Initial Margin Concerns

PJM FRMSTF

11/9/2020

PERAST
CAPITAL MANAGEMENT

Failure Rates are not Consistent

From previous PJM presentations, we could not determine the failure rate by IM Range because we were missing data. We are grateful to PJM for providing additional data, shown below for MPOR = 2.

- Failure rates are 2x or 3x as high for "small" portfolios as "large" portfolios.
  - There is a risk factor correlated to size that the IM model is not accounting for.
- Failure rates should…
  - depend upon only price uncertainty
  - be consistent for portfolios with different IMs, MW volumes, starting letters of owners (A-L vs. M-Z), etc.

Our addition

NEW

IM Range (million USD)	Shortfall (% of IM)	Average Shortfall ($ in MM)	Max Shortfall ($in MM)	Failure Rate (%)	Count of Observations	Total Observations	Failure rate (%)
0-1	52	0.06	0.79	0.48	76	7813	**0.97**
1-3	43	0.76	2.32	0.06	10	3473	**0.29**
3-10	13	0.63	1.48	0.06	9	3041	**0.30**
10 and above	37	7.19	22.29	0.04	7	1365	**0.51**

=7/15,692

sum=15,692

=7/**1365**

Failure Rates are not Consistent

Missing risk factors correlated to portfolio size could be:

- **Purchase price**: "cheaper" FTRs are more likely to increase in value than decrease (intuitively and empirically)
  - See Perast Capital's 8/26/20 FRMSTF presentation[1]
- **Term structure of volatility**: volatility increases the closer an FTR is to delivery
  - Larger portfolios' average "time to delivery" is greater than that of smaller portfolios that are more heavily weighted toward near-term contracts
    - For the same volume, the volatility is lower for farther contracts than near-term contracts
  - See PJM's observation of this phenomenon from 9/25/19 FRMSTF presentation[2] →
    - Slides 20-21 of that pdf show increasing failure rates for nearer-term contracts

It appears we are using the "All" column volatility for all portfolios, whether they are concentrated in the near-term or not.

- Volatility decays for farther contracts. Standard deviation for each FTR contract is calculated for the distribution corresponding to MPOR=2

PATHS	Auction month + 2	Auction month + 3	Auction month + 5	Auction month + 7	All
AECO-AEP	8.50	2.92	2.50	2.19	4.19
AEP-DPL	8.79	3.08	2.46	2.24	4.33
DOM-DUQ	7.81	3.07	2.36	2.42	4.02
PECO-PEPCO	3.77	1.78	1.27	1.17	2.02
PENELEC-EKPC	4.28	1.67	1.06	0.60	2.00

1. https://pjm.com/-/media/committees-groups/task-forces/frmstf/2020/20200826/20200826-item-07-impact-of-bid-cleared-price-presentation.ashx
2. https://pjm.com/-/media/committees-groups/task-forces/frmstf/20190925/20190925-item-07-results-of-risk-model-quantitative-analysis-presentation.ashx

Quantifying Risk of Stakeholder Losses due to Default

- Total shortfall = # of failures x average shortfall = $68.16M
  - Assuming these occurred over 62 months (a figure used in previous IM backtesting by PJM), that is $13.2M per year
- *Shortfall does not equal default*
  - What is average participant credit available divided by FTR credit requirement? Assume 20%.
    - E.g., $.5M FTR credit requirement; $.6M in PJM collateral account → availability ratio = 20% above requirement
    - Average shortfalls as ratio of IM were 13-52% (see below)
    - For this $.5M requirement example, the average shortfall ratio was 52%, so a 20% cushion covers almost half
- *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%.

