Docket No.: A.22-04-008 et seq.
Exhibit No.: PCF-02
Witness: Mark E. Ellis

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

Application of Pacific Gas and Electric Company for Authority to Establish Its Authorized Cost of Capital for Utility Operations for 2023 and to Reset the Cost of Capital Adjustment Mechanism.	Application 22-04-008 (Filed April 20, 2022)
And Related Matters.	Application 22-04-009 (Filed April 20, 2022) Application 22-08-011 (Filed April 20, 2022) Application 22-08-012 (Filed April 20, 2022)

REBUTTAL TESTIMONY OF MARK E. ELLIS

ON BEHALF OF THE PROTECT OUR COMMUNITIES FOUNDATION

AUGUST 22, 2022

FIGURES & ATTACHMENTS

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 The Protect Our Communities Foundation (PCF).

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. Have you reviewed the direct testimony submitted in this proceeding?

A. Yes.

Q. Does any of the direct testimony submitted by the non-utility parties to this proceeding conclude that the utilities have proposed a reasonable return on equity (ROE)?

A. No. All non-utility parties to this proceeding agree with PCF that SDG&E and SoCalGas have failed to meet their burden of proof and that their proposed ROEs are too high.

Q. Please summarize your understanding of the non-utility parties' testimony regarding the appropriate ROEs for SDG&E and SoCalGas.

A. Based on my review of the testimony, I have created the following table summarizing the recommended ROEs by the non-utility parties whose testimony included numeric ROE recommendations. For comparison, the table includes Sempra's recommended ROEs.

Figure 1. Summary of recommended ROEs for SDG&E and SoCalGas[1]

		Recommended ROE (%)	
Party	**Expert**	SDG&E	SoCalGas
Sempra	Coyne	10.55	10.75
UCAN	Griffing	9.70	N/A
EPUC, IS, TURN	Gorman	9.20-9.80	9.20-9.80
FEA	O'Donnell	9.5	N/A
Cal Advocates	Woolridge	8.90	8.75
EDF	McCann	8.9	8.7
WTF	Rothschild	7.81	N/A
PCF	Ellis	5.45	5.40

Q. How do the ROEs recommended by the parties compare to the ROEs you recommend that the Commission adopt for SDG&E and SoCalGas?

A. I recommend an ROE of 5.45% for SDG&E and an ROE of 5.40% ROE for SoCalGas. As seen in Figure 1, the ROEs suggested by the other non-utility parties are significantly higher than my recommendations.

Q. Are your recommended 5.45% ROE for SDG&E and 5.40% ROE for SoCalGas the same ROEs that you recommended in your direct testimony?

A. No. My recommended 5.45% ROE for SDG&E is 0.05% lower than I recommended for SDG&E in my direct testimony, and my recommended 5.40% ROE for SoCalGas is 0.05% higher than I recommended for SoCalGas in my direct testimony.

Q. Please explain the basis for the changes in your recommended ROEs.

A. The basis for the changes in my recommended ROE for each utility consists of a data entry adjustment and an update of the models upon which I rely to reflect the most recently available market data.

Q. Please explain the data entry adjustment.

A. In the course of preparing this rebuttal testimony, I noticed an error in one of the assumptions in the calculations in the multi-stage DCF model (MS DCF) for most of the proxy group member companies (all except Alliant Energy and Ameren), as well as for the S&P 500

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[1] Walmart and Southern California Generation Coalition are omitted because their testimony did not include numeric ROE recommendations.

Index, which is used to estimate the forward-looking market risk premium (MRP) in my capital asset pricing model (CAPM). Specifically, the transition period duration assumption was input as 3 years; it should have been 10 years.

Q. Please explain the update with the most current market data.

A. I have updated my analyses to reflect the most recently available data as of the time of writing this rebuttal testimony.

In the MS DCF and CAPM, I use the most recent monthly average for various model input assumptions. Model input assumptions based on the most recent monthly averages include: (1) prices and dividends[2] used to estimate yields in the MS DCF model; (2) the 20- and 30-year nominal Treasury and TIPS interest rates used to estimate expected long-term inflation, which is used to estimate terminal growth rates in my MS DCF; (3) the 30-year Treasury rate used for the risk-free rate in my CAPM. At the time of writing my direct testimony, late July 2022, full-month data for July 2022 was not available, so I used the most recent month for which full-month data was available, June 2022. I have updated the MS DCF and CAPM to reflect market data as of July 2022. In addition, I have updated the historical average MRP and the S&P 500 initial growth rate used in my forward-looking MRP MS DCF through July 2022.

Q. Are you proposing the Commission should modify the ROE each month that there is a change in market data?

A. No. I am only updating the information now because it reflects the most current information available to include in my testimony to submit into the Commission's evidentiary record for this proceeding.

Q. Why are you not recommending that the Commission modify the ROE each month?

A. Ideally, the utilities' ROEs would be adjusted as market conditions change. As the Commission has recognized, though, doing so would not be practical. In D.08-05-035, the Commission sought to "determine whether a mechanism could be adopted to maintain fair

[2] The dividend yield is based on the most recent quarterly dividend. Yields have been updated to reflect any dividends paid during July 2022, as well.

and reasonable capital structures and ROEs for the major energy utilities while reducing ROE proceedings and simplifying workload requirements and regulatory costs."[3] The cost of capital mechanism (CCM) adopted by the Commission recognized the benefits of striking a balance between responsiveness to changing market conditions, on the one hand, and regulatory and administrative expediency and fairness to consumers, on the other.[4]

Q. Do the -0.05% and +0.05% changes in your recommended ROEs for SDG&E and SoCalGas, respectively, change your conclusion in your direct testimony that Mr. Coyne employs either flawed models or flawed assumptions in his models?

A. No.

Q. Why not?

A. My conclusion that Mr. Coyne employs either flawed models or flawed assumptions in his models are based on observations about the conceptual and methodological flaws in Mr. Coyne's analysis and remain valid regardless of changes in market conditions.

