

ULSD Futures Are A Very Efficient Jet Fuel Hedge

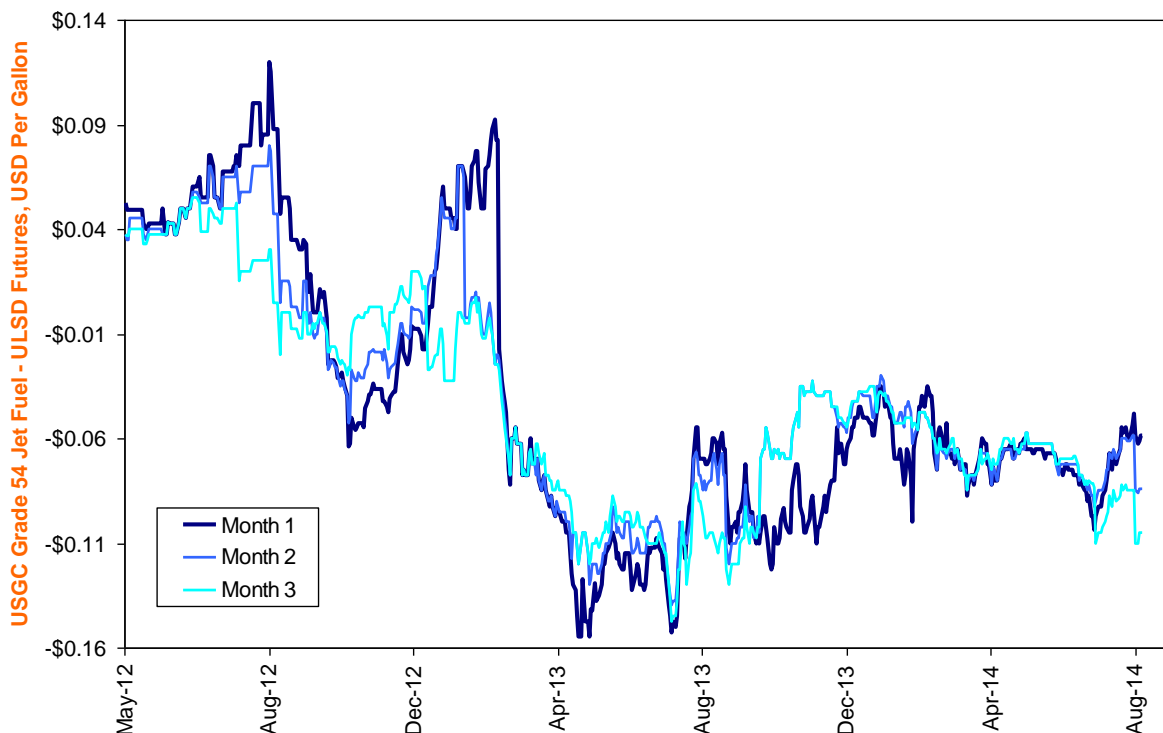
As all airlines are exposed to the risk of higher jet fuel prices at all times they should adopt policies to offset this risk. The ideal instrument for this trade might be long call options on jet fuel itself. They can cap the cost of the fuel less the option premium paid and simultaneously allow the airline to benefit from lower prices. However, this trade has not been adopted widely.

A second instrument to offset rising prices is jet fuel swaps. An airline might enter into a swap with a refiner or terminal operator to receive payments when the price of jet fuel rises over an agreed-upon index price and to make payments when the price of jet fuel falls below that index price. In addition to “vanilla” swaps such as these, airlines and fuel sellers can enter into a variety of more exotic swaps, such as capping swaps that effectively act as a call option on jet fuel prices. Jet fuel swaps offer a great deal of flexibility in terms, including volume, duration and direct exposure to local market conditions, but they expose both the airline and the fuel seller to each other’s credit risk and tend to be very illiquid.

A third instrument is long positions in ultra-low sulfur diesel fuel (ULSD) futures. These offer a statistically robust and highly liquid way for airlines to manage their fuel price risks at the AAA credit quality risk of the CME Clearinghouse. These futures replaced those based on No. 2 heating oil beginning with the May 2013 contract. Heating oil, jet fuel and ULSD all derive from the same cut of refined products known as middle distillates and therefore tend to move similarly in price. This is critical in establishing a low level of basis risk, or quality of statistical fit between ULSD futures based on delivery at New York Harbor and local jet fuel markets based on local refinery output often delivered directly to airport tank farms by dedicated pipelines.

