

The unnoticed milk price cycle



Dr Wagner Beskow and his wife Angela, who also studied at Massey, at Tambo Experimenta dairy research unit, Brazil.

Price movements tend to be displayed by the year, and often less than 10 years are considered and plotted. Figure 1 is an example.

This approach works fine when the aim is to point out contrasts between consecutive years or changes within years, but important information can be lost from such a fragmented process.

It seems this is what has happened to our understanding of dairy commodity prices as it appears there is a price cycle in the background that has gone unnoticed for decades.

If the same price series is plotted for its full length with 24 years of data, a new dimension is revealed (Figure 2). The historical September 2007 peak stands out, price bumps become larger over time showing greater volatility, and troughs or local minimum prices also go up.

A pattern is formed by the up and down waves that repeat themselves at roughly regular intervals. None of these is revealed by the type of plotting

used in Figure 1.

I noticed this wave pattern in early 2008 when prices were starting to fall, leading to the expectation of a hard and well-defined drop. But the predominant view around the world at that time indicated the maintenance of high prices.

2008 prediction

The following forecast was issued to Brazilian dairy farmers in early October 2008, before the onset of the world economic crisis (Beskow, 2008): “dairy commodity prices are expected to continue to fall until April 2009, whole milk powder [WMP] reaching a bottom price between US\$2100-\$1900/t FOB Oceania, to rebound from June 2009, possibly to new record prices”.

WMP was trading at US\$3700/t then. It is now known that dairy commodity prices fell until July, WMP reached US\$1700/t and the rebound started two months later than the forecast indicated.

➡ 42

Figure 1. ANZ dairy commodity price index from January 2005 to December 2009, as an example of how price changes are commonly displayed.

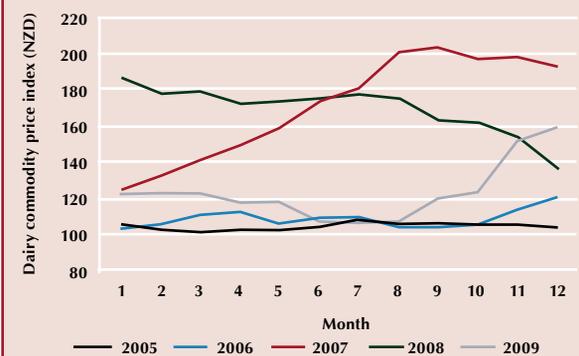
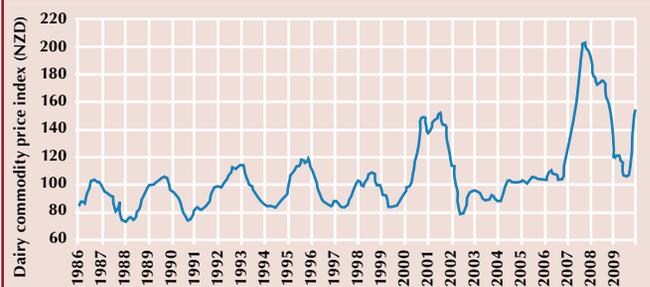


Figure 2. ANZ dairy commodity price index from January 1986 to December 2009.



➔ From 40

At the time, the technique used was technical analysis, also known as graphical analysis, developed by financial market analysts. While meaningful to some people, it is subject to criticism because of its empirical nature and assumptions.

Also, it couldn't provide answers to the following questions: Is there really a cycle there? How is it formed and where does it come from? Why did the 2004/05 wave not form?

Recently, a more scientific approach was employed, which attempted to uncover the underlying forces beneath the waves. This was achieved through a mathematical method called "wavelet transform".

As with the previous approach, it doesn't depend on direct knowledge of supply and demand, the real forces that determine price movements, that are so difficult to quantify.

Symphony music

The process will be further explained but let's imagine that the line shown in Figure 2 is a complex music played by a symphony orchestra. The

wavelet transform technique breaks down this music into sounds coming from each of the individual instruments that make up the orchestra and plots them in separate lines.

For someone, especially an economist dedicated to understanding the intricate behaviour of systems formed by pasture, cows, humans and markets, this looks very exciting. A very complex system is revealing some of its secrets...

So seven, well-defined waves (the "instruments") were found, with their periods ranging from three to 286 months.

To help understand them better they were grouped into short, medium, and long waves, as if they were strings, woodwinds, and brass or percussion instruments. The

three distinct wave groups are shown in Figure 3.

Note that the waves oscillate around zero, contributing either to the local rise or fall of prices and that the sum of

the three wave groups at each moment in time equals the price movement.

• The **short wave** group, as shown by the black line in Figure 3, explains the jigsaw effect on prices seen in Figure 2. It has a very limited span and amplitude, repeating itself every four months (± 0.3) on average

(± 95 percent confidence interval).

• The **medium wave** group, the red line, are the forces determining the regular waves depicted in Figure 2. They complete a cycle in 36 months (± 0.5), ie three years.

• The **long wave**, or blue line, describes a general trend over time and is the group of forces that have been driving prices up in the long run. Its period is 96 months (± 3.8), ie eight years. It has not yet had the chance to repeat itself enough times so its behaviour is still unfolding.

Very exciting

For someone, especially an economist dedicated to understanding the intricate behaviour of systems formed by pasture, cows, humans and markets, this looks very exciting. A very complex system is revealing some of its secrets and it's very tempting for anyone, let alone a curious scientist, to fiddle with it.

In part two of this article, I will attempt to relate these waves to concrete things like cows, seasons, inflation and new dairy markets.

This will, I hope, allow us to gain a deeper understanding of the whole system, be able to see where the market is heading and, more importantly, know what we can do to protect ourselves in bad times and take the best of the good times. The more predictable the market becomes, the safer it is for everyone.

• Dr Wagner Beskow (wagnerbeskou@gmail.com) is a Brazilian scientist who did his masters and PhD in grazing systems at Massey University. Originally a lecturer in farm management, most of his work has been concentrated into understanding and improving grass-based dairy farming efficiency and profitability. He now works for CCGL Tecnologia, a secondary agricultural cooperative in Rio Grande do Sul, Brazil. He also acts as a reviewer for the Journal of Dairy Science (US). **D**

The second part of his article and New Zealand comment will appear in the March issue of the Dairy Exporter.

Figure 3. Main cyclic forces determining the behaviour of the ANZ dairy commodity price index from January 1986 to December 2009.

