DMaP
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Information Letter Series

Margins During the Dairy Price Cycle—Will This Time Be Different?

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In a recent article[2] published in *Agribusiness: an International Journal*, we discussed our analysis of cycles in the U.S. All-milk price. We found that since 1996 there have been five complete price cycles, with an average duration of about 39 months and recent amplitude (difference between peak and trough values) of more than $5.50/cwt (Figure 1). As noted by Andrew Novakovic in Information Letter 14-03 and by a number of other industry analysts, milk prices have entered the downward part of the price cycle after the peaks of 2014, and key questions about milk prices—and margins—are: how low will they go and for how long? The trough of recent price cycles resulted in a good deal of financial pressure for many dairies and influenced the development and implementation of the Margin Protection Program for Dairy (MPP-Dairy). Going forward, margins and expected margins will influence farmer decisions for coverage levels under MPP-Dairy, and the decision for coverage in 2016 appears to be a more challenging one than for 2014 or 2015. Given that, this information letter has two purposes:

1. To summarize the patterns of the All-milk and price and MPP margin during milk price cycles during the past 15 years;
2. To examine alternative forecasts of All-milk prices and MPP margins for the current cycle, which is expected to last until the next price peak in 2017, and compare them to previous cycles.

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[2] Nicholson, Charles F. and Mark W. Stephenson. 2015. Milk Price Cycles in the U.S. Dairy Supply Chain and Their Management Implications. Agribusiness: an International Journal. DOI: 10.1002/agr.21416

