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May 20, 2017

## Continuation vs. Continuous Futures Charting

### Background

The Apr 16, 2017 Factor Update addressed a member's question on the use of Continuation vs. Continuous futures charting. I came down hard in favor of Continuation charts and against Continuous charts (in hindsight I was actually too harsh toward Continuous graphs).

My good friend and peer Jack Schwager posted a piece on LinkedIn taking the other side of the debate. See <https://www.linkedin.com/pulse/should-futures-charts-spread-adjusted-contract-opinion-jack-schwager> for his post, "Should Futures Charts Be Spread-Adjusted at Contract Rollovers? – A Difference of Opinion." A PDF copy of Jack's LinkedIn post is a companion piece to this document.

*Please read Jack's post before proceeding*

In a private dialogue with Jack we agreed that a public response by me to his post might be of educational value to traders attempting to better understand the characteristics of Continuation and Continuous charts.

This document should **IN NO WAY** be viewed as a rebuttal to Jack – he and I have way too much respect and fondness for each other to engage in a debate that reflects any criticism. It is difficult for me to imagine having greater respect for another trader or human being than I have for Jack Schwager. Jack will go down as THE AUTHOR ON RECORD in this generation for great trading books (such as the Market Wizard series) and the definitive book on futures trading (*The Complete Guide to the Futures Market*, John Wiley and Sons). It was one of my career highlights to write the forward to one of the books in Jack's Market Wizard series.

### Understanding the issue

Individual futures contracts have limited lives – sometimes only a matter of months – from inception to expiration. The challenge is to construct a longer-term chart of a futures market given the limited life-span of individual contract months. Most speculators concentrate their trading activity in the nearest (and most active) contract month. Usually just prior to or in the first week of an expiration month traders will move their trading activity to next contract month in the series. Some markets have very few major contract months, such as currencies (Mar, Jun, Sep and Dec) while other markets have a contract for every month of the year (Crude Oil).

Most commonly, the price of the soon-to-expire contract month will be trading at a lower price than the next contract month in line – which will be trading at a lower price than the second contract in line, and so on. This is referred to as backwardation (or carrying-charge) pricing structure.



In some markets the price of the expiring contract may be higher than the price of the next contract month in line – which may be higher than the second contract month in line, and so on. This condition is especially true during times of short supply or supply-chain disruption. This condition is referred to as a contango (or inverted) pricing structure as shown in the graph on page 1.

Long-term charts of futures markets are constructed by linking or stringing together contracts in their sequential chronological order. There are two approaches to do this – and three variations of the two different approaches.

Continuation charting. This method rolls one contract month to the next contract month without any adjustment when the two contracts are at different prices at the time of the roll. This is the approach I highly favor, even though a sizable price gap might exist between the contract month being dropped and the next contract month in line.

Continuous (or roll-adjusted) charting. This method back-adjusts the price history of the contract being expired or rolled to eliminate the price gap between the expiring contract and the contract replacing it. The price of the contract being dropped is adjusted upwards or downwards to the price level of the contract being picked up in the series on the day of the roll. This is the approach preferred by Jack Schwager and others.

The three variations of each approach. There are three variations on when the roll occurs on Continuation and Continuous graphs.

- Roll at first trading day of expiration month. On my trading platform (Trade Navigator) this is referred to as 055 for the Continuation charts and 065 for the Continuous (roll-adjusted) charts. Retail traders are generally not allowed by their FCMs to hold positions past the first notice day of an expiration month.
- Roll at contract expiration. On Trade Navigator this is referred to as 056 for the Continuation charts and 066 for the Continuous (roll-adjusted) charts.
- Roll based on volume and open interest. This charting variation rolls from an expiring contract to the next contract in the series when the next contract becomes the most actively traded. On Trade Navigator this is referred to as 057 for the Continuation charts and 067 for Continuous (roll-adjusted) charts. It is not unusual for the 055 and 057 to roll on the same exact day or within a day or two of each other (also true for 065 and 067).

#### Why I prefer Continuation charts vs. Continuous (roll-adjusted) charts

The entire raison d'être for the futures markets is to enable commercial interests to lock in the approximate price at which they will buy or sell an underlying commodity or instrument in the cash or spot market at some future date – thus, the benchmark or reference point for all futures pricing is the cash or spot market.

In short, the futures markets cannot exist in an orderly manner if the pricing structure is not linked to cash settlement (as is the case in most financial instruments) or delivery of actual commodity items (as is the case in most agricultural instruments).

The price of an expiring futures contract will converge upon the cash price of an underlying financial instrument or commodity item as expiration approaches. The price of an expiring futures contract for a financial instrument is often identical to the cash market price on the date of expiration. There is a strong tendency for the price of an expiring raw material futures contract to converge with its corresponding cash market price on the day of expiration – but the convergence is not to the degree characterized by financial instrument futures contracts.

There are several factors that may prevent convergence between the cash market and an expiring commodity futures contract for deliverables.

- Dislocation of supply in relationship to delivery locations specified by the contract specifications
- Disruption of the supply chain
- Tightness of supply

Yet, the fact futures contracts are subject to delivery of physical commodities forces convergence most of the time. For example, an extreme premium in the price of an expiring Live Cattle contract relative to the cash market price could prompt cattle feedlot facilities to sell futures contracts with the intent upon making delivery. This process would tend to correct the price imbalance. Similarly, an extreme discount in the price an expiring Live Cattle contract relative to the cash market could prompt beef processors to buy futures contract with the intend upon taking delivery. The delivery process acts as a form of arbitrage.

**To repeat – futures markets could not exist in an orderly manner if delinked from their corresponding cash markets.** In fact, cash markets ranging from Corn at a local grain elevator in Mankato, Minnesota to Soybeans on a barge in the Gulf of Mexico to copper wire in a warehouse in Hamburg, Germany to a pile of Gold bars in South Africa to U.S. Treasury Notes being traded in London all are expressed in relationship to futures prices.

For me, the question is whether Continuation or Continuous (roll-adjusted) charting of a given market better reflects the historical price trends of the underlying instrument (financial or commodity).

I will examine this question through a series of price graphs.

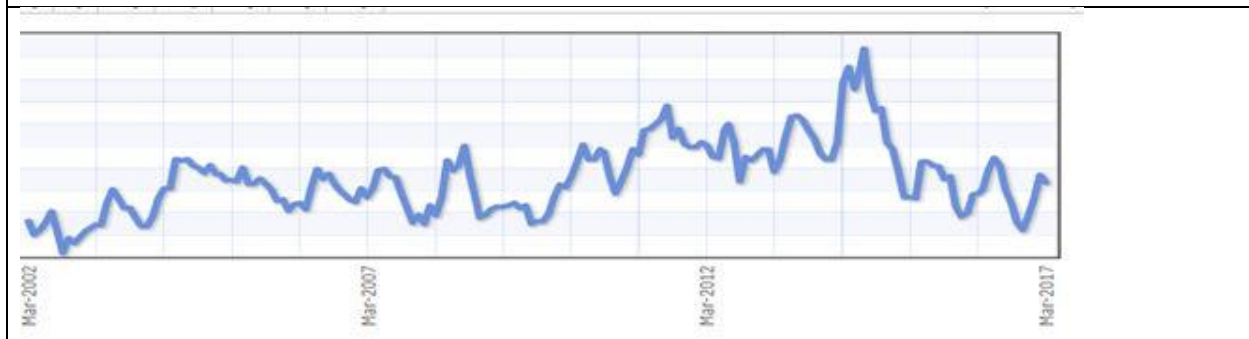
The first sequence (pages 4 -9) stacks Continuation charts, cash charts and Continuous charts for several markets. I suggest that readers look at these to determine whether Continuation charts or Continuous charts better reflect the price history of the respective cash markets.

The second sequence (pages 10-16) stacks the actual spread (or differential charts) charts of the cash market vs. the Continuation chart and cash market vs. the Continuous (or back-adjusted) chart for several commodities.

I will let you – the reader – make up your own mind on whether Continuation or Continuous graphs are a better match to the reality expressed by the underlying cash markets for which the futures markets are intended by design and contract specifications to represent.

A discussion begins on page 17.