Q. In recommending updated ROEs of 5.45% for SDG&E and 5.40% for SoCalGas, have you changed any of the principles you applied in your direct testimony when you recommended ROEs of 5.50% and 5.35%?

A. No.

Q. In recommending updated ROEs of 5.45% for SDG&E and 5.40% for SoCalGas, have you utilized any different logic than you applied in your direct testimony when you recommended ROEs of 5.50% and 5.35%?

A. No.

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[3] D-08-05-035, *Decision Establishing a Multi-Year Cost of Capital Mechanism for the Major Utilities* (May 29, 2008), p. 3.

[4] D.08-05-035, p. 16 ("This CCM streamlines the major energy utilities' cost of capital process while providing greater predictability of the utilities' cost of capital by eliminating the use of interest rate forecasts and disputes concerning interest rate levels and trends, as well as uncertainties associated with conflicting perceptions of financial markets and the return requirements of investors. The CCM also enables the utilities, interested parties, and Commission staff to reduce and reallocate their respective workload requirements for litigating annual cost of capital proceedings.").

Q. Do the -0.05% and +0.05% changes in your recommended ROEs for SDG&E and SoCalGas, respectively, require any changes to your direct testimony?

A. Yes. Several figures and their accompanying text require updating to reflect the data entry adjustment and more recent market data. These changes are attached to this testimony as Exhibit 1.

Q. Based on your review of the testimony and your expertise, why do you think that your recommended ROEs are so much lower than the ROEs proposed by the other intervenors?

A. Three main reasons explain the discrepancy between the ROEs that I conclude should be adopted and the ROEs suggested by the other intervenors in their testimony. First, nearly all of the other intervenors make the conceptual error, in at least one of their models, of confusing the *cost of* equity with the *return on* equity, an error I discussed at length in my direct testimony in Section II. Second, like SDG&E and SoCalGas witness Coyne, the other intervenors' frequently fail to calibrate their assumptions against historical trends or cross-check their model results against available third-party estimates. As a result, the other intervenors' various models are often flawed in their implementation or assumptions. Third, I am the only expert submitting testimony in this proceeding with decades of experience in finance roles within energy and utility companies, experience that has given me unique insight into how utility executives think about the cost of capital and makes investment decisions.

Q. Please explain what you mean when you testified that almost all of the other intervenors confuse the cost of equity with the return on equity.

A. As I explained in my direct testimony, the cost of equity is an economic concept and one of the actual subjects of this proceeding.[5] The return on equity is a performance metric that generally does not equal the cost of equity, and in the case of US investor-owned utilities, has substantially exceed the cost of equity for decades, as demonstrated by market-to-book ratios well above 1.0 and the widening gap between authorized ROEs and interest rates.

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[5] A.22-04-008 et seq., Assigned Commissioner's Ruling Consolidating Four Applications and Scoping Memo and Ruling (July 12, 2022), p. 3.

Nonetheless, some non-utility parties employ models that implicitly assume that the cost of equity should reflect the return on (book) equity, such as the Risk Premium[6] and Expected Earnings Analysis,[7] which are based, respectively, on historical authorized and forecast ROEs and make no reference at all to the *cost* of equity.

Q. Please explain what you mean when you testified that the other intervenors employed models with flawed implementations or assumptions.

A. In general, the non-utility parties fail to calibrate their input assumptions against historical trends or cross-check their model results against available third-party cost of equity estimates. All intervenors' implementations of the constant-growth DCF model (CG DCF) assume perpetuity growth rates, based on short-term, typically biased, analyst forecasts or recent historical trends, that are well in excess of long-term trends and what is economically sustainable. Intervenors using multi-stage models also assume unreasonably high terminal growth rates. While some intervenors cite third-party estimates of expected market returns, their own results are much higher, yet they fail to explain the discrepancy.

The intervenors' CAPM implementations suffer many of the deficiencies I identified in Mr. Coyne's CAPM: use of a systematically upwardly biased forecast risk-free rate instead of the unbiased current rate; selection of a single beta calculation methodology without assessing its consistency with current market risk perceptions and long-term historical trends; using Blume-adjusted betas; and estimating a forward-looking market risk premium using a flawed short-term model like the CG DCF. Some intervenors introduce other implementation errors, such as estimating a historical MRP using arithmetic, not geometric, average returns, and bond yields, not bond returns.

Finally, several intervenors note that their assumptions, results, or recommendations are "conservative" in favor of the utilities yet fail to explain why such favoritism toward the utilities is desirable or appropriate.

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[6] Used by Gorman (EPUC, IS, TURN), Woolridge (Cal Advocates), Griffing (UCAN). EDF also bases its ROE recommendations on a specific recently authorized ROE in Arizona. Walmart's testimony compares SDG&E's and SoCalGas's proposals to recent authorized ROEs but does not make numeric recommendations.

[7] Used by O'Donnell (FEA).

Q. Please explain what you mean when you testified that your experience in finance roles within energy and utility companies gives you unique insight into how executive management thinks about the cost of capital.

A. I spent nearly two decades in finance roles in energy and utility companies, many of which involved deep engagement on the topic of the cost of capital. At Sempra, I oversaw the design and implementation of the company's enterprise-wide cost of capital function. How executive management thinks about the cost of capital for the purposes of investment and other decisions differs in material ways from the information presented in their cost of capital applications.

Q. As related to your professional experience, why should the Commission adopt your recommendations as opposed to the other non-utility parties' recommendations?

A. My recommendations more accurately reflect the actual way the utility executive mangement itself estimates cost of capital, which publicly available documents reveal.

