

Is USDA Overly Optimistic About 2015 Soybean Prices?

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Chicago grain futures recently rallied to meet or exceed the price USDA forecast in its October and November grain reports. In particular, USDA pegged the expected carryover of soybeans at the end of the 2014/15 crop year at about 12.5% of use, with a price forecast at around \$10. This compares to a 4% stocks/use ratio in the most recent crop year with an average price of \$13. The rally was caused by late harvest in the US, late planting in South America, some stronger than expected Chinese imports, and technical buying by managed funds.

Visually, when one examines the recent history of the relationship between stocks/use ratios and annual prices for grains and oilseed, two things stick out. The first is that the relationships seem to have changed after the 2006/07 crop year. This will be examined below. The second is that the soybean price forecast for the current crop year seems out of line with recent history.

As a result of this observation, the authors undertook a simple analysis of the pricing relationships. The objective was to determine whether there has been a change in pricing behavior and, if so, how it has changed. The answers to these questions leads to further questions about the current year's price forecast and, in a practical sense, questions about managing price risk for farmers and end-users.

The Pricing Relationships

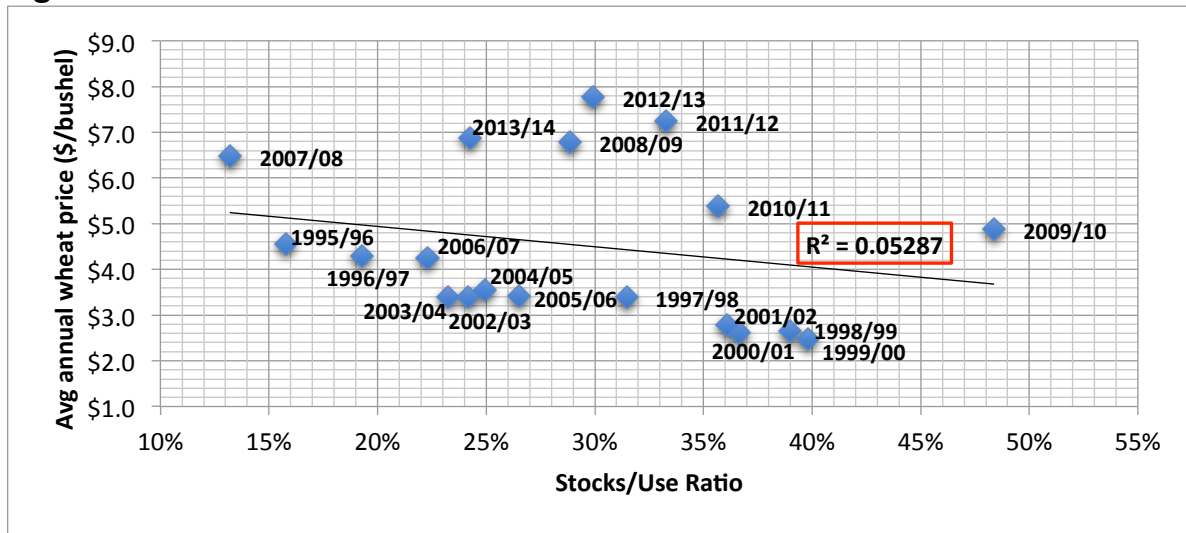
The three graphs in Figure 1 show the historical patterns of prices versus the stocks/use ratios. In each case, the ratio is the end of the crop year for each of the three grains and the price is the average price in US funds during the same crop year. For example, 2013/14 is the stocks/use ratio at the end of August 2014 for corn, while the price is the average for the crop year that ended on that date. The data include the crop years from 1995/96 through 2013/14.

It is immediately obvious that there is an inverse relationship: in years when supply was low relative to use, the ratio was low and prices tended to be high, and vice versa in years when supply was large relative to use. Each of the graphs contain a line which is the trend line for the entire period. It has associated with it an R squared. This is the sum of squared variation in the distances of each of the points from the line: if all the points were on the line, then the R squared would be 1.0 and the equation for the line would explain 100% of the variation in prices. So, an R squared of .49 means that 49% of the price variation is explained by the line.

