

Farm Structure: A Policy Issue for the 1980s

By Marvin Duncan and Ann Laing Adair

The history of farming in the United States since World War II has been characterized by rapid and continuing change. Not only have the institutions, technology, and management practices associated with farming changed, but the farm structure itself has undergone a marked transition. Specifically, the ownership and operatorship of U.S. farms have become much more concentrated. For example, the U.S. now has fewer than half the number of farms it had just before the start of World War II. Moreover, two-thirds of the nation's food supply is now produced by only 10 per cent of the nation's farms. And many of the remaining smaller farms have become only part-time operations or rural residences.

The increasing concentration in farm structure has recently attracted the attention of government policymakers. Secretary of Agriculture Bob Bergland, calling for a national dialogue on farm structure, has said, "It is my hope that wide-ranging, informed discussion will give us a better understanding of our options and enable us to choose wisely among

them."¹ To further that discussion, this article outlines the recent changes in U.S. farm structure, identifies the major forces behind these changes, and suggests some major policy issues likely to emerge from the dialogue.

THE CHANGING FARM STRUCTURE

The trend toward concentration in farm ownership and in the operatorship of farms is of central importance to a discussion of farm structure. A number of agricultural data series serve as barometers of the concentration that has occurred since World War II.

Farm Numbers

While the number of farms in the U.S. has declined since 1930, the pace of the decline has increased substantially since World War II. Moreover, the adjustment has proven to be a continuous one. Farm numbers declined by more than 54 per cent between 1945 and 1979—from 5.9 million farms to fewer than 2.7

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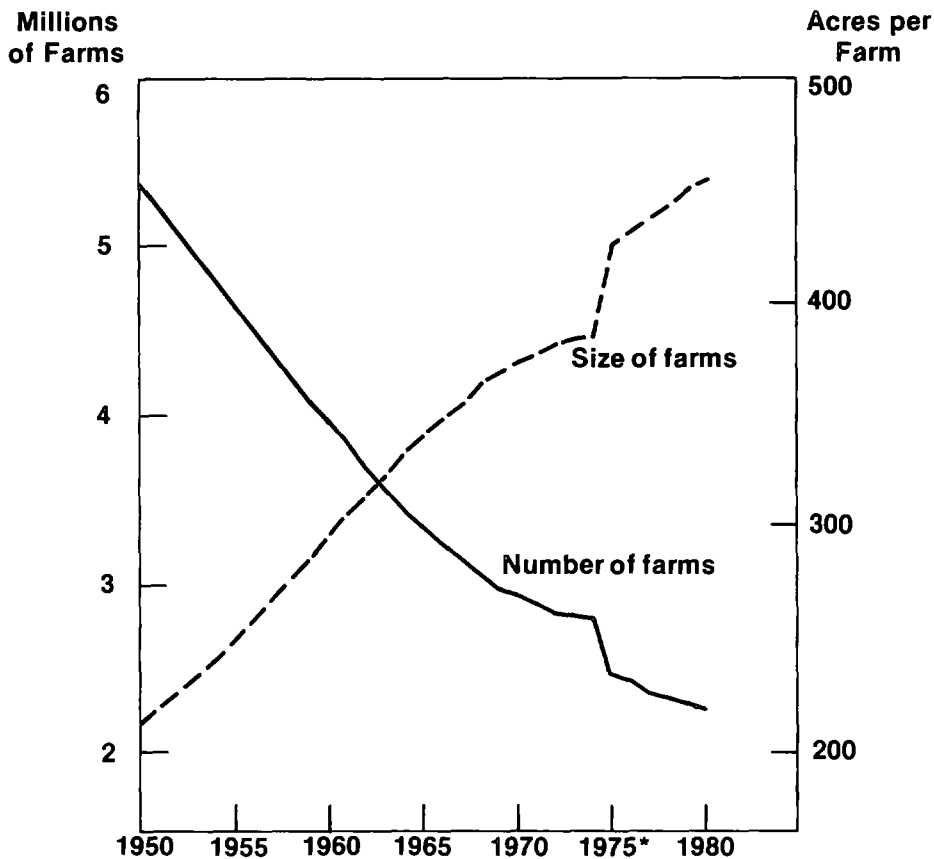
¹ Bob Bergland, Secretary of Agriculture, *Structure Issues of American Agriculture*, U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, Agricultural Economic Report 438.

million. Currently, almost a third of today's farms are very small, producing annual sales of less than \$2,500, and can be characterized as primarily rural residences.

