

## Structural Changes in the Agricultural Economy

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Mr. Chairman and other members of the Committee:

Thank you for the opportunity to talk with you today about some of the major changes in the agricultural economy.

My name is Patrick Westhoff. I am a research associate professor in the Department of Agricultural Economics at the University of Missouri–Columbia and a program director at the Food and Agricultural Policy Research Institute.

FAPRI is a joint institute of the University of Missouri–Columbia and Iowa State University. For the past 20 years, we have received federal funding to provide objective analysis of agricultural markets and policies. We have enjoyed the opportunity to work with you and Committee staff in looking at issues related to the 2007 farm bill debate, biofuel policies, and international trade negotiations.

Each year, FAPRI prepares a ten-year baseline outlook for the agricultural economy. The outlook we prepared for release in February 2007 looked a lot different than the one we issued a year earlier:

- In 2006, our outlook showed average corn prices that increased slowly over time, but remained below \$2.50 per bushel through 2015. In the 2007 outlook, our average baseline corn prices never drop below \$3.00 per bushel.
- Our projected prices for soybeans, wheat, and many other products also were much higher in the 2007 baseline than in the one prepared a year earlier.
- In the 2006 baseline, projected farm program outlays by the Commodity Credit Corporation exceeded \$14 billion in every year through fiscal year 2012. In the 2007 baseline, CCC spending is always below \$12 billion per year.

We are just now beginning the process that will lead to the FAPRI 2008 baseline outlook for the farm economy. I suspect that baseline will also show major changes from the 2007 projections.

What's going on? Why do we keep changing our mind about the outlook?

## **Biofuels and US agriculture**

The obvious answer is biofuels. In 2006, we expected biofuel production to increase, but the actual pace of expansion has been much more rapid than we anticipated. The combination of high petroleum prices and supportive policies has encouraged massive new investment in ethanol and biodiesel production capacity.

All those new ethanol plants could use a lot of corn. The 2006 outlook called for almost three billion bushels of corn to be used to produce ethanol by 2015. In the February 2007 outlook, we said four billion bushels by 2009.

Using more corn to produce ethanol puts upward pressure on corn prices. Higher corn prices encourage producers to shift acreage away from other crops to satisfy the growing demand for corn. The resulting reduction in supplies of soybeans, wheat, cotton and other crops results in higher prices for those commodities.

Higher US prices also encourage crop producers in South America and elsewhere to expand production. Livestock producers around the world face higher feed costs. These higher costs slow the rate of expansion of livestock production and eventually raise the price of meat and dairy products.

This is a now-familiar story. Many have said and our projections suggest that we are experiencing a major structural shift in the agricultural economy. We expect that average grain and oilseed prices will be consistently higher over the next ten years than they were over the last ten years.

The basic outlines of this story remain believable. However, events of recent months remind us that we still have a lot to learn about biofuel markets and the impacts of biofuels on agricultural markets. Furthermore, we've been reminded that factors unrelated to biofuels continue to have major impacts on the farm economy.

Ethanol prices that exceeded \$3.00 per gallon in the summer of 2006 have dropped below \$2.00 per gallon. On October 11, ethanol futures traded on the Chicago Board of Trade closed at or below \$1.60 per gallon for all 2007 and 2008 contracts.

This drop in ethanol prices has occurred in spite of petroleum prices around \$80 per barrel this fall and NYMEX futures prices that remain above \$70 per barrel as far as the eye can see. Earlier this year most of us would have thought that \$80 petroleum should imply ethanol prices well above \$1.60 per gallon.

These lower ethanol prices have squeezed ethanol plant profit margins. By our estimate, net returns over operating costs averaged \$1.56 per gallon in 2005/06 and \$0.95 per gallon in 2006/07. With those kinds of returns, a plant built in 2005 could be fully paid for today. Current futures, in contrast, suggest a return over operating costs of just a few cents per gallon, and that's before considering capital costs.

As a result, the future of the ethanol industry is now much less certain than it seemed just a few months ago. We expect plants under construction to be completed. However, it is less certain whether they will all operate at full capacity, and the pace of new investment seems sure to slow dramatically.

Similarly, profit margins to biodiesel producers have been declining sharply in recent months. In contrast to ethanol, however, the change is primarily caused by rising feedstock costs for vegetable oil, rather than declining prices for biodiesel. We currently expect vegetable oil prices to remain high by historical standards, which could slow or even stop expansion of the industry.

