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TRADING AWAY U.S. FARMS

'Fast track' will exacerbate problems with U.S. trade and agricultural policies that continue to hurt farmers

by Robert E. Scott and Adam S. Hersh

The White House has asked Congress to put any negotiations leading to a Free Trade Area of the Americas (FTAA) agreement and any trade deals it negotiates at the World Trade Organization on a legislative "fast track," meaning that Congress must simply vote the deals up or down, without amendment. In the meantime, Congress is now reviewing the performance of the 1996 Federal Agriculture Improvement and Reform (FAIR) Act for American farming, and it must decide whether to re-authorize the act in its original form or revise it. Fast track supporters have claimed that trade arrangements such as the North American Free Trade Agreement (NAFTA), the WTO, permanent normal trade relations for China, and the proposed FTAA are good for U.S. agriculture. But the current path is a dead end for American farmers, who have been exported to death in recent years, and it will lead to major problems for the U.S. trade agenda.

NAFTA, the WTO, and the FAIR Act have hurt farmers in the United States and around the world in many ways. The U.S. farm trade balance has fallen 57% in real terms, to $12.6 billion, from a peak of $29.5 billion in 1996 (**Table 1**). Prices for major commodities have fallen between 25% and 43%, and farm incomes have plummeted. Were it not for a 200% increase in federal farm payments, most family farmers would have been forced out of business by these colossal failures. Yet even with these payments, more than 72,000 family farms disappeared between 1993 and 1999, a decline of 8% (**Table 2**). Clearly, trade has not delivered prosperity to U.S. farmers.

Research & Ideas *for* Working People

15 Years

TABLE 1
U.S. agricultural trade balance, 1990-2000 (billions of 2000 dollars)

Year	Exports	Imports	Trade balance
1990	52.1	30.2	21.9
1994	53.7	31.4	22.3
1996	66.3	36.8	29.5
2000	51.6	39.0	12.6
Changes:			
1990 - 96	27.3%	21.8%	34.8%
1996 - 2000	-22.2	6.0	-57.4
1990 - 2000	-1.0	29.1	-42.5

Deflator: CPI -U series.
Sources: USDA (2001b) and BLS (2001).

TABLE 2
Changes in the distribution of working farms, 1993-99

	Size class (annual sales)				
	$500,000 or more	$250,000 - 499,999	$100,000 - 249,999	$50,000 - 99,999	Total
1993	45,856	70,982	224,823	212,531	554,192
1997	53,531	82,984	207,058	187,831	531,404
1999	63,422	80,917	199,012	166,208	509,559
Totals 1993-99					
Percent change	38%	14%	-11%	-22%	-8%
Number gained or lost	17,566	9,935	-25,811	-46,323	-44,633
Number lost with gross incomes $50,000-250,000					-72,134

Source: USDA, Farm Business Economics Briefing Room, Farm Structure Reading Room, "A Close-Up of Changes in Farm Organization"; (USDA 1996a and 2000).

The 1996 FAIR Act replaced a set of market-stabilizing agricultural policies developed since the Great Depression with an export-oriented program governed almost entirely by deregulated markets. Farmers were allowed to plant as much of whatever crops they wanted in exchange for the virtual elimination of government price supports. Farmers were also promised rapid growth in export markets for their expanded output, to be driven by rising incomes in China, Southeast Asia, and the rest of the developing world.

U.S. agricultural and trade policies are in conflict, and both must change. The first step toward

rescuing American farmers and the U.S. trade agenda is a strategic pause in trade liberalization—including termination of all proposals for new fast track authority—until agricultural policy is refashioned into a sustainable and coordinated program that creates mechanisms that would enable farmers to earn a fair market price and encourages them to produce at levels that promote conservation, sustainable farming, and food security. Other policy changes should include:

- Restoration of the Farmer Owned Reserve System to buy excess commodity stocks that are depressing farm prices and help farmers better market their products;
- Expansion of the 10-year Conservation Land Reserve Program to remove excess lands from production and reduce the negative environmental impacts of farming;
- Establishment of a short-term inventory management program to limit the build-up of excess stocks of commodities in the Farmer Owned Reserve System and other reserve systems;
- In the long run, support for and encouragement of the development of alternative crop and land uses, such as biomass energy. These can raise farm incomes and reduce government outlays.
- Development of a new framework for future trade negotiations that recognizes the rights of countries to maintain food security and preserve rural communities.

The chimera of salvation through rising exports

In the early and mid-1990s, the U.S. Department of Agriculture and grain trading companies promoted the view that rising exports could absorb an expanding share of U.S. agricultural production. There was a growing belief that small reductions in domestic prices would yield large increases in grain sales. Furthermore, with income growing rapidly in China and other Southeast Asian countries in this period (prior to the 1997-98 Asian financial crisis), and with China preparing to enter the WTO, there was an increasingly popular belief, especially among government officials and trade negotiators, that export demand would grow rapidly and become more price-responsive in the future.

Two problems with these assumptions were revealed by changes in U.S. trade flows after implementation of the FAIR Act. First, the new view assumed (implicitly) that foreign producers would reduce production if U.S. agriculture became more competitive. However, just the opposite occurred. Despite massive declines in U.S. farm commodity prices, both Brazil and Argentina increased acreage, production, and exports of soybeans. Brazil, for example, increased soybean acreage by 13% between 1996 and 2000 (Ray 2001a, 28), Argentina increased its wheat production by 3.7%, and the European Union increased its wheat production by 5.8% (United Nations 2001). Partly as a result, U.S. exports of corn fell by 8% and wheat by 11% between 1996 and 2000, while soybean exports increased only 5% (**Table 3**). Thus, the expected “elasticity” in export demand, in which falling prices would be met by rising sales abroad, has failed to materialize.

The second problem ignored by supporters of the elastic markets view is that many countries value

TABLE 3

Quantities of farm products produced, stocked, and traded (millions of metric tons or MMT)

	Corn					Soybeans				
	Production	End stock	Exports	Imports	Trade balance	Production	End stock	Exports	Imports	Trade balance
1990	201.5	38.64	52.0	0.04	52.0	52.4	8.96	15.3	0.06	15.2
1994	255.3	39.57	35.6	0.36	35.2	68.4	9.11	18.1	0.18	17.9
1996	234.5	22.43	52.2	0.34	51.9	64.8	3.59	25.6	0.09	25.5
2000	253.2	52.02	47.8	0.19	47.6	75.4	7.34	26.9	0.11	26.8
Percent change 1990-2000	26%	35%	-8%	375%	-8%	44%	-18%	76%	83%	76%
Percent change 1996-2000	8%	132%	-8%	-44%	-8%	16%	104%	5%	22%	5%

	Wheat					Cotton				
	Production	End stock	Exports	Imports	Trade balance	Production	End stock	Exports	Imports	Trade balance
1990	74.3	23.63	27.4	0.63	26.8	3.375	0.51	0.037	0.028	0.009
1994	63.2	13.79	30.5	2.47	28.0	4.281	0.58	0.083	0.018	0.065
1996	62.0	12.07	30.9	1.29	29.6	4.124	0.86	0.059	0.189	-0.130
2000	60.5	23.25	27.6	1.86	25.7	3.749	1.22	0.061	0.038	0.023
Percent change 1990-2000	-19%	-2%	1%	195%	-4%	11%	139%	65%	36%	156%
Percent change 1996-2000	-2%	93%	-11%	44%	-13%	-9%	42%	3%	-80%	-n.a.

Source: USDA (2001b and 2001c).

TABLE 4
Planted agricultural land in the U.S. (1,000 acres)

	Corn	Soybeans	Wheat	Cotton	Total
1990	74,166	57,795	77,041	12,348	221,350
1994	78,921	61,620	70,349	13,720	224,610
1996	79,229	64,195	75,105	14,653	233,182
2000	79,545	74,496	62,529	15,517	232,087
Percent change 1990-2000	7.3%	28.9%	-18.8%	25.7%	4.9%
Percent change 1996-2000	0.4%	16.0%	-16.7%	5.9%	-0.5%

Source: USDA (2001c).

the security of their food supplies enough to protect them from economic forces. For example, Japan, compelled by memories of widespread hunger and starvation during and after World War II, continues to protect its farmers from world competition, despite the high cost to Japanese consumers. Similarly in China, food security and self-sufficiency have been primary objectives of the state since the communist revolution of 1949.

