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Diversity in Crop Farming: Its Meaning for Income-Support Policy

SPECIAL STUDY

DIVERSITY IN CROP FARMING: ITS MEANING FOR INCOME-SUPPORT POLICY

Congress of the United States
Congressional Budget Office

PREFACE

Ever since the Great Depression of the 1930s, the federal government has undertaken to support and stabilize farm prices and incomes. Today it provides direct income support to farmers producing feed grains, wheat, rice, and cotton. This support is given through deficiency payments when prices fall below specified levels; it is in proportion to their production of principal crops, and has no relation to farmers' individual needs.

The 99th Congress will enact new farm program legislation to replace the expiring Agriculture and Food Act of 1981. This paper, requested by the Senate Budget Committee, is intended to assist the Congress in examining alternative income-support policies for U.S. crop farmers. In keeping with the Congressional Budget Office's mandate to provide an objective and nonpartisan analysis of issues before the Congress, no recommendations are offered.

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SUMMARY

A principal purpose of the federal government's farm programs is to protect crop farmers from losses of income when prices fall. Income support is provided through deficiency payments made to farmers who produce the major crops--corn and other feed grains, wheat, rice, and cotton. The support is provided in proportion to the volume of production of the supported crop. These production-based farm programs are not designed to provide income support on the basis of need. Less than a third of U.S. farms produce any of these crops, and hence more than two-thirds receive no direct benefit from the programs at all. Among those who do benefit, the diversity of crop farming causes the programs to have uneven effects on farm incomes.

THE DIVERSITY OF CROP FARMING

Crop farms vary widely in size and income. In 1982, about 652,000 farms with agricultural sales of $20,000 or more sold about 95 percent of all corn, soybeans, wheat, cotton, rice, and grain sorghum. Families operated most of these crop farms. Sales ranged from $70,000 for small farms to $454,000 for those in the largest size category (see Summary Table 1). Farm incomes also varied, from less than $14,000 on the average small farm to more than $95,000 on the largest. Summary Table 2 shows similar differences among types of farms. Corn and wheat farms had net cash farm incomes that were about average for all crop farms; soybean and sorghum farms had incomes that were below the average; and cotton and rice farms had incomes much above the average. (Net cash farm income measures the cash available to the farm family from farming; it excludes income from off-farm employment, which is often substantial.)

The share of net cash income accounted for by the major crop programs varied among farms. Rice and cotton farms had the largest net gain in income from deficiency payments in 1982, and corn farms the smallest. Except for rice and cotton farms, the smallest farms received very little of their net cash farm income from government payments.

SUMMARY TABLE 1. CHARACTERISTICS OF COMMERCIAL CROP FARMS, BY SIZE OF FARM, 1982

Farm Size [a]	Principal Crop Acreage Range (acres)	Farms (thousands)	Average Harvested Acreage All Crops	Average (thousands of dollars)		
				Sales	Net Cash Farm Income	Value of Farm Assets
Small	1-99.9	244.8	142	70	13.9	389
Medium	100-249.9	221.1	312	98	16.5	677
Large	250-499.9	115.5	578	154	25.3	1,088
Very Large	500-749.9	38.4	919	233	37.9	1,581
Largest	750 or more	32.6	1,790	454	95.2	2,861
Total or Average		652.4	405	123	22.3	804

SOURCE: Congressional Budget Office, from the 1982 Census of Agriculture.

a. Farm size was defined in terms of the crop. Thus a small corn farm harvested less than 100 acres of corn, and corn was either the only crop or was the largest in acreage.

The average rate of return to farm assets also varied widely among farms in 1982 (see Summary Table 2). For most crop farms, debt reduced the overall rates of return. The largest farms tended to have higher rates of return to assets than other farms.

Specialization also varied among farms and influenced their incomes. As measured by the share of total agricultural sales from the principal crop, specialization increased the relative importance of crop-specific farm programs to some farms. Cotton and rice farms were more specialized than other types of farms, which explains in part the greater importance of

SUMMARY TABLE 2. CHARACTERISTICS OF COMMERCIAL CROP FARMS, BY TYPE OF FARM, 1982

Farm Type	Farms (thousands)	Average Harvested Acreage All Crops	Average (thousands of dollars) Sales	Net Cash Farm Income	Value of Farm Assets	Rate of Return to Assets (percent)
Corn	328.3	298	123	21.7	712	3.6
Soybeans	147.7	407	106	17.5	774	2.5
Wheat	136.8	608	123	22.2	939	2.3
Cotton	15.7	668	277	81.3	1,524	8.4
Rice	3.8	632	234	62.7	1,844	4.2
Grain Sorghum	19.9	506	115	12.0	864	1.0
Total or Average	652.4	405	123	22.3	804	3.3

SOURCE: Congressional Budget Office, from the 1982 Census of Agriculture.

government payments to them. Many of the smaller farms, especially corn, wheat, and sorghum farms, relied on livestock, dairy, and poultry sales rather than crop sales for most of their income. These "crop farms" grew grains mainly for feed and received relatively little direct benefit from crop programs. Crop production was concentrated on relatively few farms: about two-thirds of the crop farms in this study, or 18 percent of all U.S. farms, harvested almost 85 percent of all major crops in 1982.

THE INCOME-SUPPORT OBJECTIVE

Income support to crop producers (except in soybeans) is provided mainly by deficiency payments. These payments are made in proportion to production;

they support the incomes of the producers of specific crops, and do so without a test of economic need. Because of the diversity of crop farming, the farm programs have different income effects on farms of different types and sizes. Though no person is allowed to receive more than $50,000 in payments, the benefits are concentrated among a relatively small number of people on larger-than-average crop farms.

Under these circumstances, income support tends to benefit farmers with relatively high incomes while providing little if any help to low-income farmers. In addition, the support tends to accrue to larger-sized farms. A case might be made for separating income support from the crop programs and extending assistance directly to low-income farm families. Raising the incomes of these people would help to keep more families in agriculture and stimulate the economies of rural communities.

The most effective way to raise the incomes of low-income farmers would be through assistance based on a means test. Under a **targeted income maintenance program**, payments would be made to keep family incomes at or above a minimum level. The income floor would take account of family size, off-farm income, farm assets, location, and other factors, including the availability of other public assistance programs. Such a program would not be without its problems of design, implementation, and administration, but it is probably the most effective way to target income support in today's widely diverse agriculture.

Another approach would be to **continue deficiency payments** but to impose tighter limits on them. The present $50,000 maximum could be lowered; alternatively, payments could be denied to farms above a certain acreage or production limit. These options would not transfer more income to low-income farmers than do the current programs: they would only limit total payments to persons on the larger farms. To overcome this problem, support could be scaled inversely so that smaller crop farms (as measured by acreage or units of output) would receive larger deficiency payments than larger farms.

But deficiency payments must inevitably make some use of farm size as a proxy for farm income, which is an imprecise way of matching benefits with need. Some small "crop farms" that would qualify for assistance on the basis of their harvested acreage are in reality among the nation's largest livestock and dairy farms in terms of annual sales and income.

CONCLUSION

A policy of targeting income support to low-income farmers could be combined with the present policy of stabilizing prices and incomes for all farmers. Many farm families do not have chronically low incomes, but they operate under conditions of risk and uncertainty so that their incomes are highly variable. Public policy has long acknowledged this fact. Targeted income support to low-income farmers need not conflict with those policies aimed at stabilizing the incomes of other farmers.

CHAPTER I

INTRODUCTION

The 99th Congress is considering legislation to replace the Agriculture and Food Act of 1981, which expires in 1985. This is the authorizing law for the federal farm programs applying to crops and milk (also called price-support and commodity programs), which are the subject of this special study. To assist the Congress in its legislative task, this study was undertaken to see how well the crop programs serve their purpose of supporting farm incomes, and also to examine the feasibility of targeting income support to low-income farm families. This study draws on the 1982 Census of Agriculture, which details the characteristics of farms that grow the major crops--corn, soybeans, wheat, cotton, rice, and grain sorghum.

