

U.S. AGRICULTURE IN THE 1980s: ECONOMIC PERCEPTIONS

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The purpose of this paper is to provide a perspective on agriculture during the decade of the eighties.

It is contended that a potentially important set of circumstances has evolved for U.S. agriculture. In part, these circumstances involve the global supply and demand for agricultural commodities, and the role that American farmers will play in that arena. Also involved is the current profile of U.S. agriculture. Taken together, forces are converging on two fronts — in the domestic and world economies and within the farm sector itself — that give rise to the issues of where production agriculture currently is and where it might be headed.

A Profile of Domestic Agriculture

Current evidence would seem to suggest that American agriculture has finally come of age. A reasonable semblance of equilibrium has been achieved by the farm sector within the larger economy.

The importance of agriculture as a major economic sector is well documented. Within the domestic economy, fully one-fifth of all employment and a similar percentage of GNP are in some way related to agriculture. For each \$1 billion in added exports over \$2 billion in domestic economic activity and 35,000 jobs are generated. And, of course, the growing agricultural trade surplus has provided some offset against the tremendous drain of U.S. dollars going to meet oil import bills.

The achievement of relative resource equilibrium in agriculture is important, from the standpoint of both U.S. farmers and the American public. It means that the malallocation of resources and the chronic overproduction of years past is for the most part behind us. Producers are freer to respond to the signals of the marketplace than at any time in recent history. Farmers should be able to compete for the resources that they need.

However, it is important to review the facts that underlie these assertions. First, the resources agriculture employs — land, capital,

labor and/or management — and the manner in which they are combined to yield an economic output needs to be considered. Second, the level of resource use and the returns that resources are receiving must be looked at. Third, the concentration of farm production must also be noted, e.g., four-fifths of agricultural output is produced by one-fifth of the farms. Although this latter issue is often raised in relation to the equity of farming opportunity, it is perhaps most important in terms of the debt structure of “primary” farms and their performance in an uncertain future.

The Labor Resource

The profile of the domestic farm sector begins with a brief look at the farm population. Their numbers have become reduced over time — from 32 million or 30 percent of the population in 1920 to just over 6 million or 3 percent of the population in 1979 (see Table 1). We also know that some farm families live in towns, some non-farmers live on farms, and some farm household members hold non-farm jobs. A once easily identifiable group of people whose well-being was a national concern is no longer so easily identified. This fact becomes especially important in the political process where the needs of constituent groups are met or overlooked depending on the way in which such groups and their needs are perceived.

Of course, the principal focus of the human resource in agriculture is the agricultural labor force. Total farm employment is now less than half of what it was in 1950 (see Table 1). More importantly, though, the trend appears to have eased with total agricultural employment holding fairly constant over the 1970s. Hired farm labor, moreover, while down somewhat from 1950 levels, has been slowly moving upward (see Table 1). Out of this can be surmised that the existence of excess labor in agriculture may well be a fact of history.

Present day agriculture has apparently achieved a relative resource equilibrium with respect to its use of human resources. Additional labor may be drawn into use in either an absolute sense or to replace more expensive capital inputs, but this will happen in competition with other sectors of the economy.

The Land Resource

In reviewing the land resource in agriculture several facts emerge as significant. As indicated in Table 2, just over 380 million acres of cropland were available in 1974; an additional 80 million acres of pasture were potentially convertible for cropland use as well. By 1979, however, 380 million acres of cropland had been brought into production. Although there were 80 million acres of pasture, livestock production would presumably be traded-off if that pasture were converted to cropland use. The conclusion emerges that most of the easily available cropland base was probably already in use by 1979.