As farm numbers have declined, there has been an increase in the average size of farms because most of the land from farms that have

ceased to exist has been absorbed into existing farms (Chart 1). Average farm size has increased from 196 acres in 1945 to 450 acres in 1979. Concentration of land holdings, greatest for rangeland, has increased rapidly for harvested land as well. In 1964, farms of 1,000 acres or more harvested about 70 million acres of

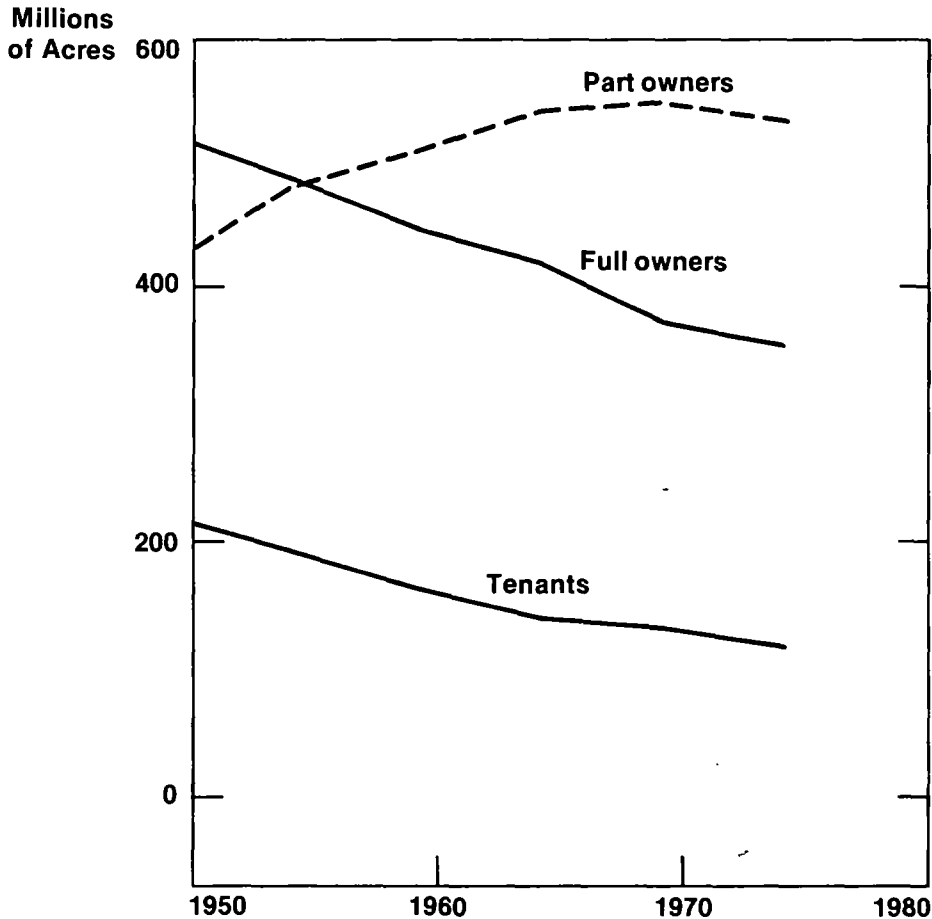
Chart 1
NUMBER OF FARMS AND NUMBER OF ACRES PER FARM
UNITED STATES, 1950-1980



SOURCE: USDA, ESCS, *Agricultural Statistics*, various years.

*Beginning with 1975, a farm is defined as a place which has annual sales of agricultural products of \$1,000 or more. Before 1975, a farm was defined as a place of 10 or more acres that had annual sales of agricultural products of \$50 or more or a place of less than 10 acres that had annual sales of \$250 or more.

Chart 2
LAND IN FARMS, BY TENURE OF OPERATOR
UNITED STATES, 1950-1974



SOURCE: U.S. Census of Agriculture, Vol. II, Part 3, 1974, p. I-10.

cropland. Ten years later, farms in this same size class harvested 100 million acres.

Tenure Patterns

As farms have grown larger and fewer in number, patterns of tenure have changed as well. Part owners—those who both rent and own the land on which they work—have increased as a proportion of total farmers. Also,

over half of all the land in farms is now in units operated by part owners (Chart 2). The proportion of land in the hands of both full tenants and full owners has consistently declined since 1950.

Despite changing tenure patterns, about 89 per cent of all farm businesses were still sole proprietorships in 1974. Even among the corporations in farming, almost 97 per cent were

