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## DIAGNOSING AND TREATING FARM PROBLEMS<sup>1</sup>

Luther Tweeten

That many farmers in 1983 and 1984 were experiencing economic hardship was evident in economic indicators, press reports, mob action at foreclosure sales, and formation of new farm protest organizations. That such manifestations of economic difficulties are not new is also apparent-- economic cycles and farmer protests are as old as U.S. commercial agriculture itself. But that farm problems of 1983-84 fundamentally differed from those of the 1930s or 1960s may not be so apparent.

Economic problems, like medical problems, have symptoms, causes, and cures. The objective of this paper is to diagnose and suggest treatment for farm economic ills. We shall observe that what farmers view as problems are frequently symptoms of more basic economic ills. On occasion, it is useful to treat symptoms. But confusing symptoms with causes or treating symptoms as causes is usually bad economics as well as bad medicine. The last section selectively prescribes policy treatment for the ills diagnosed.

### Symptoms of Farm Problems

Just as the medical doctor checks the patient's temperature, pulse, and other vital signs for symptoms of physical ills, so the economic doctor checks the patient's vital signs for evidence of economic ills. Economic vital signs to be examined for farm problems include:

- (1) excess capacity defined a normal production in excess of market demand at existing prices;
- (2) level, variability, and distribution of income and wealth of farm people;
- (3) level, variability, and distribution of rates of return on resources; and

(4) other symptoms such as farm failure rates, government interference with private decisions, and demise of the family farm.

### Excess Capacity

At some price, the market will clear. Excess capacity exists because the government wills it. Excess capacity here is defined as output under normal weather and stocks in excess of what the market will clear at politically acceptable prices.

Table 1, summarizing the farm production balance in 1983, shows sources and disposition of excess capacity. Farm output fell 15 percent from 1982 to 1983 (U.S. Office of the President, 1983, 326).<sup>2</sup> Output would have been four percent lower in 1982 with normal weather, and 1983 output would have fallen only 11 percent. Weather caused output to be five percent below normal in 1983, other things equal. If 1982 and 1983 weather had been normal, farm output would have fallen six percent in 1983 due to payment-in-kind (PIK) and other acreage reduction programs.<sup>3</sup>

Of the 15 percentage points of reduced output, eight were required to reduce excessive carrying stocks to normal levels, assumed to be one billion bushels of wheat, 60 million tons of feed grains, 325 million bushels of soybeans, five million bales of cotton, and 10 billion pounds of milk equivalent. But the stock reduction proceeded below desired levels; two percentage points of the 15 percent drop in output reduced stocks below desired levels.<sup>4</sup> The remaining five percentage points of the 15 percent drop in output removed excess capacity to hold farm prices at 57 percent of 1910-14 parity after adjusting for normal weather and normal stocks.

At issue is whether this excess flow capacity of five percent represents chronic overcommitment of resources and sector-wide low income and rates of return on resources as in the 1930s and 1960s. Or is it a recurring manifestation of instability characterized by intermittent periods of a few good years and several lean income years that have plagued agriculture since its very origins? Table 1 provides clues. The 16 percent drop in exports from 1981 to the end of 1983 represents three percent of farm output. A recovery of only two-thirds of the loss is not an unlikely "one-shot" possibility if the nation takes decisive action toward a more balanced budget. The result will be lower real interest rates, less foreign capital inflow, a lower value of the dollar in international exchange, and greater demand for our farm exports. Revived economies worldwide will also boost our exports. Another one percentage point one-shot

Table 1. Farm Output Capacity Balance Sheet, U.S., 1983.

	(Percent of Output)
(1) Reduction in output 1982 to 1983	15
Origins of reduction:	
Favorable weather in 1982	4
Unfavorable weather in 1983	5
PIK and other acreage reduction	<u>6</u>
Total	15
Disposition of reduction:	
Excess carryin stocks	8
Short carryout stocks	2
Flow excess capacity	<u>5</u>
Total	15
(2) Potential disposition of flow excess capacity at 55 percent of 1910-14 parity price:	5
Increased exports with reduced federal deficit, lower real interest rate, lower value of the dollar, and worldwide economic recovery	2
Increased domestic demand with strong economy	1
Reduced resources in farming, lower real interest rate	<u>2</u>
Total	5
Location of flow excess capacity:	
Grains	3.1
Dairy	1.4
Cotton, peanuts, other	<u>.5</u>
Total	5

Source: Basic data from Council of Economic Advisors; from ASCS commodity fact sheets for dairy, grains, and cotton; and from equations estimated by Tweeten (March 1983).

demand increment can come from further recovery in the domestic economy.

Farm input volume increased one percent from 1975 to 1979, then fell five percent from 1979 to 1983. Another drop of two percentage points in input volume from 1983 levels is entirely feasible, especially since nearly two-thirds of all farm inputs are relatively flexible purchased inputs such as fertilizer and pesticides compared to the 1950s when half of all farm inputs were somewhat inflexible "farm-supplied" land, labor, and equity capital. Thus elimination of five percent excess capacity at equilibrium prices approximately 55 percent of 1910-14 parity is quite possible, although recovery may await the second half of the 1980s. Unlike the 1930s and 1960s, current excess capacity mostly is the result of somewhat transitory failure of exports rather than the more permanent excess resources (mostly labor) generated by rapid technological change in the 1950s and 1960s. The current excess capacity could be perpetuated by continued high, rigid price supports, however.

Excess capacity in resources and commodities behaves like a balloon filled with water. Squeezed at one end, it bulges at the other. The location of excess capacity mostly in grains and dairy as shown in Table 1 is the result of deliberate government policy. The nation has capacity to overproduce any farm commodity at current prices if excess resources are devoted to it.

Given normal stocks, what would happen with normal weather if all production control were eliminated? Given an elasticity of aggregate farm output demand  $B = -.25$  in the short run (see Tweeten 1983b), each one percentage point of excess capacity placed on the market reduces prices four percent and gross receipts three percent. Multiplied by five percent released capacity, the estimated reductions in prices and receipts are as follows:

Impact on: <sup>5</sup>	<u>Short Run</u> (1-2 years) $B = -.25$	<u>Intermediate Run</u> (3-5 years) $B = -.50$	<u>Long Run</u> (over 5 years) $B = -1.0$
Price $5F$ where $F=1/B$	20	10	0
Receipts $5(F+1)$	15	5	0

The short-term impact, a 20 percent drop in prices and 15 percent drop in receipts, is severe from release of excess capacity on the market. The long-term impact is nil. The implication is that (a) holding excess capacity for extended periods by public programs is not only costly to the government but of no benefit to farmers, and (b) the short-term consequences of release of excess capacity are severe. A

transition program is useful to relieve the trauma of farm adjustment to uncontrolled production from the current excess capacity.<sup>6</sup>

The 1982-83 parity ratio, 57 percent, would have been lower without government programs but may be sustainable without government programs following return to more normal real estate rates, value of the dollar, and exports. An important issue is whether farms can cover costs with prices at 1983 levels. We shall observe that the good news is that "normal" equilibrium is within reach; the bad news is that receipts thereunder will not cover opportunity resource costs on the vast majority of farms.

#### Level, Variability, and Distribution of Farm Income and Wealth

Per capita farm income from all sources relative to that of nonfarm people has improved gradually if erratically since the 1930s. By the late 1970s, personal income of farm people had reached parity with income of nonfarm people on the average.<sup>7</sup> For the first time in decades, the farm economy was near equilibrium. But income from farming is highly variable from year to year (Tweeten 1983b). A typical coefficient of variation (standard deviation as a percent of mean income) is 25 percent for the farming industry and at least double that level for individual farms.

Several observations concerning farm income in 1970 and 1982 are apparent from data in Table 2:

(a) Income and sales (receipts) of farms are highly concentrated on large farms. In 1982, farms with sales of over \$200,000 accounted for only five percent of all farms but for half of all sales and for 79 percent of all net income from farming. If current trends continue, only 50,000 farms will account for nearly two-thirds of all farm output by year 2000.

(b) Net income from farm sources was negative on the average for farm classes accounting for 71 percent of all farms but for only 12.4 percent of farming receipts in 1982.

