Midwest Aluminum Premium Produces Market Solutions

Warehouses, silos, tanks and all other storage facilities are an integral part of all physical derivative markets, both exchange-traded and over-the-counter. Thinks of them as part of financial markets' plumbing or wiring; they perform their mundane but necessary tasks in the background, are taken for granted and are capable of producing large and unwelcome surprises when something goes wrong. This appears to be the case with the aluminum market in the U.S. Midwest today.

Monetizing Storage

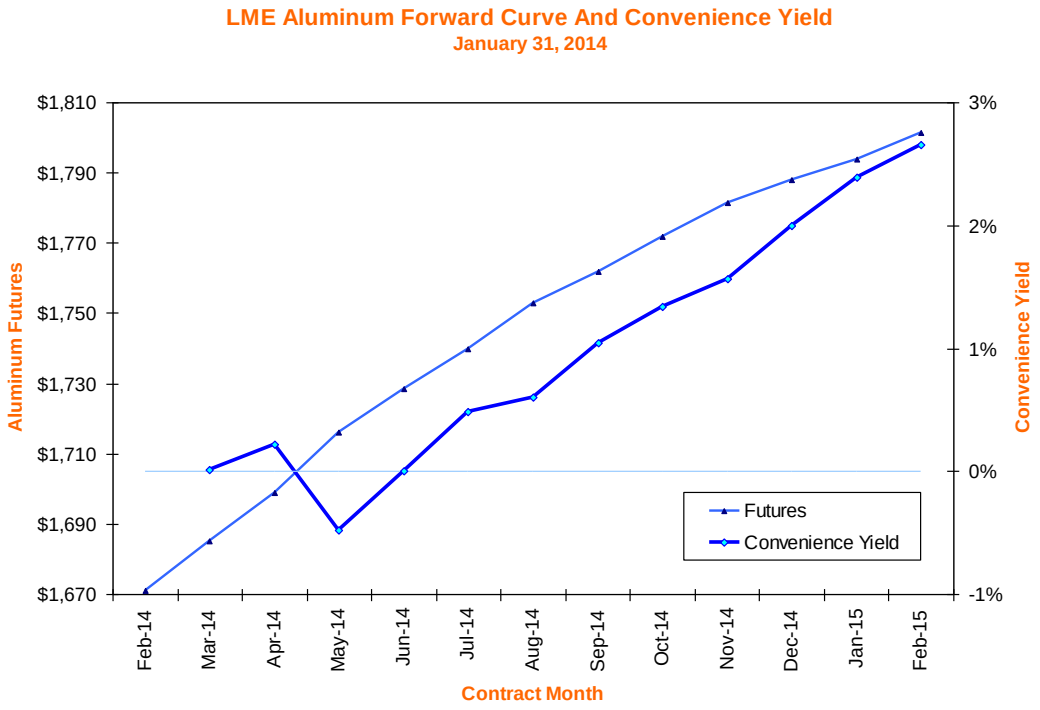
The forward curve of a futures market is based on the cost of carry model; buyers should be indifferent between holding a commodity themselves and taking a long position in a futures contract that is priced at the current spot price plus all of the physical and financial costs of storage.

This is the base case. In practice, many buyers in physical process industries such as oil refining or wheat milling are willing to pay to keep available inventories on-hand to avoid very expensive shutdowns in case of supply disruptions or demand surges. This acceptance of inventory holding costs acts like an insurance premium against having to pay unexpectedly high prices for future spot delivery. This payment often is referred to as the convenience yield of a market, 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.

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

A market with a rising forward curve where futures prices exceed spot prices but where convenience yields are positive will be referred to as a "carry" market. A market with a declining forward curve with futures prices less than the spot price always has a positive convenience yield and is a "backwardated" or inverted market. A market with a negative convenience yield is in "contango;" here inventory holders can sell futures contracts forward and more than cover their storage costs. We should expect inventories to decline in backwardated markets and to rise in contango markets.

