SOUTHERN AGRICULTURE IN AN ERA OF EXPANDING EXPORTS

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Exports have played an important role in the history of southern agriculture. C. E. Bishop noted more than two decades ago that "southern agriculture has a high stake in international trade." In recent years, the effects of exports on the southern region have become even more pervasive. Rudd was recently led to observe that "the shift to a substantially greater involvement and interdependency of agriculture in international trade during the 1970s is perhaps the most far-reaching event of [that] decade."

Southern farmers have realized the effects of a greater U.S. presence in the world marketplace. Among the more important of these effects has been a greater volatility in the demand for agricultural commodities. As a result, farmers growing feedgrains have seen a heightened variability in the prices that they receive; farmers raising livestock have experienced the related swings in feed prices; and farmers producing specifically for the export market have found their economic circumstances dictated in large measure by events occurring in the international agricultural economy.

It is this instability that has been introduced through the export demand for U.S. farm products which provides the central focus of this paper. At issue, is whether, given that farmers have expanded to meet the opportunities of the world marketplace, they are adequately prepared to deal with its volatility. The paper begins with an overview of recent U.S. export experience—including the matter of variability. This is followed by a brief review of the southern farm industry as it relates to the issue of exports and instability. Next, prospects for exports and their instability during the 1980s are assessed. Finally, some of the more important concerns that instability in export demand raises for southern agriculture are addressed.

AGRICULTURAL EXPORTS: PROMISE AND PROBLEMS

Businessmen—including farmers—seek out expanded marketing opportunities. For the past two decades, a major source of growth for American agriculture has been the world marketplace. The increase in exports has been impressive. During the 1960s and 1970s average annual export volume growth generally exceeded 5 percent (Table 1). Exceptions during the 1960s included wheat and cotton, both of which rebounded sharply during the 1970s.

The growth of agricultural exports has several roots. First, changes were initiated in farm price support policy during the 1960s that effectively made U.S. commodities more competitive in world markets. Second, the adoption of a floating exchange rate in the early 1970s improved the farmer's competitive position. Third, a conscious decision was made in many developed and emerging middle income countries to upgrade consumers' diets. Feedgrains and related products have found especially good markets, as livestock production received increased attention.

Despite the growth in agricultural exports, variation around trend has emerged as problematic. During the 1950s and through much of the

TABLE 1. Average Annual Growth Rates of Agricultural Exports, Selected Commodities, Southern Region, 1950s, 1960s, and 1970s*

Commodity	1950s	1960s	1970s
Wheat	2.5	0.1	7.1
Rice	-	8.7	6.4
Soybeans	-	11.8	6.3
Corn	6.3	11.0	22.6
Cotton	1.2	-9.5	5.8
Peanuts	-	9.7	18.2
Broilers	34.7	5.4	12.0

[a] Southern region defined as follows: Appalachian states (Kentucky, North Carolina, Tennessee, Virginia, West Virginia); Delta states (Arkansas, Louisiana, Mississippi); Southeastern states (Alabama, Georgia, Florida, South Carolina); and Southern Plains states (Oklahoma, Texas).

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1960s, the U.S. market was characterized by surplus stocks and fairly stable prices. The only significant source of instability was the weather. However, as U.S. agriculture has moved more prominently into world markets, the situation has changed.

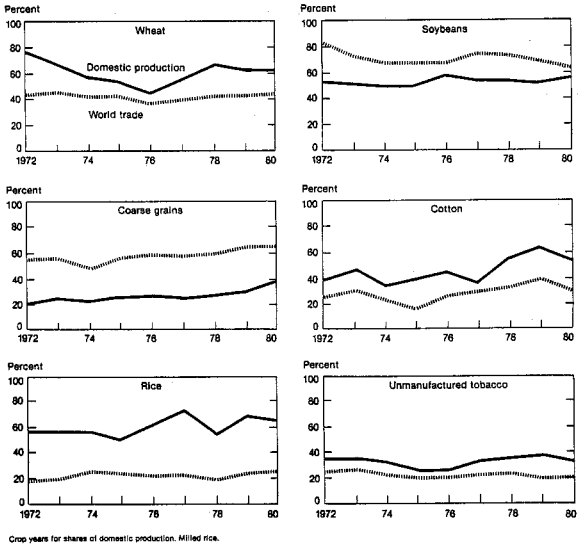
The importance of exports to U.S. agriculture is demonstrated in Figure 1, with the share of domestic production going to world markets that are highly significant for wheat, soybeans, rice and cotton. Of perhaps even greater importance is the proportion that U.S. exports make up of total world trade in various farm products (Figure 1). Coarse grains and soybeans originating on U.S. farms have consistently accounted for more than half of the world trade in these commodities; wheat trade is also highly dependent on U.S. participation. Taken together, these two measures demonstrate the problematic nature of agricultural exports—their critical importance to domestic producers and the exposure to world market shocks that they permit. In part, this exposure is a function of the dominant position of U.S. commodities in particular markets. The fact that the United States holds an estimated one-quarter of the world's wheat stocks and nearly half of the world's coarse grain stocks is also important. Because of the exposure that exports permit, changes in importing countries' production, general economy, and government policies are transferred to U.S. farmers through the export market. For instance, the several countries that employ policies protecting their domestic consumers and producers from the price and quantity adjustments of the world market effectively shift and exacerbate the adjustment shock onto residual suppliers such as the United States.

