasts (BCFF)

- Systematic upward bias
- Inconsistent with DCF
- Current rate better predictor

30-year Treasury rate, BCFF vs. actual
Next 4 quarters



COC = expected return

McKinsey, *Valuation* (2010)

Price of Risk

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.

Utilities' own experts acknowledge ROR should equal COC

Morin, *New Regulatory Finance* (2006)

The regulator should set the allowed rate of return equal to the cost of capital so that the utility can achieve the optimal rate of investment at the minimum price to the ratepayers. [p. 23]

...

[I]f regulators set the allowed rate of return equal to the cost of capital, the utility's earnings will be just sufficient to cover the claims of the bondholders and shareholders. No wealth transfer between ratepayers and shareholders will occur. [p. 359]

Kolbe, et al., *The Cost of Capital: Estimating the Rate of Return for Public Utilities* (1984) devotes an entire chapter to why ROR should equal COC

Why should the cost of capital "set on Wall Street" determine the rate of return that a utility thousands of miles away should receive? This chapter provides the answer. [p. 13]

...

2. Why the Allowed Rate of Return Should Equal the Cost of Capital

Law

The United States Supreme Court has established that investors in companies subject to rate regulation must be allowed an *opportunity* to earn returns sufficient to attract capital and comparable to those they would expect in the unregulated sector for bearing the same degree of risk. The *Bluefield* and *Hope* cases provide the seminal decisions. [p. 20]

...

Economics [p. 22]

...

Fairness [p. 23]

...

Excess ROEs drive executive compensation

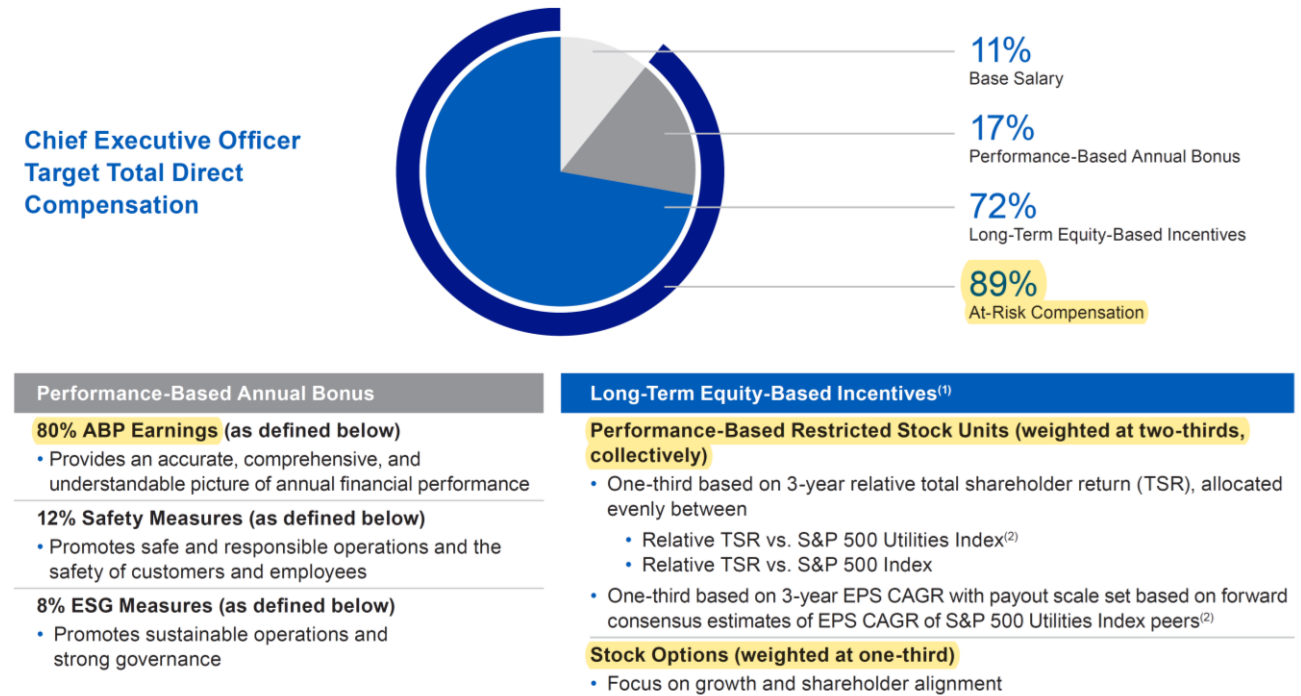
The majority of utility executive compensation is composed of bonus and shares

- Bonus is based on net income, i.e., ROE
- Share value is based on ROE and investment

Executive Compensation

2022 Compensation Overview

Our executive compensation program is designed to attract, motivate and retain key executive talent and promote strong, sustainable long-term performance. We place an emphasis on variable performance-based pay, with each component designed to promote value creation and alignment of our management team's compensation with our long-term strategic objectives.