BACKGROUND

Public concern for the economic welfare of farm families and the nation's supply of food and fiber has led the federal government to play a major role in supporting and stabilizing farm prices and incomes. The basic orientation of farm programs has changed little since they were begun during the Great Depression. (The key features of current programs are shown in the accompanying box.) Their policy objectives also have changed little, being mainly to support and stabilize farm prices and incomes. 1/

If farm programs have changed little, agriculture itself has changed dramatically. Farm families are now more fully part of the domestic economy: they buy a large share of their materials and equipment--seed, fertilizer, chemicals, and machinery--from the nonfarm sector; they borrow heavily to finance production; and they earn about 60 percent of their total income from off-farm employment. This means that overall economic policies have a greater influence on farmers than in the past.

In addition, farmers have become part of the international economy as agricultural markets have become increasingly global in character. Exports now take the production from about two of every five acres, providing about

1. See Congressional Budget Office, *Crop Price-Support Programs: Policy Options for Contemporary Agriculture* (February 1984).

AN OVERVIEW OF FARM PROGRAMS

Farm programs have two principal objectives: (1) to stabilize farm prices and incomes, and (2) to increase farm incomes. The main price stabilization tools are nonrecourse loans and the farmer-owned grain reserve. The principal tools for income support are deficiency payments and reductions in planted acreage.

Nonrecourse loans are made to crop farmers at a specified loan rate, or price support, per unit of production. (All major crops are covered.) Farmers may store crops and use them as collateral for 9- to 12-month loans at the loan rate. If a farmer elects not to repay the loan plus interest, the government agrees to accept the commodity as full reimbursement. Thus, nonrecourse loans place a floor under market prices, provide a source of interim financing for farmers, and help farmers spread their sales throughout the marketing year.

Under the **grain reserve** program, a wheat or feed grain grower contracts with the government to store grain for a three-year period and receives a nonrecourse loan and annual storage payments. Grain in the reserve cannot be sold, except with a financial penalty, until the market price reaches a trigger release price, at which time storage payments cease and farmers can repay loans without financial penalty. Interest is charged only for the first year.

Deficiency payments support the incomes of feed grain, wheat, rice, and cotton farmers (but not soybean farmers) when national average prices for a specified period fall below target prices. The maximum payment per unit of production is the difference between the target price and the nonrecourse loan rate.

Reductions in planted acreage from predetermined base levels may also be required of grain and cotton farmers wishing to qualify for the above program benefits. Further, these farmers may be offered land diversion payments in cash or in kind for additional acreage reduction. The total amount of deficiency and cash diversion payments that a person can receive under one or more of these crop programs is $50,000 a year.

one-fourth of gross farm income. Farm prices and incomes have become highly sensitive to conditions abroad--to changes in weather and crop production, to demographic and economic factors, and to shifting government policies.

When farm programs began in the 1930s, nearly a quarter of the nation's population lived on farms; three-fifths of their income came from farming, but their average per capita income was only one-third that of the nonfarm population. Today, less than 3 percent of the population live on farms and their income is much closer to that of the nonfarm population. Along with the demographic changes, farming itself has become highly concentrated: 12 percent of all farms account for 70 percent of farm output. Their operators have incomes well above the median income of U.S. families.

Any program to support farm incomes must take account of these realities. Clearly, the incomes of many farm families compare favorably with those of nonfarm families. If there is a case for income support, it lies at the lower end of the income scale. But current farm programs provide income support in proportion to the volume of a farm's production of specific crops, which may be inversely related to need. As two writers have put it, farm programs "were designed to benefit the fellow with something to sell, and obviously the more he had to sell the more he benefited." 2/

Direct income support is provided mainly by **deficiency payments**, when the average crop price for a specified period falls below target prices (see box). To be eligible for deficiency payments a person must have a production interest (as owner, operator, etc.) in a farm that has a base acreage of a supported crop; 3/ and agree to reduce planted acreage at government request. Thus deficiency payments may also serve as an incentive to reduce acreage in order to limit supply. Farmers may also receive **diversion payments** in return for diverting acreage to other uses. **Nonrecourse loans** and the **farmer-owned grain reserve**, while intended for price stabilization, also can support farm income. The eligibility requirement for these is the same as for deficiency payments.

A limitation of the current farm programs is that they concentrate benefits among a relatively small number of farms that are much larger than the average. Farmers who do not produce a supported crop do not

2. Willard W. Cochrane and Mary E. Ryan, *American Farm Policy* 1948-73 (Minneapolis: University of Minnesota Press, 1976), p. 366.

3. The base acreage is the higher of either the previous year's planted acreage or the average of the two preceding years.

receive direct program benefits. About two-thirds of farmers' cash receipts are from the sale of commodities not supported by major crop programs (including cattle, hogs, and poultry, which together account for about 40 percent of cash receipts).

For many farmers, the 1980s have been a period of worsening economic and financial stress, despite soaring farm program outlays that reached a peak of $18.8 billion in fiscal year 1983. Unless the programs are changed, federal outlays are projected to remain at historically high levels, averaging about $13 billion yearly over fiscal years 1986-1990. [4] Among the questions being asked are to what extent the programs can **raise farm income** and how useful they are for **targeting income support** to low-income farmers.

The farm programs discussed in this paper do not include all of the federal policies influencing agriculture, such as those relating to credit, taxes, marketing orders, research and development, resource development, and agricultural extension. (Not all of these policies are consistent with one another. For example, some of them may stimulate production when others are working to restrict it.) The federal government also promotes exports of farm products through trade liberalization, export credits, food aid, overseas market development, and bilateral trade agreements. By some measures, agriculture receives more federal support relative to its importance than any other sector of the economy. [5]

PURPOSE AND ORGANIZATION

A major aim of the study was to examine options for targeting support to those who need it. Targeting means distinguishing between those who will receive assistance and those who will not, which requires taking account of the diversity among farms. Because of diversity, a uniform program may have quite different impacts on different types and categories of farms.

Diversity among crop farms is shown in Chapters II and III, which focus on the characteristics of farms that produce corn, soybeans, wheat, cotton, rice, and grain sorghum. Farm type and size are defined in terms of **acreage harvested of the principal crop**. The crop-specific approach was used because farm programs operate on that basis. It differs from the usual method of grouping farms according to **value of annual sales**, which masks

4. See Congressional Budget Office, *An Analysis of the President's Budgetary Proposals for Fiscal Year 1986* (February 1985), Table IV-1, p. 55.

5. See Congressional Budget Office, *Federal Support of U.S. Business* (January 1984).

differences among farms that are important from a policy perspective. As the study shows, however, neither measure of farm size provides a satisfactory indicator of which farms may have low incomes.

The data are drawn from a special tabulation of the 1982 Census of Agriculture made for the Congressional Budget Office. 6/ They exclude farms with agricultural sales of less than $20,000, which were about 61 percent of all farms but accounted for only 6 percent of total sales. The 652,359 commercial crop farms in this study were about 30 percent of all farms; they made 60 percent of all agricultural sales and 94 percent of major crop sales. The 1982 census data may be taken as generally representative of crop farming in 1985, with some qualifications:

- The year of the census, 1982, was one in which acreage reduction programs were in effect. Returns were low compared to 1975-1981, but the differences were similar for all crops.

- The data are total or average values of farm characteristics for groups of farmers. No individual farm data were available, and there was no estimate of the variability associated with the data.

- The data may not be comparable with other farm data. For the agricultural census, an operator completes a form for one farm only, even though the area farmed by that operator may include several farms owned by others.

In Chapter IV some options for targeting income support are examined in light of the substantial diversity among U.S. crop farms. Appendix A describes the census data set, and Appendix B presents the estimation methods used in the study.

6. The tabulation was of preliminary census data. Differences between the preliminary and final figures are generally less than 5 percent for major items. See Appendix A for a description of the data set.

CHAPTER II

OVERVIEW OF U.S. CROP FARMS

Income support to crop farmers is provided for growers of specific crops. The purpose of this chapter is to give an overview of crop farming based on the 1982 Census of Agriculture. It focuses on some important characteristics of corn, soybean, wheat, cotton, rice, and grain sorghum farms, including their numbers, acreage, sales, assets, net cash income, and the degree to which they specialize in a particular crop.