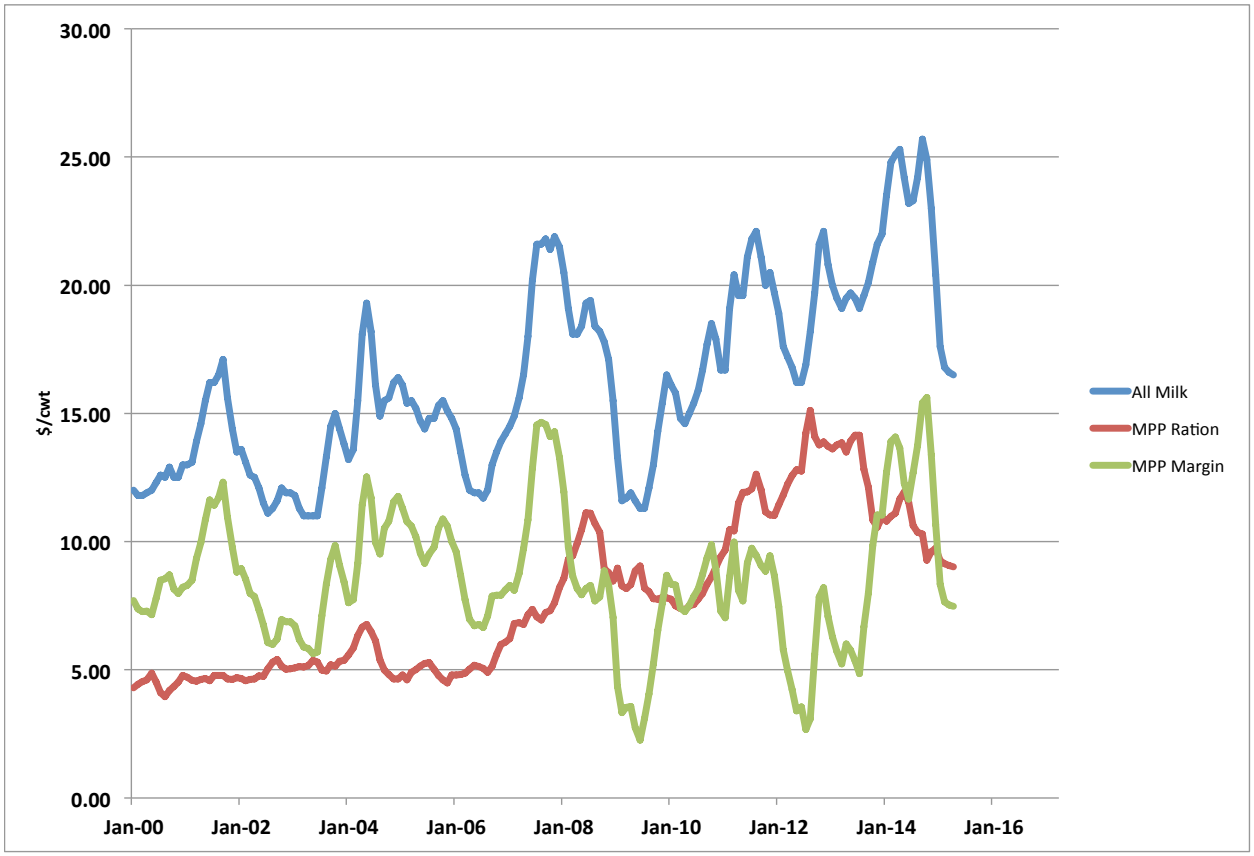

Figure 1. U.S. All-milk Price, MPP Ration Value and MPP Margin, 2000-2015

Patterns in Previous Price Cycles

Although our previous analysis indicated that the average length of a price cycle was a 39 months, the price cycles since 2000 have been somewhat longer (40 months on average), and the difference between peak and trough values for the All-milk price and MPP margin has varied (Table 1). The variation in the length and amplitude of the cycles presents challenges for forecasting and decision making. In addition, the pattern of prices has differed during the previous four cycles (Figure 2). The three cycles before 2011 varied in length from 33 to 48 months, and the low-price point of the cycle was reached from 20 to 27 months after the start of the cycle. Despite quite different starting (peak) milk prices and timing, the lowest All-milk price was similar for each of these cycles, less than $12.00/cwt. The most recent complete cycle from 2011 to 2014 stands out because its lowest price is about $5.00/cwt higher, a value near the peak was reached in late 2012 (just a year after the 2011 peak), the time to reach the lowest value is shorter, and the price peak reached at the end of the price cycle is significantly higher. This raises questions about how the current price cycle will evolve: will it be more like 2011-2014, or more like prior cycles?

Table 1. Characteristics of Four Recent Milk Price Cycles, 2001 to 2014

Characteristic of Price Cycle	Cycle (Beginning-Ending Year)			
	2001-2004	2004-2007	2007-2011	2011-2014
Length of cycle, months	33	41	48	38
Lowest All-milk Price, $/cwt	11.00	11.70	11.30	16.20
When Low Point of All-milk Price Reached, months after peak	20	27	22	10
Lowest MPP Margin Value, $/cwt	5.63	6.64	2.25	2.67
Average MPP Margin Value, $/cwt	8.02	10.09	7.97	8.30
Amplitude of All-milk price, $/cwt	6.10	7.60	10.50	5.90
Amplitude of MPP Margin, $/cwt	6.68	5.89	12.31	6.80

Note: We define the length of the cycle as the length of time between peak All-milk price values and the amplitude as the difference between the peak and lowest all-milk price value. This is a simpler approach than that used in Nicholson and Stephenson (2015), which identifies cyclical components of price behavior controlling for other factors. Amplitude of the MPP margin is defined as the difference between the margin value at the peak All-milk price and the lowest MPP margin value.