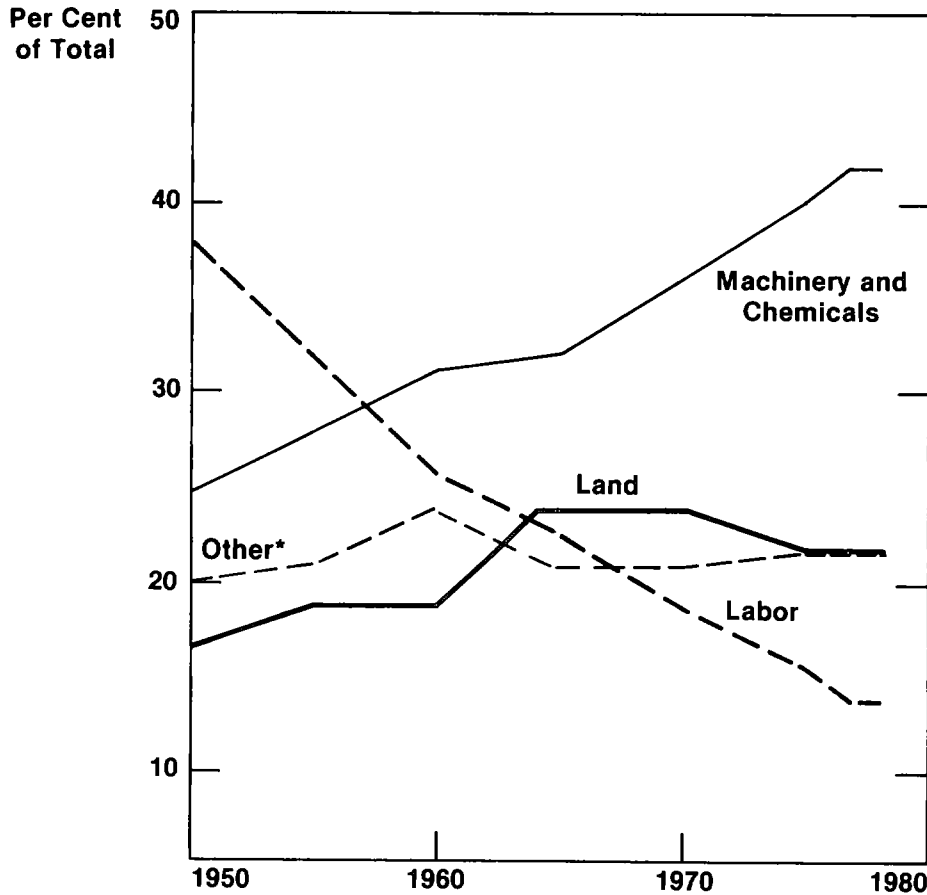
privately held and three-fourths were classified as family corporations.

Shifts in Resource Use

Shifts in resource use patterns by farmers have both caused, and been the result of, farm structure changes. Labor has declined from 40

per cent of all resources used in 1950 to 14 per cent in 1977. While labor use, measured in man-hours, is presently less than one-third that of 1950 and continues to decline, use of other resources has increased. Use of capital—including machinery and chemicals—has increased from 25 per cent of

Chart 3
RESOURCES USED IN FARMING
UNITED STATES, 1950-1978



SOURCE: USDA, ESCS.

*"Other" category includes taxes, interest, feed, seed, livestock purchases, and miscellaneous.

total resources used in 1950 to 42 per cent in 1977 (Chart 3).

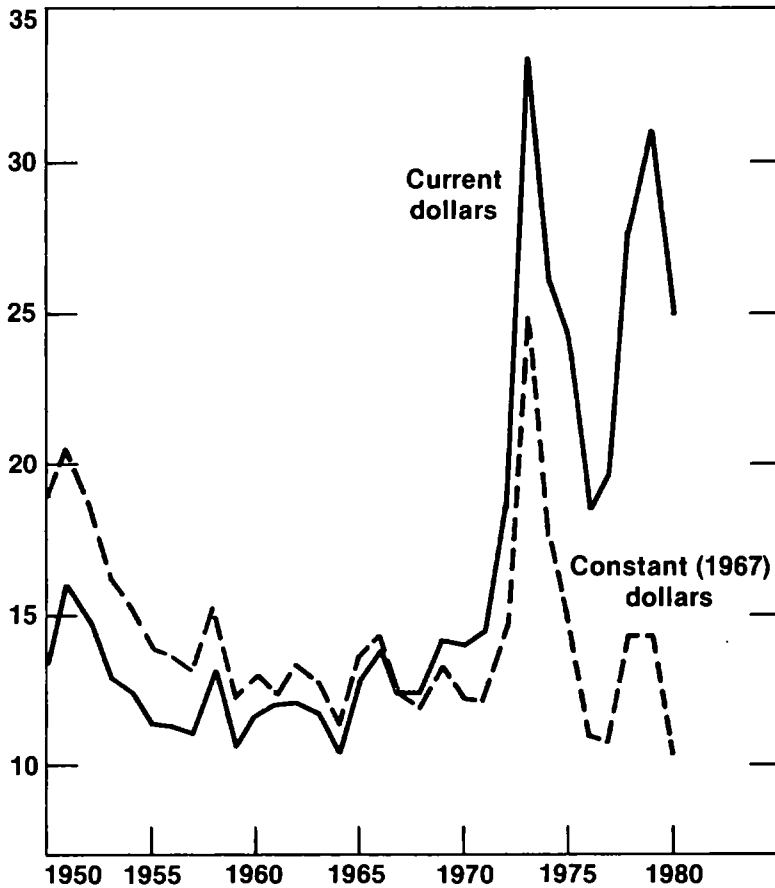
Farm Income and Assets

Net farm income has become much more volatile during the past decade. At the same time, inflation has eroded much of the potential gain in purchasing power associated with higher

income levels. Chart 4 illustrates the changes in net farm income since 1950 in both current and constant dollars. Over the same period, income to farm families from off-farm sources has grown substantially. Most of this income is captured by smaller farmers, greatly increasing their ability to remain in farming. In 1978, 59 per cent of the \$34.3 billion off-farm income

