

Policy Matters

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Special Compilation, Spring 2000

Agricultural Policy Questions Series

“Agricultural Policy Questions” is a special series of the Agricultural Policy Analysis Center’s Policy Matters Newsletter. The series was created to bring attention to the underlying issues surrounding current discussion of the performance of U.S. agricultural policies set in place in 1996 with passage of the 1996 Farm Bill. Each issue addresses a specific policy question in depth. This publication compiles each of the six policy topics into one reference location.

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Do Grain Markets Self-Correct Under Current Policies?

September 1999

Policy Matters: Volume 4, Number 4

The agricultural policy debate is again heating up in the midst of falling incomes for grain and cotton producers as bulging inventories sink prices to levels not seen in decades. The political response has been to partially plug the holes left by the market with taxpayer money. During the 1999 calendar year, the U.S. Department of Agriculture projects that \$16.6 billion will be dropped into the income gap and over \$20 billion may be stuffed into even larger income holes in calendar 2000. The 1999 payment projection is just shy of the record \$16.7 billion paid in 1987. Combining the record payments expected in 2000 with 1999 payments, the two-year total will exceed the previous two-year record by over \$5 billion. Yet even with the payments, many commercial farm operations are covering only a small portion of expenses above variable costs and some are not covering variable costs (*Policy Matters: Vol. 4, No. 3*).

Where does the 1996 FAIR Act fit into this? Weren't the contract payments to be a fixed amount each year, declining through 2002 and transitioning agriculture to free markets? Yes, and some continue to feel that the current price and income problem is an unfortunate and rare aberration that will pass, much like a hundred year flood. But I'm not so sure.

The critical question is: *Are there systemic reasons for the chronic or periodic price and income problems in agriculture?* In other words, are there unique characteristics of agriculture that prevent grain and cotton markets from adjusting production or expanding demand when inventories become

large so prices and incomes recover in a timely manner? If such reasons or conditions exist, current price and income problems are more likely to be chronic than unique.

We know that during the last couple of years, grain inventories have become burdensomely large driving down prices. But inventories get out of balance periodically in all sorts of industries. In most industries (and in economics textbooks), an over supply problem tends to be self-correcting. When inventories are bulging and prices decline, producers produce less and consumers buy more. Inventories return to normal and prices bounce back. After two years, this process of self-correction has not occurred in the grain and cotton markets.

In general, why have grain markets not self-corrected?

Limited ability to adjust agricultural production in the short run

When inventories are high and prices are low, the first response in most sectors of the economy is to reduce production. A plant manager in a non-ag sector can adjust output weekly or daily, shutting down lines or reducing workforce. Farmers make the output decision only once a year at planting time without a later option to idle land. Though the mix of crops may change some from year to year, as a rule, total acres planted do not.

Low agricultural prices don't trigger large increases in demand to deplete stocks

In most sectors of the economy, low prices and high inventories trigger an increase in

demand for the goods or products, as consumers take advantage of low prices. But examination of the data reveals that agricultural demand—both domestic and export—has not responded to price swings sufficiently to deplete large inventories.

Also, the supply of livestock to consume feed grains is relatively fixed at any given time. It would be difficult as a nation to eat much more. Year-to-year changes in export demand are driven more by world production shortages or gluts because of yield swings and less by price swings.

Limited ability to reduce agricultural productive capacity in the long run

If chronically high inventories and low prices indicate production overcapacity, then we expect a non-ag industry to respond by downsizing its productive capacity. Plants are closed and industry capacity reduced, selling plants and equipment for use in another industry—one that is expanding.

But in the case of agriculture, when inventories continue to increase and prices remain depressed, farmers are forced out of agriculture but the land is not. The farmland is taken over by other farmers and corn, soybeans and cotton are produced just as before. Productive capacity changes little or none.

How did we get to the point of high stocks and low prices that brought us here today?

The situation of near-record low prices for major crops and soaring stock levels that underlie the current farm income crisis results from a combination of economic and policy conditions operating in this unique agricultural market.

While the recent Asian economic crisis has

contributed to a slow down in export demand for some crops, especially cotton, most of the current crisis is caused by excess production rising from the additional acreages made available after the passage of the 1996 Farm Bill and above average yields. Also over the longer-term, it is clear that the optimistic projections for export demand growth beginning after the new century from China and other counties that prevailed during the last Farm Bill discussion will not come to fruition.

These economic and weather conditions that are contributing to the current farm income crisis are occurring in a policy environment unlike any we've seen in a long time. Under the 1996 Farm Bill, there are no acreage set aside mechanisms to reduce supply. Farmers have every incentive to maximize production and no incentive to voluntarily reduce acreage.

The absence of a stock control mechanism pushes stocks onto the market at the point when prices are at the very lowest levels. With the use of marketing loans in place of non-recourse loans, there is no price floor, as there has been in the past. Many have argued that free markets in agriculture allow farmers to take advantage of market signals and adjust their crop mix accordingly. Underlying this argument is the assumption that there's always a better bet, but that may not be the case when all major crops are in excess and all prices are low.

What can be done this year?

A number of suggestions have been brought forward. It will be helpful to increase the loan deficiency payment limitations, provide more money to farmers as compensation for low prices (and in some cases low yields), and make other adjustments. But, as is evident from my review of how the grain markets work, funneling money to farmers will not solve the underlying

problems. Neither the money nor the low prices will cause farmers to significantly reduce their acreage/output of total grain nor will it cause users to sufficiently increase grain consumption. Next year, unless yields drop sharply and/or exports explode—which you can never rule out—stocks could continue to accumulate, prices could decline further, and even more money could be needed to cover economic losses in agriculture.

Reintroducing the Farmer-Owned-Reserve and encouraging the use of non-recourse CCC loans in place of the marketing loan would be helpful immediately. The idea behind the marketing loan was that, by allowing prices to go below the loan rate, demand would expand, especially export demand. With the lower price, import customers would import more and export competitors would produce less. This has failed or at best has cost billions of dollars to increase demand by millions. For example, a \$2 billion dollar LDP payment that resulted in 200 million bushels of increased soybean exports, would be at a cost of \$10 per bushel.

Bringing back the Farmer-Owned-Reserve could immediately raise prices to the loan rate and storage payments would only have to be paid on a fraction of the bushels produced. (Storage could be paid for many, many years before reaching \$2 billion dollars).