As indicated in Table 2, the level of interannual variability in the foreign demand for major export commodities has trended upward throughout the past 30 years. Consider the most recent 15-year period in comparison to the 1950–64 period: interannual variability for wheat exports was nearly double; for coarse grains, it was more than quadruple; for rice, it was nearly 50 percent greater; and for soybeans it was more than 7 times higher. As a percent of exports, these annual swings in foreign demand now amount to almost 15 percent for wheat and 10 percent for coarse grains.

Although not so clearly documented, there appears to be a rather strong cause and effect relationship between this variation in exports and that which has been experienced in farm prices and incomes. Examination of the coefficients of variation for the index of prices received (Table 3) shows a marked increase in variability moving from the 1950s, through the 1960s, and up to the late 1970s. This is especially true for crop prices. Cash receipts follow a similar pattern (Table 3) with variation noticeably greater during the 1970s. These results tend to track quite closely with the increase in variability noted for export volume.

Farm income also exhibits a significant increase in variability by the mid 1970s (Table 3).

FIGURE 1. U.S. Exports: Share of Domestic Production and World Trade



Source: 1981 Handbook for Agricultural Charts, Agriculture Handbook No. 592, U.S. Department of Agriculture.

TABLE 2. Interannual Variability in Foreign Demand for U.S. Products[a]

Years	Wheat	Coarse grains	Rice	Soybeans	Soybean meal	Total
	1,000 metric tons					
1950-64	2,920	1,880	170	260	290	5,520
1951-65	2,800	2,125	170	300	380	5,805
1952-66	2,275	1,950	190	300	390	5,105
1953-67	2,450	1,950	175	290	390	5,255
1954-68	3,325	2,800	142	270	370	6,907
1955-69	3,475	3,000	140	885	380	6,880
1956-70	3,300	3,250	190	990	385	8,115
1957-71	3,450	3,125	185	950	340	8,050
1958-72	4,085	4,725	195	960	310	10,275
1959-73	4,730	5,555	215	1,010	305	11,815
1960-74	4,725	5,590	205	1,165	405	12,090
1961-75	4,900	6,605	215	1,160	420	13,300
1962-76	4,875	6,830	200	1,200	490	13,595
1963-77	4,925	7,075	195	1,310	475	13,980
1964-78	5,125	7,290	220	1,495	490	14,620
1965-79	5,350	7,425	230	1,715	540	15,260
1966-80	5,475	7,650	245	1,925	595	15,890

[a] Estimates of variability based on standard errors of the regression for successive best fit 15 linear and curvilinear time trends.

Source: O'Brien, P. M. "Global Prospects for Agriculture," *Agricultural-Food Policy Review: Perspectives for the 1980's*, AFPR-4, ESS, USDA, 1981, p. 15.

TABLE 3. Variation in Farm Income and Product Prices, Selected Periods, United States, 1955–78

Item	Coefficient of variation[a]		
	1955–63	1964–71	1972–78
Index of prices received			
All products	2.6	5.9	14.6
Crops	2.9	3.8	18.9
Cash crop receipts	10.4	9.1	20.6
Personal income received by the farm population			
Farm income	9.4	18.6	24.3
Farm income (incl. government payments)	6.3	14.1	21.7
Nonfarm income	12.5	16.0	15.7
From all sources	5.5	12.1	13.9

[a] The coefficient of variation is the standard deviation of the series divided by the mean and expressed as a percent.

Source: Penn, J. B. "The Changing Farm Sector and Future Public Policy: An Economic Perspective," *Agricultural-Food Policy Reviews: Perspectives for the 1980's,* AFPR-4, ESS, USDA, 1981, p. 47.

Even with government payments included, considerable variation remains. Only when nonfarm income sources are included does the variability tend to be dampened, although even then the variability is found to persist at a rather high level.

Thus, beyond their promise, expanded exports also appear to contribute rather significantly to the price and income variability problems of the U.S. farm sector. Of course, the opportunity for expanded export sales, with the possibility that they will actually exceed expectations, makes continued participation in world markets attractive. At issue, however, is whether and how well the variability in export sales can be anticipated and dealt with by farmers of the southern region.

SOUTHERN FARM INDUSTRY

An understanding of how export instability will affect southern farms requires a perspective on the structure of the farming industry in that region. Major crop commodities produced by southern agriculture with export potential include cotton, peanuts, rice, soybeans, wheat, and tobacco. There is also significant citrus and livestock production, much of which is destined for markets overseas. Also important is the production of livestock for domestic consumption—especially hogs and broilers—which relies on feed supplies in competition with the export market.

