

# **The Impacts on Dairy Farmers and Milk Markets of a Standalone Dairy Producer Margin Insurance Program**

*July 2012*

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# *The Impacts of a Dairy Producer Margin Insurance Program*

## Introduction

The rapid rise in corn and other feed prices beginning in 2007 and the low milk prices of 2009 led to a cost-price squeeze for dairy farmers that had not been seen since the early 1970s. This led to the realization that existing dairy safety net programs were inadequate to the new realities of dairy markets, and for that matter world agricultural markets. This led the National Milk Producers Federation (NMPF) to develop ideas for new safety net programs that would sweep away the existing Dairy Price Support Program and Milk Income Loss Contracts. NMPF made a very useful contribution to the discussion of volatility in dairy farm financial performance with a methodology for a milk and feed price margin calculation.<sup>1</sup> The Senate modified this basic idea in the dairy provisions of the Senate Agriculture Reform, Food, and Jobs Act of 2012<sup>2</sup>. The basic calculation determines the margin as the U.S. All Milk Price<sup>3</sup> minus the value of the ration where the ration value is calculated as:  $(1.0728 \times \text{corn price}^3) + (0.00735 \times \text{soybean meal price}^4) + (0.0137 \times \text{alfalfa hay price}^3)$ . This measure is a trigger for both the Dairy Producer Margin Protection Plan (DPMPP) and the Dairy Market Stabilization Plan (DMSP).

As the discussion of these two plans has developed over the last year or more, there are those who favor the margin insurance concept that is at the heart of the DPMPP and would like to explore its viability as a standalone dairy policy. Recent CBO analysis suggests that a variation of the two-tier premium model introduced in the Senate farm bill would be financially feasible, even favorable, from a budget perspective. This paper explores the potential effectiveness of a standalone plan based on parameters developed in a proposal developed by Congressman Goodlatte et al..

## The Proposed Margin Plan

The calculation of the Actual Dairy Producer Margin is shown (Figure 1) with historic values from January, 2006 through June, 2012 and with values projected through March, 2013 based on current futures market prices.

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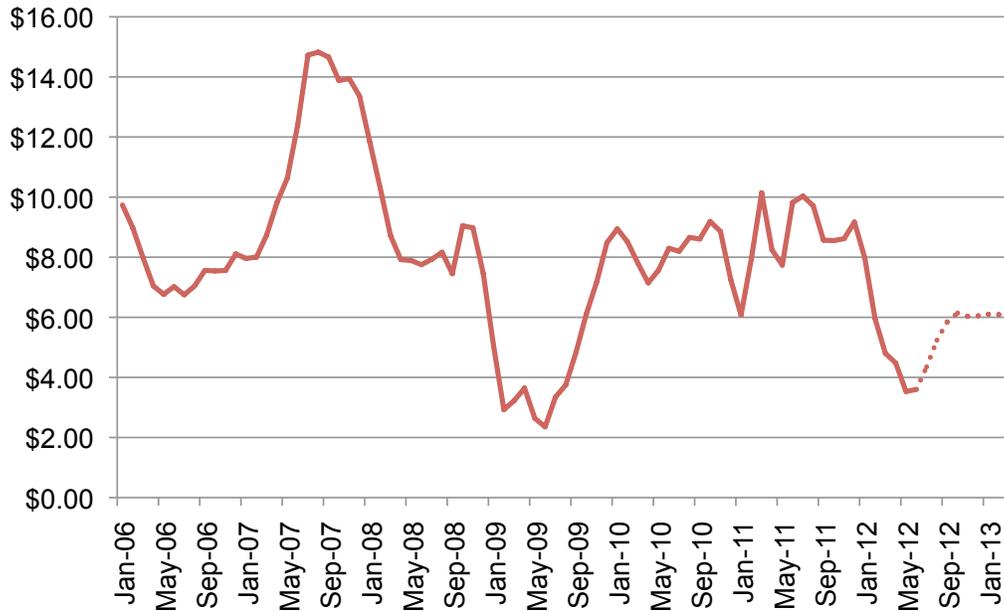
<sup>1</sup> National Milk Producers Federation. June, 2010. *Foundation for the Future*.

