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Setting the Stage: American Agriculture Today and What We Can Expect Over the Next 5 to 10 Years

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According to estimates made by the Food and Agricultural Policy Research Institute in March of 1999, there are several macro factors that will significantly impact U.S. and global agriculture over the next decade. Factors leading to near-term price pressure are contrasted with likely implications for the longer term. In general, the longer run estimated consequences for global agriculture are more positive, but with the strong likelihood of low price pressure lingering over the next two to three years.

Key Words: agricultural policy, farm financial pressure, global agriculture, global economics, technology

I have been in the policy analysis and long-term projection business for almost 30 years. Most of the time has been devoted to establishing a funding base that permitted the development of large-scale models that are global in scope. This modeling effort necessitates combining the economic and policy structures associated with planted land area, livestock production, and global population into a uniform system. Long-run projections are developed that serve as a base of reference for policy analysis. Currently, seven universities with about 60 researchers are devoted to this effort. At any given time, five to ten Ph.D. students are involved in research projects that complement dissertation requirements. The University of Missouri and Iowa State University anchor the Food and Agricultural Policy Research Institute (FAPRI) Consortium with support from the University of Arkansas, Texas A&M University, Arizona State University, Kansas State University, and North Dakota State University. My comments are based on the efforts of this very dedicated team of researchers—the baseline analysis in 1999. I hope my comments do sufficient justice to their efforts; however, observations expressed in this paper are solely the responsibility of the author.

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Some Observations

Anyone who enters the projection game is going to make mistakes. The mistake that stands out from all others in my mind is underestimating the potential for the expansion of global production and the corresponding supply of agricultural commodities. Every time I bought the notion that global demand for agricultural commodities was going to outpace global supply, with corresponding sustained increases in commodity prices, I have been wrong. So one of the first things that I do as our analysis nears completion each year is to examine our expected price projections, contrast them with previous historical averages, and evaluate differences from our last baseline. Which case won out this time? Are we entering a period of tighter supplies with higher prices, or did the supply side prevail once again with lower prices? Our current baseline reflects one of the lowest price paths in recent memory, and is well below levels expected in January 1998. Once again, it appears that the supply side prevails. What made this difference is the subject of our discussion today.

Why the Current Low Prices of Grains and Oilseeds?

The FAPRI team was asked this question by the House Committee on Agriculture in July of 1998. Dr. Gary Adams' testimony before the committee addressed significant factors contributing to the outlook for the U.S. agricultural economy (FAPRI, 1998). His conclusions point in three directions. First, the leading contender is seen as increases in global production fueled by expanded area and exceptionally good crops in 1996, 1997, and 1998. Approximately 50 million acres of land were added to global planted area in 1996, another testimony to the responsiveness of the supply side. The calendar has to be rolled back to 1985, 1986, and 1987 to find three years with consecutive weather patterns that compare with the last three years. Second on the priority list was the global economic situation led by the precipitous downturn in the Asian Pacific Rim countries. Third is the Federal Agriculture Improvement and Reform (FAIR) Act. The 1996 farm bill released about 15 million acres of land for additional production by eliminating annual land idling.

Price Trends

In fairness to our modeling team, price estimates in January of 1998 were already on the decline, reflecting both the expected increase in acreage and the market nature of the FAIR Act. What was not anticipated was the magnitude of the Asian financial situation and the continuation of the phenomenal weather pattern, both here and in South America. The weather pattern carries the most weight with regard to the estimated price differentials.

Technology Expansion

Our baseline projections start from a lower base than last year and hold this level for the next two to three years. There is little hope for near-term optimism given the current global projections. Global economies are expected to decline over the next two to three years by about 0.5 percentage points from 1998. Taken in conjunction with the fact that baseline projections are conditioned on trend levels of technology growth and average weather, it is unlikely that current stock levels will be significantly reduced. China continues to be a major factor in the equation. There is considerably more optimism this time around with regard to China's yield growth. A reevaluation of the last two years suggests a more aggressive pace than was factored into previous analyses. For example, this results in a net export position for corn through about 2002/03.