Growth rates for U.S. commodity exports of interest to the southern region are reported in Table 1. Similar rates of growth over the 1970s for the production of selected commodities in the southern region are presented in Table 4. As indicated, rice and soybean production increased, largely at the expense of cotton. Rice production

TABLE 4. Average Annual Growth Rates of Production, Southern Region, 1970–1979

State	Rice	Cotton	Peanuts	Soybeans	Wheat	Corn	Broilers	Tobacco
Kentucky	*	-35.2	*	15.5	7.6	15.0	-6.8	0.5
North Carolina	*	-13.3	-1.1	8.0	-2.9	8.3	2.2	-0.7
Tennessee	*	-6.9	*	10.0	3.5	9.4	-0.4	1.4
Virginia	*	-29.0	-1.3	7.9	-2.0	6.1	6.3	0.9
West Virginia	*	*	*	*	-6.7	5.0	-2.5	-3.2
Arkansas	9.8	-4.3	*	1.4	8.5	1.7	4.6	*
Louisiana	0.7	1.0	*	7.1	-2.5	-9.8	4.7	-10.3
Mississippi	15.8	-2.1	17.4	4.4	-3.2	0.6	1.4	*
Alabama	*	-5.8	8.2	14.3	2.3	9.8	3.1	2.2
Georgia	*	8.5	5.7	15.6	2.1	7.7	2.0	-1.2
Florida	*	-4.3	7.2	7.9	-18.9	14.3	7.9	-2.1
South Carolina	*	-6.1	0.7	5.6	1.4	18.0	3.8	0.4
Oklahoma	*	8.6	3.6	9.6	7.3	6.7	9.2	*
Texas	2.2	3.3	0.9	18.4	8.3	21.8	1.4	*
Southern Region	5.4	0.04	3.7	7.0	6.7	11.9	2.9	-0.1

exhibited particular growth in the non-allotment states of Arkansas and Mississippi. The growth in rice and soybean production was generally commensurate with the increase in U.S. exports. Wheat production also reflects a proportionate capturing of export share. Increases in peanut production generally mirror the increase in world oilseed demand of the early 1970s and the competitive stimulus of the "additional" peanut support level of the 1977 Farm Act. The growth in southern corn production was somewhat below that exhibited by U.S. exports—not surprising, given the historical feed deficit nature of the region.

Industry Structure

While agricultural production has increased, the number of farms in all areas of the South has declined since 1960 (Table 5). For the region as a whole, the total of 1.74 million farms in 1969 decreased to 1.01 million in 1980. Throughout this same period, however, the average size of farm

TABLE 5. Indexes of Farm Numbers and Cropland Use, Southern Region, 1960, 1970, and 1979

Area	Index of farm numbers			Index of cropland used for crops		
	1960	1970	1979	1960	1970	1979
	1967=100					
Appalachian	126	92	67	108	95	122
Delta States	140	95	62	86	110	133
Southeast	136	92	65	111	98	128
Southern Plains	112	89	75	118	100	112

Source: Farm numbers index calculated from *Agricultural Statistics,* 1980, 1972 and *Statistical Bulletin No. 507,* Crop Reporting Board, USDA, January 1973. Cropland use index calculated from *Economic Indicators of the Farm Sector: Production and Efficiency Statistics,* 1979, ESS, USDA.

increased from 276 acres to 340 acres; average nominal sales per farm rose from $11,474 to $45,052.

Also, as indicated in Table 5, the amount of cropland in use rebounded by 1979 after a decline in 1970. Significant gains in cropland use were registered in the Appalachian, Southeast, and Delta states. In the Appalachian and Southeast areas, corn, soybeans, and wheat acreage expanded, while cotton planting decreased. The Delta states increased their acreage of soybeans and wheat. Much of this expanded acreage, along with land already in use, was put under irrigation. A considerable increase in double cropping, particularly wheat and soybeans, also occurred.

Although farm numbers have declined and average farm size has increased, it does not mean that southern agriculture has become a significantly more homogeneous sector. Table 6 contains a breakdown of production by sales class for 1978. In the southern region, there are essentially three groups of agricultural producers. First, there are producers reporting less than $2,500 in annual sales. Although they represent nearly one-third of all farms, they contribute only 1 percent of total sales in the region. These are perhaps best thought of as "rural residence" farms.[1] A second group of farms has sales ranging from $2,500 to $40,000 annually. Over one-half of all farms are included in this group, and they generate about 18 percent of total sales. These farms are typically referred to as "small" farms. Finally, there are farm businesses that have over $40,000 in annual sales. Less than 15 percent of all farms are in this class, having sales that account for more than 80 percent of those reported in the region. This latter group includes the "primary" farms of southern agriculture.

As might be expected, the concentration of production tends to differ somewhat when viewed for individual commodities and producing areas. To better understand how variability in export demand affects the South's farmers, it is useful to examine the concentration of production on a more disaggregate basis (Appendix Tables A-1–A-7).

TABLE 6. Concentration of Agricultural Production, Southern Region, 1978

Farm size by value of agricultural products sold	Farm numbers		Farm sales	
	Number	Percent of total	Sales ($1,000)	Percent of total
Less than $2,500	326,037	32.9	378,615	1.2
$2,500 - 9,999	323,647	32.6	1,686,536	5.3
10,000 - 39,999	197,292	19.9	3,959,626	12.5
40,000 - 99,999	81,371	8.2	5,170,863	16.3
100,000 - 199,999	38,085	3.8	5,319,851	16.8
200,000 or more	25,913	2.6	15,241,541	48.0
Total	992,345	100.0	31,757,032	100.0

Source: Calculated from *1978 Census of Agriculture,* U.S. Department of Commerce.