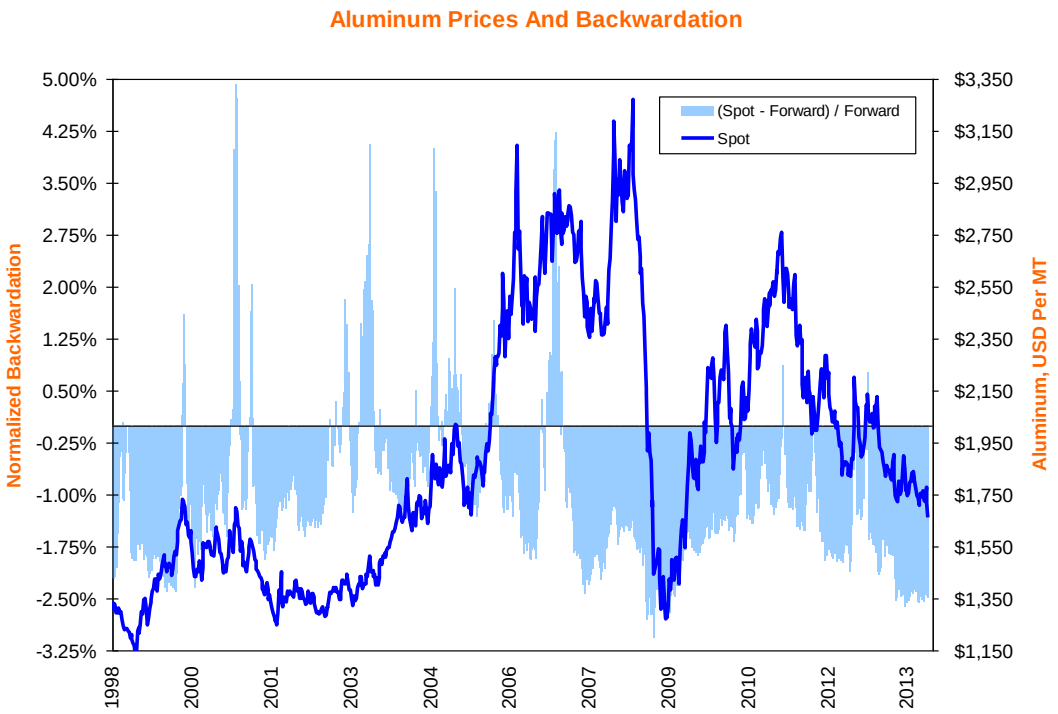
A snapshot of the London Metals Exchange Primary Aluminum futures market from Friday, January 31, 2014 shows the forward curve to be in a steady carry. An implied convenience yield using current U.K. swap rates indicates monthly storage costs would have to be as low as $13.60/metric ton/month to drive convenience yields down to 0%. As current maximum storage rates in warehouses in the U.S. Midwest are over $39 per MT/Mo., the structure of the futures market implies a low level of inventory building as cash-and-carry storage should be unprofitable.