Chart 4
NET INCOME FROM FARMING
UNITED STATES, 1950-1980

Billions of Dollars



SOURCE: USDA, ESCS, *Agricultural Statistics*, various years.

went to farms with annual cash receipts from farm marketings of \$5,000 or less.

Increasing farm asset values have spurred concentration in farm structure. Since 1950, farm real estate values have increased at rates in excess of price inflation and far in excess of rates of capital appreciation in most other non-farm assets. Farmers owning real estate were able to use this increased value as collateral in purchasing additional land. Off-farm investors also were attracted by the favorable rates of appreciation. But new entrants into farming and those without land have found it increasingly difficult to purchase and service the debt on farmland.

Cash Receipts from Farm Marketings

Distribution of cash receipts has favored larger farms in recent years. The proportion of farm products sold by farms with sales of \$100,000 or over has increased dramatically. In 1970 these farms—1.9 per cent of all farms—received 33.4 per cent of the cash receipts from farming. By 1978, this category—7.0 per cent of all farms—received 56.3 per cent of cash receipts. By 1978, those farms with cash receipts of over \$200,000 received 39.3 per cent of all cash receipts from farming.²

Part of the growth of farms with annual sales of more than \$100,000 is more exaggerated than real. Since current dollar—rather than inflation adjusted—sales are used for comparison, price inflation during the past decade has pushed many farms into the \$100,000 sales category with no change in acreage or in real purchasing power. This is evidenced by the changes over the past 10 years in the indices of prices paid and received by farmers. While the index of prices received by farmers has increas-

² U.S. Department of Agriculture, *Farm Income Statistics*, ESCS, Statistical Bulletin 627, October 1979, Table 2D.

ed 110 per cent since 1970, the index of prices paid has increased 114 per cent.

In brief, the data indicate that farm structure has become more concentrated since World War II, and the most recent evidence suggests that this concentration may be accelerating. If unchecked, this trend will likely lead to a U.S. farm structure composed of relatively few very large farms producing most of the nation's food and fiber, while most other farms will be very small and dependent upon off-farm income for survival.

THE FORCES OF CHANGE

This section identifies the forces that have contributed to the recent changes in farm structure, forces that can be put into one of seven major classifications.³

Inflation

Mainly due to generalized inflation, land prices have risen sharply in recent years, thereby increasing the wealth of landholders (Chart 5) and spurring their demand for additional land. Additionally, land has been bought by people outside agriculture seeking a long-run hedge against inflation. Farmland prices have thus been bid up to a level at which, during the early years of ownership, the income from the land purchased often is not adequate to service the debt incurred. Outside income, therefore, is required to bridge the gap. Farm input costs also have responded quickly to price inflation, lowering the profit margins in agriculture and creating pressure for government farm subsidies. In turn these subsidies have reinforced the demand for farmland.

³ The discussion of these classifications draws heavily upon an analysis by Lyle P. Schertz, "The Major Forces," in Lyle P. Schertz and others, *Another Revolution in U.S. Farming*, USDA, ESCS, Agricultural Economic Report 441, December 1979, pp. 42-75.

Agricultural Exports

Rapid increases in farm exports, especially after 1970, have resulted in higher product prices and much greater volatility. Farmers have reacted to these price trends by buying larger farm equipment and more land, using greater amounts of credit in the process. Also, the increased demand for wheat, feed grain, and soybean exports has led to greater production specialization on farms, which has enabled farmers to increase the size of their operations without increasing labor input.