Corn production in the southern region tends to be somewhat less concentrated than total production would suggest. Farmers growing corn also produce other crops, including soybeans, peanuts, and tobacco, as well as raising livestock. Of the region's cash corn producers, those with annual sales in excess of $40,000 (although not necessarily all from corn) made up less than one-fifth of all such farms in 1978, while producing nearly three-fourths of the corn. In the Delta states, there were relatively fewer "primary" corn farms, which means that production was generally in the hands of smaller farmers. The Appalachian and Southeast states saw about one-fifth of their cash corn farmers raising two-thirds of their crop. Farmers growing corn in the Southern Plains were somewhat larger, with one-third in the "primary" category contributing more than 90 percent of production.

In the case of soybeans, one-third of all producers had sales of $40,000 or more (although, again, not necessarily from soybeans alone). Soybean production is a strong complement to cotton and rice throughout the region. The "primary" farmers who grow soybeans account for more than three-quarters of the South's soybean production.

Cotton farming tends to involve a smaller number of large producers—a greater proportion are categorized as "primary." With the exception of the Appalachian states, about one-half of all cotton farmers have annual sales in excess of $40,000. These larger producers account for 80 to 90 percent of the region's total cotton output. Rice production also exhibits larger levels of concentration. More than three-quarters of all rice farmers have sales in excess of $40,000 annually. These "primary" producers grow nearly all the region's rice.

Tobacco farmers show modest levels of concentration. Only a relatively small number of producers fit the "primary" designation; of those that do, slightly over one-half of all tobacco production is attributable to them.

Arising out of these concentration data are two points of particular note. First, "primary" producers in the South tend to account for much of the agricultural production in the region—in aggregate and for individual commodities. How these larger farms respond to variation in prices and receipts is therefore basic to an understanding of the impact of exports on southern agriculture. Second, there are many "rural residence" and "small" farms that also will be affected by variation in exports; their response is likely to be quite different from that of the "primary" farms.

[1] Although this characterization holds at the national level, it is recognized that many of these units in the South are more typically farms in rural poverty.

Economic Viability

Variability in export demand is important to southern agriculture as it affects the economic viability of the region's farms. An indicator of the economic status of farms is the relative value of their assets and debts. The data in Table 7 indicate that during the decade of the 1970s, nominal asset values increased 126 percent throughout the region; however, in this same period, debt increased 159 percent. Debt-to-asset ratios increased by 1 percent in the Southern Plains states, 13 percent in the Southeast states, 24 percent in the Appalachian states, and 31 percent in the Delta states. For southern agriculture as a whole, the debt to asset ratio increased from 14.8 in 1970 to 17.0 in 1979, a 15-percent increase. While the rate of increase and the absolute level of the ratio are not atypical of U.S. agriculture, they do signal a diminished equity position for at least some southern producers and a greater cash flow need simply to meet debt service. Such conditions could very well affect the ability of farmers in the South to deal with volatility in export demand.

Which southern farmers are most likely to be adversely affected by volatility in export demand? Casual observation would suggest that new farmers, or those who assumed new debt for land or irrigation systems in response to increases in real crop prices during the 1970s would be most vulnerable. More generally, however, the debt-to-asset ratio is highest for the larger or "primary" farms. Information available at the national level supports this observation (Table 8). These data also suggest that, while the debt-to-asset ratio in the South was somewhat lower in 1970 than for the country as a whole, it was at least as great by the end of the decade.

With the increased assumption of debt during the 1970s, cash flow has assumed an even greater role in the economic status of southern farms. As reported in Table 9, during 1979, cash expenses as a percent of cash receipts ranged from 67 to 74 percent across the region. However, again, the proportion that cash expenses constitute of cash receipts tends to be greater, the larger the farm business. Data for U.S. agriculture illustrate this point with the ratio of cash expenses to cash receipts at 72.1 for all farms; 57.4 for farms with less than $40,000 in annual sales; 63.5 for farms with sales from $40,000 to $100,000; and 81.3 for farms with sales of more than $100,000 (Penn p. 48). It seems likely that this pattern also holds for southern farms.

In summarizing this perspective, southern agriculture has come to be characterized by a smaller number of farms producing on more acres. A large number of "rural residence" and "small" farms remain, but production has generally become concentrated among the 15 percent of the region's farms that produce 80 percent of its output. This tends to be somewhat less true for farms producing corn and tobacco, many of which also feed livestock. Debt-to-asset-ratios, particularly for the "primary" farms, have increased, as have cash flow needs. Research suggests that "primary" farms operate on limited cash flow margins (Penn, p. 48). While a 10- or 20-percent increase in prices and cash receipts make world trade attractive, unexpected declines of this same magnitude can bring severe hardship. Research (Penn, pp. 42–43) also suggests that while "small" farms may have somewhat larger cash margins within which to operate, those in the $20,000 to $40,000 annual sales range

