



Wheat Futures Contracts: Liquidity, Spreading Opportunities, and Fundamental Factors

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Both hedge funds and asset managers have the choice of two futures contracts at the CME Group for expressing views in the wheat markets: either via the Chicago soft red winter wheat (W) contract or the Kansas City hard red winter wheat (KW) contract. Regarding the latter contract, the CME Group acquired this contract in late 2012 when it purchased the Kansas City Board of Trade. Table 1 on the next page summarizes that both wheat futures contracts have a combined \$17.6 billion in open interest exposure (Panel A) and are also represented in the main commodity indices with an estimated \$5.4 billion in total exposure (Panel B), as of the writing of this article.

Once a decision has been made to gain exposure to wheat futures contracts, possibly as part of a broad-based reflationary investment strategy, how should a fund manager analyze the two classes of wheat represented by CME Group futures contracts? This article will assist in answering this question, but first will provide some brief fundamental background on soft red winter wheat and on hard red winter wheat.

Background on Wheat Classes

Types of wheat are classified according to three broad factors: (1) the timing of planting (encompassing winter or spring); (2) the level of protein (low, medium, or high); and (3) the color of the kernels (red or white). The more the protein, the “harder” the type of wheat is. Correspondingly, the less the protein, the “softer” the type of wheat is. Hard red winter (HRW) wheat “has excellent milling capabilities and baking characteristics ... and is used in artisan and pan breads, Asian noodles, hard rolls, flat breads, and general purpose flour” while soft red winter (SRW) wheat is used in “pastries, cakes, cookies, crackers, pretzels, flat breads, and for blending flours,” as explained by the California Wheat Commission (2017). HRW wheat has tended to trade at a premium to SRW because of its higher protein content. As depicted in Figure 1, HRW wheat is by far the largest class of wheat produced in the U.S. According to estimates in Bond and Lierfert (2016), HRW wheat accounted for 45% of U.S. wheat production while SRW wheat accounted for just 16% of production.



Table 1
CME Group Wheat Futures Contract Statistics at a Glance

Panel A Open Interest and Trading Volume as of 4/7/17				
	Aggregate Open Interest		Aggregate Trading Volume	
	(in contracts)	(in dollars)	(in contracts)	(in dollars)
Chicago SRW Wheat Futures Contract (W)	521,179	11,419,714,725	184,604	4,014,661,875
Kansas City HRW Wheat Futures Contract (KW)	280,004	6,148,551,025	54,083	1,185,593,950

Panel B Commodity Index Exposure Estimates			
	S&P GSCI	BCOM	Total
	(in dollars)	(in dollars)	(in dollars)
Chicago SRW Wheat Futures Contract (W)	1,950,000,000	2,145,000,000	4,095,000,000
Kansas City HRW Wheat Futures Contract (KW)	550,000,000	780,000,000	1,330,000,000

Panel C CFTC COT Report as of 4/7/17		
	Non-Commercial	5-Year Average
	Spreading Contracts	Non-Commercial
		Spreading Contracts
Chicago SRW Wheat Futures Contract (W)	102,351	75,284
Kansas City HRW Wheat Futures Contract (KW)	28,276	19,766

Panel D 5-Year Correlation as of 4/7/17	
Correlation of Front-Month W Contract with Front-Month KW Contract using weekly data and percent changes:	
92%	

Data Source for Panels A, C, and D: The Bloomberg.