Management's internal views on the cost of capital can sometimes be found in SEC filings and investor presentations. For example, from 2015 through 2019, Sempra's executive compensation plan contained an "absolute total shareholder return" modifier to the restricted stock payout formula, as described in Sempra's 2016 proxy statement:

> In 2015, the design for our performance-based restricted stock units based on relative total shareholder return was enhanced by the inclusion of a modifier based on absolute total shareholder return. While relative total shareholder return continues to be the primary performance measure, the addition of a modifier strengthens the focus on achieving both strong relative and absolute total shareholder return performance. This further strengthens alignment with shareholder interests. For instance, the modifier reduces award payouts for high relative performance if absolute total shareholder return is low. In an instance in which both relative and absolute total shareholder return are high, the modifier may increase award payouts but cannot cause the total award payout to exceed 200 percent (2.0 shares earned for each restricted stock unit).
>
> *The modifier was developed based on two financial benchmarks, Sempra Energy's historical total shareholder return and historical estimated cost of equity.* The modifier adds 20 percent to the award's payout (as initially calculated based on relative total shareholder return) for absolute total shareholder return performance in the top quartile of the distribution of the historical benchmark data. It reduces the award's payout by 20 percent for performance in the bottom quartile of the distribution of the historical benchmark data. *For the 2015 award, the modifier is triggered if our total*

> *shareholder return is at or above 37 percent or if our total shareholder return is at or below -23 percent.* If performance falls within the second or third quartiles, the modifier is not triggered and the payout is based solely on the relative total shareholder return performance result. The modifier cannot cause the total award payout to exceed 200 percent.[8]

Sempra's 2017, 2018, and 2019 proxy statements contain similar descriptions of the absolute return modifier. The +37% and -23% figures are cumulative over three years, or 11.1% and -8.3% annually. Under any reasonable assumption about the distribution of potential returns with a 25th percentile of 11.1% and a 75th percentile of -8.3%, Sempra's internal estimate of its cost of equity is on the order of 2%-3%.[9] While the percentile range shifted higher in 2017 and 2018, under any reasonable assumption about the distribution of potential returns, Sempra's internal estimate of its cost of equity could not have exceeded approximately 4%.

Q. How do the cost of equity estimates revealed in Sempra's executive compensation plans for 2015 through 2018 compare to the ROEs requested by SDG&E and SoCalGas during the same period?

A. In the three cost of capital proceedings surrounding this period, between 2012 and 2019, SDG&E and SoCalGas ("the Sempra Utilities") requested ROEs exceeding 10%,[10] significantly higher than the internal estimates revealed in the proxy statements described above would support.

Q. Is it reasonable for the Sempra Utilities' costs of equity to be higher than 10% while Sempra's was 4% or less?

A. No. It is not economically reasonable for the Sempra Utilities' cost of equity to be 10% while Sempra's was 4% or less. At a minimum, Sempra's cost of equity is the weighted average of the cost of equity of its constituent companies. To the extent Sempra carried additional debt at the parent level, which it did throughout the period in which the absolute return modifier

[8] Sempra, Notice of 2016 Annual Shareholders Meeting and Proxy Statement (March 25, 2016), p. 44 (emphasis added).

[9] For example, assuming returns are normally distributed, the expected cost of equity is simply the average of +37% and -23%, or 7.0%, or 2.3% when annualized. Other methods of estimating the expected cost of equity, such as annualizing the percentiles before averaging or assuming returns are log-normally distributed, produce lower values.

[10] S&P Global Market Intelligence (S&P GMI) data [last accessed August 20, 2022].

was used,[11] the parent company's cost of equity would be higher than the weighted average of its subsidiary utilities, which did not carry the level of debt that the parent company did.

Throughout this period, the Sempra Utilities accounted for approximately three-quarters of Sempra's book equity and earnings.[12] For Sempra's weighted average cost of equity to have been only 4% while the cost of equity for approximately three-quarters of its portfolio exceeded 10% would require the weighted average cost of equity of the companies other than SDG&E and SoCalGas to be negative, i.e., investors would have been expecting a negative return on Sempra's investment in those other companies, an economically nonsensical conclusion.

Other evidence suggests that the Sempra Utilities' cost of equity was comparable or lower than Sempra's cost of equity during the absolute return modifier period. Sempra's credit rating was lower than both Sempra Utilities' throughout the period in which the absolute return modifier was used. For example, Moody's long-term issuer rating for Sempra remained at Baa1, while SoCalGas's remained at A1 and SDG&E's ranged from A2 to A1.[13] These credit agency ratings are partly attributable to Sempra's higher leverage: Sempra's average debt-to-equity ratio throughout the period was 1.2, compared to 1.0 for SDG&E and 0.8 for SoCalGas.[14] Lower credit quality and higher leverage imply greater risk and, therefore, a higher cost of equity.

The betas of Sempra and the Sempra Utilities reveal a similar pattern. SDG&E and SoCalGas are not publicly traded, so their betas cannot be calculated from market data. Instead, the average historical betas of their respective proxy groups can be compared to Sempra's historical average beta over the years in which the absolute return modifier was used.[15] Under 15 different beta calculation methodologies – using trailing history durations

[11] M. Ellis analysis of Sempra annual statistical reports.
[12] M. Ellis analysis of Sempra annual statistical reports and investor presentations.
[13] *See* https://www.moodys.com/credit-ratings/Sempra-Energy-credit-rating-600046021/ratings/view-by-class, https://www.moodys.com/credit-ratings/San-Diego-Gas-Electric-Company-credit-rating-657000/ratings/view-by-class, https://www.moodys.com/credit-ratings/Southern-California-Gas-Company-credit-rating-693200/ratings/view-by-class, [last accessed August 20, 2022].
[14] M. Ellis analysis of S&P GMI data [last accessed August 20, 2022].
[15] From December 31, 2014, approximately 3 months before the release of Sempra Energy's Notice of 2016 Annual Shareholders Meeting and Proxy Statement, which discusses the first use of the absolute return modifier, through March 22, 2019, the release date of Sempra's 2019 Notice of Annual Shareholders Meeting and Proxy Statement, in which the board approved the 2018 executive compensation plan, the last to include the absolute return modifier.

of 1 to 5 years and daily, weekly, and monthly return calculation frequencies – Sempra's beta was, on average, 0.16 higher than the SDG&E proxy group average and 0.08 higher than the SoCalGas proxy group average. Sempra's beta was higher than the SDG&E proxy group average under all 15 duration-frequency combinations, and higher than the SoCalGas proxy group average for 13 of 15 combinations.[16]

Q. What do you conclude from your findings regarding Sempra's internal estimates of its cost of equity?

A. Sempra executives maintained two inconsistent sets of cost of equity estimates. For the purposes of determining their compensation, where a low value would serve their personal financial interests, the estimated cost of equity was low. For the purposes of the Commission's cost of capital proceedings, where a high value would serve their personal financial interests, the estimated cost of equity was more than 2.5 times as high.