Aluminum Market

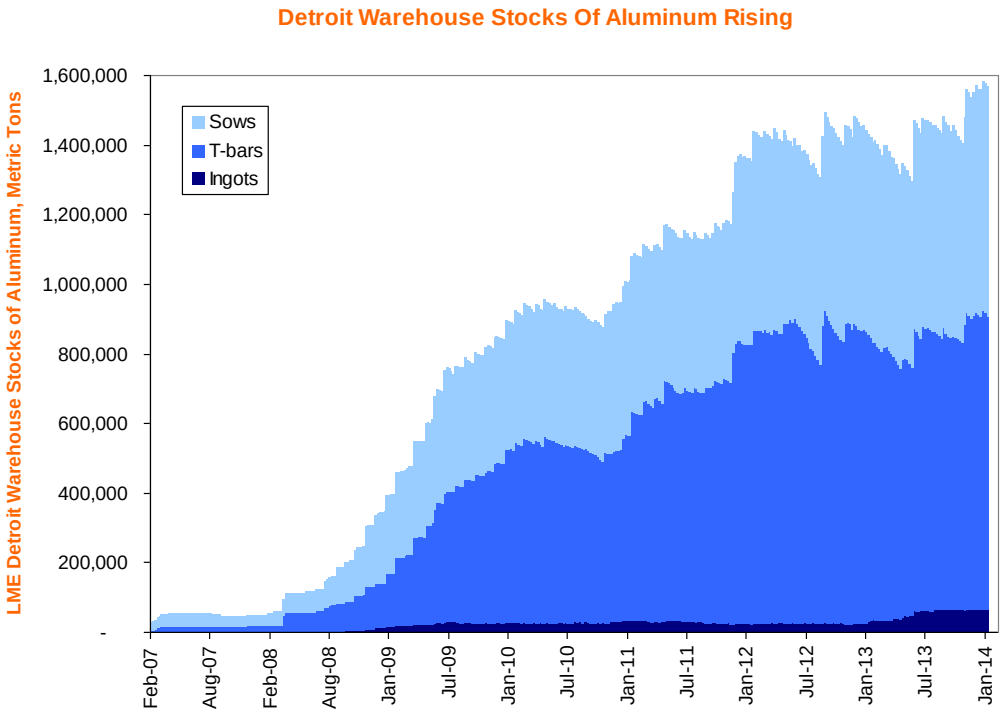
The aluminum market has followed the pattern of so many other physical markets in general and non-ferrous metals markets in particular in recent years. Prices rose during China's massive construction boom of 2003-2008, fell during the financial crisis and then stabilized in early 2009 as China began a short-lived strategic stockpiling campaign for aluminum and other industrial materials. Chinese imports of aluminum rose from an average of 77,670 metric tons per month in the second quarter of 2008 to 375,020 metric tons per month in the second quarter of 2009 and then retreated to 87,470 metric tons per month in the second quarter of 2010. Monthly imports in the fourth quarter of 2013 averaged 103,843 metric tons.

The normalized backwardation between LME spot prices and three-month forwards ebbed and flowed with price. This has been the traditional pattern in physical markets such as metals and petroleum where the cheapest places of storage are with the producer rather than with the buyer. As the aluminum market has been well-supplied and without either significant disruptions in supply or surges in demand since the financial crisis, spot prices have declined both absolutely and relative to three-month forwards. All of this has been quite normal.

