



Peak Market Activity Updates

Risk Management Committee

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1. Proposed Solutions and Key Back Test Results

2. Conclusion

Collateral Requirement Setting Options:

- Option 1: maximum (sum of rolling one, two, or three week invoices) in *reference period*^[1]. i.e., rolling 3-week invoices
- Option 2: maximum (sum of rolling one, two, three, or four week invoices) in *reference period*. i.e., rolling 4-week invoices
- Option 3: Rolling 3-week invoices + $2 \times \text{Current Unbilled Obligations}$ ^[2]
- Option 4: Rolling 4-week invoices + $2 \times \text{Current Unbilled Obligations}$
- Option 5: Mixed rolling 4-week invoices (Option 2) or rolling 4-week invoices + $2 \times \text{Current Unbilled Obligations}$ (Option 4)

In back testing, a failure was recorded every time the collateral requirement was less than the *target period*^[3] invoices. Failure rate was the percentage of failures over total samples.

Collateral Coverage can be measured by:

- Option A: Participants posted exactly the collateral required (see Option 1-5 above)
- Option B: $\max(\text{Available Market Credit}^{[4]}, \text{Option A})$
- Option C: $\max(\text{Available Market Credit} - \text{Unsecured Credit Allowance}^{[5]}, \text{Option A})$

[1] Reference Period: From week 0 (most recent invoiced week) to week-2 (2 weeks prior to week 0) for rolling 3-week invoices, or from week 0 to week-3 for rolling 4-week invoices.

[2] Current Unbilled Obligations: unbilled obligations since last invoice. Measured on each Tuesday, which covered unbilled obligations from past Thursday to Sunday. Current week unbilled obligations (Thursday –

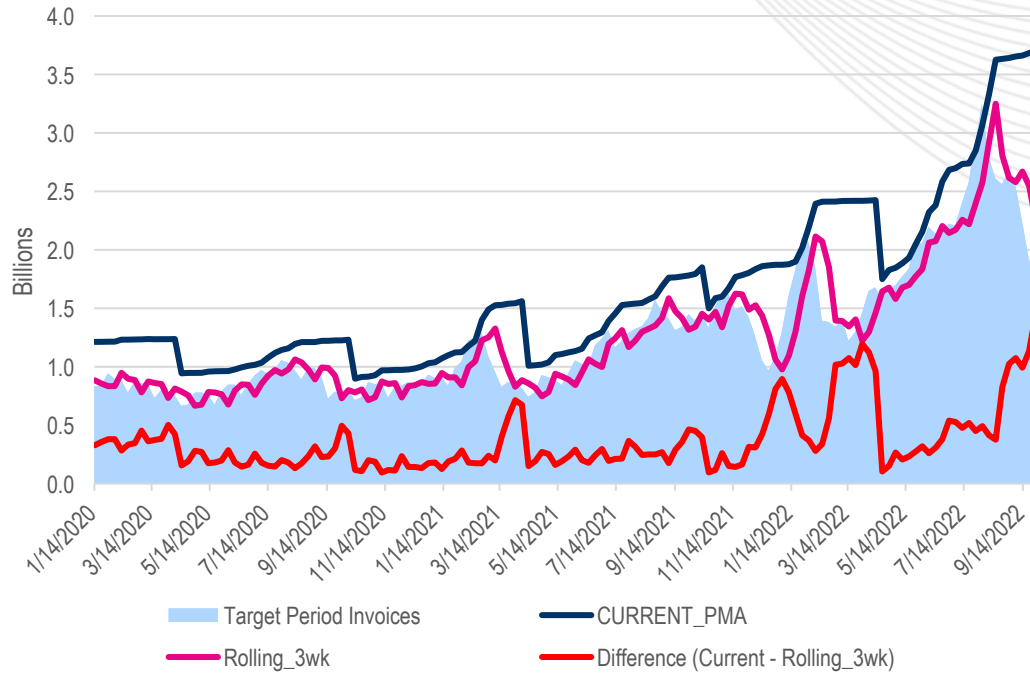
Wednesday) can be approximated by $2 \times \text{Current Unbilled Obligation}$.

[3] Target Period: week 0 to week+2 (2 weeks after week 0).

[4] Available Market Credit: Amount of collateral and unsecured credit allowance not allocated to FTR and RPM.

[5] Unsecured Credit Allowance: Amount of unsecured credit granted by PJM based on an evaluation of participant's creditworthiness and not secured by collateral plus guaranties from others less guaranties to others.