In the long run, we expect ethanol to sell for roughly its value as a fuel. That would be a much lower price than ethanol sold for in 2006, but higher than it is trading for today. In our August 2007 baseline update, we projected a 2012 ethanol price (FOB Omaha) of \$1.72 per gallon, compared to a petroleum price (West Texas Intermediate) of \$69 per barrel.

Those projections, of course, are based on a long series of assumptions, some of which will certainly prove to be wrong. To take the most obvious example, the price of petroleum could be much lower or higher than \$69 per barrel.

Analysis we conducted earlier this year showed that the ethanol industry and agricultural markets look very different at low petroleum prices than at high petroleum prices. For example, we estimated that 2015 ethanol production under current policies could be less than eight billion gallons if the refiners' acquisition price for petroleum falls to \$30 per barrel or over 20 billion gallons if the oil price consistently exceeds \$80 per barrel.

What does all this mean for the agricultural sector?

1. First, there has been a fundamental shift in the demand for agricultural products. Increased demand for corn and soybean oil translates into higher prices for corn, soybeans, and other farm products. Most affected are commodities that are close substitutes for corn and soybeans in supply or demand; less affected are fruits and vegetables.
2. Second, energy markets and agricultural markets are becoming increasingly intertwined. This does not mean that every time the price of petroleum changes by a dollar the price of corn will change proportionally on the same day. It does mean that it is unlikely that grain and petroleum markets will move in opposite directions for extended periods of time. If corn prices are low, relative to petroleum prices for a long time, more ethanol plants will be built and that will drive up prices for corn and other crops. If corn prices are high enough relative to petroleum prices, ethanol production becomes unprofitable, moderating corn demand.
3. Third, biofuel subsidies matter. The FAPRI outlook assumes an indefinite extension of the \$0.51 per gallon ethanol tax credit, the \$0.54 per gallon ethanol tariff, and the \$1.00 per gallon tax credit for biodiesel made from virgin vegetable oil. If those subsidies are reduced or allowed to expire, the result will be less biofuel production and lower prices for corn, soybean oil, and other farm commodities. For example, earlier this year we estimated that letting those subsidies expire would reduce average corn prices by \$0.30 per bushel.
4. And, finally, biofuel use mandates can matter, too. Biofuel use in 2012 is likely to far exceed the 7.5 billion gallons mandated by the 2005 energy bill. If the mandate is set at a high enough level, it could be important. For example, suppose there is a drought that severely limits corn supplies. Without a binding mandate, corn prices would rise until ethanol production becomes unprofitable. Plants would close and the reduction in corn use would moderate the increase in corn prices. Suppose instead that there is a binding mandate that requires blenders to continue to use biofuels regardless of the price. Ethanol production would continue in spite of high corn prices, forcing greater reductions in feed use, exports, and other uses of corn.

## **Other factors driving agricultural markets**

Biofuels are extremely important to US agriculture, but the last few months have demonstrated the importance of several other factors affecting agricultural markets.

### Global economic growth

Milk prices have increased dramatically in 2007. Higher feed prices caused by ethanol production and weather conditions are only a small part of the story. More important has been strong global demand for dairy products, led by consumers in Asia. Rising incomes have contributed to the sharp increase in demand for dairy products and many other commodities as well.

### Exchange rates

The weakness of the US dollar has had mixed effects on the US economy as a whole, but it has been beneficial for most US agricultural producers. By making US goods less expensive when prices are expressed in foreign currency, the weaker dollar encourages foreign consumption of US products and discourages competing exporters. While prices of grains and oilseeds have increased around the world, the increases are much larger when measured in US dollars than when measured in Canadian dollars or Brazilian reais. This is one of the reasons why the foreign supply response to high commodity prices has not been as great as one would normally expect.

### Population growth

The world's population continues to grow, but at a declining rate. In general, this means population will decline in importance as a driver of increases in food demand. However, population growth rates remain high in Africa, a major export destination for commodities like wheat and rice.

### Technology

When we develop the FAPRI outlook, we assume that the average rate of growth in crop yields and other productivity indicators will generally be in line with past trends. Usually that is a reasonable assumption, but not always. Current high prices for many commodities provide an incentive to producers to increase input usage and make them more willing to pay for new technologies. Growth

in demand has made it hard for crop supplies to keep up with demand in 2007, but that may not always be true. If the pace of yield growth increases in the years ahead, commodity prices could fall even if demand continues to grow.