The growth in global capital mobility also has made it much easier for farmers around the world to purchase the equipment and material inputs needed to approach U.S. farm productivity levels and for multinational agribusiness corporations to invest in production infrastructure in developing countries, where land and labor are much cheaper. For example, the land accounts for 76% of Brazil's production cost advantage over U.S. soybean producers (Baumel et al. 2000). Furthermore, transportation costs have fallen significantly in many areas because of growing investments in ports and transportation infrastructure. As a result, the competitiveness of foreign producers has increased rapidly, despite the quick fall in U.S. grain prices.

For all of these reasons, the demand for U.S. crops has failed to become more price responsive (i.e., more elastic) and is unlikely to do so in the future. In sum, because demand is not price-responsive, most price movements in agricultural markets are caused by changing supplies of agricultural commodities, which, due to the FAIR Act, have frequently been somewhat oversupplied. As a result, most commodity prices have fallen sharply.

Trends in production and trade

The total U.S. acreage planted with corn, soybeans, wheat, and cotton rose by about 5% between 1990 and 2000 (**Table 4**). Shifts between crops were large, with corn, cotton, and soybean acreage increasing by 7.3%, 25.7%, and 28.9%, respectively, during the decade, while wheat acreage fell by 18.8%. It appears that farmers took advantage of the freedom-to-plant features available under the FAIR Act.

Exports of U.S. agricultural products varied considerably in the 1990s. Commodity prices and export revenues were bid up in the mid-1990s by speculative demand fueled by the Asian financial bubble and by

restricted supplies, as a few bad growth seasons in the U.S. drew down stocks and as droughts in China, the world's largest agricultural producer, forced it to import significant and uncharacteristic quantities of grains and soybeans. But by 2000, total U.S. agriculture exports had fallen to $51.6 billion, 22.2% below their 1996 peak—prior to the FAIR Act—and 1.0% below their 1990 level. Agricultural imports grew steadily during the decade, from $30.2 billion in 1990 to $39.0 billion in 2000. Together, shrinking exports and growing imports drove the U.S. agricultural trade balance down to $12.6 billion in 2000. Over the course of the decade the U.S. agricultural trade surplus fell 42.5% in real terms and 57.4% since the 1996 farm bill (Table 1).

Despite the spike in prices in the middle of the decade, real prices fell for most commodities in the 1990s, by as much as 38% for some crops. Asia bought the lion's share of U.S. agricultural exports in 2000, accounting for $22.3 billion, or 43% of total exports. While the share of exports to Asia remained level over the 1990s, the share going to Japan—the largest market for U.S. agricultural exports—fell from 21% to 18%. Exports to Japan, South Korea, and Taiwan—which accounted for nearly one-third of agriculture exports in 1990—fell to 27% of the total. The share of U.S. exports to China grew only slightly, from 2.0% in 1990 to 3.3% in 2000, and, even during the peak export years of 1995-96, exports to China made up less than 5% of the total (USDA 2001b).

The U.S. agricultural trade deficit with Latin America and Canada has doubled from $1.3 billion to $2.6 billion since the adoption of the 1996 farm bill. Deterioration of the trade balance with Canada and falling export revenues to Brazil and Argentina led this trend. The U.S. ran a $1.4 billion surplus in agricultural trade with Canada in 1990, but by 2000 that surplus became a $1 billion deficit. Exports to Brazil and Argentina fell $3.8 billion and $380 million, respectively, after 1996. While falling imports helped the U.S. agricultural trade deficit with Brazil improve from $1.8 billion in 1990 to $880 million in 2000, growing imports caused further erosion of the trade deficit with Argentina, from $480 million in 1990 to $520 million in 2000. Though export revenues to Mexico have grown 22% since the onset of NAFTA in 1994, imports from Mexico grew faster, at 50%. As a result, the U.S. agricultural trade surplus with Mexico declined by $500 million between 1994 and 2000 (USDA 2001b).

Beef. Over the course of the 1990s, the U.S. trade balance in beef reversed course, moving from a $380 million deficit to a $650 million surplus in real terms. Much of this change can be attributed to the rash of livestock diseases that plagued the United Kingdom and continental Europe over the past decade, and not to any change in comparative advantage. Beef production fell 29% in the U.K. and 15% in the European Union from 1990 to 2000, as authorities moved to curb the spread of foot-and-mouth disease and bovine spongiform encephalopathy ("mad cow" disease).

Beef production growth elsewhere in the world, however, made up for lost output in the U.K. and EU. The U.S. is still the top beef producer, with a 22% share of world production, but in the 1990s both China and Brazil made great leaps in production and captured significant shares of the world market. Chinese beef production grew an average of 13.5% annually (compared with 1.5% growth in the U.S.), and it is now responsible for 9% of world output. Brazil increased its share of world production from 7% to 11% in the same period (United Nations 2001).

Corn. The United States is the world's largest corn producer and exporter, accounting for 43% of world output and 58-71% of world corn exports (United Nations 2001). U.S. corn production increased more than 2% annually from 1990 to 2000. China is the world's second largest corn producer, with output in 2000 totaling 18% of world production. Major importers of U.S. corn include Japan (31% of total exports in 2000), Africa (14%), Mexico (11%), and Taiwan (10%). U.S. corn production of 253 million metric tons in 2000 marks a 26% increase over 1990 production levels.

In 1995, poor growing conditions in China led it to import 5.4 million tons of corn from the U.S.—or 9% of that year's U.S. corn exports—though average exports to China over the 1990s amounted to less than 1% of the United States' total corn exports.

Corn accounts for two-thirds of global trade in coarse grains, and it is largely consumed as animal feed. The high substitutability of other feed grains for corn makes corn susceptible to large fluctuations in export demand, which is dependent upon production and stock levels and the pricing policies for all grains throughout the world. U.S. corn exports reached a high of 60 million metric tons in 1995; export revenues from corn reached a high of $9.2 billion in 1996 (real 2000 dollars) (**Table 5**). In 2000, the U.S. exported almost 48 million metric tons of corn (down 12.2 million tons since 1995—see Table 3) for revenues of $4.5 billion (down $4.8 billion since 1995 in real 2000 dollars—see Table 5).

In 1995 corn prices jumped to $3.66 per bushel (marketing year average in real 2000 dollars) due to low U.S. output, low carry-in stocks, and increased demand in Asia **(Table 6**). After 1995, when U.S. corn exports began to fall, prices remained relatively high for a period while depleted stores were restocked. But on average, corn exports have fallen 4% annually since their 1995 high, as production and ending stocks have grown annually by 5% and 3%, respectively. Eventually the increased supply and decreased export demand drove corn prices down to $1.52 per bushel in August 2000, they lowest level since 1987. As the world's largest corn producer, the United States imports almost no corn. Given this, the $3.5 billion decrease in the corn trade surplus can be explained by the 38% fall in real corn prices and the 8% decrease in export demand since 1990 (Tables 3, 5, and 6).

Cotton. U.S. agricultural trade also saw a reversal in the fortunes of cotton crops over the past decade. Modest growth in export revenues from $20.8 million in 1990 to $21.3 million in 2000 combined with a 73% fall in the real value of imports turned a $4.8 million deficit into a $14.4 million surplus in 2000. The turnaround in cotton exports is likely the result of the migration of textile, garment, and footwear manufacturing to China and the rest of Asia, Mexico, the Caribbean, and Latin America.