TABLE 7. Total Assets, Total Debts, and Debt to Asset Ratio, Southern Region, 1970 and 1979

Area	Total assets		Total debts		Debt/asset ratio		
	1970	1979	1970	1979	1970	1979	Percent change
	Mil. dol.						
Appalachian	25,373	58,404	3,456	9,790	13.6	16.8	+24
Delta States	17,803	38,093	2,914	7,047	16.4	18.5	+13
Southeast	20,355	45,007	3,002	8,753	14.8	19.4	+31
Southern Plains	36,274	84,076	5,446	12,773	15.0	15.2	+1
Total	99,805	225,580	14,818	38,363	14.8	17.0	+15

Source: Calculated from *Balance Sheet of the Farming Sector,* 1979, AIB 430, ESCS, USDA, and *Economic Indicators of the Farm Sector: State Income and Balance Sheet Statistics,* 1979, SB 661, ESS, USDA.

TABLE 8. Debt to Asset Ratio, by Farm Size, United States, Selected Years, 1960–78

Year	All farms	Farm size by sales class ($)						
		Less than 2,500	2,500 to 4,999	5,000 to 9,999	10,000 to 19,999	20,000 to 39,999	40,000 to 99,999	100,000 and over
	Percent							
1960-64	13.5	8.1	10.2	12.9	15.0	15.0	15.2	18.8
1965-69	16.3	9.2	9.4	14.4	17.8	17.8	19.2	23.4
1970-74	16.4	5.1	8.8	11.5	15.5	17.8	19.7	24.9
1974-78	16.0	4.7	6.9	7.6	12.2	14.9	18.2	24.9

Source: *Balance Sheet of the Farming Sector,* 1976, 1978 and 1979 Supplement, U.S. Department of Agriculture.

TABLE 9. Cash Receipts and Expenses, Southern Region, 1979

Area	Cash receipts[a]	Cash expenses	Cash expenses as percent of cash receipts
	Mil. dol.		%
Appalachian	9,012.9	6,294.7	70
Delta States	6,988.3	4,797.3	69
Southeast	10,145.2	6,792.7	67
Southern Plains	13,954.8	10,380.4	74
Total	40,101.2	28,265.1	71

[a] Includes cash receipts from farm marketings, government payments, and other sources.

Source: *Economic Indicators of the Farm Sector: State Income and Balance Sheet Statistics,* U.S. Department of Agriculture, 1979.

depend to a significant degree on their farm earnings. Off-farm earnings are in some cases important, but the economic viability of these farms is tied to their success in raising and selling agricultural commodities. In addition, these farms typically do not have the equity position of larger farms against which to borrow funds when necessary.

Thus, while southern producers of soybeans, wheat, peanuts, rice, and tobacco have expanded their sales through export markets, they have also become exposed to an increased variability in cash receipts. Corn farmers have also been affected by the expanded marketing opportunities, even though most corn is consumed on-farm, or within the region as feed for livestock. Variability inherent in the world feedgrains market filters down to the regional level so that southern producers are not insulated from its effects.

EXPORT PROSPECTS FOR THE EIGHTIES

Exports of interest to the southern region have increased during the past decade. In some cases, the effects of these increased exports have been realized directly. For feedgrain producers and those farmers raising livestock, the impacts have been less direct, but nevertheless quite real. Associated with the expansion of exports, moreover, has been an added volatility in the overall demand for agricultural commodities.

Of prospective interest to farmers in the South are expectations for exports and their volatility during the decade of the eighties. One such look to the future has been completed by the Economic Research Service (USDA). Despite near-term problems, it was generally concluded in the ERS study that the foreign demand for agricultural commodities would continue to be strong, although increasingly variable. Projections of these U.S. crop exports are presented in Table 10.

For the 1981 through 1989 period, it is expected that the export demand for corn and rice will grow at about 4 ½ percent per year. Exports of wheat and soybeans are anticipated to increase at around 2 percent each year. Cotton exports will expand rather slowly, perhaps at less than 1 percent annually. The peanut index is somewhat deceptive, given the poor crop produced during 1980/81. Exports of peanuts should increase around 5 percent each year, however.

While these increases in exports may not match the growth of the 1970s, they do represent substantial increases in production by U.S. farmers. If southern producers do no better than retain their share of the export total, it will mean significant increases in output for the region. How such production might be achieved is a matter for consideration. Additional land could be brought into cultivation, although after the gains of the 1970s, it is not entirely clear at what rate this might or could occur. The use of irrigation could be further expanded, but groundwater supplies are potentially limiting. Alternatively, more intensive use of fertilizer and pesticides could occur, although relative factor (e.g., energy) prices will play a determining role. Or, perhaps, there will be technological advances of one sort or another that will permit greater output from a given level of inputs.