Option 1: Rolling 3-Week Invoices

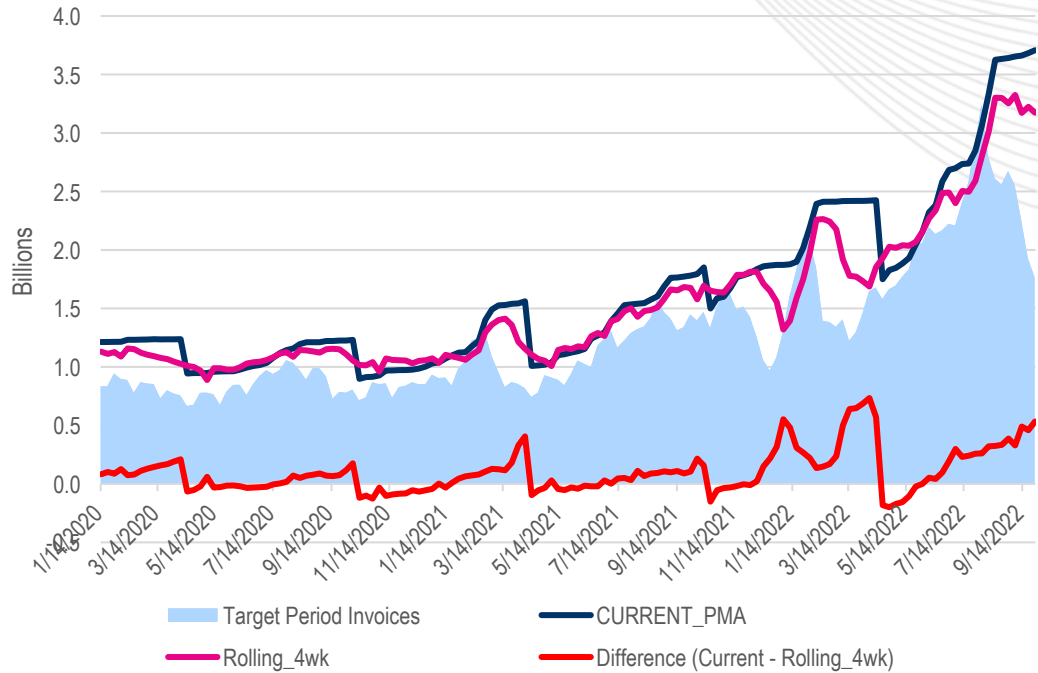


- On aggregate, PJM would hold \$365 million less than current collateral when using rolling 3-week invoices.
- Compared to current PMA, this option provided smaller RMSE when over collateralized, but higher RMSE when under collateralized, higher median shortfall, and higher failure rate.

	RMSE (lower is better)			Shortfall (less negative is better)		Failure Rate (lower is better)		
	Under Collateralized	Over Collateralized	Total	Median	Average Top 5 (\$ Million)	Option A (req'd)	Option B max (avail. credit, req'd)	Option C max(avail. credit -unsecured, req'd)
Current PMA	1,663,416	6,148,133	6,369,183	(24,832)	(84)	16.1%	2.9%	7.0%
Rolling 3-week Invoices	2,274,152	2,226,651	3,182,726	(46,425)	(92)	37.9%	3.2%	13.5%