Table 1 — Selected Population Characteristics, 1920-1979

| Year | Total resident population ^a | Rural population ^b | Farm population ^c | Total agricultural employment ^d | Agricultural wage and salary workers ^e |
|---------------------|--|-------------------------------|------------------------------|--|---|
| Thousands | | | | | |
| Current definition | | | | | |
| 1979 | 220,099 | 55,000 (est.) | 6,241 | 3,297 | 1,413 |
| 1978 | 218,228 | 55,000 (est.) | 6,501 | 3,342 | 1,418 |
| Previous definition | | | | | |
| 1979 | 220,099 | 55,000 (est.) | 7,553 | 3,297 | 1,413 |
| 1978 | 218,228 | 55,000 (est.) | 8,005 | 3,342 | 1,418 |
| 1977 | 216,400 | NA | 7,806 | 3,244 | 1,330 |
| 1976 | 214,680 | NA | 8,253 | 3,297 | 1,318 |
| 1975 | 213,051 | NA | 8,864 | 3,380 | 1,280 |
| 1974 | 211,389 | NA | 9,264 | 3,492 | 1,349 |
| 1973 | 209,859 | NA | 9,472 | 3,452 | 1,254 |
| 1972 | 208,219 | NA | 9,610 | 3,452 | 1,216 |
| 1971 | 206,219 | NA | 9,425 | 3,387 | 1,161 |
| 1970 | 203,810 | 53,887 | 9,712 | 3,462 | 1,152 |
| 1960 | 179,323 | 54,054 | 15,635 | 5,458* | 1,762 |
| 1950 | 151,326 | 54,479 | 23,048 | 7,160 | 1,630 |
| 1940 | 132,166* | 57,459 | 30,547 | NA | NA |
| 1930 | 122,755 | 54,042 | 30,529 | NA | NA |
| 1920 | 105,711 | 51,553 | 31,974 | NA | NA |

*Denotes first year Hawaii and Alaska included in the data.

^aEstimate as of July 1 each year.

^bPersons outside urban areas in open country, on farms, and in places with a population less than 2,500

^cCurrent definition: Persons on places with at least \$1,000 of agricultural sales. Previous definitions: Since 1960, persons on places of 10 acres or more with at least \$50 of agricultural sales and on places under 10 acres with at least \$250 of agricultural sales. Prior to 1960, farm residence was based essentially on self-identification of the respondent.

^dSole or primary agricultural employment of persons 16 years old and older. The data are not strictly comparable over time because of definitional changes. Data are annual averages.

^ePersons 16 years old and older.

Source: U.S. Bureau of the Census, Decennial Census of Population and Current Population Reports, U.S. Department of Labor, Bureau of Labor Statistics.

Table 2 — Major Uses of Land, 1924-1979

| Year | Cropland harvested | Crop failure | Fallow | Total used for crops | Idle | Pasture | Total cropland excluding pasture | Acres idled by programs |
|---------------|--------------------|--------------|--------|----------------------|------|---------|----------------------------------|-------------------------|
| Million acres | | | | | | | | |
| 1924 | 346 | 13 | 6 | 365 | 26 | NA | 391 | 0 |
| 1929 | 356 | 13 | 10 | 379 | 34 | NA | 413 | 0 |
| 1934 | 296 | 64 | 15 | 375 | 40 | NA | 415 | 0 |
| 1939 | 321 | 21 | 21 | 363 | 36 | NA | 399 | 0 |
| 1944 | 353 | 10 | 16 | 379 | 24 | NA | 403 | 0 |
| 1949 | 352 | 9 | 26 | 387 | 22 | 69 | 409 | 0 |
| 1954 | 339 | 13 | 28 | 380 | 19 | NA | 399 | 0 |
| 1959 | 317 | 10 | 31 | 359 | 33 | 66 | 392 | 22 |
| 1964 | 292 | 6 | 37 | 335 | 52 | 57 | 387 | 55 |
| 1969 | 286 | 6 | 41 | 333 | 51 | 88 | 384 | 58 |
| 1972 | 289 | 7 | 38 | 334 | 51 | NA | 385 | 62 |
| 1973 | 316 | 5 | 31 | 352 | 32 | NA | 384 | 19 |
| 1974 | 322 | 8 | 31 | 361 | 21 | 83 | 382 | 3 |
| 1975 | 330 | 6 | 30 | 366 | NA | NA | NA | 2 |
| 1976 | 331 | 9 | 30 | 370 | NA | NA | NA | 2 |
| 1977 | 338 | 9 | 30 | 377 | NA | NA | NA | 0 |
| 1978 | 331 | 7 | 31 | 369 | NA | NA | NA | 18 |
| 1979 | 342 | 7 | 30 | 379 | NA | NA | NA | 12 |

NA = Not available.