Weather and Stocks

An additional near-term caveat is weather. Holding prices at near-term levels, as projected over the next two to three years, will require at least average weather in all years. Although stock levels are projected higher, they do not compare with levels carried under previous government programs. Moderate, dry weather will allow stocks to gain lost ground quickly, moving prices back to longer run averages for at least one growing season.

Global Land Area

For some years, our analysis has suggested an interesting balance between global supplies and demand for grains and oilseeds. Examination of conditioning information revealed some interesting characteristics. First, with regard to technology growth, we tended to hold a path that was at or near the rate of global population growth. Second, with expected average weather patterns, this tended to suggest very little increases in crop land area. This balance generally prevailed throughout our projections unless weather problems erupted or global income demand began to exceed previous levels of expectation. So, in general, our projections suggested moderate increases in nominal prices and moderate stock reduction over time.

Income-Demand Responsiveness

In the mid-1990s, things began to change. There was greater excitement over the potential world income growth than in the past two decades. Among the many questions debated was "why now?" WEFA and the United Nations' Project LINK

financial statistics suggested that real global gross domestic product (GDP) growth averaged above 2.5% for the decades of the 70s, 80s, and 90s. Why the sudden interest in income growth if all decades have been at or near the same level? The answer tends to be associated with the sustained (30-year) levels of income growth and the likelihood of the same in the next decade. This simply implies that a substantial number of people around the world have finally reached an income level that places greater demand on meats. As a result, our analysis tended to reflect a stronger export path. And our models began to reflect increasing export demand.

Prior to 1999, price projections tended to move above long-run averages for grains and oilseeds by the end of the 10-year horizon. Global stocks became progressively tighter and modelers scrambled to find additional land area that was required to make up the difference.

We never did join the euphoric scene about export expansion; however, both the crops and livestock models were indicating export demand growth. And our price projections were generally on the optimistic side.

Moderated Export Growth Expected

Were we wrong or will this occur again? If income growth returns, our models will again reflect this growth. And this is exactly what does occur in the 1999 baseline. But this time there is a decided difference, and therefore a major turning point, from previous analysis.

This difference is associated in large part with a change in our assumption about technology growth. A number of countries reflect more aggressive adoption rates than previously estimated. This may well be another characteristic of the global supply potential. Higher prices in 1996 and 1997, plus concerns of food shortages, seem to have fueled the supply side once again.

The resulting pace of technology expansion, particularly in places like China, Brazil, and Argentina, tends to outpace the rate of global population growth, which is projected to decline over time. This leaves slack on the supply side of the system, especially given the current situation of soft world demand and better-than-average weather patterns.

Expected Price Path

Starting from a low price and moderate near-term income, growth simply shifts the entire global momentum, at least for the next three to five years, to a low-side price path for grains and oilseeds. Projected growth for U.S. corn yield, for example, is 1.3% per year, and global yields, weighted for major production regions, suggest a growth rate of 1.5% per year.

Table 1. Selected FAPRI Baseline Projections Relative to Historical Averages

Description	1980–1989	1990–1999	2000–2008
Real-World GDP Growth (%)	2.7	2.5	2.9
World Population Growth (%)	1.7	1.5	1.2
World Corn Yield (%)	1.4	1.9	1.5
U.S. Farm Price:			
Corn ($/bu.)	2.45	2.38	2.28
Soybeans ($/bu.)	6.19	5.97	5.52
Wheat ($/bu.)	3.35	3.34	3.49
Cotton ($/lb.)	0.60	0.64	0.61
Rice ($/cwt)	7.81	8.13	9.07
Planted Area, United States (mil. acres):			
Corn	75.7	70.2	80.3
Beans	64.1	64.0	70.4
Wheat	76.7	77.5	66.6
Cotton	11.2	13.7	12.1
Rice	2.8	3.1	3.3
Planted Area, Brazil and Argentina (mil. acres):			
Corn	38.4	39.9	37.4
Beans	32.0	43.0	53.1

Population Growth Slower than Projected Technology Growth

The corresponding world population growth rates imbedded in the current projections suggest growth rates of 1.3% through 2002, then falling to 1.2%. Developed countries are well below this average, as is China. However, developing countries that are lower on the income scale are at a faster pace of 1.6% per year, led by Africa at 2.5%.