Option 2: Rolling 4-Week Invoices

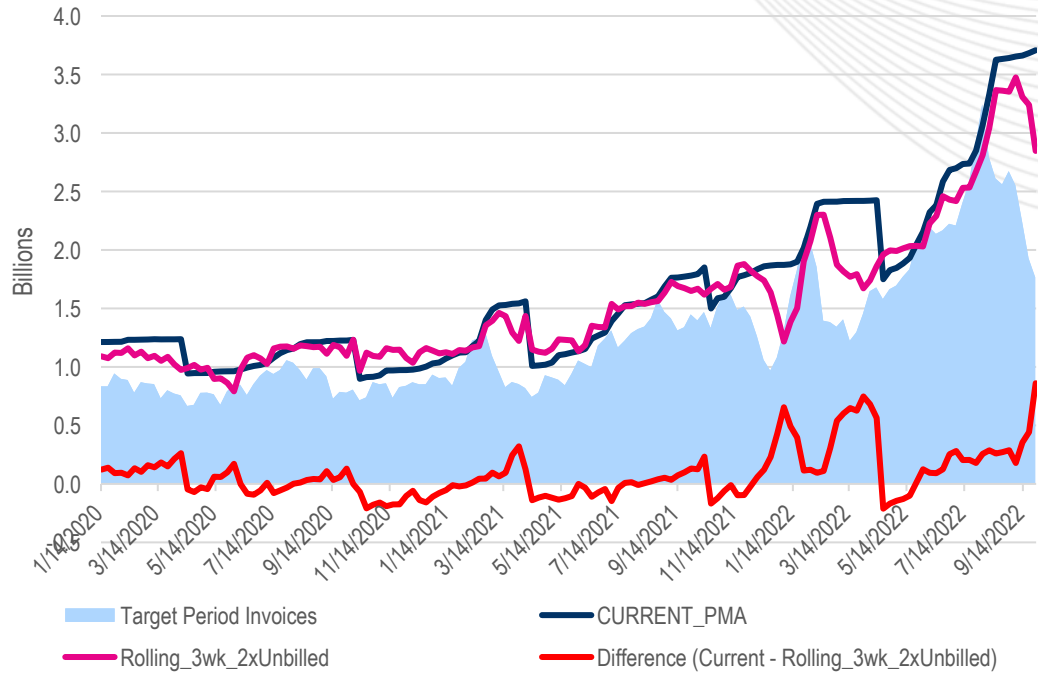


- On aggregate, PJM would hold \$103 million less than current collateral when using rolling 4-week invoices.
- Compared to current PMA, this option provided smaller RMSE when over collateralized, and smaller median shortfall, but higher RMSE when under collateralized, and higher failure rate.

	RMSE (lower is better)			Shortfall (less negative is better)		Failure Rate (lower is better)		
	Under Collateralized	Over Collateralized	Total	Median	Average Top 5 (\$ Million)	Option A (req'd)	Option B max (avail. credit, req'd)	Option C max(avail. credit -unsecured, req'd)
Current PMA	1,663,416	6,148,133	6,369,183	(24,832)	(84)	16.1%	2.9%	7.0%
Rolling 4-week Invoices	1,743,954	4,440,298	4,770,495	(6,797)	(88)	19.7%	2.5%	7.2%



Option 3: Rolling 3-Week Invoices + 2xUnbilled Obligations

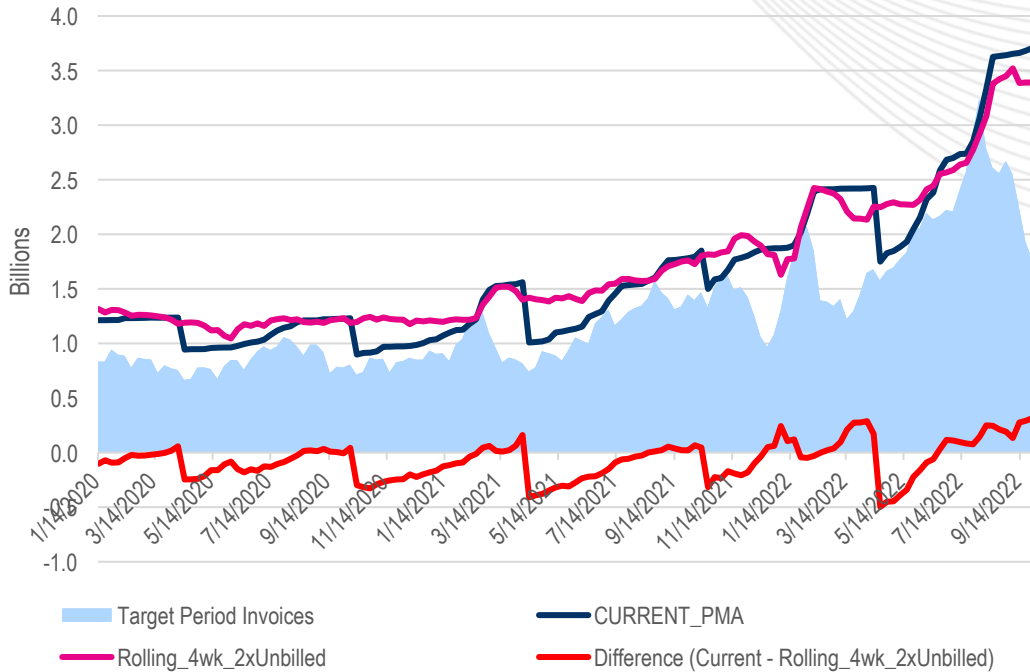


- On aggregate, PJM would hold \$83 million less than current collateral when using rolling 3-week PMA plus 2 times unbilled obligations.
- Compared to current PMA, this option provided smaller RMSE when both under and over collateralized, smaller median shortfall, but higher failure rate.

	RMSE (lower is better)			Shortfall (less negative is better)		Failure Rate (lower is better)		
	Under Collateralized	Over Collateralized	Total	Median	Average Top 5 (\$ Million)	Option A (req'd)	Option B max (avail. credit, req'd)	Option C max(avail. credit -unsecured, req'd)
Current PMA	1,663,416	6,148,133	6,369,183	(24,832)	(84)	16.1%	2.9%	7.0%
Rolling 3-week Invoices + 2xUnbilled Obligation	1,655,824	4,498,244	4,793,324	(4,288)	(83)	17.3%	2.9%	6.7%