Basis is defined as the difference between a cash market price and a futures market price. If a hedge is perfect, basis should move to zero by the delivery date for the standard delivery date at the exchange’s delivery point. Moreover, the convergence path of basis should be smooth. In the real world with grade differentials and with local market variations, basis will fluctuate as illustrated by the basis spread swap futures for Grade 54 jet fuel at the U.S. Gulf Coast (USGC) and each of the first three months of ULSD futures. As an important side note, these futures allow both airlines and sellers to lock in a basis in addition to locking in a New York Harbor price with ULSD futures.

USGC Jet Fuel Vs. NYH ULSD Spread



Local Market Hedges

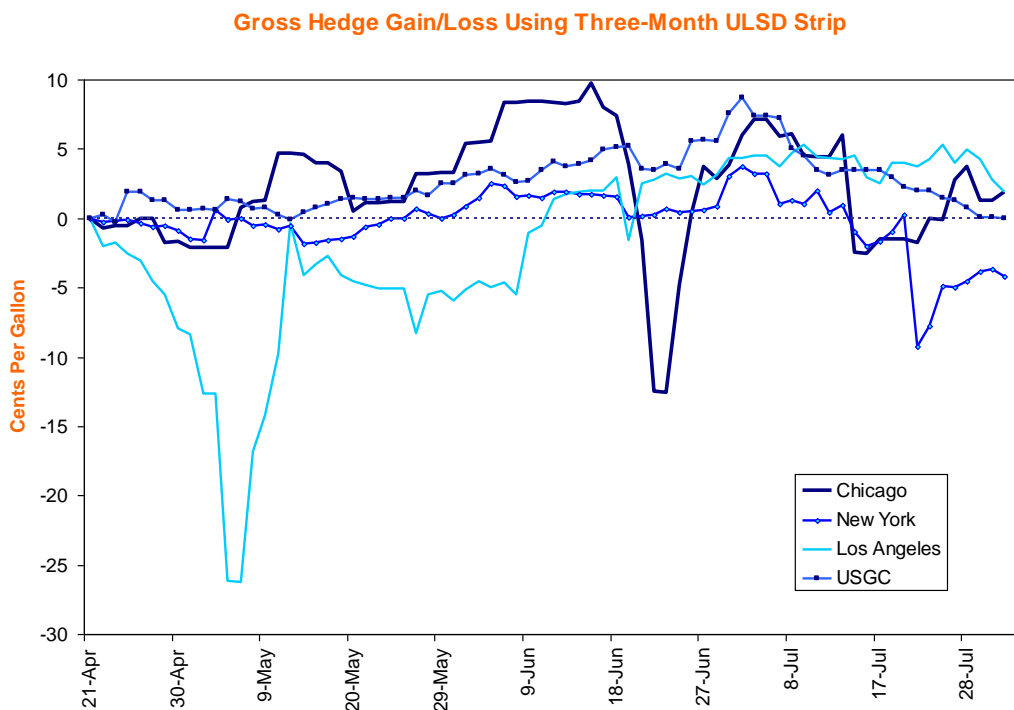
The definition of a bona fide hedge under the Financial Accounting Standards Board's Statement 133 includes a beta or relative variance ratio between 0.80 and 1.25. ULSD futures meet these requirements as a hedge for jet fuel easily. Let's take four regional markets for Grade 54 jet fuel, Chicago, New York, Los Angeles and the USGC and a three-month calendar strip of ULSD futures. Their betas between the May 2012 start of ULSD futures trading and early August 2014 are 1.001, 1.0038, 1.0032 and 1.0037, respectively.

This quality of fit was similarly high for these four regional jet fuel markets when No. 2 heating oil underlay the middle distillate futures contract. Betas for the combined period extending back to May 2006 for the four markets were 1.0042, 1.0042, 1.0041 and 1.0042, respectively. The r^2 , or percentage of variance explained, over the post-May 2006 period for the four markets have been 0.952, 0.968, 0.957 and 0.965, respectively.

Case Study

While jet fuel price risk management must be a continuous process of maintaining a long ULSD futures position against a naturally short jet fuel position, it is still instructive to map a three-month case study of how a three-month ULSD strip would have hedged Grade 54 jet fuel positions beginning on April 21, 2014 and extending through the expiration of the August ULSD futures contract on July 31, 2014.

