



True North In Canadian Public Policy

Commentary

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Are Higher Commodity Prices driven by Speculation or Fundamentals?

by Larry Martin

Introduction

It never fails.

Each time commodity prices rise there are calls for more curbs on speculation. A recent one in late July was Sylvain Charlebois, of the University of Guelph College of Management and Economics. But other “experts” have and will continue the drumbeat. They always do when shortages drive prices up.

Charlebois, in an article that appeared in a number of newspapers, asserts (with no evidence) that:

What is driving commodity prices upward is speculation; too much, that is. Speculation is obviously nothing new to markets. However, excessive speculation in derivative markets has enhanced the rate of price swings in recent years. Agriculture has recently attracted what many call “price manipulators” — hoarders and influential speculators who are attracted to commodities, as they are believed to move in an opposite direction to equity markets, thereby providing a hedge against inflation. As a result, regular traders are not able to hedge their risk, and farmers are not getting benefits of price rise, while manipulators cash in. Regrettably, therein lies the real story behind current soaring prices.

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Is it true traders cannot hedge their risk and farmers cannot benefit?

The starting point for critiquing this is the sentence, “regular traders are not able to hedge their risk, and farmers are not getting benefits of price rise”. I work with real people with real hedging plans. I witnessed Canadian livestock feeders use the opportunity to buy corn futures around \$6.00 per bushel and hedge against the run up to \$8.00. Recently, with corn and soybeans at all-time highs and wheat and canola exceeded only by the 2008 highs, the grain farmers I’m dealing were trying to decide whether to price more of their product or whether the drought will take prices higher yet.

So, traders actually have not had a problem hedging their risk and farmers are able to get the benefit of the higher prices. Nothing is standing in the way of either outcome. There is no lack of liquidity in the market – a hedger can take a position anytime. There have been very few, if any, limit moves. In fact the new longer trading hours, including before and after US Department of Agriculture (USDA) reports, appear to have dampened the inclination for limit moves caused by surprising reports, thereby removing that hedging problem. Similarly, basis levels held up and some even firmed in this rally. So, there is no reason that hedgers can’t hedge and farmers can’t benefit from rising prices.

No question that some grain farmers contracted at lower prices in June and July, and a few sold more than they produced because of weather – reduced yields. But it’s difficult to blame that on speculators. In May, the USDA forecast a record yield of corn at 166 bushels per acre, with record acreage. Prices plunged to \$5 and professional analysts were warning that corn prices could slump to \$4.00 or lower. Speculators certainly weren’t driving prices up then. Then it became obvious that much of the US was affected by drought. USDA lowered its July yield estimate to 144 bushels per acre. That’s a 13% drop in the corn crop, even before taking into account the fact that some of the acres will not be harvested at all. With about four weeks of corn use in inventory, a drop of more than 15% in the expected crop meant that price needed to rise to ration the product over the storage period. They rose again.

In August, USDA dropped its yield estimate by another 15% to 123.6 bushels per acre. If this is correct, the US will have the lowest inventory of corn relative to use in history. Usually when supply declines relative to demand, prices rise to ration the supply. Some farmers in Canada certainly did not anticipate the extent of the drought and did sell at what now seem to be low prices. They didn’t seem low at the time the decisions were made given the information available. And some didn’t anticipate how much the drought was going to affect their own crops.

Some Fundamental Facts about Derivative Trading

The paragraph quoted above has other, even more basic logical problems when one considers some fundamental aspects of futures and options trading. First, it’s essentially impossible for trading in options to affect futures or cash prices. The level and volatility of futures prices affects the price of options, but not vice versa. So, the only “derivative” that speculators can trade that affects commodity prices is futures.

Second, speculators can either sell or buy futures: they sell when they think prices will fall and buy when they think prices will rise. They don’t all buy, which is borne out by the bi-weekly reports on traders’ positions in every US commodity. In fact, sometimes – like very recently with wheat – speculators sold more futures than they bought.