What are the longer-term policy possibilities?

Some of the possibilities for the future are actively being discussed including expansion of the Conservation Reserve Program (CRP) and a shorter-term CRP. Depending on how they are structured, both of these could force a reduction in major crop acreages that lower prices could not accomplish. Other possibilities such as improved revenue insurance, whole farm

insurance, and farmer savings accounts suggest continuation of the ‘1996 Farm Bill Mindset’, i. e., ‘everything will be okay on the average’. That is not necessarily true. Given the reasons that grain markets do not self-correct in times of excess supplies, a three or even five year run of extremely low prices is possible with continuation of current policies.

Right now, the year-to-year future of agriculture is determined at the yield roulette table. To me, a more appealing approach would be to use the Farmer-Owned-Reserve and/or buffer stock mechanisms to sop up the excess stocks that currently overhang the market. The stock would be used to ensure a ready supply of feed for domestic livestock and poultry producers and reduce or eliminate the possibility of export embargoes when the yield draw comes in at 100 bushels per acre for corn and 25 bushels per acre for soybeans. Once future contingencies are reasonably covered, if production still exceeds consumption, use a total cropland acreage reduction program to reduce the supply of grains and cotton. The ‘set-aside’ would not be crop by crop but would require that a certain percentage of all cropland, say five percent, not be planted to crops with complete planting flexibility on the remaining acreage.

Why Have Grain Prices Fallen So Low?

October 1999

Policy Matters: Volume 4, Number 5

Why has the bottom fallen out of grain prices? Yes, inventory levels are up from two years ago, but corn and wheat stocks are puny compared to record levels of the 1980s. Prior to 1998, the last time corn prices were below \$2 per bushel, corn ending-year inventories hit 4.3 billion bushels, far greater than the 1.8 billion bushels of ending stocks expected this crop year. So, again, why did prices drop so sharply? And why may we be in even worse shape if a drought here or abroad sends prices soaring? The concise answer is: *Farm policy was changed*. The farm program provisions that moderated crop prices in the past were eliminated or made ineffective in the Federal Agriculture Improvement and Reform Act of 1996, commonly called the Freedom to Farm Act. The Farmer-Owned Reserve (FOR) was mothballed as was the acreage set aside program. The nonrecourse loan program remains but was rendered ineffective as a price support and stock buffer device by the 'marketing loan'.

What is the role of the marketing loan?

With the marketing loan, there is no price floor. A program crop's price can fall (has fallen) below the 'support price' because farmers can repay their Commodity Credit Corporation (CCC) loan using the current market price or the loan rate (the price used to value the loan) which ever is less. For example, when supplies are large, a farmer could pay off a loan on 5,000 bushels of corn based on a posted price of say \$1.40 per bushel rather than the \$1.89 per bushel loan rate used to determine the original amount of the loan. The 5,000 bushels now becomes available on market. With the marketing loan,

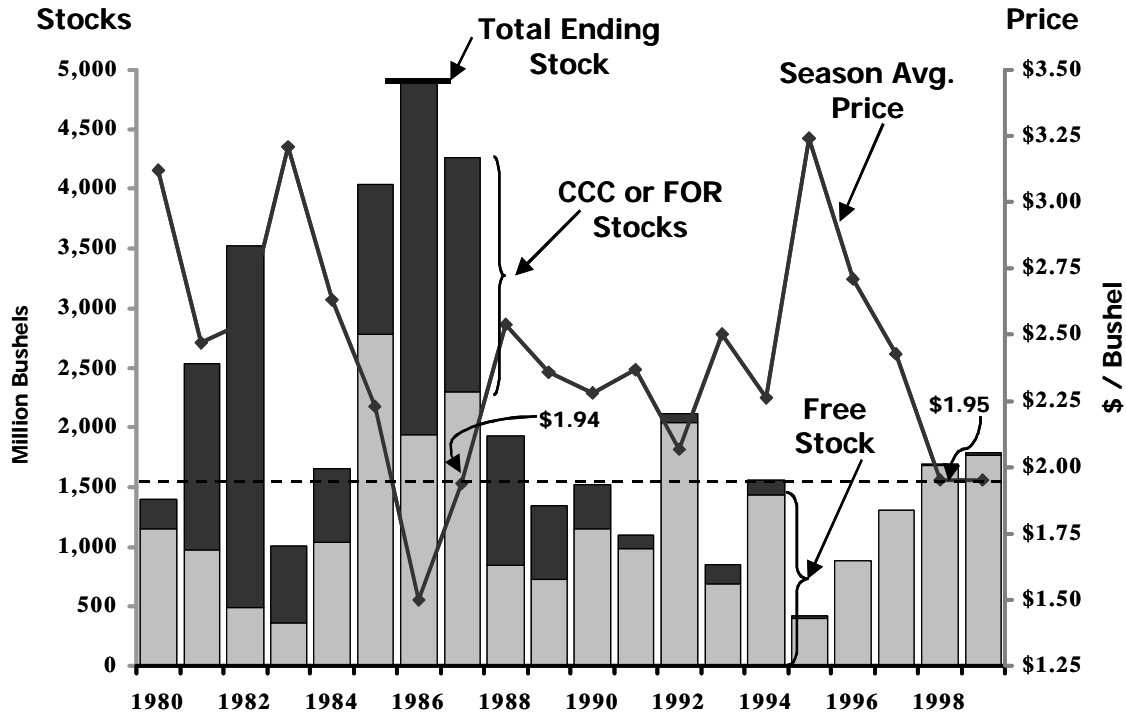
stocks overhang the market when prices are the lowest.

Before the marketing loan became available in the 1996 Farm Act (it was available for cotton and rice in earlier legislation), farmers' most appealing option, when supplies were in excess, was to forfeit the grain to the CCC. By law, the CCC has no recourse but to accept the grain as full payment for the loan. By doing this, the farmer was assured of the support price or loan rate as the price for his grain. Since each farmer could do this and the forfeited grain was held off the market by the government, the loan rate became the floor or minimum price. In this case, government stocks overhang the market when prices are 'high' or more accurately as market price approaches a predetermined government release price. Under Freedom to Farm, the government no longer accumulates sufficient stocks to support prices and it currently has virtually no stocks to release when supplies are tight.

What is the role of stocks today?