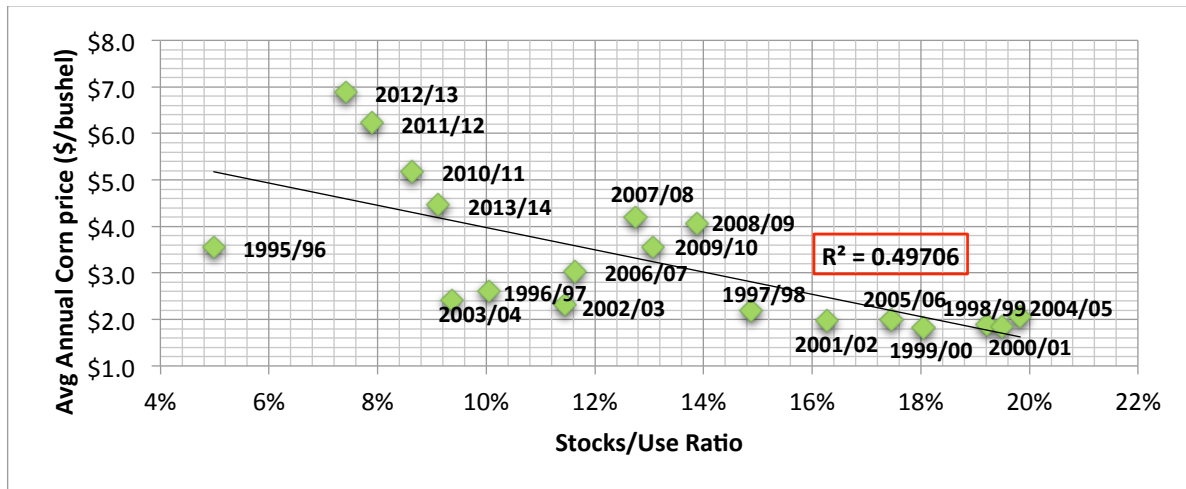
Similarly, the trend lines for wheat and soybeans explain about 6% and 33% of the variation in prices for these two products from 1995/96 through 2013/14.

Figure 1:

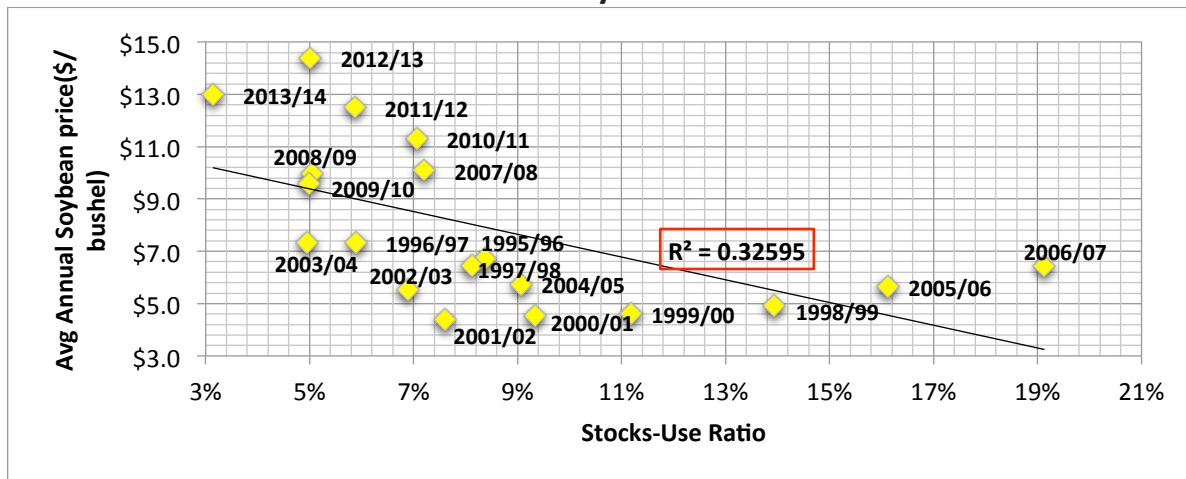
Wheat



Corn



Soybeans



Changes in the Pricing Relationships

The same three graphs are reproduced in Figure 2, except in this case the periods before and after 2006/07 have separate trend lines and they include USDA's November 2014 forecasts of the stocks/use ratios and annual prices (US\$).