Implicit, too, in export growth is the introduction of still further variability in cash receipts to the farm sector. When coupled with domestic yield-related fluctuations that might normally be experienced, it gives rise to some potentially wide swings in prices. Drawing again on the ERS report on agricultural prospects for the 1980s, the implications of a one-standard deviation change

TABLE 10. Indexes of Projected U.S. Crop Exports[a]

Commodity	Units	1981	1982	1983	1984	1985	1986	1987	1988	1989
		(1981=100)								
Corn	Mil. bu.	100	106	111	115	123	127	131	135	139
Wheat	Mil. bu.	100	96	99	101	103	105	107	110	115
Rice	1000 cwt.	100	109	113	117	120	124	127	131	135
Cotton	1000 bales	100	107	103	103	103	104	106	106	107
Soybeans	Mil. bu.	100	100	101	104	107	111	113	116	119
Peanuts	Mil. bu.	100	123	140	147	150	153	157	160	163

[a] Note that these are research projections and *do not* represent official USDA projections.
Source: Calculated from *Problems and Prospects for U.S. Agriculture* ERS, USDA, December 1981, p. 5.

in exports on farm prices and cash receipts at the mid-point of the decade are identified in Table 11.

For wheat, a base export demand of 1,875 million bushels is expected in 1985. At a nominal price of $5.40 per bushel, cash receipts of $10,125 million would be anticipated. However, there is about a one-in-three chance that exports will be either higher or lower by 244 million bushels. If exports were to increase by that amount, the farm price of wheat would be $0.55 higher, and cash receipts would be $2,483 million greater than the base situation.[2] On the other hand, if exports were 244 million bushels lower, a reduction in the farm price of $1.15 would be likely, and cash receipts might be $3,193 million lower.

Corn exports of 3,000 million bushels are projected for 1985. At a season average farm price of $3.70 per bushel, this would generate $11,100 million in cash receipts. Export variability of ± 402 million bushels might possibly occur, however. At the higher level of exports, farm price could rise by $0.40 per bushel, causing cash receipts to be $2,848 million higher than in the base situation. If exports decline, farm price would fall by $0.35 per bushel and cash receipts by $2,397 million.

Exports of cotton are projected at 7,200 thousand bales in 1985. A base price of $0.86 per pound would give cash receipts of $2,972 million. Variation in exports could range within ± 950 thousand bales. The effect of these changes on the cotton price would be to cause it to rise, or decline by approximately $0.13 per pound. Cash receipts could increase by $901 million, or decrease by $782 million.

The situation for soybeans is similar to that for the other commodities. A base level of exports is projected at 890 million bushels in 1985. At the expected season average farm price of $8.15 per bushel, there should be cash receipts from exports totalling $7,254 million. But there is also a one-in-three chance that exports will be either ± 115 million bushels from the base. This could mean as much as $4.60 per bushel more in the farm price if exports are higher, or $1.45 less if exports are lower. Cash receipts might be $5,560 million greater, or they could decline by $2,061 million.

In general, export variability will likely continue to confront those producers who choose to trade in world markets during the 1980s. The implications of such variability for farmers selling directly to export markets are rather significant in terms of the price and cash receipts effects. In addition, those farmers producing crops for domestic use will most likely experience the same price and receipts variability. Livestock producers will face this variability through their feed purchases. Overall, there appears to be a one-in-three chance that because of variability in export demand, cash receipts could be ± 20 to 30 percent from that which might otherwise be expected.

TABLE 11. Impact of Potential Export Variability on Farm Prices and Cash Receipts, United States, 1985

Item	Export Demand[a] (Mil. bu. or 1000 bales)	Farm price impact ($/bu. or $/lb.)	Cash receipts impact (Bil. dol.)
Wheat			
Base	1875	5.40	10.125
Increase	+244	+0.55	+2.483
Decrease	-244	-1.15	-3.193
Corn			
Base	3000	3.70	11.100
Increase	+402	+0.40	+2.848
Decrease	-402	-0.35	-2.397
Cotton			
Base	7200	0.86	2.972
Increase	+950	+0.13	+0.901
Decrease	-950	-0.13	-0.782
Soybeans			
Base	890	8.15	7.254
Increase	+115	+4.60	+5.560
Decrease	-115	-1.45	-2.061

[a] Variability equal to one standard deviation around international time trend.

Source: Calculated from *Problems and Prospects for U.S. Agriculture,* ERS, USDA, December 1981, p. 83.

IMPLICATIONS

What, then, can be said about southern agriculture in an era of expanding exports? Clearly, southern farmers play an important role in producing for export markets. They have brought significant cropland back into production—much of it being used to produce soybeans and wheat for international trade. Rice, cotton, and peanuts continue to be important commodities in world markets, too. Increased feedgrain production supports expanded livestock production in the region—with much of the poultry output being destined for markets overseas.

Reflecting national trends, agriculture in the southern region has experienced a reduction in farm numbers. The remaining 1 million or so farms are considerably larger on average than in years past. Commercial agriculture in the South is now characterized generally by the 18 percent of its farms that produce in excess of 80 percent of its output. For individual commodities, the level of concentration in production varies, although in most cases well over two-thirds of the output is produced by "primary" farms with more than $40,000 in annual sales.

The economic viability of these "primary" farms, as well as that of the smaller farms, is quite closely tied to their ability to withstand the vagaries of the world marketplace. On average, it is found that the debt-to-asset ratio for all farms in the southern region has increased over the past decade—both across the region and compared to all farms in the United States. For the "primary"

[2] Analysis assumes that, at the increased price, the farmer-owned grain reserve release trigger would be reached and the price effect dampened.

farms, national data suggest that the debt-to-asset ratio is even higher.