The shift toward marketing loans and away from farmers' use of grain forfeiture to repay CCC loans goes a long way toward explaining why prices fell so sharply over the last year or so as inventories increased. Since stocks aren't automatically separated from the market and put into government ownership when prices are at loan rate levels, any increase in stock bears down hard on price. Also, since neither the Farmer Owned Reserve nor set aside programs exists anymore, market participants know that grain will not be moving from the market into the FOR nor will prices be higher next year strictly because acreage set asides are imposed.

Figure 1. U.S. Corn Stocks and Price, 1980-1999.



The relationship between stocks and season average price is easily seen when graphed together on the same chart. The bar graphs are corn total ending year stocks, composed of the free stocks (shown in a light shading) and CCC/FOR stocks. Corn season average price is graphed as a line using the scale on the right.

In September of 1999, the USDA estimated the season average corn price for the 1998 marketing year, which ended August 30, 1999, at \$1.95 per bushel. The \$1.95 price was based on estimated August 30, 1999, corn carryover of 1,699 million bushels. Of course, during the marketing year, price fell considerably below the estimated season average and below the national average loan rate of \$1.89 per bushel. For the 1999 marketing year, a price range of \$1.75 to \$2.15 was projected or \$1.95 plus or minus 20 cents.

The last time the season average price of

corn was near \$1.95 was 1987 when it was \$1.94 per bushel. Ending-year stocks in 1987 were 4,259 million bushels, considerably above the projection for the 1998 marketing year. But about half of the 1987 stock was isolated from the market in the Farmer Owned Reserve or owned by the Commodity Credit Corporation. After subtracting out 1987 FOR and CCC stocks, commercial or 'free' stocks were 2,297 million bushels or still about 500 million bushels above the 1998 ending stock level that generated about the same price.

A similar pattern is evident for wheat and soybeans. In 1986, wheat price dropped to near its \$2.40 per bushel loan rate but ending year stocks that year were twice what is expected this marketing year and about two thirds of the 1986 stocks were isolated from the market in the CCC or FOR. In the case of soybeans, the last time the soybean season average price was \$5.00 per

bushel, the estimate for the 1998 marketing year, was in 1985 but stocks were 40 percent higher then and 25 percent of total stocks belonged to the CCC. In 1999, soybeans may be charting new ground. Ending year stock in commercial hands for the 1999 soybean crop—the marketing year that ends August 31, 2000—is projected to be an all time record. Soybean prices could average lower than anytime since 1972.

What does this mean for prices in the future?

With the marketing loan in effect and the CCC and FOR out of the storage business, prices plummet with a much lower carryover of stock than under previous legislation. Prices will also soar higher when production is short relative to demand. Ironically, this may be more of a problem than the ‘low price’ problem being dealt with now. Congress uses loan deficiency payments, contract payments and special emergency direct payments to ameliorate a portion of farmers’ financial pain in the case of low prices. A period of excessively high prices—caused by more than one year of general drought here or abroad, for example—could eventually make the current agricultural crisis look like a minor event. With sufficient incentive, Brazil is capable of bringing into production roughly as much additional acreage as the U.S. has historically planted to soybeans. Just as in the seventies, major leaps in price, of the doubling to quadrupling sort, cause our export customers and competitors to find alternative sources of supply and to greatly increase resources devoted to agricultural production. In the U.S., rapid run-ups in land prices, machinery investment and debt complete the prerequisites for the inevitable crash.

What can we learn from the past?

We have already mentioned that the last time season average corn prices were about \$1.95 was

1987 when stock levels were at 4.3 billion bushels. It just so happened that the next year, corn yield dropped to 85 bushels per acre from 120 in 1987 causing a 2.2 billion bushel reduction in 1988 corn production. Prices did increase by 25 percent, but because 2.4 of the 4.3 billion bushels of carry-in stock were utilized, the U.S. reputation as a dependable supplier of corn for export and domestic use was not eroded. In fact, corn exports during the low-yield year exceeded the previous year. Note the drop in carryover between 1982 and 1983. Here again, stocks were able to buffer a 30 percent reduction in yield without causing prices to go sky high or jeopardize long term markets.

Without the buffering mechanisms of earlier farm legislation, even small changes in the imbalance between production and use can cause rapid and disproportionately large changes in price and market receipts. We experienced the sharp decline in prices this last year when supply outran demand. Prices could soar upward just as quickly if the balance between supply and use became tight. While farmers always like higher prices, either extreme can spell trouble for production agriculture, immediately for the low price extreme and years later for the high price extreme.

How Have Crop Exports Performed with the Price and Income Farm Policy Changes of the Last Two Decades?

November 1999

Policy Matters: Volume 4, Number 6

The importance of exports to the farm economy is one of several forces that have driven farm policy changes over the last two decades. As a means to improve price competitiveness in international markets, farm policy shifted from supporting crop prices through market intervention to supporting incomes with direct payments.

While earlier legislation contained some export-related changes, the drop-off in exports during the early-to-mid 1980s and subsequent price and income problems set the stage for legislation in the 1985 Farm Bill especially designed to expand crop exports. Support prices were reduced by about one-quarter initially and, in the case of corn, by nearly forty percent by 1990 using a combination of moving averages of market prices and discretion of the Secretary of Agriculture. Now, with the implementation of the loan deficiency payment program (LDP), support prices no longer support prices; their current major use is to determine LDP rates.

By allowing prices for program crops to fall, several things were expected to happen. In the short-run, by being more price competitive, the U.S. would increase its export share as importers purchased more from us and less from other suppliers. In the longer-run, in addition to further increases in our market share, the size of the world export pie would increase. With lower prices and time to adjust, importers would consume more and, if they produced the crop, produce less. Export competitors would respond to the lower prices by devoting fewer resources to agriculture and producing less for the export market. The overall expectation was that in-

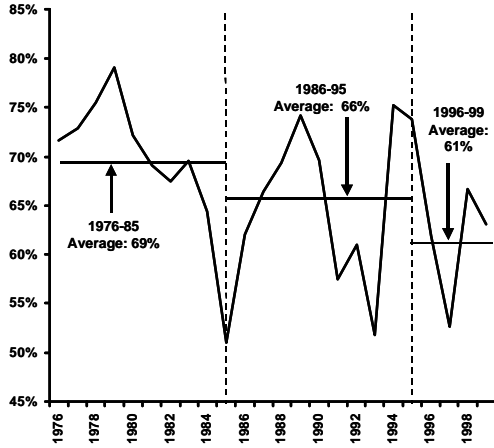
creased U.S. exports would again drive demand growth and foster prosperity for U.S. agriculture.