Source: Adapted from changes in Farm Production Efficiency, 1978; *Major Uses of land in the United States, 1950*, Technical Bulletin 1082 (Supplement), and published reports in the land use series since 1950.

Such a conclusion is conditioned, of course, by the significant amount of cropland development that has occurred over this period as well. The 420 million acres of cropland employed during the 1930s and 1940s could once again be matched or even exceeded. At what cost would these acres be drawn into production? Not only are the development costs for such land important, but also the costs of treating or leaving untreated any increased erosion or sedimentation that might occur.

The easily available land appears to already be in use. Additional land may be available but agriculture will have to compete for its services through the returns that are necessary to either justify its development, maintenance, and debt service or as an alternative investment tying up the limited financial resources of farmers.

The Capital Resource

Capital resource use has increased dramatically over time. From 42 million horsepower units in agriculture in 1940 we have moved to

over 240 million in 1979. The 1.76 million tons of fertilizers used in 1940 have multiplied in use many times over with an estimated 20.6 million tons used in 1978. Similar data could be cited for other machinery, pesticides, and credit.

The important point in all this is not simply that capital resource use has increased, but that the conditions under which this use is now occurring have changed. As full participants in our market economy, farmers must and can now compete for capital resources along with other sectors. The very clear response of many farmers in terms of land and capital resource acquisitions during the early 1970s is indicative of the situation. Given appropriate market signals a great many farmers were quick to respond. Of course, not all farmers made good business decisions, just as in other sectors of the economy. The returns that farmers have been receiving on their capital resources explain the rationality of their decision process.

The Farm Business

In addition to matters of individual resource use, a profile of the agricultural sector requires consideration of the manner in which these resources are combined for use in an economic unit.

Farm numbers and sizes. The total number of farm businesses in the United States has declined rather precipitously over the years. From 5.5 million in 1950, the number of farms had fallen to 2.3 or 2.7 million in 1979, depending on the Census definition used. At the same time, average farm size rose from 200 acres in 1950 to over 400 acres in 1979. The profile now reflects fewer, but larger farm business units. This profile is consistent with Miller's research findings that suggest a farm size of 400 - 700 acres may be necessary to realize many of the available size economies.

A simple reference to averages can be misleading. Something must be said concerning the size distribution of farms if a true sense of the potential as well as the vulnerabilities of the sector are to be understood. Data for 1978 suggest, for example, that there are perhaps three broad classes of farm businesses (see Table 3). First, there are those farm businesses that report less than \$5,000 in annual sales. Although they represent 44 percent of all farms they contribute only 2 percent of total agricultural sales. These might be termed "rural residence" farms.

A second class of farms has sales of from \$5,000 to \$40,000 annually. Approximately 34 percent of all farms fall into this class. They generate 17 percent of total agricultural sales and might be considered "small" farms. Finally, there are those farm businesses that have sales over \$40,000 each year. Just over 20 percent of all farms are in this class. These farms account for over 80 percent of total sales. This third class is best characterized "primary" farms.

Table 3 — Number (in thousands) and Percent of Farms by Value of Sales (Mil. \$) Size, 1978

| Size by value of sales | Number | Percent | Sales | Percent |
|------------------------|--------|---------|---------|---------|
| Less than — \$ 2,500 | 911 | 34.1 | 1,056 | 0.9 |
| \$ 2,500 — 4,999 | 275 | 10.3 | 1,289 | 1.1 |
| 5,000 — 9,999 | 281 | 10.5 | 2,580 | 2.2 |
| 10,000 — 19,999 | 294 | 11.0 | 5,259 | 4.6 |
| 20,000 — 39,999 | 323 | 12.1 | 11,406 | 9.9 |
| 40,000 — 99,999 | 398 | 14.9 | 28,962 | 25.0 |
| 100,000 — 199,999 | 126 | 4.7 | 19,708 | 17.0 |
| Over 200,000 | 64 | 2.4 | 45,413 | 39.3 |
| Total | 2,672 | 100.0 | 115,773 | 100.0 |

Source: *Farm Income Statistics*, ESCS, U.S. Department of Agriculture, 1979, pp. 52-53.