<sup>2</sup> commonly referred to as the "Farm Bill" <http://www.gpo.gov/fdsys/pkg/BILLS-112s3240es/pdf/BILLS-112s3240es.pdf>

<sup>3</sup> USDA's-NASS <http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1002>

<sup>4</sup> USDA's-AMS [http://www.ams.usda.gov/mnreports/gx\\_gr211.txt](http://www.ams.usda.gov/mnreports/gx_gr211.txt)

Figure 1. Actual and Forecast Dairy Producer Margins



The Goodlatte-Scott Amendment to the House Agricultural Committee’s mark of the Farm Bill (hereafter referred to as GSA), would repeal existing dairy policy in the form of the Dairy Product Price Support Program, the Milk Income Loss Contracts, and the Dairy Export Incentive Program, just as has been proposed in the Senate bill. It would replace those programs with a Margin Insurance Program (MIP) for dairy producers. The MIP would be in place from October 1, 2012 through September 30, 2017.

Producers are not compelled to participate in the MIP. They would be given one year from the date of enactment of the Farm Bill to make a participation decision. Each farm would have a fixed Production History based on the highest annual production in the three years prior to enactment of the bill<sup>5</sup>. At the time a participation decision is made, producers would also have to choose the level of margin protection from \$4.00 to \$8.00 in 50¢ increments, and the percentage of Production History to cover from 25% to 80%. This design is similar to other versions of the DPMPP, but combines the Basic and Supplemental components and establishes 80% as the maximum marketings coverage amount.

### Premiums

Annual premiums would be paid either by January 15 of each year or in biannual payments by January and June 15 of each year. These premium payments would be fixed for the expected five-year life of the MIP. Annual premium amounts are calculated as: **Production History x Coverage Percentage x Premium per Hundredweight** (Table 1). The premium rates vary based on the farm’s Production History. In 2011,

<sup>5</sup> Provision is made for new entrants into dairy, farm sale or lease, location transfer, etc.

approximately 86 percent of U.S. dairy farms had a production history of 4 million pounds of milk or less and they produce about 25 percent of the total milk volume.

Table 1. Applicable Premiums for Various Coverage Levels and Milk Volume

Coverage Level	Production History less than 4 million pounds	Production History more than 4 million pounds
\$4.00	\$0.000	\$0.030
\$4.50	\$0.010	\$0.045
\$5.00	\$0.020	\$0.066
\$5.50	\$0.035	\$0.110
\$6.00	\$0.045	\$0.185
\$6.50	\$0.090	\$0.290
\$7.00	\$0.180	\$0.380
\$7.50	\$0.600	\$0.830
\$8.00	\$0.950	\$1.060

This two-tier pricing model is similar to the Senate bill but it makes the very important mid-range coverage more affordable to larger scale farms. Catastrophic coverage levels of \$5 or lower are priced similarly, as are the shallow loss levels at \$7.50 and \$8. The \$6 to \$7 range represents a serious low margin that is consistent with normal cyclical lows of the last 15 years. This pricing structure provides the opportunity for meaningful coverage of genuinely poor years, beyond just catastrophic coverage.

### Indemnities

A participating producer will receive an indemnity payment whenever the average Actual Dairy Producer Margin is less than the elected coverage level threshold in any two-month period (defined as Jan/Feb, Mar/Apr, May/June, Jul/Aug, Sep/Oct, Nov/Dec). Historic and forecast values of these margins (Figure 1) are averaged in the two-month periods and subtracted from the coverage levels in Table 2 and shown as the indemnities that would have been paid in recent years.