(c) Off-farm income has risen dramatically since 1970 and has become more concentrated on smaller farms. Among farm classes, those with sales of \$10,000 to \$100,000 had the lowest income from all sources in 1982, a major turnaround from 1970 when smaller farms had the lowest total income per farm. If people residing on farms were classified according to where they received the majority of their income, most would be classified as clerks, doctors, operatives, lawyers, mechanics, electricians, or government employees.

Table 2. Farm Numbers, Receipts, and Income from Farm and Off-Farm Sources by Size of Farm, 1970 and 1982, United States.

Item	Farm Size by Sales Class				Total
	\$200,000 and Over	\$40,000 to \$199,999	\$5,000 to \$39,999	Less Than \$5,000	
Number of Farms (1,000)					
1970	17	201	1,036	1,695	2,949
1982	112	579	885	824	2,400
Percent of All Farms					
1970	.6	6.8	35.2	57.4	100.0
1982	4.6	24.1	36.9	34.4	100.0
(-----Dollars Per Farm-----)					
Cash Receipts					
1970	79,412	88,124	19,960	2,255	18,570
1982	658,000	99,668	18,717	2,604	62,541
Percent of All Receipts					
1970	22.9	32.4	37.7	7.0	100.0
1982	49.1	38.5	11.0	1.4	100.0
Realized Net Farm Income					
1970	204,941	24,334	6,258	-142	4,825
1982	169,402	10,100	-406	-678	9,959
Off-Farm Income					
1970	9,522	6,353	4,410	7,071	5,974
1982	16,647	10,762	16,600	17,843	16,430
Total Net Income					
1970	214,463	30,687	10,668	6,929	10,799
1982	186,049	20,862	16,194	17,165	26,389

Source: USDA (October 1983). Off-farm income data for 1970 for large- and medium-size adjusted from 1979 Farm Finance Survey.

(d) Farm income from all sources is becoming more equally distributed among economic sales classes of Farms (Tweeten and Huffman 1980). This paradox of increasing inequality of farm income and greater equality of income from all sources among farm classes suggests a fundamentally healthy adjustment to economies of size and resource rewards.<sup>8</sup>

(e) Adding in a cost for farm equity capital (assuming a 10 percent rate of return) and for farm operator and family labor and management, farms with sales of over \$500,000 in 1982 covered all direct and indirect costs while all other farm classes lost money.

The incidence of farm poverty, as high as 50 percent as recently as 1960, approached an incidence similar to that in the nonfarm sector by the late 1970s. Reduced poverty and a more equal income distribution trace to similar origins: the rise in off-farm earnings, exodus of small full-time operators, and investments in human resources. The considerably higher rate of poverty among farm families, 20 percent, compared to nonfarm families, 11 percent reported by Banks and Mills (1983, 18) for 1982 was caused by the recession in agriculture.

Several observations are apparent from farm balance sheet data in Table 3:

(a) Nominal assets per farm increased massively from 1970 to 1983. Most of the increase was inflation--real assets in the farming industry increased only three percent during the same period.

(b) Financial health measured by debt-asset ratios alone is unequally distributed among farms. Large farms are more heavily leveraged than small farms. Many young farmers who started operations in the 1970s have high debt-asset ratios and are experiencing severe economic hardship from depressed farm prices and incomes. But about half of all farmers have no debt.

(c) Net worth of farmers averaged \$346,845 in 1983. Proprietors' equity on farms with sales of under \$5,000 had an average net worth of \$106,540 per farm in 1983. As in the case of net income from all sources, farm wealth as measured by proprietors' equity has become more equally distributed among farm sales classes since 1970 (Tweeten and Huffman 1980).

(d) Debts increased faster than farm assets, raising the ratio of debt to assets from 17 percent in 1970 to 21 percent in 1983. Debt-asset ratios for the farming



Table 3. Balance Sheet of the Farming Sector Per Farm (Including Households) by Sales Class, U.S., January 1, 1970 and 1983

Item	Farm Size by Sales Class				Total
	\$100,000 and Over	\$40,000 to \$99,999	\$5,000 to \$39,999	Less Than \$5,000	
(-----Dollars Per Farm-----)					
<b>Assets</b>					
Real Estate					
1970	567,842	209,719	83,765	32,855	73,172
1983	1,143,208	476,174	194,719	88,191	321,859
Other					
1970	274,947	97,820	38,487	13,711	33,609
1983	422,849	168,973	65,586	31,462	115,109
TOTAL ASSETS					
1970	842,789	307,539	123,252	46,566	106,781
1983	1,566,057	645,147	260,305	119,653	436,968
<b>Claims</b>					
Liabilities					
Real Estate Debt					
1970	92,175	37,708	12,006	2,377	9,896
1983	200,950	62,379	20,206	8,813	45,623
Other					
1970	117,035	30,961	8,725	1,195	8,086
1983	215,604	61,499	16,815	4,300	44,500
Total					
1970	309,210	68,669	20,732	3,572	17,982
1983	416,554	123,878	37,021	13,113	90,123
Proprietors' Equities					
1970	633,579	238,870	102,520	42,994	88,799
1983	1,149,503	521,269	223,284	106,540	346,845
TOTAL CLAIMS					
1970	842,789	307,539	123,252	46,566	106,781
1983	1,566,057	645,147	260,305	119,653	436,968
Debt to Asset Ratio (%)					
1970	24.8	22.3	16.8	7.7	16.8
1983	26.6	25.9	14.2	11.0	20.6

Source: USDA (October 1983, p. 136; and earlier issues).

industry are low and favorable relative to those in non-farm industries (Tweeten 1979a). Despite capital losses in the 1980s, the financial health of the farming industry as a whole remains sound.

(e) Most farm assets are real estate, creating problems of cash flow on durable capital as will be noted later.

Level, Variability, and Distribution  
of Rates of Return on Farm Resources

It is clear that farmers as a whole are not poor. Commercial farmers normally earn more income and have more wealth than nonfarmers (U.S. Office of the President 1983, 112). Farmers need not be poor to be underpaid, however. At issue is whether resources in farming earn as much as similar resources earn elsewhere.

Several observations regarding this issue are as follows:

(a) From 1965 to 1980, total rates of return on farming equity capital from current earnings plus capital gains averaged well above returns on other major investment alternatives (U.S. Department of Agriculture 1981a, 51). Equity returns were computed as a residual after subtracting all resource costs (including an opportunity cost for operator and family labor and management) from farm gross income. It follows that if farm equity capital opportunity costs were subtracted from net income to compute a residual return to operator and family labor and management, then that return also would be favorable relative to returns elsewhere.

(b) As with farm income, rates of return on farming resources vary considerably from year to year. Strict comparisons with variation in rates of return elsewhere are difficult because net farm income combines earnings from operator and family labor and management components which can be separated only arbitrarily. Rates of return to farm equity capital have been more stable from year to year than returns to risk capital in the stock market. However, returns to farm operator labor have been less stable than returns to labor elsewhere.

(c) As with farm income, rates of return in farming differ systematically by size and type of farm. Returns to dairy and tobacco producers tend to be more stable than returns to grain producers from year to year. Rates of return to resources on small farms have been systematically lower than returns to resources on large farms.

(d) A highly important distributional dimension is the apportionment of returns into current and capital gains

components. From 1960 to 1982, current rates of return on farm equity capital averaged only 3.5 percent with no apparent upward or downward trend. Real capital gains averaged 4.2 percent to bring total real rates of return to a highly respectable 7.6 percent. Capital gains are unrealized until assets are sold. The result is a severe cash-flow problem of which more will be said later.

#### Other Symptoms of Farm Problems

The price system rewards those who fortuitously invest their resources and farm efficiently; it penalizes those who do not. Many individuals and families have left the farm to employ their resources in the nonfarm sector. Consequently, farm population and farm numbers have fallen markedly since 1950 but at a considerably slower rate since 1970. Most of the farm-urban emigrants were youth. Some established farmers have been forced out by foreclosures and bankruptcy. The failure rate in farming traditionally has been lower than in other businesses, especially small businesses (Tweeten 1979a). The farm foreclosure rate per thousand farms was 2.3 in 1980 and 2.9 in 1981 (USDA 1981b, 23). Although not strictly a comparable concept to the foreclosure rate, the failure rate per thousand commercial and industrial businesses was 4.2 in 1980 and 6.1 in 1981 (U.S. Office of the President 1983, 268).