Although prices are projected lower, there will still be regions of the world with large populations that suffer from food shortages. Our models do account for these characteristics on a region or country basis. A blend of population and purchasing power sets the pace for global demand.

Expected Prices for Crops

Table 1 places FAPRI's 1999 baseline projections for selected crops in historical perspective. Wheat prices tend to be an exception to the price path for grains and oilseeds, primarily reflecting lower planted acres and a continued strong concentration

Table 2. FAPRI Baseline Projections: U.S. Livestock Relative to Historical Averages ($/cwt)

Description	1980–1989	1990–1999	2000–2008
Beef (1,100–1,300 lb. steers)	64.92	69.81	72.38
Pork (barrows and gilts, 51–52% lean)	47.00	44.84	41.92
Broilers	52.04	56.92	56.55
All Milk	23.22	13.47	13.08

of land in the Conservation Reserve Program (CRP). Prices in the 80s and 90s averaged about $3.35 per bushel, but are expected to increase to around $3.50 per bushel in the next decade.

Soybean prices are projected to average below $6 per bushel ($5.52) for the next 10 years, starting at a low of about $5.08 for the 1999/2000 crop and gradually increasing to around $5.90 by 2008/09. This is well below the average of previous decades—almost 70 cents below the decade of the 1980s and about 50 cents below the decade of the 90s. South America continues as a strong competitor, adding about 10 million acres of production each decade.

The projected path for corn is similar. The projected $2.30 per bushel average for the next decade is about 20 cents below the 90s estimated average and 15 cents below the average of the 80s.

Cotton prices are also likely to continue to float at or near 60 cents per pound, reflecting strong world competition on both the supply and demand sides. Rice prices are likely to increase, reflecting growth primarily in the domestic market with strong competition from traditional crops for land area.

If the technology growth assumptions used in previous baselines had been maintained, it is certain that current price projections would be at higher levels. We are simply on a higher projected path of technology adoption than anticipated previously.

Expected Prices for Livestock

Table 2 places FAPRI's 1999 baseline for livestock in historical perspective. The long-term outlook for beef prices is positive. This is particularly associated with the normal phase of the cattle cycle plus the expectation that export demand will recover. Domestic demand continues to be a concern. However, prices seem to be on a slight upward trend for the decade.

The long-term price path for pork is down, reflecting the economic advantages of confined pork production in conjunction with expected feed and protein prices at or below long-run trends. Over the next decade, prices are expected to average

Table 3. Selected Components of U.S. Net Farm Income Relative to Historical Averages ($ bil.)

Description	1980–1989	1990–1999	2000–2008
Cash Receipts:			
Total Crops	70.60	95.50	115.94
Total Livestock	73.08	90.19	100.71
Production Expenses	136.99	170.14	201.15
Net Cash Income	42.43	55.14	56.82
Net Farm Income	8.74	45.29	46.92

slightly above 40 cents per pound. However, current projections are for prices in the low to mid-30 range until 2000/01.

Poultry prices are expected to continue to average in the upper 50-cent per pound range, reflecting strong consumer demand and strength in the export market.

All milk prices are expected to average around $13 per hundredweight over the next decade, slightly below the $13.50 average of the 90s.

Net Farm Income

Table 3 places the 1999 baseline projections for U.S. net farm income in historical perspective. Lower prices in the first part of the next decade followed by moderate gains in the latter half are likely to leave net farm income at or about the same level as the current decade—$47 billion projected as compared to $45 billion for the 1990s.