COMMERCIAL CROP FARMS IN GENERAL

Crop farms vary widely in size, income, and specialization. In this study, farms are classified in terms of their principal crops in 1982. For example, a farm is classified as a corn farm if it harvested only corn, or if corn was the crop to which it gave the most acreage. Farm size is based on the acreage of the principal crop. Thus, **small corn farms** harvested 1-99.9 acres of corn; **medium corn farms**, 100-249.9 acres; **large corn farms**, 250-499.9 acres; **very large corn farms**, 500-749.9 acres; and **largest corn farms**, 750.0 acres or more. 1/ This size definition understates actual farm size because most farms harvested acreage that was not planted to their principal crop. About two-thirds of the commercial crop farms in this study grew more than one major crop. (See Appendix Table A-1.)

Table 1 shows some key characteristics for each size class, averaged for all crop farms. Sales of farm products averaged $123,000 for all crop farms in 1982, ranging from $70,000 for small farms to $454,000 for those in the largest size category. Average net cash income per farm was $22,256, but here again the range was quite large--from less than $14,000 on the

1. In the data base a "corn only" farm harvested only corn of the six major crops, and a "corn plus" farm harvested corn plus one or more of the major crops though corn acreage was largest. This classification scheme resulted in 60 groups (12 types x 5 sizes) of farms. In this study the "only" and "plus" farms were merged to give six farm types and 30 groups.

TABLE 1. CHARACTERISTICS OF COMMERCIAL CROP FARMS, BY SIZE OF FARM, 1982

Farm Size	Principal Crop Acreage Range (acres)	Commercial Crop Farms (thousands)	Average Harvested Acreage, All Crops
Small	1-99.9	244.8	142
Medium	100-249.9	221.1	312
Large	250-499.9	115.5	578
Very Large	500-749.9	38.4	919
Largest	750 or more	32.6	1,790
Total or Average		652.4	405

SOURCE: Congressional Budget Office, based on Census of Agriculture, 1982.

a. Including only sales of corn, wheat, soybeans, rice, cotton, and grain sorghum.

average small farm to more than $95,000 on the largest. [2] Most farms were operated by a family or a single person as sole proprietorships, and the operators owned all or part of the land in their farms. The degree to which a farm specialized in the production of its principal crop increased with farm size, although some types of farms were more specialized than others. Many of the smaller "crop farms" were really livestock enterprises that grew grains to feed their stock.

The diversity of crop farming can be seen from a few simple comparisons. Average net cash income in 1982 ranged from $4,165 for small grain

2. Net cash income is calculated by subtracting cash production expenses (excluding depreciation) from gross farm revenue. This cash income concept includes deficiency payments and excludes nonmoney income, off-farm income, and inventory adjustment. See Appendix B for details.

TABLE 1. (Continued)

Commercial Crop Farms' Share of U.S. (percent)			Average per Farm (thousands of dollars)		
Farms	All Sales	Crop Sales a/	All Sales	Net Cash Farm Income b/	Value of Farm Assets c/
10.9	13	7	70	13.9	389
9.9	17	23	98	16.5	677
5.2	14	25	154	25.3	1,088
1.7	7	14	233	37.9	1,581
1.5	11	24	454	95.2	2,861
29.2	62	94	123	22.3	804

b. Net cash farm income includes deficiency payments but not income from off-farm employment or changes in inventory.

c. Assets include both owned and rented land, buildings, machinery, equipment, and livestock. Crops stored and financial assets are not included.

sorghum farms to $338,275 for the largest cotton farms. Total asset values ranged from $334,000 for small soybean farms to $5,917,000 for the largest rice farms. The remainder of this chapter examines the diversity among crop farms in more detail.

CORN FARMS

Corn is produced on more farms than any other crop in the United States and is the most important crop in terms of value. 3/ Commercial corn farms harvested over two-thirds of U.S. corn acreage in 1982 (see Table 2),

3. This section covers corn harvested for grain. In 1982, about 89 percent of total corn acreage was harvested for grain and the remainder for silage. Approximately 50 percent of the 652,400 commercial crop farms raised corn as their principal crop in 1982, but many others also grew corn.

TABLE 2. CHARACTERISTICS OF COMMERCIAL CORN FARMS, BY SIZE OF FARM, 1982

Farm Size	Corn Farms (thousands)	Average Acreage		Commercial Corn Farms' Share of U.S. (percent)		
		All Crops	Corn	Farms	Acreage	Corn Acreage
Small	162.9	136	46	7.3	7	11
Medium	109.3	303	155	4.9	10	24
Large	40.8	578	334	1.8	7	20
Very Large	9.7	947	587	0.4	3	8
Largest	5.6	1,738	1,168	0.3	3	9
Total or Average [a/]	328.3	298	153	14.7	30	72

SOURCE: Congressional Budget Office, based on Census of Agriculture, 1982.

a. May not add because of rounding.

b. Average sales include receipts from crop and livestock sales.

while soybean farms accounted for nearly a fifth. Nearly 60 percent of corn farms are in Iowa, Illinois, Wisconsin, Minnesota, and Indiana.

Corn farms are concentrated in the smaller size classes, about 85 percent of them being small and medium farms. [4/] As shown in Table 2, average sales and net cash income for all corn farms in 1982 were comparable to the averages for all crop farms, but in each size category corn farms had higher average sales and incomes than the average for all crop farms. Their asset values range from about $374,000 for small farms to $3,860,000 for the largest.

4. The concentration of corn farms among the smaller farm size classes strongly affects the average levels of income and sales for corn farms, and the degree to which they specialize in cash grain production.

TABLE 2. (Continued)

Corn Sales (percent of total sales)	Average (thousands of dollars) Sales Per Farm b/	Net Cash Farm Income c/	Value of Farm Assets d/
8	71	15.4	374
24	114	19.6	711
34	209	33.5	1,301
37	367	49.6	2,092
42	747	113.8	3,860
24	123	21.7	712

c. Net cash farm income includes deficiency payments but not income from off-farm employment or changes in inventory.

d. Assets include both owned and rented land, buildings, machinery, equipment, and livestock. Crops stored and financial assets are not included.

Corn farms are less specialized than other crop farms as measured by the ratio of principal crop sales to total agricultural sales. In general, the importance of income support to a farm for a major crop increases with the degree of specialization in that crop. Corn farms tended to depend less on corn sales for their gross incomes than other types of farms depended on their main crops. Corn sales ranged from about 8 percent of total sales for small corn farms to 42 percent for the largest. This low degree of specialization is explained by the fact that many corn farms are livestock and dairy enterprises that feed their corn to their animals: about one-third of annual corn production is fed to livestock and poultry on farms where it is raised.

The corn program has relatively little impact on the incomes of smaller corn farms, since they harvest relatively few acres of corn. (This is

TABLE 3. CHARACTERISTICS OF COMMERCIAL SOYBEAN FARMS, BY SIZE OF FARM, 1982

Farm Size	Soybean Farms (thousands)	Average Acreage		Commercial Soybean Farms' Share of U.S. (percent)		
		All Crops	Soybeans	Farms	Acreage	Soybean Acreage
Small	42.6	130	59	1.9	2	4
Medium	59.8	294	159	2.7	5	15
Large	29.2	561	338	1.3	5	15
Very Large	8.9	906	590	0.4	2	8
Largest	7.1	1,748	1,273	0.3	4	14
Total or Average [a]	147.7	407	245	6.6	18	56

SOURCE: Congressional Budget Office, based on Census of Agriculture, 1982.

a. May not add because of rounding.

b. Average sales include receipts from crop and livestock sales.

also the case for other small crop farms: limited acreages of a program crop mean small benefits.) Moreover, the smaller corn farms often are not eligible for government payments and other benefits because they do not participate in acreage reduction programs, their corn being needed for feed. A further irony is that if they buy additional grain or feed for their livestock, they must pay the higher grain prices induced by farm programs. (Much of the same is true of small wheat and sorghum farms.)