Indemnities will be paid on either the percentage of Production History or current production, whichever is less. For instance, a producer with a Production History of 3,750,000 pounds of milk annually (37,500 cwt) with 80% coverage at the \$5.00 level, would have received  $(37,500 \times 80\% \div 6) \times \$2.50 = \$12,500$  for the months of May & June, 2009 if they had produced more than 500,000 pounds of milk in those two months. If they had only produced 400,000 pounds in those two months (less than their Production History), they would have received  $(4,000 \times \$2.50) = \$10,000$ . This is similar to the Senate version of DPMPP but a bit simplified.

Table 2. Historic and Forecast Indemnities Paid at Various Coverage Levels

Coverage:	\$4.00	\$4.50	\$5.00	\$5.50	\$6.00	\$6.50	\$7.00	\$7.50	\$8.00
Jan-07	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.02
Feb-07	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.02
Mar-07	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Apr-07	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
May-07	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Jun-07	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Jul-07	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Aug-07	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Sep-07	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Oct-07	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Nov-07	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Dec-07	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Jan-08	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Feb-08	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Mar-08	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Apr-08	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
May-08	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.18
Jun-08	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.18
Jul-08	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Aug-08	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Sep-08	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Oct-08	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Nov-08	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Dec-08	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Jan-09	\$0.01	\$0.51	\$1.01	\$1.51	\$2.01	\$2.51	\$3.01	\$3.51	\$4.01
Feb-09	\$0.01	\$0.51	\$1.01	\$1.51	\$2.01	\$2.51	\$3.01	\$3.51	\$4.01
Mar-09	\$0.57	\$1.07	\$1.57	\$2.07	\$2.57	\$3.07	\$3.57	\$4.07	\$4.57
Apr-09	\$0.57	\$1.07	\$1.57	\$2.07	\$2.57	\$3.07	\$3.57	\$4.07	\$4.57
May-09	\$1.50	\$2.00	\$2.50	\$3.00	\$3.50	\$4.00	\$4.50	\$5.00	\$5.50
Jun-09	\$1.50	\$2.00	\$2.50	\$3.00	\$3.50	\$4.00	\$4.50	\$5.00	\$5.50
Jul-09	\$0.45	\$0.95	\$1.45	\$1.95	\$2.45	\$2.95	\$3.45	\$3.95	\$4.45
Aug-09	\$0.45	\$0.95	\$1.45	\$1.95	\$2.45	\$2.95	\$3.45	\$3.95	\$4.45
Sep-09	\$0.00	\$0.00	\$0.00	\$0.02	\$0.52	\$1.02	\$1.52	\$2.02	\$2.52
Oct-09	\$0.00	\$0.00	\$0.00	\$0.02	\$0.52	\$1.02	\$1.52	\$2.02	\$2.52
Nov-09	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.17
Dec-09	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.17
Jan-10	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Feb-10	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Mar-10	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.03	\$0.53
Apr-10	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.03	\$0.53
May-10	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.07
Jun-10	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.07
Jul-10	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Aug-10	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Sep-10	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Oct-10	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Nov-10	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Dec-10	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

Table 2. Historic and Forecast Indemnities Paid at Various Coverage Levels (cont.)

Coverage:	\$4.00	\$4.50	\$5.00	\$5.50	\$6.00	\$6.50	\$7.00	\$7.50	\$8.00
Jan-11	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.49	\$0.99
Feb-11	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.49	\$0.99
Mar-11	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Apr-11	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
May-11	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Jun-11	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Jul-11	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Aug-11	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Sep-11	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Oct-11	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Nov-11	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Dec-11	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Jan-12	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.04	\$0.54	\$1.04
Feb-12	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.04	\$0.54	\$1.04
Mar-12	\$0.00	\$0.00	\$0.00	\$0.46	\$0.96	\$1.46	\$1.96	\$2.46	\$2.96
Apr-12	\$0.00	\$0.00	\$0.00	\$0.46	\$0.96	\$1.46	\$1.96	\$2.46	\$2.96
May-12	\$0.00	\$0.00	\$0.40	\$0.90	\$1.40	\$1.90	\$2.40	\$2.90	\$3.40
Jun-12	\$0.00	\$0.00	\$0.40	\$0.90	\$1.40	\$1.90	\$2.40	\$2.90	\$3.40
Jul-12	\$0.00	\$0.00	\$0.00	\$0.40	\$0.90	\$1.40	\$1.90	\$2.40	\$2.90
Aug-12	\$0.00	\$0.00	\$0.00	\$0.40	\$0.90	\$1.40	\$1.90	\$2.40	\$2.90
Sep-12	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.39	\$0.89	\$1.39
Oct-12	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.39	\$0.89	\$1.39
Nov-12	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.14	\$0.64
Dec-12	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.14	\$0.64
Jan-13	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.34	\$0.84
Feb-13	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.34	\$0.84