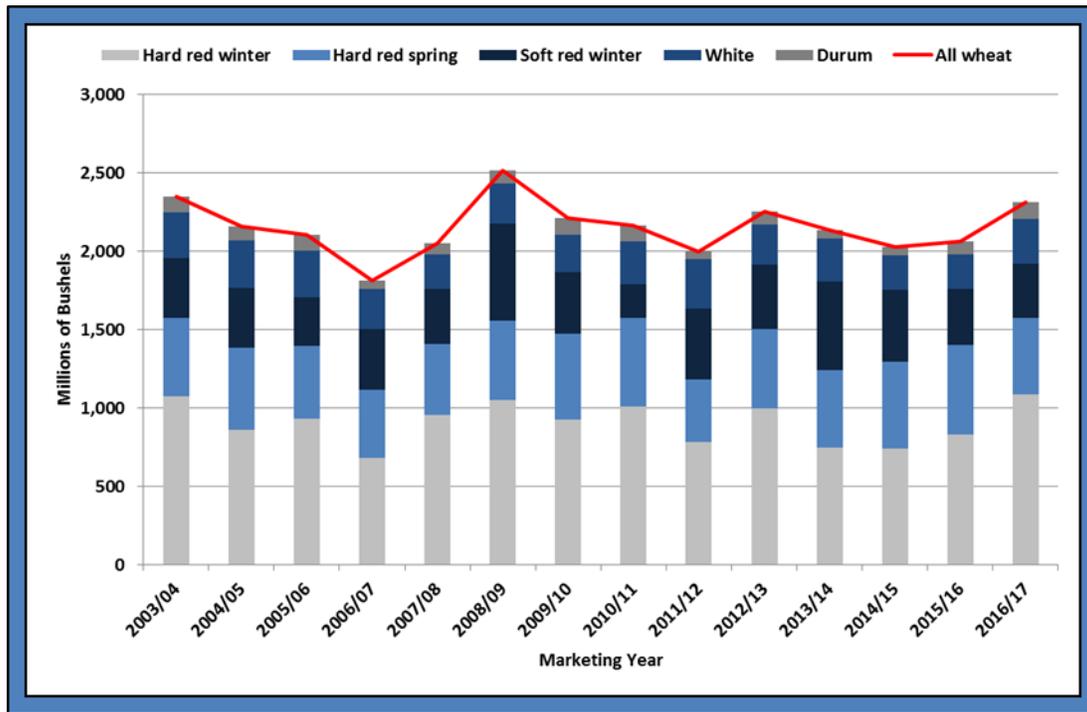
For Panel B, the commodity index exposure estimates are based on S&P Global (2016) and Bloomberg (2016) press releases along with Keenan (2017) index investment estimates.

Abbreviations:

SRW:	Soft Red Winter
HRW:	Hard Red Winter
CFTC:	Commodity Futures Trading Commission
COT:	Commitments of Traders
S&P GSCI:	Standard and Poor's Goldman Sachs Commodity Index
BCOM:	Bloomberg Commodity Index



Figure 1
U.S. Wheat Production by Class



Data Source: USDA Economic Research Service Wheat Data: Yearbook Tables, <https://www.ers.usda.gov/data-products/wheat-data/>, Wheat Data-All Years.xls, Table 6, in which the data was run on 3/10/17.

This manner of presenting data is based on Bond and Lierfert (2016), Figure 1.

