

RECENT COMMODITY PRICE MOVEMENTS IN HISTORICAL PERSPECTIVE

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Important agricultural commodity prices more than tripled from prices observed in 2005 and 2006 to those observed in the spring and summer of 2008. Prices subsequently fell precipitously so that by early November 2008 (and continuing in the subsequent few months), the near-term futures prices of corn, wheat, and soybeans stood about 50–70% higher than before the price run-up began.¹

The huge percentage price increases in 2007 and 2008 demanded attention from the press and policymakers concerned about food price increases (Washington Post 2008; Lazear 2008; Glauber 2008). Of even greater concern are impacts on hunger among the poor in poor countries (Benson et al. 2008). Many economists summarized the potential sources of the price jumps and assessed their relative importance (McCalla 2008; Trostle 2008a; OECD 2008). My quick assessment of this literature is that once the specific price changes to be explained and time periods have been standardized, economists are in reasonable agreement about the likely causal factors and their impacts, at least in broad terms.

My aims here are modest. I do not attempt to attribute recent price changes to such factors as: (a) biofuels policy; (b) jumps in input costs due to energy price shocks; (c) reduced farm subsidies in Europe; (d) exchange rate movements; (e) growth in demand in developing countries; (f) weather shocks; (g) lack of adequate stocks; (h) border policies in exporting and importing countries; or (i) speculative movements in organized commodity markets,

to name some of the suspected drivers. The literature has evaluated many of these factors as explanatory variables for the recent jump in prices. The even more precipitous decline in prices deserves an equal effort, which is already underway (Trostle 2008b).

This article places recent commodity prices in an historical context and asks what we can learn from observing how the recent situation fits in the long price history. (See also Brümmer, Koester, and Loy 2008). I compare the experience of the current period with other episodes of extreme commodity price fluctuation from the 19th and 20th centuries. Price increases, and especially price declines, educate government policy responses and the experience of the past can also suggest guidance in this sphere.

Long-Term Trends in U.S. Farm Commodity Prices

Although there are distinct causal agents for each commodity, markets are linked across commodities, and prices tend to move together, especially over the long run. For the discussion here, I will present and discuss price data for wheat and corn because they are major farm commodities that have been important for many decades and have played different roles in the agricultural economy. The technological history of the two crops differs, and they have been centered in different parts of the country (Olmstead and Rhode 2008).

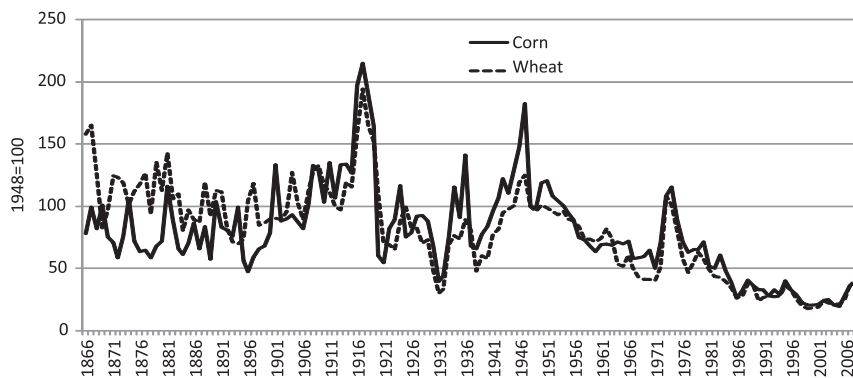
While the patterns of corn and wheat prices have differed from one another in some decades, the two crops share long-term trends and major price fluctuations. Figure 1 plots real prices relative to a 1948 base. Corn prices were low compared to wheat and to the 1948 corn base price for most of the period through 1907, while wheat prices were above the 1948 base price in the early postbellum period but then fell below the base for most of the latter years of the nineteenth century. The

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¹ These statements are consistent with data used by many analysts cited below but are based on November 6 prices of the harvest period contract on the Chicago Board of Trade (<http://futures.tradingcharts.com/menu.html>).