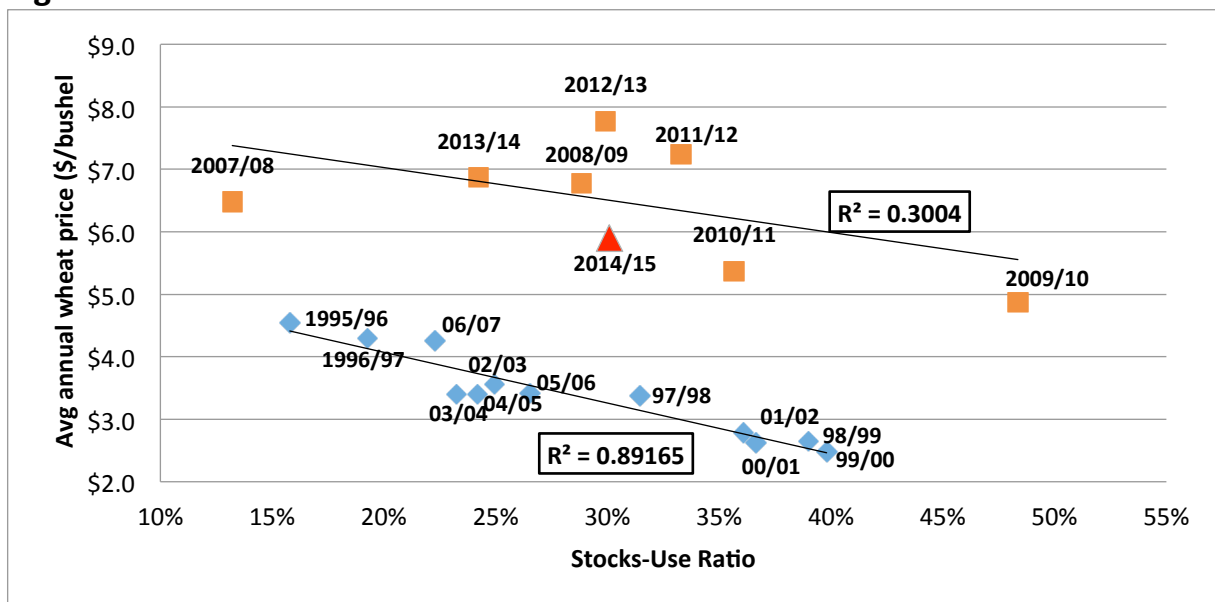
Separating the two periods gives trend lines that are "higher" for all three products after 2005/2006—i.e. after 2006/07 annual prices were higher at any given stocks/use ratio. For corn and soybeans, the post-2005/06 trend lines are also steeper. This means that annual prices are much more sensitive to relatively small changes in the stocks/use ratio.

It is interesting to note that the R-squared's are much higher for all of the separated trend lines. Therefore, the separated trend lines appear to explain much more of the relationship between annual prices and the stocks/use ratio than did the single line for the whole period.

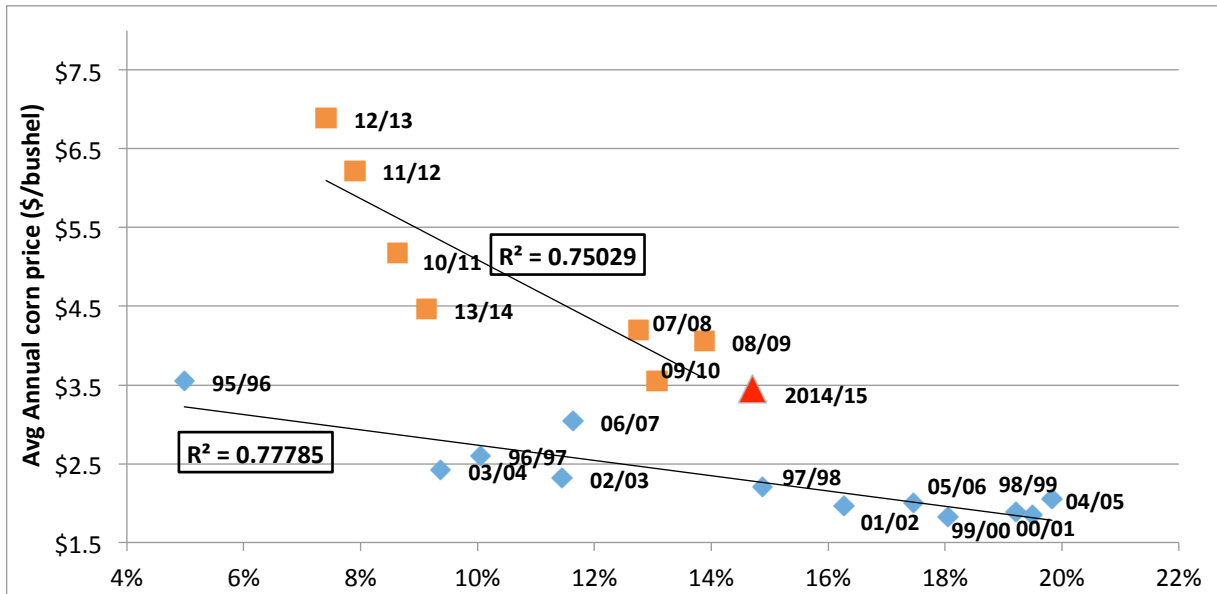
While it seems clear that there has been a change in the pricing relationship since 2006/07, it is interesting to speculate about the cause of this change. It is tempting to point out that 2006 is when ethanol production really began to take off in the US. However, it's not clear why this would affect anything but to lower the stocks/use ratio and raise the price level, but not change the underlying relationship. Also, it's not immediately clear why this would affect soybeans and wheat.