SOYBEAN FARMS

Soybeans are the second most valuable U.S. crop. While commercial soybean farms are about one-quarter of commercial crop farms, soybeans are also grown on other farms where they are rotated with corn and double-cropped with wheat (soybeans are planted after wheat is harvested in the

TABLE 3. (Continued)

Soybean Sales (percent of total sales)	Average (thousands of dollars) Sales Per Farm b/	Net Cash Farm Income c/	Value of Farm Assets d/
18	56	9.7	334
33	78	11.6	618
38	137	21.3	1,029
41	210	33.0	1,530
48	380	78.2	2,724
35	106	17.5	774

c. Net cash farm income includes deficiency payments but not income from off-farm employment or changes in inventory.

d. Assets include both owned and rented land, buildings, machinery, equipment, and livestock. Crops stored and financial assets are not included.

spring, and then harvested in the fall.) Nearly 60 percent of soybean farms are in Illinois, Iowa, Missouri, Minnesota, Ohio, and Indiana. Other states with relatively large numbers of soybean farms are North Carolina, Arkansas, Georgia, Tennessee, and Mississippi.

In terms of acreage, assets and sales, soybean farms are below the averages for all farms (see Table 3). Their net cash income in 1982 was about one-fifth less than the average for all crop farms, and varied widely among farms of different size.

Soybean farms tend to be more specialized in their main crop than are corn and wheat farms. Soybeans accounted for about a fifth of total sales for small soybean farms and one-half for the largest soybean farms. Nevertheless, farms that grow soybeans often rotate them with corn or double-

TABLE 4. CHARACTERISTICS OF COMMERCIAL WHEAT FARMS, BY SIZE OF FARM, 1982

Farm Size	Wheat Farms (thousands)	Average Acreage		Commercial Wheat Farms' Share of U.S. (percent)		
		All Crops	Wheat	Farms	Acreage	Wheat Acreage
Small	31.0	185	48	1.4	2	2
Medium	38.8	366	167	1.7	4	9
Large	35.6	596	351	1.6	7	18
Very Large	15.7	911	596	0.7	4	13
Largest	15.7	1,765	1,293	0.7	8	29
Total or Average [a]	136.8	608	366	6.1	26	71

SOURCE: Congressional Budget Office, based on Census of Agriculture, 1982.

a. May not add because of rounding.

b. Average sales include receipts from crop and livestock sales.

crop them with wheat. Soybeans return some of the nitrogen removed from the soil by other crops, which can reduce fertilizer costs for the following crop. The machinery and equipment used for corn and wheat can also be used for soybeans so that equipment outlays are minimized. [5] Double-cropping wheat and soybeans also improves cash flow, both in amount and timing, and makes more efficient use of fixed resources. [6] Thus, in any year, most farms that grow soybeans are likely to sell other cash crops. For example, in 1982 soybean farms produced almost as much rice as did rice farms.

5. See Department of Agriculture, Agriculture Information Bulletin No. 472.

6. See Department of Agriculture, Agriculture Information Bulletin No. 467.

TABLE 4. (Continued)

Wheat Sales (percent of total sales)	Average (thousands of dollars) Sales Per Farm [b]	Net Cash Farm Income [c]	Value of Farm Assets [d]
8	82	13.0	517
23	84	14.0	662
37	104	18.7	882
41	158	29.1	1,263
46	310	62.0	2,262
33	123	22.2	939

c. Net cash farm income includes deficiency payments but not income from off-farm employment or changes in inventory.

d. Assets include both owned and rented land, buildings, machinery, equipment, and livestock. Crops stored and financial assets are not included.

Soybeans are not eligible for the deficiency payments that producers of other major crops receive (although soybean prices are supported through nonrecourse loans). But the rotation and double-cropping of soybeans has policy implications for the other crops, especially with respect to reduced acreage programs. For example, a wheat and soybean producer who diverts acreage to be eligible for wheat program payments has a smaller acreage to plant to soybeans; by participating in the wheat program, the producer gives up returns on both crops. For this reason many wheat and soybean producers, mainly in the South, do not participate in the wheat program. Similarly, on a farm where corn and soybeans are grown in rotation, the producer must consider the returns from both crops in deciding whether to participate in the corn program.

TABLE 5. CHARACTERISTICS OF COMMERCIAL COTTON FARMS, BY SIZE OF FARM, 1982

Farm Size	Cotton Farms (thousands)	Average Acreage		Commercial Cotton Farms' Share of U.S. (percent)		
		All Crops	Cotton	Farms	Acreage	Cotton Acreage
Small	2.5	135	60	0.11	0.1	1.5
Medium	4.6	292	169	0.21	0.4	7.9
Large	4.4	534	353	0.20	0.7	15.9
Very Large	2.1	874	599	0.09	0.6	13.2
Largest	2.2	2,128	1,425	0.10	1.4	31.6
Total or Average [a/]	15.7	668	435	0.71	3.2	70.1

SOURCE: Congressional Budget Office, based on Census of Agriculture, 1982.

a. May not add because of rounding.

b. Average sales include receipts from crop and livestock sales.

WHEAT FARMS

Wheat is third in value of production among field crops. Its production is dominated by relatively large farms that harvest wheat as their principal crop. Wheat is also grown on other crop farms, especially soybean farms. [7/] Two-thirds of wheat farms are in the Great Plains states from Texas to North Dakota, including Colorado and Montana, and a tenth are in the Northwest.

About half of the wheat farms fall into the categories of large, very large, or largest farms (see Table 4, page 14). One reason for the relatively

7. Much of this acreage is on farms that double-crop winter wheat and soybeans, mainly in the South.

TABLE 5. (Continued)

Cotton Sales (percent of total sales)	Average (thousands of dollars) Sales Per Farm b/	Net Cash Farm Income c/	Value of Farm Assets d/
27	93	19.1	610
42	128	33.0	816
58	174	40.5	1,194
61	291	79.0	1,668
59	992	338.3	4,571
55	277	81.3	1,524

c. Net cash farm income includes deficiency payments but not income from off-farm employment or changes in inventory.

d. Assets include both owned and rented land, buildings, machinery, equipment, and livestock. Crops stored and financial assets are not included.

large scale of wheat farming is that producers employ technology that is adapted to large acreages. Another reason is that relatively few other crops can be commercially produced in much of the wheat-growing region.

Average sales for wheat farms were comparable to the average for all crop farms in 1982, but lower on the large, very large, and largest wheat farms than on other crop farms of comparable size. This reflects several factors: on the larger wheat farms, wheat accounted for a higher proportion of total sales than it did on smaller farms; and wheat is not as high-valued as are cotton and rice, which are also grown on larger farms. Wheat farms also had lower average asset values than other crop farms of the same size, except among small farms.

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TABLE 6. CHARACTERISTICS OF COMMERCIAL RICE FARMS, BY SIZE OF FARM, 1982

Farm Size	Rice Farms (thousands)	Average Acreage		Commercial Rice Farms' Share of U.S. (percent)		
		All Crops	Rice	Farms	Acreage	Rice Acreage
Small	0.51	109	66	0.02	0.02	1.0
Medium	1.17	250	168	0.05	0.09	6.1
Large	1.14	508	349	0.05	0.18	12.3
Very Large	0.48	971	596	0.02	0.14	8.9
Largest	0.53	1,932	1,301	0.02	0.31	21.4
Total or Average [a/]	3.82	632	419	0.16	0.74	49.5

SOURCE: Congressional Budget Office, based on Census of Agriculture, 1982.

a. May not add because of rounding.

b. Average sales include receipts from crop and livestock sales.

Net cash incomes in wheat farming were below the average for other crop farms in every size category in 1982. They ranged from $12,981 on small farms to $61,998 on the largest farms.

Specialization in wheat farming increases with size. At the lower extreme, small wheat farms, like their counterparts among corn and grain sorghum farms, are predominantly livestock and dairy farms; they receive less than a tenth of their sales from wheat, and therefore the wheat program makes little difference in their incomes. Overall, wheat sales accounted for one-third of the total sales of all wheat farms in 1982.