Third, the only way new buying in a market can drive prices up is for there also to be new selling: you can't buy something unless someone is willing to sell it. It is very clear from the position reports that speculators bought more contracts than they sold in the most recent price rise. So, as speculators bought more when prices rose, who sold to them? There can be only two answers: other speculators and hedgers. If other speculators sold and prices rose further, they lost money – so far. If hedgers sold and prices rose further, they also lost money on futures but they had two other results. First, they accomplished their hedging goal of protecting against a price decline (if for example, yields turn out higher than expected, or the US EPA reduces the ethanol mandate). Second, they enjoyed an increase in the value of their physical commodity to roughly offset the loss on futures. Most primary producers hedge less than their full production, so in this case the gain in value on physical grain was greater than the loss in value of their futures position. And the higher they sold futures, the greater their protection, the more they gained on their physical commodity, and the less they lost on futures. That's what hedging is about.

Speculation versus Fundamentals

Let us return to the assertion that speculation is the cause of rising prices and rising volatility. It was argued above that the basic cause was the fundamental market situation resulting from the drought-induced shortage. Fundamental market factors are the alternative cause for price movement, including volatility.

While there are many and complex factors that affect price movements, a very basic one is the stock-holding behaviour of end users. The world grain processing industry has moved almost exclusively to just-in-time shipping of their raw material: feed mills, flour mills, feed lots, cereal manufacturers, starch mills, etc. don't like to have their scarce capital tied up in grain storage facilities and in grain inventory. Most firms usually purchase from the market as they need the product. This keeps costs down when there is plenty of inventory and good handling and transportation facilities.

But what happens when there is not much product in inventory and an apparent shortage? For example, what if inventories are already low relative to demand and a USDA report comes out forecasting a lower yield? Some end users will become concerned about security of supply and buy a little extra just in case. Some may call this hoarding, but others would call it prudent risk management – trying to make sure the plant is kept open and their people can keep working.

Whatever it is, the effect is to increase prices – and the lower the inventories and the more just-in-case buying there is, the more prices will rise.

An interesting aspect of all the price spikes of the past few years is that they occurred during the growing season (i.e. before harvest) and were relatively short-lived because, in all cases, the shortages turned out to be overstated. In other words, production turned out better than expected and/or higher prices curtailed demand. When USDA reports forecast that production and inventories were larger than expected, what did the just-in-case purchasers do? Naturally, they bought less because they had already purchased ahead and now had only to go back to their normal just-in-time behaviour. Reduced demand obviously had the effect of lowering prices. The more they had bought ahead, the less they had to buy later, and the greater the downward pressure on prices.

In this way, price volatility “thins” markets.

Price Volatility and the Stocks/Use Ratio

To illustrate this in action, consider the stocks/use ratio. Each year as the cropping season unfolds; USDA reports (and all the private forecasters begin to forecast) the end of the year carryover of grain inventories. In order to obtain this value, they have to forecast supply, domestic use and exports for the remainder of the crop year. By subtracting expected demand from expected supply for the year, one finds the expected stocks at the end of the crop year. So, in May we get the expected supply, demand and stocks for this and the next crop years. The crop year for corn and soybeans ends at the end of August. These data are then adjusted each month as the year progresses and as estimates change.

Market analysts then take the actual or forecast stocks at the end of the crop year and express it as a percentage of the annual use. This is the stocks/use ratio.

There is a very strong inverse historical relationship between annual average prices and the stocks/use ratio (Figure 1). The lower the stocks/use ratio, the lower supply is relative to demand and the higher prices need to be in order to ration the available supply.

Data in Figure 1 show the historical relationship between prices and the stocks/use ratio for corn from 1991 - 2011 (for 2011 this is a preliminary projection for the crop year just ended). The inverse relationship is clear, and it appears to have become more acute since 2006 when, among other things, US ethanol production increased and the US currency began to drop relative to most others.

