

Public Policy Intervention Through Futures Market Operations

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Robert Heller (1989) recently suggested a revision to the Federal Reserve's approach to breaks in the market for equities. The problem he addresses is the threat that liquidity constraints will aggravate shocks to the financial system. The Fed reacted to these October episodes in 1987 and 1989 by supplying liquidity through open-market operations. Heller argues this approach tends to work against monetary policy. He suggests a more direct operation, namely, long positions in stock index futures. These long positions would tend to bid up stock prices, ameliorating needs for additional liquidity. He contends that interventions of this sort will lessen disruptions to monetary policy objectives.

The idea of using futures markets to obtain a public policy goal is not new. During the early 1930's the Federal Farm Board opened futures positions in wheat and cotton to reach its policy objectives. The experience of this intervention offers a case study for this type of action. The evidence from this experience suggests that interventions in futures markets disrupt both the price-discovery process and the hedging function of futures markets. To ascertain the impact on markets, this article examines three issues. First, the Heller proposal depends on the link between futures and cash markets. This linkage is established through the delivery specifications of the futures contract. Second, futures markets serve two key economic purposes: price discovery and risk control. These purposes are developed. Third, government intervention alters the link between futures and cash markets. An example of such intervention is made of the Federal Farm Board's use of the wheat futures market during the early 1930's.

LINKAGE BETWEEN CASH AND FUTURES MARKETS

A well-designed futures contract is linked to the cash market through its final settlement procedure. Before contract expiration, gains and losses in futures are determined by daily settlement prices. In itself, this feature might produce futures prices which are independent of events in the cash market. To link prices in the two markets, the final settlement price at contract expiration is determined from prices in the cash market. This is accomplished in either of two ways. Short futures positions are provided with the right to deliver on their contracts. They will choose

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to exercise this right when the cash price is lower than the futures price. Discrepancies between cash and futures prices result in buy or sell orders which bring the futures price into alignment with the cash market price. This route to link cash and futures prices is widely used in futures contracts for commodities such as wheat and cotton contracts. Alternatively, contracts are settled by simply replacing the futures price with the cash price as of the contract expiration date. This is called cash settlement. Stock index futures are cash settled. (The Heller proposal emphasizes this contract feature to make clear that the Fed would never be buying stock.) Both final settlement procedures produce a consistent effect, over the life of a futures contract, futures prices converge to cash market prices. Heller's suggestion depends on the linkage of these markets. His proposal implicitly places a quantity of limit orders in the futures pit to buy futures. On obtaining the limit price, its execution produces a surfeit of buy orders which bids up futures prices. Cash prices quickly rise in response as traders sell futures to the Fed. Since the contract's final settlement price is the cash price, sales of futures can be covered with purchases of stock. Orders to purchase this stock will put upward pressure on stock prices. Similarly, Federal Farm Board operations used wheat futures markets to lessen the impact of declining agricultural prices. These operations disrupted the linkage between cash and futures markets.

FARM BOARD INTERVENTIONS IN WHEAT FUTURES

The Agricultural Marketing Act of 1929 created the Farm Board to put agriculture "on a basis of economic equality with other industries."¹ To accomplish this goal, the Board was commissioned to promote orderly marketing through control of farm surpluses and to stabilize farm product prices. A revolving fund of \$500 million was authorized for these purposes.

Wheat prices began falling in August 1929. In July, wheat sold at \$1.40 a bushel, falling to \$1.15 by October 25 of that year. On September 5, the Board began a supplementary loan program enabling agricultural cooperatives to borrow against wheat stocks at \$.10 per bushel. These loans were intended to finance grain purchases from farmers and to put the grain in storage. The stock market crash coincided with further declines in wheat prices. On October 26, the Board stepped up its lending operations, lending against the full value of wheat as of the previous day's closing prices. Prices responded by rising briefly. On renewal of the decline, the Board began preparations to purchase surplus stocks. News of these planned purchases pushed prices to close the year at \$1.28. In February 1930, the Board created the Grain Stabilization Corporation for the purpose of handling its grain-purchase operations. The GSC, headed by George S. Milnor, discovered profiteering by producers who purchased grain from farmers, hedged it with sales of futures contracts, then sold the wheat to the GSC for a profit. Grain purchases were promptly discontinued. The GSC believed sales of futures contracts put downward pressure on cash prices.² On March 1, 1930 the GSC resumed grain purchases, this time accompanied by purchases of May futures contracts principally at the Chicago

¹See Davis (1931). The Farm Board sought equality with industry by promoting corporate practices. For example, marketing organizations were incorporated in Delaware. Delaware incorporation had long been favored by industrialists for its favorable charter law.