Growth in cotton exports has led to a renewed interest in cotton farming. Acreage planted in 2000 reached 15.5 million, 26% above 1990 levels, as farmers in the Southeastern U.S. anticipated greater profits in cotton crops (Table 4). Production grew to 4.3 million tons in 1994 before easing to 3.7 million tons in 2000—still 11% above production in 1990 (Table 3). While exports grew in volume from 37,000 to 61,000 metric tons, a 36% drop in real cotton prices caused relatively steady output levels to fall in production value from $6.7 billion for 3.4 million tons of cotton in 1990 to $4.8 billion for 3.7 million tons in 2000 (Tables 3

TABLE 5

Value of U.S. farm products produced and traded (billions of 2000 dollars)

	Corn				Soybeans			
	$ Production	$ Exports	$ Imports	$ Trade balance	$ Production	$ Exports	$ Imports	$ Trade balance
1990	$23.98	$7.94	$0.01	$7.94	$14.49	$4.68	$0.02	$4.66
1994	26.61	4.58	0.05	4.53	15.92	5.03	0.05	4.98
1996	27.55	9.22	0.06	9.16	19.10	8.03	0.03	8.01
2000	18.60	4.47	0.02	4.45	13.10	5.24	0.03	5.21
Change 1990-2000	-5.38	-3.47	0.01	-3.49	-1.39	0.56	0.01	0.56
Change 1996-2000	-8.95	-4.75	-0.04	-4.71	-6.00	-2.79	0.00	-2.79

	Wheat				Cotton			
	$ Production	$ Exports	$ Imports	$ Trade balance	$ Production	$ Exports	$ Imports	$ Trade balance
1990	$9.49	$5.05	$0.11	$4.94	$6.72	$3.69	$0.02	$3.67
1994	9.30	4.71	0.32	4.38	7.90	3.11	0.02	3.09
1996	10.76	6.87	0.26	6.61	7.02	3.01	0.33	2.68
2000	6.00	3.36	0.23	3.13	4.80	1.90	0.03	1.87
Change 1990-2000	-3.49	-1.69	0.12	-1.81	-1.92	-1.79	0.01	-1.80
Change 1996-2000	-4.76	-3.51	-0.04	-3.47	-2.22	-1.11	-0.30	-0.81

	Fruits and vegetables				Beef and veal			
	$ Production	$ Exports	$ Imports	$ Trade balance	$ Production	$ Exports	$ Imports	$ Trade balance
1990	n.a.	$6.10	$4.70	$1.40	NA	$2.10	$2.50	$-0.40
1994	n.a.	7.80	5.00	2.80	NA	2.70	2.10	0.60
1996	n.a.	7.80	6.00	1.80	NA	2.70	1.50	1.20
2000	n.a.	7.90	7.50	0.50	NA	3.10	2.40	0.70
Change 1990-2000		1.80	2.80	-0.90		1.00	-0.10	1.10
Change 1996-2000		0.10	1.50	-1.30		0.40	0.90	-0.50

Source: USDA (2001b and 2001c).

TABLE 6
Real commodity prices, marketing year average

	Corn ($/bu)	Soybeans ($/bu)	Wheat ($/bu)	Cotton ($/lb)
1990	$3.00	$7.56	$3.44	$0.90
1994	2.63	6.37	4.01	0.84
1996	2.97	8.07	4.72	0.77
2000	1.85	4.75	2.65	0.58
Percent change 1990-2000	-38.4%	-37.2%	-22.9%	-35.7%
Percent change 1996-2000	-37.8%	-41.1%	-43.8%	-25.3%

Source: USDA (2001c).

and 5).

China is the world's largest producer and consumer of cotton, generating 23% of world output in 2000 as compared with the 20% share produced in the United States. Cotton remains a planned crop in China's command economy, and some of its cotton crops have now been replaced with feed and grain production as a result of food security concerns in recent years. These shifts make it unlikely that Chinese cotton production will meet its domestic demand (Colby and MacDonald 1998).

Cotton exports to China, though negligible from 1990 to 1993, took off rapidly in 1994. Between 1994 and 2000, cotton exports to China increased from an 8% to a 58% share of total cotton exports. Cotton exports to Asia grew 154% between 1990 and 2000, now accounting for 82% of total U.S. cotton exports. This trend was mirrored in exports of other inputs to apparel manufacturing, such as hides and skins, which grew an astonishing 13,517% between 1990 and 2000 (accounting for 14% of the total by 2000). The share of hide and skin exports to Asia remained fairly level, averaging 75% of the total for the same time period.

While new exports are a boon to cotton farmers, the net effect of cotton trade only adds to the U.S. total trade deficit as these primary inputs return to the U.S. in the form of higher value-added apparel. The future prospects for American cotton farmers will depend largely on exports, especially if manufacturing continues to migrate out of the U.S. and if the U.S. dollar remains so highly valued (which would continue to undermine demand for domestic textile and apparel industry products).

Wheat. U.S. wheat production has fallen nearly 2% annually since 1990, as farmers cut their acreage by 19% over the course of the decade (Tables 3 and 4). Since 1990 the U.S. share of world wheat production has fallen from 13% to 11%, while the U.S. share of world wheat exports has fallen from 28% to 25%.

World wheat output is also on the decline, largely due to lost production in the former Soviet Union. In 1990, the USSR led world wheat production with 103 million metric tons annually, claiming an 18% share of wheat output, but by 2000 production in the former Soviet Union fell 35%. China is now the single largest wheat producer, with 17% of world output in 2000. Other major wheat producers include the EU (18%) and India (13%).

U.S. wheat exports grew in the early part of the decade but fell back to their 1990 levels by the end of 2000. U.S. wheat exports to Asia have fallen from 53% of total exports in 1990 to 43% in 2000, due largely to China's increased production and ability to meet domestic demands. Wheat production in China grew an average of 1.5% per year to 1999. Though unfavorable weather in the 2000 growing season led to lower production levels, wheat exports to China fell to less than 1% of total exports. Exports to Africa grew considerably, from 18% of U.S. exports in 1990 to 30% in 2000. Over 99% of U.S. wheat imports come from Canada.

Wheat prices reached a high of $5.14 per bushel in 1995 (marketing year average in real 2000 dollars) and remained high in 1996 as reduced yields in 1994 and 1995 drew down wheat stocks. Higher prices caused export revenues to soar to $6.9 billion in 1996 in real terms (Table 5). Wheat prices have fallen 44% since their 1996 high to $2.65 per bushel in 2000 (marketing year average), as stocks more than doubled over their lows in the mid-1990s. As a result of this fall in price and the decreased share of world exports, wheat export revenues in 2000 were $3.4 billion, or 51%, lower than in 1996 when FAIR became law (Table 5).

Soybeans. The United States is the world's largest soybean producer. Between 1990 and 2000 world soybean production increased 49%. In the same period, U.S. soybean production grew 44% (Table 3) but lost ground in its share of world production as Argentina and Brazil outpaced U.S. annual production growth by 2.2% and 0.9%, respectively. In 2000, the U.S. accounted for 47% of world soybean output, Brazil accounted for 20%, Argentina for 13%, and China for 10%. Acreage planted to soybeans in the United States grew 28.9% between 1990 and 2000 (Table 4).

The vast majority of soybeans are processed in crushing operations that extract meal and oil from the raw seed. This meal makes up 65% of world supplies of high protein feed and 98% of livestock feed. Depending on the price spread between soybean meal and oil, meal accounts for 50% to 75% of the total value of soybean production. Although U.S. meal and oil production increased throughout the 1990s, crush production still lost ground to foreign competitors. Soybean production in Argentina grew 89% during the 1990s, with both meal and oil production in the same period growing by almost 160%, helping Argentina capture a larger share of world production. China experienced similar growth, where soybean production grew 40%, with meal and oil production growing 78% and 73%, respectively. In both the United States and Brazil, soybean production outpaced growth in meal and oil production (United Nations 2001).

These trends are indicative of major investments in processing industries abroad that capture the benefits from lower land and labor costs in those countries. China's imports of U.S. soybeans have grown to 19% of total U.S. exports since 1990, as China's domestic supply has failed to meet its demand. China, however, imported little or no meal during most of the 1990s. Similarly, Mexico's soybean imports from the U.S. have grown to 13% of the United States' total exports, but meal exports to Mexico have fallen from a high of 8.6% of total meal exports in 1994 to 2.4% in 2000 (USDA 2001b, 2001c).

Soybean prices reached a high of $8.07 per bushel in 1996 (marketing year average in real 2000 dollars), driven by low carry-in stocks and booming demand in the EU, China, and the rest of Asia (Table

3). Export revenues soared to historically high levels of $8 billion in 1996 and $7.9 billion in 1997 (Table 5). A fall in export volumes in 1998 and 1999 allowed stocks to accumulate to pre-boom levels, causing prices to fall 41% in real terms from 1996 to 2000 (Table 6). In 2000, export levels exceeded those in 1997 by close to 800,000 tons, but revenues were 30% lower at $5.2 billion. Export revenues from crush operations fell $300 million in real terms, or 18%, to $1.4 billion over the course of the 1990s, as processing capacity in China and Latin America greatly expanded.

Although soybean exports have grown considerably over the last decade—with the U.S. exporting 27 million tons of soybeans in 2000, a 75% increase from 1990—the composition of export markets has changed. Exports to Asia (excluding China) have fallen from a 43% to a 36% share of the U.S. total; exports to the EU have fallen from 42% to 23%. Exports to Mexico, which increased from 5% to 13% of total exports, and to China, which grew from 0% to 19%, have shown the most growth (USDA 2001b). The big problem facing soybean farmers is that production has grown rapidly in the U.S., Argentina, and Brazil, outpacing demand growth and leading to sharply lower prices, as noted above.