Of perhaps greater importance to the economic viability of southern farms over short to intermediate periods is their cash flow position. The ratio of cash expenses to receipts in 1979 was a little more than 70 percent. This compares rather closely with national data that also suggest that "primary" farms have somewhat greater cash needs than the average.

The export experience of farmers in the past two decades can perhaps best be characterized as one of both promise and problems. Export demand has measurably increased the market possibilities for agricultural commodities. However, it has introduced a significant source of variability in farm prices and income. This has been reflected in the prices that farmers have received, in their receipts, and in the income position of their farm businesses.

While crystal balls are always dangerous, those who would venture some projections on exports in the 1980s believe that foreign demand for U.S. agricultural products will continue to grow. With this growth, however, will be the very real possibility of even greater variability in quantities demanded and prices received. Year-to-year variation of as much as 20 to 30 percent in expected cash receipts seems quite possible.

Such variation becomes especially critical to those "primary" farms of the southern region that work on as little as 15 to 20 percent cash margins. These, and other farms in the South that expanded their acreage, invested in irrigation, and took actions during the decade of the 1970s that increased their debt and raised their cash commitment, are potentially vulnerable to the swings in cash receipts that exports portend.

The policy implications of the situation are several. To begin, it is imperative that farmers be able to withstand major variability in cash receipts that exports might bring. This does not necessarily mean that a high level of price support is needed, because that could tend to work against a competitive position in world markets. Rather, it suggests that for farmers who are good managers but occasionally find themselves in a difficult cash flow situation, some accommodation be provided. This might be handled entirely within the private sector, or it could involve public support of one form or another. Current commodity programs may not meet the needs of farmers in an era of expanding exports on at least two grounds. Existing programs are directed at supporting income levels, not necessarily, variability in income. Also, with current commodity programs, participating farms usually are larger than nonparticipants in terms of acres farmed and sales. Participating farmers tend to own a substantial portion of their acreage base, while also being active renters. Thus, current programs may not reach or meet the needs of many "primary" farms and perhaps most "small" farms.

A second policy concern relates to livestock production and exports. Although broilers and other livestock products received only limited attention in this paper, the producers of these commodities are directly affected by events affecting crop agriculture. Poultry and other livestock products can be subject to the same kinds of international forces that create instability in grain markets. Moreover, variability in the supplies and prices of feedstuffs can critically alter the economic viability of livestock production. As the major producing region for broilers, for example, there should be a fundamental concern among those in the South about the implications of 20- to 30-percent swings in corn prices. Feed costs make up more than two-thirds of the total cost of production for broilers. Hog producers, too, are vulnerable to significant increases in feed prices. Feeder pigs and farrow-to-finish operations have feed costs of up to 50 percent or more of total variable costs.

A third policy issue emerging from the prospect of continued expanding exports involves the natural resource base of agriculture. Soil erosion has been shown to be a critical problem in several areas of the southern region. The expansion of soybean acreage in western Tennessee and other row crop production in the Delta states has caused erosion of serious magnitude. Greater corn production in the eastern Piedmont has given rise to a loss of shallow soils. Wind erosion continues to cause problems in the Texas High Plains. The drawdown of the Ogallala Aquifer and other water-related problems also give rise to concern. The issues involved are essentially two-fold. Where will production be expanded to meet the increased export demand and at what cost? There are limits on the potential land base—in its quality, if not its quantity—that suggest some substitution or supplementation through other inputs. This can occur only through a further squeezing of the already tight cash flow position of the South's "primary" farmers. With the variability that could well be associated with expanding exports, moreover, there is real concern about the willingness or ability of farmers to adopt soil or water conserving practices, even if it is in their best long-term interests.

APPENDIX TABLE A1. Distribution of Wheat Production, Southern Region, 1978

Income	Appalachian		Delta		Southeast		Southern Plains		Total	
	Farms	Production	Farms	Production	Farms	Production	Farms	Production	Farms	Production
	Percent									
Less than $2,500	8.8	1.3	2.8	0.3	8.5	1.0	5.0	0.5	6.0	1.0
$2,500-19,999	38.4	13.5	22.3	4.7	29.5	9.6	38.7	14.3	37.0	14.0
$20,000-39,999	19.8	13.2	14.7	6.3	14.7	9.6	20.4	17.3	20.0	16.0
$40,000-99,999	22.7	26.2	23.1	16.9	21.7	22.7	22.2	31.4	22.0	30.0
$100,000 and over	10.3	45.8	37.1	71.8	25.6	57.1	13.7	36.5	15.0	39.0

Source: Calculated from 1978 *Census of Agriculture*, Bureau of the Census.