Natural resource depletion. Soil and water depletion is a serious problem in some areas. In the Southern Great Plains portion of the massive Ogallala aquifer, water is being mined for agricultural irrigation without much recharge. Most economic supplies will be exhausted in a few decades. The region will revert to mostly dryland farming. In general, the West faces difficult choices in allocating scarce water resources within agriculture and between agricultural and other uses.

Approximately one-fourth of our cropland is experiencing soil loss in excess of established tolerance levels (Tweeten 1983e). Simple linear extension of farmland losses from urban encroachment and soil erosion indicates total depletion of soil resources in 300 years. Past trends will not continue, and recent data indicate a marked slowdown in agricultural land lost. The above considerations notwithstanding, scarcity of water and land in no way threatens food supplies in the foreseeable future.

Government involvement. In centrally planned countries, government involvement in agriculture would hardly be viewed as the symptom of a farm problem. But in the United States, farmers prefer to obtain their income from the market and view government production controls as an unfortunate if

sometimes necessary infringement on the freedom of each farmer to make production and marketing decisions.

Tax dollars spent for farm programs have high opportunity cost because they can be used to promote a more nearly balanced federal budget or serve other worthy ends. The level and stability of farm income and rates of return depicted earlier were made a little more favorable by government farm price and income supports. But pressures are intense to reduce the burden on taxpayers of government outlays for farm program which totalled nearly \$30 billion in 1983. Farmers have a major stake in macroeconomic policy and can expect to share in the budget cuts needed to restore federal fiscal responsibility.

Demise of the family farm. The changing structure of the farming industry is viewed by many as a symptom of farm problems. The nation cherishes the family farm, defined as a crop and/or livestock production unit on which the operator and his immediate family provide most of the labor, management, and equity capital. To survive, many farmers have resorted to strategies of part-time farming, hiring labor, renting land, relying on financial capital from off-farm sources, and vertically coordinating with agribusiness firms. The portion of farm output under vertical coordination increased from 20 percent in 1960 to 30 percent in 1980. These accommodations compromise the family farm ideal. Family farms may constitute a stable proportion of all farms, but numbers have fallen substantially.

Trends indicate eventual loss of the mid-size family farm. Though more efficient than small farms, mid-size farms lack their off-farm income to cope with cash-flow and instability problems. Relative variation of net income from all sources is much less on small farms than on large farms. Medium-size family farms experienced the greatest relative variation in income from all sources at least in some time periods (Tweeten 1983b, Table 9). Ability to control costs and access to diverse sources of debt and equity capital make risk more tolerable on large farms than on mid-size farms. The public probably is not much concerned over economic failure of very large farms. The mid-size family farm is at risk, and many view its potential demise as the symptom of serious deficiencies in agriculture worthy of correction.

Some fear that changes in farm structure will concentrate control of production decisions in so few hands that farm and food prices will be manipulated and food supplies threatened. No substantive evidence supports such fears for the foreseeable future. The broiler industry is the most

concentrated of major agricultural commodities but its performance in terms of product quantity, quality, and price has been favorable if not exemplary. Even if one integrated agribusiness firm controlled all broiler production, it should have to compete with beef and pork producers as well as with foreign broiler producers

Summary of symptoms. Symptoms examined in this section suggest several major economic concerns relating to agriculture:

(a) Cash flow. Rates of return on investment and farm income per capita comparable to those elsewhere are of little consolation to farmers who are unable to service cash-flow requirements. Cash flow is primarily a problem of commercial farms, especially of heavily leveraged young operators.

(b) Instability. Commodity prices and income are unstable for all sizes of farms. Variation in food quantity and price also troubles consumers at home and abroad.

(c) Low income. Chronic low farm income, once a sector-wide problem, has become a case-poverty problem associated with certain high-risk groups within agriculture. Modern, efficient, commercial farming entails such large asset requirements that persons with limited resources cannot enter. Although the incidence of farm poverty has declined substantially in recent decades, poverty is not rare among full-time small and medium-size farms, especially among those with aged operators.

(d) Environment. Soil conservation is the principal environmental problem in agriculture. Efficient use of water supplies is a worthy but so far elusive goal. Food health, safety, and quality are of concern but cannot be dealt with here due to space limitations.

(e) Family farm demise. Part-time, small and large farms can cope with cash-flow and instability problems more easily than can full-time family farms, long prized as the backbone of the rural economy if not the nation.

#### Causes of Farm Problems

The foregoing symptoms of farm problems have basic causes. Emerging realities suggest the following observations:

(a) Traditional explanations for farm economic ills such as excess labor, asset fixity, rising opportunity cost of labor, and of technology increasing supply at a greater rate than demand (treadmill theory) no longer suffice (Cochrane

1958; Heady 1967; Johnson and Quance 1972). The widely held view that farmers supply more output when product prices fall is convenient fiction (Tweeten and Quance 1969). The theory that farm returns are low because farmers are exploited by input supply and product marketing firms is without substance.

(b) A growing proportion of farm economic ills are "equilibrium" problems which will remain even if farmers make all desired adjustments to economic forces. The equilibrium theories of farm problems explain why returns in agriculture appear to be low when in fact they are not.

(c) A disturbing portion of farm economic ills, including the cost-price squeeze in 1980 initiating the 1980s recession, the chronic cash-flow problem, and reduced farm exports since 1982, trace to macroeconomic policies of the U.S. government. Forces of nature continue to cause economic instability, but a disturbing portion of instability in agriculture is "man made" by macroeconomic policies. The "big story" in farm policy is the lesser role of technology and the greater role of macroeconomic policy in causing farm problems. The following pages of this section elaborate on these elements.

#### Farm Supply and Demand Curve Slopes and Weather Shocks

There continues to be merit in the traditional view that farm prices and income are unstable because slopes of short-run industry supply and demand curves are steep.<sup>10</sup> However, each farmer is faced with a perfectly elastic demand -- his decision to supply more or less to the market will not change the price he receives. Farmers continue to be price takers, not price makers. For the most part, farm markets do not feature administered or negotiated prices which have characterized more stable pricing arrangements in the nonfarm sector.

It is well known that supply shifts widely because of unpredictable forces of nature including weather, pests, and disease. These same forces overseas create instability in demand for U.S. farm exports. Biological processes of farm production do not lend themselves to rapid adjustments in output to correct imbalances.

#### Theories Explaining Why Returns in Farming Appear To Be Low When They Are Not Low

To explain why farm resources appear to receive low returns in equilibrium when in fact real returns are favorable, I have advanced two theories, the decreasing-cost theory, and the cash-flow theory.

### Decreasing-Cost Theory

The decreasing cost (increasing returns to size) theory helps to explain why rates of resource returns in farming appear to be lower than in other sectors even in equilibrium (Tweeten 1979b, chapter 6). To illustrate, Figure 1 is constructed by first dividing all resource costs (including a return to operator and family labor, management, and risk) by all returns on each of eight economic sales classes of farms. The result shows average cost within a size class but marginal cost among classes. Figure 1 also shows the parity ratio required to cover all resource costs.