Fruits and vegetables. The U.S. trade surplus in fruits and vegetables fell 64%, or $900 million, from $1.4 billion in 1990 to $500 million in 2000 (Table 5). Although exports grew 30% between 1990 and 2000, imports grew at double that pace. The $1.5 billion increase in fruit and vegetable imports since 1996 dwarfed a $100 million growth in export revenues.

Most U.S. fruit and vegetable imports originate in Latin America. Mexico, Chile, and Central America accounted for a combined 81% share of total U.S. fruit imports, while Canada and Mexico accounted for 90% of U.S. vegetable imports.

Japan increased its share of U.S. vegetable exports from 14% of the total in 1990 to 21% in 2000, but the share of fruit exports to Japan fell from 21% to 16%. The United States lost ground in fruit exports to the EU, which fell from 11% to 7% of the total, and in vegetable exports to Canada, which fell from 70% to 55% of the total.

Budget implications of the failure of U.S. trade policies and the FAIR Act

Pressure is growing domestically and from abroad to cut U.S. farm subsidies. Since implementing the FAIR Act, U.S. farmers have had to rely on increasing levels of both regular and emergency support by the federal government—totaling $118 billion between 1998 and 2001—in order to avoid economic disaster. These payments have imposed a growing burden on the federal budget. The budget surplus, which grew steadily between 1996 and 2000, fell sharply in 2001 as a result of a slowdown in U.S. economic growth and a large tax cut implemented in mid-year.[1] In the future, the Bush Administration will be tempted to reduce agricultural subsidies to reduce budget deficits. But the need to renew the FAIR Act in 2002 should be seen as an opportunity to assess the policies in that program and to reform the structure of the system so as to reduce future government outlays for agricultural programs.

But pressure is also building in the international sector for the United States to reduce agricultural payments and subsidies, which have exacerbated trade tensions with Europe and the governments of many developing countries who feel that U.S. subsidies are an egregious, market-distorting program that

unfairly denies other countries access to world markets. A commitment to reduce or eliminate those payments has been established as a key demand by many developing countries and by the European Union as a pre-condition for a new round of WTO negotiations. U.S. trade negotiators have announced their willingness to put agricultural payments on the negotiating table in order to move forward with a new round of global trade negotiations and also to make progress in the existing negotiations for a new FTAA agreement.

Agriculture, trade, and the FAIR Act, 1996-2000

The models used by the USDA to forecast exports are based on a number of flawed assumptions and biased calculations (Baumel 2001, 1-2). Contrary to the USDA's robust predictions, growth in export markets has failed to materialize. In fact, actual export demand has fallen consistently below the 1996 USDA forecasts, which were off by as much as 400 million bushels for corn alone (Ray 2001a, 22). Growth in demand for U.S. agricultural exports—the fundamental assumption upon which the FAIR Act rests—is unpredictable at best and could decline further as the U.S. pursues future trade agreements. Expanding supplies are capable of outpacing demand for U.S. agricultural products for the foreseeable future.

The simplified market models used to sell the FAIR Act do not reflect real life agricultural markets. Unlike most other industries, production of and demand for agricultural products are unresponsive to market signals in both the short and long terms. The FAIR Act failed to recognize this, instead exacerbating inherent structural incentives in agriculture markets toward overproduction while providing no outlet for excess production.

Prelude to a farm bill

The models employed in USDA projections used to justify the FAIR Act ignore the history of U.S. agricultural export flows. Commodity exports have experienced sustained growth for periods as long as five to seven years only three times in the past century—during the two World Wars and during the mid-1970s to the early 1980s (Ray 2001a, 24). The latter period closely coincided with an energy price crisis that gave a temporary advantage to U.S. farmers, who generally paid much lower prices for fuel and chemicals than farmers in most other regions of the world. Crop exports have typically exhibited a flat to declining trend.

In order to understand why the FAIR Act was adopted despite the history of weak export demand, it is important to note when it was enacted—April 1996—around the time that commodity prices had reached record highs (Table 6). But soon thereafter, prices for corn futures collapsed from $5.38 per bushel in July 1996—just three months after the FAIR Act was passed—to $3.58 in August 1996, a decline of more than one-third (Ray 2001a, 9-10). The record-setting prices were not, however, the result of surging exports (Table 3) but rather were the result of sharp declines in the production of corn and soybeans between 1994 and 1996. This decline resulted in a sharp drop in stocks (see Table 3) that, in turn, caused futures prices of these grains to rise rapidly until production outlooks improved.

Thus, in early 1996, prices reached record highs. The FAIR Act promised to convert previous crop subsidies (through loan-guarantee prices and price supports) into fixed (and declining) payments. Since the need for subsidies and prices supports was expected to decline after the farm bill passed in 1996, farmers expected to receive a windfall of payments from the combination of high commodity prices and large, assured government payments in the initial years of FAIR. In other words, farmers were bought off, and they accepted the deal in the hope that high prices would persist in the future, based in part on the USDA's zealously optimistic forecasts of future crop demand.

The FAIR Act and the performance of commodity markets

The FAIR Act eliminated most government regulation of agricultural markets and established a free market that relied on competitive behavior to regulate supply and demand. From the 1930s to the passage of the FAIR Act in 1996, the federal government had used various policies to control production, prices, and farm incomes. Between the 1930s and 1960s, agricultural policies relied on Commodity Credit Corporation storage programs and land-use set-aside programs to manage supplies and prices in commodity markets. From the 1960s until the passage of the FAIR Act, the USDA reduced reliance on storage programs and increased direct payments to farmers in support of commodity prices.

The FAIR Act marked a sharp departure from the regulated agricultural policy regime of the previous 60 years. Under the FAIR Act, farmers were free to plant whatever they wanted on all available arable land. As supplies increased and prices varied, farmers were expected to regulate output and shift to the most profitable array of crops. After an initial period of disequilibrium, it was expected that prices and incomes would stabilize and begin to grow. One of the fundamental assumptions behind these forecasts was the belief that export demand would grow quickly because of rapid income growth in countries such as China.

This market model assumes that production will fall rapidly in response to a decline in prices and that demand (especially for U.S. exports) would rise significantly to bring markets quickly into equilibrium. However, prices, production, revenues, and farm incomes did not stabilize after 1996, despite the flexibility provided by the new farm bill. Commodity markets have not demonstrated any tendency to adjust quickly or automatically, nor have prices stabilized; production and demand have not responded in ways that eliminate commodity surpluses.

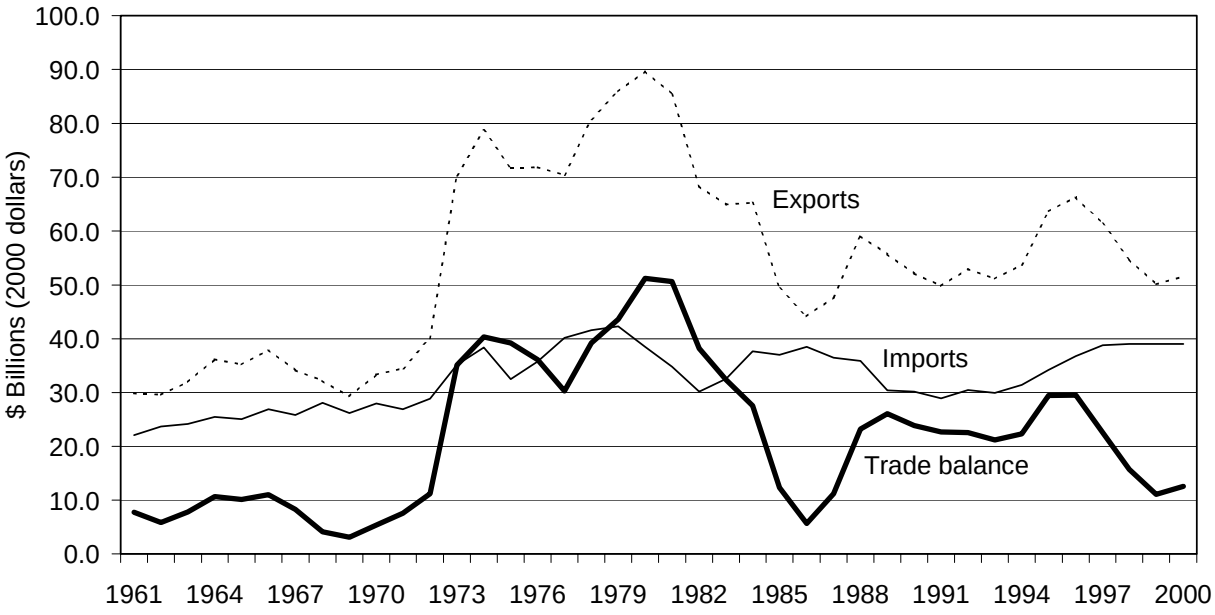
Why agricultural markets have not worked as expected since 1996

In order for the deregulated commodity markets created by new trade deals and the FAIR Act to efficiently allocate resources and fairly reward farmers for their work and investments, two assumptions had to be true. First, net farm exports (the agricultural trade balance) had to grow steadily, as they had between 1985 and 1995. Second, crop supply and demand had to respond significantly to changes in prices. This is particularly true for exports, which were expected to grow rapidly as domestic commodity prices declined.