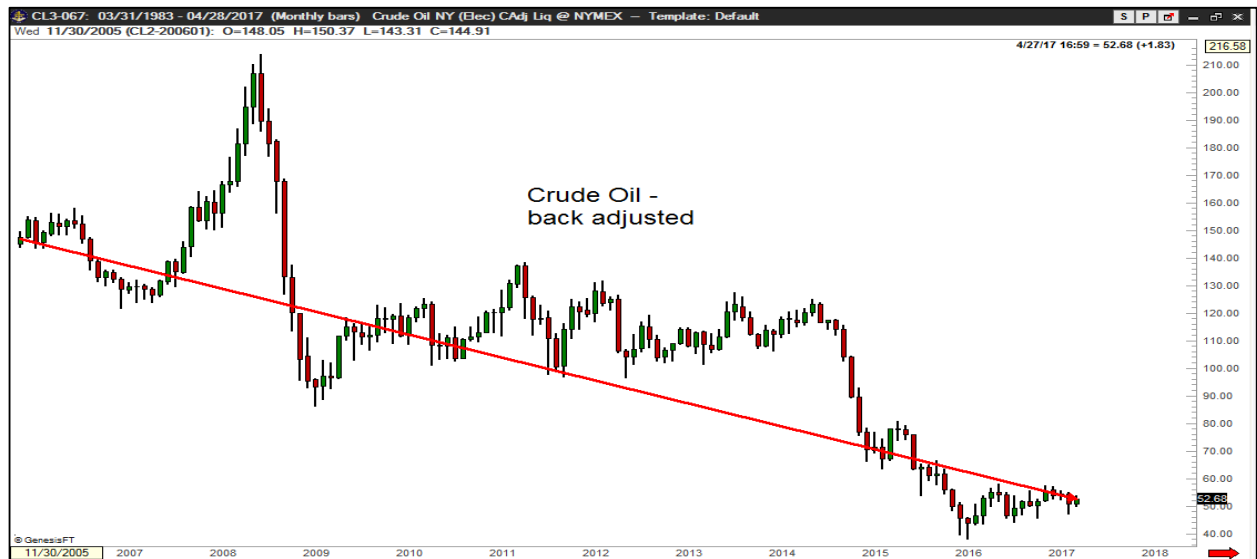
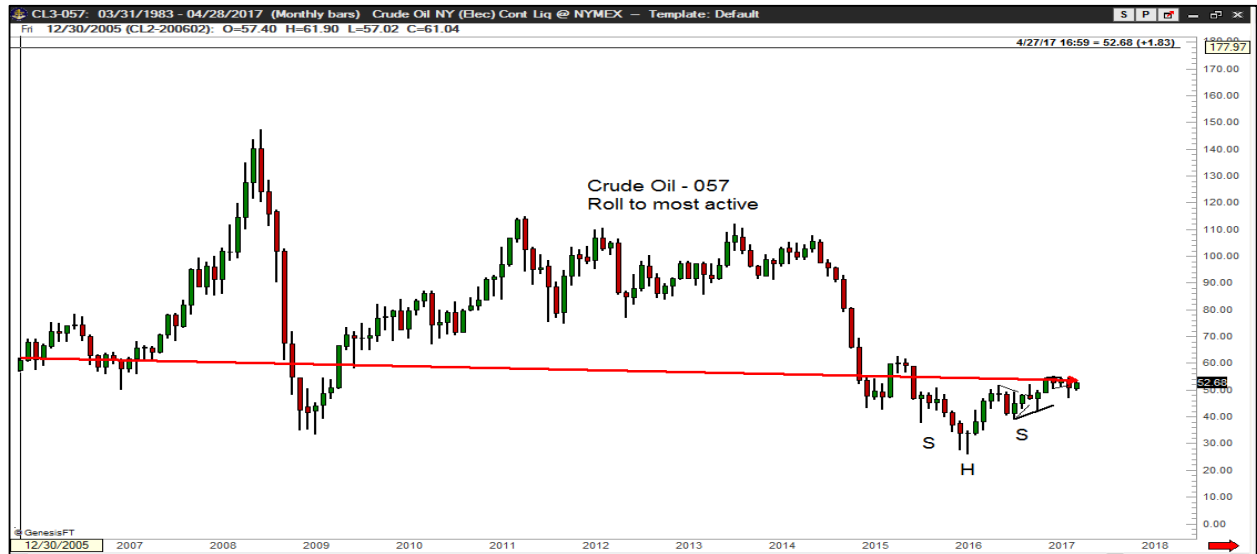
# Lean Hogs