The other intervenors propose ROEs more in line with the ROEs proposed in Sempra's cost of capital applications, which serve Sempra shareholder and management interests, not the interests of consumers. In contrast, my recommended ROEs, developed to reflect the Sempra Utilities' actual cost of equity, are more in line with Sempra's own internal cost of equity estimates.

A. Other than the changes required as a result of the 0.05% changes in your recommended ROEs, does your direct testimony remain correct?

A. I did notice some clerical errors and one incorrect assumption has come to my attention in responding to discovery.

Q. Please describe the clerical errors.

A. The clerical errors are set forth in the errata attached as Exhibit 2.

[16] M. Ellis analysis of S&P GMI data [last accessed August 20, 2022].

Q. Please describe the incorrect assumption that came to your attention in responding to discovery.

A. During discovery it came to my attention that my assumption that the 80% earnings weight in the calculation of the annual performance-related bonus for Sempra corporate officers also applied to officers at SDG&E and SoCalGas was incorrect. The earnings weight at the Sempra Utilities was lower, 30% in 2020 and 27% in 2021. Nonetheless, the overall share of SDG&E and SoCalGas officers' annual compensation that is tied to ROE and rate base growth – directly through the earnings component of their annual performance-related bonuses, or indirectly through their annual stock grants – ranges from approximately 40% to nearly 60%. For Sempra corporate officers, the range is approximately 60%-85%.[17]

Q. Does the lower actual earnings weight in the calculation of the annual performance-related bonuses for Sempra Utilities officers change your conclusion in your direct testimony that the organization's most senior leadership faces powerful incentives to maximize ROEs and rate base growth?

A. No.

Q. Why not?

A. For the most senior executives, the share of individual compensation that is tied to ROE and rate base growth – directly through the earnings component of their annual performance-related bonuses, or indirectly through their annual stock grants – ranges from approximately 40% to over 80%, a range that can amount to hundreds of thousands to millions of dollars per year. Sempra's executive compensation practices strongly incentivize the most senior leadership at both the Sempra Utilities and the parent company to maximize earnings by maintaining high ROEs and rate base growth.

[17] M. Ellis' analysis of Sempra 2021 and 2022 Notices of Annual Shareholders Meeting and Proxy Statement, SoCalGas 2021 and 2022 Notices of Annual Shareholders Meeting, and SDG&E 2020 and 2021 Wildfire Safety Division (WSD) executive compensation compliance letters and WSD approval letters.

Q. Other than the +/-0.05% changes in your recommended ROE, the clerical errors, and the lower share of Sempra Utilities' officer compensation tied to ROE and rate base growth, does your direct testimony remain correct?

A. Yes.

EXHIBIT 1. ROE-RELATED CHANGES TO DIRECT TESTIMONY

1. Section I.A.2., from page 9, line 14, through page 10, line 2, is updated as follows:

Figure 1 summarizes the key findings of my review of Mr. Coyne's analysis, the modifications required to correct its deficiencies, and the resulting ROE estimates. More rigorous, fact-based, and accurate analyses result in substantially lower recommendations for SDG&E's and SoCalGas's ROEs: 5.45% and 5.40%, respectively, roughly one-half Mr. Coyne's recommended 10.55% and 10.75%.

Figure 1. Comparison of Coyne and Ellis ROE methodologies and results[18]

	Coyne COE (%)		Ellis COE (%)		
Model	SDG&E	SoCalGas	SDG&E	SoCalGas	**Comment**
DCF	**8.81**	**9.72**	**5.98**	**5.83**	
Dividend yield	3.59	3.57	3.51	3.24	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	5.14	6.04	NA	NA	Coyne: extrapolates DPS using analysts' 3-to-5-year EPS growth forecasts • 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 • Economically impossible • Range of results too wide for companies with similar risk profiles
Initial growth rate	NA	NA	5.20	5.93	Analysts' EPS growth rates for three years to mitigate upward bias
Terminal growth rate	NA	NA	1.41	1.41	Based on long-term historical utility DPS growth rate equal to inflation
CAPM	**13.99-14.13**	**13.43-13.62**	**4.90**	**4.90**	
Risk-free rate (30-year Treasury) • Current • Forecast	 2.20 3.20	 2.20 3.20	 NA 3.10	 NA 3.10	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	0.87-0.88	0.82-0.85	0.45	0.45	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	15.62 NA 15.62	15.62 NA 15.62	4.00 4.79 3.20	4.00 4.79 3.20	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	**9.47-9.99**	**9.47-9.97**	**NA**	**NA**	Conceptually invalid: equates COE to ROE
Expected Earnings Analysis	**10.72**	**9.77**	**NA**	**NA**	Conceptually invalid: equates COE to ROE
Mean	**10.72-10.89**	**10.60-10.77**	**5.44**	**5.37**	
Recommended ROE	**10.55**	**10.75**	**5.45**	**5.40**	

[18] A.22-04-008 et seq., Exhibit No. SDG&E-04, Prepared Direct Testimony of James M. Coyne – Return on Equity on Behalf of San Diego Gas & Electric Company (May 2022) (hereafter "SDG&E-04"), Exhibits JMC-2, JMC-4, JMC 5.2, JMC-6, JMC-7; A.22-04-008 et seq., Exhibit No. SCG-04, Southern California Gas

<u>2. Section V.C.3, page 49, lines 7 through 13, is updated as follows:</u>

The MS DCF uses inflation for the terminal, not initial or transition, growth rate, so expected 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 the average Treasury yields for the month of July 2022, the long-term inflation estimate is 1.41%.[19]

<u>3. Section V.C.4, page 49, line 18, through page 50, line 3, is updated as follows:</u>

Figure 17 summarizes the MS DCF results for the electric and gas utility proxy groups. The average COEs for the electric and gas proxy groups are 6.0% and 5.8%, respectively – substantially lower than Mr. Coyne's corresponding CG DCF average results of approximately 8.8% and 9.7%.

