



## Implications of Credit Market Problems for Crop Prices

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The price of many agricultural commodities has declined markedly from the highs reached in the spring/summer of 2008. The peak price, current price, and size of price declines for five major commodities are highlighted in Table 1. Further detail on the daily pattern of price movements for the five commodities is presented in Figure 1.

There are a number of factors that have likely contributed to the sharp drop in prices. For crop prices, these include larger U.S. crop prospects than feared when flooding peaked in June; record large wheat, feed grain, and soybean crops outside of the U.S.; and larger than expected September 1 inventories of corn and soybeans. For livestock, those factors might include a continuation of record large production and some weakening of export demand beginning in July. Price declines since early September, however, have coincided with the severe problems in U.S. and global credit markets. Is the timing of the price declines and credit problems a matter of coincidence or is there a cause and effect relationship in these markets?

The problems in the credit market come on top of poor domestic economic performance for most of 2008. For example, unemployment has risen in 2008 and the housing market has been under pressure for the past two years. The magnitude of the credit problem leads to concerns that the poor domestic economic performance will continue and likely worsen. In addition, a slowing of economic growth outside of the U.S. is

increasingly likely. What does all of this have to do with agricultural prices? In a word it is, **DEMAND**. Slowing economic growth threatens the robust demand growth that agricultural commodities have enjoyed for the past two years in both the food and biofuels sectors. Slowing economic growth would likely dampen the demand for livestock products, resulting in a weaker demand for feed. All other things equal, weaker demand results in lower prices for livestock and crops. Similarly, slowing domestic and world economic growth points to slowing demand for energy, particularly crude oil. Again, all other things equal, reduced demand translates to lower prices. Lower crude oil prices, resulting in lower gasoline prices, results in lower ethanol prices. Lower ethanol prices reduces the breakeven price for corn processed into ethanol.

The credit crisis, as we now know it, is new enough that it is too early to observe demand shocks. The agricultural markets have basically anticipated negative shocks. There are several questions, then, that emerge. How severe will the economic slowdown be in terms of depth and duration? What will the consequences be for crop prices? What should crop producers do?

The severity of the current economic slowdown cannot accurately be predicted, but the magnitude of the problems in the credit markets and the global nature of the issues point to at least a modest recession in the U.S. economy. Many factors are considered

in defining a recession, but many indicators suggest that the U.S. economy moved into a recession beginning in August 2008. Some guidance into the possible depth and duration of the current recession can be provided by previous recessionary periods in the U.S. economy.

As shown in Figure 2, beginning with the "Great Depression" of 1929 to 1933, there have been 13 recessionary periods in the U.S. economy. Typically, a decline in the Gross Domestic Product (GDP) is associated with a recessionary period, although revised GDP data for 2001 indicate that there was actually small growth in the GDP that year. The 10 Post-World War II recessions have varied in length from 6 months (1980) to 16 months (1973-75 and 1981-82). The average length of the 10 periods of contraction was 10 months. The peak-to-trough changes in the domestic GDP ranged from +0.3 percent to -3.2 percent and averaged -1.6 percent.

If the current economic downturn is of average duration and severity, it would be expected to extend into the spring of 2009 and result in a 1.5 to 2.0 percent decline in domestic GDP. If the downturn equals the most severe since World War II, it would be expected to extend through all of 2009 and result in a 3.0 to 3.5 percent decline in the domestic GDP. Early indications are that the current downturn might be in the latter category.

Agricultural prices do not behave consistently during recessionary periods since those prices are influenced by a wide range of factors. The years of 1973 and 1974, for example, were characterized by relatively high rates of inflation and significant shortfalls in crop production in the U.S. and around the world. In fact, 1973 marked the beginning of a structural shift to a new higher level of nominal prices for crop and livestock commodities (see Good and Irwin, 2008). In contrast, the period of 1981 and 1982 was characterized by large U.S. and world crops, relatively strong domestic and export demand

and crop and livestock prices that could be characterized as average or normal.

To some extent, the agricultural economy is a bit more "recession-proof" than the general economy because of the importance of the export market and because food expenditures are not as discretionary as most other expenditures. Still, poor performance in the U.S. and world economy will tend to reduce the demand for agricultural products. That is, consumers may be willing to pay less for the same level of consumption or willing to consume less if prices are not reduced. What can be said about the "value" of agricultural commodities in the current economic environment? For crops, the answer likely centers around the value of corn since it is consumed in large quantities in both the fuel and feed sectors. What price can ethanol producers and livestock producers afford to pay for corn?