### Individual Producer Impacts

One can begin to understand individual producer impacts by calculating what premium payments and indemnities received would have been over a recent historic past. Using the same months as in Table 2, premiums, indemnities and net payments are calculated for four example herd sizes. Tables 3 and 4 show these values for the January, 2007 through February, 2013 time period for small, medium, large, and extra large farms corresponding to herd sizes of 100, 250, 500 and 1,000 cows respectively. The herds begin at these sizes in 2007 with the average production per cow of just less than 20,000 pounds. Over the time period, the combined average herd sizes and milk per cow increase at an annual compound rate of 5.21%—the rate at which the U.S. milk production per farm remaining in production grew during that time period. Table 3 shows an elected coverage level of 80% of Historic Production while Table 4 displays the same calculations for 25% of Historic Production.

Table 3. Premiums and Indemnities Paid, and Net Payments at 80% Coverage of Production History

Goodlatte/Scott	80% Coverage	\$4.00	\$4.50	\$5.00	\$5.50	\$6.00	\$6.50	\$7.00	\$7.50	\$8.00
	< 4 million Premium	\$0.000	\$0.010	\$0.020	\$0.035	\$0.045	\$0.090	\$0.180	\$0.600	\$0.950
	> 4 million Premium	\$0.030	\$0.045	\$0.066	\$0.110	\$0.185	\$0.290	\$0.380	\$0.830	\$1.060
Premiums Paid	Small Farm	\$0	\$1,008	\$2,016	\$3,528	\$4,536	\$9,073	\$18,146	\$60,486	\$95,769
	Medium Farm	\$7,561	\$11,341	\$16,634	\$27,723	\$46,624	\$73,087	\$95,769	\$209,180	\$267,145
	Large Farm	\$15,121	\$22,682	\$33,267	\$55,445	\$93,249	\$146,174	\$191,538	\$418,360	\$534,291
	Xlarge Farm	\$30,243	\$45,364	\$66,534	\$110,891	\$186,498	\$292,348	\$383,076	\$836,720	\$1,068,582
Indemnities Received	Small Farm	\$6,911	\$12,360	\$18,906	\$28,146	\$39,044	\$49,943	\$61,996	\$78,324	\$98,582
	Medium Farm	\$17,278	\$30,901	\$47,266	\$70,365	\$97,611	\$124,856	\$154,990	\$195,809	\$246,456
	Large Farm	\$34,557	\$61,802	\$94,532	\$140,730	\$195,221	\$249,713	\$309,980	\$391,618	\$492,912
	Xlarge Farm	\$69,113	\$123,605	\$189,064	\$281,459	\$390,442	\$499,426	\$619,960	\$783,237	\$985,824
Net Payments	Small Farm	\$6,911	\$11,352	\$16,890	\$24,618	\$34,508	\$40,870	\$43,850	\$17,838	\$2,813
	Medium Farm	\$9,718	\$19,560	\$30,633	\$42,642	\$50,986	\$51,769	\$59,221	-\$13,371	-\$20,689
	Large Farm	\$19,435	\$39,120	\$61,265	\$85,284	\$101,972	\$103,539	\$118,442	-\$26,741	-\$41,379
	Xlarge Farm	\$38,870	\$78,240	\$122,530	\$170,568	\$203,945	\$207,078	\$236,883	-\$53,483	-\$82,758
Net Payments per cwt Milk Produced	Small Farm	\$0.05	\$0.07	\$0.11	\$0.16	\$0.23	\$0.27	\$0.29	\$0.12	\$0.02
	Medium Farm	\$0.03	\$0.05	\$0.08	\$0.11	\$0.13	\$0.14	\$0.16	-\$0.04	-\$0.05
	Large Farm	\$0.03	\$0.05	\$0.08	\$0.11	\$0.13	\$0.14	\$0.16	-\$0.04	-\$0.05
	Xlarge Farm	\$0.03	\$0.05	\$0.08	\$0.11	\$0.13	\$0.14	\$0.16	-\$0.04	-\$0.05