The question is: Have the expectations generated by this shift in policy been realized? In this issue, we look at changes in U.S. market share and growth in exports compared to domestic demands for U.S. corn, soybeans, and wheat since the 1985 Farm Bill. Figure 1 shows U.S. export volume as a percentage of world export volume for each of the three crops. While there is significant year-to-year variation, trend for all three crops is down. For comparison purposes, average percentage shares were computed for three time periods: the ten years prior to the 1985 Farm Bill, the ten years after the 1985 Farm Bill (covers the 1985 and 1990 Bills), and the first four years of the 1996 Farm Bill.

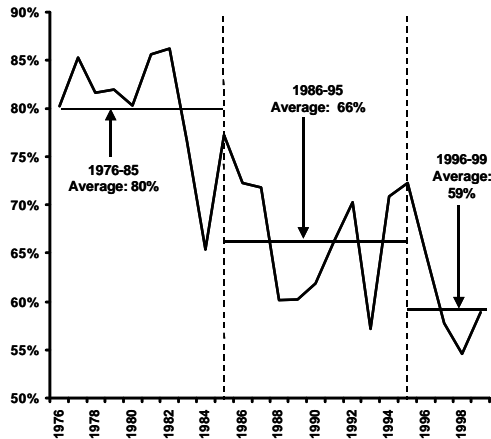
In the case of corn (Panel A), the overall downward trend in the U.S. share of the world export market is evidenced by the 69, 66, and 61 percent average shares for the ten years before the 1985 legislation, the next ten years, and the most recent four years, respectively. Looking year-to-year, the dips in market share in 1985, 1993, and 1997 are especially sharp and occur under widely different U.S. production and price conditions. In the 1985 marketing year, the U.S. experienced record level corn production, price averaged 40 cents below the previous year, but U.S. share of world corn exports dropped to 51 percent from 64 percent in 1984. Similar U.S. circumstances surrounded the drop in market share in 1997. In 1993, on the other hand, U.S. corn yield and production were down significantly from the past and corn price was about 40

Figure 1. U.S. Exports as a Percentage of World Export Volume.

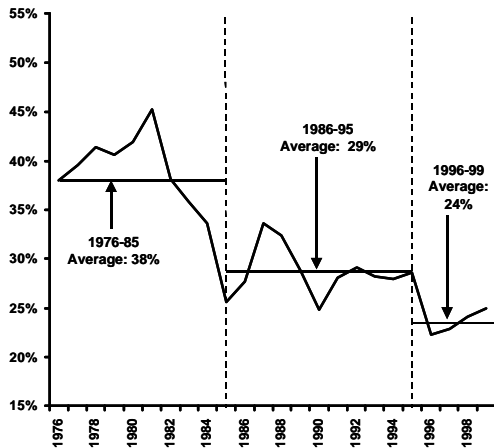
Panel A. Corn



Panel B. Soybeans



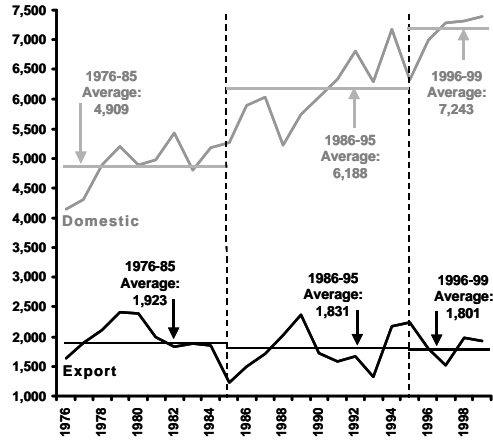
Panel C. Wheat



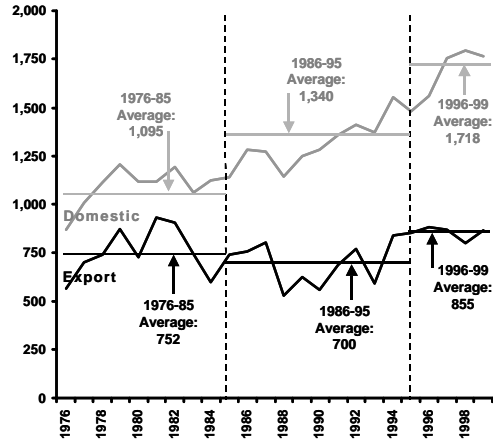
Source: USDA PS&D Database

Figure 2. U.S. Domestic and Export Demand.

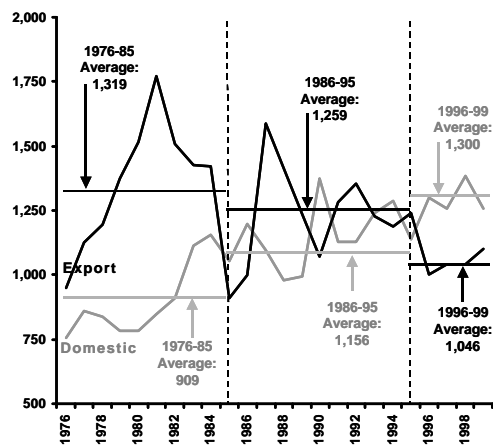
Panel A. Corn



Panel B. Soybeans



Panel C. Wheat



Source: USDA

cents higher than the previous year. Contrasts in U.S. production/price circumstance also occur during years in which our market shares are relatively large. In 1995, for example, corn season average price was record high at \$3.24 per bushel and the U.S. captured a 73 percent share of the world export market. While price is always a factor, it is evident that other events in a given year, especially yield-determined production levels of our export competitors and export customers, are of considerable importance.

Compared to corn, the U.S. average share of world soybean exports (Panel B) dropped considerably further the ten years after 1985 and slightly more than corn the last four years. These numbers do not include meal exports. If they did, the scale would change and the percentage point drops between the first and second period averages would be greater since export market share eroded at a faster rate for soybean meal than for soybeans during that time. The percentage point drop between the second and last period would be slightly less if meal were included. Again, on a year-to-year basis, note that the lowest U.S. market share for soybeans during the 24-year period occurred when the season average price of soybeans was \$5 per bushel in 1998. The 1999 expected share is only slightly improved and the season average price is expected to be record or near-record low for the 1976-99 period.