A more appealing argument, at least to the authors, is that 2006/07 is roughly the point in time when the US dollar began to devalue against other world currencies. This makes any given price in the US, less in other currencies. Therefore, it is possible that foreign buyers were able to buy US grain at reasonable prices in their own currency, thereby driving the price up in US currency. It also corresponds with the time at which Asian, particularly Chinese, imports of soybeans and corn began to rise substantially. Therefore, it may represent a shift in demand for these products.

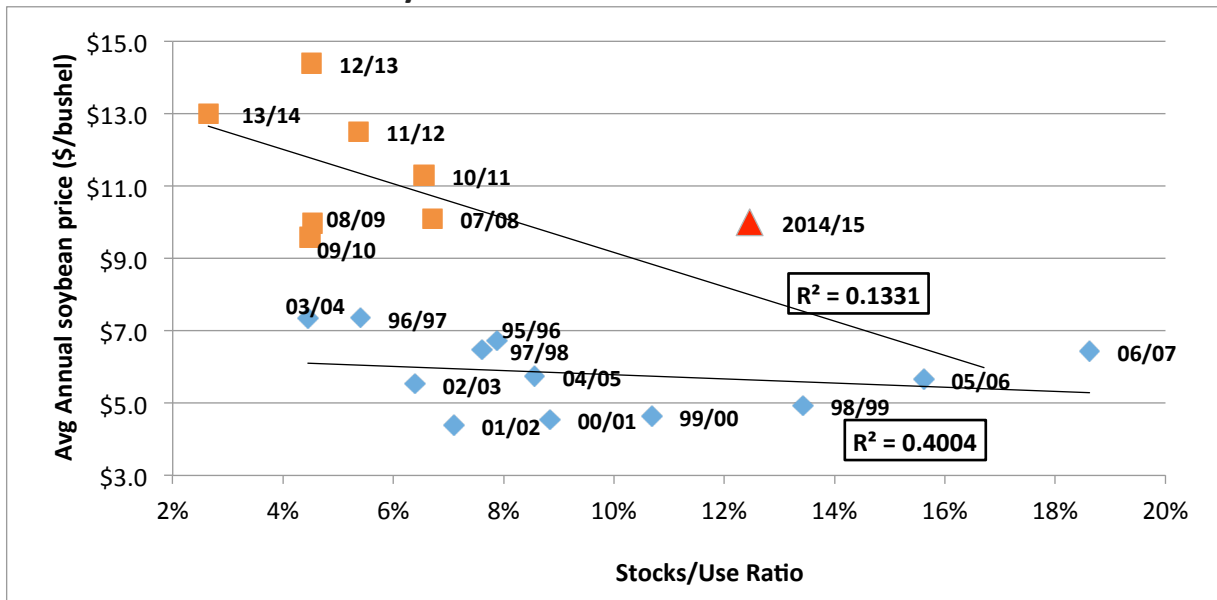
Figure 2. Wheat: 1995-2007 & 2007-2014



Corn: 1995-2007 & 2007-2014



Soybeans: 1995-2007 & 2007-2014



Implications for Pricing and Risk Management in 2014/15

Whatever the cause of the change in the relationship, there are some interesting questions about the current USDA forecast. As indicated at the outset, nearby futures prices have rallied above the USDA forecasts and soybeans have rallied to an approximate 38.2% Fibonacci retracement. Whenever a

significant chart point like this is on the charts, it is a good place to stop and think about why it got to here and what the risks are of the market moving unfavorably from here.