Company Prepared Direct Testimony of James M. Coyne (Return on Equity) (hereafter "SCG-04"), Exhibits JMC-2, JMC-4, JMC 5.2, JMC-6, JMC-7.

[19] M. Ellis analysis of FRED data [last accessed August 18, 2022].

Figure 17. Utility Proxy Group MS DCF unlevered COE
As of July 2022

			Yield	Initial growth rate (%)				COE
Utility	**Price**	**DPS**	%	S&P GMI	Yahoo!	Zacks	Average	%
Electric								
Alliant Energy	58.08	1.71	2.94	5.40	5.72	5.93	5.68	5.40
Ameren	88.34	2.36	2.67	6.46	7.20	7.25	6.97	5.34
American Electric Power	94.97	3.12	3.29	6.17	6.20	6.38	6.25	6.00
Avista	42.06	1.76	4.18	5.90	5.89	4.96	5.58	6.98
Black Hills	72.65	2.38	3.28	4.67	6.27	6.26	5.73	5.85
CMS Energy	66.21	1.84	2.78	8.48	8.11	7.85	8.15	5.79
Consolidated Edison	93.62	3.16	3.38	5.16	2.00	3.00	3.39	5.36
Duke Energy	106.72	3.94	3.69	5.87	6.01	5.55	5.81	6.41
Edison International	62.55	2.80	4.48	5.00	2.82	4.12	3.98	6.82
Entergy	110.78	4.04	3.65	6.04	6.72	6.13	6.30	6.50
Evergy	65.07	2.29	3.52	4.95	5.12	6.31	5.46	6.09
Eversource Energy	84.29	2.55	3.03	6.67	6.21	6.82	6.57	5.73
IDACORP	106.49	3.00	2.82	2.80	2.82	4.76	3.46	4.73
NorthWestern	56.49	2.52	4.46	4.50	2.27	2.92	3.23	6.57
OGE Energy	39.05	1.64	4.20	1.90	3.47	1.50	2.29	5.99
Pinnacle West	71.32	3.40	4.77	0.10	NA	5.90	3.00	6.84
Portland General Electric	49.58	1.81	3.65	3.23	4.39	4.45	4.02	5.85
Southern Company	72.32	2.72	3.76	6.12	4.00	5.74	5.29	6.35
WEC Energy Group	99.95	2.91	2.91	6.01	6.08	6.51	6.20	5.49
Xcel Energy	69.86	1.95	2.79	7.07	6.43	6.24	6.58	5.42
Mean			**3.51**				**5.20**	**5.98**
Gas								
Atmos	113.64	2.72	2.39	8.61	7.36	7.37	7.78	5.13
New Jersey Resources	44.10	1.45	3.29	6.00	6.00	6.85	6.28	6.01
NiSource	28.89	0.94	3.25	7.18	7.11	6.73	7.01	6.17
Northwest Natural Gas	52.94	1.93	3.65	4.60	4.30	4.70	4.53	5.99
ONE Gas	81.35	2.48	3.05	5.00	5.00	6.00	5.33	5.45
Spire	71.62	2.74	3.83	4.30	5.00	4.65	4.65	6.24
Mean			**3.24**				**5.93**	**5.83**

4. Section V.E.1, page 71, lines 3 through 5, is updated as follows:

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 July 2022, of 3.10%.

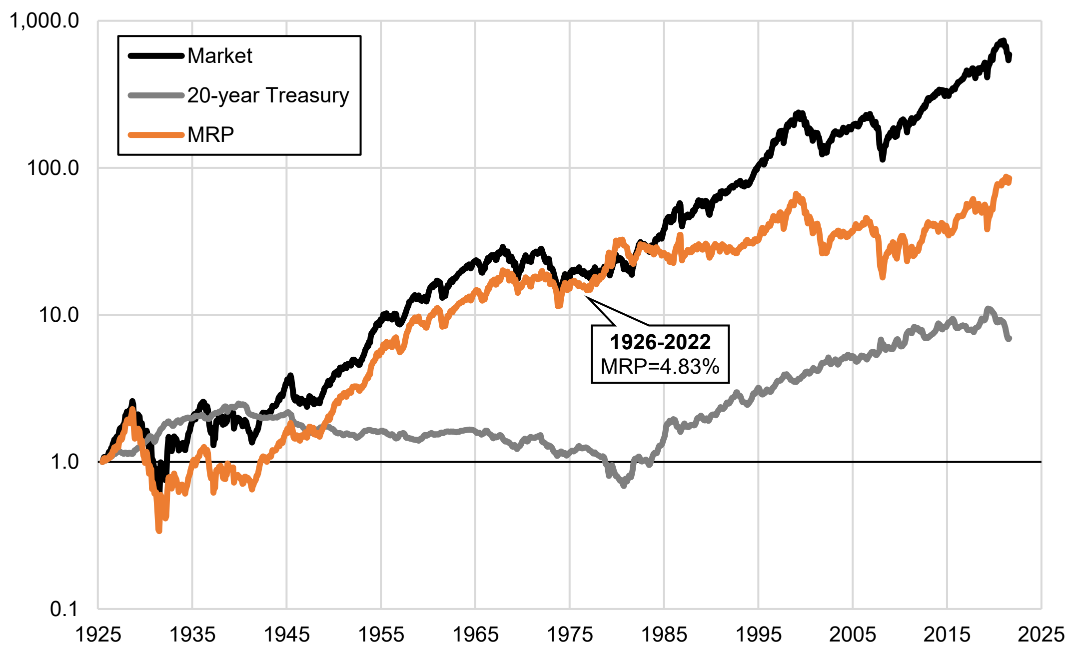
<u>5. Section V.E.3, page 72, line 7, through page 76, line 7, is updated as follows:</u>

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.[20]

Figure 27 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 July 2022. Over the last 96+ years, stocks have outperformed 20-year Treasurys by 4.83% per year.