That question can be first answered for the current price environment and then for alternative scenarios for 2009. With wholesale unleaded gasoline priced near \$1.90 per gallon and a \$0.45 per gallon blenders tax credit (that credit is scheduled to decline from the current \$0.51 to \$0.45 beginning in January 2009), ethanol has a value of about \$1.72 per gallon. With ethanol plant operating costs of about \$1.50 per bushel, ethanol producers can afford to pay up to about \$4.60 for corn and cover non-corn operating costs. Including overhead cost, but no return to equity, total ethanol production costs are near \$2.10 per bushel of corn. To cover total costs, then, ethanol producers can afford to pay up to about \$3.75 for corn, assuming the price of distillers' grains changes proportionately with the price of corn.

In the current environment, the value of corn to produce ethanol is in the upper \$3.00 to mid \$4.00 range. Where will crude oil and unleaded gasoline prices be in 2009? A recovery from the current financial and stock market meltdown might suggest crude oil prices near \$100 per barrel and unleaded

gasoline near \$2.38. Under that scenario, ethanol would be valued near \$2.05 per gallon and corn would be valued in the range of \$5.00 to \$5.80. A continuation of an economic slowdown and crude oil prices near \$70 per barrel puts corn values in the \$3.00 to \$4.00 range. The left side panel of Table 2 indicates the price of corn that ethanol producers could afford to pay for corn to cover variable and total costs at prices of crude oil ranging from \$60 to \$100 per barrel.

Similarly, breakeven corn prices for livestock feeding margins can be calculated to determine corn value. Here we use Iowa farrow-to-finish hog operations as a proxy for determining the value of corn. Hogs farrowed in early October, for example, will be marketed in late March or early April. April lean hog futures closed at \$72.725 per hundredweight on October 13. That is equivalent to about \$53.80 per hundredweight on a liveweight basis. Assuming a basis of about \$3.00 for the Iowa-Minnesota hog market, current lean hog futures suggest a spring cash price of about \$50.80. Based on hog production budgets from Iowa State University (Ellis et al., 2008), the non-corn variable costs of hog production are near \$19 per hundredweight and the total non-corn cost of production is near \$28 per hundredweight. To cover all variable costs, farrow-to-finish operators could afford to pay \$6.21 for corn to feed hogs from October 2008 through March 2009. To cover all costs, the breakeven price is only \$4.42 per bushel. The middle panel of Table 2 indicates the maximum price that Iowa farrow-to-finish hog operations could afford to pay for corn to just cover variable and total costs of production at prices of live hogs ranging from \$40 to \$60 per hundredweight.

Based on current market prices for crude oil and hogs, the value of corn is likely in the low to mid \$4.00 range. Assuming a value of \$4.00 and a soybean to corn price ratio of 2.3 to 1, soybeans would have a value of about \$9.20 per bushel. Similarly, a wheat to corn price ratio of 1.26 to 1 would point to a soft red winter wheat value near \$5.00 per bushel.

The right side panel of Table 2 indicates the likely value of soybeans and soft red winter wheat for corn prices ranging from \$3.00 to \$5.00 per bushel.

### **What to Do?**

Illinois producers are currently harvesting corn and soybean crops with yields generally exceeding spring time expectations, but with cash prices well below expected levels. The future level of prices will be influenced by a large number of factors and are difficult to forecast. However, the recent drop in prices appears to have resulted in price levels below value based on likely livestock and energy prices. On the basis of value, crude oil prices at or below \$70 per barrel and hog prices at or below \$45 per hundredweight would be required to justify corn prices that prevailed on October 10.

The apparent over-reaction of crop prices to the downturn in financial markets suggests that at least a modest recovery in prices can be expected in the post-harvest period. The timing and magnitude of such a recovery will be heavily influenced by the confidence the market shows in a stabilization of the financial markets and the depth and duration of the domestic and global economic slowdown. While ownership of corn and soybean crops is expensive, prospects for a price recovery suggests storing a substantial portion of the crop that has not yet been priced, particularly if on-farm storage is available. Costs of commercial drying and storage vary substantially. A careful analysis of those cost differences can be conducted using the FAST Tools *Grain Delivery Model* (see Schnitkey, 2008).

Longer term, corn and soybean producers will have to make decisions relative to acreage allocation in 2009. Current projections of use and carryover stocks for the 2008-09 marketing year suggest that nationally there will be a need to shift 3 to 4 million acres from soybeans to corn. Relative prices will have to motivate that shift, implying a price ratio that favors corn production.