Note: Prices through 2007 are marketing year averages. The 1866–1908 wheat prices are weighted by production; the 1909–2007 prices are weighted by sales. The 2008 wheat and corn prices are the November 2008 *World Agricultural Supply and Demand Estimates* (WASDE) season average, mid-point of range. Due to lack of another consistent deflator, prices deflated by Bureau of Labor Statistics (BLS) calendar year Consumer Price Index (CPI) for all urban consumers.

Sources: Carter et al. (2006), U.S. Department of Agriculture, National Agricultural Statistics Service, *Agricultural Prices*, USDA WASDE and BLS “CPI- All Urban Consumers.”

Figure 1. Index of real corn and wheat prices, 1866–2008

corn price index exceeded that for wheat for most years from the mid-1920s through the mid-1950s.

Neither corn nor wheat prices showed much trend in real terms from just after the Civil War through the end of World War II. The war years exhibited price spikes, and the two-decade long agricultural depression from 1920 through the early 1940s stands out, with low prices in most years. It is only after World War II that the sustained downward trend in real prices of both commodities is strongly evident. The volatility of real corn and wheat prices is the stark lesson from this figure. For example the price index for wheat collapsed by one-half from a post-bellum high of 165 in 1867 to a low of 82 two years later. Just a few years on, the corn price index jumped from a low of 58 in 1872 to 105 in 1874. Veblen (1892, 1893) dissects the wheat price movements during the post-bellum period, detailing effects of weather variations and demand shocks related to macroeconomic crises. Throughout this period, wheat prices in particular were supported by rapid reductions in costs of transport from western growing regions to the consuming regions in the eastern United States and Europe.

Economists often cheerfully note how the most dismal of the dismal scientists, Thomas Malthus, was happily wrong in his 1798 predictions about agricultural supply prospects and their sad implications for food prices.² Less famous, but also noted by agricul-

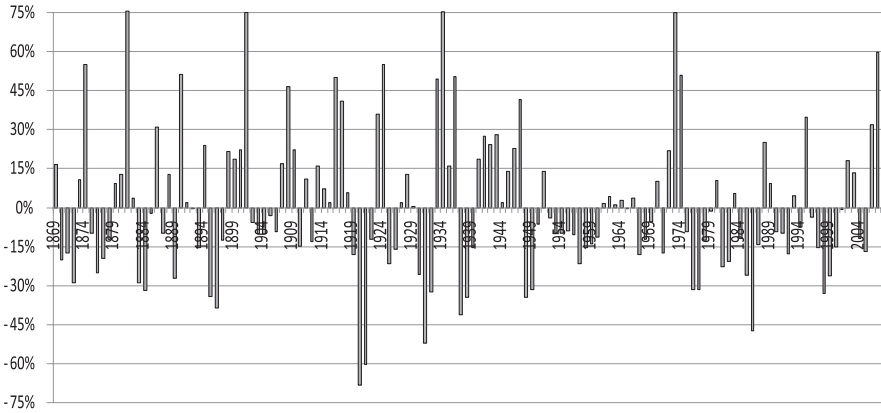
tural economists, were the prognostications of Sir William Crookes in his Presidential address to the British Association of the Advancement of Science one century after Malthus (Davis 1939; Johnson 1976). Crookes observed that wheat yields had been stagnant, and new regions for wheat cultivation seemed limited. He asserted with great confidence that, within thirty years, England and the world population of “bread eaters” would be facing hunger. Joseph Davis uncharitably pointed out in his 1932 essay (Davis 1939) that the world was actually facing a severe glut in wheat markets during the period for which Sir William had projected severe shortages (Davis 1939). Of course, Crookes has not been alone in predicting long-term food shortages after observing price spikes.³

Many of the most dramatic price movements in the 140-year history have been associated with war and macroeconomic shocks. Price gains during World War I followed a period of already high prices from 1910 through 1914. The corn price collapse following the war, from the peak of 215 in 1917 to a low of 55 in 1921, is the most dramatic in our history. And, the 1921 trough initiated a grain price depression, with only occasional annual relief, that lasted for almost two decades. The price spikes in the mid-1930s, associated with weather problems

any case the data demonstrating his error was not convincingly marshaled during his lifetime, although he adjusted his pronouncements in the second edition of his famous work.