$13.2M shortfall per year x

20% / 47% shortfall (wted avg) x

(1 – 90%) uncured default rate x

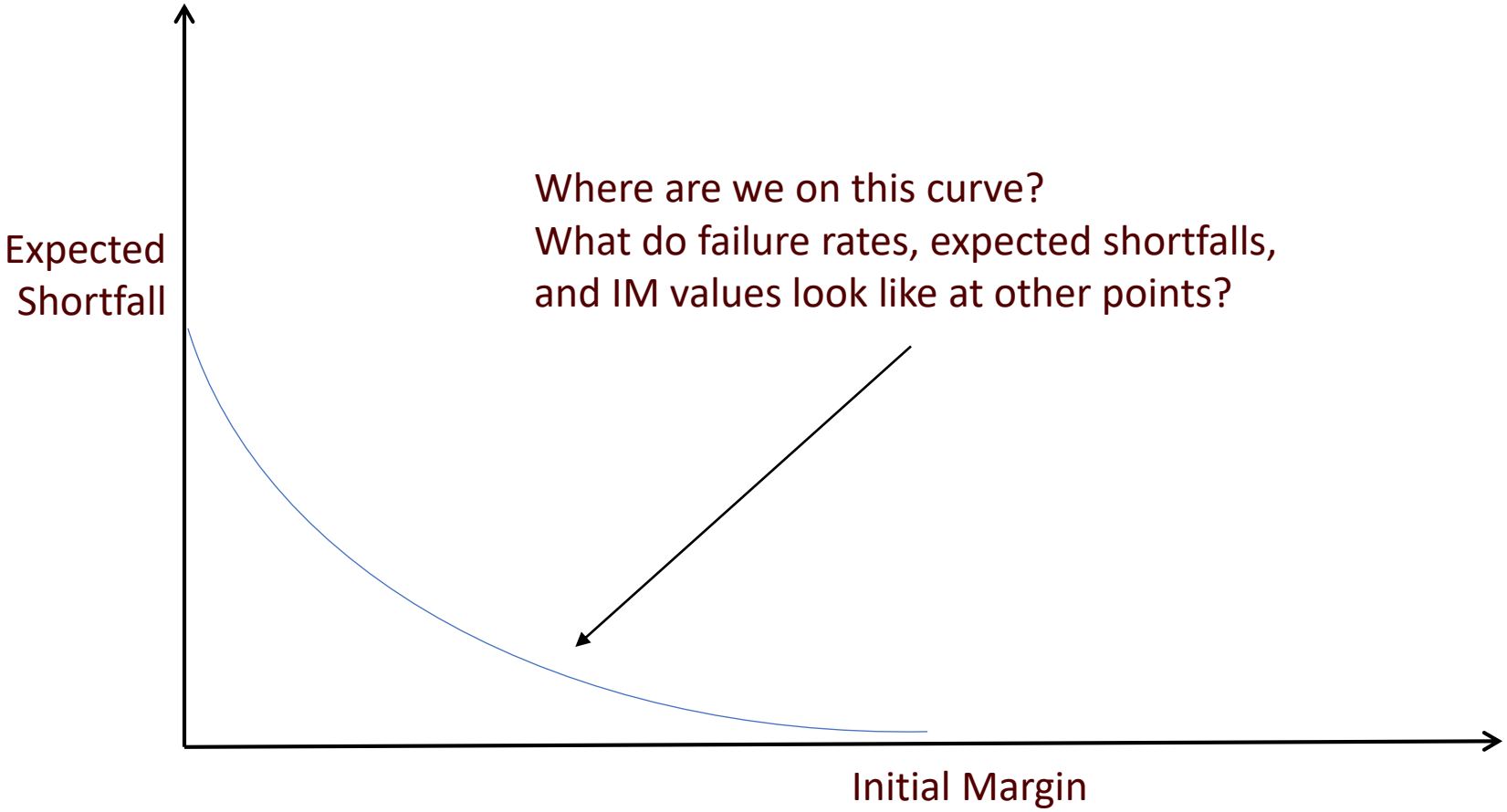
1 / approx. 1,000 PJM members

= $562 avg loss per member per year

IM Range (million USD)	Shortfall (% of IM)	Average Shortfall ($ in MM)	Max Shortfall ($in MM)	Count of Observations	Total Shortfall
0-1	52	0.06	0.79	76	**$4.56M**
1-3	43	0.76	2.32	10	**$7.60M**
3-10	13	0.63	1.48	9	**$5.67M**
10 and above	37	7.19	22.29	7	**$50.33M**
	wtd avg=47				sum=$68.16M

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

Weighing the Costs and Benefits of Loss Protection



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!

SUMMARY

- The current IM proposal is a substantial improvement over status quo.
  - However, it is still not capturing some important risk factors as demonstrated by its inconsistent failure rate
- Let's keep risk in perspective and consider cost to minimizing risk beyond a reasonable level
  - The minimum credit and MTA rules already plugged the biggest holes
  - We must decide what the constant "factor" should be
    - There is a substantial cost to the market to have to post hundreds of millions of more dollars for a potentially modest improvement in default loss coverage
- Bid collateral is a crucial component
  - We must vet potential bid collateral calculation proposals before voting on a package
  - If PJM adopted a model similar to ERCOT in which bid collateral was simply a constraint in the auction solution, there would be no need to develop a different bid credit calculation method
    - Use single "cleared credit" calculation but do not allow the cleared credit to exceed what is posted