Quite clearly, agricultural production is heavily concentrated among primary farms. Many of the rural residence and small farms would be at a great economic disadvantage were it not for income earned off the farm. At the same time, the two smaller classes of farms provide agriculture with a good deal of its short-term flexibility. These tend to be general farming operations that can switch rather readily between crops. Their experience in obtaining off-farm earnings, moreover, may well allow them to enter and exit from full-time farming more easily than the larger commercial farming operations.

Farm family income. The data show rather clearly that for the smaller classes of farm businesses looking only at farm income can be misleading. For rural residence farms (less than \$5,000 in sales), off-farm income is significantly greater than farm income. For small farms (\$5,000 - \$40,000 in sales), off-farm income is less important than farm sales but is still highly significant. For primary farms (over \$40,000 in sales), off-farm income is relatively unimportant.

Relative to national median family income, moreover, farm families tend to compare rather favorably. The addition of nonfarm income has created a more equal distribution of income among farm families and with the rest of the economy.

Farm business income. A business is typically said to be viable over the long run if the returns to the resources employed are adequate to hold them in that use. If returns are higher elsewhere, resources will migrate. This, of course, is what happened in the agricultural sector over the past 40 to 50 years.

The situation is now markedly different. As shown in Table 4, total returns to farm assets have been substantially above those realized on stocks and bonds over the past 15 years. To be certain, an important part of this return has been through capital appreciation. The return from current income has been less dramatic. Still, the total return to farm assets has been considerably better than that on stocks and bonds with a definite improvement shown since 1965. Investments in agricultural businesses have yielded returns comparable to those earned elsewhere in the economy.

Taking the evidence on returns to the farm business one step further, it is useful to consider these returns according to the three classes of farms described earlier. What we find is that the capital gains experience of all three classes is roughly comparable. Returns from current farm income is another story — rural residence farms actually show a negative return from current income, small farms show a limited return, and only for primary farms is there a substantial return. Despite recurring cash flow problems, primary commercial farms are generating returns that should generally allow them to compete for resources in the larger economy.

Still, there are certain vulnerabilities to which larger, primary farms may be susceptible. One reflection of this concern can be seen in the debt to asset ratios exhibited by farm businesses of various sizes. As indicated in Table 5, debt to asset ratios have tended to move around a bit for all sizes of farm business over the past 20 years. As might be expected, the highest ratios are exhibited by primary farms (over \$40,000 in sales). On average, for this particular class of farms, the ratio has tended to become higher in recent years. The notion of primary farms being more heavily leveraged is not inherently a problem, but does suggest the need for some minimum cash flow on a rather consistent basis.

An example can perhaps best demonstrate the issue that is of concern with respect to farm indebtedness. In Table 6, production expense to cash receipt ratios of 70, 85, and 90 percent are analyzed. Fixed expenses can often be deferred, but usually within a fairly short period of time even fixed expenses must be paid. Table 6 shows that highly leveraged farm businesses may be particularly susceptible to disruptions in their cash flow.

As the data in Table 7 further show, cash production expenses constitute a significant percentage of cash receipts, depending on the size of farm. Primary farms appear to be potentially quite vulnerable to cash flow disruptions.

Variation in prices and income. As indicated in Table 8, the index of prices received by farmers for all products has demonstrated increased variability when moving from the 1955-63 period to the 1972-78 period. This variability was especially pronounced for crop prices. Cash receipts exhibited a similar pattern with crop receipts being particularly variable during the 1970s.