Markets could have self-corrected if these assumptions had been accurate. Farm incomes would have increased in the late 1990s as a result of a sharp rise in domestic and foreign consumption of U.S.

FIGURE 1

U.S. agricultural trade, 1961-2000



Sources: 1961-88 trade data: "World Economic Trends and Indicators," (USDA, ERS), http://usda.mannlib.cornell.edu/usda/usda.html; 1989-2000 trade data: Foreign Agricultural Trade of the United States (FATUS), Database Search, http://www.ers.usda.gov/db/FATUS/index.asp?Type=MC; Deflators: BLS, consumer price index, http://stats.bls.gov/cpihome.htm.

farm products. The guaranteed transition payments authorized in the FAIR Act would have provided an additional boost that would have ensured that overall farm income (including government payments) would continue to grow after 1996. Most proponents of the act in 1996, including the U.S. Department of Agriculture and some of the farm associations and co-ops, believed that markets had become more price-responsive in the past few decades.

Forecasts prepared by the USDA,[2] private researchers, and lobbying groups all predicted steady growth in exports throughout the late 1990s (Ray 2001a; Baumel 2001). But the real value of U.S. agricultural exports *declined* 22% between 1996 and 2000, as shown in **Figure 1**. During the same period, total agricultural imports rose by 6%. The U.S. agricultural trade balance has declined 57% since 1996 as a result of these trends. Sadly, the government and its private-sector supporters could not have been more wrong in their forecasts and assumptions. The collapse of farm exports has had devastating effects on family farmers, rural communities, U.S. agriculture, and global trade policy making.

The long-term trends in real U.S. agricultural trade (Figure 1) clearly demonstrate that the popular assumptions about growth prospects in foreign markets were fundamentally flawed for at least three reasons. First, agricultural exports grew very slowly between 1960 and 2000 (1.41% per year). Second, imports grew at a slightly faster rate (1.47%) in the same period. Finally, as a result, the U.S. agricultural trade balance has been almost flat for the past four decades (growing 1.24% per year) (Figure 1).[3]

Although U.S. exports have grown over the last 40 years, they have been offset by the growth of

agricultural imports. The trends of declining net export revenues of corn, soybeans, cotton, wheat, fruits and vegetables, and beef and veal (Table 5) since 1996 are completely consistent with the long-term trend of a relatively flat or declining trade balance. The export surge of the mid-1990s was an anomaly, and trade flows have now regressed to more normal levels, as shown in Figure 1.

The fact that imports were largely ignored in the debate over the FAIR Act reflects a common blind spot. Any measure of the impacts of trade on the domestic economy must include *both* imports and exports. Elected and appointed government officials at both the federal and state levels have frequently touted the benefits of export growth while remaining silent on the impacts of rapid import growth.[4] Ignoring imports and counting only exports is like keeping score in a baseball game by counting only the runs of one team, making it impossible to determine who won or lost the game. While exports increase demand for some domestic farm products, imports reduce demand for others.

Although the U.S. has experienced losses in the international sector, farm incomes could have been preserved if the price mechanism had performed as expected. Domestic prices and production would have moved rapidly into balance if markets were working properly. For all the attention given to opening the foreign agricultural markets, net exports were only 6.5% of the value of all U.S. farm commodities, meaning that domestic consumption accounted for more than 90% of all demand for U.S. farm products.[5] This ratio suggests that the most fundamental U.S. agriculture problems after the adoption of the FAIR Act had to do with the way domestic supply and demand responded to large price drops in crops. In other words, the primary problem with the FAIR Act has something to do with the price responsiveness of agricultural markets.[6] (Problems in the real world of trade have also reduced net demand for U.S. farm products, for reasons discussed below.)

Conclusions and policy implications

U.S. farming stands at a critical juncture, and the path taken will have vast implications for U.S. trade policy and for the structure of U.S. agriculture and rural communities. If budget and international pressures result in a phase-out of domestic agricultural subsidies and payments then the family farm, as it has been known in the U.S. for two centuries, will largely disappear within a short period of time.

Conflicts between trade and agricultural policies

If Congress and the administration persist with this allocation of farm subsidies, the tensions between trade and agricultural policies will increase. If regular and emergency farm appropriations are maintained or increased in the future, they will make it increasingly difficult to progress with further international trade negotiations. This is particularly true with the present structure of the WTO (and the proposed FTAA). The philosophy of these institutions is that market forces should determine all trade flows, and that all subsidies should be eliminated. This structure is uniquely ill-suited to addressing national preferences for food security.

For these reasons, current agricultural policies and appropriation patterns make it increasingly difficult to negotiate the kinds of trade policies preferred by large U.S. businesses, such as ADM, Cargill,

and the big co-ops, and by the current administration. Pressure from powerful international interests to dismantle farm payments and subsidies will continue to grow. At the same time, growing farm losses will increase protectionist pressures on Congress in the future. The fundamental and inherent problem in the present structure is that U.S. agricultural policy is inconsistent with U.S. trade policy.

Moving toward more consistent trade and agricultural policies

The WTO, NAFTA, and the FAIR Act have produced disastrous results for farmers in the U.S. and for many of its major trading partners, including Mexico and Canada (Faux et al. 2001; Woodall et al. 2001). In addition, further expansion of these agreements through a new round of WTO negotiations and the completion of the FTAA will require reductions or the elimination of farm payments, which is politically and socially unacceptable.

There are no compelling reasons for rushing global or regional trade negotiations. Before proceeding with new, difficult-to-revoke government policies, the U.S. needs to take a strategic pause in trade negotiations until fundamental conflicts between trade and agricultural policies are resolved. Since the FAIR Act must be renewed in 2002, this allows for a reasonable span of time to make these crucial policies more consistent with one another.

There is no urgent need for Congress to give the president renewed fast track or "trade promotion" authority. President Reagan, for example, was able to enter into initial trade negotiations in September 1986 that eventually resulted in the creation of the WTO in 1995 without such authority.[7] U.S. agriculture is too important to sacrifice in the name of further WTO expansion.

The next step should be to create a set of new agricultural policies that are designed to correct the fundamental market failures inherent in the structure of U.S. commodity markets. These structural problems prevent markets from adjusting quickly to shifts in foreign and domestic supply and demand, and they have generated steadily declining prices for most major farm products.

The first step toward a new agricultural policy framework is to recognize that agricultural output is inherently volatile. Farming is a risky operation, and crop yields can vary by 20% or more from year to year (NFFC 2000, 3). One policy option is to establish a multi-year, Farmer Owned Reserve System that would ensure stable supplies and prices of food and livestock feed supplies. Targets would be set for a minimum level of reserves equal to a percentage of total crop use, and a maximum level to allow stocks to meet demand during a downturn in production. The reserve will be open to farmers anytime the ratio of ending-stocks-to-use exceeds 5%. The reserve should be financed by a CCC loan system and based on a system of loan rates. If prices exceeded the CCC loan rate by a given threshold (e.g., 25%), then the system would release reserves to further limit price increases. In principle, if prices are low, farmers can increase expected profits by holding grain and selling it at higher prices a few years later. Creating a new Farmer Owned Reserve System would enable farmers to earn a fair price from the market. However, ensuring higher prices (instead of a trend of steady decline) will also require measures designed to reduce excess crop production.

A second, closely related policy option is to expand the 10-year Conservation Land Reserve Program. This program is used to support long-term removal of land from production and reserve it for

conservation purposes. Farmers should be compensated for acreage that is added to compensation reserves through guaranteed annual payments to land owners. One purpose of the Conservation Land Reserve Program is to steadily reduce excess capacity in agriculture, which results when farm productivity increases faster than food demand (which in turn depends on rates of population and income growth). This program will also improve the sustainability of agriculture by reducing the intensity of land use and related run-off problems and, at the same time, provide more resources to support wildlife development.