COTTON FARMS

Cotton farms tend to be relatively large in all the dimensions under analysis--in acreage, sales, incomes, and assets (see Table 5, page 16). Cotton is

TABLE 6. (Continued)

Rice Sales (percent of total sales)	Average (thousands of dollars) Sales Per Farm b/	Net Cash Farm Income c/	Value of Farm Assets d/
e/	56	4.6	481
e/	83	21.7	682
e/	167	47.8	1,391
e/	371	75.3	2,675
e/	753	288.8	5,917
	234	62.7	1,844

c. Net cash farm income includes deficiency payments but not income from off-farm employment or changes in inventory.

d. Assets include both owned and rented land, builidngs, machinery, equipment, and livestock. Crops stored and financial assets are not included.

e. Rice sales were not reported in the census.

grown in the South and Southwest and about 75 percent of cotton farms are in Texas, California, Mississippi, and Louisiana. Those below the largest in size tend to have smaller average acreages of all crops taken together but larger acreages of the principal crop than other types of farms. The largest cotton farms have larger acreages in all crops as well.

Cotton farms averaged 668 acres in 1982, compared with 405 acres for all crop farms. About half were in the categories of large, very large, or largest farms. Cotton farms had average sales of $277,000, more than double the average for all crop farms, ranging from about $100,000 for small farms to almost $1,000,000 for the largest cotton farms. They also averaged larger total assets per farm than most; only rice farms had larger asset values.

TABLE 7. CHARACTERISTICS OF COMMERCIAL GRAIN SORGHUM FARMS, BY SIZE OF FARM, 1982

Farm Size	Grain Sorghum Farms (thousands)	Average Acreage		Commercial Grain Sorghum Farms' Share of U.S. (percent)		
		All Crops	Grain Sorghum	Farms	Acreage	Grain Sorghum Acreage
Small	5.2	164	56	0.23	0.26	2.3
Medium	7.5	327	160	0.33	0.75	9.4
Large	4.2	598	343	0.19	0.78	11.5
Very Large	1.5	940	596	0.07	0.43	7.0
Largest	1.5	1,897	1,369	0.07	0.88	16.3
Total or Average [a]	19.9	506	296	0.89	3.09	46.5

SOURCE: Congressional Budget Office, based on Census of Agriculture, 1982.

a. May not add because of rounding.

b. Average sales include receipts from crop and livestock sales.

The average income for the largest cotton farms was more than triple that for all the largest farms taken together. Since the largest farms comprised 14 percent of all cotton farms, their very high incomes raised the average income for cotton farms above that for all other crop farms. Average net cash income was $81,319, ranging from $19,059 for small farms to $338,275 for the largest farms.

Specialization was also higher among cotton farms than among other farm types, with the possible exception of rice farms. [8] Cotton sales accounted for about 55 percent of cotton farms' total sales. As might be

8. Standard industrial classification (SIC) data suggest that rice farms may be at least as specialized as cotton farms. However, rice sales are omitted from census data.

TABLE 7. (Continued)

Grain Sorghum Sales (percent of total sales)	Average (thousands of dollars)		
	Sales Per Farm b/	Net Cash Farm Income c/	Value of Farm Assets d/
8	65	4.2	442
22	86	10.7	652
31	131	9.1	973
40	166	10.9	1,460
47	336	54.5	2,480
29	115	12.0	859

c. Net cash farm income includes deficiency payments but not income from off-farm employment or changes in inventory.

d. Assets include both owned and rented land, buildings, machinery, equipment, and livestock. Crops stored and financial assets are not included.

expected, specialization increases with size. For this reason, cotton farms receive relatively more of their income from federal support than do most other farm types.

RICE FARMS

Rice farms are located mainly in California, Arkansas, Texas, Louisiana, and Mississippi. Rice farms have relatively large harvested acreages, sales, and incomes, on the average, and their assets are the largest of all crop farms. Only cotton farms have larger harvested acreages, sales, and incomes. But rice farms are the smallest in number and total acreage of all commercial crop farms.

Over half of all rice farms were classed as large, very large, or largest farms in 1982. The average rice farm harvested 632 acres, and had assets of $1,844,000 (see Table 6, page 18). Much of the high asset value is attributable to highly valued land.

The sales of rice farms averaged about twice those for all crop farms. Net cash incomes ranged from $4,621 for small farms to $228,756 for the largest farms. On average, small rice farms had smaller average incomes than other small farms, but incomes averaged higher among other rice farms than among other crop farms of similar sizes.

Census data suggest that rice farms are very specialized. 9/ As a result, rice farms, like cotton farms, tend to benefit more from farm programs than other farm types.

GRAIN SORGHUM FARMS

Grain sorghum acreage is second to corn among U.S. feed grains. Sorghum farms represented about 3 percent of the crop farms in 1982. 10/ Grain sorghum is also produced by wheat and soybean farms. Nearly 80 percent of grain sorghum farms are in Texas, Nebraska, and Kansas.

Sorghum farms harvested larger acreages than the average for all crop farms, particularly in the larger sizes (see Table 7, page 20). They also had average asset values slightly above those of all crop farms. On the other hand, sales and farm income were lower than the average for all crop farms. Only soybean farms had smaller average sales, and average net cash income was $11,966--the lowest for all crop farms.

On average, grain sorghum sales were about 30 percent of grain sorghum farms' total sales, similar to the ratio for wheat and soybean farms. About 35 percent of sorghum farms are livestock or dairy farms, mainly small and medium farms. These farms grow sorghum for feed, and--like similar corn and wheat farms--receive only small benefits from farm programs.

9. Overall, nearly all rice farms were SIC cash grain farms in 1982. A SIC cash grain farm receives 50 percent or more of its total sales from the sale of a single grain crop or from more than one grain crop. Cash grain farms dominated in every size including small farms where 85 percent were cash grain.

10. This section covers sorghum harvested for grain, or about 95 percent of all sorghum acreage in 1982.

CONCLUSION

This chapter has sought to show the wide differences that exist among crop farms. Those harvesting the same crops vary in size, assets, income, and degree of specialization. When farms harvesting different crops are compared, similar differences appear. For example, average net income varied in 1982 from $12,000 among sorghum farms to over $81,000 for cotton farms. Such diversity means that some farms benefit much more from crop support programs than others. Chapter III relates these characteristics to public policy.


CHAPTER III

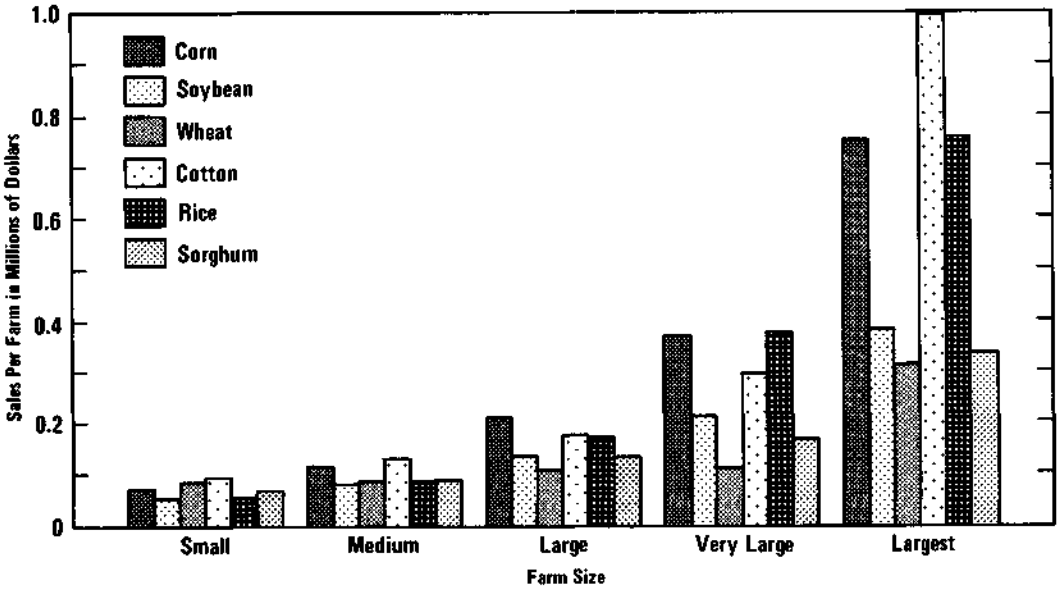
CROP FARMS: CHARACTERISTICS IMPORTANT TO PUBLIC POLICY

As Chapter II has shown, there is great diversity among crop farms. This chapter considers some implications of that diversity for public policy.