Table 4. Premiums and Indemnities Paid, and Net Payments at 25% Coverage of Production History

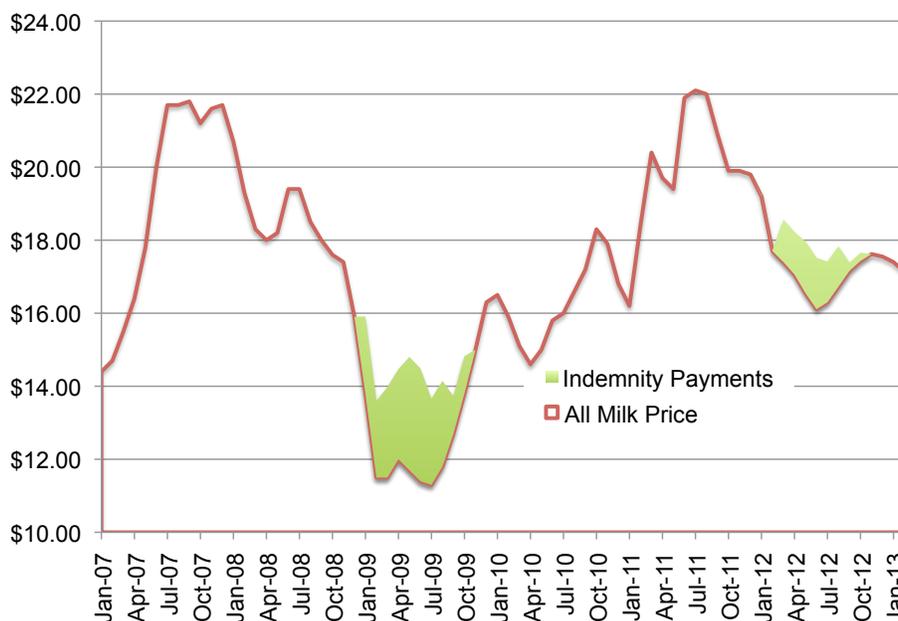
Goodlatte/Scott	25% Coverage	\$4.00	\$4.50	\$5.00	\$5.50	\$6.00	\$6.50	\$7.00	\$7.50	\$8.00
	< 4 million Premium	\$0.000	\$0.010	\$0.020	\$0.035	\$0.045	\$0.090	\$0.180	\$0.600	\$0.950
	> 4 million Premium	\$0.030	\$0.045	\$0.066	\$0.110	\$0.185	\$0.290	\$0.380	\$0.830	\$1.060
Premiums Paid	Small Farm	\$0	\$315	\$630	\$1,103	\$1,418	\$2,835	\$5,671	\$18,902	\$29,928
	Medium Farm	\$2,363	\$3,544	\$5,198	\$8,663	\$14,570	\$22,840	\$29,928	\$65,369	\$83,483
	Large Farm	\$4,725	\$7,088	\$10,396	\$17,327	\$29,140	\$45,679	\$59,856	\$130,737	\$166,966
	Xlarge Farm	\$9,451	\$14,176	\$20,792	\$34,653	\$58,281	\$91,359	\$119,711	\$261,475	\$333,932
Indemnities Received	Small Farm	\$2,160	\$3,863	\$5,908	\$8,796	\$12,201	\$15,607	\$19,374	\$24,476	\$30,807
	Medium Farm	\$5,399	\$9,657	\$14,771	\$21,989	\$30,503	\$39,018	\$48,434	\$61,190	\$77,017
	Large Farm	\$10,799	\$19,313	\$29,541	\$43,978	\$61,007	\$78,035	\$96,869	\$122,381	\$154,035
	Xlarge Farm	\$21,598	\$38,626	\$59,083	\$87,956	\$122,013	\$156,071	\$193,737	\$244,761	\$308,070
Net Payments	Small Farm	\$2,160	\$3,548	\$5,278	\$7,693	\$10,784	\$12,772	\$13,703	\$5,574	\$879
	Medium Farm	\$3,037	\$6,113	\$9,573	\$13,326	\$15,933	\$16,178	\$18,507	-\$4,178	-\$6,465
	Large Farm	\$6,073	\$12,225	\$19,145	\$26,651	\$31,866	\$32,356	\$37,013	-\$8,357	-\$12,931
	Xlarge Farm	\$12,147	\$24,450	\$38,291	\$53,303	\$63,733	\$64,712	\$74,026	-\$16,713	-\$25,862
Net Payments per cwt Milk Produced	Small Farm	\$0.01	\$0.02	\$0.03	\$0.05	\$0.07	\$0.08	\$0.09	\$0.04	\$0.01
	Medium Farm	\$0.01	\$0.02	\$0.03	\$0.03	\$0.04	\$0.04	\$0.05	-\$0.01	-\$0.02
	Large Farm	\$0.01	\$0.02	\$0.03	\$0.03	\$0.04	\$0.04	\$0.05	-\$0.01	-\$0.02
	Xlarge Farm	\$0.01	\$0.02	\$0.03	\$0.03	\$0.04	\$0.04	\$0.05	-\$0.01	-\$0.02