Figure 27. Market, 20-year Treasury, and MRP real total return index[21]
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.[22] Because I use the 30-year Treasury in my CAPM analysis, though, the premium is reduced by the current difference in the real 20- and

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[20] 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.*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1077876).

[21] M. Ellis analysis of FDL data [last accessed August 11, 2022].

[22] 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.

30-year Treasurys (TIPS), 0.014%, for a 30-year real MRP of 4.69%. Adjusted for the 30-year inflation rate estimated from the Treasury-TIPS spread (2.19%), the nominal MRP is 4.79%.

Q. How do you estimate the forward-looking MRP?

A. I apply the same multi-stage DCF model I use for the utility proxy groups 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 July 2022, divided by the average price of the index over the most recent month. I use the composite data reported by S&P. The current annualized yield is 1.73%.[23]

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. I estimate the value as of July 31, 2022, 13.6%, by linearly interpolating the values reported as of July 22, 2022, 13.7%, and August 11, 2022, 13.4%.[24]

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.[25] 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 V.C.3.

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[23] M. Ellis analysis of S&P GMI data [last accessed August 11, 2022].

[24] S&P Dow Jones Indices, S&P 500 Earning and Estimate Report (July 22, 2022 and August 11, 2022), most recent report available at https://www.spglobal.com/spdji/en/documents/additional-material/sp-500-eps-est.xlsx [last accessed August 12, 2022].

[25] *See, e.g.*, Ibbotson, Harrington, *Stocks, Bonds, Bills, and Inflation 2021 Summary Edition* (2021), p. 157-160 (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),[26] the Energy Information Administration (EIA),[27] and the Social Security Administration (SSA).[28] 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 28 summarizes the three agencies' real long-term per-capita GDP forecasts.

Figure 28. Real long-term per-capita GDP forecasts
Percent

		GDP						
Forecast	**Horizon**	Real	Deflator	Nominal	Population	**Nominal GDP pc**	**CPI**	**CPI-deflated 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[29]	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						**2.69**	1.41	

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, 1.41%, used to estimate the terminal growth rate in the proxy group MS DCF in Section V.C.3 above gives a nominal rate of 2.69%.[30] The corresponding average of the CBO, EIA, and SSA long-term

[26] Congressional Budget Office, "The 2022 Long-Term Budget Outlook" (July 2022); data available at https://www.cbo.gov/system/files/2022-07/57054-2022-07-LTBO.xlsx.
[27] Energy Information Administration, "Annual Energy Outlook 2022" (March 2022); data available at https://www.eia.gov/outlooks/aeo/excel/aeotab20.xlsx.
[28] Social Security Administration, "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); data available at https://www.ssa.gov/OACT/TR/2022/SingleYearTRTables_TR2022.xlsx.
[29] SSA does not forecast real GDP or the GDP deflator, only nominal GDP and CPI.
[30] 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 July 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 6.30%. This result is consistent with the buy-side equity return forecasts summarized in Figure 2, which average 5.9% over the 10+-year horizon. Subtracting the current 30-year Treasury, 3.10%, gives an MRP of 3.20%.

Q. And your combined MRP?

A. The average of my historical (4.79%) and forward-looking (3.20%) MRPs is 4.00%.

6. Section V.E.4, page 76, lines 13 through 19, is updated as follows:

Q. What are the results of your CAPM analysis?

A. Figure 29 summarizes my CAPM calculations and results. The averages of the Yahoo! Finance 5-year monthly betas for the electric and gas proxy group, listed in Figure 21, are both 0.45. The corresponding COEs are both 4.90%, approximately one-third of Mr. Coyne's estimates of 13.99-14.13% for SDG&E and 13.43%-13.62% for SoCalGas.

Figure 29. CAPM results

Utility	**Risk-free rate**(%)	**Beta**	**Market risk premium** (%)	**COE** (%)[31]
SDG&E	3.10	0.45	4.00	4.90
SoCalGas	3.10	0.45	4.00	4.90

[31] COE = 3.10% + β x 4.00%

7. Section VI.A, page 77, lines 6 through 12, is updated as follows:

Q. What are your ROE recommendations for SDG&E and SoCalGas?

A. I base my ROE recommendations on each Sempra Utility's actual, fact-based cost of equity. As summarized in Figure 30, the average of the MS DCF and CAPM COEs for SDG&E and SoCalGas are 5.44% and 5.37%, respectively, which I round up to the nearest 0.05% to arrive at my recommended ROEs of 5.45% and 5.40%.

Figure 30. Summary of SDG&E and SoCalGas COE analysis and recommended ROEs

	COE (%)		
Model	SDG&E	SoCalGas	**Key assumptions**
DCF	**5.98**	**5.83**	
Dividend yield	3.51	3.24	Most recent quarterly dividend divided by one-month trailing price history (~21 trading days)
Initial growth rate	5.20	5.93	Analysts' EPS growth rates for three years to mitigate upward bias
Terminal growth rate	1.41	1.41	Based on long-term historical utility DPS growth rate equal to inflation
CAPM	**4.90**	**4.90**	
Risk-free rate	3.10	3.10	Current (one-month trailing average) 30-year Treasury
Beta	0.45	0.45	5-year monthly balances long-term historical trend and current market conditions
Market risk premium	4.00	4.00	Average of forward-looking using MS DCF and long-term historical average; MS DCF long-term growth rate equal to pre-capita GDP
• Historical	4.79	4.79	
• Forward	3.20	3.20	
Mean	**5.44**	**5.37**	
Recommended ROE	**5.45**	**5.40**	

EXHIBIT 2. ERRATA

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As a result, the ROE-Treasury spread has more than ~~doub~~tripled, from approximately ~~3.8~~2.3% in the 1980s to 7.7% over the last two years.