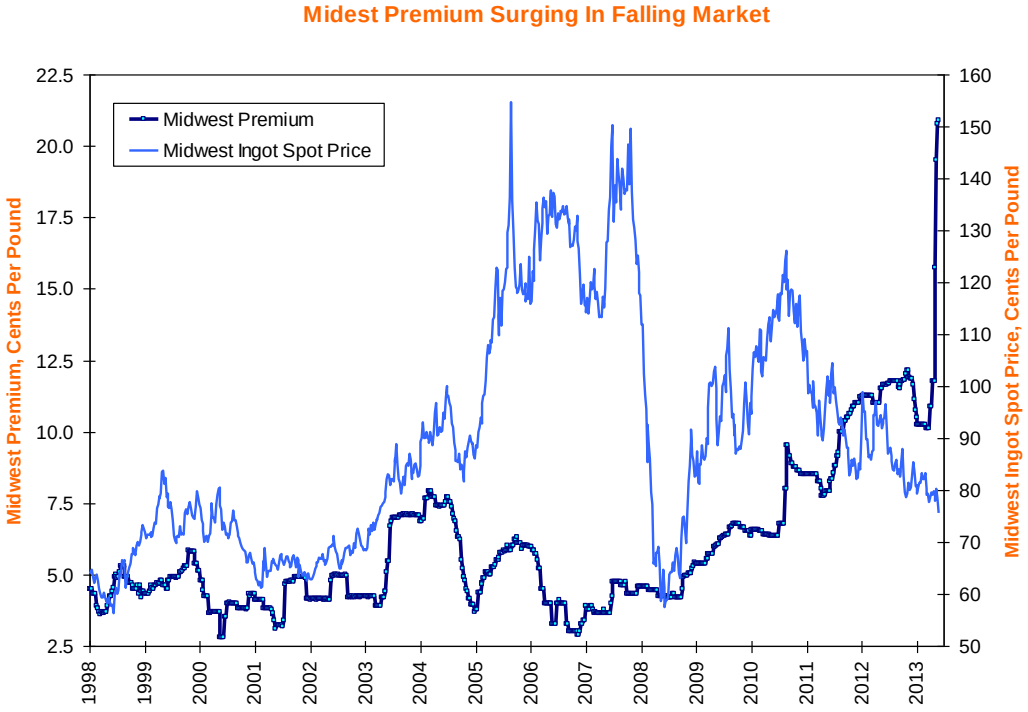


The U.S. Midwest

For all of Detroit's misfortunes in municipal finance, it remains a hub of automobile manufacture and hence a primary market for aluminum and three certified LME warehouses for the metal. Stocks of aluminum held in these three warehouses have increased steadily over the past seven years. These rising inventories should suggest tame spot prices and quick delivery times. The Conference Board uses a slower deliveries diffusion index as one of its leading economic indicators; we should expect high inventories to be associated with faster, not slower, delivery times.



What we have seen is something rather different. The *Metals Bulletin* premium for delivery of P1020 aluminum ingots began rising along with inventories in mid-2009 and has surged since November 2013 while the spot price of ingots has declined.



The Embedded Call Option

Physical commodities held in storage and hedged with short positions in futures or other derivatives embed a call option. Inventory holders are in a position to command a premium price from buyers in need of spot delivery; the most expensive pound of aluminum to an automobile manufacturer is the one whose unavailability led to a shutdown of the plant. As those premia can rise swiftly and with few natural bounds, the profit profile of the trade starts to resemble the profit profile of a call option. In exchange for what may be a small loss on putting aluminum into storage, selling a short position against it and holding the trade to expiration, the inventory holder receives the opportunity to extract extraordinary gains from the final buyer.

Let's illustrate broadly and using data from November 15, 2013 and January 31, 2014. The *Metals Bulletin* Midwest spot and premium prices are converted from dollars per pound to dollars per metric ton. A long position in the Midwest spot can be matched against a short February futures contract. Two and one-half months later, after paying the LME warehouse and capital charges, the trade would be approximately $55.55 per metric ton underwater. However, if the futures contract was repurchased and sold at a Midwest premium $237 greater than it was in November, the trade would gain more than $182 per metric ton on a gross and indicative basis.

Midwest Aluminum Premium As A Call Option

	Midwest Spot	February Future	Storage	Midwest Premium
Nov. 15, 2013	$1,741.66	$ 1,792.00		$223.22
Jan. 31, 2013	$1,666.92	$ 1,671.00		$460.22
Component Gain/Loss:	$ (74.74)	$ 121.00	$(100.81)	$237.00
Net:	$ 182.45			

Extraordinary Profits Invite Competition

The at-risk potential to capture these gains is why storage operators are willing to buy metal in a declining market. However, this does not explain why the final users of aluminum, such as automobile manufacturers, are willing to maintain their own just-in-time inventory policies and expose themselves to paying a large Midwest premium. Processors in other industries have learned about the "convenience" of paying an insurance premium in the form of inventory holding costs to avoid having the economic rent of ample supplies go to the warehouse operators and not to themselves and their various stakeholders.

Midwest aluminum buyers clearly need a vehicle to manage their all-in costs including the spot price, conversion and freight costs and the Midwest premium. This is no different in principle than pricing systems in other industries, such as crude oil cargoes, where a system of contracts-for-differences (CFDs) has arisen. These CFDs trade in over-the-counter markets and are a swap on the differential between the 10-25 day market and forward contracts.

One instrument already being traded in the aluminum market and finding growing acceptance is the CME Group's Aluminum Midwest Transaction Premium Platts contract. This contract settles financially on the average monthly Midwest premium as reported by *Platts*.

The long history of financial risk management is markets work when you let them. The price signals and inventory hedging opportunities created by the existing system of aluminum derivatives has given aluminum buyers the physical insurance of greater supplies at the cost of warehouse operators capturing the difference between spot and forward prices. A second, physically delivered contract, based on the all-in price for aluminum in the Midwest will allow buyers to recapture some of the economic rent from warehouse operators. It is expected to be launched by the CME Group sometime in 2014.