The third policy is the creation of a short-term Inventory Management Program (IMP) at the USDA. This is a necessary complement to the Farmer Owned Reserve System. In order to avoid chronic accumulation of excess reserves, which occurred frequently in reserve programs in the era that preceded the FAIR Act, it will be necessary to manage crop supplies on a short-term, annual basis.

The IMP would require the secretary of agriculture to target specific crops for reduced planting. Additions to the program would be required any time that production plus expected ending stocks, including Farmer Owned Reserve, exceed 120% of total use, and could be implemented if projected ending stocks, including the Farmer Owned Reserve, exceed 15% of total use for any particular crop.

The IMP would be designed to avoid any systemic growth of reserves in the farming system. This program would have to be coordinated with the Conservation Land Reserve Program. Any time that the IMP program is accumulating a growing volume of land in its inventory, the targets for the Conservation Land Reserve Program should be increased.

The combination of these three programs should provide stability and ensure that the U.S. farm sector does not fall prey again to the systemic tendency to overproduce crops and generate regular excess supplies.

Another alternative to the IMP and Conservation Land Reserve Program would be to encourage the production and use of energy crops, such as switch grass, for electrical generation. This can be accomplished through regulatory changes (e.g., encouraging the expanded use of ethanol in gasoline blends) and research into new crop-to-energy conversion technologies. As the demand for such crops increases in the future, government land set-aside and retirement payments could be reduced.

A biomass energy program would require long-term investments in developing technologies to burn energy crops or convert them to ethanol. In addition, potential emission problems must be addressed, and there are transportation and logistical costs must be considered. If these hurdles are cleared, the government could afford to pay farmers $40 per dry ton for these fuels and deliver them to utilities for free, according to a recent study (Ray 2001c). Specifically, the study examined the impacts of diverting 22.2 million acres from crop production to switch grass and found that, by reducing production of eight major crops, gross farm income could increase by $3.6 billion. The resulting increase in prices would also reduce government payments under the Loan Deficiency Program from $1.9 billion to $39 million, for a savings of $1.8 billion. The farmers would also receive additional payments of $657 million for their biomass crops. The government could afford to pay for these crops, give them away to utilities for free, and still reduce government payments by $1.2 billion.

This example illustrates that the USDA and the federal government can reduce overall payments to the farm sector through a modern program of supply and reserve management that addresses the funda-

mental market failures inherent in the structure of U.S. agricultural markets. It would be cheaper and better for farmers if this market were intelligently managed. At the same time, by reducing production in a market that is not price responsive, farmers receive increases in prices and market income that can be two to three times as large as forgone government payments.

A comprehensive program of this kind can dramatically reduce the overall cost of USDA farm programs. However, the biomass energy proposals will require careful thought and investments in technology and new crop development programs. In addition, new crops such as switch grass require two to three years to mature, and significant time and resources would be required to establish a biomass energy program of the size and scope suggested.

Thus, the kinds of reforms needed to stabilize agricultural markets will take at least several years to develop and implement, and the first policy step in this direction should be to halt the push for fast track. There is no urgent need to give the president fast track authority, but there is great risk that it will hurt U.S. farmers unless U.S. trade and agricultural policies are realigned first.

Any future rounds of negotiations should seek to establish a new framework for agricultural trade policies, one that recognizes legitimate needs for food security and the maintenance of rural communities. The problems of excess crop production and the dominance of agribusiness interests in the rural economy are not limited to the United States. The next round of negotiations should find ways to set global limits on commodity production and on the monopoly powers of multinational agribusiness corporations. This is the best way to improve the incomes of farmers in both the U.S. and in the rest of the world.

Trade can still be of great value in a world in which farm incomes and rural communities can be self-supporting and sustainable agriculture can be adequately promoted. These policies are not protectionist, but they do rely on careful regulation of market forces. Countries can still benefit from specialization in certain commodities (e.g., corn from the U.S., coffee from high-altitude regions located near the equator). But farmers around the world will be better off if new institutions are created to regulate supplies, eliminate chronic excess production, and limit the power of agribusiness interests. These policies will also work better in a world where agricultural trade is balanced, and countries do not seek to profit by exploiting consumers or farmers in other regions. These are the types of principles, institutions, and policies that are worthy subjects for a new round of trade negotiations. But they will not be created with fast track authority, NAFTA-like trade agreements, or the policy limitations imposed by the WTO. A strategic pause in trade liberalization—including termination of all proposals for new fast track authority—is desperately needed to provide the time necessary to evaluate and repair the failures of the FAIR Act.

October 2001

Appendix: Supply and demand factors in world markets

Agricultural markets appear highly competitive to the casual observer. On the surface, liquid trading of nearly identical farm outputs in centralized global markets seems to confirm theoretical models of competitive world markets and suggests that previous policies of agriculture regulation only impeded the markets' intrinsically efficient self-regulation. A closer inspection of market performance reveals a set of market failures where structural factors prevent supply and demand from adjusting to market prices at great cost.[8]

The supply of farm products

In the ideal firm of textbook economics, managers regularly scrutinize market conditions and make frequent decisions about output levels to adjust to changing conditions in the business environment. Structural factors associated with agricultural production, however, prevent farmers from making similar management decisions. Farmers make output decisions once or maybe twice a year. After the seeds are sown, output cannot be increased to benefit from higher prices, and output can only be curtailed by plowing crops into the ground. Economies of scale generated by increasing mechanization and the use of chemical fertilizers and pesticides in agriculture have led to low marginal costs of production that impel individual farmers to produce at full capacity, even when prices are low, in order to cover escalating fixed costs.

In an ideal market, the erosion of profits induces firms to leave the market until the production capacity of all firms in the market reaches equilibrium with demand. Indeed, over 3,600 farms have filed for bankruptcy since 1996,[9] and over 72,000 small working farms have vanished since 1993 (see Table 2), but this disappearance of farms has failed to solve the problem of chronic oversupply of agricultural commodities induced by the 1996 farm bill. In most sectors when a factory is no longer profitable, capital equipment can be reconfigured and employed to make other products, but this is not the case for agriculture. When a farm goes bankrupt, larger farms almost always acquire and plant the same land. While ownership of the land may change hands, there is no decrease in production capacity (Ray 2001a). Despite the extreme toll paid by small farmers in these dislocations, structural incentives for overproduction remain.

There are at least two reasons why the farming sector is insensitive to price changes. First, not growing crops (reducing acreage) is not an option. Farming involves large fixed costs (for land and equipment). No matter how low prices fall, revenues usually exceed the marginal costs of seeds, chemicals, and fuel. Thus, farmers will produce on all available land, even if they expect to operate at a net loss for the year. Not planting is not a viable option for most farmers.

Second, farming is different from other large, capital-intensive industries as a result of these patterns. For example, as the steel industry contracted in the early 1980s, the oldest plants were removed permanently from production and scrapped. Some new, more efficient capacity was added as the industry recovered, but total U.S. steel production capacity declined significantly in the 1970s, 1980s, and 1990s (Scott and Blecker 1997). As a result, the steel industry became much more efficient, stable, and profitable in the 1990s until the onset of the most recent steel crisis late in that decade.

In practice, the FAIR Act had much larger impacts on the distribution of acreage allocated to different commodities than it did to total acreage planted (Table 4). Farmers will plant and grow crops as long as all production is expected to make some kind of contribution to help cover those fixed costs.[10] Farming is a large capital- and land-intensive industry. Hence, market forces will tend to reduce the number of farms over time. This problem was greatly exacerbated by the FAIR Act. The family farm is quickly disappearing from the rural landscape, and is being replaced with large, corporate-operated farms. These changes are transforming and destroying rural communities and lifestyles in many parts of the U.S.