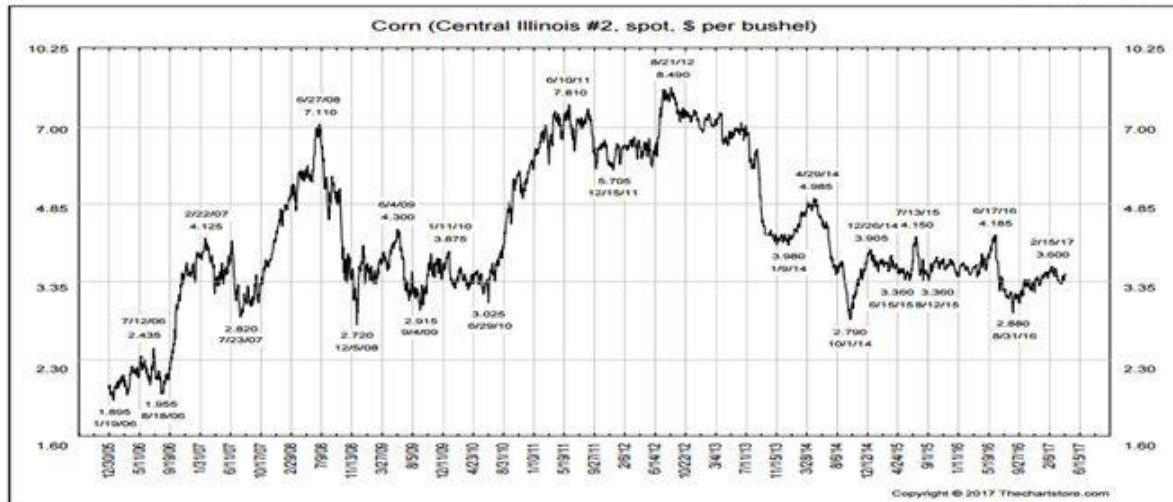
# Kansas City Wheat



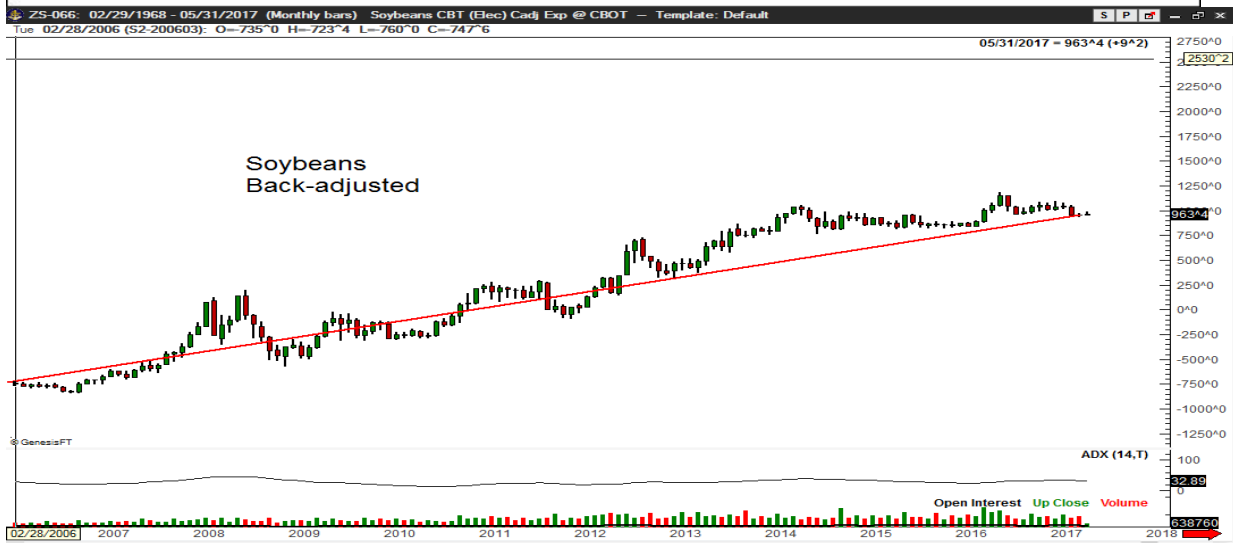
# Crude Oil



# Corn

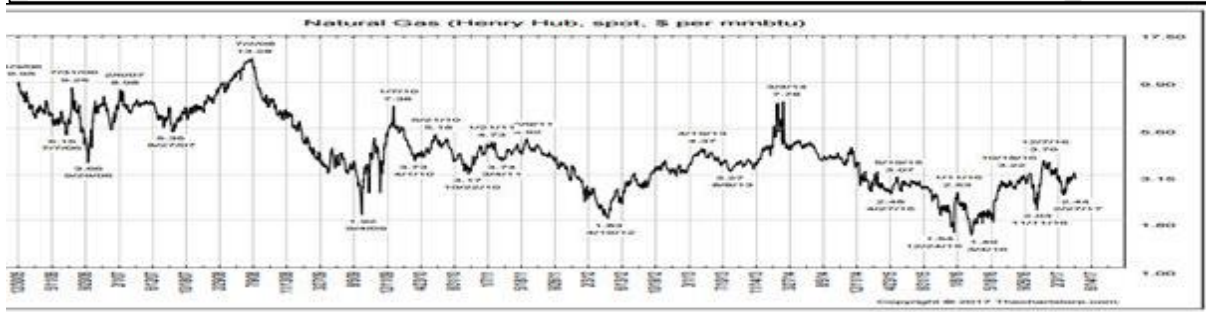


# Soybeans



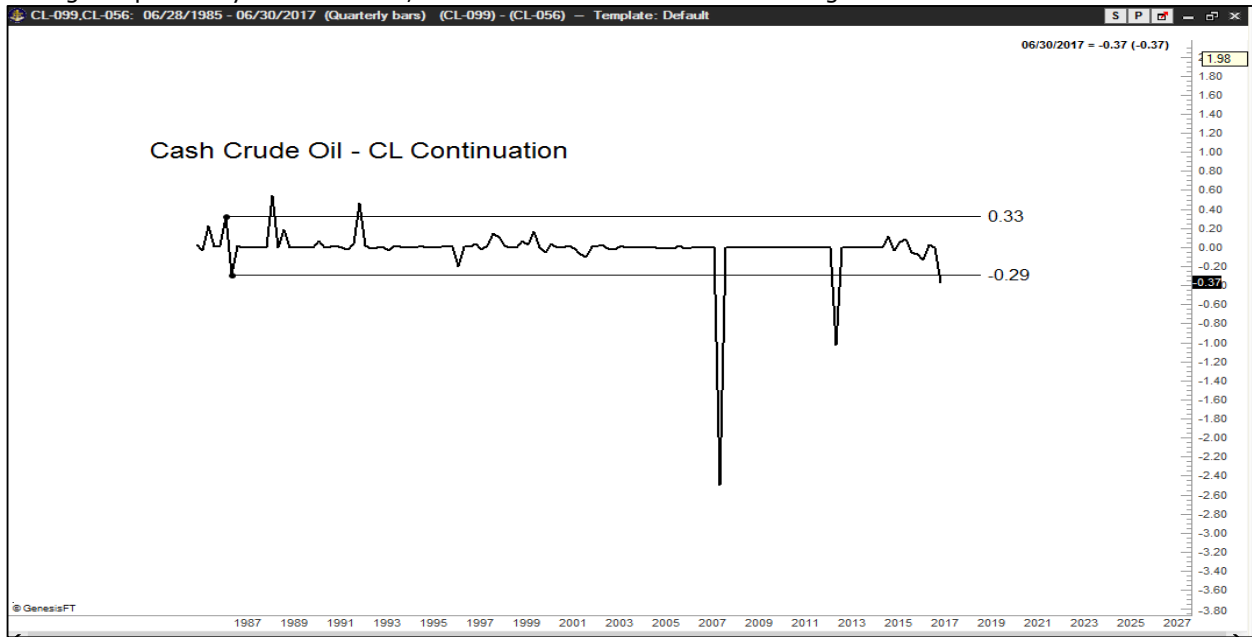


# Natural Gas

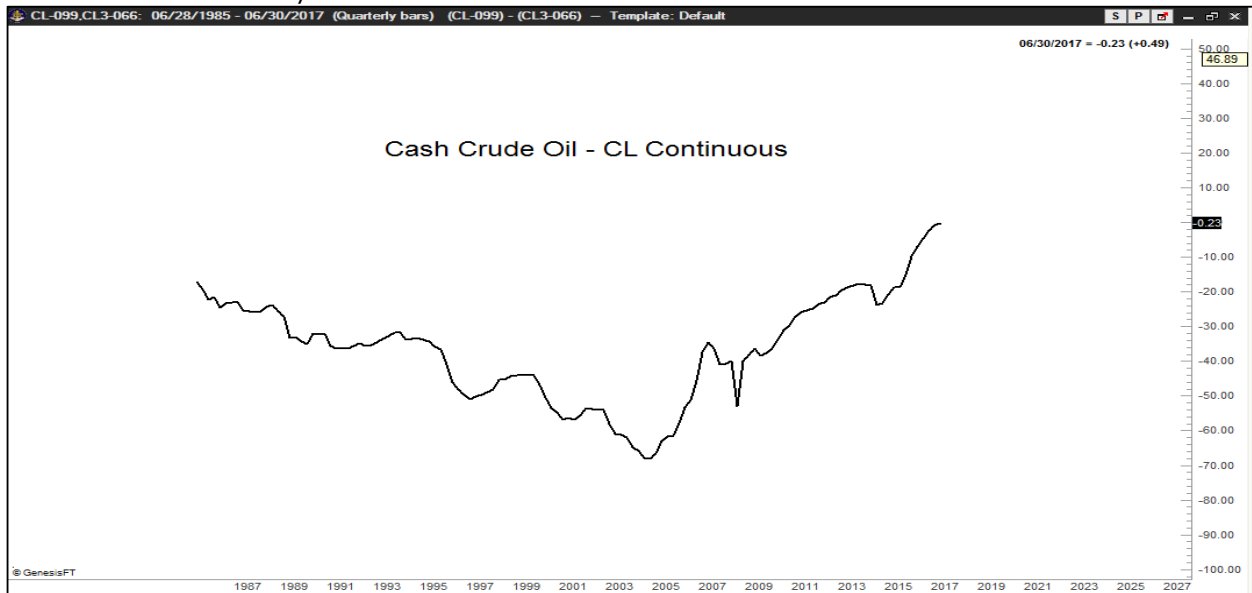


Spread charts – Cash Market minus Continuation Pricing (top) and Cash Market minus Continuous Pricing (bottom)

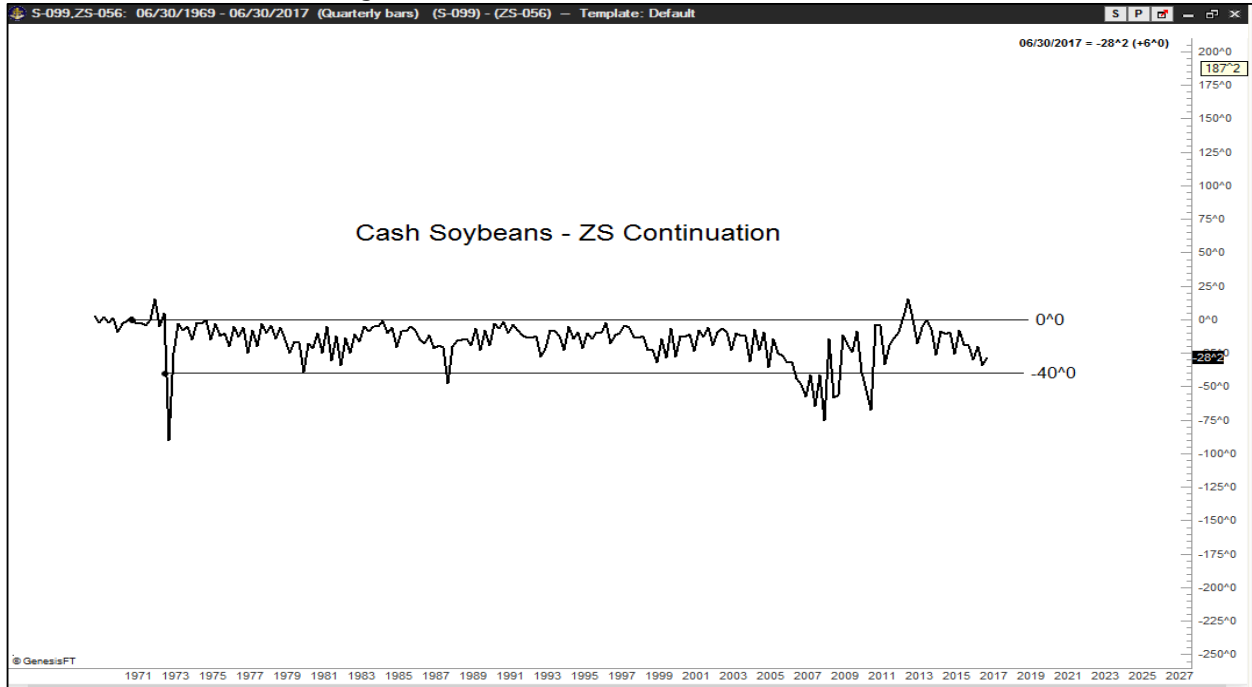
Crude Oil. With the exception of two brief spikes in the spread differential between the Cash market and the Continuation nearby contract month, the two have reliably converged to within a 60-point range during the past 30 years. In short, the Continuation chart has converged with cash.



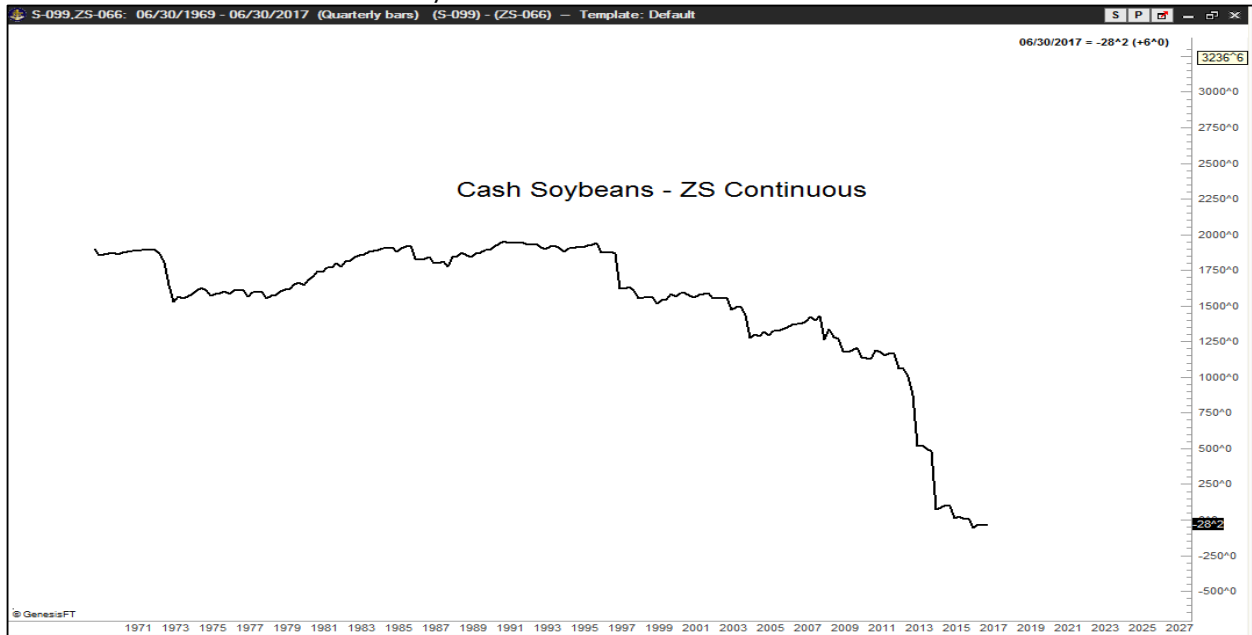
The spread differential between the Cash market and Continuous chart (back-adjusted) has a 30-year range of \$70 per barrel, or a price far greater than the current flat price of Crude Oil. The Continuous Chart does not accurately track the historical cash market.