Panel C shows information on the changes in U.S. wheat export share since 1976. The trend is clearly down with the rate of decline steeper than for corn and roughly comparable to soybeans. Note that wheat export shares varied very little the last four years but wheat price went from \$4.30 per bushel in 1996 to \$2.50 per bushel in 1999.

Figure 2 contains graphs of domestic and export demand for each of the three crops over the

1976 to 1999 period along with averages for the ten-year periods before and after the beginning of the 1985 Farm Bill and the first four years of the current bill.

Corn exports trended upward from 1976 to about 1980 and then flattened out. Domestic demand, on the other hand exhibits an upward trend over the full period. The average for domestic corn demand for the 1996-99 period is 2.3 billion bushels above average domestic use during 1976-85. On the other hand, the average of corn export for the last period, 1996-99, is 122 million bushels less than the average for the first period, 1976-85.

Corn use numbers are not adjusted for corn fed to export-bound livestock and livestock products. More accurately, the corn numbers are not adjusted to reflect net exports of livestock products on corn usage. Even though livestock exports have increased significantly of late, the U.S. continues to import more red meat than it exports. So we are also importing feed via livestock product imports as well as exporting feed via livestock product exports. Also, much of the poultry exports, including giblets, necks and dark meat, are complements to the preferred poultry cuts or portions in the U.S. So it is not clear how much less corn the poultry industry would demand without this segment of poultry exports. By simply multiplying U.S. corn feed demand by the ratio of livestock exports to livestock production, 400 to 500 million bushels of corn would switch from domestic to export averages in the 1996-99 period if livestock imports and the composition of poultry exports are ignored. Assume the actual shift to exports in the last period is 100 to 300 million bushels. Then, comparing averages for the first and the last periods, the difference in export demand would not decline as shown in Panel A, but increase by 100 million bushels or so, while domestic demand between

the first and last period would increase by about 2 billion bushels.

Soybean domestic demand increased over the full period and at a significantly faster rate than soybean export demand. Domestic demand averages for the 1976-85 and 1996-99 periods increased by 600 million bushels while export averages increased by 100 million bushels. If soybean meal equivalent of soybean exports were included in the calculations, the export curve and averages would be scaled upward and the domestic curve and averages would be scaled downward but, since domestic soybean meal use has increased faster than exports over the analysis period, the same general pattern would remain. Just as in the case of corn, adjustments to account for livestock exports have not been made but doing so would not change the overall comparison of domestic versus export demand growth.

Average wheat domestic demand increased by 400 million bushels between 1976-85 and 1996-99 while export demand averages between the two periods decreased by nearly 300 million bushels. During this span of time, export demand and domestic demand switched places. Exports exceeded domestic demand by 400 million bushels, on average, during 1976-85 but for the 1996-99 period, exports averaged 300 million bushels less than domestic demand.

Since the mid-eighties, grain demand has been driven by domestic demand, not exports. Does that necessarily mean that exports could not take off again like they did in the 1970s? No, but the fundamentals that drive world-wide grain supply and demand do not point to exponential growth of grain exports in the next few years, although in ten to thirty years they may. Of course, a series of weather or other events could provide relatively short-lived surges in export demand at anytime. Clearly, changes in

farm legislation beginning in 1985 did not offset the tangle of political, sociological, and economic factors that influence the U.S. grain export market.

Since Prices Are So Low, Why Hasn't Production Declined?

January 2000

Policy Matters: Volume 5, Number 1

With crop prices severely depressed for two years in a row, why are we still producing so much grain? One answer—and the one often heard these days—is that it's the emergency government payments that have made it possible for farmers to continue producing. Of course this is true for some farm operators, but the clear implication of that answer is that if the payments were withdrawn the oversupply problem would disappear.

But is that really true? Given what we know about the nature of agricultural markets, is it credible to decree: "Do away with payments and crop production will decline, inventories will rebalance, and all will be well." Given our recent dismal success record in proclaiming 'only if' solutions to farm problems, credibility of policy prognosticators is likely to be in short supply. The litany of 'only if' answers is indeed long: *only if* loan rates were lower, *only if* interest rates were in single digits, *only if* inflation were conquered, *only if* the value of the dollar were lower, *only if* government payments were decoupled, *only if* there were no government stocks, *only if* soybean acreages were higher, *only if* set-aside and bases were eliminated, *only if* the Asian Crisis had not occurred, *only if* farmers are given another season to respond, etc. In fact, it would not be surprising if exasperated farmers and others give a "there you go again," reaction to yet another 'only if' solution.

The unfulfilled expectations of one-liner panaceas suggest that it is time to "Get Back to the Basics" of grain market economics. Clearly, the supply and demand structure of grain agricul-

ture is not a textbook case. The markets for crop agriculture do not react robustly to price declines and general oversupplies like the markets for other economic sectors.

Agricultural economists have long known why crop agriculture tends to have price and income problems. But since the 1970s that explanation has been drowned out by the very compelling argument that the nature of agricultural markets has changed to point that now the crop sector can adjust rapidly to changes in economic conditions just as the textbook suggests. Yet when unleashed to the open market—free of government program constraints—crop agriculture's adjustments to two years of low prices have not been sufficient to rebalance inventories and raise prices and incomes. While the September issue of Policy Matters very briefly summarized the traditional reasons why agriculture has trouble adjusting to low prices, this issue begins a more detailed explanation. Let's begin with the supply side.

No Control Over Industry Supply

In contrast to other product-producing industries, there is no leading grain producer to balance grain supply to match demand. In fact, each producer's output is so miniscule compared to the sector total there is no perceptible influence at all on industry supply and price. In stark contrast, leading firms are large enough in typical nonfarm industries that they can and do influence product prices by governing supply to match demand.

Producers Do Not Decide Industry Size

Unlike nonfarm product-producing industries, crop agriculture does not deliberately plan the production capacity of the sector. In the farming industry, production capacity is driven by technology. Since farmers cannot influence price, the only way they can increase per unit net returns is to slash cost. This competitive struggle to cut costs translates into a continual escalation of productive capacity. Farmers clamor for new cost-reducing and output enhancing technologies. Publicly funded agricultural experiment stations and private firms develop the new technologies including higher-yielding, disease-resistant seed strains, improved chemicals for controlling weeds, insects and diseases and more productive machinery. This combination of ready sources of technology and eager innovators ensure perpetual launching of new technology adoption cycles in agriculture.

