IM Cost-Benefit Analysis

PJM FRMSTF

3/24/2021

PERAST
CAPITAL MANAGEMENT

QUANTIFYING RISK OF STAKEHOLDER LOSSES DUE TO DEFAULT

- Total shortfall = # of failures x average shortfall
  - Assume these occurred over 62 months (a figure used in previous IM backtesting by PJM)
- *Shortfall does not equal default*
  - What is average participant credit available divided by FTR credit requirement? Assume 20% (conservative).
    - E.g., \$.5M FTR credit requirement; \$.6M in PJM collateral account → availability ratio = 20% above requirement
    - This 20% is higher for price-sensitive bidders, and would be much higher under some proposed bid collaterals
    - Average shortfalls as ratio of IM were 13-54%
      - Any shortfalls <20% would be covered without a collateral call
      - A shortfall of 52% of IM would have only 32% (52-20) of IM as a collateral call
      - % of shortfall uncovered (by existing posted collateral) = 32/52 = 62%
- *Default does not equal stakeholder losses*
  - According to PJM[1], "vast majority" of all defaults have been cured in the past 10 years. Assume 90%.
- Example calculation:

\$0.88M shortfall per year x 62% uncovered shortfall ratio x

(1 – 90%) uncured default rate x 1 / approx. 1,000 PJM members **= \$54 avg loss per member per year**

1. Slide 6 from https://pjm.com/-/media/committees-groups/task-forces/frmstf/2020/20201015/20201015-item-06a-minimum-capitalization.ashx

QUANTIFYING RISK

								A	B	C	A x B x C
	IM Range (million USD)	Shortfall (% of IM)	Average Shortfall ($ in MM)	Max Shortfall ($ in MM)	Failure Rate (%)	Count of Observations	Total Shortfall	Shortfall per yr	% Shortfall uncovered	Uncured rate	Default per yr
99	0-1	52	0.06	0.79	0.48%	76	$4.56M	$0.88M	62%	10%	$54k
	1-3	43	0.76	2.32	0.06%	10	$7.60M	$1.47M	53%	10%	$78k
	3-10	13	0.63	1.48	0.06%	9	$5.67M	$1.10M	0%	10%	$0
	10 and above	37	7.19	22.29	0.04%	7	$50.33M	$9.74M	46%	10%	$448k

	IM Range (million USD)	Shortfall (% of IM)	Average Shortfall ($ in MM)	Max Shortfall ($ in MM)	Failure Rate (%)	Count of Observations	Total Shortfall	Shortfall per yr	% Shortfall uncovered	Uncured rate	Default per yr
97	0-1	53	0.08	0.87	0.64%	109	$4.56M	$1.69M	62%	10%	$105k
	1-3	49	0.80	2.62	0.08%	13	$7.60M	$2.01M	59%	10%	$119k
	3-10	18	1.07	7.37	0.12%	20	$5.67M	$4.14M	0%	10%	$0
	10 and above	32	5.63	25.41	0.06%	11	$50.33M	$11.99M	38%	10%	$449k

	IM Range (million USD)	Shortfall (% of IM)	Average Shortfall ($ in MM)	Max Shortfall ($ in MM)	Failure Rate (%)	Count of Observations	Total Shortfall	Shortfall per yr	% Shortfall uncovered	Uncured rate	Default per yr
95	0-1	54	0.08	0.89	0.81%	138	$4.56M	$2.14M	63%	10%	$134k
	1-3	32	0.55	2.74	0.17%	29	$7.60M	$3.09M	38%	10%	$116k
	3-10	19	1.07	8.10	0.15%	26	$5.67M	$5.38M	0%	10%	$0
	10 and above	37	5.98	26.71	0.08%	13	$50.33M	$15.05M	46%	10%	$691k