²The idea that short futures positions cause cash price declines was well established during the populist era. For examples, see the Peffer Report, US Congress, Senate Committee on Agriculture and Forestry, *Agricultural Depression: Causes and Remedies*, February 15, 1894.

Board of Trade. The GSC insisted its operations were not speculative. Said Mr. Milnor on March 6, "the stabilization corporation is prepared, and expects, to take delivery of all grain purchased on futures contracts."³ Apparently the GSC did not understand the role of delivery in futures contracts. Absence of delivery does not make a trade speculative. In fact the GSC was speculating. The Board regarded the current depressed prices as temporary. For example, the *New York Times* (June 3, 1930), reported "Higher prices than those prevailing were anticipated, not only by the United States Department of Agriculture and the Federal Farm Board, but by large sections of the grain trade, here and abroad, including some of the most experienced grain dealers." Repeatedly, GSC operations were explained as smoothing prices until a higher price was obtained. Board holdings were motivated by an understanding that current market prices were too low. The GSC holdings were speculative. To establish its position, it proceeded to corner the wheat market.⁴ Continued purchases netted the GSC 65 million bushels of wheat by June. Of these, up to 13.9 million were through deliveries on the May futures contract. The impact of the March operations was immediately felt. Wheat prices stabilized at \$1.07 by the end of March. Prices at the end of the crop year (May) stood at \$1.06. GSC pledged not to dump, it would hold its wheat stocks until prices rose. With an estimated one-half of available wheat stocks held by the GSC and an outstanding pledge to sell only when prices rose, prices did not rise. The Board began the 1931 crop year making small purchases, entering the futures market heavily in December. On December 18, Farm Board chairman Alexander Legge estimated that futures holdings came to 60 million bushels, about 42% of the Chicago futures market. Prices were pegged at \$.81 for the remainder of the crop year. At this price, the Farm Board estimated its support to be worth 20 to 30 cents a bushel.⁵ Although it had succeeded in stabilizing prices, the Board was unable to slow production.⁶ Criticism of the program prompted a Senate debate on February 9, 1931. Fearing criticism that it would be accused of interference, the Senate voted down a bill restricting the Board's use of futures. On March 22, the Board announced it would cease purchases at the end of the current crop year. In May 1931, GSC stocks stood at 257 million bushels, 80% of total stocks. Prices had fallen by \$.54 over the period of Farm Board interventions. An additional \$57.6 million stood to be lost were the GSC to sell at its estimated price of \$.52. The Farm Board was out of money. James C. Stone, chairman of the Farm Board, commented, "as long as your money lasts, you can make the price of wheat anything you want to."⁷ As the GSC began winding down operations in June 1931, its sales of wheat produced a sharp drop of \$.25 by August. Sales of stocks were curtailed in November, to be resumed when world prices rose.⁸ As depressed prices continued, the Board decided its stocks were holding down prices. Its stocks were sold at the bottom of the depression. Production dropped from 942 million bushels at 1931's supported prices to 552 million bushels two years later. The GSC completed its liquidation in April, 1933.

³*Wall Street Journal*, June 3, 1931.

⁴See Sturtevant (1931). Also, Chairman Legge stated that government holdings of futures were sufficient to "embarrass" the market if all deliveries were required. *Journal of Commerce*, December 15, 1930.

⁵Milnor reached this conclusion by comparing US prices to current world market prices. See statement by Milnor quoted in the *Financial Chronicle*, June 6, 1931.

⁶See Howland (1932).

⁷*Ibid.*

⁸See Shepherd (1945).

The effect on futures prices for these crop years is apparent in Figure 1. Figure 1 plots the averages of monthly high and low wheat prices to illustrate the effect of Farm Board operations.⁹ Gaps in the graph are for the months of June and July when the May wheat contract did not trade.

