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A NOTE ON HISTORICAL WHEAT PRICES AND FUTURES TRADING

The question whether and under what conditions speculation is price stabilizing (or destabilizing) has long intrigued economists. An important subquestion is whether or not futures trading stabilizes the price of the commodity traded. The relationship between speculation in commodity futures and price variability is blurred, however, by several factors. Price discovery on commodity futures markets is the outcome of trading by both hedgers and speculators, and the relationship between speculation and price variability is, in part, indirect because it is hedgers who perform the relevant temporal allocations of stocks. Consequently, the problem for analysis is partly the extent to which speculation is necessary for hedging (see *4*). As a corollary, some observers argue that "unnecessary" speculation causes "excessive" price fluctuations. Both the indirect nature of the relationship and the vagueness of the allegations introduce problems of definitions and analysis, and little empirical evidence exists on the relationship between speculation in futures and price variability.

One facet of price variability is the seasonal range, and an exceptional opportunity to measure the effects of futures trading on this dimension of price variation was provided by Public Law 85–839, which prohibited futures trading in onions. As a consequence, it became possible to measure the seasonal variability of onion prices before, during, and after futures trading (*2*; *3*; *5*). One conclusion from such studies was that future trading probably decreases intraseasonal price variability, at least for onions.

This note provides an additional bit of similar evidence for wheat and simultaneously retrieves a piece of research published almost 50 years ago. James E. Boyle collected high and low prices for wheat in Chicago by months for the crop years 1841–1921 inclusive (*1*).[1] This note summarizes one part of his results and adds one piece of analysis of these data.

Futures trading in wheat developed in Chicago in the 1860s. Boyle takes the crop years 1871 and following as representative of the period with futures trading

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[1] Prices are for the most heavily traded grade; thus, several different grades were used. The midpoint of the price range is taken as the average monthly price. Data for the 1841–70 period were obtained from newspapers in the archives of the Chicago Historical Society; data for subsequent years are contained in the annual reports of the Chicago Board of Trade.

TABLE 1.—SEASONAL INDEXES OF WHEAT PRICES, CHICAGO, 1841–1921*

Month	1841–70 (*Before futures*)	1871–1921 (*With futures*)
July	101	98
August	98	97
September	100	97
October	96	97
November	93	97
December	93	98
January	96	101
February	99	100
March	100	101
April	104	103
May	111	108
June	107	102
Range	18	11

* Data are from J. E. Boyle, *Chicago Wheat Prices for Eighty-One Years* (Ithaca, N.Y., 1922), p. 12.

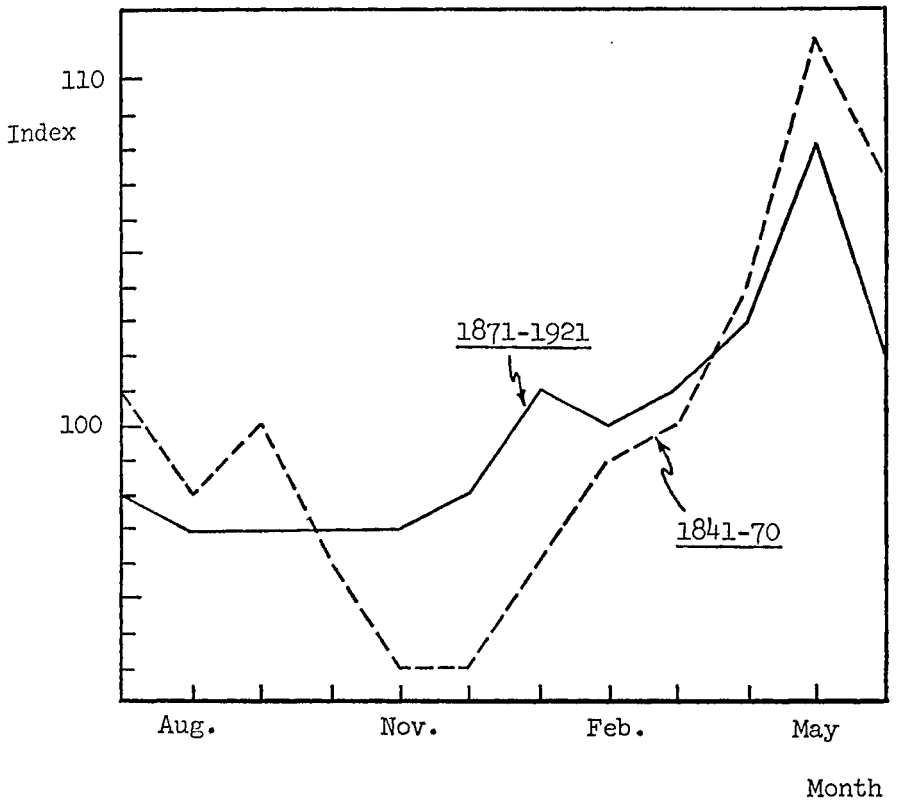
and the years 1841–70 as the period before futures (*1*, p. 9). Of course, changes in marketing facilities other than futures trading occurred in the 81 years, 1841–1921. For instance, transportation and communication facilities improved, and such improvements reduce the likelihood of natural and artificial corners of a local market. Thus, observed changes in price behavior cannot be attributed solely to the advent of futures markets. However, if one starts with the hypothesis that futures trading increases price variability and if prices actually are less variable, then the hypothesis of greater variability cannot be accepted (e.g., see *5*, p. 25). In addition, if one takes the view that intraseasonal price behavior is related in part to changes in marketing institutions, including futures markets, then improvements in marketing institutions in today's less developed countries have implications for intraseasonal price behavior.[2]

Two measures of intraseasonal price behavior are considered: a seasonal index computed from the midpoint of each monthly price range and the average range of prices for each month. The seasonal indexes were computed by Boyle simply by dividing the 81 years into two periods—1841–1870, before futures trading, and 1871–1921, with futures trading (*1*, p. 12; Table 1; Chart 1). Not surprisingly, the results indicate a decrease in the seasonality of wheat prices from the earlier to the later period.