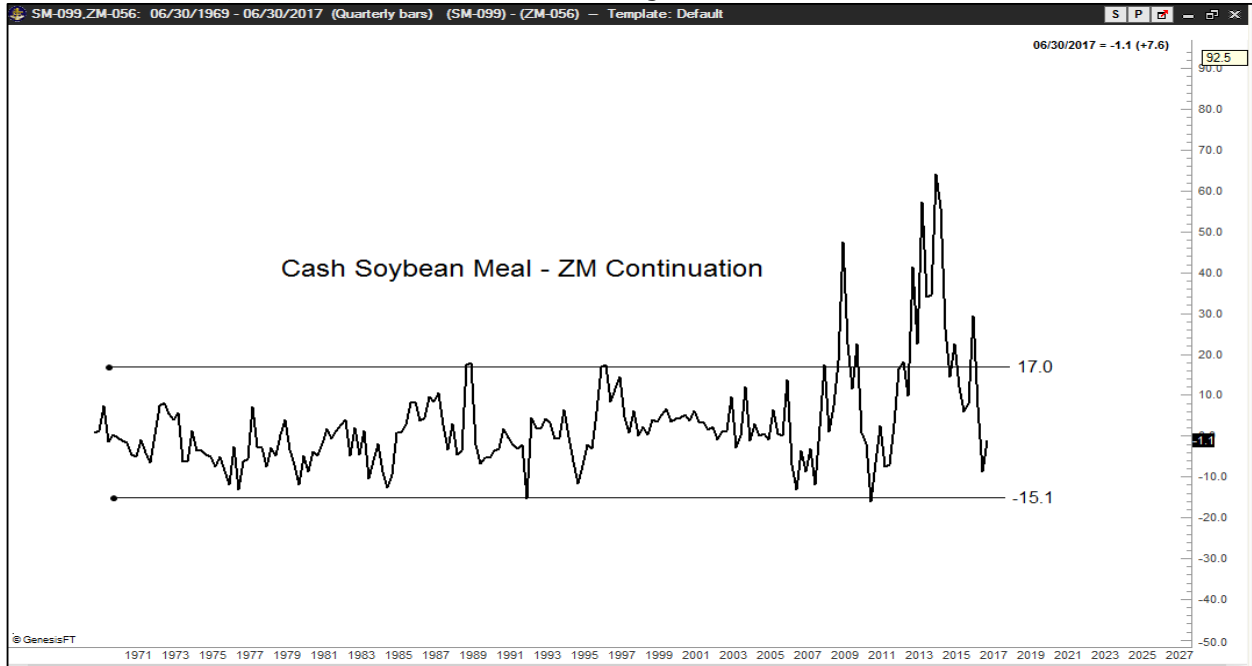
Soybeans. With the exception of a few spikes in the spread differential between the cash market and the Continuation nearby contract month, the two have reliably converged to within a 40-cent range during the past 45 years. The spikes have occurred during the old crop/new crop transition. In short, the Continuation chart has converged with cash.



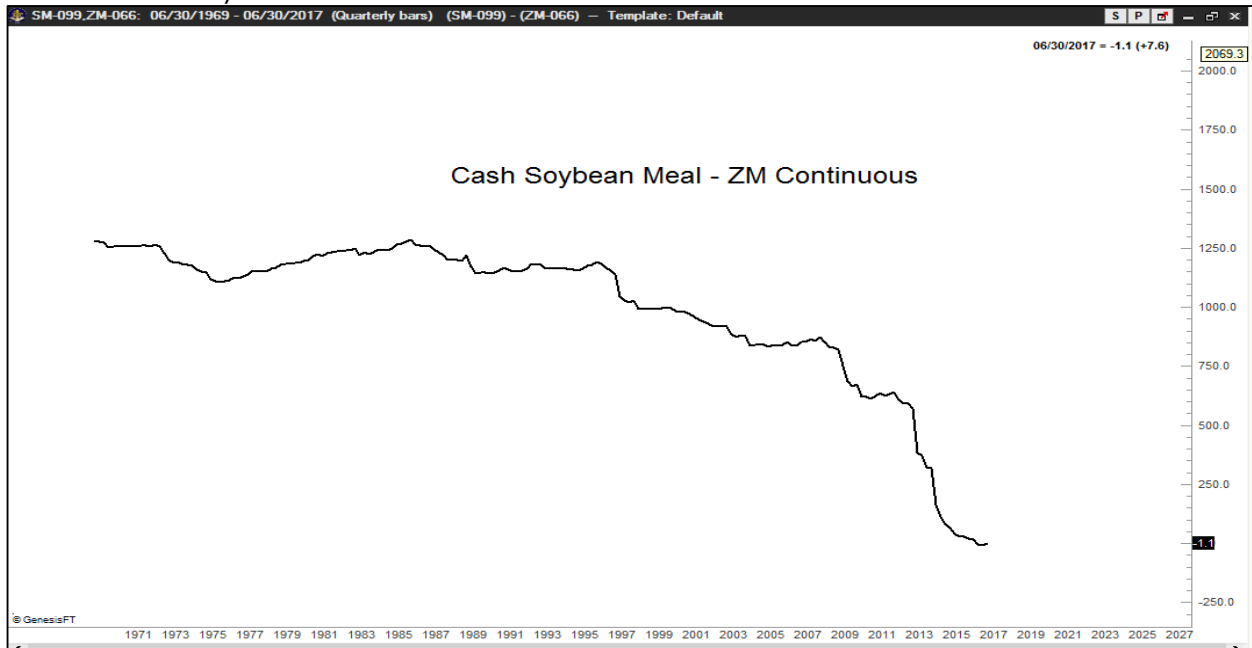
The spread differential between the Cash market and Continuous chart (back-adjusted) has a 45-year range of more than \$20 per bushel, or a price far greater than Soybeans have ever traded. The Continuous chart does not accurately track the historical cash market.



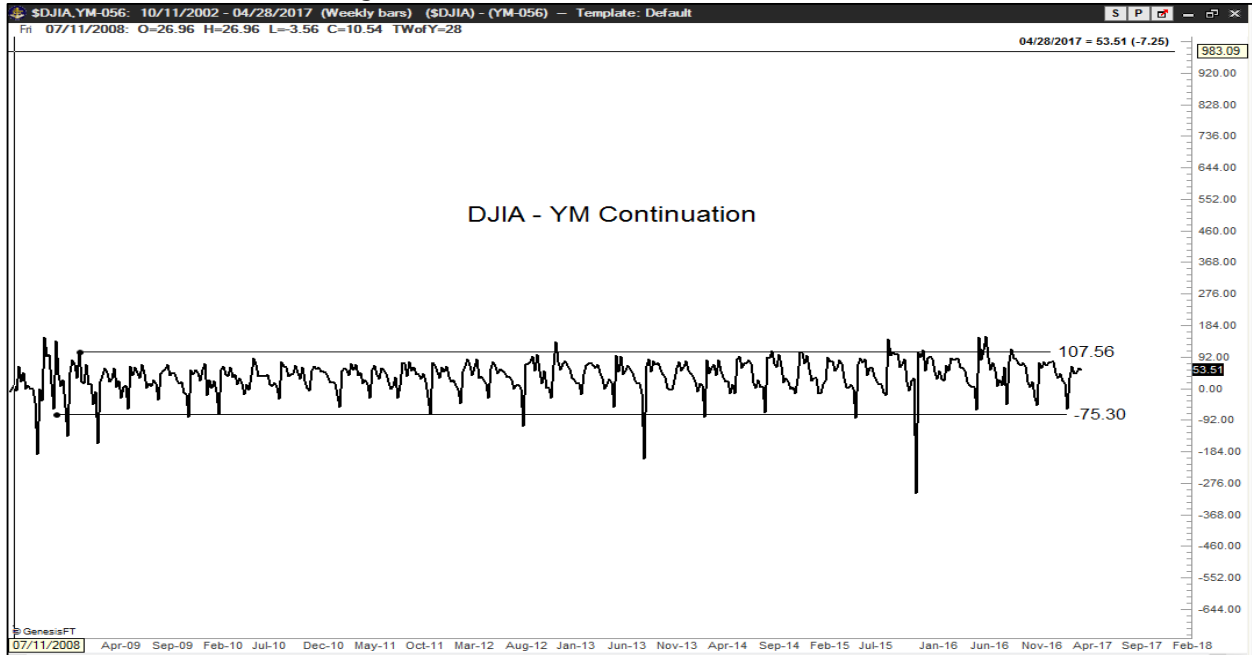
Soybean Meal. With the exception of a few recent (and large) spikes in the spread differential between the cash market and the Continuation nearby contract month, the two have reliably converged to within a \$30 per ton range during the past 45 years. The spikes have occurred during the old crop/new crop transition. In short, the Continuation chart has converged with cash.



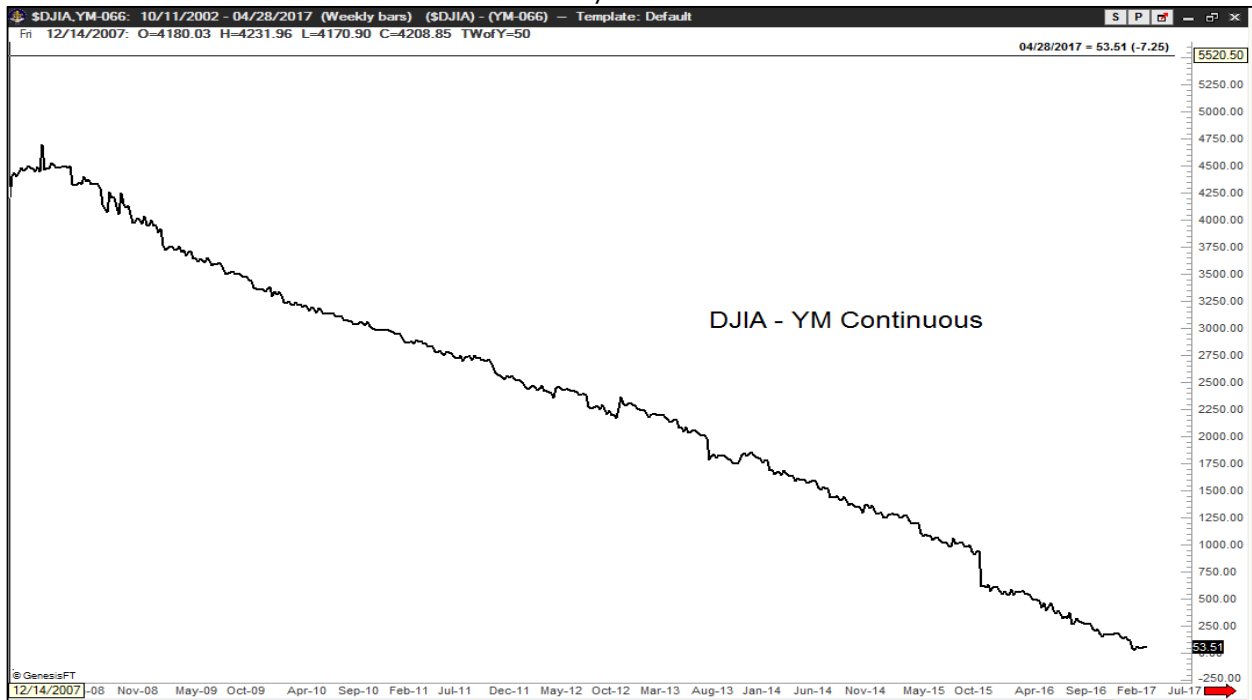
The spread differential between the cash market and Continuous chart (back-adjusted) has a 45-year range of more than \$1,200 per tone, or double the all-time high price of Meal. The Continuous chart does not accurately track the historical cash market.