New Technologies

New technologies reducing the per-unit cost of farm production have found a ready market in agriculture. Capital goods incorporating new technologies, such as four-wheel-drive tractors or new plant hybrids, have often required additional production inputs or a larger scale of operation to fully utilize the yield increasing, or

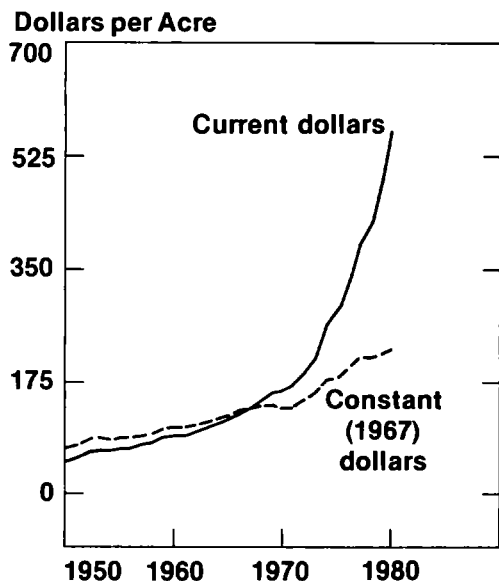
cost reducing, potential of the technology. Increased farm profitability during periods of the 1970s has provided a powerful incentive for farmers to purchase new technology, and for business firms to develop and market such technology. Thus, driven by technological change, the scale of agricultural production needed to achieve near minimum per-unit cost of production has been increasing.

Nonfarm Employment Opportunities

U.S. nonfarm employment opportunities have been plentiful since World War II. Consequently, people earning an inadequate income in agriculture have often been able to leave the farm for better paying jobs in the city.

For much of the post-war period, labor has been a relatively higher cost and less reliable input into agricultural production than has capital. Hence, farmers have added more capital to their resource mix. But new capital equipment purchases have often more than offset the labor they were intended to replace. Therefore, farmers have attempted to add more land in order to fully utilize their equipment. Consequently, a continuous cycle of demand for more equipment and more land has been established.

Chart 5
FARM REAL ESTATE VALUES
UNITED STATES, 1950-1980



Credit Expansion

Farmers have greatly expanded their use of credit since World War II. Five years after the war ended, in 1950, total farm debt was \$12 billion. By 1980, total debt had grown to \$157 billion. Even when adjusted for inflation, farm debt measured in 1967 dollars increased 2.8 times during this 30-year period. Farmers have increasingly been willing to use financial leverage in their businesses. Indeed, the high rate of inflation during the 1970s has greatly benefited debtors and has allowed debt repayment in ever cheaper dollars.

The supply of credit has generally been sufficient to meet the increased demand in

agriculture. This is true in part because the attitude of lenders toward risk in agriculture has become more favorable. New means of intermediating loan funds from money market centers have been developed. And government-supplied credit has increased markedly through the Commodity Credit Corporation (CCC), the Small Business Administration (SBA), and the Farmers Home Administration (FmHA). The availability of credit on terms farmers can afford has greatly increased their demand for equipment and farm real estate.

U.S. Farm Commodity Programs

Both farm product prices and farmer incomes have been supported by a variety of government programs—CCC nonrecourse grain loans, cropland diversion, target price payments, marketing orders, etc. On balance, the programs have increased the quantity of farm assets, the annual capital expenditures by farmers, and land prices. The quantity of labor used in farming has been reduced and net farm income has been stabilized as income peaks and valleys have been reduced. Since farm program benefits have mostly been tied to acres farmed or quantities of products produced, most benefits have gone to larger, well capitalized producers. Thus, farm programs have tended to encourage increasing scale in U.S. agriculture.

Tax Rules

A number of tax rules tend to encourage larger farms, investment in farming by non-farm people, and the corporate structure of farms. Farmers can adjust their taxable income by choosing the method of accounting—cash or accrual—to be used for tax purposes; by counting as current expenses for tax purposes their expenditures for developing orchards, ranches, and breeding cattle; and by treating the gains from sales of purchased and breeding livestock as capital gains after holding the livestock for a

specified period. Some special advantages are available under estate taxes as well, such as valuing assets at use value, rather than market value, and deferring estate tax payments. Finally, income tax rate differentials often favor incorporated, over unincorporated, farm businesses. Generally, these benefits tend to lower the level of taxes on farm income and assets, increasing the rate of return on and the demand for the farm assets.

While the foregoing set of factors is not exhaustive, it does capture most of the forces of change. These forces do not act independently to affect change but are interrelated. For example, export market growth increases the demand for new technology, while the adoption of new technology can stimulate export market development by increasing product output or reducing product cost.

SORTING OUT THE ISSUES

While there is general agreement as to the major forces of change having an impact on farm structure, it is difficult to identify direct causal relationships. Moreover, it is not immediately apparent that something ought to be done to control the direction and the speed of changes in farm structure.

Four public policy issues pertinent to the recent changes in farm structure have been selected for discussion in this article. They are not the only issues that can be identified, but they are believed to be the issues of major importance to agricultural producers and to the general public. They also serve to illustrate the complexity and interrelationships of farm structure issues.

The Concentration of Farm Assets and Income

Farm assets and income have become increasingly concentrated, and the trend appears to be accelerating. In the decade ending in 1978, the proportion of land in farms with \$100,000

in sales almost doubled and the value of that land increased more rapidly than the value for all farmland. Moreover, those large farms held 30 per cent of all farm assets and 28 per cent of agriculture's net worth, although they represented only 7 per cent of all farms. They also received over 36 per cent of realized net farm income.