Tables 3 and 4 show the total amount of premiums that would have been paid over the 6-year time period. It also shows the total amount of the indemnities that would have been received at the various levels of coverage. The third block of values for the four farm sizes shows the net payments (indemnities received minus premiums paid) and the final block shows the net payments on a per hundredweight basis of total milk produced.

These tables indicate that producers would have wanted to focus on insurance in the \$6.00 to \$7.00 range with coverage above \$7.00 showing net losses. Unlike the Senate version of the dairy provisions, the GSA does not have a market stabilization program linked to participation in the MIP. With the Senate provisions, a \$4.00 margin coverage for farms with less than 4 million pounds of milk production would also had a \$0.00 premium fee. However, it would still come with the obligation to participate in market stabilization and thus a portion of milk production would not receive payment during trigger events. This obligation with few indemnities paid makes the free base a potentially costly strategy. The MIP, unencumbered from milk stabilization, may make the \$4.00 margin coverage an appealing strategy for catastrophic protection of small producers. There is no cost and, although it is not expected to pay indemnities very frequently, it would have been a significant help to producers for half of 2009.

It can be seen in Table 2 that there were periods in 2009 and 2012 when indemnities would have been paid at many margin coverage levels. The sum of those activities are reflected in Tables 3 and 4 but the impact on price over time is not shown. Figure 2 does show the All Milk Price and the indemnities that would have been paid per total hundredweight of milk produced with the \$7.00 margin and 80% coverage of Production History.

Figure 2. Contribution of Indemnity Payments to the All Milk Price\*



\*Calculated at the \$7.00 margin with 80% coverage of Production History

## A Dynamic Model Analysis

Using historical data provides an easy way to estimate impacts under "what if" scenarios. However, it is always appealing to look at how producers might make different production decisions and markets might respond differently when policies are changed in the future. A dynamic model of the US dairy sector is also used to evaluate the MIP. This model has been used many times on analyses including the National Milk Producer's Federation program referred to as the Foundation for the Future and on the later version known as the Dairy Security Act of 2012.<sup>6</sup>

This model may be uniquely qualified to address the dynamic nature of volatility in dairy markets, to analyze how producers and markets change from month to month. What is unknown and must be assumed is the degree of producer participation in the MIP, the coverage level and the percentage of Production History selected. Various levels of all assumptions are run to bracket the market impacts of the program.