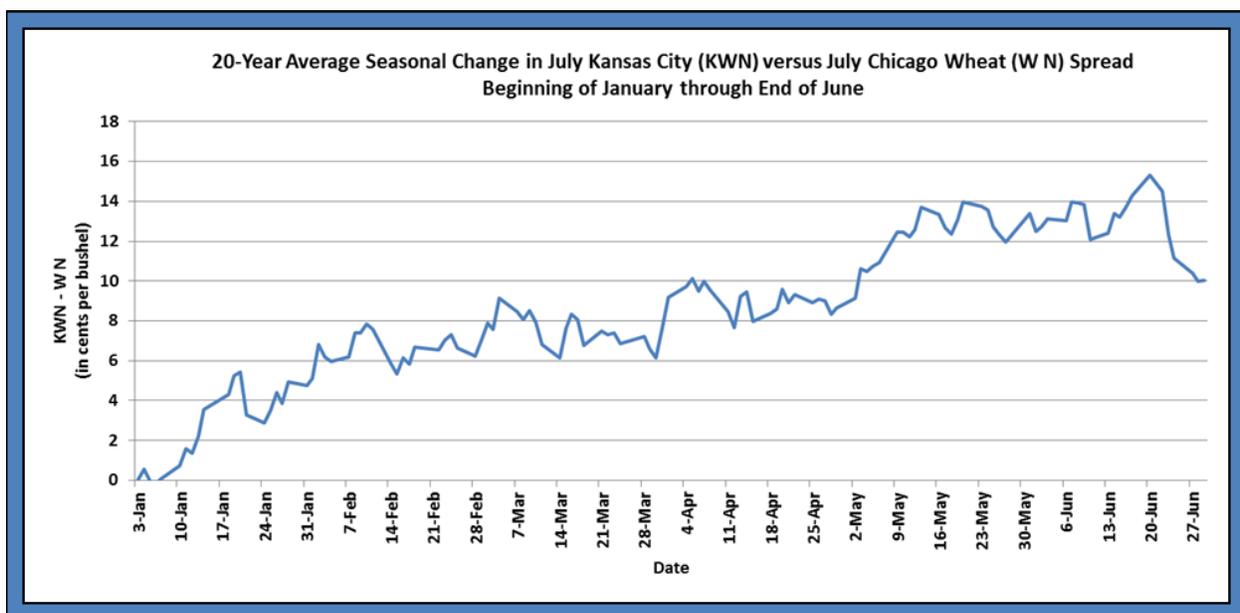
The Two Wheat Futures Contracts: Liquidity and Spreading Opportunities

Despite the relative economic ordering of HRW and SRW wheat, the futures contract on SRW is where hedgers can obtain the greatest amount of liquidity provision from speculators. This can be ascertained both from Panel A of Table 1, showing the greater open interest and trading volume in the Chicago SRW contract versus the Kansas City HRW contract, and also from Panel C of Table 1, showing the greater amount of speculative spreading activity in the SRW contract. Futures contract liquidity providers typically manage risk by spreading so the amount of speculative spreading provides an indication of the level of speculative services that a commercial hedger may be able to access. One might expect that at least some commercial hedging in Kansas City HRW wheat futures contracts would have to be risk-managed by speculators using the Chicago SRW futures contract, given (a) the latter contract's greater liquidity, and (b) how correlated the two contracts are, as shown in Panel D of Table 1. In this scenario, a commercial hedger would be entering into a short position in KC HRW futures contracts and a liquidity provider would correspondingly take the other side of this position by entering into a long KC HRW futures contract, and then hedge that position with a short Chicago SRW futures contract. But for this liquidity provision service to be consistently provided, there would likely have to be a statistical edge in



the resulting speculative spread position (KC HRW futures – Chicago SRW futures) being a profitable trade over time. Winter wheat is usually harvested in the summer so one might expect hedging would be focused on the summer contracts. Figure 2 shows, as might be expected from the necessities of liquidity provision, that the July KC HRW futures contract has on average outperformed the July Chicago SRW futures contract over the past 20 years. What this long-term graph obscures is that the spread was only profitable twelve out of the last twenty years, but also that periodically the trade has had very large gains, giving a long-options-like payoff profile to this position. This latter feature is very attractive to investors and speculators alike and also helps in compounding returns. In fact, according to Bloomberg data, the futures-only returns from buying and rolling front-month KC HRW contracts has outperformed a similar strategy for Chicago SRW contracts by 4.0% per year from 2000 through 2016.

Figure 2



Data Source: The Bloomberg.

Fundamental Factors Impacting Wheat Spread Opportunities

What this initial analysis points to is that a fund manager should not automatically choose Chicago SRW wheat (W) futures contracts as the vehicle to express a bullish view on wheat. There has historically been a statistical edge in choosing Kansas City HRW wheat futures (KW) contracts. One might even term the spread strategy identified in Figure 2 as earning a type of risk premium where on average there is a return for liquidity provision by taking exposure in the less liquid contract relative to the more liquidly traded contract. But hedge fund managers and asset managers alike have higher expectations for trades and investments: an actively managed position must have superior (entry-and-exit) timing and risk-management rules and should not just passively involve entering into a spread trade with a statistical expectation of profit.