Company managers in nonfarm product-producing industries, especially leading firms, use demographic and other projections to estimate potential future demand for their products. Per unit costs are computed at various firm and industry size configurations to evaluate margin opportunities. If the numbers work, they expand. Industry capacity is not left to chance but is part of the business plans of dominant firms.

Producers Always At Full Capacity

Nonfarm industries usually maintain sufficient capacity to meet peak demand periods but they pull back on production schedules when demand is slack. If orders fail to keep pace with production and inventories begin to balloon, selling prices may be reduced but usually as a last resort. Rather the work week is shortened, or workers are furloughed, material purchases are delayed, and production is curtailed. By restraining production, operating costs can be

sharply reduced which generally generates a better 'bottom line' than making steep price cuts and trying to move large quantities of output. If the imbalance is prolonged, the firm's highest cost plants may be boarded up or sold to another industry and workers dismissed.

Farmers on the other hand, do not have the option of holding-the-line on price. If crop supplies outrun demand, it makes no difference what an individual farmer does or does not do, prices are going to fall and without delay. Understanding farmers' reaction when full production capacity is not required is an important piece of the farm-problem puzzle.

Productive capacity tends to be fully used not only during the crop year but also from one production season to the next. Even when supplies are excessive, farmers find it best to continue full production but readily shift from one crop to another. Individual farmers often find that slowing down farm operations reduces gross income faster than total costs. Adjustments in input applications per acre may reduce or retard growth in yields somewhat, or land may be converted to less intensive uses but few acres are totally idled. Any contribution to paying fixed costs including taxes, insurance and weed control—after paying out-of-pocket crops expense—beats no returns at all.

Farmers natural tendency is to stay in business as long as possible. Farmers are emotionally tied to the land. Also farmers tend to take the long view. They believe that financial hardships come with the territory but if you persevere, reduce per unit costs by using the latest proven technologies, be a steward of the land, work hard and have faith in the future, times will eventually get better. Again, the bias is toward producing at full tilt.

Individual Farmers May Quit But Land Remains in Production

When industry capacity far exceeds demand at acceptable prices, both farm and nonfarm firms go broke or reluctantly decide to leave before all their capital is depleted. But the effects are vastly different.

If there are too many tire or tractor plants, the closed plants are offered for sale to some *other* industry. The plants are removed from the industry list. The total size of the industry is reduced in plant capacity and the real property becomes part of a different industry.

But transference of land and buildings to another industry is usually not possible when a farm fails. Housing developments, high-rise office buildings, and shopping centers are possibilities for farms on the periphery of cities and towns. But most farmland is not so ideally located. What usually happens is that another farmer takes over the land, perhaps, at a lower price or rental rate. He adds the land to his existing operation. And, since his methods may be better, the transaction may actually increase the original farm's output but a lower fixed cost. Unlike the typical nonfarm industry, the size of the farm industry is typically not reduced when a farmer goes out of business. Some marginal farmland may leave but it produced very little before.

The next issue of the *Policy Matters* Policy Question Series will continue the summary of why agriculture tends to have price and income problems by adding the peculiarities of agricultural demand into the discussion.

With Prices Low, Why Haven't Bargain Hunters Scooped Up the Excess Grain?

February 2000

Policy Matters: Volume 5, Number 2

Granaries are bulging and crop prices are depressed, but farmers continue to produce at full-throttle anyway. The last issue of *Policy Matters* explained why this occurs. In a nutshell: Farmers tend to stay in agriculture as long as they can, but even if financial bankruptcy forces a farmer to leave, another operator typically takes over the land and keeps it in agricultural production. In another industry, the land and other resources would be shifted to a totally different industry. But since this doesn't happen in agriculture, supply declines very little even when prices for major grains drop by nearly one-half, as they have since 1997. In the parlance of the agricultural economist, total crop supply is highly price inelastic.

If rebalancing bloated grain inventories with production cutbacks is too much to expect, what about the demand side? A large boost in grain usage in response to lower prices indeed would reduce inventories and solve the problem. To be sure, in most other industries, a 50 percent price drop would likely clear out any excess inventories. But even after two years, no such demand explosion has occurred in the grain market. So what is it about the nature of the demand for agricultural products that makes it react differently than in other industries? Just as in the case of supply, the unique nature of agricultural demand has long been known by agricultural economists, but with the surge in grain exports in the 1970s and 1980s came a more price-responsive interpretation of grain markets, muting the long-established understanding of these markets. This issue of *Policy Matters* focuses on the domestic

demand while the characteristics of export demand will be looked at in a future issue.

Essential For Life

By far, the characteristic that most defines the nature of food demand (feed demand in the case of animals) is that it is absolutely required for life. This fundamental difference between agricultural products and the products of most industries is a positive and a negative for agriculture. On the positive side, every person/animal must be fed so as population increases so does demand. But there is also a negative.

Price is of little consequence in the case of the domestic food market. That does not mean price is not important, it just has little effect on the quantity of food consumed. This gets back to its most fundamental attribute, food, unlike all but a few economic goods, is absolutely required for life. A person who has not eaten for days—and has money—will pay an exorbitantly high price for food. But once his stomach is full and he feels secure about the availability of food, food prices can be cut by 90 percent and he would buy very little more.

The demand for food at “low” versus a “high” price can be likened to a sponge which continues to soak up water until it is saturated but, once it saturated, it makes no difference if the sponge is in a small pail or a large lake—no more will be absorbed. Food tends to be close to the saturation point at all price levels, especially when compared with most consumer goods.

There is a striking difference in how price

changes affect the quantity demanded for non-farm versus farm products. The demand for non-farm goods is generally more responsive to price. For example, when first introduced, VCRs were priced well above \$1000. When most of the development costs had been recouped and economies of size had lowered per unit costs, the industry greatly increased revenue and profit by lowering its price. Selling 20 million units with a margin of \$100 beats selling 1000 units with a margin of \$800.