FIGURE 1 Average Price vs. Stock/Use Ratio – US Corn



SOURCE: USDA Foreign Agricultural Service and USDA Economic Research Service

Also, the *forecast* stocks/use ratio is a shorthand representation of expectations about the current crop. Again, if the crop is short, the ratio will be low reflecting the shortage, and prices will need rise to ration the low amount of supply.

To hone in on this relationship more fully, it is interesting to note the effect that changes in the USDA reports have on the *forecast* stocks/use ratio and the relationship between that and futures as well as cash prices. The relationship in Figure 1 is the historical relationship between the eventual *actual* stocks/use ration and prices. The effect of the forecast stocks/use ratio can be shown by going back to the major price spike in 2008 (which people also blamed on speculators). This relationship is shown in (Table 1). It contains the projected stocks/use ratio and the five-day price range on the nearby futures contract following each USDA report.

The correlation is obviously very direct and very strong. It even held with the slight decrease in the stocks/use ratio in September.

TABLE 1 USDA Forecast and Actual Stocks/Use Ratios, May – December 2008

Date	Stocks/Use Ratio (%)	Price Range (\$)
9 May	7.3	5.86 - 6.03
10 June	6.4	6.75 – 7.30
11 July	7.9	6.30 – 6.80
12 August	10.5	5.09 – 5.57
12 September	9.6	5.27 – 5.62
29 October	10.2	4.24 – 4.87
10 November	10.6	3.85 – 4.11
11 December	14.2	3.38 – 3.94

The same phenomenon is occurring this year. While some find it expedient to blame speculators, serious market analysts actually show that the market is doing its job of rationing a short supply. For example, Darrel Good and Scott Irwin at the University of Illinois updated earlier work when USDA revised its production forecast to estimate corn prices under various assumptions of yield following the USDA’s August report. They assessed prices with average yields of 115, 120 and 128 bushels per acre, compared to the USDA’s 123.4. The USDA’s September price forecast was \$8.20. Good and Irwin suggest a range of \$8.05 - \$9.60 for the highest to the lowest of their yield estimates.

Interestingly, I can find no reference to speculators being responsible for these prices in either the USDA’s work or Good and Irwin’s work: it’s all about the value to the market for the different levels of production. As I write this, the highest price at which a corn futures contract is trading is \$7.40 per bushel and the highest it’s ever traded is \$8.49. These prices are just below the range that the market analysts come up with from analyzing the market.

As one manifestation of the market at work, Chris Hurt from Purdue University recently showed the effect of the high feed grain prices on hog producers’ losses and concluded that herd liquidation has started and will

continue well into the fall. This is obviously painful for hog producers, but it will reduce demand for corn, which is needed given the extremely short supply.

Does Speculation Cause Volatility or Does Volatility Cause Speculation?

This is the more general question underlying allegations that speculation causes price changes. Many people see that commodity price volatility has risen and so has the amount of speculation. So, the easy conclusion is that more speculation leads to more volatility. But, as illustrated above, this confuses correlation and causation, as has been done in many NGO and other analyses of the situation. There is also more hedging, but surely, it makes no sense to assert that more hedging leads to more volatility! For every buyer, there must be a willing seller.

The real reason for greater volatility is the trend toward structurally lower grain inventories. This in turn is caused by burgeoning demand in emerging economies as well as from bio-fuels that production is having trouble keeping up with.

Let's look at the other side of this. It seems intuitive that speculators are attracted by risk. That's what speculators do; they take risk. They never flock to markets that are flat and stable – we certainly didn't hear about speculators in the late 1990's and early 2000's when corn prices seldom moved outside a range of \$1.90 - \$2.50, and stocks/use ratios were at or near 15%. So, is it the volatility of the commodity markets that attract speculators, or is it speculators that cause volatility?