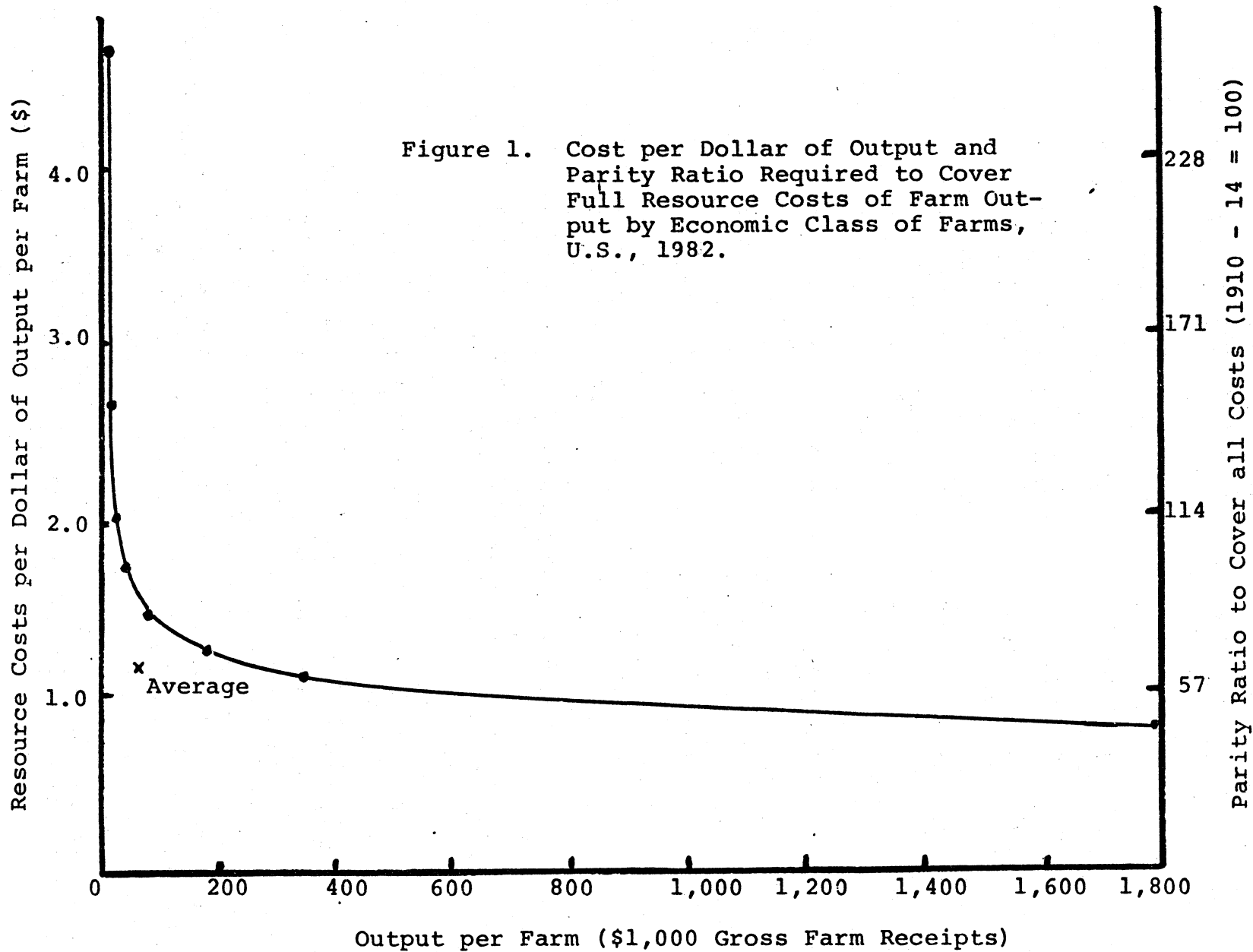
Over 200 percent of 1910-14 price parity was required to cover all resource costs on small farms in 1982. Only 53 percent of parity was required to cover all resource costs on the largest two classes of farms.<sup>11</sup> On the average, the largest two classes required \$.92 to produce \$1.00 of output in 1982. Operators of adequate-size, efficient farms quite rationally bid up the price of land until returns are comparable to those on alternative investments. This price is clearly "too high" for smaller, less efficient farms. If operators of such farms depended on farm earnings to pay all costs of farming, they could not enter or survive. Small full-time farming units, once numerous, mostly have been discontinued, or become larger or part-time operations. Comparatively few remain.

Personal interviews with operators of small farms reveal that typical monetary returns from an hour spent on farm work is much less than from an hour spent on off-farm work (Rogers 1983). Part-time operators remain on the farm, not because they have no alternatives or are unaware of them, but because they value the farm way of life. When the psychic value of farming is added to money value of farm output, the "social" unit cost curve comparable to the private unit cost curve in Figure 1 becomes nearly horizontal. Tax advantages and subsidized rural services also help maintain small farms.

Additional points suggested by Figure 1 are notable:

(a) Economies of farm size appear to have extended beyond the traditional family farm of approximately \$100,000 in sales and \$1 million in assets. Market economies in the form of input price discounts and product price premiums undoubtedly play a role. This marginalization caused near demise of the full-time small farm; could the process now cause demise of the full-time family farm?

(b) When all resources are valued at opportunity cost,



Source: Basic data from USDA (October 1983, p.88)



large farms are about breaking even and smaller farms are losing money. It follows that average equilibrium farm returns will tend to fall below those elsewhere. The puzzle is why, in view of Figure 1, conventional measures of resource returns in agriculture historically appear so favorable relative to alternatives.

### Cash Flow

National inflation creates a cash-flow problem in agriculture that is easily confused with a low-return problem. The conceptual basis for the cash-flow problem is illustrated in Table 4 for farmland investment. A well-functioning market with informed, rational participants desiring a real rate of return  $r$  on investment will bid the farmland price to  $P_0$  given current rent  $R_0$  and expectations of future rents increasing at real rate  $i'$  in excess of the general inflation rate  $i$ . Assuming that real interest rates and real rates of return desired on farmland are equal, with rents constant in nominal terms ( $i' = 0$ ) the normal or equilibrium current rate of return on farmland will be  $r + i$  and the interest rate also will be  $r + i$  on farm mortgages. The cash-flow deficit, defined as the current rate of return on farmland less the nominal interest rate, will be zero whatever the inflation rate under such circumstances. Farmland behaves like a fixed interest bond when returns are constant in nominal dollars over time.

Land earnings and rents have tended to rise with inflation in past decades as depicted in situation (2) in Table 4. If rents exactly keep pace with inflation to provide constant real rents, the equilibrium current and real rate of return is  $r$  and the cash-flow deficit is  $i$ . Thus the cash-flow deficit under normal circumstances on a fully indebted acre (perpetual mortgage) valued at \$2,000 is zero if the inflation rate is zero but is \$200 if the inflation rate is 10 percent.

The cash-flow problem is more severe if land earnings are expected to increase in excess of the inflation rate by rate  $i'$ , the third situation depicted in Table 4. Since  $r$  appears to be approximately four percent, the ratio of land price to land rent is expected to average 25 and is invariant to the inflation rate under condition (2) with  $i' = 0$  in Table 4. Because of sharply rising exports and lagging productivity rates, many land market participants as well as economists in the late 1970s expected  $i'$  to average two percent per year in the future. If  $i'$  is expected to be two percent in perpetuity, then the equilibrium land price-rent ratio increases to 50 and the current return to farmland (again invariant to the inflation rate) is only two percent as noted from the framework in Table 4. Even in the absence of inflation the cash-flow deficit is two percent of land

Table 4. Key Parameters Explaining Cash-Flow Problems in the Farming Industry

Expected Future Rent ( $R_t$ ) ( $t=1,2,\dots$ )	Present Value of Farmland ( $P_0$ )	Long-Term Real Rate of Return on Farmland	Current Rate of Return on Farmland ( $R_t/P_t$ )	Nominal Interest Rate	Cash-Flow Deficit Rate
	(Dollars Per Acre)	(-----Percent-----)			
(1) Rents constant in nominal terms	$\frac{R_0}{r+i}$	$r$	$r + i$	$r + i$	None
(2) Rents constant in real terms	$\frac{R_0}{r}$	$r$	$r$	$r + i$	$i$
(3) Rents increasing at rate $i'$ in real terms	$\frac{R_0}{r-i'}$	$r$	$r - i'$	$r + i$	$i + i'$

Source: Tweeten 1981a.

price when  $i'$  is two percent. With expected inflation of 10 percent the cash-flow deficit is 12 percent. Thus current earnings from three acres are required to pay mortgage interest on one acre. Because  $i'$  is rarely expected to exceed two percent while  $i$  is expected by many to average at least six percent in future years, it follows that inflationary expectations rather than real earnings expectations explain most of the cash-flow problem in agriculture.