FARM SIZE

Farm size may be measured by annual sales of farm products or, as in this study, by acreage harvested of the principal crop. The sales and acreage measures tend to move together, especially within farm types as shown in Figure 1, but they are not substitutes. Some farms that are small in harvested acreage have large sales--for example, livestock and dairy farms--while some that are larger may have relatively small total sales because they depend on one crop (see Table 8). This means that farm size is not an adequate indicator of farm income for purposes of public policy.

Figure 1.
Crop Farms: Average Sales Per Farm by Farm Size and Type, 1982



SOURCE: Congressional Budget Office, based on Census of Agriculture, 1982.

Whatever measure of size is used, farm programs that link income support to farm size necessarily overlook the income differences among farm types that were shown in Chapter II. For example, the average small corn farm had an income nearly 60 percent larger than the average small soybean farm in 1982. The same conclusion holds if sales are used instead of acreage. In 1982, for example, the average medium rice farm had sales comparable to those of the average small wheat farm, but an income nearly two-thirds larger.

SPECIALIZATION

In this study, specialization is measured by the share of total sales accounted for by a farm's principal crop. Specialization was greatest among cotton and rice farms. It also tended to increase with farm size. 1/ Because of specialization, a small number (less than one-fifth) of U.S. farms produce about 85 percent of the major crops. 2/ Such concentration means that most farms receive little direct benefit from crop programs, since income support payments are made in proportion to the volume of production of specific commodities. For an individual farm, the importance of a crop-specific farm program increases with the farm's dependence upon that crop. In other words, income support for a specific crop will boost the income of a farm relatively more if it receives 60 percent of its total agricultural sales from the crop than if it receives only 20 percent. Many smaller crop farms that depend on livestock sales often choose not to participate in farm programs because of the small benefits and acreage restrictions. In contrast, other farms more specialized in program crops do participate. 3/

The fact that as farms become larger (in terms of acreage harvested) they tend to be more specialized does not necessarily imply a causal relationship. Several factors affect specialization and farm size. 4/ Chief

1. This is also the case when specialization is measured by the Standard Industrial Classification (SIC).

2. In 1982, medium, large, very large, and largest crop farms were 18 percent of all U.S. farms and they harvested 84 percent of the acreage of the six major crops.

3. In 1982, the proportion of crop farms that participated in crop programs (as measured by whether they set aside acreage) increased with farm size and with specialization.

4. See Congressional Budget Office, *Public Policy and the Changing Structure of American Agriculture* (September 1978), Chapter III.

TABLE 8. U.S. CROP FARMS: DISTRIBUTION BY SALES CLASS, 1982 (In thousands)

Farm Size	Sales Class (In thousands of dollars) 20-39.9	40-99.9	100-249.9	250-499.9	500 or More	All
Small (1-99.9) a/	107.4	97.3	34.5	4.3	1.4	244.8
Medium (100-249.9)	50.0	105.1	55.6	8.3	2.1	221.1
Large (250-499.9)	11.8	39.1	49.8	11.7	3.0	115.5
Very Large (500-749.9)	1.4	10.1	16.0	8.5	2.5	38.5
Largest (750 or more)	0.3	3.8	11.7	9.8	7.1	32.6
Total	170.8	255.4	167.6	42.5	16.0	652.4

SOURCE: Congressional Budget Office.

a. Acres harvested of principal crop in 1982.

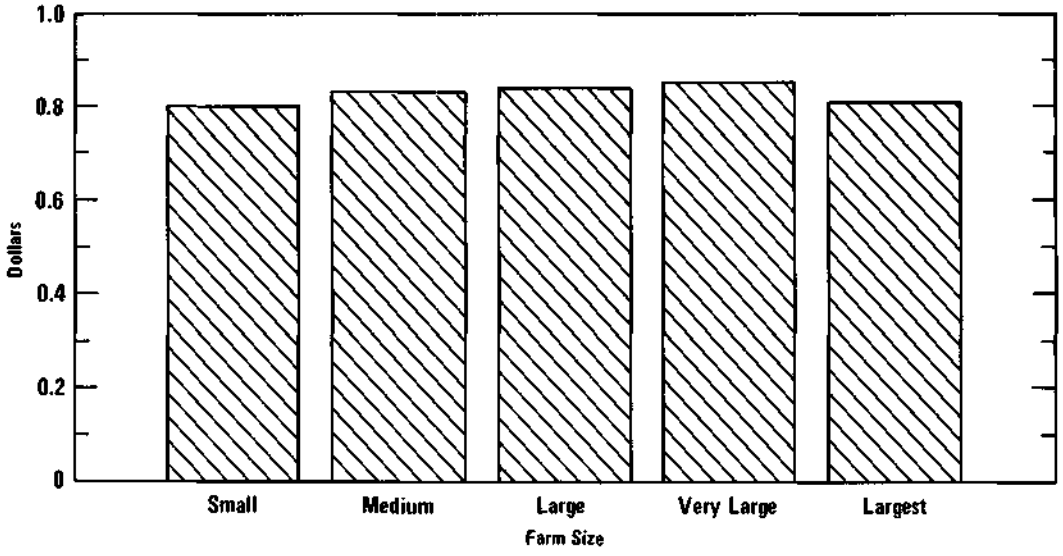
among these are technology, resource mobility, risk and uncertainty, financing, and public policy including farm programs, taxes, credit, irrigation, and research. Producers' response to risk and uncertainty is especially important. A common response to risk is to diversify. The greater the perceived risk, the more likely risk-averse farmers are to diversify; reduced risk, on the other hand, may stimulate specialization. To the extent that public policies have reduced risk and uncertainty, it is very likely they have encouraged specialization and growth in farm size.

EXPENSES AND SALES RELATIONSHIPS

Current farm programs tend to provide income support according to a farm's output. It is sometimes argued that this encourages efficiency and is therefore in the public interest. But the evidence suggests that large-scale farming is not necessarily the most efficient. 5/ The expense-to-sales ratios estimates in this study support a similar conclusion when size is measured by acreage harvested of the principal crop.

In 1982, cash production expenses per dollar of farm product sales were similar for all farm sizes (see Figure 2). 6/ That is, as acreage harvested of the principal crop increased, expenses per dollar of sales changed

Figure 2.
Crop Farms: Cash Production Expenses Per Dollar of Sales by Farm Size, 1982



SOURCE: Congressional Budget Office, based on Census of Agriculture, 1982.

5. See Thomas A. Miller, "Economies of Size and Other Growth Incentives," in U.S. Department of Agriculture, *Structure Issues of American Agriculture*, Agricultural Economics Report 438 (1979), pp. 108-115.

6. Within the largest size category it was not possible to array farms by size groups and examine their expenses and sales. It may be that sales-to-expense ratios would decline among the largest farms if they were arrayed by size.

little. This was also the general case for each farm type--for example, the expense-to-sales ratio of small corn farms was similar to that of the largest. Thus there is no persuasive efficiency argument for preferentially supporting the incomes of large farms.

The comparisons in Figure 2 represent averages for broad categories of farms. Information from other sources suggests that there is much variation in costs among farms which, except for the smallest units, cannot be explained by farm size. Other factors influencing costs include technology, resource productivity, weather-induced yield variability, geographic price differences, and the management skills of individual farmers.

OWNERSHIP AND THE FAMILY FARM

A central presumption behind farm programs is that they support the "family farm." While it is generally the case that family farms benefit from farm programs, a preponderance of benefits accrue to the larger farms, which are less likely to be single-family operations. On the other hand, larger farms are often operated by more than one family. To the extent that this is so, the relatively large net cash incomes they receive may not leave each family better off than families on smaller farms. Thus, for income-support purposes, defining a family farm strictly in terms of size is not especially meaningful.

In general, the nation's crop farms are operated by families or persons who own all or part of their farms as sole proprietors. While family farms decline in relative importance as farm size increases, more than 60 percent of the largest farms are family farms (see Figure 3). Partnerships are the second most common form of farm organization and they tend to increase slightly in relative importance with farm size. Many partnerships are family enterprises. Corporations, despite the attention they receive, are less than 5 percent of the nation's crop farms, and most are family-held corporations. Corporations also increase in importance with farm size.