## References

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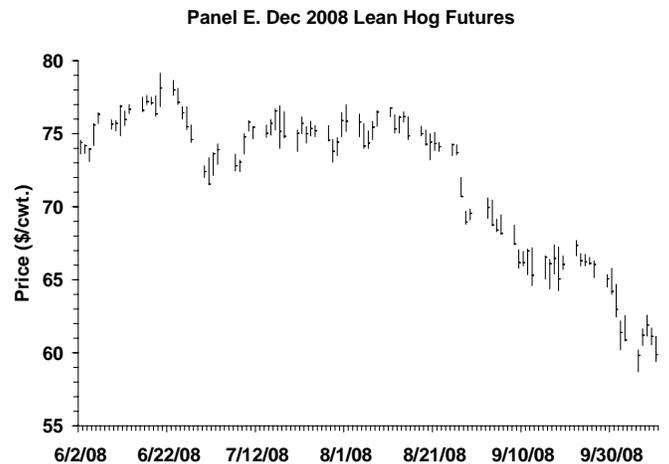
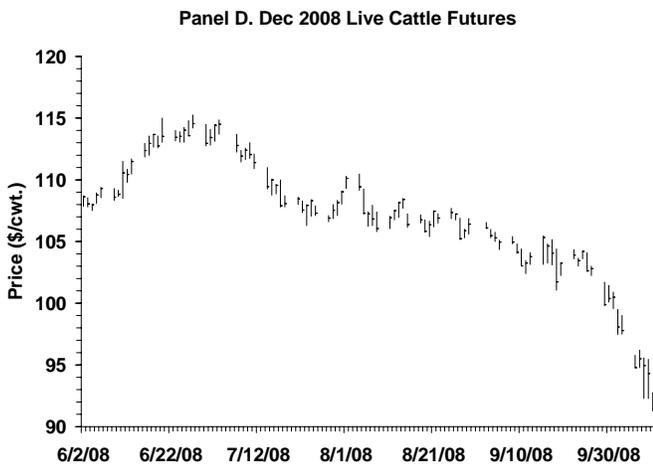
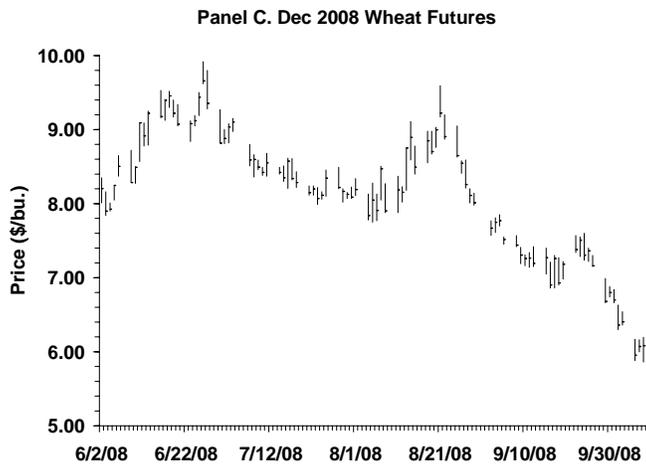
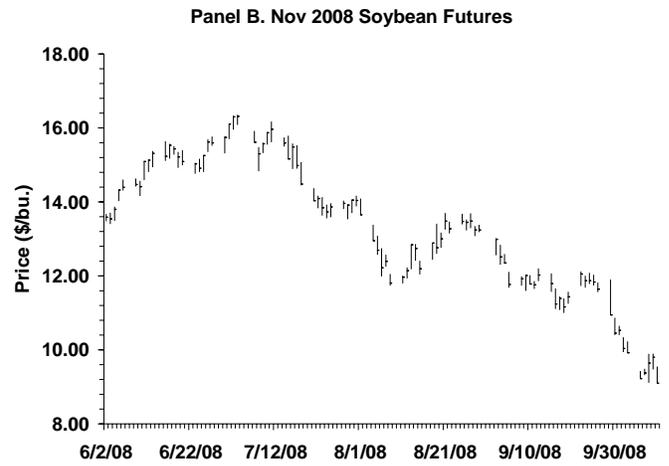
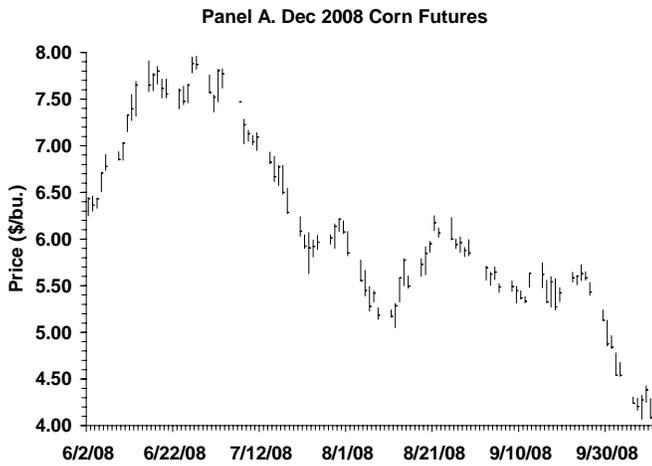
**Table 1. Movement of Agricultural Futures Prices since Spring and Summer 2008 Price Peaks**