Farms with \$100,000 in annual sales may seem huge. However, that size may not be out of proportion to what most people consider a family farm. It should be recognized that the annual sales of a farm business approximate its gross income before either the variable or fixed costs of farming are subtracted. Net income will account for only a small proportion of gross income. Additionally, farm product prices have increased substantially in recent years. Thus, it is quite possible that in 1980 a relatively small family farm harvesting only 320 acres of corn could produce annual sales of \$100,000.

A driving force in farm enlargement is the effort to move toward a scale of farming where the per-unit cost of output is minimized. Based on research of the late 1960s, which is probably still valid in 1980, agricultural economists have generally concluded that most meaningful reductions in cost can be captured by a farming operation large enough to provide full employment for one or two men. Chart 6 illustrates this point by outlining theoretical short-run average cost curves for varying sizes of farms, measured in dollars of output.⁴

⁴ The resources used by the one-man farm do not stay constant over time. To the contrary, as new labor-saving, cost-reducing, or output-increasing technologies are adopted, the mix of land, labor, and capital used by a farmer can change, and the cost curves shift. Typically, however, the shifts of the curves have been downward and to the right so that the annual dollar sales for the optimum one-man farm tend to increase over time—even without price inflation. On balance, it seems likely that new research would reaffirm the efficiency of the fully employed one- or two-man farm.

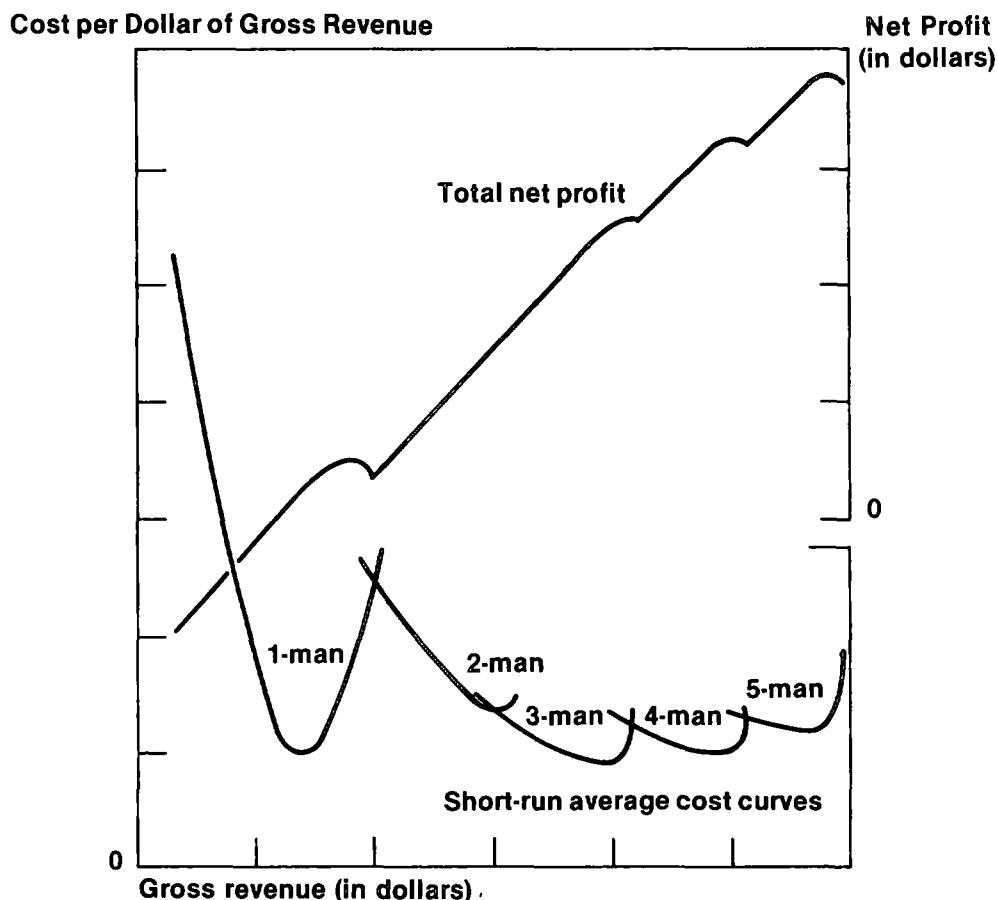
Why then do many farms expand beyond the one-man size? Again, an examination of the short-run average cost curves and the profit curve provides the answer. Even though the per-unit cost of production declines only slightly as the farm size expands, the cost curves do not turn sharply upward until a very large farm size is reached. Thus, there is no inherent economic limitation on farm size, and, within a broad range, size is indeterminate. With the low points on the cost curves relatively flat as the size of the farm increases, total net profit increases along with increasing size. Consequently, farmers wishing to increase net income often choose to increase farm size.