Weigh the Cost / Benefit

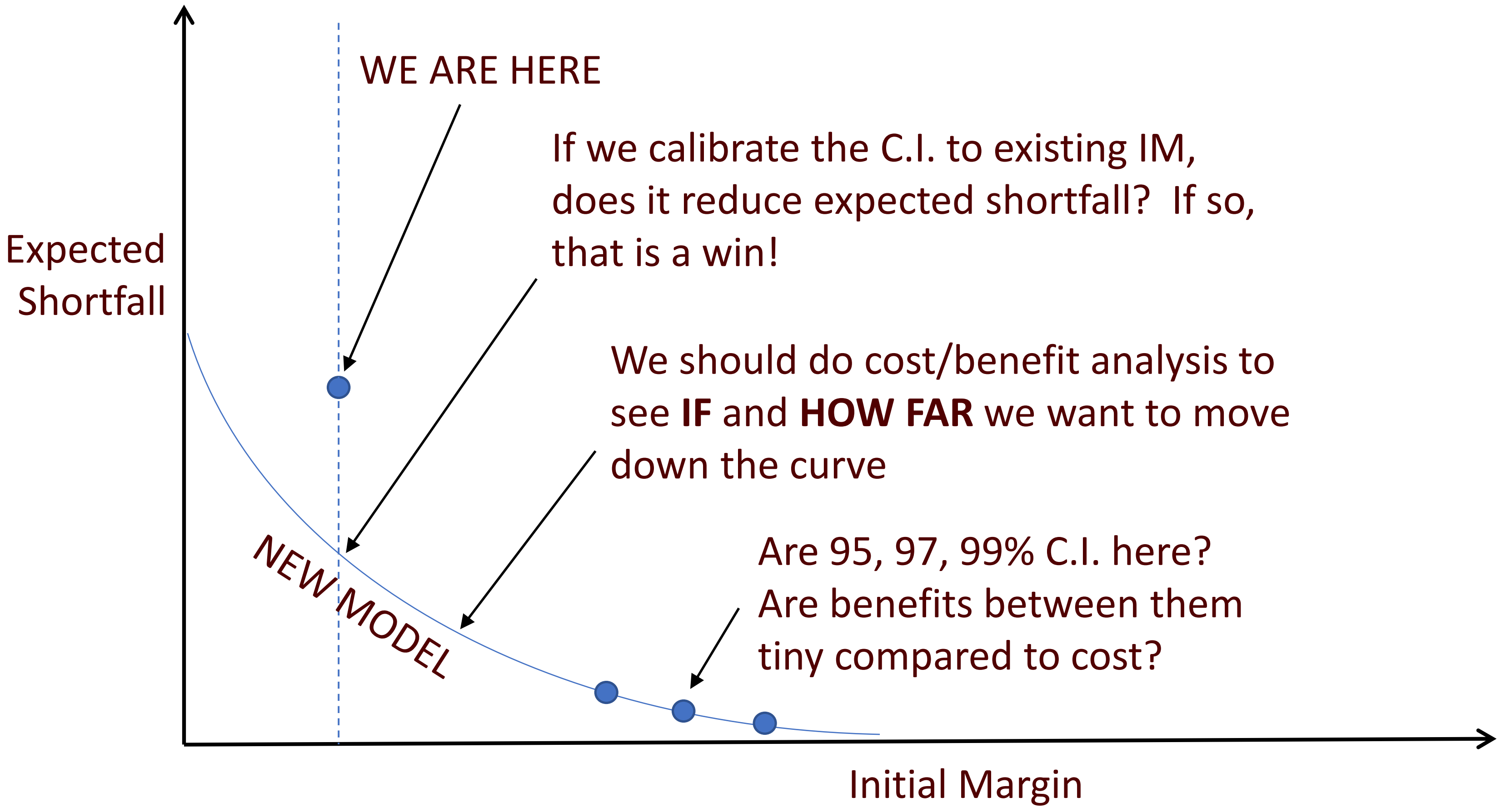
	99% Conf. Int.	97% Conf. Int.	95% Conf. Int.	Status Quo
Expected default loss per year	$581,000	$674,000	$942,000	?
Expected annual default per member	$581	$674	$942	?
Collateral required	Z	Y	X	A
Total cost to members	Cost of capital (CoC) * Z	CoC * Y	CoC * X	CoC * A
Marginal benefit to cost ratio	$93,000 / [(Z-Y)*CoC]	$268,000 / [(Y-X)*CoC]	? / [(X-A)*CoC]	

$674k - $581k

- Where do we stop?
  - We support reducing risk, but *not at any cost*
  - The membership posting an extra $500M (for example) at 5% CoC costs $25M
  - Losing $25M for certain to possibly avoid losing $93,000 (likely conservative) does not make sense
- We need A, X, Y, Z numbers

1. Slide 6 from https://pjm.com/-/media/committees-groups/task-forces/frmstf/2020/20201015/20201015-item-06a-minimum-capitalization.ashx

We need to calibrate new model to existing collateral



We're talking about adding up to \$800M of collateral from current numbers to limit expected default losses to approximately \$0.56M (\$562 x 1,000 members) for the stakeholders as a group.

What is the expected default loss for a more modest collateral increase of 10-20% instead of up to 80%?

E.g., a 4x increase in expected loss adds \$.56M x 4 = \$2.24M to market loss but could save \$700M in collateral. You need only a 0.32% return on the \$700M to cover that additional loss!