Amongst the fundamental factors that can materially impact the KW – W spread from year-to-year include (1) whether SRW supply is particularly low; (2) whether HRW export demand is particularly low; and (3) the fluctuating protein content in HRW wheat. For example, regarding the first two points, Ehmke (2015) provided the following explanation for the steep premium of SRW to HRW, which occurred in November 2015: “Driving SRW’s rally against HRW is the serious shortage of quality SRW supplies ... while HRW inventories are abundant because of its weak export pace,” quoting an official from U.S. Wheat Associates.

SRW Wheat Supply

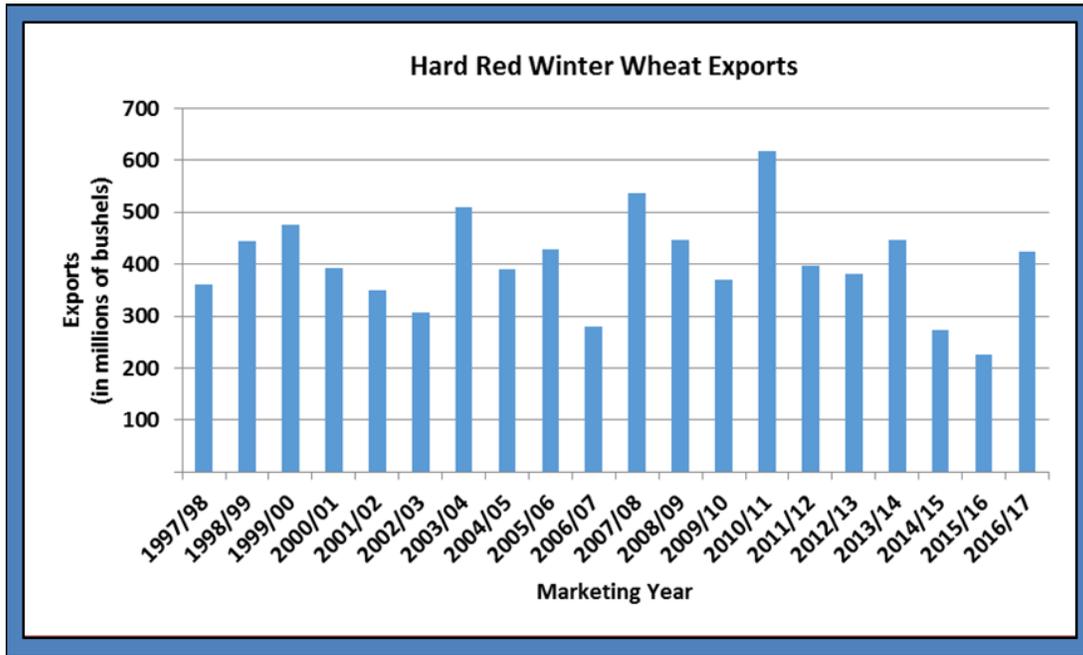
The data sources for monitoring the three factors noted above include not only U.S. Department of Agriculture (USDA) reports, but also information gleaned from Commodity Futures Trading Commission (CFTC) data. The CFTC helpfully produces the weekly Disaggregated Commitments of Traders (DCOT) report, which provides a breakdown of commodity futures positions across the following four categories: (1) Producer/Merchant/Processor/User; (2) Swap Dealers; (3) Managed Money; and (4) Other Reportables. The first category provides a window into the amount of commercial hedging (and therefore, amount of supply that is being hedged for a commodity.) When SRW wheat supply is particularly low, one would expect two results: (1) the amount of producer hedging would be low, and (2) the KC HRW – Chicago SRW spread level would not be particularly high, as there would be upward pressure on SRW wheat prices. And indeed since June 13, 2006, the start of data in the DCOT report, when the Chicago wheat futures contract’s Producer/Merchant/Processor/User short-hedging participation has been one standard deviation below average, the KC HRW – Chicago SRW spread has been below average.