## Scenarios Considered

Model results are compared to a baseline. The time period begins with January, 2010 and simulates results of a policy period from October, 2012 through September, 2017. The baseline for comparison keeps all current dairy programs in place. However, all scenarios of the MIP repeals the DPPSP, MILC and DEIP. Descriptions of various participation rates are shown below and labeled as "Low", "Medium", and "High" reflecting different participation rates.

Table 5. Margin Insurance Program Scenarios Modeled.

<b>Scenario</b>	<b>Percent of Milk Participating</b>	<b>Percent of Production History Covered</b>	<b>Margin Level Protection</b>
Low	30%	75%	\$6.00
Medium	50%	50%	\$6.00
High	80%	80%	\$7.00

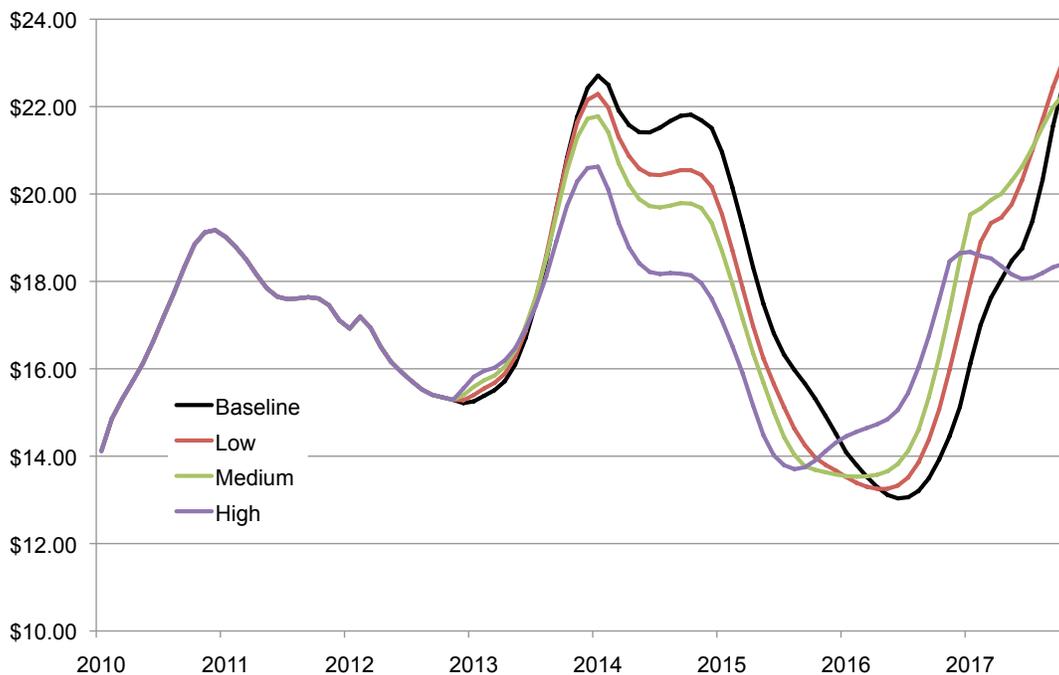
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<sup>6</sup> <http://dairy.wisc.edu/PubPod/Pubs/DSA%20Farm.pdf> and <http://dairy.wisc.edu/PubPod/Pubs/DSA%20Market.pdf>

## Modeling Results

The Baseline All Milk price shows patterns of volatility similar to what has been seen in recent years. The basic pattern of high prices and low prices is not changed, but it can be seen that at higher levels of participation, the alteration of individual producer decisions does have a market-wide impact. Because the volatility of individual net farm operating income is smoothed by the use of the MIP, price risk is reduced and modestly increased milk production results. Collectively, the modest increase in milk production has a tendency to reduce average All Milk prices. The Low level scenario reduces the All Milk price by about 10 cents per hundredweight. It should also be noted that at high levels of participation market price volatility is also reduced.