Futures prices are normally greater than cash prices prior to the May delivery month. The spread in prices is usually a few cents. Final settlement specifications produced the necessary convergence of futures prices with cash prices. Of the five crop years depicted, each ends with a smaller futures-cash spread than it begins with. Third, this spread, the basis, is generally larger and more variable during periods of Farm Board operations. The large basis was due to the shortage of short positions. Having created a floor for the cash market, the futures price had to be higher to provide holders of short futures positions with a profit opportunity. It was more variable because the price had to converge on the final settlement date.

ECONOMIC ROLE OF FUTURES MARKETS

Futures markets serve two purposes. They aid in price discovery and provide a means to manage risk. The relatively low transactions costs which distinguish these markets from cash markets reduces the cost to traders speculating on price forecasts. These lower costs tend to increase speculative behavior, increasing the number of information-based trades. The aggregation of these forecasts is impounded into futures prices as competing forecasts push, tug, and pull toward a consensus forecast. The process is efficient in the sense that prices generated by this process encompass all the information used in these trades. These forecasts which are readily available from the financial press enable businesses to plan future operations whose profits are dependent on these prices. The large and variable basis demonstrated in the 1930 and 1931 crop years implies that futures prices did not produce reliable forecasts of cash-market prices. Futures prices should reflect an expectation of cash prices at delivery plus compensation for the costs incurred for scarce resources. These costs are determined in competitive markets for these resources

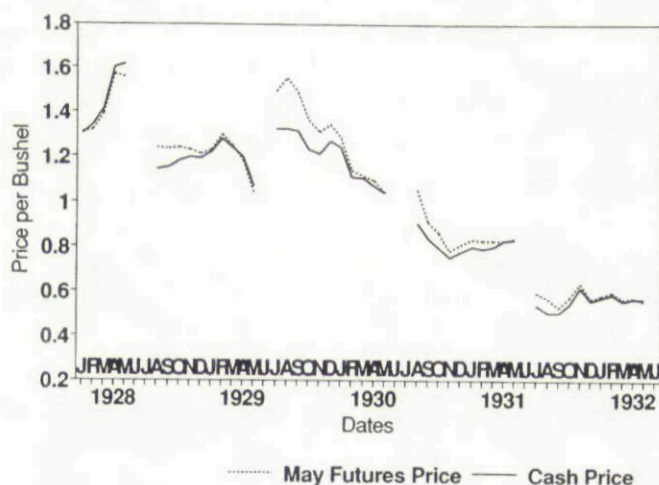


Figure 1

Federal Farm Board grain interventions: cash and futures prices, 1928–1932.

⁹Data for the graph are from various issues of the Chicago Board of Trade *Annual Report*.

and are normally understood to be small and predictable. Hence, futures prices frequently provide good predictions of spot prices. A large and variable basis weakens the predictive power of futures. In December 1931 Chairman Legge noted that the spread between cash and spot prices did not reflect normal business costs.¹⁰ Farm Board operations had disrupted the price discovery process. In addition, futures markets enable managers to control exposure to price risks. Managers contracting to make deliveries can offset price risks through hedge positions in futures markets. As economists have known for a long time, and merchants for an even longer time, these hedges depend on a stable basis. On June 3, 1931 the *New York Times* reported that during the GSC interventions hedgers left the futures market. The futures market no longer served its hedging role.

WHAT THE EXPERIENCE TEACHES

The Farm Board operations demonstrate that officials who view these markets as a means to obtain price stability are likely to be disappointed. Price pegging obtained through futures trades disrupts both the price-discovery process and the need to manage price risks. Further, traders willing to take short positions in a market dominated by a single large buyer are probably scarce. Even the possibility of government entry produces a shortage of short positions. The implicit limit order of unknown quantity, on execution, cuts into the anticipated profits of short positions, making these positions less attractive. This threat weakens the market by reducing liquidity. With its economic purposes frustrated and liquidity reduced, the futures markets will no longer exist. The consequences of the Federal Farm Board actions in the 1930's wheat futures market are instructive. Public policy interventions in futures markets are not inherently neutral. The currently viable futures contracts for stock indices serve important economic roles. The Heller proposal is flawed by its failure to weigh these costs against the benefits to monetary policy.

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¹⁰*Journal of Commerce*, December 15, 1930.

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