Table 4 — Rates of Return to Stocks, Bonds, and Farm Assets, 1950-79

| Period | Current income | | | Real capital gains | | | Total | | |
|--------------------------|----------------|---------------------|---------------|--------------------|---------------------|---------------|----------------|---------------------|---------------|
| | Common : stock | Long : term : bonds | Farm : assets | Common : stock | Long : term : bonds | Farm : assets | Common : stock | Long : term : bonds | Farm : assets |
| 1950-54 | 5.85 | 2.61 | 5.0 | 11.95 | -1.69 | 3.28 | 17.53 | 0.92 | 8.23 |
| 1955-59 | 3.94 | 3.38 | 3.2 | 13.12 | -4.65 | 4.02 | 17.06 | -1.27 | 7.19 |
| 1960-64 | 3.20 | 4.00 | 3.6 | 7.45 | -1.49 | 2.42 | 10.65 | 2.51 | 6.02 |
| 1965-69 | 3.18 | 5.01 | 4.4 | 1.61 | -9.09 | 2.48 | 4.79 | -4.08 | 6.94 |
| 1970-74 | 3.47 | 6.25 | 6.3 | -8.66 | -8.65 | 6.15 | -5.19 | -2.40 | 12.41 |
| 1975-79 | 4.68 | 7.49 | 4.5 | -4.09 | -12.06 | 5.10 | 0.59 | -4.57 | 9.60 |
| Coefficient of variation | 22 | 26 | 34 | 281 | 192 | 106 | 152 | 185 | 60 |

Source: Stock and bond returns are from David A. Lins, "Financial Performance and Economic Well-Being of the Farm Sector and Rural People," (Mineo), NED, ESCS, USDA, and farm asset returns are calculated from data in annual issues of *Farm Income Statistics*, U.S. Department of Agriculture.

Table 5 — Debt to Asset Ratio, by Farm Size, Selected Years, 1960-78

| Year | Farm size by sales classes (\$) | | | | | | | | |
|---------|---------------------------------|-----------------|----------------|----------------|------------------|------------------|------------------|------------------|--|
| | All farms | Less than 2,500 | 2,500 to 4,900 | 5,000 to 9,999 | 10,000 to 19,999 | 20,000 to 39,999 | 40,000 to 99,999 | 100,000 and over | |
| | | | | <u>Percent</u> | | | | | |
| 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 | |
| 1975-78 | 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 6 — Sensitivity of Annual Net Income to Changes in Production Expenses

| Item | Ratio of production expenses to cash receipts | | |
|--|---|----------------|------------|
| | 70 percent | 85 percent | 90 percent |
| | | <u>Dollars</u> | |
| Gross receipts | 100 | 100 | 100 |
| Production expenses | 70 | 85 | 90 |
| Net cash income | 30 | 15 | 10 |
| | | <u>Percent</u> | |
| 10 percent increase in production expenses | 77 | 94 | 99 |
| Net cash income | 23 | 6 | 1 |
| Decrease in net cash income | 23 | 60 | 90 |

Source: Penn, p. 49.

Personal income received by the farm population reflected the basic variability in prices. Farm income, not including government payments, was twice as variable during the late 1960s as it was over the 1955-63 period. During the 1970s, income was nearly three times as variable. Government payments tend to dampen the

Table 7 — Cash Production Expenses as a Percent of Cash Receipts, 1935-78

| Period | All farms | Farms with gross of sales of | | |
|---------|-----------|------------------------------|-----------------------|---------------------|
| | | Less than \$40,000 | \$40,000 to \$100,000 | More than \$100,000 |
| 1935-39 | 59.8 | NA | NA | NA |
| 1940-45 | 56.3 | NA | NA | NA |
| 1946-49 | 53.4 | NA | NA | NA |
| 1950-54 | 58.7 | NA | NA | NA |
| 1955-59 | 63.2 | NA | NA | NA |
| 1960-64 | 67.1 | 60.2 | 71.8 | 85.6 |
| 1965-69 | 68.5 | 59.6 | 69.4 | 84.8 |
| 1970-74 | 67.4 | 55.9 | 63.9 | 80.6 |
| 1975-78 | 72.1 | 57.4 | 63.5 | 81.3 |

Note: Cash receipts include marketings from livestock and crops, government payments, and income from recreation, machinery hire, and custom work. Cash expenses include operating expenses, taxes, interest on farm mortgage debt, and rent to non-operator landlords.