³ It is tempting to use mistaken claims as evidence to dismiss concerns about higher long-term food prices. Such a misuse of history is not proposed here.

² Obviously, *humankind* can be happy that Malthus was wrong. The record on whether Malthus was happy is at best mixed. In



Note: In 1901, the upside price deviation was 88%; in 1934, the deviation was 117%. Prices are marketing year average prices received except that 2008 prices are the November 2008 WASDE season average, mid-point of range for the 2008/09 marketing year. Prices deflated by BLS calendar year CPI for all urban consumers. Sources: Carter et al. (2006); U.S. Department of Agriculture, National Agricultural Statistics Service, *Agricultural Prices*, USDA WASDE and BLS “CPI- All Urban Consumers.”

Figure 2. Deviations of annual real prices of corn from three-year moving averages, 1869 through 2008

and supply controls, were followed by price declines. World War II then ushered in higher prices that lasted for a decade, even though the immediate post-war spikes were not sustainable.

Against this long history, the real price jumps from 2006 through the middle of 2008 are hard to notice (figure 1). In part this is because real grain prices have declined so much over the past sixty years that even large percentage increases are small relative to the earlier real prices. Some current observers have become accustomed to low real farm commodity prices and may not realize how far prices would have to rise to reach real prices seen only three or four decades ago.

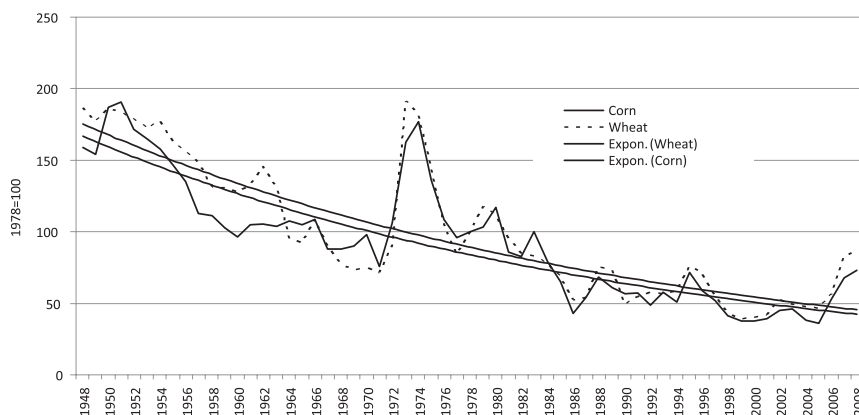
In order to visualize more clearly the variability in grain prices, let us consider how prices compare to a moving average of past prices. Figure 2 displays the percentage deviations of the real price of corn from the three-year moving average of past prices. (A similar picture may be observed by a plot of log prices.) Corn price spikes are clear throughout the period, with large individual increases and more smaller decreases. At 60%, the 2007 price increase was exceeded by only four previous price spikes. The recent corn price increases since 2006, up 32% in 2006, 60% in 2007, and 37% in 2008, are also very large by historical standards, exceeded only by the cumulative effects of the four years following 1932 and the three years between 1972 through 1974. In all cases price spikes have been followed by peri-

ods of prices that were well below the three-year moving average of previous prices.⁴

Figure 3 displays more clearly the history since 1948 so we can get a better look at the rapid secular decline in real prices and fluctuations around the trend over the past six decades. Figure 3 differs from figure 1 by using a 1978 base for the index and using the more appropriate GDP deflator, which was not available for the longer time series. Prices for both corn and wheat have declined by about 2.3% per year over this 61-year period. Besides showing the rapid decline in real grain prices, figure 3 also highlights the dramatic jump in real prices in 1973 and 1974 and the subsequent collapse until prices were back into the pre-surge range by 1977. However, it took a decade before real grain prices were back to their long-term trend. The recent three-year period represents one of only a handful of periods when prices have been above the post-war trend. The period with most of the above-trend prices was in the 1970s, when sluggish economic growth, inflation, and oil price fluctuations were also in the news.