Our assessment is that the rally to date has several components:

- A late harvest in the US caused uncertainty of supply, especially for soybean meal, and contributed to the rally.
- This was exacerbated by dry weather in southern Brazil, which caused a delay in planting the first soybean crop thereby causing doubts about whether there would be time for a *safrinha* second crop.
- Grain exports, and especially soybean exports, have been far ahead of expectations for several weeks, thereby calling into question the export demand of the USDA in its October report.
- The most significant aspect of these fundamental factors is a precipitous rise in soybean meal prices, from \$295 to almost \$410 between early October and early November on the December futures contract. This rally, compounded by a very strong rally in the cash basis, started because of a near absolute shortage of meal toward the end of the 2013/14 crop year. The shortage was magnified by the late harvest in the US and then unexpectedly large exports that extended the period of shortage for soybean meal.
- These three fundamental factors worked together to start the rally, which in turn fed on itself because it induced technical buying by managed funds.

The result is a set of charts that have reached significant resistance planes. January soybeans rallied back, following meal, by 38.2% of the major decline in prices between June and early October. December corn rallied back slightly more than 23.6% of the June - October slide and is facing resistance from an old high that was made in August as well as a gap back in July. December wheat rallied the least, but technically is resisting along a double top that was made over the past few months. It is at the same level as several bottoms that were made as the market was moving down during the summer.

USDA's November report surprised the market with a little less corn production than the market expected, but still with a stocks/use ratio very near 15%. USDA raised the production estimate for soybeans marginally, but also raised consumption estimates of that the stocks/use ratio fell very slightly to 12.6%. The price and stocks/use ratio forecasts for each of the three grains is shown in the graphs in Figure 2.

Looking forward, the major fundamental factors that will determine the direction of price change are:

- Whether exports continue to exceed expectations, especially in view of relatively large crops around the world.
- Whether US harvests get back on track, which they appear to be doing as weather improves, and whether actual yields match the forecasts.
- Whether the South American soybean crop reaches expected record levels. As with US harvests, weather has improved in South America and planting appears to be catching up rapidly.

If any of these things go bad, one would expect to see the resistance planes penetrated on the charts and the rallies will continue. Interestingly, the slightly bullish report on corn in the USDA report was not able to cause resistance to be penetrated, at least in the market's first reaction.

Continued clear weather in the US, sufficient rain in Brazil and a drop in Chinese demand for soy products can rapidly reverse the direction of trend. If the fundamentals begin to drive price down, any negative reaction can be magnified as managed funds get technical signals to reduce their long futures positions and, potentially, turn short.

And underlying all of the fundamentals in the grain markets, one should not lose sight of the fact that the US dollar is now rallying against other currencies instead of falling. This could be significant if our assessment of the reasons for the change in pricing behavior has any validity.

Producers who have unpriced grain and oilseeds currently face the risk of another major dip, to or below the October lows. End-users face the risk of buying at these prices and seeing competitors benefit if prices fall.

If current basis levels are relatively strong, we have recommended for some time that producers do some forward pricing on this rally. Of course, the risk of doing so is that you might sell too low if the rally continues. This can be offset by buying Calls on futures. We would not buy the calls as long as prices stay below the resistance planes: there may be better places to buy those Calls for less money and greater protection.

If the rally reverses to negative, the obvious question is, how low can prices go? As one way to respond to this, it's interesting to go back and look at the graphs in Figure 2. The USDA forecast for corn is almost exactly on the trend line that we estimated for the period after 2006/07. That price is \$3.45, slightly below current futures prices, but higher than the contract lows in October. For wheat, the price forecast is a little lower than the trend line, but we are using the hard red wheat contract at Kansas City, which is priced at a premium over Midwest winter wheat. Therefore, the forecast is not inconsistent with the estimated trend line.

Soybeans are a different USDA's midpoint forecast is \$10 per bu, while the trend line would place prices close to \$8.00 per bushel. Admittedly, the trend line for soybeans is not as statistically significant as the others. However, with the prospect of an extremely large soybean crop in Brazil and a move toward more adequate supplies of meal in North America, it would not be surprising to see an adjustment back to this level, should those two things occur. Soybeans, led by meal, have rallied the most during the past two months. If fundamental change, they also have the highest scope for falling.

These factors should be taken into account as people think about their pricing strategies for the current year's crop. There remains considerable downside risk. At the same time, while stocks are building up, they are not yet at onerous levels for either corn or soybeans. Therefore, it is important to assess one's risks, especially if your farm is highly leveraged.

This is why we like the concept of pricing physical product now and using options to manage the risk of pricing too low.