Source: Penn, p. 49.

Table 8 — Variation in Farm Income and Produce Prices, Selected Periods, 1950-78

| Item | Coefficient of variation ¹ | | |
|---|---------------------------------------|---------|---------|
| | 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 |
| Livestock | 5.5 | 11.3 | 13.7 |
| Cash receipts | | | |
| Crops | 10.4 | 9.1 | 20.6 |
| Livestock | 8.3 | 14.6 | 15.7 |
| Personal income received by the farm population | | | |
| Farm income less government payments | 9.4 | 18.6 | 24.3 |
| Farm income | 6.3 | 14.1 | 21.7 |
| Nonfarm income | 12.5 | 16.0 | 15.7 |
| From all sources | 5.5 | 12.1 | 13.9 |

¹The coefficient of variation is the standard deviation of the series divided by the mean and expressed as a percent.

Source: Penn, p. 47.

Table 9 — Variability in Farm Income Per Farm Operator Family by Size of Farm, Selected Periods, 1960-78

| Sales class (\$) | Coefficient of variation | | | |
|----------------------|--------------------------|---------|-------------------|---------|
| | Net farm income | | Total income | |
| | 1960-72 | 1973-78 | 1960-72 | 1973-78 |
| Less than — \$ 2,500 | 8.5 | 10.8 | 33.2 | 15.6 |
| 2,500 — 4,999 | 6.9 | 16.2 | 30.6 | 14.6 |
| 5,000 — 9,999 | 4.4 | 16.0 | 23.9 | 12.2 |
| 10,000 — 19,000 | 6.8 | 15.7 | 18.9 | 7.3 |
| 20,000 — 39,999 | 11.9 | 13.7 | 15.0 | 7.7 |
| 40,000 — 99,999 | 12.9 | 15.2 | 8.6 ¹ | 10.7 |
| \$100,000 and over | 19.6 | 32.0 | 16.3 ¹ | 26.5 |

¹ For 1965-72.

Source: Data from *Farm Income Statistics*, U.S. Department of Agriculture.

variability somewhat but the increase over time is still rather striking. Only when nonfarm income is included does much of the variability become muted.

Variability in total income by farm size is also of interest. The data in Table 9 portray the situation quite graphically. For rural residence farms (less than \$5,000 in sales) and small farms (\$5,000 to \$40,000 in sales) there was increased variability in net farm income during the 1970s as compared to the 1960s. However, due to increased reliance on off-farm sources of income, the variability in total income was diminished during the 1970s. Primary farms, with only limited off-farm employment, tended to exhibit greater variability in both farm and total income during the 1970s.

The Global Setting in the 1980s

With the production from 1 out of every 3 acres moving into export markets, the role of American agriculture in the world arena seems clearly charted. Growth rates in the demand for U.S. agricultural commodities averaged about 1.9 percent annually in domestic markets and 5.5 percent annually in export markets over the 1950-1972 period. Domestic demand dropped off slightly to a 1.5 percent annual increase between 1972 and 1980. Export demand increased rather significantly to an 8.9 percent annual rate over the 1972-1980 period. At the same time, domestic production grew at the average annual rate of 2.1 percent for the 1950-1972 period and at the somewhat greater annual rate of 2.8 percent between 1972 and 1980. Production has significantly outpaced domestic disappearance, and concurrently exports have come to absorb an increasing proportion of total production.

An ever-widening gap between foreign (i.e., non-United States) disappearance and foreign production has also occurred. And even with U.S. production, the supply of agricultural commodities in the world has barely kept pace with disappearance. Given these trends it seems most likely that American farmers will continue to be called upon to provide food and fiber for the world marketplace.

In meeting an expanding world market over the past three decades it has become apparent that forces are sometimes in motion that can play havoc with prices and income. A number of countries have developed rather elaborate systems of tariffs and quotas that shield their domestic producers and consumers from variation in world prices. Such protection may smooth out domestic demands and ensure producer prices, but in the process the world market price which is an adjustment mechanism that U.S. producers respond to tends to be rendered less effective.