The foregoing analysis considered land pricing and cash flow assuming a constant anticipated rate of inflation. If the inflation rate changes from that expected, the unanticipated changes will generate real wealth gains or losses--another major source of economic instability to farmland owners. Unanticipated low, even negative, real interest rates in the 1970s transferred billions of dollars from creditors to debtors. Unanticipated high real interest rates in the 1980s transferred billions of dollars from debtors to creditors. As net debtors, farmers benefited from unanticipated inflation in the 1970s but lost billions of dollars from disinflation in the 1980s.

Other factors contributing to cash-flow problems include the now-large assets required for an economic farming unit and a family farm structure emphasizing owner-operations refinanced each generation. Separation of farm ownership from farm operation, a current trend, means more nonfarm ownership of farm assets in a corporate stock structure. Such structure reduces cash-flow problems but compromises the family farm ideal.

Expansionary fiscal policy combined with tight monetary policy in recent years has introduced a new and onerous wrinkle in the inflation cycle. High real interest rates generate cash-flow shortfalls as in Table 4 condition (2) but without ultimately redeeming capital gains. Huge federal deficits, anticipated for the foreseeable future even after the economy has reached full employment, require major federal borrowing in financial markets. This raises real interest rates and crowds out private borrowing to finance business investment.

### Macroeconomic Policies

Much instability in agriculture is man-made--the product of government policy at home and abroad. The shift in Soviet policy to import grain following a poor crop in 1972 is an example of instability in U.S. export demand originating from public policies of other countries. However, most of the instability originates from our own policy decisions,

which also figure prominently in cash-flow problems depicted above.

Macroeconomic policies cause farm problems of instability through cost-price effects. The effects vary over the inflation cycle characterized by an expansionary phase of stimulative monetary-fiscal policy and a stabilization phase of restrictive monetary-fiscal policy. My most recent and complete econometric specification indicates that the initial (first year) impact of stimulative monetary-fiscal policy in the expansion phase of the inflation cycle is to reduce the ratio of prices received to prices paid by farmers up to one percent for each one percent increase in the general price level (Tweeten 1983d). The initial cost-price squeeze stemming from inflation dissipates with time, but not before creating instability for farmers.

An example of the cost-price squeeze induced by macroeconomic policy was in 1980 when prices paid by farmers for inputs of nonfarm origin increased by 16 percent. Real demand increased relative to real supply and prices received by farmers increased. But the ratio of prices received to prices paid by farmers decreased 10 percent.

Some of the most insidious macroeconomic effects are felt through international linkages. High real interest rates attract foreign investment in U.S. financial markets. The increased foreign demand for dollars relative to supply raised the value of the dollar in foreign exchange markets about 30 percent in recent years (Figure 2).<sup>12</sup> As a result, prices of U.S. grains, soybeans, and cotton increased in terms of foreign currency and demand for U.S. farm exports dropped (Dunmore and Longmire 1984).

The worldwide economic recession attended by major financial crises in several developing countries also reduced overall demand for farm exports. Both worldwide recession and high value of the dollar trace in no small part to our macroeconomic policies.

Farm mortgage interest rates are now about 12 percent while the inflation rate is four percent. The inflation-adjusted real interest rate is eight percent, far in excess of long-term historical real interest rates averaging three percent. Farmland has been priced in recent decades to provide approximately a four percent real rate of return. If the eight percent real interest rate is permanent, it would require current farmland values to drop by half to adjust to the new equilibrium.

In my judgment, the current high real interest rate is transitory. Real interest rates in the long run depend on time preferences for present versus future consumption and

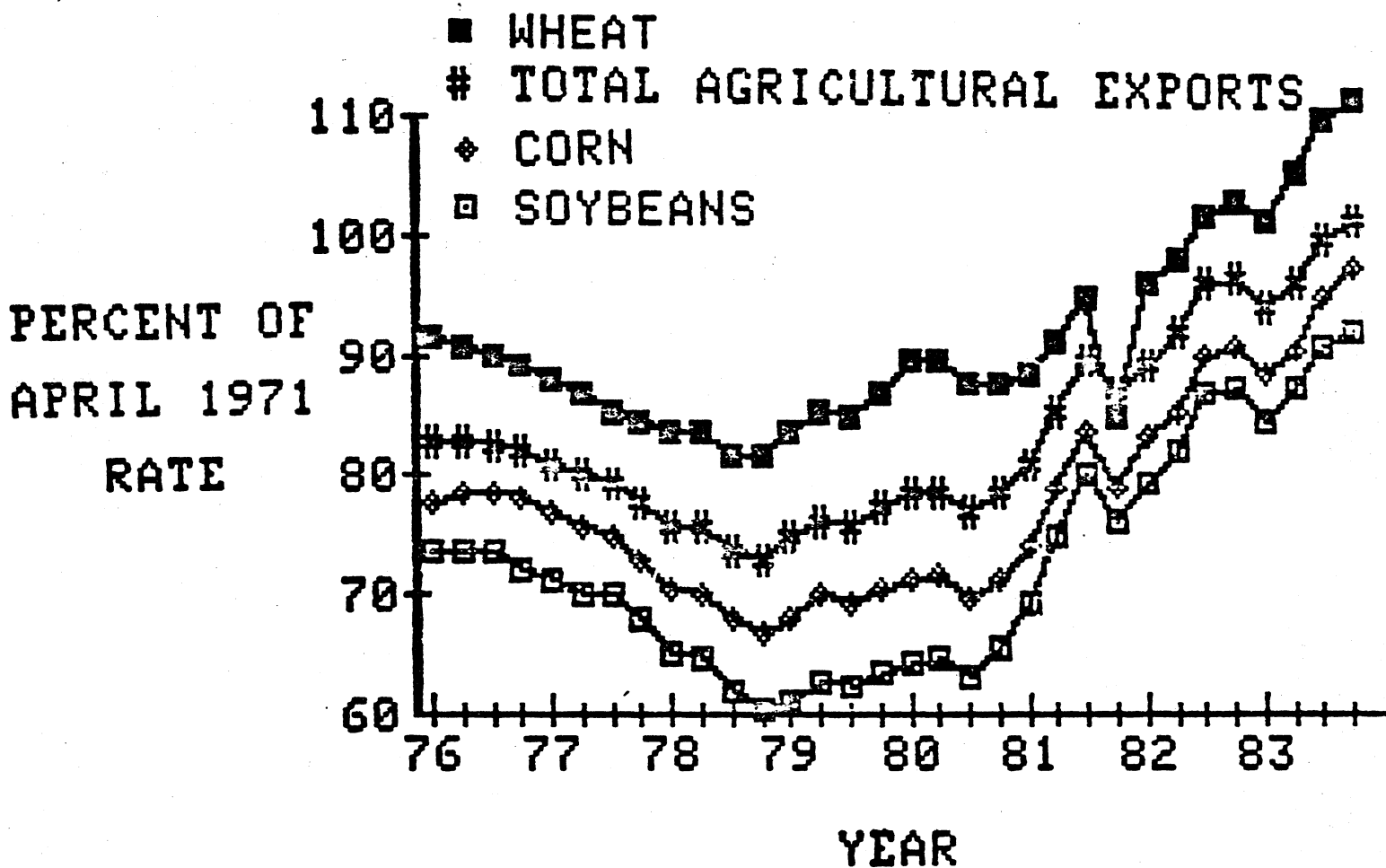


Figure 2. Index of Real Exchange Rates for U.S. Farm Exports

Source: Unpublished data from International Economics Division, Economic Research Service, USDA.

real earning power of invested capital. These are very fundamental forces changing very little over time; they probably have not changed in recent years. As indicated earlier, the current high real rate is a product of strong demand for money brought about by federal borrowing to finance the deficit in the face of a relatively tight money supply. There is uncertainty and expectation that the money supply will be eased to bring about at least a six percent inflation rate. This expectation comes in part from a belief that the Federal Reserve will need to expand the money supply to accommodate huge federal borrowing and thereby avoid recession. Many investors believe that the Federal Reserve lacks discipline or capability to permanently restrict money supply and hold inflation to less than six percent per year.