Again, Scott Irwin and colleagues have addressed this question with substantial analysis. They start with the logic that when two things are highly correlated, it is a mistake to automatically assign causality to one or the other. They rely on a statistical technique called Granger Causality tests and apply them to a series of periods when prices were moving upward rapidly and speculators' positions were increasing. The technique is designed to test which, if either of the two series causes the other. Their tests showed overwhelmingly that speculation was a result of volatility. This result has also been found in other research, including the Bank of Canada and oil prices¹. Irwin and his colleagues argue very strongly that law makers should tread lightly on controlling speculation: the worst possible outcome is to regulate a market into too little liquidity.

Conclusions

Some observers blame speculators for the current spike in grain prices and for increased price volatility during the past few years. However, economists who specialize in market analysis have suggested current prices are very much in line with what is required to ration a very small drought-reduced crop. Hence market fundamentals indicate that market prices have simply adjusted.

Indeed, tracing back to the 2008 price spike, it's very clear that prices adjust to market fundamentals, as summarized in the stocks/use ratio; the lower the projected ratio based on USDA reports, the higher the price of corn and vice versa. The evidence cited here supports a different view; that markets continuously adjust to the fundamentals as they change. Markets look for the price that will keep them from using up all the product and running out, or from having overwhelming surpluses.

Having said all this, I acknowledge that speculator positions can have a short term impact on prices. But the evidence is pretty clear that fundamentals drive markets in the long run.

While it's wonderful that there is a column about agriculture (not planted by a farm organization) in many urban newspapers around the country, it is not helpful to have agricultural issues characterized by superficial thinking. According to the quote in the introduction, all we needed to do to have avoided current high prices was curb speculation. Speculators somehow prevent hedgers from hedging! Getting rid of speculators will protect us from the price effects of the worst drought in a century exactly how? And how are farmers going to take advantage of the higher prices if there are no speculators to take the opposite side of the farmers' or grain handlers' hedges? They would be latent sellers left without buyers. As Irwin and his colleagues point out, the worst problems and the most volatility are in markets with too little speculation to provide liquidity that hedgers need.

Perhaps more importantly, what if people actually heed the argument regarding these claimed effects of speculators? In a world with real problems, how much harm can be done by focusing on non-problems with solutions that can do harm – in this case, by potentially jeopardizing the liquidity needed in a well-performing market. With only two to four weeks of grain inventory and the spectre of very high food prices and starvation in vulnerable economies, the focus should be on how to make sure people have enough to eat and to have fewer reasons to resort to revolution and terrorism.

Please, let's try to understand the reality of the food situation and focus on what's important.

References:

[www://farmdocdaily.illinois.edu/2012/08/rationing_the_2012_corn_crop_revisited.html](http://farmdocdaily.illinois.edu/2012/08/rationing_the_2012_corn_crop_revisited.html)

[www://farmdocdaily.illinois.edu/2012/08/pork_industry_faces_record_losses.html](http://farmdocdaily.illinois.edu/2012/08/pork_industry_faces_record_losses.html)

Martin, Larry and Kate Stiefelmeyer, *Canadian Agriculture and Food, A Growing Hunger for Change*, MacDonald Laurier Institute, Ottawa, October 2011

Irwin, S.H., D.R. Sanders, and R.P. Merrin. "Devil or Angel? The Role of Speculation in the Recent Commodity Price Boom (and Bust) *Journal of Agricultural and Applied Economics* 41(2009):377-391.

Irwin, Scott H and Dwight R. Sanders. *The Impact of Index and Swap Funds on Commodity Futures Markets: Preliminary Results*", *OECD Food, Agriculture and Fisheries Working Papers*, No. 27, OECD Publishing. doi: 10.1787/5kmd40wl1t5f-en

ⁱ See "The Role of Speculation in Driving the Price of Crude Oil" by R. Alquist and O. Gervais, Bank of Canada Discussion Paper 2011-6.



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