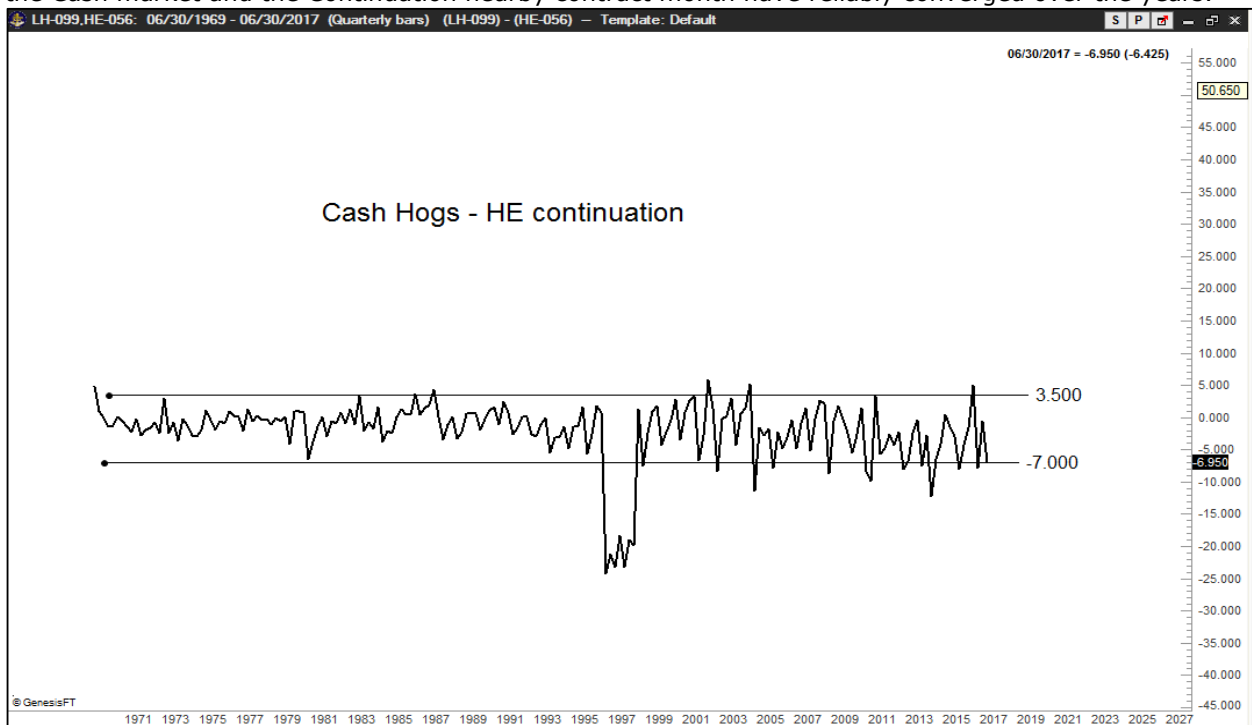
DJIA. With the exception of a few spikes in the spread differential between the cash market and the Continuation nearby contract month, the two have reliably converged over the years. More often than not the expiring contract and cash have been near identical at the moment of expiration. In short, the Continuation chart has converged with cash.



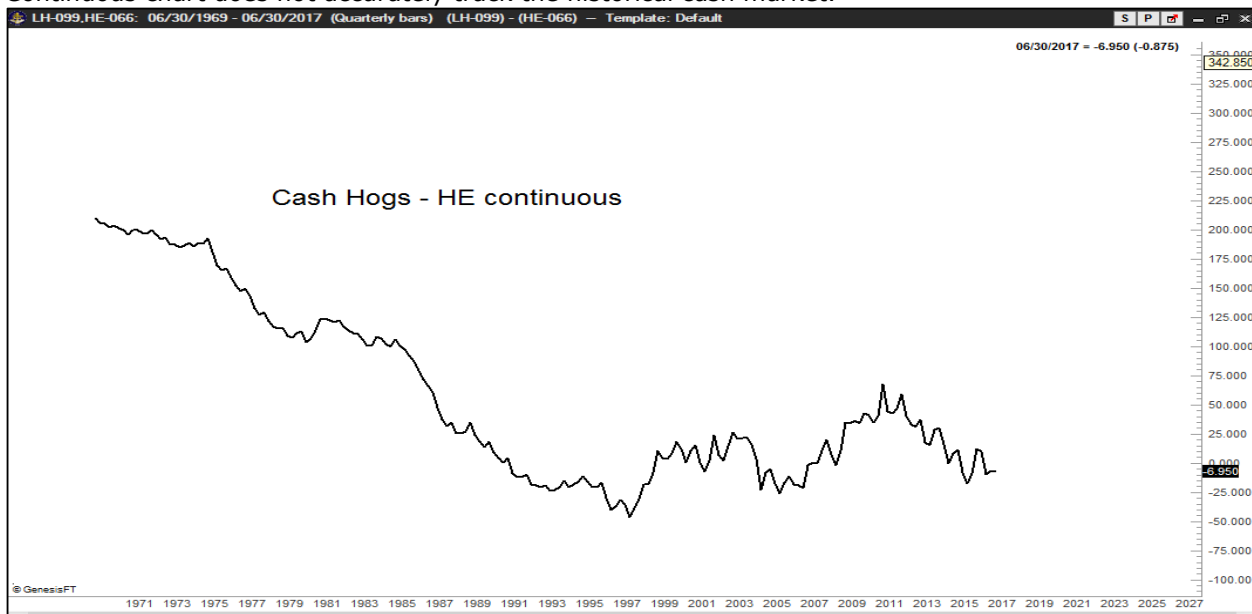
I will not even comment on the chart below, representing the spread differential between cash and Continuous chart (back-adjusted). There are some technical reasons the spread differential between Continuous chart and the cash market has steadily trended down.



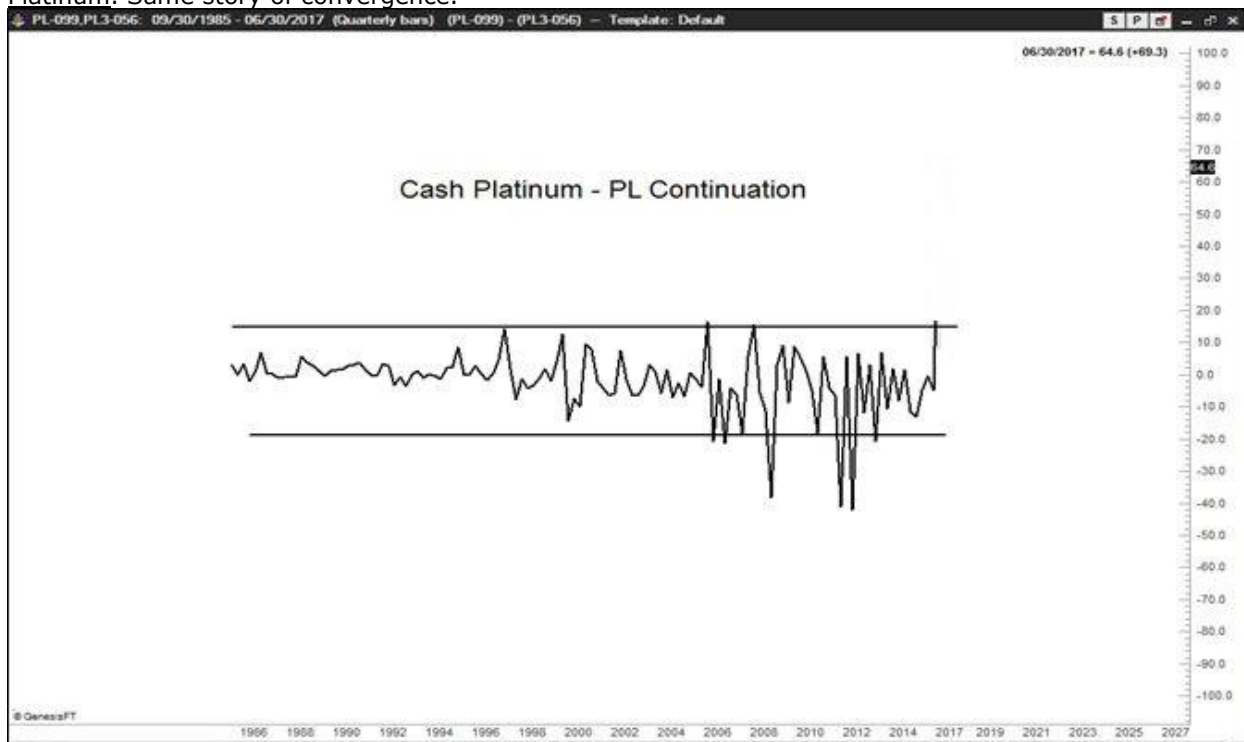
Lean Hogs. Despite the tendency for large roll gaps in Lean Hogs, the the spread differential between the Cash market and the Continuation nearby contract month have reliably converged over the years.