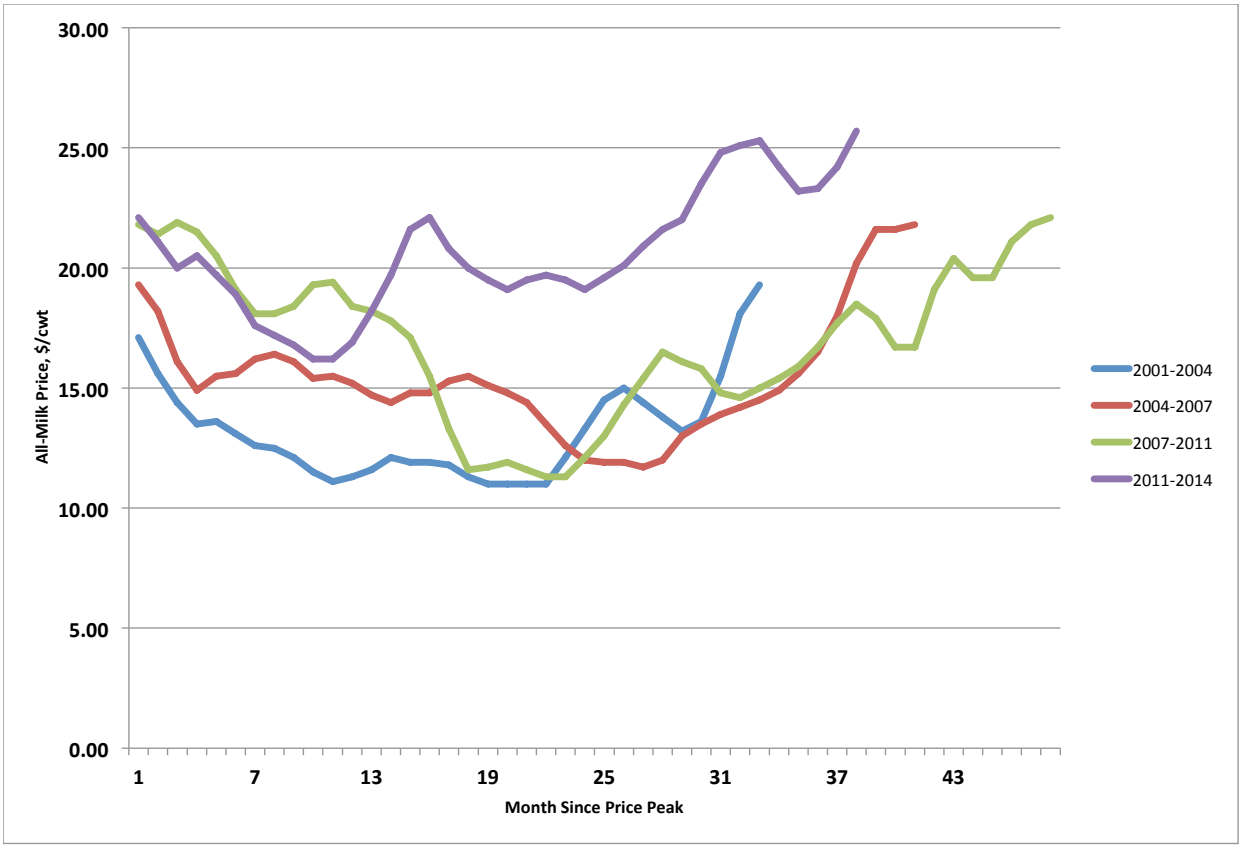

Figure 2. U.S. All-milk Price During Four Recent Milk Price Cycles

The patterns of margins during the price cycle can differ somewhat from those of the All-milk price because feed prices also vary over time. In our previous analyses, we noted that cycles in milk prices exist even when the effect of feed prices is accounted for, and in that sense, changes in feed prices are not the underlying "cause" of cycles in prices and margins. The four most recent cycles differ in the lowest margin observed and the average margin during the cycle (Table 1). Although the cycle from 2004-2007 recorded a lowest price of $11.70/cwt, the lowest margin recorded during the cycle was nearly $4.50/cwt higher than the lowest MPP margin during the 2007-2011 cycle ($6.64/cwt versus $2.25/cwt), and the average margin was more than $2.00/cwt larger during 2004-2007 than during 2007-2011. The most recently completed cycle (2011-2014) started from a lower initial margin value than the previous three cycles (by more than $2.00/cwt) due to higher feed costs, but ended with margins higher than the 2004-2007 cycle (Figure 3).