Total farmland in use will not change even if some farms are dissolved through land sales or bankruptcy. Someone will buy the land and return it to production, though with lower fixed costs due to increased economies of scale or lower land prices. The most common pattern is that the land will be acquired by nearby larger farms. Thus, the number of large farms has grown and the number of small, family farms (and the total number of farms) has declined steadily for the past few decades (Table 2).[11] The new owner will keep the land in production, and output will remain constant, or could even increase.[12]

These problems demonstrate that farm production and supply suffer from a fundamental failure of market forces to self-regulate the total farming capacity and crop supplies. These problems have been intensified by the rapid growth of agricultural productivity, and the recent diffusion of new (and often capital-intensive) farming techniques to developing countries. Thus, the growth of global commodity supplies has accelerated in the past two

decades, as the speed of technology transfer has increased and international capital flows have greatly expanded (Ray 2001a, 28-29).[13]

Solutions to market failures in farming are available, though none were included in the FAIR Act, which only worsened these problems. Generally speaking, regulation of production and pricing may be needed in industries that cannot self-regulate production and are becoming increasingly monopolized. However, before suggesting specific policy alternatives, it is important to analyze the demand side of U.S. agricultural markets.

Demand for U.S. farm products

The demand side of the market is also unresponsive to changes in price because food is a basic necessity. An increase in food prices compels individuals and families to adjust their budgets to meet the needs of at least a minimum level of sustenance. If prices rise too much, budgetary constraints prevent people from getting enough food. When prices fall, people can consume slightly more food, but they quickly become sated and further reductions in price will not induce people to consume more food.

While income growth can change the overall composition of food demanded (typically shifting to diets with more beef, pork, and chicken), the overall volume of food demanded is most affected by population levels (Ray 2001a). Increased livestock production may not increase demand for feed grain inputs. In recent years, the per unit grain consumption of livestock production has fallen.[14] Investments in production, storage, and transportation technologies in China as well as environmental constraints to livestock production in Japan, South Korea, and Taiwan (the largest U.S. export markets) is likely to level or decrease demand for U.S. feed exports in the future (Baumel 2001; McMillion 2000).

Since the early 20th century the consensus view among agricultural economists was that demand for farm products was limited by the size of the population and by income levels. At a given level of income, food consumption could not change if prices fell. Over time, if incomes rose, then meat consumption per capita would rise (up to limits that are now being reached in the U.S.). Since it takes more grain to raise livestock for consumption than to feed people directly, overall grain production was expected to rise with incomes and population. But incomes are relatively constant at any point in time, so the demand for farm products was not price-responsive (i.e., not elastic).

Two simple models of imperfect competition in U.S. agricultural markets

Two simple supply and demand models are constructed here. The first (illustrated in **Figure A1**) illustrates the way in which a price-responsive (elastic) market for agricultural products should function. The second (illustrated in **Figure A2**) illustrates a market with demand and supply functions that are not price responsive (inelastic). The predicted outcomes of these two models are then compared with the actual performance of the U.S. agricultural sector between 1996 and 2000, and inferences are drawn about which model more accurately describes the performance of U.S. agricultural markets after the FAIR Act was implemented.

U.S. agricultural product supply

The impacts of different levels of price responsiveness are illustrated here using simple supply and demand graphs (Figures A1 and A2). These figures illustrate the changes in market price, quantity supplied, and gross incomes that result from the FAIR Act under different assumptions about the price-responsiveness of producers and consumers. A simplified, competitive market is illustrated in Figure A. Supply and demand curves are relatively flat. A flat supply curve is highly responsive, or "price elastic." If such a market is highly responsive, then small changes in prices will result in large changes in quantities at the given initial price. Thus, in Figure A1, a small shift in the supply of crops (e.g., a 5% increase in acreage) will have a large impact on the demand for crops. If prices remain constant at P_0, then production rises from Q_0 to Q'_1.

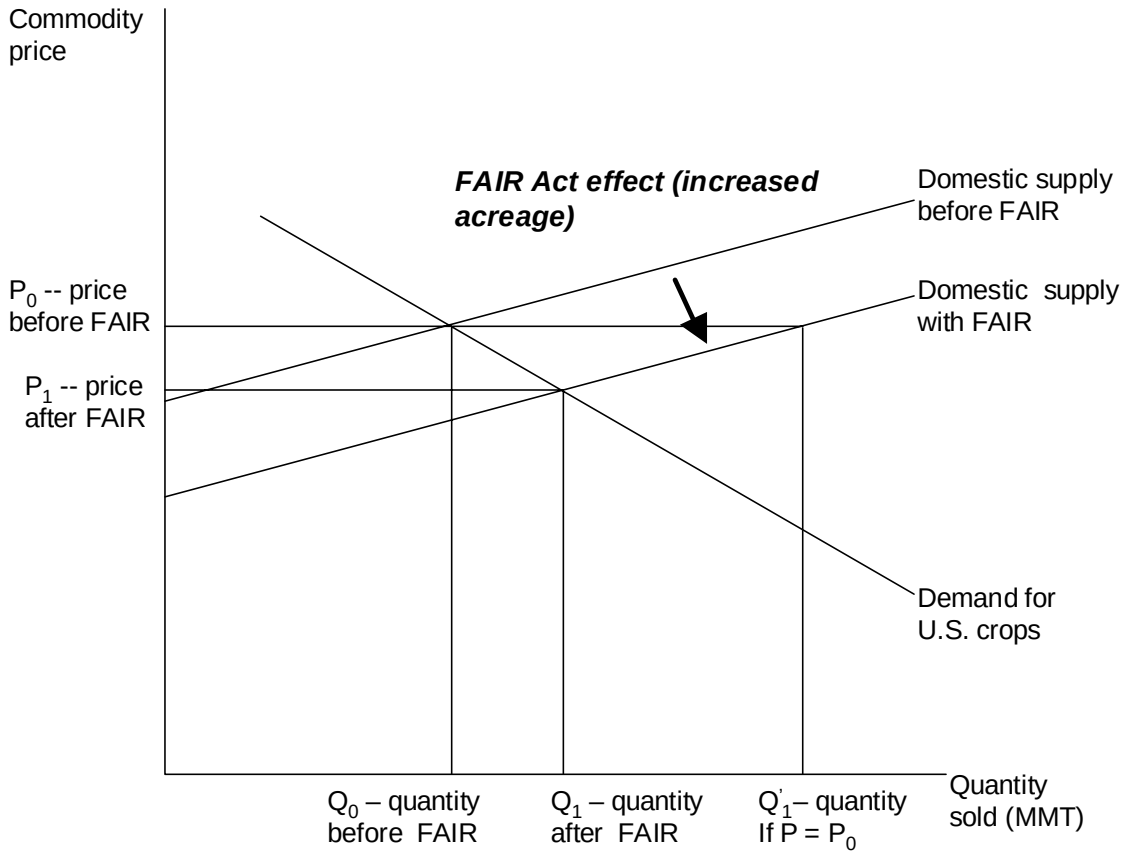
Markets adjust rapidly in this case because the increase in supplies due to the new farm bill causes prices to fall. Since supply is highly responsive to prices, a small drop in prices from P_0 to P_1 causes a sharp reduction in supplies from Q'_1 to Q_1. After markets completely adjust, the increase in supplies generated by the FAIR Act results in a relatively small change in prices and a somewhat larger change in domestic production.[15]

Under the FAIR Act, farms are ultimately motivated by changes in their total income as output grows. Gross income, or total revenue, is equal to price times quantity for any given market outcome. Changes in total revenue are equal to the sum of the percentage change in price plus the percentage change in the quantity supplied by each farmer. The distance between Q_0 and Q_1 shows the ultimate change in quantities after markets adjust in Figure A2.

Prices fall slightly when markets adjust after the FAIR Act takes effect if markets are price responsive (Figure

FIGURE A1

Crop markets if supply and demand are price-responsive



A2). The percentage decline in prices is smaller than the percentage increase in quantities if markets are price responsive, as shown in Figure A2.[16] Gross income (total revenues) will grow if the increase in Q is greater than the decline in P. Gross farm incomes will increase if markets are "price elastic," as shown in Figure A2, because the increase in quantities produced more than offsets the decline in prices.

In the real farm market, prices have fallen rapidly (by as much as 43%, Table 6), total output effects have varied, with production of corn and soybeans growing slowly and falling for wheat and cotton (Table 3), and the market incomes of U.S. farms (before government payments) have fallen sharply since the FAIR Act took effect in the second half of 1996 (Ray 2001a, Figure 6, 26).

These results are not in any way consistent with the results predicted by the price-responsive (elastic) model (Figure A1). However, these outcomes are consistent with a market model that is not price-sensitive, as shown in Figure A2. In this model, commodity supplies do not respond significantly to changes in price. As a result, the market supply curves are quite steep (as the figure shows).