HRW Wheat Exports

Regarding the relevant USDA data, Figure 3 on the next page draws from the USDA’s Economic Research Service in showing the history of HRW exports. The HRW exports in the 2014/2015 and 2015/2016 marketing years were one to two standard deviations below average since the 1997/1998 marketing year. In both of these years, the July KC HRW – July Chicago SRW spread did not appreciate as in the typical pattern shown in Figure 2.



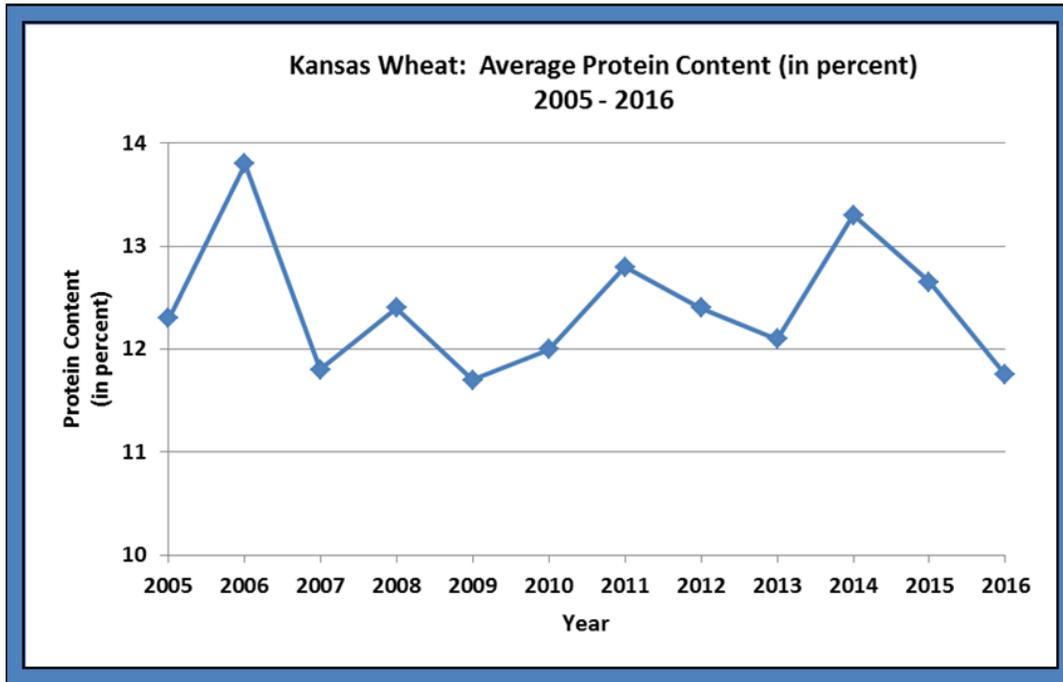
Figure 3



Data Source: USDA Economic Research Service Wheat Data: Yearbook Tables, <https://www.ers.usda.gov/data-products/wheat-data/>, Wheat Data-Recent.xls, Table 7, in which the data was run on 3/10/17.

Protein Content in Kansas Wheat

One can also refer to USDA reports for information on the fluctuating protein content of wheat grown in Kansas, as shown in Figure 4 on the next page. Ninety-five percent of wheat grown in Kansas is HRW, and 40% of U.S. HRW production is grown in Kansas. The above average protein-content showings in 2006, 2011, and 2014, depicted in Figure 4, correspond to times when the July KC HRW – July Chicago SRW spread did explosively well.

**Figure 4**

Source: Groskurth (2016).

Conclusion

How should fund managers choose amongst wheat futures contracts if they are interested in expressing bullish economic and inflationary views through positions in the agricultural futures complex? They should consider the various factors that drive the relative performance of different classes of wheat futures contracts, as briefly covered in this digest article.

Endnotes

This article is based on Till (2017).

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And finally, this article made liberal use of historical data and analyses in discussing past empirical relationships in the wheat futures markets. Consequently, the reader should be aware that the paper's past results are obviously not guaranteed to continue into the future. The reader should be further aware that all commodity futures trading endeavors are, in practice, quite risky.



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Keywords

Wheat futures contracts, liquidity.