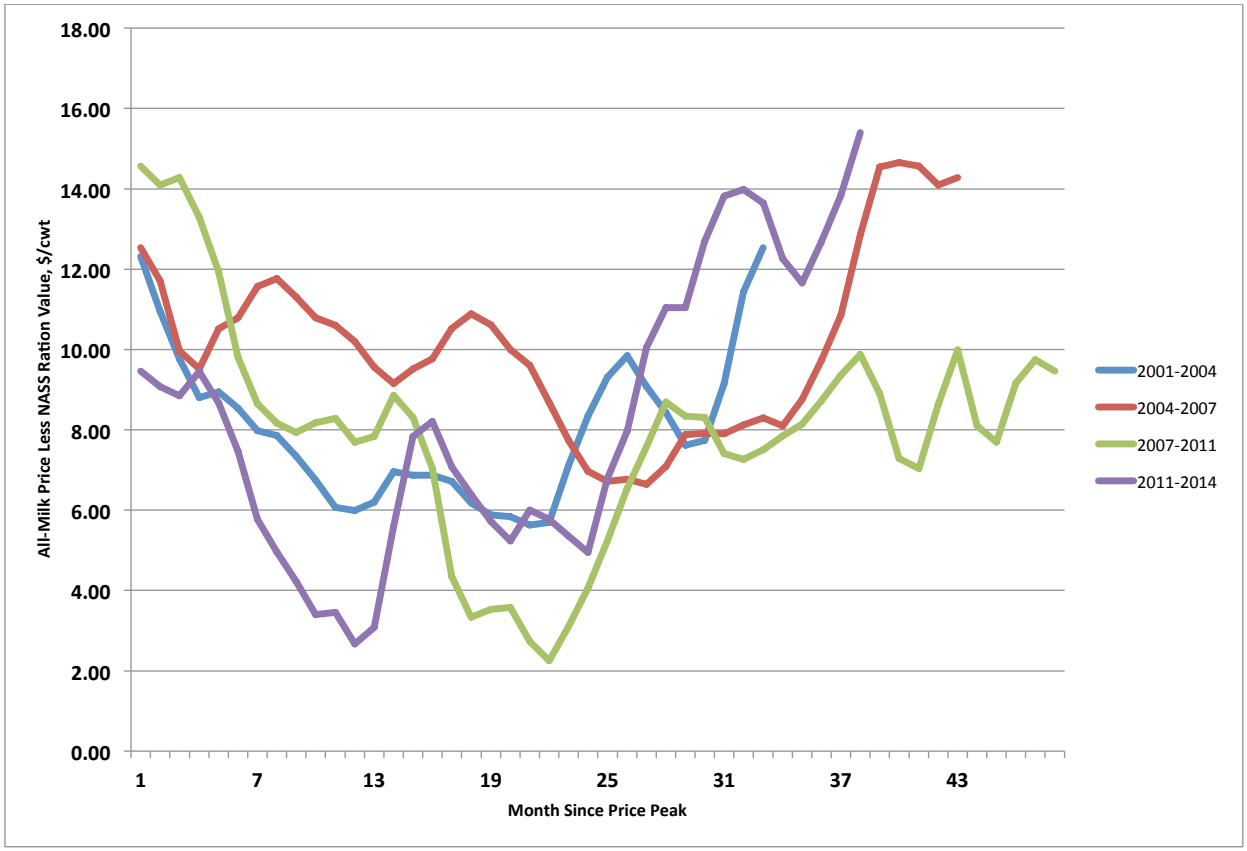

Figure 3. MPP Margin During Four Recent Milk Price Cycles

Forecasts for The Current Price Cycle

As noted above, a key question is what the current cycle will look like in terms of its duration, amplitude and low price point. Although the current cycle began with much higher margins than any previous one, the margin value has experienced a faster decline than the previous four cycles and as of April 2015 was below the values of three of the other cycles based on the number of months after the price peak (Figure 4). We examined three projections of future margins using the same statistical modeling approach (but with updated data) as in our previously-cited article, futures market forecasts, and a dynamic simulation model[3]. The statistical model predicts a relatively short cycle (27 months), with an amplitude in the All-milk price of $9.22/cwt and a period where the MPP margin is below $8.00/cwt extending only through August 2015. The statistical model predicts a relatively rapid increase in the All-milk price, with a new price peak in November 2016 at just above $22.00/cwt and the MPP margin reaching nearly $14.00/cwt. The forecast for the All-milk price based on future market values is similar to the statistical model through February 2016, then increases more slowly. (The peak of the cycle based on futures market cannot be determined because the data only go 18 months into the future.) Future markets predict an

[3] *Nicholson, Charles F. and Mark W. Stephenson. 2015. Dynamic Market Impacts of the Dairy Margin Protection Program. Journal of Agribusiness, in press.*

MPP margin above $8.00/cwt beginning in June 2015. The dynamic simulation model predicts a longer cycle (40 months), with an amplitude of $10.22/cwt and a period where the MPP margins is below $8.00/cwt through September 2016. The pattern predicted by the simulation model is similar to those observed during the 2001-2004 and 2007-2011 cycles, but without the large price drop that occurred in the more recent cycle.