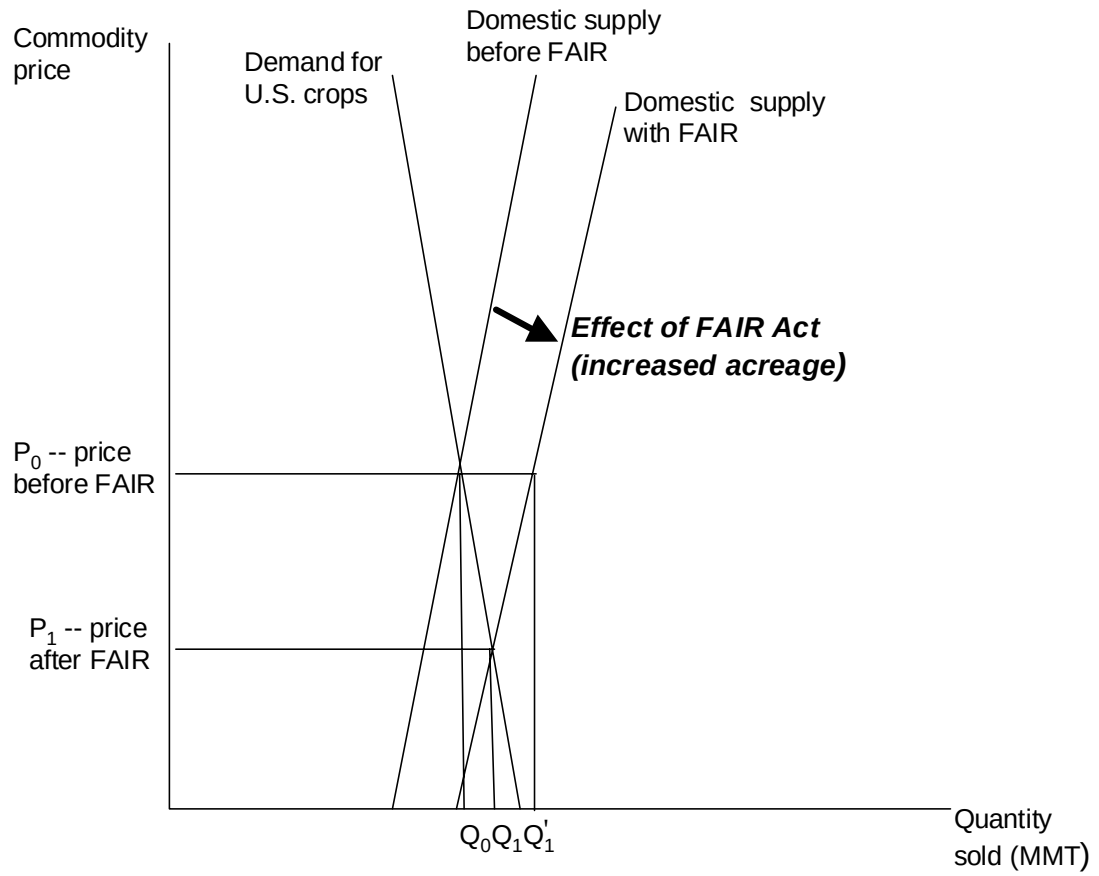
When the FAIR Act shifts out the supply curve (by making it more attractive for farmers to increase acreage and switch land use to the most profitable crops), total production increases only slightly, from Q_0 to Q'_1, if prices are held constant at P_0. When the market adjusts to eliminate excess supplies with the new supply curve, prices fall rapidly from P_0 to P_1 because farmers are not sensitive to price changes.

Demand for U.S. farm products

It has been a well-established fact in agricultural economics for many decades that demand for farm products is not price-responsive (Ray 2001b, 27; Cochrane 2000). A price-responsive (elastic) demand curve is shown in Figure

FIGURE A2

Crop markets if supply and demand are not price-responsive



A1. In this case, food demand increases substantially if prices fall. Figure A2 illustrates the impacts of a demand curve that is not price-responsive (inelastic). In this case, a large drop in farm prices yields only a small increase in consumption. (Note that Figures A1 and A2 include all sources of demand for domestic farm products, including U.S. consumption and exports).

Figure A2, which illustrates inelastic crop markets, is the best model of U.S. farm economy. The story revealed in Figure A2 is dramatically different from the one sold to U.S. farmers in the FAIR Act debate. By increasing supplies, farmers condemned themselves to a future of steadily falling real commodity prices. They were also expected to grow more crops, so all have ended up working harder for less.

Endnotes

1. As Congress returned for its fall budget session in September 2001, Rep. Charles Stenholm (D-Texas) said that, “Instead of a long, hot fall, it's over....There’ll be no Farm Bill because there’s no more money” (Dewar 2001).

2. See U.S. Department of Agriculture (1996b).

3. The growth rate of a trend line fit to the agricultural trade balance was nearly identical to this point estimate (1.4%).

4. The Clinton Administration claimed that rising exports have created jobs in every state in the United States (EOP 1997).

5. Although exports consumed 26.5% of domestic production in 2000, imports reduced demand for domestic farm products by 20.0%. Thus, gross exports were more than four times as large as net exports (USDA 2001f). Imports and exports are, however, spread unevenly across agricultural industries, as shown in Table 6. U.S. net export surpluses were concentrated in a handful of sectors, such as corn and soybeans. Trade surpluses have declined rapidly in some sectors (cotton and wheat) and nearly vanished in others (fruits and vegetables and beef and veal) during the 1990s. (See Table 1 and USDA (2001) *Farm income and costs: national farm income estimates*. http://usda.mannlib.cornell.edu/usda/usda.html.)

6. A more complete model of the structure of U.S. agricultural markets is developed in the appendix. This appendix also compares the performance of domestic farm products markets, and demonstrates that these markets are not competitive. Rather, they are dominated by an unbalanced power relationship between oligopolistic buyers of products and suppliers of key inputs, and by an economic tendency toward ever greater concentration within the farm sector itself. Markets cannot regulate behavior in such industries without suffering extreme volatility in prices and production, and the sacrifice of nonmarket concerns with issues such as the maintenance of food security, family farms, and rural communities.

7. The Uruguay Round was initiated under the terms of the Punte Del Este Agreement of September 1986, with an original target date for completion of December 1990. Fast track negotiating authority expired in January 1998 and was not renewed until August 28, 1998, when the Omnibus Trade and Competitiveness Act of 1988 was signed into law (Destler 1992, 91-95, 444). In addition, “although hundreds of trade pacts were implemented since fast track’s 1974 inception, fast track has been used only five times ever. Despite the oft-repeated mantra about how every president since Ford has ‘had’ fast track authority, in fact, its only uses were the GATT Tokyo round, U.S.-Israel FTA, Canada-U.S. FTA, NAFTA, and the GATT Uruguay round” (GTW 2001).

8. Two simple models of supply and demand are developed in the appendix. The first illustrates how a price-responsive market should perform, and the second illustrates a market that is not price responsive. The predictions of these two models are then compared with the actual performance of U.S. agriculture since the FAIR Act was implemented. The results suggest that U.S. agricultural markets are not price responsive, for the reasons discussed here.

9. See U.S. Department of Agriculture (2001a).

10. The FAIR Act reduced incentives to rotate some lands out of production because it eliminated land set-aside programs. Payments that used to be based on set-aside acreage were converted to fixed (and declining) income support payments.

11. These characteristics suggest that agriculture markets are oligopolistic, or “monopolistically competitive,” and not perfectly competitive, as assumed in the farm bill.

12. Output could grow if the new farm owners employ more advanced production technologies and/or raise the level of investments in capital equipment used per acre. Both events are likely, given that the displaced farmer was likely operating at a significant deficit for some time before the farm was sold.

13. The growth of crop supplies will reduce prices over time, if the rate of growth of supply is larger than the rate of growth of global population (holding income constant).

14. See U.S. Department of Agriculture (2001e).

15. If supplies were perfectly elastic (e.g., if the supply curve was perfectly flat), then prices would not change at all because a rightward shift in the supply curve would have no effect on the vertical position of the curve. In this case, there would be no change in either prices or quantities. The only effects of the policy change would be on the allocation of land. In theory, farmers could maximize revenues for each farm by adjusting the allocation of crops across available acres. In addition, some lands might be taken out of production, while production on other lands would increase. Gradually, the supply of land in use for production would decline as productivity increased, assuming that the demand for food did not grow. Thus, deregulation via globalization could, in theory, lead to small reductions in the environmental impacts of farming, on a global basis.

16. This refers to the absolute value of prices changes. In this case, as in most with increasing supplies, prices decline and quantities increase.

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