The data on increased concentration in farming raise the question of whether it is appropriate to vest the ownership of agricultural resources and the control of production in fewer and fewer hands. Different value systems may give rise to different answers, but the question may be more appropriately answered in terms of economic performance of the farms in the agricultural sector. On that point, it seems clear that efficiently operated one- or two-man farms capture most of the significant economies of scale for most kinds of agricultural production. Clearly, the answer is complicated by considering the impact of farm size on the community and the rest of the environment in which the farms exist. Moreover, it may be appropriate to consider the impact of increasing farm scale on the barriers to entry and exit in agriculture. Do the large farms prevent new entrants from obtaining sufficient land for an efficient farm operation? Should large farms be passed intact to succeeding generations? If so, how should this transfer be financed?

Government Policy Bias

Some people argue that government farm policy has contributed to the emergence of larger farms. As evidence, they point to the

Chart 6
NET PROFIT CURVES COMPARED WITH AVERAGE COST CURVES



SOURCE: USDA, ESCS, *Structure Issues of American Agriculture*, Agricultural Economic Report 438.

distribution of farm program benefits. Because program benefits are generally proportional to farm acreage or production, large farms receive a very large share of the benefits. About 58 per cent of the 1978 farm program benefits were captured by less than 22 per cent of the nation's farms (Table 1). And 7 per cent of the largest farms received over one-fifth of all payments.

Benefits from government programs are largely capitalized into the value of farm real

estate.⁵ Thus, as long as program benefits are based on acreage or production—with largely ineffective payments limitations—most of the resulting increases in asset values accrue to larger landholders.

Many observers also believe that the pro-

⁵ Michael Boehlje and Steven Griffin, "Financial Impacts of Government Support Price Programs," *American Journal of Agricultural Economics*, Vol. 61, No. 2, May 1979, pp. 285-296.

gressive tax structure in this country biases government policy toward large-scale farms. That is because a dollar of deductible production cost or interest expense will shelter more income at the margin for large farms with both higher incomes and higher marginal tax rates

than for small farms. Thus, as long as production expenses and interest costs on land and equipment loans are deductible in determining taxable income, this bias will tend to continue.

Policymakers have searched for ways to neutralize the bias of government policy toward

Table 1
SIZE AND DISTRIBUTION OF FEDERAL FARM PROGRAM PAYMENTS
(Dollars per Farm)

Farm Size Class	1970	1973	1975	1977	1978
\$100,000 Sales and Over	\$9,263	\$4,985	\$1,179	\$2,204	\$3,476
Percent of Payments	14.2	26.2	20.4	19.6	21.5
Percent of Farms	1.9	4.8	5.1	6.0	7.0
\$40,000 to \$100,000 Sales	\$4,056	2,135	739	1,770	2,800
Percent of Payments	19.4	25.5	28.7	33.9	36.0
Percent of Farms	6.1	11.0	11.3	12.9	14.6
\$20,000 to \$40,000 Sales	\$2,583	1,410	539	1,280	2,012
Percent of Payments	22.7	17.8	21.6	22.6	21.5
Percent of Farms	11.1	11.7	11.7	11.9	12.9
\$2,500 to \$20,000 Sales	\$1,111	638	202	407	647
Percent of Payments	36.3	24.8	24.7	20.2	18.2
Percent of Farms	41.1	35.9	35.5	33.9	32.0
Less than \$2,500 Sales	\$ 235	145	37	71	92
Percent of Payments	7.4	5.7	4.6	3.7	2.8
Percent of Farms	39.8	36.6	36.4	35.3	34.3
Total Government Payments					
Billions of Dollars	3.7	2.6	0.8	1.8	3.0
Millions of Farms	2.9	2.8	2.8	2.7	2.7

SOURCE: U.S. Department of Agriculture, Farm Income Statistics, July 1979.

larger farms. The alternatives presented usually involve size limitations on program benefits, tax deductions, and tax credits. But thus far, policymakers have been unwilling to sharply reduce the proportion of benefits accruing to larger farms, and changes in the tax codes are difficult to accomplish. Indeed, the debate must decide whether government policy ought to be corrected before the task of how to make the adjustment can be addressed.

Returns from Public Investment in Agriculture

Ensuring a bountiful supply of reasonably priced food for American consumers is an obvious reason for government farm programs and other public investment in agriculture. Public policy has clearly been successful in that respect. Americans spend about 16.5 per cent of their disposable personal income on food, a smaller proportion than is spent by the citizens of all other industrial countries.