Significantly greater swings in prices often result as a consequence of producers and consumers in many nations not being given the appropriate price signals to which to respond. Compounding the problems is the world weather situation. Just as U.S. production is often governed by the vagaries of the weather so, too, is production around the world.

The data presented in Table 10 provide some insight into the nature of the interannual variability in foreign demand faced by American farmers. Based on 15-year periods, these data portray the extent of export variability experienced relative to the trend average. Variability is largest for wheat and coarse grains as might be expected given the volume of trade in these commodities. For both wheat and soybean meal, variability in the most recent 15-year period was nearly double what it was from 1950 to 1964. The variability associated with foreign demand for coarse grains was more than quadruple from the 1966-80 period relative to 1950-64. For soybeans the variability in foreign demand was increased over seven-fold in the most recent period.

In terms of the total foreign demand for U.S. agricultural commodities the level of variability has increased as well. Of perhaps equal importance, however, has been the absolute level of variability experienced — from an interannual variability of 5.5 million tons during 1950-64 to a level of 15.9 million tons during 1966-80. The appropriate interpretation for these data requires, of course, the recognition that potential swings in export volume work both ways. Variability has been experienced above trend as well as below.

Regardless of the direction of the variability in exports, the point is that variability has existed. For example, five of the eight largest deviations between world production and consumption have occurred during 1972-80. We have seen record high and low post-war real prices within the same five-year interval during the 1970s. And

Table 10 — Interannual Variability in Foreign Demand for U.S. Products¹

| | 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 |

¹Estimates of variability based on standard errors of the regression for successive best fit 15 linear and curvilinear time trends.

Source: (2, p. 15).

some observers conclude that variability in foreign demand for U.S. agricultural commodities could as much as double in the 1980s.

A Concluding Perspective

A number of somewhat unresolved questions remain. On the one hand, we have a domestic agriculture that can and does compete with other sectors of the economy for resources. In doing so, it reflects the basic supply and demand conditions for agricultural commodities.

At the same time, unfolding before us is an unparalleled opportunity in world markets. To be certain, there will be swings between periods of strong and weak exports. The potential for such variability is perhaps worrisome.

Given the circumstances in the domestic and world economies, and in the farm sector itself, the question of how U.S. agriculture will respond and the implications of that response remain. Additional resources will have to be drawn into production if U.S. agriculture is to meet its challenge during the 1980s. Labor and capital are probably available although returns will have to be adequate to attract their use away from other sectors of the economy. The land resource is also apparently available but its use may involve costs beyond those incurred for use of land in the past. Returns will have to be adequate to justify the use of this resource.

Although all farms may be affected by the expansion of export activity, it seems likely that primary farms will be most directly affected. Given the rather sensitive nature of the financial position of primary farms, a variety of problems could arise due to variability in prices and income induced by export oscillations. And if the farm sector is, in fact, in equilibrium with the rest of the economy, changes in the economic situation of farmers could well be transmitted to the many sectors that are directly and indirectly linked with agriculture. The possibility that longer-term efficiency in resource use could be jeopardized by short-term fluctuations in profits cannot be overlooked.

The actual outcome for U.S. agriculture in the decade of the 1980s will be conditioned by several matters. First, the U.S. farm sector's response to an expanding world demand will be affected by its capacity to produce. This involves the state of our farm technology and the level of productivity. It also involves the availability of land and water.

The use of the natural resource base, in particular, will be a function of competing demands for present and future use of that same set of resources. Without adequate land and water resources and in the absence of any major genetic breakthrough, it would appear that America's farmers will, for the most part, be pushed rather hard to meet both domestic and world food and fiber demands.

The other side of the equation relates to expected domestic and global demands. What can we say about exports? About the issue of food security? About the emerging and competing demands for commodities, including gasohol and high fructose sweeteners? These issues clearly have a major bearing on the challenge that U.S. agriculture will face in the 1980s.

Views expressed in this paper are those of the author and do not necessarily reflect those of the Economic Research Service, U.S.D.A.

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