Evidence from the long-term history promotes the notion that whenever prices have jumped up, they have soon collapsed, and the more rapid the up-spike, the more precipitous

⁴ I include only the corn data to avoid clutter in figure 2. Corn and wheat prices differ somewhat in how they have deviated from the moving averages over time, but the basic story is the same for wheat as for corn.



Note: The 1948–2007 prices are marketing year average prices. The 2008 prices are the November 2008 WASDE season average, mid-point of range for the 2008/09 marketing year. Prices deflated by BEA annual implicit GDP deflator. Sources: Carter et al. (2006); U.S. Department of Agriculture, National Agricultural Statistics Service, *Agricultural Prices*; USDA WASDE; and BEA “National Economic Accounts.”

Figure 3. Index of real corn and wheat prices, 1948–2008

the decline. The handful of extreme jumps in commodity prices, in the late 1890s (for corn), around World War I, around the New Deal and the 1934 drought, and around World War II and in the 1970s, were all followed by extreme price downturns. The price drop at the end of 2008 seems to be consistent with this pattern.

Comparison of the Prices in 2006 through 2008 with the 1970s

The early 1970s stand out in the long history of U.S. commodity prices, and it may be particularly interesting to compare the current price experience with this earlier period. Figure 4 exhibits the real corn price index by month from January 1972 to December 1975, with July 1972 set at 100. Figure 4 also shows the real corn price index for 2006 through October 2008, with July 2006 set at 100. The two series are aligned such that January 2006 is at the same starting point as January 1972. Starting in the summer of the first year, the corn price rose more rapidly in 2006 than in 1972, reaching about 50% above the base price in just six months (January 2007), where it remained for most of 2007. The corn price rose over the next eight months to reach 2.5 times the base price by the summer of 2008, before collapsing back to about 1.8 times the base price in October 2008.⁵

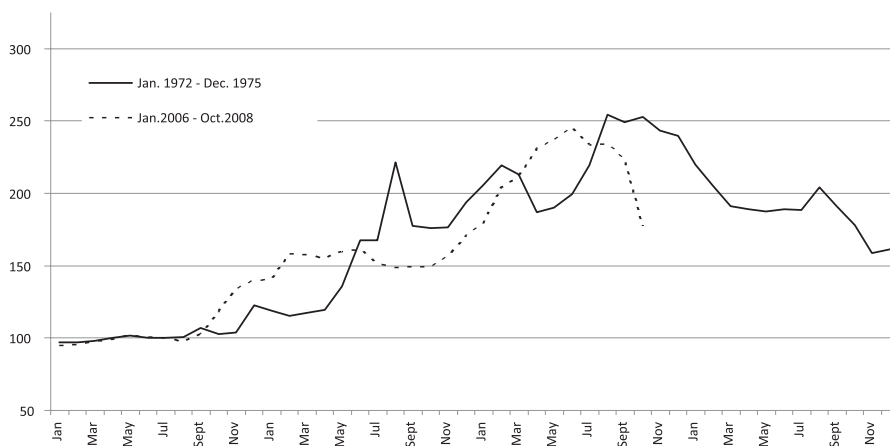
⁵ Notice that these prices received by farmers each month have been less volatile than the futures market prices discussed in paragraph one. Also the months from November 2008 through February 2009 display relatively little price movement.

The price rise in the 1970s was more gradual, and of course, we have the opportunity to observe more of the price decline. Corn prices rose gradually to only about 20% above the base through April of 1973, before rising by 90% by August 1973. Prices moved erratically before peaking at over 2.5 times the base price in the fall of 1974. Prices declined in stages reaching about 1.5 times the base price by the end of 1975.

A number of observers projected that the price jumps in the early 1970s presaged a long-term food crisis. A range of policy measures were proposed to deal with the crisis, which was over before any measures were implemented. Many economists, perhaps best represented by D. Gale Johnson, provided calm assessments, suggesting that commodity prices would be back on trend in a few years and proposing policy tools that might moderate future price spikes (Johnson 1974, 1975, 1976).