Not only are Americans well fed at relatively low cost, but the products from about one of every three harvested acres are available for sale to world markets. In both volume and dollar value, U.S. agricultural exports are expected to set new records in fiscal 1980, continuing a decade of rapid growth. These exports will earn as much as \$40 billion in foreign exchange for the United States during fiscal 1980.

If public investment in agriculture provides benefits in the form of low-cost food and in support for the U.S. balance of payments, why should there be questions about the efficacy of such an investment? An examination of the economies of scale in farm production yields some insights. Most studies examining economies of scale conclude that per-unit costs of production decline sharply as farm scale increases, out to about the size farm that fully employs one or two men (Chart 6). Thus government policy to increase farm size to that scale could result in lower farm product costs to

U.S. consumers. However, beyond that size range there is apparently little payoff in lower costs. Hence, public subsidies to larger farms can be questioned.

Another line of reasoning suggests that government must underwrite part of the risk in agriculture to prevent disruption of the food supply. This argument has some validity if policy is oriented toward reducing hardship on individual farmers. But there is little evidence to indicate that the nation's food supply has been jeopardized by either intermittent short-falls in agricultural output or periodic declines in farm income.

Another argument sometimes made is that the buying power of farmers must be protected to stabilize rural economies. Indeed, there do appear to be some costs to rural communities as a result of falling farm income. However, there are also costs to communities as farm size increases beyond the point necessary for near minimum cost in food production. These costs result as some communities grow and others decline in response to changing trade patterns caused by changes in farm structure.

Finally, if government resources are finite, the criterion of a positive benefit-cost relationship for public investment is a necessary, but not a sufficient, condition to justify such an investment. To maximize public returns, investment must be in those projects with the greater rates of return. Applying this test, one might ask whether basic agricultural research yields a higher return to the public than do farm price supports. An even broader question might be whether some other form of public investment, such as energy development or improvements to the nation's transportation system, would yield even higher returns than would public investment in agriculture.

Resiliency of the Emerging Farm Structure

As larger farms have become prominent in U.S. agriculture, they have been characterized

as rapidly growing, carrying higher ratios of debts to assets than smaller farms, and specializing in a single product. These farms also have benefited from a high rate of price inflation that has raised their asset values and provided them collateral to support rapid, debt-financed growth. And, some researchers assert, these farms have benefited disproportionately from government farm programs.

But how resilient would these farms be to economic adversity and to the discipline imposed by stable or declining rates of price inflation? If the experience of 1980 is valid, that resilience may be limited.

Many large, rapidly growing, heavily leveraged farms experienced financial stress in 1980 after a very short period of economic adversity. Decreased income prospects resulted in cash flow difficulties for many heavily leveraged farmers at the same time that appreciation in farm real estate values slowed drastically.⁶ Hence, farmers often could not borrow further against their land equity to resolve short-term financial problems. Many of these farmers had, in recent years, already restructured and refinanced farm debt using inflation-buoyed land equity. Others resorted to direct and guaranteed government loans to resolve cash flow problems. Indeed, the growth of government lending to agriculture has increased rapidly in recent years. As recently as 1970, the Farmers Home Administration held only 5.8 per cent of outstanding farm debt. By 1980, the proportion had reached 9.9 per cent.

Has a farm structure been encouraged that is unable to survive periods of economic adversity without large and continuing infusions of government farm program benefits and soft credit? Is this structure less able to prosper in a period of relatively stable prices than alter-

native farm structures? These are important policy questions, since U.S. agriculture's capacity to feed our population and to successfully compete for export markets has been premised on the efficiency and resilience of the nation's farms. These questions may be more related to the process by which many farms have grown than to the size of farms. To this point, perhaps too little attention has been given in recent years to developing staying power in the farm businesses. Too often investors have counted on rapid rates of price inflation for favorable investment outcomes. Nonetheless, limited evidence suggests that the emerging U.S. farm structure, especially at the upper end of the size spectrum, may be much more fragile than anyone had expected.

CONCLUSION

This article has outlined the post-World War II changes in U.S. farm structure and has identified some major forces contributing to those changes. Four major public policy issues related to the farm structure debate were suggested and discussed. While the policy issues discussed were not exhaustive, it is believed they do provide an indication of the breadth, the interrelatedness, and the complexity of the farm structure debate.

The nature of the policy issues that have been put forward suggests that the farm structure debate may be with us for some time. Some participants will likely call for additional government intervention to limit farm size, such as graduated land taxes or fertilizer taxes. Others will prefer that present government policies be continued, and they oppose policy changes that would neutralize the impact of government policy on farm structure. Overall, perhaps the most efficient economic solution over the long-run would entail reducing the policy bias toward big farms and increasing the reliance on market forces to shape farm structure in the future.

⁶ "Agricultural Credit Survey Results," *Financial Letter*, Federal Reserve Bank of Kansas City, Vol. 6, No. 5, May 1980.