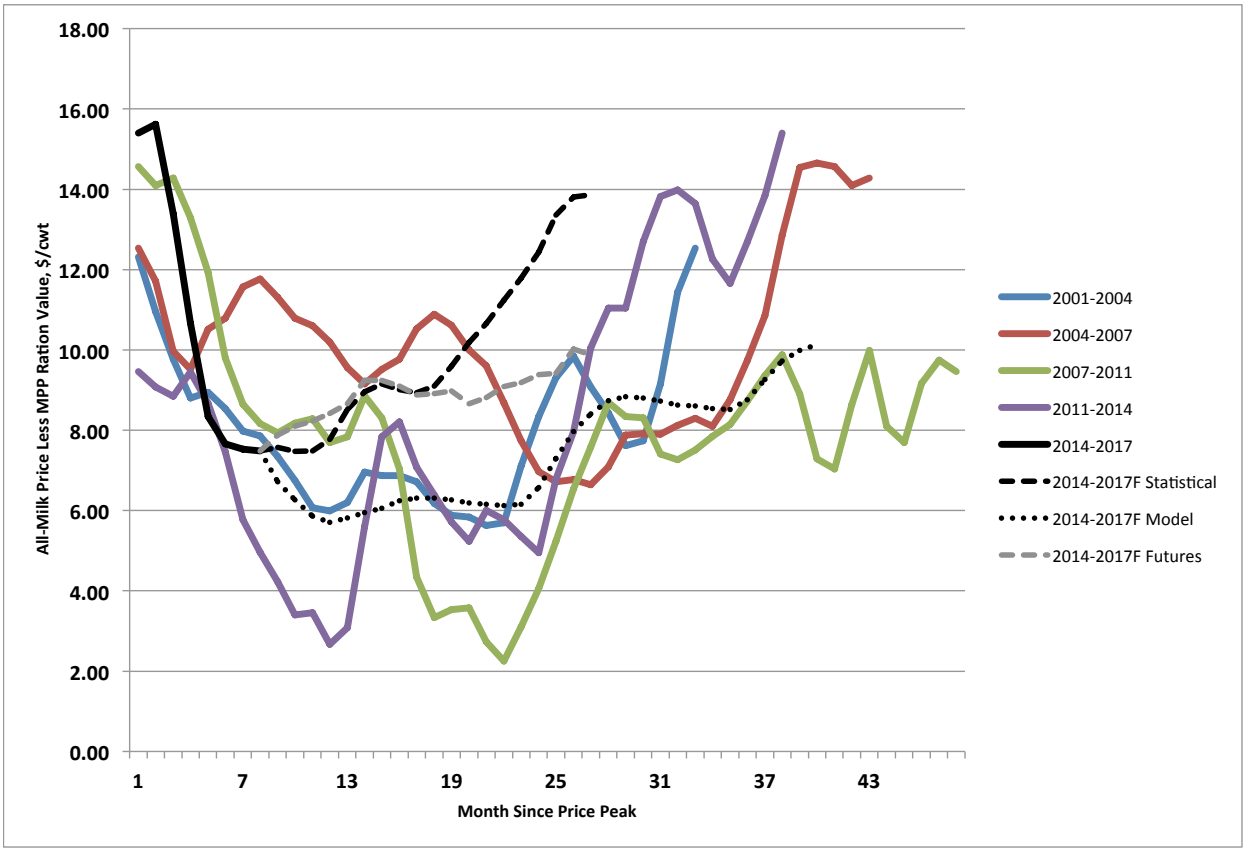

Figure 4. . Margin (All-milk Price Less NASS Ration Value) During Four Recent Milk Price Cycles, Actual and Forecast Values for the Projected 2014-2017 Milk Price Cycle

Concluding Comments

It is clear from the foregoing that although the occurrence of cyclical behavior in milk prices and margins is predictable, the *amplitude and length of the cycles* can vary a good deal based on a variety of factors, including their starting point and random shocks. Forecasts for the margins during the current cycle through 2017 vary from quite optimistic--a short cycle with a limited number of months with an MPP margin below $8.00/cwt (the statistical forecast)—to a cycle close to the average length of 40 months, with a prolonged period of where the MPP margin is below $8.00/cwt (the simulation model). Futures market forecasts are similar to the statistical forecasts through early next year, then shows more moderated increases. The differences in the forecasts and the implications suggests that dairy decision makers should closely monitor the future evolution of margin values during the period for MPP-Dairy signups for 2016, which runs from July 1 to September 30, 2015.