Utilities' own experts acknowledge M/B should equal 1.0

Morin, *New Regulatory Finance* (2006), p. 359

[I]f regulators set the allowed rate of return equal to the cost of capital, the utility's earnings will be just sufficient to cover the claims of the bondholders and shareholders. No wealth transfer between ratepayers and shareholders will occur.

The direct financial consequence of setting the allowed return on equity, r , equal to the cost of equity capital, K , is that share price is driven toward book value per share, at least in theory under ideal conditions. Intuitively, if $r > K$, and is expected to remain so then market price will exceed book value per share since shareholders are obtaining a return [on book equity] in excess of their opportunity cost.

Kolbe, et al., *The Cost of Capital: Estimating the Rate of Return for Public Utilities* (1984), p. 25

3. Use of the Market-to-Book Ratio as a Guide for Regulators

... that regulators actions should make the ratio of a regulated stock's market value to its book value (slightly more than) one. ... It turns out to be simply another way of saying that the allowed rate of return should equal the cost of capital. It is worth approaching the topic from this direction because understanding this proposition's premises yields additional insights into the nature of the cost of capital and the "fairness" of alternative policies. It also shows that failure to follow the prescription may prove very costly in the long run.

Why Choose a Market-to-Book Ratio of One?

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.

Utility ROR “expert” bag of tricks (1 / 3)

Model/method	Common utility expert assumption/ approach	What the evidence says
Peer groups	<ul style="list-style-type: none"> • Utility • Non-utility companies with “comparable” risk profile 	<ul style="list-style-type: none"> • Criteria tend to exclude poor performers (e.g., no dividends) • Conceptually flawed <ul style="list-style-type: none"> – Conflicts with <i>Bluefield</i> – Begs the question – Ignores most salient factor (regulation)
Discounted cash flow (DCF)	<ul style="list-style-type: none"> • Constant-growth (CG DCF): analyst growth estimates into perpetuity • Multi-stage: terminal growth equal to GDP 	<ul style="list-style-type: none"> • Analyst bias • Collectively unsustainable • Contradicted by analysts’ own forecasts • Long-term historical growth rates <ul style="list-style-type: none"> – Market: ~GDP/capita – Utilities: ~inflation
Capital asset pricing model (CAPM)	<ul style="list-style-type: none"> • Forecast, not current, risk-free rate • Adjusted beta • Arithmetic, not geometric, returns 	<ul style="list-style-type: none"> • Systematically biased (e.g., BCFF) • Adjustment does not apply to utilities (trend toward 0.5-0.6) • (Lower) geometric returns reflect equity claim on cash flows into perpetuity • Adjust for volatility of realized ROE

Utility ROR “expert” bag of tricks (2/3)

Model/method	Common utility expert assumption/ approach	What the evidence says
CAPM (continued)	<ul style="list-style-type: none"> • CG DCF-based MRP • Empirical CAPM: adjust for observed “flatness” of relationship between beta and excess return 	<ul style="list-style-type: none"> • Historical/implied geometric MRP: ~3% • ECAPM based on returns relative to short-term r_f; flatness much less pronounced relative to long-term r_f • Utilities don’t exhibit flatness seen in the market as a whole
Risk premium model	<ul style="list-style-type: none"> • Authorized ROEs in other jurisdictions • Forecast bond yields as input • Arithmetic returns 	<ul style="list-style-type: none"> • Circular logic: assumes regulators are infallible • Rejected by FERC • Conceptually flawed: model based on current, not forecast, yield • Forecast bias • See above
Comparable earnings	<ul style="list-style-type: none"> • Forecast utility ROEs, e.g., Value Line 	<ul style="list-style-type: none"> • Circular logic: based on current authorized ROEs • Assumes stock can be bought at book value • Rejected by FERC