FARM INCOME

In this study the economic and financial status of farms is measured in two ways: by **net cash farm income** as discussed in Chapter II, and by **rates of return to assets and to equity.** These indicators give different information about crop farms in 1982. Net cash farm income is a measure of the cash income from farming available to farm families for living expenses and for

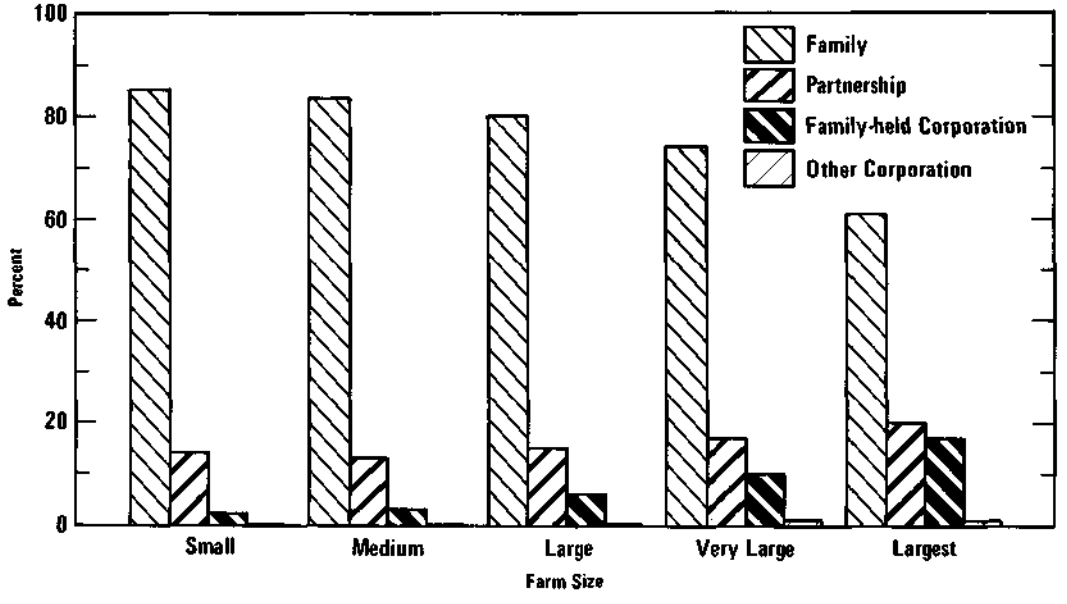
replacing capital in the farm business. The rate of return is a measure of the return on invested capital, and may be used to compare the farm business with alternative types of investments.

Net Cash Farm Income

Figure 4 shows that average net cash farm income increased with farm size, and was about seven times larger for the largest farms than for small farms. It also varied widely among farm types: cotton farms had the highest incomes and grain sorghum farms the lowest, among farms in each size group. The largest cotton farms had an average income of about $338,275 compared with $54,489 for grain sorghum farms. Small cotton farms averaged $19,059 compared with $4,165 for grain sorghum farms.

Net cash farm income is the difference between farm cash receipts, including deficiency payments, and cash production expenses. Excluded are nonmoney income, depreciation, and off-farm income, which in 1982 was 60 percent of the income of the farm population. (See Appendix B.) In 1982, government payments were clearly most important to rice and cotton

Figure 3.
Crop Farms: Organization by Size, 1982

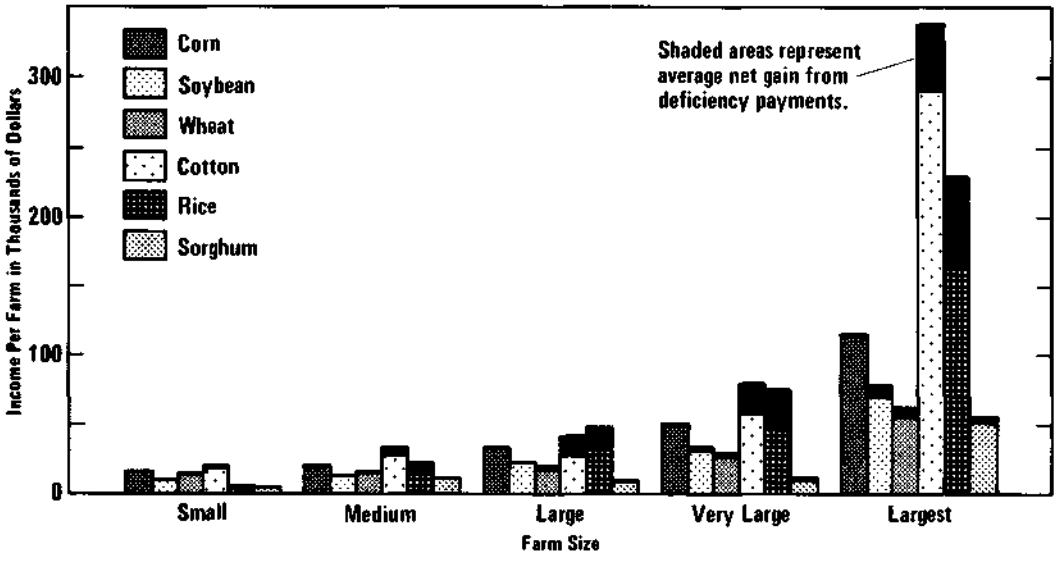


SOURCE: Congressional Budget Office, based on Census of Agriculture, 1982.

farms (see Figure 4). Average payments, weighted for participation of farms, were much less important to the cash incomes of corn, wheat, soybean, and grain sorghum farms. In 1982, a larger proportion of rice and cotton farms participated in commodity programs, and rice and cotton per-acre deficiency payment rates were larger than for other crops. 7/ As a result, rice and cotton farms received relatively larger deficiency payments than did other farms. In addition to deficiency payments, participating farms were eligible for nonrecourse loans, which are not included in net cash income. Generally, for each farm type, the share of farms that received loans increased with acreage harvested, as did the relative importance of loans to total sales.

Figure 4.

Crop Farms: Estimated Net Cash Farm Income by Farm Size and Type, 1982



SOURCE: Congressional Budget Office, based on Census of Agriculture, 1982.

7. The participation rate, measured by the proportion of farms that set aside acreage, generally increased with farm size for all farm types. The 1982 participation rates were: cotton farms, 53 percent; rice farms, 40 percent; corn farms, 15 percent; wheat farms, 34 percent; soybean farms, 19 percent; and grain sorghum farms, 38 percent. Appendix Table B-1 gives 1982 per-acre deficiency payment rates.

Returns to Assets and Equity [8]

Returns to assets and equity varied widely among the different farm types (see Figure 5). The **return to assets** measures the income return to non-rented assets, before allowing for interest payments and before subtracting debt from the value of the assets. Capital gains (or losses) were not estimated. The **return to equity** is the income return to owned assets, taking account of interest expense and debt. The difference between the two rates of return reflects the degree of indebtedness and interest expense. [9] If an operator has no debt, the rates of return to assets and equity are the same. If the rate of return to assets is less than the rate of return to equity, the interest rate on outstanding debt is less than the rate of return on assets so that the debt has a positive effect on the rate of return. Only the largest cotton farms were in this strong a position in 1982. By contrast, a rate of return to equity lower than the rate of return to assets indicates that debt has become a burden.

In 1982, the average rate of return to assets for all commercial crop farms was 3.3 percent. The largest farms had higher rates of return to assets and equity, on average, than did smaller farms. Among other size groups, however, there was no clear association between farm size and rates of return.

The large variations in net cash income and rates of return among farms may be explained by differences in market demand, the volume and combination of commodities produced, government farm programs, production costs not necessarily associated with farm size, and debt. In the light of previous data on returns in excess of cash expenses in 1975-1981, the 1982 census data probably reflect the long-term income ranking of each farm type and size.