Elastic Vs. Inelastic

When demand increases by a larger percentage than the price reduction, demand is said to be price elastic. A product is price elastic if a percentage change in price (say, one percent) causes the quantity demanded to change in the opposite direction by a greater percentage (more than one percent). Thus, to an elastic demand, a fifty percent reduction in price must generate more than a fifty percent increase in the quantity demanded.

Because food/feed is a necessity for life, this kind of response to price does not occur in agriculture. Since its demand varies little whether price is high or low, food/feed is price inelastic meaning that for any percentage decrease in price the quantity demanded increases by a smaller percentage. For example, a price elasticity of aggregate demand for agricultural products of 0.25 means that a 10 percent decrease in the index of agricultural prices would increase the quantity demanded all agricultural products by 2.5 percent.

In the case of domestic demand for feed, which is the largest demand category for feed grains and processed soybeans, demand may be less price responsive now than decades earlier. Until relatively recently, livestock was produced on small to medium size units by individual farmers, many of whom were “inners and outers”

who make adjustments in livestock numbers or number of farrowings per year depending on price. Today a large share of livestock—almost 100 percent for some species—is produced under some type of contract in fixed facilities that are so specialized and expensive that casual shifts in and out of productions are not economically feasible. While these large livestock concerns likely use more sophisticated procurement strategies than earlier producers, one way or another, the feed must be purchased whether prices are high or low. That is, feed demand becomes less price responsive—or more price inelastic—as more and more livestock are produced under fixed contractual arrangements. A somewhat offsetting effect is provided by the more price responsive industrial demand for crops. While industrial demand for major crops has been increasing, feed demand remains the dominant use for feed grains and soybeans.

Demand Rigid, Not Shock Absorber

This lack of response in quantity demanded in agricultural markets to price changes (i.e., this price inelasticity) means that, to clear the market following a surge in output, price must decline dramatically to offset buyers inherent unwillingness to buy more. Food (and hence agricultural) demand is very rigid. Ideally, there should be a shock absorber effect such that additional output would move through the market with a relatively small price decrease and, conversely, a relatively small price increase would significantly reduce product sales following a crop shortfall. This shock absorber function is accomplished in many markets, but much less so in agriculture. Instead, an over expansion in supply causes extreme farm price and income declines. As consumers learned in the 1970s, prices also go up dramatically when agriculture supplies become low.

Income Growth Also Has Little Effect

What about income growth? With the rest of the economy experiencing remarkable sustained growth, why haven't increases in per capita incomes of late increased the demand for agricultural products and thereby raised agricultural prices? The answer is that, while income is an important determinant of demand for most goods and services, income growth affects agricultural demand very little in a rich country like the U.S.

On the other hand, the demand for many non-farm products is more dependent on income than population. As incomes permit, consumers buy more and higher quality clothes, larger houses, more expensive furniture, increasingly more luxurious automobiles, college educations for their children, the latest crop of electronic gadgets or go on longer and more exotic vacations. Demand for many nonfarm products stretches or is elastic with increased incomes.

Such elasticity is not evident for food and its underlying agricultural ingredients. In high-income countries such as the U.S., increases in per capita income have almost no effect on the total demand for food and, thus, almost no effect on the demand for agricultural products. After reaching a certain income level, the consumer's marginal urgency for securing additional food is very low. Of course, the mix of foods consumed may change with incomes—better cuts of meat, more fresh fruits and vegetables and less rice and beans—but few are going to add a fourth meal to their daily diet just because it is now affordable.

Consumers are likely to dine out more often and at fancier places as their incomes grow. They may switch to more highly processed foods that are more convenient and require little preparation time. But these effects only increase the demand for services associated with the food.

Farmers as a group receive very little of these additional expenditures.

Based on what agricultural economists have long-known about the nature of supply, as summarized in the last issue, and the nature of (domestic) demand, as discussed in this issue, it is evident that one could easily be overly optimistic about how grain markets—unfettered by government involvement—would perform. In the next issue in the Policy Questions Series of *Policy Matters*, we will look at how the export market fits into all this.

Betting Farm Prosperity on Exports — Realistic or Déjà Vu All Over Again?

March 2000

Policy Matters: Volume 5, Number 3

We have heard countless times that exports are to be the salvation of agriculture. Since the 1985 Farm Bill, agricultural policy has been specifically shaped to favor exports and to make us more competitive in the export market. We lowered price supports and instituted other programs designed to increase export volume, world-export share, and presumably export value. Indeed, grain prices have declined. Average grain prices are lower for the ten-year period after the 1985 farm bill than for the ten-year period before the farm bill. Grain prices during the four-year tenure of the 1996 Farm Bill are lower yet. So have average grain export volumes increased over these periods? No, they have not. In fact, export averages for grains (corn and wheat, which are the major export grains) have declined somewhat over those three periods (see the November issue of Policy matters or original data from USDA's PS&D database). Soybean export averages have increased only marginally during the three periods.

With export volumes for corn, wheat, and soybeans flat, the U.S. share of world exports and export shares of total U.S. use have declined, and markedly in some cases. That is, exports of major U.S. crops represent smaller percentages of world exports and smaller proportions of total U.S. grain and soybean disappearance than before the U.S. lowered price supports and instituted other measures designed to increase exports, including recent use of marketing loans that allow market prices to fall below support prices.

The data are clear. Exports have not been the

driving force behind the U.S. grain and soybean markets since the mid-1980s. Of course, that does not mean that exports couldn't become the demand growth engine for a period of time in the future. As we will see, over the last century exports have played that role during three relatively brief time periods. And, as occasionally occurs, there will be years in which exports will surge (pulling up prices for that year and perhaps the next year). But, what the last fifteen years have taught is that there are special circumstances that surround the grain export market that often overpower the influence of price. This realization about the nature of the demand for crop exports has been a gradual and painful process. Among the reasons for the extended learning curve are the suddenness of the last grain export explosion in the 1970s, the new era frenzy it caused during the 1970s through the mid-1980s, and the fact that many of the non-economic considerations that affect grain exports only originated or intensified a relatively few decades ago following World War II. Let's begin by putting the export boom of the 1970s and 1980s into historical perspective.

Long Tradition of Agricultural Exports

Given unbridled optimism that accompanied the export boom of the 1970s and 1980s, one could think that U.S. agriculture had never materially participated in world trade prior to 1970. Of course, agricultural exports have been important to this country since before this country was this country. Great Britain's control over Colonial exports of agricultural products and the imposition of stiff export taxes were high on the list

of grievances that resulted in the Declaration of Independence. Export taxes were subsequently prohibited in the Constitution.