APPENDIX TABLE A2. Distribution of Peanut Production, Southern Region, 1978

Income	Appalachian		Delta		Southeast		Southern Plains		Total	
	Farms	Production	Farms	Production	Farms	Production	Farms	Production	Farms	Production
	Percent									
Less than $2,500	3.4	0.1	53.2	2.5	6.1	0.1	3.7	0.2	6.0	--
$2,500-19,999	45.8	5.7	32.7	3.5	30.3	5.3	38.9	9.6	35.0	6.0
$20,000-39,999	18.4	9.0	2.0	1.9	18.0	8.6	20.4	13.7	18.0	9.0
$40,000-99,999	26.7	26.2	3.2	6.3	25.0	25.2	24.7	34.4	25.0	27.0
$100,000 and over	5.7	59.0	8.9	85.8	20.6	60.8	12.3	42.1	16.0	58.0

Source: Calculated from 1978 *Census of Agriculture*, Bureau of the Census.

APPENDIX TABLE A3. Distribution of Corn Production, Southern Region, 1978

	Appalachian		Delta		Southeast		Southern Plains		Total	
	Farms	Production	Farms	Production	Farms	Production	Farms	Production	Farms	Production
	Percent									
Less than $2,500	17.4	1.9	52.7	15.2	31.8	0.3	18.3	0.4	2.4	2.0
$2,500-19,999	46.6	17.1	34.5	24.0	40.2	15.3	38.6	3.5	44.0	14.0
$20,000-39,999	14.6	14.0	4.0	8.3	11.6	11.0	9.9	3.8	13.0	11.0
$40,000-99,999	13.7	26.3	4.3	13.7	14.0	22.3	15.0	17.2	13.0	23.0
$100,000 and over	7.7	40.7	4.5	38.8	2.4	51.1	18.2	75.1	6.0	50.0

Source: Calculated from 1978 *Census of Agriculture*, Bureau of the Census.

APPENDIX TABLE A4. Distribution of Soybean Production, Southern Region, 1978

	Appalachian		Delta		Southeast		Southern Plains		Total	
	Farms	Production	Farms	Production	Farms	Production	Farms	Production	Farms	Production
	Percent									
Less than $2,000	10.2	1.0	9.6	0.1	13.5	1.1	5.7	0.1	11.0	1.0
$2,500-19,999	43.1	15.4	34.7	6.0	40.9	13.9	31.2	8.0	40.0	10.0
$20,000-39,999	17.1	13.6	14.1	7.4	14.2	11.9	17.0	8.8	16.0	10.0
$40,000-99,999	18.5	27.0	19.1	19.8	17.0	25.0	22.9	21.7	18.0	23.0
$100,000 and over	11.1	43.0	22.5	66.7	14.4	48.1	23.2	61.4	15.0	56.0

Source: Calculated from 1978 *Census of Agriculture*, Bureau of the Census.

APPENDIX TABLE A5. Distribution of Cotton Production, Southern Region, 1978

Income	Appalachian		Delta		Southeast		Southern Plains		Total	
	Farms	Production	Farms	Production	Farms	Production	Farms	Production	Farms	Production
	Percent									
Less than $2,500	6.9	0.2	5.1	0.1	4.9	0.1	3.4	0.1	4.0	--
$2,500-19,999	32.9	6.5	28.1	2.7	29.3	3.7	27.7	5.3	28.0	4.0
$20,000-39,999	14.2	6.2	13.0	3.5	14.6	5.4	22.2	11.2	19.0	8.0
$40,000-99,999	20.7	18.3	20.5	12.6	21.1	17.0	28.4	30.3	25.0	23.0
$100,000 and over	1.6	31.2	33.3	81.1	30.1	73.8	18.3	53.1	24.0	65.0

Source: Calculated from 1978 *Census of Agriculture*, Bureau of the Census.

APPENDIX TABLE A6. Distribution of Rice Production, Southern Region, 1978

Income	Appalachian		Delta		Southeast		Southern Plains		Total	
	Farms	Production	Farms	Production	Farms	Production	Farms	Production	Farms	Production
	Percent									
Less than $2,500	--	--	0.9	0.1	--	--	0.3	--	1.0	--
$2,500-19,999	--	--	12.5	1.9	--	--	6.8	0.7	12.0	2.0
$20,000-39,999	--	--	12.1	4.3	--	--	8.4	1.8	12.0	4.0
$40,000-99,999	--	--	28.8	19.3	--	--	25.6	11.8	28.0	17.0
$100,000 and over	--	--	45.7	74.4	--	--	58.9	85.7	47.0	77.0

Source: Calculated from 1978 *Census of Agriculture*, Bureau of the Census.

APPENDIX TABLE A7. Distribution of Tobacco Production, Southern Region, 1978

Income	Appalachian		Delta		Southeast		Southern Plains		Total	
	Farms	Production	Farms	Production	Farms	Production	Farms	Production	Farms	Production
	Percent									
Less than $2,500	19.6	2.8	--	--	5.2	0.1	--	--	19.0	2.0
$2,500-19,999	56.1	26.8	--	--	32.7	7.4	--	--	55.0	24.0
$20,000-39,999	12.2	18.7	--	--	19.8	11.6	--	--	13.0	18.0
$40,000-99,999	5.9	26.7	--	--	25.1	30.9	--	--	7.0	27.0
$100,000 and over	6.2	25.0	--	--	17.2	50.0	--	--	6.0	29.0

Source: Calculated from 1978 *Census of Agriculture*, Bureau of the Census.

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