Policy Considerations

The FAPRI Consortium has been heavily involved with members of Congress who are concerned about current farm financial pressures. Several options are currently under consideration, and the Senate has recently passed a $7.4 billion package reflecting broad support for both crop and livestock producers.

Most of the requests are for near-term support that generally maintains the integrity of the 1996 Farm Bill—most especially the flexibility option. Of the several proposals that we are evaluating, only one goes so far as to suggest a major overhaul, and it also leaves the choice of switching to the farmer. There are primarily three schools of thought: risk management, commodity program reform, and a straight cash infusion.

Risk Management

Risk management takes two directions, with the lead centered around crop insurance—five insurance reform bills have been introduced. Other strategies proposed by members of Congress include training programs for farmers aimed at greater utilization of futures in their marketing strategies.

Commodity Program Reform

Commodity program reform proposals come from both sides, Democrats and Republicans. They utilize strategies common to previous farm bills:

- loan rates raised in exchange for voluntary set-aside,
- reintroduced farmer-owned reserves,
- uncapped loan rates, and
- short-term CRP.

The Secretary of Agriculture tends to agree that fundamental reform is needed; however, the direction to be taken has not been formulated at the time of this presentation.

Straight Cash Infusion

Straight cash infusion currently has the strongest support, as is reflected in the $7.4 billion Senate agricultural appropriations package. The American Farm Bureau has taken a position on additional short-term support, pointing out that crop insurance reform will not put funds in producers' pockets in 1999.

Summary and Conclusion

The short-term agriculture outlook is certainly more pessimistic than the long term. Global income, production, and program changes dominate the short-term picture. The long term is much more optimistic, but doesn't suggest prices reaching levels projected as recently as a year ago by our team. Why? Global income projections, with a probability of about 60% occurrence, turn more favorable by 2001/02. They suggest that out of the next 10 years, at least six to seven years will reflect stronger world growth. For this reason, our models tend to reflect strength in the export market for all products except, perhaps, cotton. But there is a strong caveat this time. Our projections regarding the global supply side are much stronger. This change of opinion is partially associated with the evidence of more aggressiveness in the purchase and use of technology by many of our competitors, and the expectation that

the next generation of inputs will be more environmentally friendly. And South America continues to demonstrate that new lands can, and very likely will, be added to the production picture.

The population growth component is also a significant factor. As previously indicated, current projections reflect population growth at a declining rate. For the first time, we are starting to focus on yield growth rates that exceed population growth projections.

Policies also play a role. The United States no longer supports crop prices at the previous levels. The GATT agreement is also moving other countries in this same policy direction.

The nature of the FAIR Act, with no braking mechanism on the supply side and government stocks no longer a part of the equation, poses an interesting pattern for prices in the future. In the first half of the next decade, prices will tend to the low side, even with poor crop years. Short crops followed by trend-level production will replenish stocks fast enough to quickly return prices to the low side. But, if the projections are correct, as income growth rebuilds in the latter part of the decade, stocks again appear to become tighter. The income growth component tends to catch up and again starts to overpower the stronger technology component. Stocks become continuously tighter. This makes for a different situation. Short years will hold prices higher longer, as indicated in the analysis by Adams (1998).

Given either scenario—prices on the low side staying longer or on the high side staying longer—it is very likely that prices during the crop year will show spurts of quick, rapid movement. Three weeks of dry weather will send prices scurrying upward. If it rains across the Corn Belt, the next day all price strength will very likely be lost. So, even if good crops tend to prevail, the market will continue to be very nervous in streaks of dry weather.

Stated another way, my conclusion regarding price patterns in front of us is for staying power on the low side in the first half of the decade followed by staying power on the high side in the latter half. In either case, we are likely to see a good deal of price movement within the crop year.

Finally, even with the likelihood of higher highs in the latter part of the decade, this will simply speed up the rate of technology adoption, which means the next cycle will move back to a lower price range. As I mentioned in my opening remarks, the supply side has staying power.

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