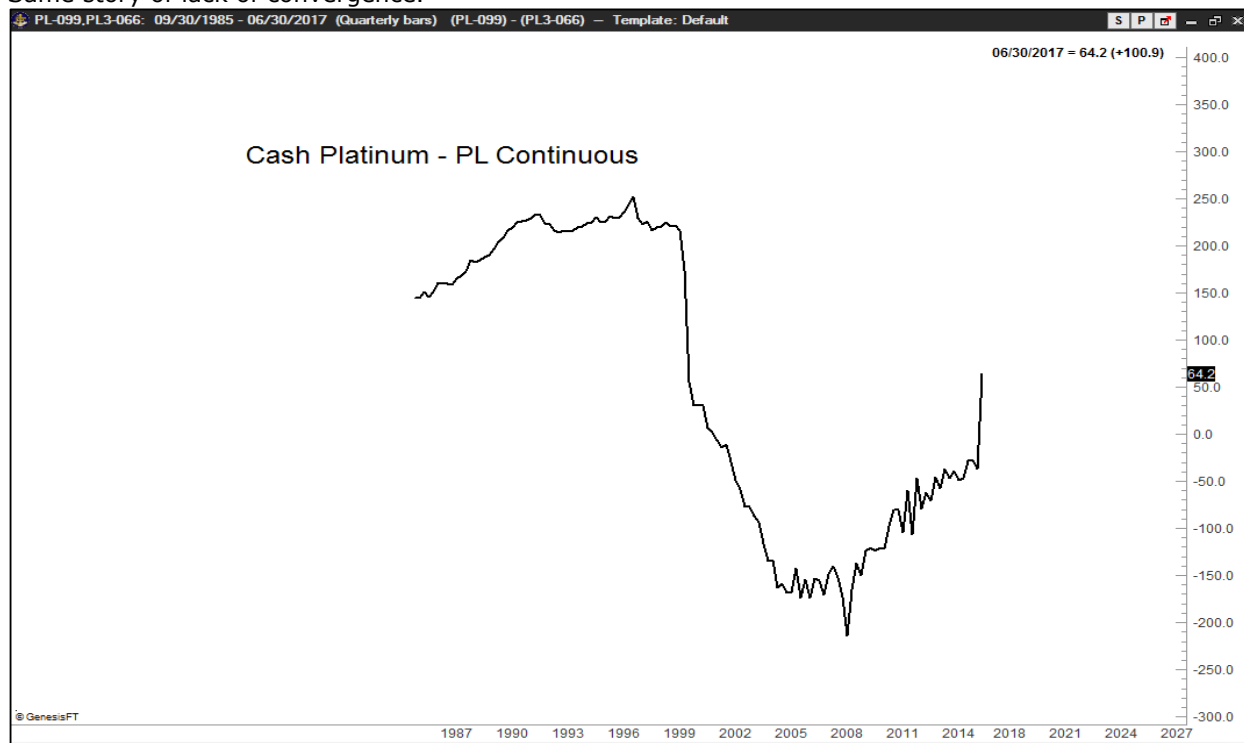
The spread differential between the Cash market and Continuous chart (back-adjusted) has a 45-year range of more than \$250 per hundred weight, or nearly double the all-time high price of Hogs. The Continuous chart does not accurately track the historical cash market.



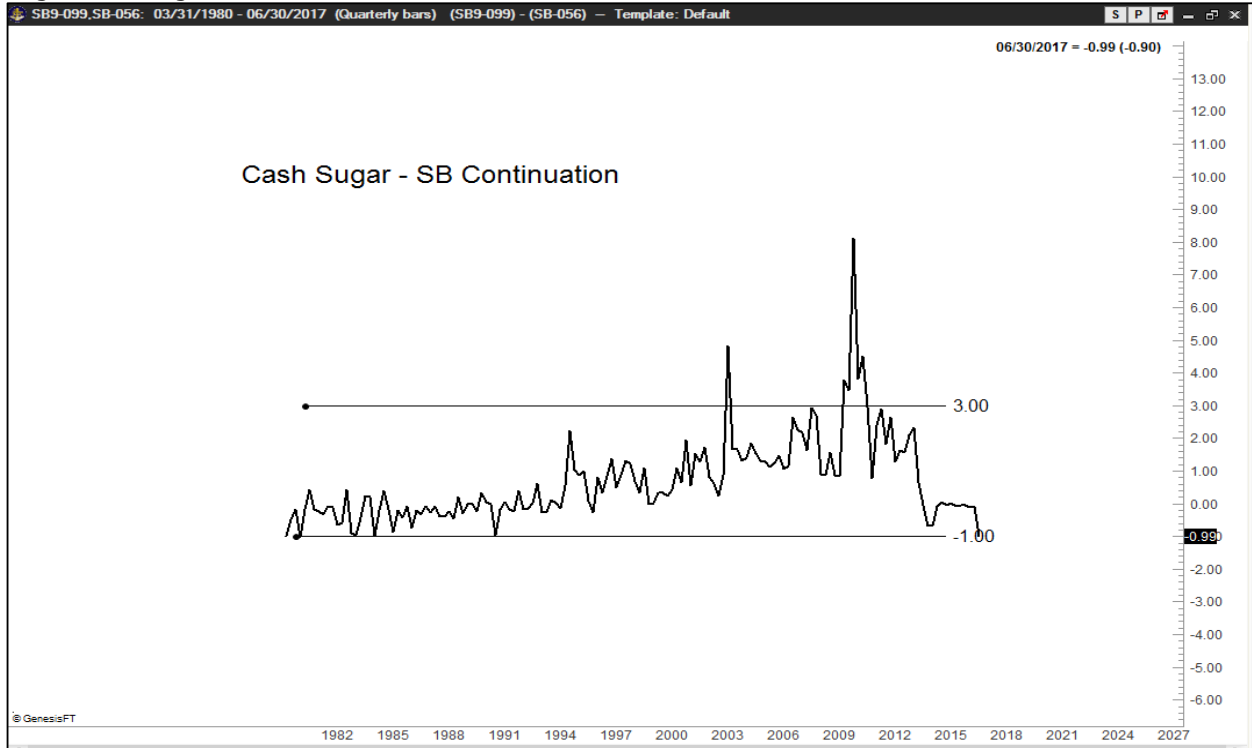
Platinum. Same story of convergence.



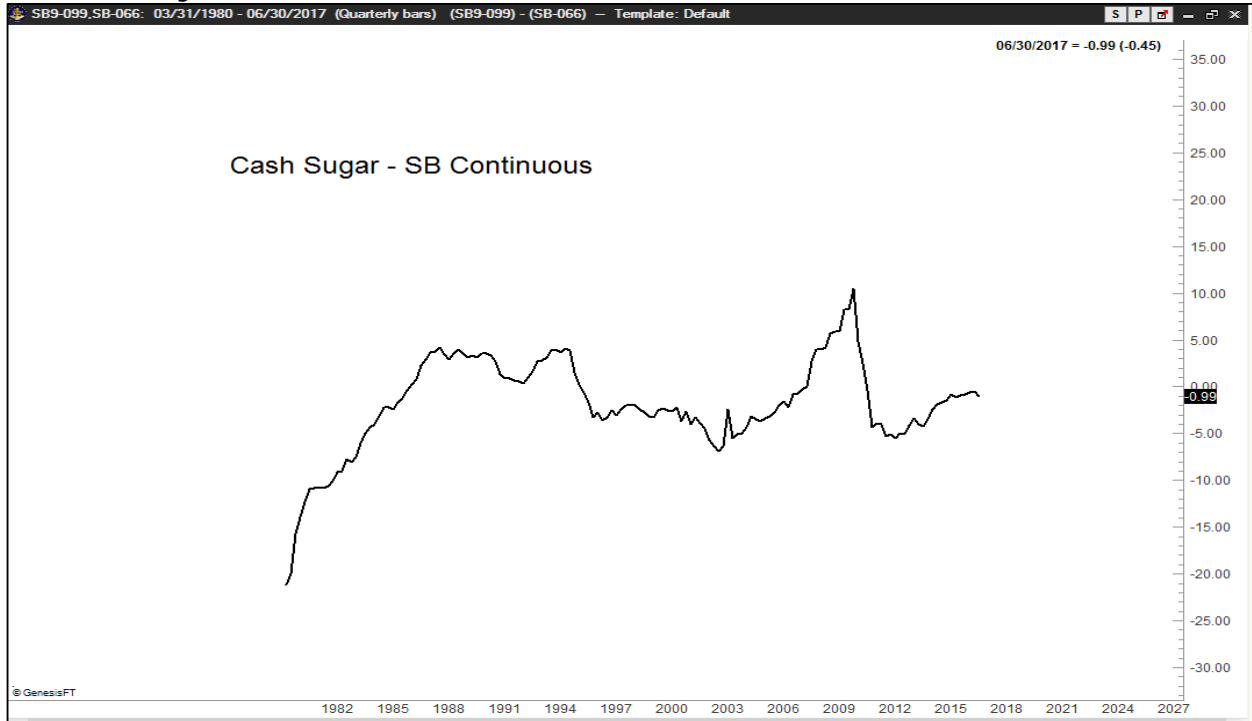
Same story of lack of convergence.



### Sugar. Convergence.



### Lack of convergence.





## Discussion

The real value of price charts are:

- Charts show where markets have been and presently are from an historical perspective
- Charts can help identify the timing of asymmetrical profit to risk trading opportunities
- Charts can show a price level where the directional bet and/or timing of a trade are wrong

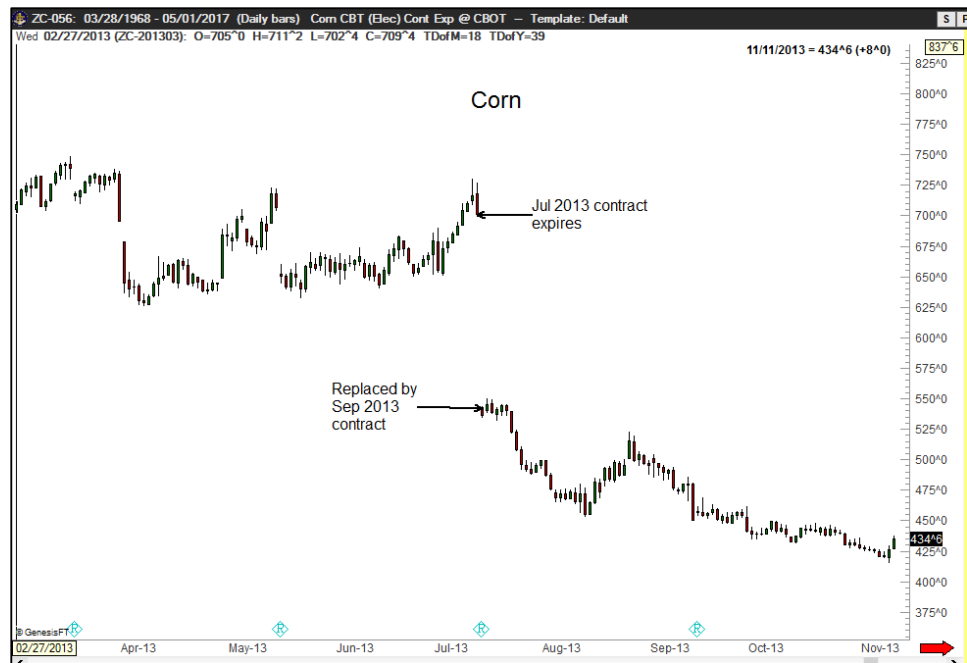
Given that most individual futures contract months have a very limited lifespan, it is necessary to patch expiring contracts together to generate longer-term price charts. How to do it? – That is the question.