Figure 3. All Milk Price for Baseline and Three Scenarios of Participation.\*



\* Program implemented October 1, 2012.

Table 6 shows the number of months during the MIP that farms of different sizes and under the different scenarios experienced negative net farm operating income (NFOI). Several observations can be drawn from this data: 1) there are fewer months of negative NFOI with higher rates of participation as market prices are moderated, 2) although the lows aren't as low nor as persistent, the highs are also lower and the average NFOI is somewhat lower for all farms, 3) farms participating in the MIP have a somewhat lower average NFOI than non-participants but they have many fewer months with negative NFOI.

Table 6. Months with Negative Net Farm Operating Income.

	Baseline	Low Participation	Medium Participation	High Participation
Small, Non-participating	0	0	0	0
Small, Participating	0	0	0	0
Medium, Non-participating	7	12	11	5
Medium, Participating	7	4	0	0
Large, Non-participating	9	10	8	1
Large, Participating	9	0	0	0
Extra Large, Non-participating	4	5	0	0
Extra Large, Participating	4	0	0	0

These results demonstrate quite clearly that there are risk/return tradeoffs. Some farms, either because of low risk preferences or because of high leverage (debt), would wish to avoid the likelihood of a bad outcome and choose to participate in the MIP. Those farms with greater tolerance for risk and with a solid degree of equity in their businesses, might choose to forego the MIP and pursue the higher average returns, despite the increased risk.

### Government Expenditures

The model structure and assumptions used in the analysis are different than those employed by the Congressional Budget Office for the official scoring of proposals. However, the dynamic model does allow for the calculation of government expenditures that are internally consistent across different policy options. The results show budget savings from MIP over current programs for most scenarios and most likely outcomes of adoption. High participation levels could cost somewhat more than existing policy, but this is not inconsistent with the participation levels assumed by CBO. It simply makes the point that until farmers actually have the ability to choose, one cannot know.

### Conclusions

Price volatility has become an issue for many dairy producers causing increased risk to their businesses. The volatility exists in both milk and, more recently, feed prices. The resulting wide swings in profitability have caused the industry to look to policy-makers for additional tools to buffer market impacts.

A simple margin insurance program can be an effective risk management tool. An ex-post analysis of recent milk and feed prices shows that producers would have benefited from purchasing a Milk Insurance Program policy. At the \$7.00 level of margin, producers would have received indemnity payments in 10 months of the very difficult 2009 year and are projected to receive more modest indemnity payments for an additional 10 months in 2012.

Widespread use of a Margin Insurance Program can also have a moderating impact on market prices themselves. As individual producers respond to more stable net farm operating income, their production patterns moderate and increase slightly. Collectively, this causes a somewhat lower average, but more stable, market price.

Under many scenarios government expenditures for indemnity payments, net of premiums collected, are lower than expenditures under existing programs. However, very high rates of participation could cause expenditures to be somewhat higher than current programs.

A margin insurance program would likely be welcomed by the dairy industry as a useful tool to employ against the increased risk of price volatility. Such a program must provide meaningful protection that does not have certain costs that negate or seriously reduce an expected benefit. Farmers will ultimately reveal the extent to which they are interested in a new margin program. High rates of participation that are modeled in this paper are not a likely initial response. The low to medium scenarios of adoption are the more likely outcomes.

This analysis illustrates that a standalone margin insurance plan could provide meaningful margin protection to all dairy farmers and significantly help them cope with the unusual market volatility present today. This could be both an effective tool for farmers and be affordable in times of very tight federal budgets.