### Weather

As important as biofuels and other developments are, the main factor driving crop prices in any given year is the weather. This is seen most clearly in the case of wheat, where poor weather has reduced 2007 yields in Europe, Australia, and North America. Because consumer demand for wheat is not very responsive to price changes and global stocks were at the lowest level in decades, reduced supplies have resulted in remarkably high global wheat prices. Drought in Australia has also limited the ability of that country's producers to respond to current high dairy prices.

### Supply response

That producers around the world respond to changes in market conditions is hardly new. However, it is worth noting just how strong the US producer response was in 2007 to price incentives. At planting time, corn prices were very high relative to prices for soybeans and other crops. US producers responded by expanding corn area planted by 15 million acres, with most of that increase accounted for by reduced production of soybeans, cotton, rice, and other crops. At least for now, it appears that relative prices at planting time in 2008 will be very different than they were in 2007. The result is likely to be increased US and world acreage devoted to wheat and soybeans, and corn acreage may actually decline.

### Policy

Current high commodity prices make many US government programs less important to producers and to market outcomes than would have been true just a few years ago. The outcome of the farm bill debate, of course, could have important implications for producers, as could the outcome (if any) of the Doha Development Agenda negotiations. In other countries governments have adjusted policies in response to high commodity prices. For example, the European Union is suspending land set-aside programs and China is limiting growth in biofuel use of grain.

## Land markets

The value of agricultural land depends on a wide range of factors. To a large extent, recent increases in land prices and rental rates are a function of the expected profitability of agricultural production. In that sense, land prices and rental rates are a result of developments in the agricultural economy, including agricultural policies. However, it is also true that land prices are strongly affected by a wide range of factors largely external to the sector, ranging from interest rates to the housing market to tax policies. How important these various factors are in determining land values varies greatly across the country.

## **Other commodity-specific concerns**

### Livestock

Livestock, dairy, and poultry producers are paying much more for feed now than they were in mid 2006. For the animal agriculture sector as a whole, however, the increase in feed costs in 2007 relative to 2006 is much less than the increase in cash receipts. Prices for milk, poultry, and beef have all been substantially higher than generally anticipated earlier this year, largely because demand has been stronger than expected for many products. Part of the strength in demand can be explained by income and population growth, but some is also due to other factors. Recent declines in hog prices are a reminder that feed market changes have not eliminated livestock cycles. Looking forward, we expect producers to continue to respond to changes in returns. For example, current high milk prices are likely to cause a supply response here and around the world that will lead to lower prices.

### Cotton

The domestic cotton milling industry has been in decline for the last ten years and there are few prospects for a reversal. As a result, domestic cotton producers have been increasingly dependent on export markets—exports now account for about three-fourths of US cotton use. Reduced purchases by China and other factors caused a sharp reduction in US cotton exports in 2006/07, resulting in large carryover stocks. The combination of low cotton prices, high production costs, and competition from high corn prices resulted in a sharp reduction in 2007 cotton area and production. In the long run, global growth in demand for cotton will determine the size and shape of the US cotton industry.



## **Concluding comments**

Prices for grains, oilseeds and many other agricultural products are above their historical average levels. Growing biofuel production is much of the reason, but the weather and a variety of other factors also play important roles.

FAPRI's projections suggest that average prices for many agricultural products are likely to remain above the average levels that prevailed prior to 2006. But, it would be premature to conclude that we are in a new world and that there is no chance that we will ever see \$2.00 per bushel corn again.

The last time the "conventional wisdom" said we were on a new higher price plateau was the mid-1990's. Demand from China and the rest of developing Asia was expected to cause a permanent upward shift in commodity prices. Then the Chinese unexpectedly reduced grain imports and a financial crisis caused a sharp reduction in import demand in other Asian countries. Grain and other agricultural commodity prices fell sharply.

There are sound reasons to expect agricultural commodity prices to remain relatively strong over the next decade. Indeed, one can easily tell stories where FAPRI's current price projections are too conservative. However, many things could lead to prices falling again. Petroleum prices could decline from current levels, domestic and foreign crop supplies could grow more rapidly, or a global economic slowdown could weaken demand.

One thing I've learned in 20 years of making agricultural market projections is that someone in this business either needs a lot of humility or a very short memory. Things never work out exactly as our projections indicate, because it is impossible to anticipate everything that can and does affect agricultural markets. We do not have a crystal ball, but we believe that our annual baseline outlook provides a reasonable and useful snapshot of the agricultural economy under a particular set of assumptions. That baseline outlook then serves as a point of comparison for other analyses, such as work we've done at the request of this Committee to examine farm bill options.

Thank you again for this opportunity. I would be happy to answer any questions.