The Federal Reserve will have to demonstrate its resolve by holding the inflation rate down for several years before investors change expectations to view price stability as permanent. Only then and with help from government to control federal deficits will real rates of interest fall to the historic normal level of three or four percent. In the meantime, farmers and others will be paying a massive economic cost for macroeconomic excesses including the unfortunate experiment with the Laffer curve. Farmers have a major stake in fiscal-monetary policies that promote economic progress with a reasonably stable general price level.

### Policy Implications

Coping with farm economic ills requires attention to macroeconomic (monetary-fiscal) policy, trade policy, and commodity program policy. A policy instrument is matched with each of the five farm problems listed earlier.

#### Policy Problems and Instruments

Problem: Cash flow

Main Policy Instrument: Monetary-fiscal policy to promote steady national economic growth with a stable general price level.

An immediate need is to reduce real interest rates and value of the dollar by fiscal policy emphasizing a more nearly balanced full-employment federal budget. Delaying action until the nation is drifting into recession would be a serious mistake.

"Full employment" now is probably at least seven percent unemployment. Using monetary-fiscal stimulus to reduce unemployment below this level will cause inflation. Reducing unemployment below this level will require a restructuring

of the economy to reduce man-made barriers to employment of marginal workers. I have elsewhere detailed needed structural changes in the economy (Tweeten 1981b).

Problem: Instability

Main Policy instrument: A payment to farmers of \$.30 per bushel to store grain buffer stocks, with no specified acquisition or release price.

The private sector alone will not provide enough buffer stocks in part because of high private discount rates for risk accentuated by export embargoes and other massive government interventions. The simplest and most direct means to augment the private sector and bring stock levels in line with social needs is to provide a government subsidy to the private sector for storing buffer stocks. There is no reason to believe that government mandated acquisition and release prices would be superior to the proposed unmandated private sector decisions of when to store and release stocks.

If nonrecourse loan supports and supply control are terminated as suggested below, an alternative to the fixed payment per unit is to maintain the Farmer Owned Reserve but with a cap. Any unfilled capacity in the Reserve would be prorated to farmers according to their production base.<sup>13</sup>

If augmented reserve stocks are deemed an inadequate instrument to stabilize food supplies, and if reserves in the form of diverted acres are required, then the loan rate needs to be retained. The Secretary of Agriculture needs to be given discretion to adjust the loan rate from year to year so as to obtain the socially desirable reserve capacity in stocks and diverted acres. A three-year moving average of market prices to set loan rates will not provide appropriate reserves.

Intermittent export embargoes imposed for foreign policy and other reasons contribute to our reputation as an unreliable supplier and are a source of instability and cost-price squeeze problems to farmers. Extended provision needs to be made for contract sanctity and for embargo authorization only in times of national emergency.

Rigid or predictable loan rates also contribute to our role of residual supplier by placing a floor under world prices. Competing exporters increase production and sell it in world markets just below our support prices.

Trade policies of other countries influence our agricultural exports in other ways. Many countries, most notably

the Soviet Union and developing countries, pursue policies that discourage domestic production and turn to export markets when supplies are short. Others such as Japan and the nations of Western Europe subsidize agriculture heavily and turn to export markets to dump surpluses. Policies to protect their domestic agriculture insulate their farmers and consumers from world prices, thereby concentrating price adjustments in fewer free markets. Bilateral trade agreements do the same. The result of such policies is more unstable world prices and export markets than would be the case in the absence of such policies.

U.S. trade policies for nonfarm commodities also impact on our farm exports. The notable recent example was U.S. restrictions on textile imports from the Peoples Republic of China in 1983. China retaliated by cutting wheat imports from the U.S.

In short, U.S. farmers have much to gain in stability of farm prices and exports by opening trade channels and allowing markets to work without interference from barriers imposed by public policy at home and abroad.

Problem: Low income

Main Policy Instrument: Income maintenance programs with payments conditioned by income and focused on low-wealth families in poverty.

Commodity programs are a highly cost-ineffective means to raise incomes of the poor. An alternative would be modifications in current welfare programs to provide more benefits to the intact-family working poor--a category not now well served but found frequently among the rural poor.

Problem: Family farm demise

Main Policy Instrument: Direct payments focused on small and mid-sized farms.

Voluntary supply controls have become costly and ineffective. As stated earlier, our price supports and supply controls make this nation a residual supplier in price sensitive export markets. An elastic long-term demand makes sustained supply control counter-productive in raising farm receipts. As indicated earlier, for large and for small farms, supply controls and price supports either are unneeded or fail to provide significant benefit. Middle-size family farms are most at risk. If commodity programs are to help preserve the family farm, a greater share of program benefits must go to mid-size farms. But that is impossible through supply controls that raise market prices for all.



Furthermore, large farms accounting for most farm output must be included to control supply. The "price" of saving the family farm is to end supply control.

If the nation wants to preserve the family farm by focusing benefits, the suggested alternative is to end loan rates and supply control but retain the target price with deficiency payments limited to, say, \$20,000 per operator. Payments would be made only to day-to-day farm operators who share significantly in the returns to risk and management of the farm. Attempts by landlords to circumvent the limitation by dividing holdings would result in more family farms, presumably one objective of farm policy. To avoid the target price becoming a supply price that encourages overproduction, the production base for defining payments would be set the first year of a new program and would remain fixed for the four-year life of the program. Target prices might be some percentage of the past seven-year average of market prices, dropping the high and low year. Or they might be set at the estimated nonland cost of production per acre divided by a three-year moving or projected average yield.

Payment might be graduated with full payment on production up to, say, 30,000 bushels of corn or 25,000 bushels of wheat. Bases above those levels would subtract \$.50 of payment per additional bushel so that large bases would be ineligible for payment. Revenue insurance with the government paying, say, one-fourth of the premium might eventually phase out deficiency payments.

Problem: Environment

Main Policy Instrument: Cropland easements.

The most serious environmental problem in agriculture is soil erosion. To promote soil conservation, the government would purchase crop easements under long-term contract on land subject to severe soil erosion. The farmer could hay or graze the land, but not crop it. An alternative or supplement would be outright purchase of whole farms in areas characterized by high erosion rates, combining purchased farms into hunting and fishing preserves and other recreational areas. Existing conservation programs would be changed to focus on erosion-prone soils.

#### A Transition Program

The shock to the farming economy from immediate implementation of the above commodity program would be severe. A transition program can cushion the shock. This paper presents no transition program in detail, but one feature might

be greater discretion for the Secretary of Agriculture to adjust loan rates. An alternative is a moving past average of market prices to set loan rates on grains until loan rates and production controls are phased out.<sup>14</sup>

A transition program for dairy would feature a price somewhat above market clearing levels on some portion (say for fluid consumption) of milk output, with additional output receiving the market price. Government supports and controls would be terminated and marketing orders would administer a two-price plan with producers no longer receiving a blend price but the market price on additional output. The higher price on the fluid consumption portion would give dairy farmers an assured income; the lower price on additional output would restrain production.

In time all price supports, production controls and other market support interventions would be terminated for all farm commodities, except perhaps for a simple subsidy of, say, \$.30 per bushel to producers of grain who hold buffer stocks and for farm revenue insurance paid for mostly by producers.

#### Summary and Conclusions

Conventional theories explaining farm problems had lost much of their relevance by the late 1970s because the phenomena they proposed to explain (chronic low income, low prices, and low rates of return in agriculture) ceased to exist. Some contend that the farm recession of the 1980s signals a return to extended disequilibrium, excess production capacity, and overcommitment of resources much as characterized the 1950s and 1960s. While it would be reckless to claim full understanding, for several reasons detailed below I judge the current economic difficulty to be transitory instability rather than a return to the chronic low income of the 1930s or chronic excess capacity of the 1950s and 1960s.

(a) The farm economic recession in the 1980s is the combined result of an inflation-induced cost-price squeeze in 1980, unusually favorable weather for crops in 1981 and 1982, and a high real interest rate along with worldwide recession and an overvalued dollar in 1982 and 1983 (Tweeten 1983c). Although not temporary, high real interest rates, a high dollar, and worldwide recession are not permanent. The situation was aggravated by a nine percent increase in input volume from 1975 to 1979 motivated in part by unwarranted expectations of continued farm prosperity brought on by excessive expansion in U.S. and worldwide money supply.