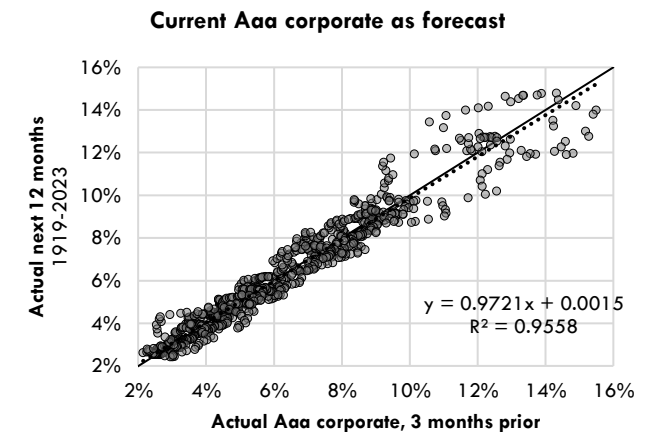
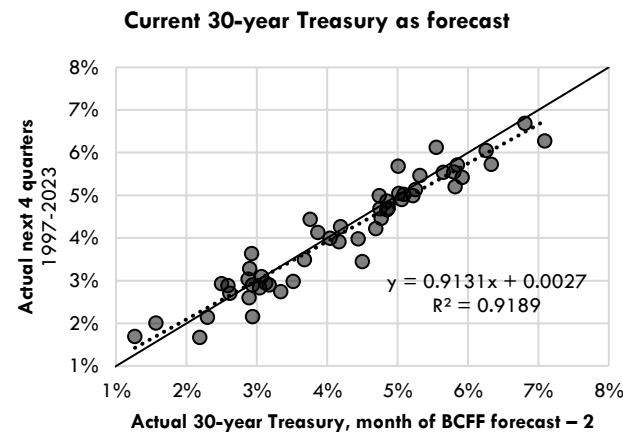
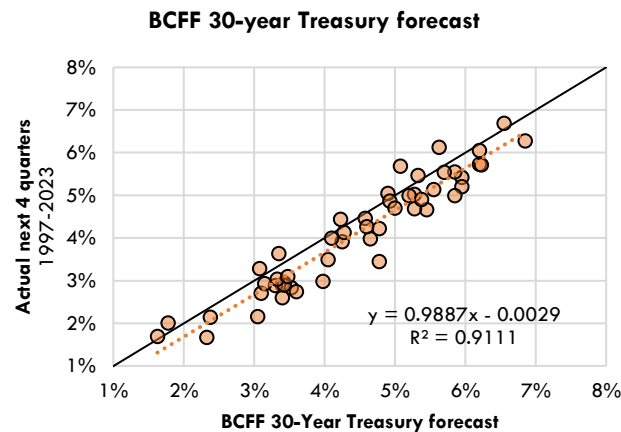
Utility ROR “expert” bag of tricks (3/3)

Model/method	Common utility expert assumption/ approach	What the evidence says
Leverage adjustment	<ul style="list-style-type: none"> Account for differences in capital structure between peers and target Unlever market, relever book 	<ul style="list-style-type: none"> Inconsistent application, e.g., CAPM but not DCF, RPM, CE Both un-/re-levering should be based on market (actual or estimated)
Capital structure	<ul style="list-style-type: none"> No analysis; just accept utility request If analyzed, simply peer comparison 	<ul style="list-style-type: none"> CFO/rating agency perspective: capital structure, ROE, and credit quality are inter-related, through cash flow (ROE) impact on credit metrics Need to determine ROE and equity ratio jointly
Ad hoc adjustments	<ul style="list-style-type: none"> Small-size premium: based on empirical observation that small stocks earn higher returns than large stocks Flotation cost: account for transaction cost of equity issuance Other risks 	<ul style="list-style-type: none"> Phenomenon refuted by recent research Applies to stocks, not subsidiaries Ad absurdum Legitimate cost only when $M/B=1.0$, but immaterial (false precision) Not statistically significant Modern Portfolio Theory: no premium for diversifiable, firm-specific risks

Current interest rate is best estimate of future rate

- If the market expected long-term bond rate to rise (fall), and value to fall (rise), bonds wouldn't trade at current rate
 - That bonds trade at current rate implies market does not expect rates to rise (fall)
- Empirically, the current rate is an *unbiased* estimate of future rate

Forecast	30-year Treasury	30-year Treasury	Aaa corporate
	BCFF report 1 month prior	Actual, month of BCFF forecast – 2	Actual, 3 months prior
Analysis period	1997-2023	1997-2023	1919-2023
Slope	0.99	0.91	0.96
Intercept	-0.29%	0.27%	0.27%
R ²	0.91	0.92	0.94
Mean square error	0.0027%	0.0016%	0.0053%
Bias	0.0012%	0.0001%	0.0000%
Inefficiency	0.0000%	0.0001%	0.0001%
Noise	0.0015%	0.0014%	0.0051%



Kahneman, et al., **Noise: A Flaw in Human Judgment**
(2021)

Wherever there is prediction, there is ignorance, and probably more of it than we think. Have we checked whether the experts we trust are more accurate than dart-throwing chimpanzees?

Models do better than people, but not by much. Mostly, we find mediocre human judgments and slightly better models. Still, better is good, and models are better.

Stock price is not a regulatory concern

Hope settled this in 1944

POWER COMM'N v. HOPE GAS CO.

Opinion of the Court.

intrastate commerce.” 315 U. S. p. 582. Rate-making is indeed but one species of price-fixing. *Munn v. Illinois*, 94 U. S. 113, 134. 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; *Nebbia v. New York*, 291 U. S. 502, 523–539 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

⁹Sec. 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.