Option 4: Rolling 4-Week Invoices + 2xUnbilled Obligations

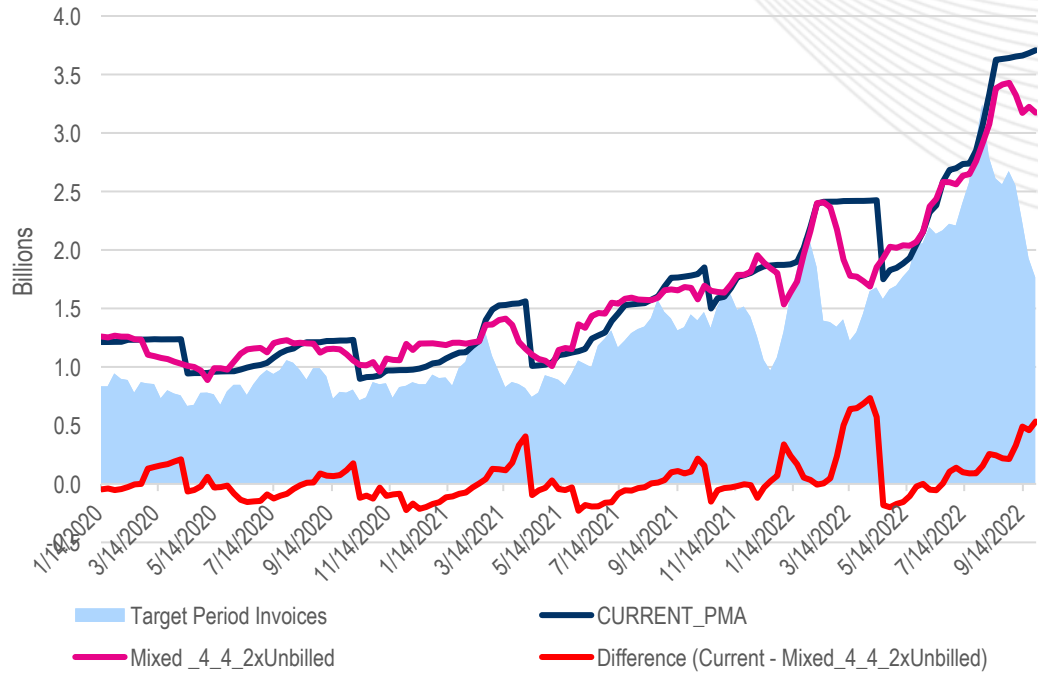


- On aggregate, PJM would hold \$45 million more than current collateral when using rolling 4-week invoices plus 2 times unbilled obligations.
- Compared to current PMA, this option provided smaller RMSE when both under and over collateralized, smaller median shortfall, and lower failure rate.

	RMSE (lower is better)			Shortfall (less negative is better)		Failure Rate (lower is better)		
	Under Collateralized	Over Collateralized	Total	Median	Average Top 5 (\$ Million)	Option A (req'd)	Option B max (avail. credit, req'd)	Option C max(avail. credit -unsecured, req'd)
Current PMA	1,663,416	6,148,133	6,369,183	(24,832)	(84)	16.1%	2.9%	7.0%
Rolling 4-week Invoices + 2xUnbilled Obligation	1,525,119	5,753,819	5,952,514	(1,747)	(79)	13.0%	2.5%	5.2%



Option 5: Mixed 4-Week Invoices or 4-Week Invoices+ 2xUnbilled Obligations



- Collateral requirement was the rolling 4-week invoices for Spring/Fall, and the rolling 4-week invoices plus 2xUnbilled Obligations for Summer/Winter.
- On aggregate, PJM would hold \$38 million less than current collateral when using mixed 4 week invoices or 4-week invoices plus 2 times unbilled obligations.
- Compared to current PMA, this option provided smaller RMSE when both under and over collateralized, smaller median shortfall, and about the same failure rate.

	RMSE (lower is better)			Shortfall (less negative is better)		Failure Rate (lower is better)		
	Under Collateralized	Over Collateralized	Total	Median	Average Top 5 (\$ Million)	Option A (req'd)	Option B max (avail. credit, req'd)	Option C max(avail. credit -unsecured, req'd)
Current PMA	1,663,416	6,148,133	6,369,183	(24,832)	(84)	16.1%	2.9%	7.0%
Mixed 4-week + 4-week_2xUnbilled Obligation	1,601,653	4,974,869	5,226,339	(3,802)	(79)	16.2%	2.5%	6.2%

- Collateral requirements calculated by rolling 3-week invoices, rolling 4-week invoices, reduced total collateral requirements and total RMSE, but failed to collect enough collateral when members were under collateralized, and the failure rate increased.
- Adding current week unbilled obligations provided improvements:
 - Reduced RMSE when both under collateralized and over collateralized
 - Reduced median shortfall
 - Reduced failure rates
 - Collateral requirements did not change substantially than current calculation
- Current week unbilled obligation can be used for discretionary Unreasonable Credit Risk calls.

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Peak Market Activity



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