Pacific Gas and Electric Company Securitization

A. 20-04-023

TURN HEARING EXHIBIT

TURN-35

Customer Credit Trust standard deviation sensitivity analysis

Exhibit TURN-35

Customer Credit Trust standard deviation sensitivity analysis

Purpose

Examine the impact of different levels of investment risk (standard deviation), in isolation, on the Customer Credit Trust's expected nominal and present value[1] and probability of surplus. This examination is consistent with the approach described in TURN Data Request 17 to PG&E, Question 12.

Methodology

TURN used the same normal rescaling methodology used elsewhere in its various analyses of the Trust and as described in TURN response to PG&E data request 2, question 21:

a. For each asset class, the Callan quarterly returns were first transformed into *z*-scores [$(x-\mu)/\sigma$], with a separate μ and σ calculated for each time period across all 2,000 Monte Carlo simulation runs, and then rescaled using TURN's assumptions for the arithmetic mean and standard deviation. This is a common means of rescaling normally distributed data, as the Callan returns are. Yields were rescaled assuming a log-normal distribution to avoid negative results.
b. Rescaling is a common technique for "adjusting values measured on different scales to a notionally common scale."[2] In this case, the different scales are Callan's and TURN's expected return normal probability distributions, as summarized in their respective arithmetic mean and standard deviation figures.
c. Details of the calculations can be found in tab Rtns [of the model TURN previously provided to PG&E].

The purpose of this analysis was to examine the effect of changes in the standard deviation in isolation. To offset interactions between the arithmetic return and standard deviation in determining the geometric return, the arithmetic return was adjusted based on the formula for the relationship between arithmetic and geometric returns described in "On the Relationship between Arithmetic and Geometric Returns," Formula 4, that has been used throughout

[1] TURN does not endorse using PG&E's expected value and present value metrics to assess the Customer Credit Trust's value or ratepayer-neutrality. They are presented solely for illustrative purposes to demonstrate the effect of a change in the Trust's risk profile on the metrics PG&E has chosen to present in its application. Expected value, by itself, ignores risk, and calculating the present value of the Trust's net cash flows using PG&E's return on rate base, a discount rate unrelated to the various risks of the Trust to customers, fails to appropriately account for the Trust's underlying risks (PG&E's income and shareholder contributions and the Trust's investment returns) and their varying contributions to the overall risk of the Trust over its life.

[2] See https://en.wikipedia.org/wiki/Normalization_(statistics).

TURN's analysis and modeling of Trust returns.[3] As can be seen in the summary table of results, the average geometric return remains relatively constant across the different standard deviation sensitivities.

In addition, in response to the discussion on p. 6-31 of PG&E's rebuttal testimony on repayment of prior shortfalls to customer from future shareholder contributions, TURN added similar logic to its model.

Base case

TURN was not able to reproduce the model output provided by PG&E in response to TURN data request 15, question 6 ("2020Securitization_DR_Misc_Rebuttal Chapter 6_Table 6-14" and in the accompanying Excel file, "("TURN DR17 Q12 sensitivity analysis.xlsx," tab Data) using the model that was also provided in that response ("2020Securitization_DR_Misc_Rebuttal Chapter 6_PGE SEC MODEL 6.3.1 WP"). As a base case, TURN used the output generated by that model, which is included in the accompanying Excel file ("TURN DR17 Q12 sensitivity analysis.xlsx," tab Base case-DR15 mdl output).

Results

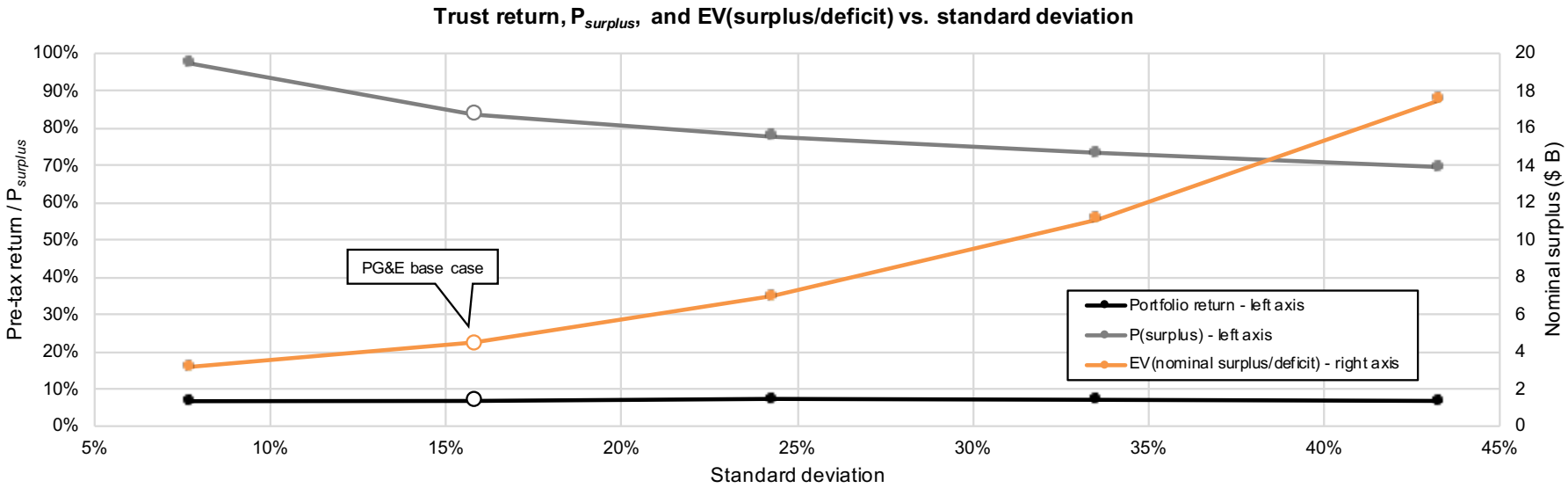
Results for all 2,000 simulation runs, as well as tables comparable to Table 6-14 in PG&E's rebuttal testimony (p. 6-34), for each sensitivity are provided in the accompanying Excel file, "TURN DR17 Q12 sensitivity analysis.xlsx," tab Sensitivity model output. The summary results are shown on the following page as a table and figure.

[3] Available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2083915.

TURN Exhibit 35

Trust standard deviation sensitivity analysis

Portfolio standard deviation			Portfolio return		Probability		Breakeven pre-tax return	EV(surplus/deficit)* $ billion		EV(positive outcomes) $ billion		EV(negative outcomes) $ billion		Customer EV* $ billion	
Factor	Input	Output	Input	Output	Surplus	Shortfall		Nominal	PV	Nominal	PV	Nominal	PV	Nominal	PV
0.50	7.2%	7.7%	6.5%	6.7%	97.3%	3.1%	0.0%	3.18	0.38	3.18	0.38	0.00	0.00	0.79	0.09
1.00	14.3%	15.8%	6.8%	6.9%	83.7%	17.2%	0.0%	4.46	0.53	4.62	0.55	-0.16	-0.02	1.00	0.12
1.50	21.5%	24.3%	7.2%	7.1%	77.7%	23.0%	0.0%	6.96	0.82	7.32	0.87	-0.36	-0.05	1.47	0.17
2.00	28.7%	33.6%	7.6%	7.1%	73.3%	27.6%	0.0%	11.10	1.31	11.64	1.39	-0.54	-0.08	2.37	0.27
2.50	35.8%	43.3%	8.1%	6.8%	69.5%	31.3%	0.0%	17.50	2.07	18.21	2.18	-0.71	-0.11	3.84	0.44



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