World War I Export Boom

Over the last century, there have been three periods of export-driven financial prosperity in agriculture. Following an extended depressed period after the Civil War, farm prices and incomes increased after the turn of the last century partly due to stronger exports. World War I brought a surge in agricultural exports as war-torn Europe turned to the U.S. for food and fiber. Historian Wayne Rasmussen writes: “Farm prices rose, the government called for increased production, and farmers responded....Then, agricultural prices collapsed in July 1920...” Prices never recovered in the twenties only to fall considerably further in the 1930s. Conventional wisdom at the time was that the low price and income problems were temporary and would evaporate once domestic and export demand strengthened. In the 1920s, large national cooperatives for major commodities and an early federal agency, the Federal Farm Board, went bankrupt as they accumulated stocks for later sale. A return to demand expansion did not materialize. Early self-help attempts also included efforts to encourage farmers to voluntarily reduce production. Even with sharply lower prices, farmers cut back output very little—free market supply response was minimal. Federal farm legislation was put in place in 1933 which included provisions to reduce supply as well as to support prices and incomes.

World War II Began the Next Export Cycle

World War II ushered in the second export boom. Again, as exports soared so did prices. Rasmussen: “Secretary of Agriculture Claude Wickard called for increased production of many

commodities...” Following reconstruction, exports stopped being a growth market and excess capacity again set in. This time around, few expected a return to brisk export growth any time soon. In fact, agricultural export demand was characterized as fickle and inherently unstable. Nor did many believe that hundreds of thousands of farmers would voluntarily idle land to eliminate excess supplies. Again, farm programs reduced production through short and long term land retirement and eased the adjustment process by providing a measure of price and income stability. During the 1950s and 1960s, farmers and their bankers knew what prices to expect during the current crop year and crop years to come. This knowledge gave some the confidence to expand their operations and others the information they needed to call it quits.

Third Export Boom—Again A Political Not Economic Cause

The third grain export boom began in 1973 and peaked in 1981. Just as in the previous two export booms, a sizable share of the surge in exports had political roots. Its beginning coincided with a USSR decision to import grains when their production fell short of needs rather than slaughter livestock to cut feed demand as they had previously done. Oddly enough, a portion of this export boom was related to the decision of the Organization Petroleum Exporting Countries (OPEC) to raise oil prices, profits, and bank balances by forming an oil cartel. As OPEC profits began to pile up in major western banks, the banks began to look for opportunities to recycle the petro-dollars back into the international community. With the help and encouragement of the U.S. government, loans were negotiated with underdeveloped countries. The money was to be used to spur economic development and to facilitate trade. Much of the money, however, was used to import agricultural products. Our ex-

ports of major crops took off. Unaware of the quicksand nature of the newfound export demand, government officials, including the secretary of agriculture, told farmers that agriculture had finally turned the corner and urged them to plant fence row to fence row. Exports remained strong until the loans came due. Excess capacity returned despite repeated assurances by policy and agricultural leaders as late as 1981 that the farm problem of the future would be how to expand capacity not constrain it. Agriculture again faced declining exports of major crops and to this day, over fifteen years later, farmers continue to face a flat crop export market.

Similar to the export collapse following World War I, the reaction following this third export surge was largely denial. When exports and U.S. share of world exports began to decline after 1981, the consensus was: “The previous higher export levels and export shares are ours to recapture and sustain, and all we need do to achieve that goal is lower crop export prices. Once those export levels are recaptured, crop agriculture will again be prosperous.” For this to work, lower prices would have to expand total export demand as importing countries imported more and produced less themselves. And/or competing export countries would have to reduce output and exports. While logic and economic theory would suggest these courses of actions by importing countries and competing exporting countries, neither course of action tends to occur to a significant degree. Here again, the difference between what is expected and observed is due to the unique nature of agriculture markets, in this case, the agricultural export and import markets.

Lower Prices Do Not Drive Out Competitors

Lower crop prices have not and will not cause our competing export countries, including

Canada, European Union, Brazil, Argentina, and Australia, to fold up shop and give us their market share. When we lower prices, they quickly respond with lower prices. We are not in a competitive market structure with many players in which no one player can affect the price. We are in a follow-the-leader oligopolistic market characterized by deep-pocket governments and marketing boards.

Nor Do Lower Prices Cause Importers To Buy More

Similarly, importing countries will not necessarily increase their imports simply because the price of agricultural products has declined. Importing countries tend not to buy much more of an agricultural product when its price declines for many of the same reasons we as individuals don't tend change the total quantity of food we buy just because prices change. We need so much food and we are willing to pay whatever it takes to get what we need but we are unlikely to buy much more because the price has dropped. Export demand is most affected by income, population and other shifters. Also, in the case of importing countries, most import agricultural products because they have to—not because they want to. If they can reasonably produce it themselves, they probably will. Thus, following a price decline, importing countries may not increase their imports of an agricultural product significantly even if it now costs more to produce it themselves than it costs to import it. It's one thing to depend on another country for television sets or some other nonessential item; it is quite another to depend on another country for something that must be consumed everyday to sustain life. As difficult as it may be to accept, comparative advantage often loses out to non economic considerations in the case of food related products.

Exports and Imports Greatly Affected By Non-Economic Considerations

Governments of nearly all countries intervene in farm markets. For many countries, especially those that have experienced food shortages, wars, and other instabilities, any short-term economic distortions from market interventions dwarf longer-term considerations including domestic tranquility and preservation and a measure of economic and political independence. While the WTO and other trade organizations will have some successes in freeing trade, it is probably naïve to think that these countries will experience a wholesale withdrawal of support to their farm sectors. When it comes to food and those that produce it, I am confident that countries will use traditional means and invent imaginative new ways to protect the availability of one of the most basic requirements for life and those that produce it.

A priori there seems to be no reason to believe that we are about to begin another export boom in the near future, especially since each of the last three involved significant political events and/or decisions. There also is no a priori reason to believe that we will be any more successful in the future than we have in the past in recapturing export levels and export shares generated at the height of the last boom by following a low price policy. Finally, just as is true for domestic supply and domestic demand, the nature of export demand for food and agricultural products is different from the nature of demand for products that are not essential for life.

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