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Authorized ROEs for PG&E, Southern California Edison, SDG&E, and SoCalGas (collectively, the “California Utilities”) have been set substantially higher than the national average for the last decade, as seen in Figure 5, which shows the difference between the California Utilities’ authorized ROEs and the corresponding ~~annual~~quarterly national average ROE in their last three cost of capital proceedings.

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Figure 8. Growth in SDG&E and SoCalGas operating and financial metrics[32]
2021 value expressed as a multiple of 2000 value

	SDG&E		SoCalGas	
Metric	Nominal	Real	Nominal	Real
Deliveries[33]	0.70		0.78	
Electricity	0.89			
Natural gas	0.60		0.78	
Revenue	2.06	1.31	1.93	1.23
Electricity	2.14	1.36		
Natural gas	1.72	1.09	1.93	1.23
Revenue less purchased energy	3.91	2.49	2.78	1.76
Less purchased fuel/power	4.19	2.66		
Less purchased gas	2.79	1.77	2.78	1.76
Rate base	5.54	3.52	4.02	2.56
Net income[34]	5.42	3.45	3.48	2.21
Capital cost[35]				
Excluding tax	5.07	3.22	3.29	2.09
Including tax	4.24	2.70	~~3.00~~2.68	1.70
Per unit delivered				
Revenue	2.96	1.88	2.48	1.58
Electric	2.40	1.52		
Gas	2.85	1.81	2.48	1.58
Revenue less purchased energy	5.62	3.57	3.57	2.27
Less purchased fuel/power	4.71	2.99		
Less purchased gas	4.61	2.93	3.57	2.27
Rate base	7.95	5.05	5.17	3.28
~~Revenue~~	~~2.96~~	~~1.88~~	~~2.48~~	~~1.58~~
Net income	7.79	4.95	4.47	2.84
Capital cost				
Excluding tax	7.28	4.63	4.23	2.69
Including tax	6.09	3.87	3.44	2.19
Average electric rate				
Residential	2.69	1.71	NA	NA
US residential	*1.67*	*1.06*	*1.58*	*1.00*
All customers	2.64	1.68	NA	NA
US average	*1.64*	*1.04*	*NA*	*NA*
Inflation (CPI)	1.57	1.00	1.57	1.00

32 M. Ellis analysis of Sempra annual statistical reports, available at https://investor.sempra.com/annual-reports-and-proxy-statement [last accessed July 30, 2022]; EIA data [last accessed July 30, 2022]; BEA data [last accessed July 30, 2022].
33 For SDG&E, assumed energy equivalent is 293 kWh per mcf of natural gas.
34 For SoCalGas in 2021, Aliso Canyon costs are added back and taxes are deducted at the average rate in 2019 and 2020 (16%).
35 Return on and of capital, both debt and equity, excluding and including income tax.

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Figure 10. Recent authorized ROEs at or below 9%[36]

Company	State	Service type	Date	ROE (%)	Equity ratio (%)	Credit rating		
						S&P	Moody's	Fitch
Orange & Rockland	NY	E/G	3/19	9.00	48.0	A-	Baa2	A-
Otter Tail Power	SD	E	5/19	8.75	52.9	BBB+	A3	BBB
Consolidated Edison	NY	E/G	1/20	8.80	48.0	A-~~A~~	Baa1~~A2~~	A-~~BBB+~~
Central Maine Power	ME	E	2/20	8.25	50.0	A~~A-~~	A2~~Baa1~~	BBB+~~A-~~
NY State E&G	NY	E/G	11/20	8.80	48.0	A-~~NR~~	Baa1~~NR~~	BBB+~~NR~~
Rochester G&E	NY	E/G	11/20	8.80	48.0	A-~~NR~~	Baa1~~Baa2~~	BBB+~~BBB~~
Corning Natural Gas	NY	G	5/21	8.80	48.0	NR~~BBB+~~	NR~~Baa1~~	NR~~A-~~
El Paso Electric	NM	E	6/21	9.00	49.2	NR~~A~~	Baa2~~NR~~	BBB~~NR~~
Brooklyn Union Gas	NY	G	8/21	8.80	48.0	BBB+~~A-~~	Baa2~~Baa1~~	A-~~BBB+~~
KeySpan Gas East	NY	G	8/21	8.80	48.0	BBB+~~A-~~	Baa1	A-~~BBB+~~
Green Mountain Power	VT	E	8/21	8.57	50.4	A~~BBB+~~	NR~~A3~~	NR
Arizona Public Service	AZ	E	11/21	8.70	54.7	A-~~BBB+~~	A2~~Baa2~~	BBB+~~A-~~
Central Hudson G&E	NY	E/G	11/21	9.00	50.0	A-	Baa1~~A2~~	A-~~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+~~A-~~	A3~~Baa1~~	NR~~A-~~
Niagara Mohawk	NY	E/G	1/22	9.00	48.0	BBB+	Baa1	NR

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Figure 15 compares the forecast aggregate earnings of the US publicly-traded companies for which analysts provide EPS growth forecasts[37] to forecast US GDP.[38]~~[39]~~ Currently, these companies' combined earnings are equal to roughly ~~6~~8% of US GDP. Yet if analysts' growth projections were correct, they would exceed total US GDP in just ~~five~~six years.~~[40]~~

[36] Credit ratings are issuer or senior unsecured. M. Ellis analysis of S&P GMI data [last accessed July 30, 2022]; company websites; Moody's data, available at https://www.moodys.com/ [last accessed July 30, 2022]; S&P Global Ratings data, available at https://www.spglobal.com/ratings/en/ [last accessed July 30, 2022]; Fitch Ratings data, available at https://www.fitchratings.com/.