(b) Current excess capacity is approximately five percent of normal output at 55 percent of 1910-14 price parity. This excess capacity, now removed by supply control and stock accumulation, can be eliminated by worldwide economic recovery, a more normal real interest rate, and a more normal value of the dollar in international exchange, domestic economic recovery, and a modest reduction in farm capital resources.

With return of a more normal value of the dollar and worldwide economic recovery, the estimated excess supply of resources would be two percent. The figure is small in relation to excess resource capacity averaging approximately five percent in the 1960s (Tweeten 1979b, chapter 15). Then 40 percent of farm labor was redundant; now the excess capacity is largely adjustable capital rather than inflexible labor resources. It will be much easier to cut back on fertilizer, fuel, machinery, and other purchased inputs (much of it introduced in the 1970s) than it was to reduce mostly labor inputs in the 1950s and 1960s. A disproportionate share of adjustments will occur among mid-size farms. Of course, sustained high government price supports and unfavorable macroeconomic policy could prolong excess capacity and turn a transitory into a fairly permanent problem.

Dissipation of current excess capacity is unlikely to occur before the second half of the 1980s and, once achieved, is unlikely to feature average real farm prices above 1982-83 levels. Adequate-size, efficient farms that account for most of farm output cover resource costs at 50-55 percent of parity, and prices will tend to cover costs on these farms. This more or less normal price level will be a disappointment for most farmers and a genuine hardship to many mid-sized family farms.

(c) Projections indicate productivity gains will average 1.5 percent annually in the next decade or more (Tweeten 1983c). If U.S. farm exports increase three percent per year, demand will advance as rapidly as supply due to productivity growth at the above rate. In view of the nine percent annual increase in our farm exports in the 1970s and the five to six percent annual increase in the 1950s and 1960s, export gains averaging three percent or more seem attainable in the next decade. The challenge is to get through the current situation to this more favorable long-term scenario.

(d) Land was not overpriced in the 1970s based on reasonable expectations of trends in demand and supply for farm output (Tweeten 1981a). Those expectations radically altered in the 1980s and land prices adjusted downward accordingly. The downward trend was halted by the payment-in-kind (PIK) program in 1983. By the second half of the 1980s

land prices may again resume an upward trend approximately at the same average rate as the general price level in the economy as a whole. In the unlikely case that investors view eight percent real interest rates of 1984 as permanent, land prices could fall up to half, however. Lower real interest rates in the second half of the 1980s will help reduce prices paid by farmers and cash-flow problems.

(e) A notable lesson from the past is that the market works, and farm resources do adjust, toward economic equilibrium, albeit slowly. The once massive resource disequilibrium, mainly labor, had largely disappeared by the late 1970s.

(f) The farming industry is in transition from a triple economy of small, medium, and large farms to a dual economy highlighted by a few large farms accounting for most output and by many small part-time operations accounting for most farms.

(g) The two most serious economic problems facing commercial farmers are cash-flow and instability. Sound monetary-fiscal policy is essential to address the cash-flow problem. Macroeconomic policies of this nation have played a major role in worldwide economic recession, high real interest rate, and high value of the dollar which resulted in a sharp fall-off of export demand. Our macroeconomic policies have also contributed problems of cost-price squeeze, real wealth redistribution, and economic instability.

(h) American agriculture has been internationalized. Macroeconomic and trade policies are interdependent among nations. We must not be deceived, however. Today's international trade problems trace in no small part to our misguided domestic macroeconomic policies. Integrated world capital and trade markets mean that high real interest rates in the U.S. cause real high interest rates abroad. Protectionist trade policies not only are costly to countries which pursue them but also to other countries by creating more unstable markets and by restraining gains from trade in general.

Greater international cooperation and coordination is required in macroeconomic, trade, financial, and commodity policies. As the world recovers from the economic recession of the early 1980s, it is imperative to begin a new round of trade and macroeconomic policy negotiations. Such negotiations would center on reducing trade barriers and coordinating macroeconomic policy to promote steady growth without substantial inflation. As the leading world economic force, the United States needs to lead world economic reform.

(i) Decreasing-cost (increasing returns to size) and cash-flow theories of farm problems help explain why current farming returns will perennially appear to be low even when returns are in equilibrium and at parity with those elsewhere. Treating symptoms is sometimes necessary but can make the patient worse. For example, treating the cash-flow problem experienced by many indebted commercial farmers as a chronic low-return problem to be remedied with the medicine of higher price supports would increase returns on farmland above returns on alternative investments. Higher returns would be bid into farmland values. The undesirable outcome would be to provide a windfall gain to landowners, transfer dollars from lower-wealth taxpayers to higher-wealth landowners, and create even greater cash-flow burdens to beginning operators purchasing land at inflated prices. Confusing equilibrium low returns of most farmers (who as noted in Figure 1 are producing and marketing at higher costs than some large operators) with an industry-wide low return problem to be remedied by across-the-board price supports for all farmers would create similar undesirable repercussions.

(j) Farm commodity programs designed a half-century ago for a chronic low income sector are inappropriate for today's internationalized agriculture. Commodity programs primarily address the instability problem in agriculture. But they can do so at less Treasury cost, less interference in markets, and less interference in farmers' decisions. Two aspects of commodity programs seem most relevant, providing "safety net" income security to mid-size family farms, and providing price and quantity stability through buffer stocks of benefit to producers and consumers. Full-time mid-size family farms are most at risk, and a greater share of commodity program benefits must be directed to them if the goal is to preserve the family farm at acceptable Treasury outlays. A direct payment program without price supports or supply controls would provide several desirable features. The program would provide direct payments of no more than \$20,000 per recipient to active operators.

To reduce price and supply variability troubling both farmers and consumers, a Farmer Owned Reserve with a cap or, preferably, a simple direct subsidy of say \$.30 per bushel of grain would be provided to farmers who store grain.

(k) The private market alone will not provide socially desirable levels of natural resource conservation of benefit to consumers as well as farmers. In the case of water conservation, however, the market price system needs fuller application to allocate water to uses with the highest value.

To conserve soil, the suggested program would feature

government purchase of long-term easements for cropping rights on erosion-prone land. The farmer could hay or graze the land but could not crop it for the life of the easement. An alternative or supplement would be outright purchase of contiguous whole farms in erosion prone areas, converting the land into a wildlife refuge, hunting and fishing preserve, or other recreational use. Thus, the conservation easements would serve three purposes: (1) conserve soil, (2) hold some reserve production capacity off markets as insurance for later use when needed, and (3) provide recreational benefits.

## NOTES

1. Professional paper of the Oklahoma Agricultural Experiment Station. Comments of John Ikerd and Daryll Ray on an earlier draft of this manuscript are much appreciated.
2. Crop output fell 28 percent from 1982 to 1983 and feed grain output was cut almost in half.
3. Normal production was calculated from equations estimated with annual data for 1950 to 1982 (Tweeten, March 1983). Production removed by diversion programs was estimated using yield and output data from individual commodities and is apportioned among commodities essentially as shown in the last rows of Table 1. Another procedure yielding the same result is to multiply the elasticity of production for land, .23, by the 25 percentage reduction in land input from 80 million diverted acres, giving  $(.23 \times .25) = .06$  or six percent of output removed by diversion programs.

If the excess capacity is expressed for crops alone, it is 10 percent of normal crop output. The \$30 billion cost of farm programs in 1983 was unusual, a more normal cost for maintaining farm income is \$25 billion using direct payments with no limitations, \$15 billion with an acreage reduction program, and \$5-\$10 billion with a direct payment program with a \$20,000 limitation to maintain incomes of only small and mid-sized farms as suggested later.