The ideal combined hedge position should oscillate around zero and have very low variance, but the real world with its refinery outages and other supply disruptions does not always allow this. What we do see in the chart below is how short-term dislocations in the Los Angeles market in late April and early May and in the Chicago market in late June were eliminated quickly. The ability of local jet fuel markets to return to a normal basis relationship vis-à-vis a three-month strip of ULSD futures illustrates just how effective and efficient they are as a hedge instrument.



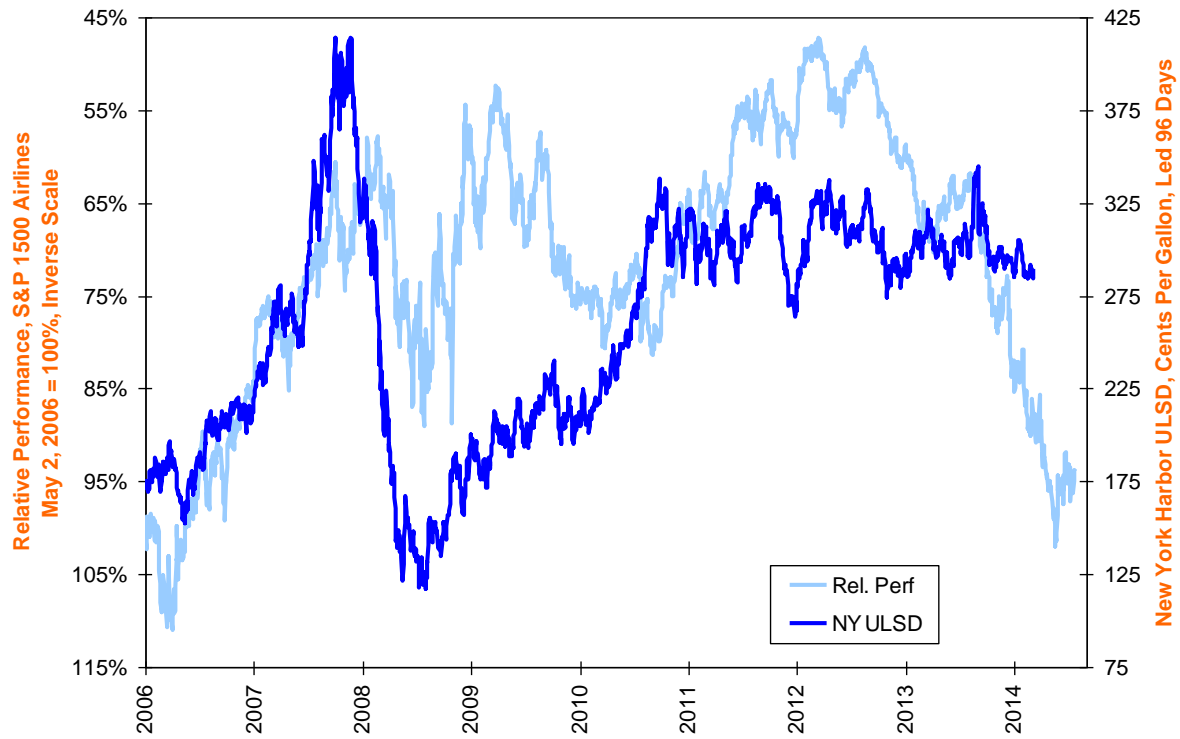
Rewards From Investors

Risk management matters. Much of the time and attention surrounding financial markets and their role in the economy in recent years has been devoted to their role as investments. This has tended to mask the very real and important role futures markets serve for commercial hedgers. Few industries illustrate better than airlines by virtue of their direct and permanent exposure to higher jet fuel prices.

While many other factors affect airline stocks' relative performance, including mergers, restructurings, labor arrangements and the general state of the economy, the price of ULSD exerts a powerful effect on airlines' profitability and stock market performance. The performance of the S&P 1500 Airline group relative to the S&P 1500 Supercomposite itself has led the price of ULSD in New York Harbor by 96 days on average since the ULSD market began in May 2006. Investors understand jet fuel price risk management matters and they buy and sell

airline stocks in anticipation of price changes for ULSD. Any airline with lower exposure to jet fuel price increases should be rewarded with a higher multiple than its peers. Hedging, while often viewed as a defensive action, is simply a good business practice.