Futures Contract	Peak		Current		Decline	
	Date	Price	Date	Price		
Dec. 2008 Corn Futures	June	\$7.99/bu.	Oct. 10	\$4.08/bu.	\$3.91/bu.	48.9%
Nov. 2008 Soybean Futures	July	\$16.37/bu.	Oct. 10	\$9.10/bu.	\$7.27/bu.	44.4%
Dec. 2008 Wheat Futures	March	\$12.75/bu.	Oct. 10	\$5.63/bu.	\$7.12/bu.	55.8%
Dec. 2008 Live Cattle Futures	June	\$115.00/cwt.	Oct. 10	\$91.30/cwt.	\$23.70/cwt.	20.6%
Dec. 2008 Lean Hog Futures	June	\$79.00/cwt.	Oct. 10	\$59.87/cwt.	\$19.13/cwt.	24.2%

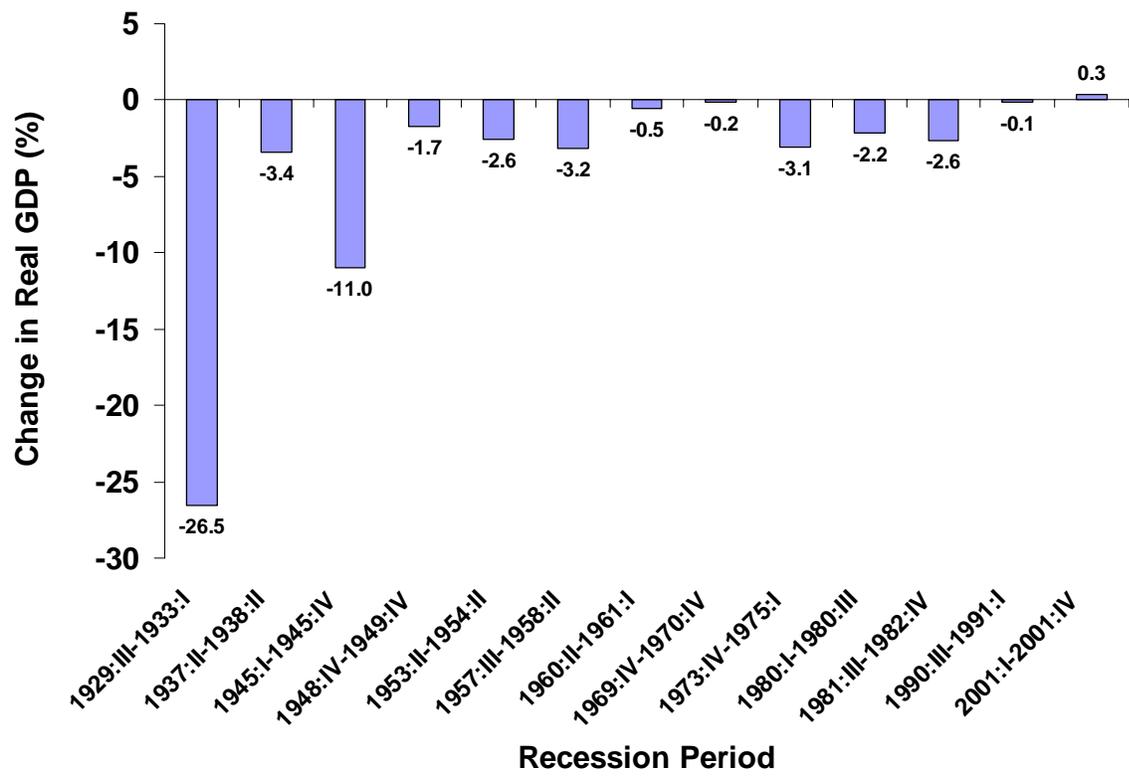
**Table 2. Indicators of Fundamental Value for Corn, Soybeans, and Wheat**

Crude Oil Price	Maximum Bid Price of Ethanol Processor for Corn After:		Hog Price	Maximum Bid Price of Hog Producer for Corn After:		Corn Price	Equilibrium Price Relative to Corn	
	Variable Costs	All Costs		Variable Costs	All Costs		Soybean Price	Wheat Price
\$/bbl.	---\$/bu.---		\$/cwt.	---\$/bu.---		\$/bu.	---\$/bu.---	
60	3.35	2.53	40	4.24	2.45	3.00	6.90	3.78
70	3.97	3.14	45	5.25	3.46	3.50	8.05	4.41
80	4.58	3.75	50	6.26	4.47	4.00	9.20	5.04
90	5.19	4.37	55	7.27	5.48	4.50	10.35	5.67
100	5.81	4.98	60	8.28	6.49	5.00	11.50	6.30

Note: Variable costs in the bid price calculations include all non-corn variable costs.



**Figure 1. Daily Prices for Selected Crop and Livestock Futures Contracts, June 2, 2008-October 10, 2008.**



**Figure 2. Peak to Trough Decline in U.S. Gross Domestic Product (GDP) During Recessions**