Current Farm Commodity Price Prospects and Policy Measures

If the current farm commodity scenario plays out like earlier events, we would expect prices to rejoin the long-term trend reduction in real prices at some point over the next few years. With rapid general inflation in the 1970s, it took several years before real prices adjusted downward to the post-war trend line. Lower real farm prices were accompanied by a severe and broad-based recession in the general



Note: The vertical axis shows indexes of deflated prices with July 1972 and July 2006 equal to 100. Monthly prices received by farmers are deflated by the BEA quarterly implicit GDP deflator. The October 2008 price is deflated by Q3 2008 implicit deflator. Sources: U.S. Department of Agriculture, National Agricultural Statistics Service, *Agricultural Prices*, and BEA "National Economic Accounts."

Figure 4. A comparison of corn prices during 1972 through 1975, with corn prices during 2006 through October 2008

economy that was triggered by monetary contraction that squeezed inflation out of the economy and sent the farm economy into a tailspin with farm incomes and land values both dropping.

After the over-reaching in the 1981 Farm Bill, the 1985 Farm Bill response to the price swings of the 1970s and early 1980s was to initiate a decade of farm program changes that facilitated partial opening of international markets by reducing government reliance on stock accumulation and annual land set-asides. The farm economy improved, but the gradual decline in real farm prices, and the stress that this engendered, led to significant income transfers to producers to soften the policy adjustments. These policy responses in the 1980s and 1990s unraveled parts of the farm program edifice erected in the 1930s. In 1933, after several years of activist farm policy by the standards of the time, agriculture became the centerpiece of new regulations and subsidies designed to stabilize markets and increase farm incomes. The New Deal programs did not solve farm price problems, and the 1930s continued to be a period of severe variability (Davis 1935; Schultz 1945).

Questions for the current episode include how far real prices will decline and if this will promote a low-price "crisis" that activates renewed commodity policy responses. And if commodity policy changes are forthcoming, will we return to more government engagement in commodity markets, or will we further

lighten market restrictions and subsidies? Answers to these questions hinge in part on how far and how fast commodity prices decline, and government policy is also important on that front.

Government-induced demand for biofuels feedstock will contribute to holding prices above the pre-2007 equilibrium. The renewable fuels standards included in the Energy Independence and Security Act of 2007 will likely cause increasing acreage of corn over the next few years to meet the increasing and completely inelastic ethanol demand implied by biofuels mandates. Unless the mandates are moderated or U.S. import duties for imported ethanol are reduced substantially, relatively high corn prices seem likely to continue. Mitigating factors include the severe global recession that reduces demand for meat and unusually rapid grain supply response outside of the United States.

Agricultural research and development is crucial for the long run path of commodity prices. For more than 140 years, jumps in real commodity prices have been followed by price declines of equal or larger magnitude. This article has not considered underlying forces that have augmented farm commodity supplies progressively to cause real prices to decline in the face of growing populations and incomes. Economists and others have long pointed to the transformative application of science to agriculture and the implications for the long-term decline in real prices. Science has not

only contributed to yield increases through better varieties; it has also facilitated the expansion of productive land available for cultivation and enhanced the productivity of additional material inputs (Olmstead and Rhode 2008).

As with previous high-price episodes, there is now concern that productivity improvements will fail to keep up with demand increases. In particular the slowing of investments in agricultural science devoted to productivity improvement suggests that the evidence of the past six decades may not be a reliable guide to the next several decades (Pardey, Alston, and Beintema 2006). Moreover, there are long lags between investment in science and broad productivity growth that has allowed relative prices of commodities to decline (Alston, Pardey, and Ruttan 2008). Therefore, even if the rate of investment in agricultural science was increased now, it may be many years before we recapture the rapid rates at which food prices have declined during the past six decades.

Concluding Remarks

The percentage price increases for grains from 2006 through 2008 were among the largest in the 140-year history for which U.S. data are readily available (figure 2). That said, at the end of 2008, real prices of grain remained near those of just two decades earlier (figure 3). Government policymakers often fail to appreciate the strength of forces driving commodity prices, and policies often exacerbate market imbalances or use commodity market flux as a rationalization for income transfers to favored groups. Looking forward, relatively minor demand-side adjustments to biofuels policy may allow grain prices to moderate significantly. However, assured renewal of long-term productivity growth requires renewed commitments to investments in agriculture science.

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