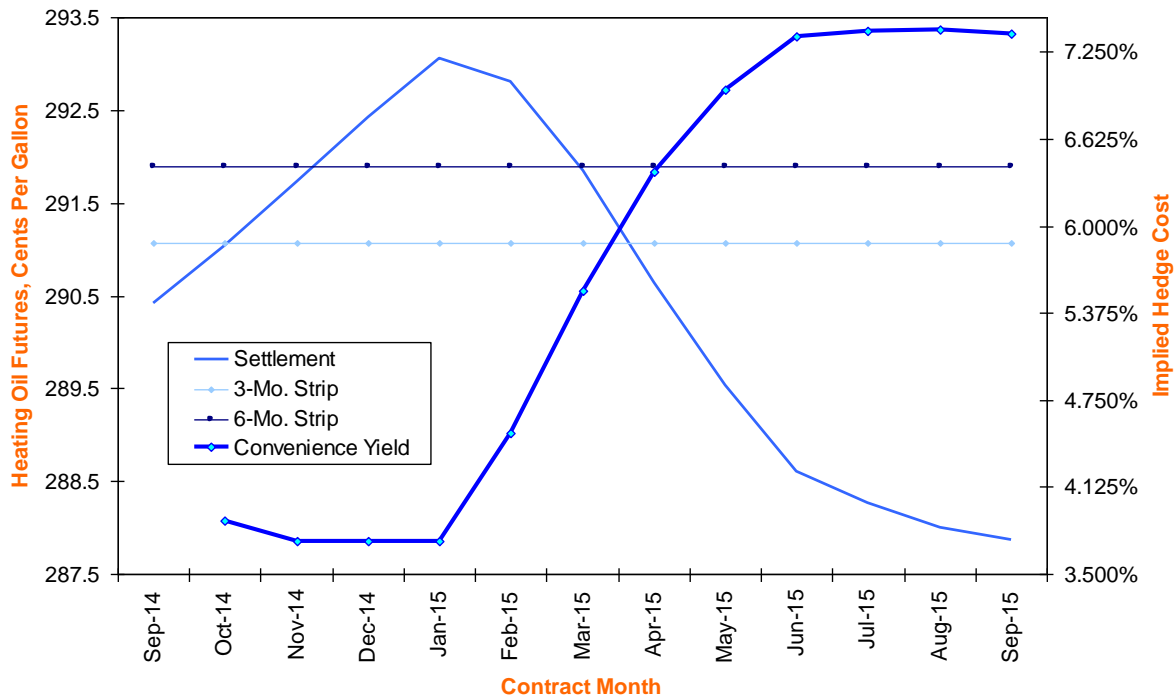
Airlines' Relative Performance Leads ULSD Inversely



Technical Appendix

While the ULSD market is not quite as seasonal as the old heating oil market had been, both increased wintertime demand for heating fuels and shifts in refinery output configurations give the ULSD forward curve a seasonal shape. An airline buying a three- or six-month strip of ULSD futures to hedge its price risk often will be buying into a carry curve where the strip price will be greater than the spot price of ULSD and will converge downwards, as illustrated below. Of course, the opposite phenomenon, buying forward into a backwarddated forward curve, often occurs during the winter and spring and will give the airline upward price convergence of futures to the spot price. These costs exist in all jet fuel hedging instruments, not just ULSD futures, and must be taken into account.

NYMEX Forward Curve And Implied Hedge Cost
August 7, 2014



While the old heating oil contract often traded in a deep carry or contango during the late spring and summer months so that heating oil buyers could build and hedge inventories by taking delivery and selling back-month futures contracts, ULSD does not follow this storage schedule. As a result, an airline buying a strip of ULSD futures will face an implied hedge cost also known as the convenience yield. This represents the cost of insurance against price risk. It is described below in equation form where $Month_1$ and $Month_2$ are the first and second futures contracts, $Storage$ is the physical cost of holding a commodity and e^{rt} is the capital cost of money tied up in inventory.

$$CY = \left[1 + \frac{Month_1 * e^{rt} + Storage - Month_2}{Month_1} \right]^{365/d} - 1$$

This cost of doing business is not confined to the futures market. The implied volatility of options on ULSD futures generally is higher for the front months in reflection of greater trading activity and demand for hedging in these months. Those same costs are reflected in the swap market as well as market-makers have to hedge their own risks in providing fixed or capped prices to airlines. No one hedge is ever cheaper than another on a risk-adjusted basis.

ULSD Futures Forward Curve And Volatility August 7, 2014