Which method of constructing longer-term charts – Continuation or Continuous (roll-adjusted) – provides a better pictorial record of actual historical pricing?

In his blog post Jack – to his credit – selected two of the very best examples of contract rolls showing the temporary inadequacy of the continuation method of charting. These are two examples I would have used had I wished to stake a claim on Continuous Charting.

### Corn

Corn supplies were extremely tight in the 2012/2013 crop year. The carryout supplies in Sep 2013 were 621 million bushels representing only 20 days of demand, draining the channels of distribution. Prices remained high though the expiration of the Jul 2013 contract. At that point the grain market assumed that the all-time record acreage of Corn planted in the spring of 2013 would produce an all-time record harvest, which in fact occurred. Thus, the Jul 2013



contract expired at \$7.01 and was replaced on the Continuation chart by the Sep 2013 contract priced at \$5.42 – creating a \$1.59 gap. There is no doubt that a Continuation chart with a \$1.59 roll gap creates a problem.

## Lean Hogs

Jack also selected Lean Hogs as a market that displays roll-gap problems on Continuation graphs. I will readily admit that the Lean Hog market is the single most problematic market for roll gaps, followed by Live Cattle. In fact, agricultural markets in general experience the largest roll gaps.



## In defense of Continuation chart

The issue is not whether roll gaps exist in Continuation charts. The issue is which charting style, Continuation or Continuous, best represent the actual pricing history on longer-term charts so that the following questions can be assessed:

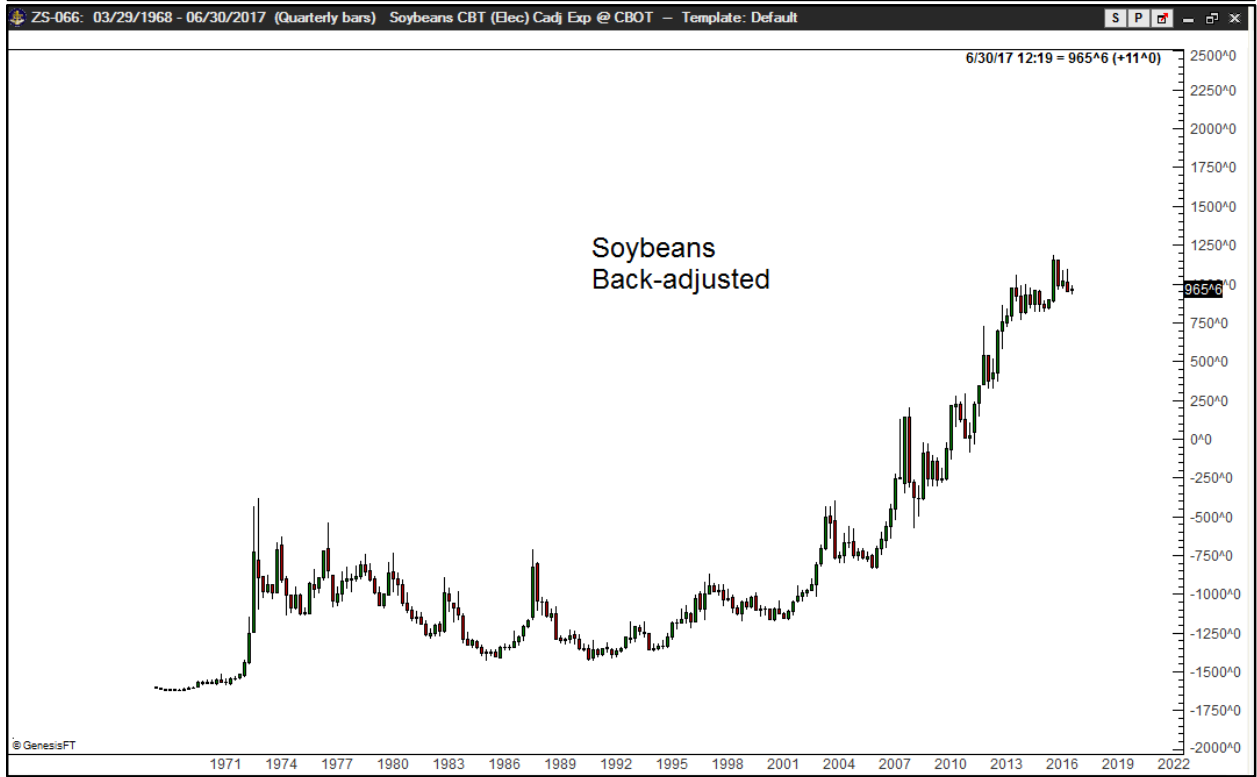
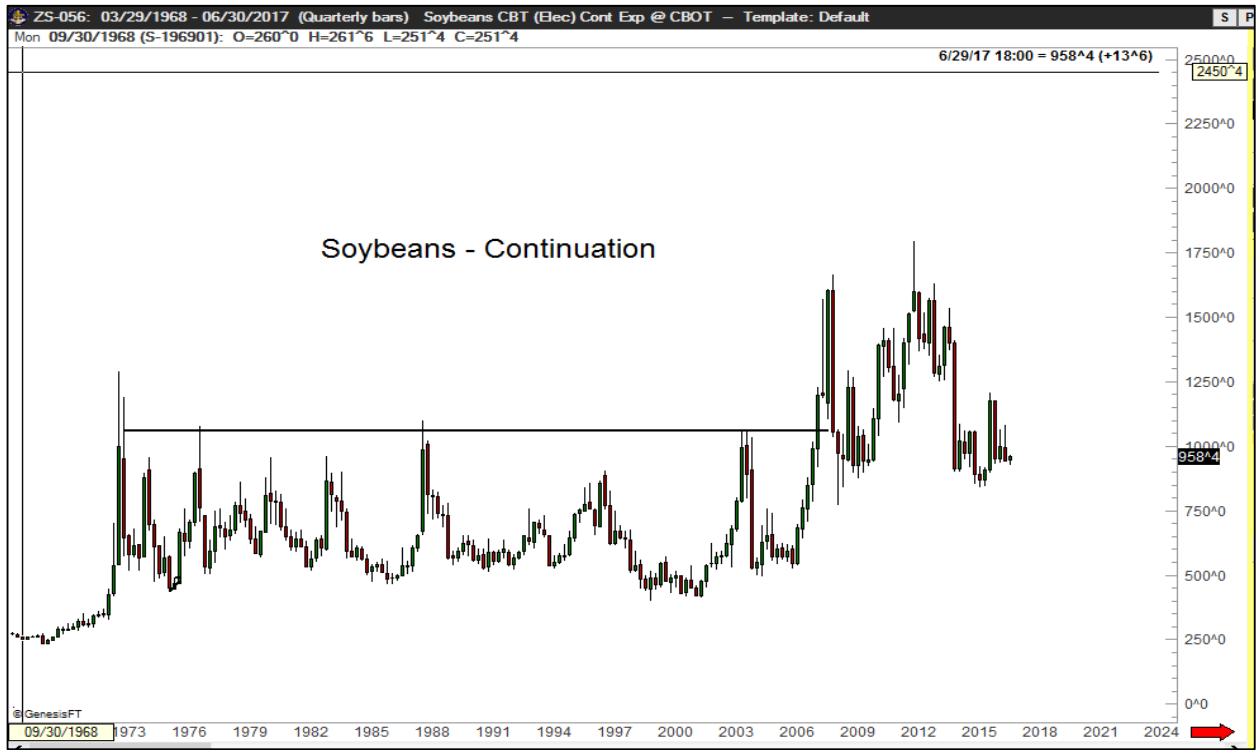
- Which charting method best shows where a market has been and where it is now relative to its historical pricing structure (i.e., trends, support and resistance levels, etc.)?
- Which charting method might display a classical chart configuration corresponding to a potential chart pattern-based trend in the underlying cash market?