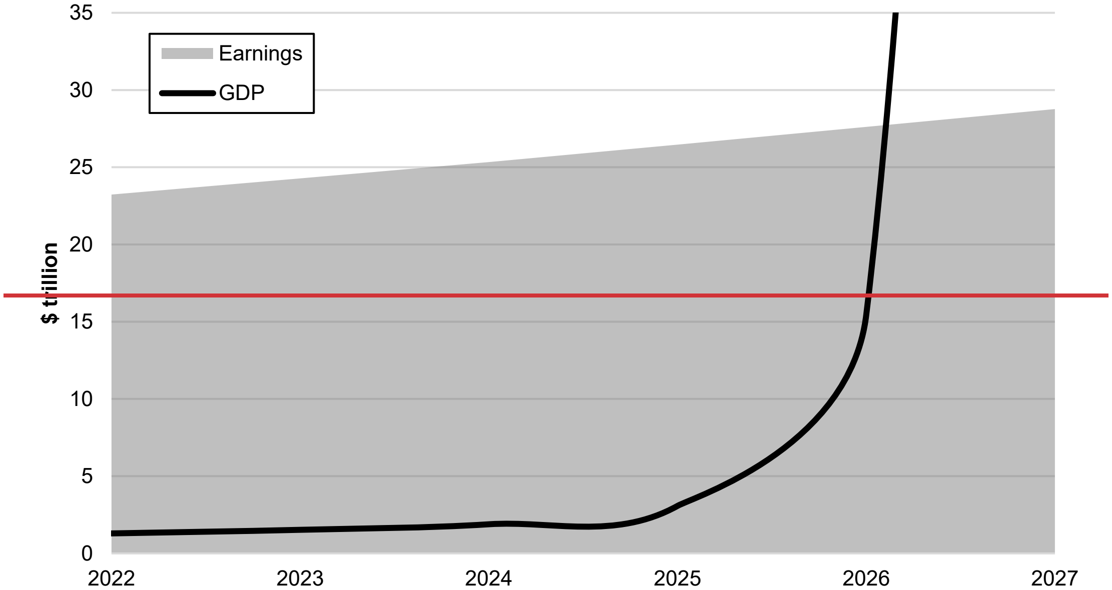
[37] M. Ellis analysis of S&P GMI data for 1,780 US stocks. Excludes companies with growth rates less than -100%.

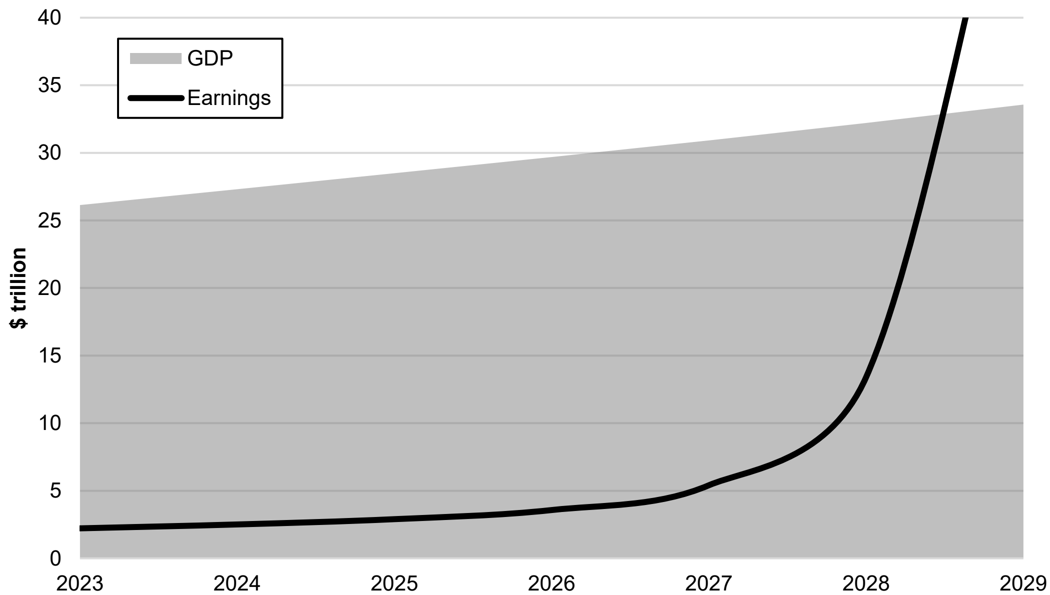
[38] Sum of the forecasts for each company. Analysts' EPS estimates and growth rates from S&P GMI as of June 30, 2022. GDP forecast is average of Congressional Budget Office, *The 2022 Long-Term Budget Outlook* (July 2022), data available at: https://www.cbo.gov/system/files/2022-07/57054-2022-07-LTBO.xlsx; Energy Information Administration, *Annual Energy Outlook 2022 Macroeconomic Indicators* (March 2022), Table 20, data available at https://www.eia.gov/outlooks/aeo/excel/aeotab20.xlsx; Social Security Administration, *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, data available at: https://www.ssa.gov/OACT/TR/2022/SingleYearTRTables_TR2022.xlsx

~~[39] M. Ellis analysis of S&P GMI data for 972 stocks. Excludes companies with growth rates less than -100%.~~

~~[40] Sum of the forecasts for each company. Analysts' EPS estimates and growth rates from S&P GMI as of December 31, 2021. GDP forecast is average of Congressional Budget Office. *See The 2021 Long-Term Budget Outlook* (March 4, 2021), available at: https://www.cbo.gov/publication/56977; Energy Information Administration, *Annual Energy Outlook 2021 Macroeconomic Indicators* (February 3, 2021), Table 20,~~

Figure 15. US stock market forecast earnings vs. GDP[41]





~~available at https://www.eia.gov/outlooks/aeo/tables_ref.php; Social Security Administration, *The 2021 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds* (August 31, 2021), Supplemental Single-Year Tables, available at: https://www.ssa.gov/OACT/TR/2021/.~~

~~[41] Average of CBO, EIA, SSA nominal GDP forecasts. S&P GMI data for 972 stocks, as of December 31, 2021. Excludes companies with growth rates less than -100%.~~