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Non-Convergence in Domestic Commodity Futures Markets: Causes, Consequences, and Remedies

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What Is the Issue?

From 2005 to 2010, many corn, soybean, and wheat futures contracts repeatedly expired at prices much higher than corresponding delivery market cash prices. In principle, these futures contracts can be exchanged for the physical commodity at expiration, so their prices should converge with the price of the underlying cash commodity. This sustained period of non-convergence, as well as its magnitude, was unprecedented in domestic commodity markets. This was a cause of concern for many market participants, policymakers, and economists, who worried that those convergence failures signaled a weakening of the traditional price discovery and risk management roles of these futures markets, and ultimately, a less efficient allocation of agricultural resources.

What Did the Study Find?

Market observers offered several explanations for the non-convergence puzzle, but none was tested rigorously and shown to explain the problem. One theory is that “excessive speculation” by nontraditional financial firms, like Commodity Index Traders (CITs), overpowered the ability of arbitrageurs to balance derivative and cash prices, leading to non-convergence in wheat markets. While it is true that CIT trading increased substantially during the time when non-convergence became a problem, this theory suffers from several theoretical limitations. For example, if purchasing behavior by these firms drove up the derivative price relative to the cash price, their equally sizable selling behavior before contract expiration should serve to force those prices together, leading to convergence. To maintain portfolio exposure, CITs enter one contract and then roll to the next, buying at first and holding it until it almost expires, then selling it to buy the next expiration.

In another account, production and trade patterns for these commodities shifted away from long-established delivery markets, limiting the ability of firms to arbitrage away the price difference between the two markets by engaging in the delivery process. On the other hand, the commercial flow for wheat in particular has bypassed these delivery markets for decades, so this theory does not adequately explain convergence problems observed since 2005.

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We conclude that recent convergence failures in grain markets are attributable to inconsistent storage rates for the physical commodity and its derivative, a delivery instrument. Specifically, the exchange-set storage rate of the delivery instrument was too low relative to the true price of storage. The resulting wedge between the costs of holding delivery instruments and storing physical grain led to an expansion of the delivery month basis, preventing convergence even in a competitive market. The available empirical evidence fits this storage rate argument: inventories, which drive the wedge, are the most important factor in explaining the change in the expiring basis. In contrast, no empirical support was found for the CIT theory: trading activities by these firms are not found to affect the change in the basis over time, at any acceptable level of statistical significance.

How Was the Study Conducted?

This report summarizes the basic theory of how the storage-rate problem caused expiring futures to diverge from cash prices and shows how the wedge explains the large magnitudes of recent non-convergence. We also discuss prominent alternative explanations for non-convergence and show why they are not supported theoretically or empirically. Based on these findings, we discuss the likely impact of various proposed policy options on the prospect of achieving convergence in grain and soybean markets.