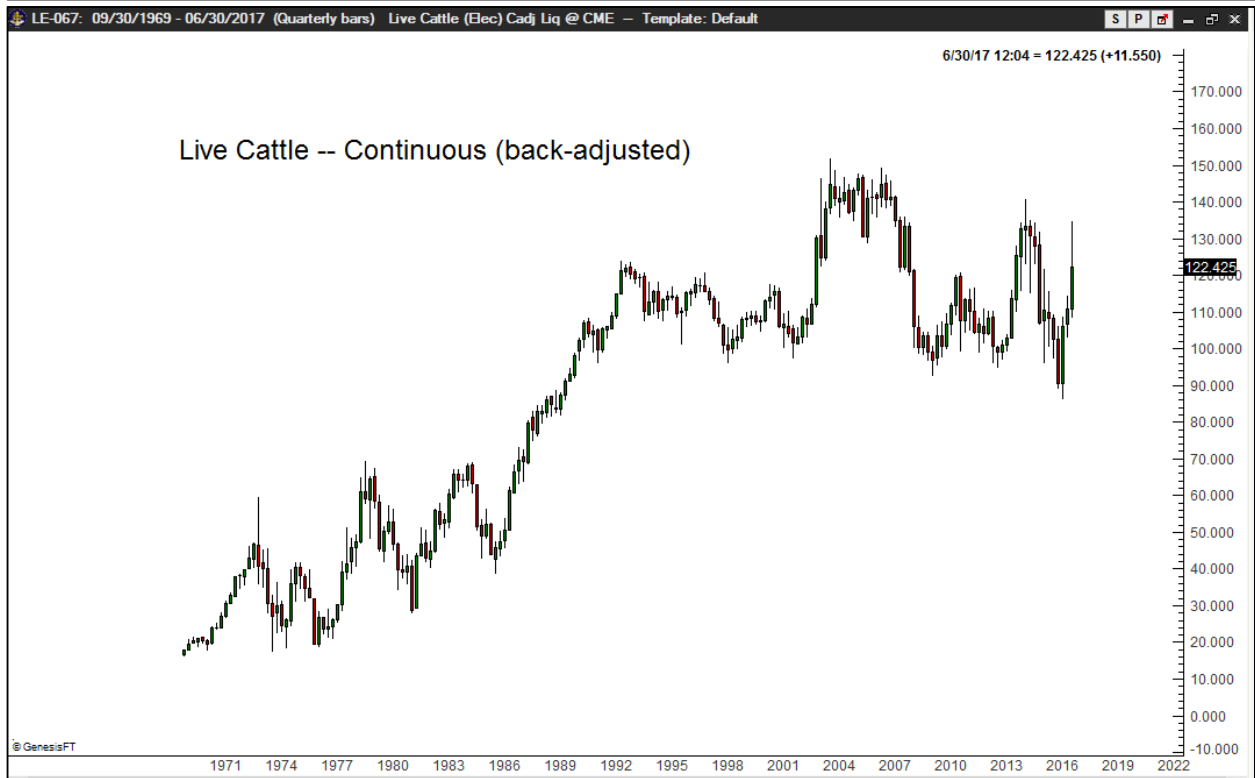
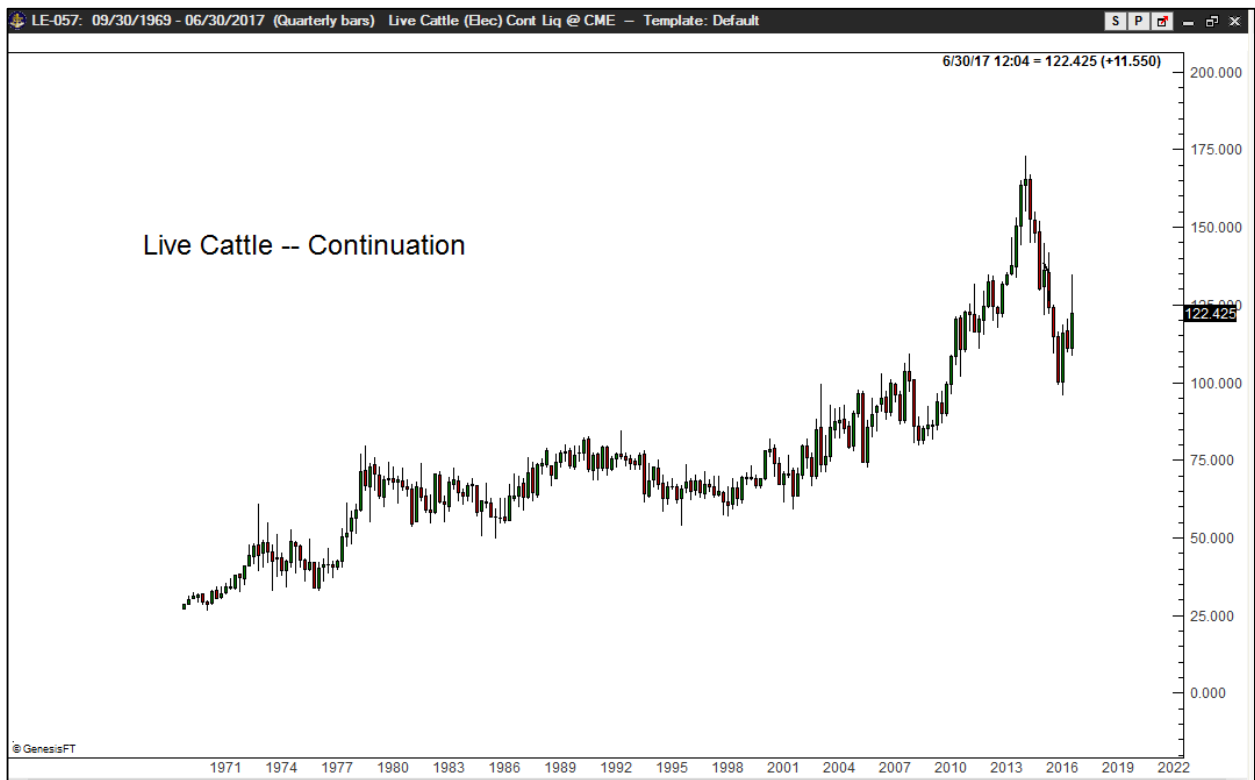
As a trader who believes underlying cash markets drive futures markets the answer to these two questions is unqualified and unequivocal – CONTINUATION CHARTS.

Continuous charting – in its attempt to removed roll gaps – can completely distort past price history beyond any resemblance of actual reality.

The past pricing history of Continuous charts is artificial with the exception of the current nearby contract month being plotted. With Continuation charts I know for certain that each bar in the time frame viewed represented the pricing of the actual contract month in the nearby position – in other words, REAL PRICES that actually occurred.

In short, Continuous charting can create a distorted price history in its efforts to eliminate the roll gap. If the charts on the previous pages have not hit home on this premise, let me once again review the Continuation vs. Continuous charts of two markets – Soybeans and Live Cattle. We know that every bar on the Continuation charts represents ACTUAL prices and that nearly every bar on the Continuous charts prior to the current nearby contract is manufactured.





## Can Continuous Charts provide value to traders?

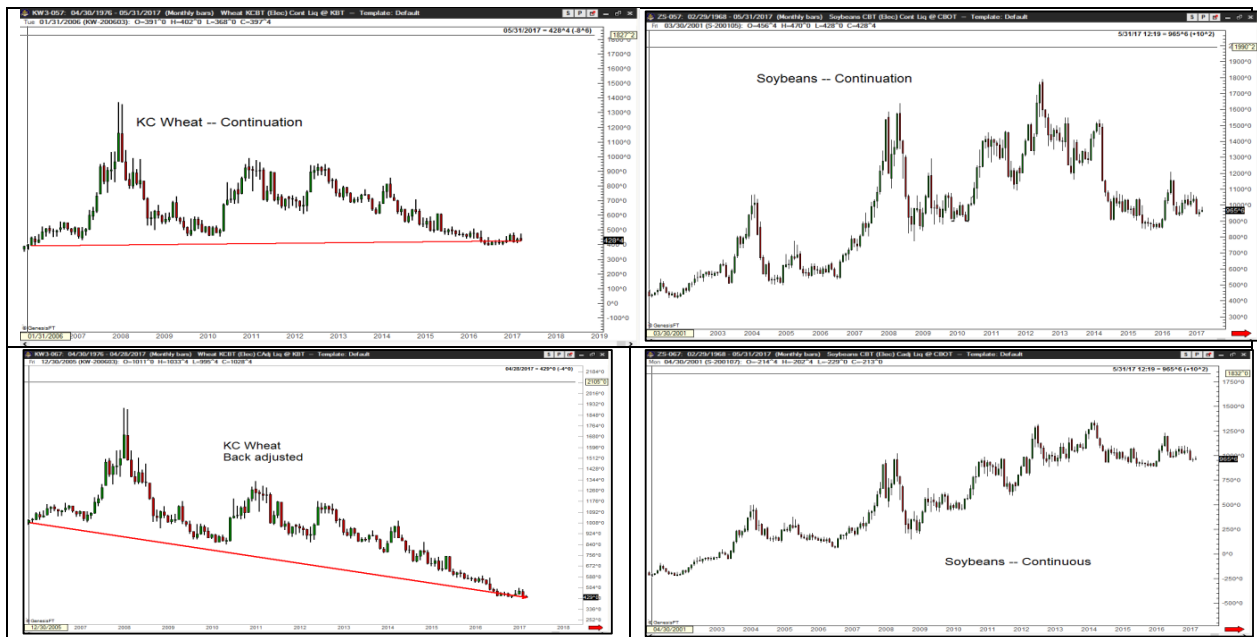
While preferring Continuation charts for overall market analysis and to identify asymmetric reward to risk trading opportunities, I do find some common ground with Jack. Continuous charts provide two distinct advantages over Continuation graphs.

Firstly, Continuous data is required to properly back-test a systematic trading approach or set of computerized trading rules precisely because the gap rolls are eliminated. Using the Corn example from page 17, a back-tested trading system would have covered a simulated position in Jul Corn at 7.01 and re-established the position in the Sep contract at 5.42, a much lower price. The 1.59 price differential between the two contracts would not have caused a gain or loss in a simulated Continuous trade. The systematic trading rules applied to Jul Corn would simply be switched over the Sep contract. In contrast to Continuous data, Continuation data cannot be used to back-test a systematic trading program.

Secondly (and related to the first point), a Continuous chart indicates whether the roll structure of a particular market has displayed a long-term bias in favor of either long or short position holders. A Continuous chart is a proxy for what would have happened to a trader who continuously maintained a long or short position throughout an extended length of time. This feature of Continuous charts is best explained by two examples.

The Continuation chart of KC Wheat displays a market that is about where it was in late 2005. However, the Continuous chart of KC Wheat shows that a trader continuously long KC Wheat would have done very poorly while a trader continuously short KC Wheat would have done quite well. Thus, the roll structure in K.C. Wheat has favored traders on the short side (top and bottom left).

By contrast, the roll structure in Soybeans has favored traders on the long side (top and bottom right).



### The final take-away

- For me, Continuation charting is far superior to Continuous charting for plotting prices that accurately reflect historical reality
- Continuation charts track quite well with the cash market for a commodity or financial instrument whereas Continuous charts can greatly misrepresent the price history of the underlying markets
- Continuation charts are mandatory for displaying levels of long-term support and resistance
- Continuous data is mandatory for back-testing systematic trading rules
- Continuous charting provides insight as to whether the roll structure of a market has historically favored the long side or short side
- If a trader can make money using Continuous Charts, who am I to object. I believe that every trader needs to discover the things that work for them. For me – it is Continuation charting.
- Neither Continuation or Continuous prices are tradeable – trading must be conducted in individual contract months
- While Continuation charts provide a best long-term perspective on historic levels of support and resistance, trades should only be made when the chart of an individual contract month provides an appropriate trading signal. Neither Continuation nor Continuous charts are valuable by themselves for short- to intermediate-term timing.

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