

How Different are State- and Farm-level Margins from the MPP Margin?: An Assessment for Pennsylvania

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Is the relationship between the national MPP margin and state- or farm-level margins consistent enough to use for MPP participation decisions?

A number of strategies for using the MPP program have been proposed, including a) maximize the expected value of MPP participation, b) use MPP consistent with a farm's liquidity and solvency risk, c) maximize expected returns subject to a limit on fees and premiums, d) select covered margin to match the historical coverage provided by MILC (see Decision Guide 14-04) or e) select margin coverage consistent with covering the farm's income over feed cost (IOFC) or other farm-specific margin. Other MPP Decision Guides summarize the historical financial outcomes for some of these strategies. This Decision Guide discusses the use of state- or farm-level margin measures like IOFC as a guideline for margin coverage level decisions under MPP.

Although the use of state- or farm-specific margins has an intuitive appeal, there are a number of potential challenges. One key challenge is determining the relationship between the national MPP margin coverage level and a farm-specific margin. A farm needs to be able to determine what level of MPP margin coverage is consistent with its farm-specific margin protection goals. **For this strategy to achieve its desired objective, there would need to be a reasonably consistent and predictable relationship between the national-level MPP margin and farm-specific margins.** We examined the relationship of the MPP margin from 2005 to 2013 with a state-level margin calculation (for Pennsylvania as an example) and for 2007 to 2013 for a farm-margin using the published IOFC for the Penn State Dairy herd.

Although the state-level and farm-level margin move up and down with the MPP margin (they are highly correlated), the average of monthly values of the

state- and farm-level margins are larger than the MPP margin and **the relationship is not constant over time** (Table 1 and Figure 1). The monthly value of the PSU IOFC margin shows a less consistent relationship with the MPP margin—it has been both as much as \$5.07/cwt above and \$2.35/cwt below the MPP margin since 2007—nor is the relationship consistent on an annual basis (Figure 2). In particular for an individual farm, the relationship between IOFC and MPP margin might not be constant for a variety of reasons, including management changes that improved IOFC over time or business models that differ from the national average price surveys (many farms grow a high proportion of feed and are less affected by increased feed prices in the short-run, when valued at production cost).

Although statistical methods like linear regression can be used to analyze the relationship between state- and farm-level margins and the MPP margin when data are available, a simple linear regression model based on the state-margin value or the PSU IOFC results in prediction errors (actual MPP value minus the statistical model's prediction) larger than \$1/cwt for one-third and three-quarters of the months during 2007 to 2013 respectively. More sophisticated methods could reduce these errors, but the key point is that **there does not appear to be a consistent, easily discernable relationship between state-level and farm-level margins and the national MPP margin** for the data we analyzed. This suggests that farms use this strategy cautiously, or apply a simpler rule that compares annual historical MPP margins to 'good', 'bad' or 'average' years on their farms and uses this as a guide for minimum margin coverage decisions.

Table 1. National MPP, Estimated Pennsylvania Margin and PSU IOFC and Difference Statistical Summary for 2007 to 2013

Indicator	MPP Margin (\$/cwt)	Pennsylvania Margin (\$/cwt)	PSU IOFC Margin (\$/cwt)	Pennsylvania Margin Less MPP Margin (\$/cwt)	PSU IOFC Margin Less MPP Margin (\$/cwt)
Average value	7.81	8.71	9.55	0.89	1.74
Median Value	8.01	8.93	10.25	0.87	1.62
Minimum value	2.25	2.98	4.00	-0.91	-2.35
Maximum Value	14.65	15.85	14.93	2.78	5.07
Coefficient of Variation	0.37	0.33	0.26	0.86	1.18

Pennsylvania Margin is calculated using the MPP formula, but with the Pennsylvania All-milk price, alfalfa hay prices and corn grain prices reported by NASS. PSU IOFC data are from <http://extension.psu.edu/animals/dairy/business-management/financial-tools/income-over-feed-cost/how-does-the-penn-state-dairy-herd-use-iofc/penn-state-dairy-herd-iofc-june-2014>. Coefficient of variation is calculated as the statistical standard deviation divided by the average.

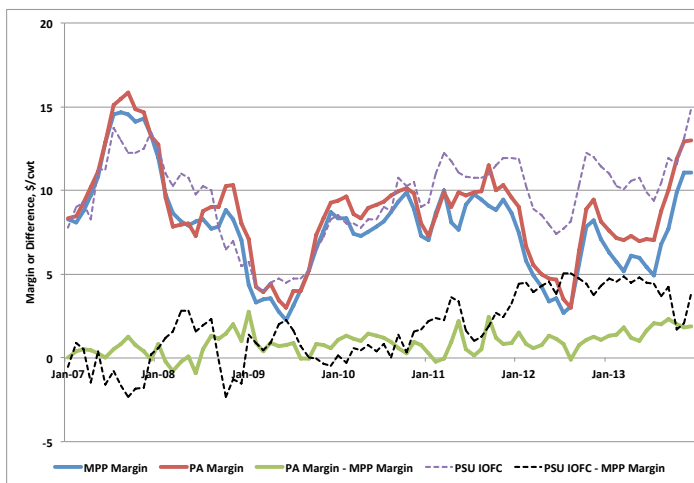


Figure 1. National MPP Margin, Estimated Pennsylvania Margin, PSU Dairy Herd IOFC and Their Differences, 2007 to 2013

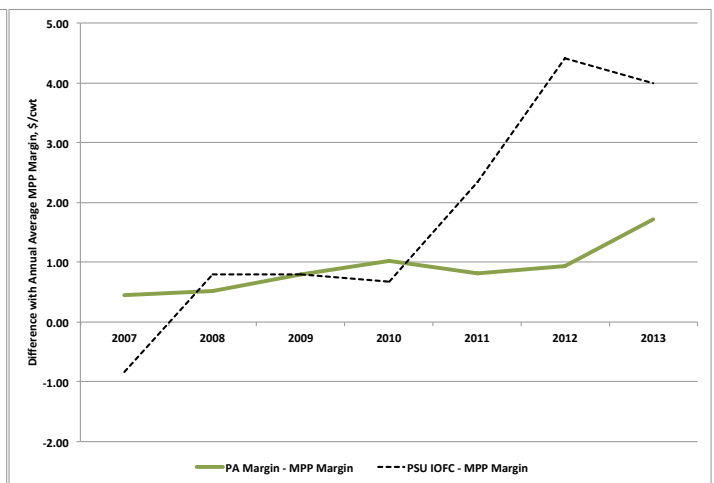


Figure 2. Estimated Annual Pennsylvania Margin and Annual PSU IOFC Less Annual Average MPP Margin, 2007 to 2013

Relationships between farm-level margins and the national MPP may not be consistent, so farm-specific margin data should be used cautiously to select MPP coverage levels.

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