The first 30 years of the 1841–1921 period include the Civil War; the second 50 years include government price controls of World War I. Thus, I selected, somewhat arbitrarily, the 20-year periods 1841–60 and 1891–1910 for additional analysis. The difference between the high and low price for each month was computed and then it was deflated by the Wholesale Price Index (1910–14 = 100).

[2] The operative mechanism between changes in marketing institutions and changes in price behavior is, in part, the impact on costs. For instance, factors reducing costs of storage reduce seasonal price variation.

CHART 1.—SEASONAL INDEXES OF CHICAGO WHEAT PRICES, 1841–70 AND 1871–1912



Finally, the average range for each month for the two periods was obtained (Table 2; Chart 2).

In 10 of 12 months, the price ranges are smaller in the recent period than in the earlier period. The average difference per month was 14.7 cents in 1841–60 and 10.5 cents in 1891–1910. If the observations for May and June 1898 are omitted, then the seasonal index for the recent period would be even less variable, and the average price differences for May and June would be, respectively, 12.5 and 11.3 cents. An artificial corner resulted in a price range (deflated) of 89.5 cents in May 1898 and 63.4 cents in June 1898 (see *1*, pp. 12, 18).[3]

In sum, the evidence indicates that intraseasonal price variability declined for wheat in Chicago over the 1841–1921 period. This can be associated with the advent of trading in futures contracts for wheat in Chicago, but of course this doesn't "prove" that trading in futures caused the decline. On the other hand, the evidence is inconsistent with the hypothesis that trading in futures increases intraseasonal price variability.

[3] It is, of course, not quite fair to omit these months from the analysis since the comparisons involve degrees of imperfection in the two periods, and a market corner is a significant imperfection. Notwithstanding the events of May–June 1898, prices were less variable on the average in 1891–1910 than in 1841–60.

TABLE 2.—PRICE RANGES FOR CHICAGO WHEAT PRICES, BY MONTH, 1841–60 AND 1891–1910*

(Cents per bushel)[a]

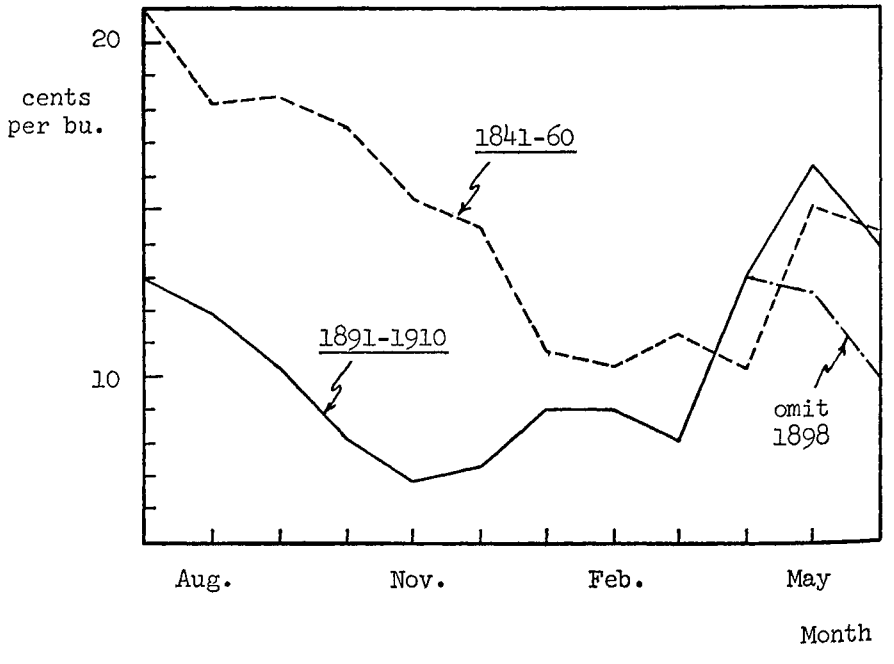
Month	1841–1860	1891–1910
July	20.8	13.0
August	18.2	12.0
September	18.4	10.3
October	17.5	8.1
November	15.3	6.8
December	14.5	7.2
January	10.7	9.0
February	10.3	9.0
March	11.2	8.0
April	10.2	13.0
May	15.1	16.3[b]
June	14.4	13.9[b]
Average	14.7	10.5[b]

* Data computed from appendix of data in James E. Boyle, *Chicago Wheat Prices for Eighty-One Years* (Ithaca, N.Y., 1922).

[a] Prices are deflated by Wholesale Price Index, 1910–14 = 100.

[b] If observations for May and June 1898 are omitted, then the respective ranges are 12.5, 11.3, and 10.0.

CHART 2.—PRICE RANGES FOR CHICAGO WHEAT PRICES, AVERAGES BY MONTH, 1841–60 AND 1891–1910



CITATIONS

1 J. E. Boyle, *Chicago Wheat Prices for Eight-One Years* (Ithaca, N.Y., 1922).
2 R. W. Gray, "Speculation Helps the Onion Growers," *Minn. Farm Business Notes*, Mar.–Apr. 1959.
3 ———, "Onions Revisited," *J. Farm Econ.*, May 1963.
4 ———, "Price Effects of a Lack of Speculation," *Food Res. Inst. Studies*, VII Supp., 1967.
5 Holbrook Working, "Price Effects of Futures Trading," *ibid.*, I, 1, Feb. 1960.