4. Stocks of wheat and dairy products remained well above needed levels in 1983.
5. If  $B$  is the price elasticity of demand for farm output, the elasticity of price with respect of a one percent increase in output is  $F = 1/B$ , of gross receipts with respect to output is  $F + 1$ , and of net farm receipts with respect to output is  $(F+1)(TR/NR)$  where  $TR$  is total receipts and  $NR$  is net receipts. Thus, the percentage reduction in net farm income, especially after subtracting direct payments, is much greater than the reduction in gross receipts.
6. Those who advocate immediate release of excess capacity on the market on the premise that a large quantity and lower price will increase farm receipts risk implementation of the agricultural equivalent of the Laffer Curve.

The allure of the Laffer Curve, which wrongly predicted that a decrease in federal income tax rates would increase the tax take, bears much blame for current federal deficits, high real interest rates, and high value of the dollar abroad.

7. Farmers frequently use the parity ratio (defined as the current ratio of prices received to prices paid by farmers and expressed as a percentage of that in the 1910-14 period) as a measure of economic health. The inadequacy of that measure is apparent. For 1981 when the parity ratio was only 61 percent of the 1910-14 average, disposable personal income per capita of farm people averaged 89 percent that of nonfarm people. Real incomes per person were probably nearly comparable between the two sectors in that year if adjustments were made for cost of living and the value of farming as a preferred lifestyle. With the same parity price ratio in the early 1930s, farm income per capita averaged only about one-third that of nonfarm persons. If personal computers were priced at 100 percent of 1960 parity today, consumers would pay 100 times current prices for them.

Using the same real volume of resources (though a very different mix) as in 1910-14, farmers now grow nearly three "blades of grass" where one grew before as apparent in aggregate productivity. It makes no sense to pay as much in real terms for each "blade of grass" as paid in 1910-14 when today only one-third as much real resource input is required to produce it. The logic underlying a call for 90 or 100 percent of 1910-14 parity today is as compelling as a call for operators to farm precisely as they did in the 1910-14 period. The real price of farm output tends to decline as the real cost of production declines.

8. Income from all sources may be becoming more unequal among all farms, suggesting that growing inequality of income within economic sales classes more than offsets growing equality among sales classes.
9. Alternative, more easily measured, economic indicators support conclusions from data showing favorable long-term rates of return to farm equity. Most farm equity capital is real estate as noted in Table 3. Rents less property taxes as a ratio to land values show current returns on farmland comparable to those calculated for equity capital.



10. A growing share of output going to the more price elastic export market relative to the price inelastic domestic market has increased output demand elasticity over time. But short-run demand and short-run supply of farm output remain price inelastic. Hence, less output raises farm prices and receipts in the short run. A notable exception is when large stocks are accumulated under government programs. Programs holding reserve capacity tend to make aggregate supply including stocks highly elastic at release prices and demand highly elastic at acquisition (loan) prices. This price structure creates stability but at prices unacceptably low to producers. Market supply and demand are elastic in the long run so that supply controls imposed for extended periods do not raise farm receipts (Tweeten, December 1983b).

11. Farms with sales of over \$500,000 covered all resource costs at farm prices only 46 percent of 1910-14 parity. This finding is misleading, however, because many of these farms depended on marketing order pricing and specialty crops not characteristic of other farms. Hence a more realistic cost per dollar of output and parity ratio is an average for the largest two classes of farms.

Costs for all farms are calculated for normal real interest rates (nominal less capital gains) of eight percent on short-term capital and five percent on long-term capital, including equity. The real resource cost estimates for 1982 are similar to those for 1981 (Tweeten, March 1983c), hence appear not to vary greatly from year to year.

12. Real exchange rates have increased only for wheat since 1971. Rates for aggregate farm exports were nearly the same in 1983 as in 1971 (Figure 2). Confidence in the dollar as a secure currency has made the dollar the reserve currency of the world. This has contributed to the strong dollar at a cost to U.S. farmers in reduced agricultural exports.

13. It is unwise to cap the Farmer Owned Reserve if nonrecourse loans are retained. Stocks accumulated through default on nonrecourse loans preferably are held by farmers under the Reserve than by the government under the Commodity Credit Corporation.

14. The success of this program in soybeans may mislead proponents of the moving average price. Soybeans are unique because of strong, increasing export demand; and excess capacity, when present, is removed by grain and cotton programs.

## REFERENCES

- Banks, Vera and Mills, Karen. "Farms Population of the United States: 1982." Series P-27, No. 56. In U.S. Bureau of the Census, Current Population Reports. Washington, D.C.: U.S. Government Printing Office, November 1983.
- Cochrane, Willard. Farm Prices: Myth and Reality. Minneapolis: University of Minnesota Press, 1958.
- Dunmore, John and Longmire, James. Sources of Recent Changes in U.S. Agricultural Exports. Staff Report No. AGES 831219. Washington, D.C.: USDA Economic Research Service, January 1984.
- Heady, Earl O. A Primer on Food, Agriculture, and Public Policy. New York: Random House, 1967.
- Johnson, Glenn and Quance, C. Leroy. The Overproduction Trap in U.S. Agriculture. Baltimore: Johns Hopkins University Press, 1972.
- Rogers, Cheryl E. "Measuring the Perceived Quality of Life of Farmers in East Central Oklahoma." Unpublished M.S. thesis, Oklahoma State University, 1983.
- Tweeten, Luther. "Causes and Consequences of Structural Change in the Farming Industry." Paper presented to Food and Agricultural Committee of the National Planning Association meeting in Des Moines, Iowa, November 1983a. (To be published by the National Planning Association.)
- \_\_\_\_\_. "Economic Instability in Agriculture." American Journal of Agricultural Economics, 65 (December 1983b): 922-31.
- \_\_\_\_\_. "Excess Farm Supply: Permanent or Transitory?" In Proceedings for the National Agricultural Policy Symposium, pp. 35-49. Columbia, MO: Department of Agricultural Economics, University of Missouri, March 1983c.
- \_\_\_\_\_. "Farm Commodity Prices and Income." In Consensus and Conflict in U.S. Agriculture, edited by Bruce Gardner and James Richardson, Chapter 2. College Station, TX: Texas A & M University Press, 1979a.

Tweeten, Luther. "Farmland Pricing and Cash Flow in an Inflationary Economy." Research Report No. P-811. Stillwater, OK: Agricultural Experiment Station, Oklahoma State University, June 1981a.

\_\_\_\_\_. Foundations of Farm Policy. Lincoln: University of Nebraska Press, 1979b.

\_\_\_\_\_. "Impacts of Federal Fiscal-Monetary Policy on Farm Structure." Southern Journal of Agricultural Economics, 15 (July 1983d): 61-68.

\_\_\_\_\_. "Policy to Control Inflation and Revitalize an Underachieving Economy." In Proceedings of Farmers Agricultural Policy Conference, edited by Keith Searce, pp. 1-20. Stillwater, OK: Cooperative Extension Service, Oklahoma State University, March 1981b.

\_\_\_\_\_. "Prospective Changes in U.S. Agricultural Structure." In Food and Agricultural Policy for the 1980s, edited by D. Gale Johnson, pp. 113-46. Washington, D.C.: American Enterprise Institute, 1981c.

\_\_\_\_\_. "Resource Conservation and Production Technology." In Research in Domestic and International Agribusiness Management, edited by Ray Goldberg, pp. 39-58. Greenwich, CT: JAI press, 1983e.

\_\_\_\_\_ and Huffman, Wallace. "Structural Change." In Structure of Agriculture and Information Needs Regarding Small Farms, Part 1. Washington, D.C.: National Rural Center, 1980.

\_\_\_\_\_ and Quance, C. Leroy. "Positivistic Measures of Aggregate Supply Elasticities: Some New Approaches." American Journal of Agricultural Economics, 51 (December 1969): 342-52.

U.S. Department of Agriculture. Economic Research Service. Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1982. Washington, D.C.: U.S. Government Printing Office, October 1983.

\_\_\_\_\_. A Time to Choose: Summary Report on Structure of Agriculture. Washington, D.C.: U.S. Government Printing Office, January 1981a.

\_\_\_\_\_. Economic Research Service. Farm Real Estate Market Developments. Washington, D.C.: U.S. Government Printing Office, August 1981b.

U.S. Office of the President, Council of Economic Advisors, Economic Report of the President. Washington, D.C.: U.S. Government printing Office, 1984.