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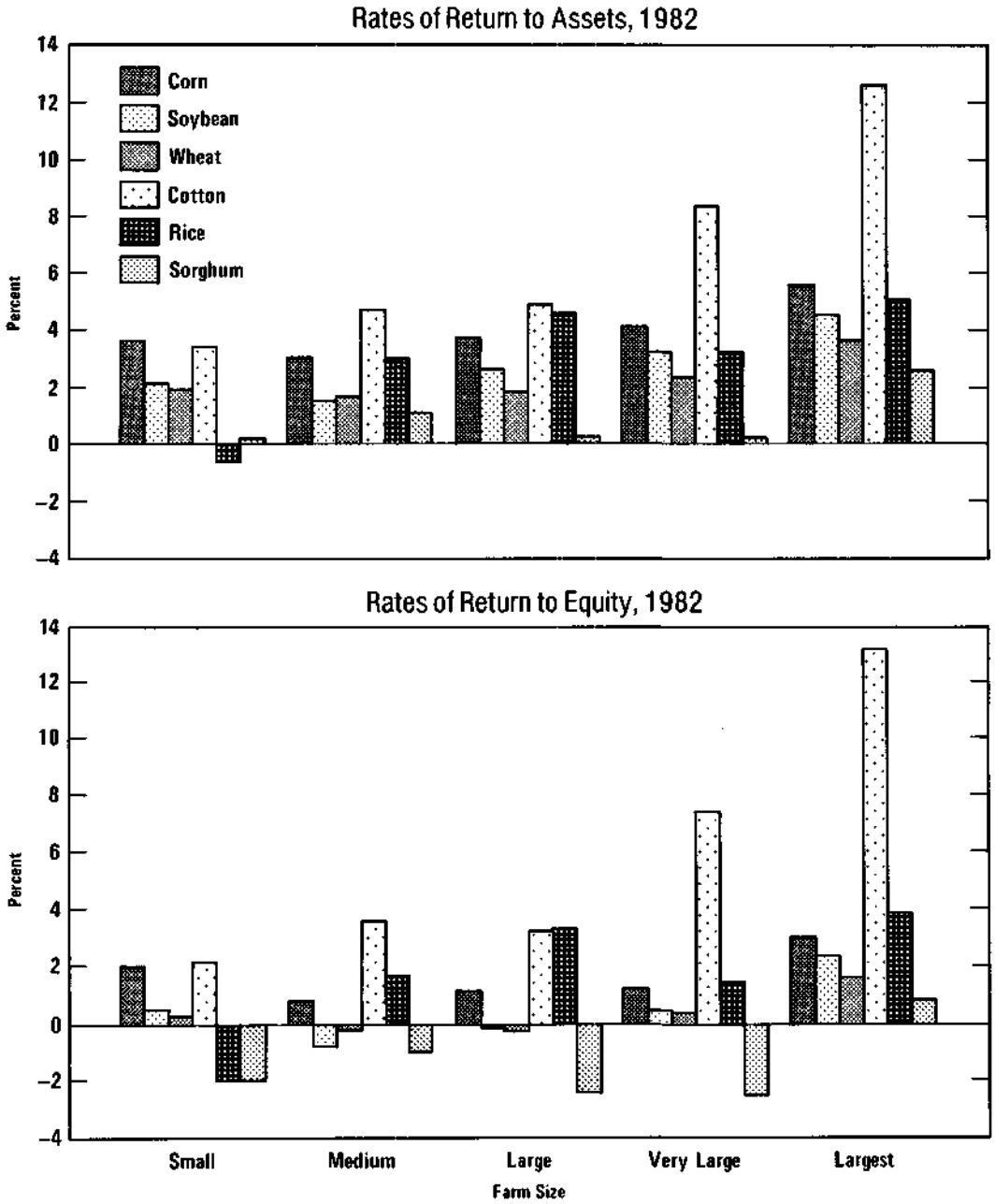
8. See Appendix B for methods of estimation. In this study, no separate return to the operator's labor and management was estimated; if it were, it would reduce the rates of return to assets and equity.

9. See also Emanuel Melichar, "The Incidence of Financial Stress in Agriculture," a paper presented at the Congressional Budget Office Agricultural Seminar on November 13, 1984. The largest group of farm operators in severe financial stress have sales of $40,000 to $499,999. Some farms in this sales interval, 8.9 percent of all U.S. farms, were estimated to have debt-to-asset ratios greater than 0.41 and to carry nearly 40 percent of total farm debt. Commercial crop farms in the present study include about 75 percent of all farms in this sales interval.

Figure 5.

Crop Farms: Rates of Return to Assets and Equity, 1982



SOURCE: Congressional Budget Office, based on Census of Agriculture, 1982.

CONCLUSION

The diversity among farms means that income support based on farm size is likely to have uneven effects--in some cases adding to the incomes of farmers who are relatively well off, and in others providing little help to those with relatively greater need. Chapter IV examines the income-support objective, and considers some alternatives that would take account of the organization and diversity of U.S. crop farming.

CHAPTER IV

IMPLICATIONS FOR INCOME-SUPPORT POLICY

Income diversity is a key characteristic of U.S. agriculture. The wide variations in net cash income and returns on invested capital among groups of farms of different types and sizes suggest even greater variation among individual farms. This variation raises important questions about income support. To the extent that raising farm income is a goal, low-income families would seem to have a special claim to public assistance. Current farm programs, however, are not designed to target income support to low-income farm families. Rather, they provide support in proportion to crop production, without regard to need. This chapter examines the income support provided under current programs and considers alternative income-support options.

INCOME SUPPORT UNDER CURRENT PROGRAMS

Deficiency payments are the main source of direct income support for producers of corn and other feed grains, wheat, cotton, and rice. Although these crops are grown on about 80 percent of U.S. cropland, less than a third of U.S. farms produce them and hence many farmers are not eligible for this direct income support.

Producers eligible for deficiency payments receive income support in proportion to their production of each crop. A significant fact of U.S. crop farming is the concentration of production: a relatively small number of larger-than-average crop farms produce a disproportionate share of the output. For example, farms in the large, very large, and largest categories harvested the bulk of most crops in 1982: in corn, 36 percent of the acreage was harvested by 12 percent of the farms; in wheat, 49 percent of the acreage was harvested by 21 percent of the farms; in soybeans the figures were 51 percent and 17 percent; in grain sorghum, 55 percent and 18 percent; in cotton, 71 percent and 33 percent; and in rice, 82 percent and 57 percent. 1/ This group of crop farms also receives the largest share of

1. Rice production appears to be less concentrated than other crops because the larger rice farms are a greater proportion of all rice farms than is the case for other farm types.

direct income support. The concentration of benefits is even greater than the above data would suggest, since many farms produce more than one program crop.

Persons with a production interest in these largest farms receive payments equal to their share of production. Deficiency payments are thus concentrated among a relatively small number who have interests in the larger farms. In 1981, a year of no acreage reduction and therefore of large payments, 6 percent of the participants in the wheat, feed grains, and cotton programs received 57 percent of the total deficiency payments made under these programs. 2/

For any specific farm, the volume of production of each supported crop and the degree of specialization determine the extent to which farm programs can increase incomes. Commercial crop farms generally become more specialized as they increase in size. Rice and cotton farms, which tend to be more specialized than the others, benefit more from the crop programs. Less specialized farms, such as small and medium corn, grain sorghum, and wheat farms, which depend heavily upon sales of cattle, hogs, and milk, derive much less benefit from the crop programs. 3/ Another factor governing benefits is the level of support per unit of production of each crop. As shown in Appendix Table B-1, the level of support is not consistent across crops.

Figure 6 shows the effect of deficiency payments upon average net cash farm income for a typical farm of each type and size receiving payments on all the acreage of its principal crop in 1982. 4/ An average small rice farm getting payments on all its rice acreage would have received about 80 percent of its net cash farm income from deficiency payments, compared with about 5 percent for small wheat farms. Rice and cotton farms, as noted earlier, benefit more from deficiency payments than other farm types. The relative importance of payments tends to grow with acreage harvested in the case of corn and wheat farms, and to decrease in the case of rice and cotton farms, partly because of the $50,000 payment limit.

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2. Unpublished Department of Agriculture data.

3. Small and medium corn, grain sorghum, and wheat farms are more than 50 percent of commercial crop farms. Depending upon farm type, 40 percent to 65 percent of these farms are SIC dairy and livestock farms.

4. Figure 6 shows a greater effect of payments on income than does Figure 1, which takes account of the actual participation rates for each group of farms. In either case, payments have since become more important because of higher per-unit payment rates.

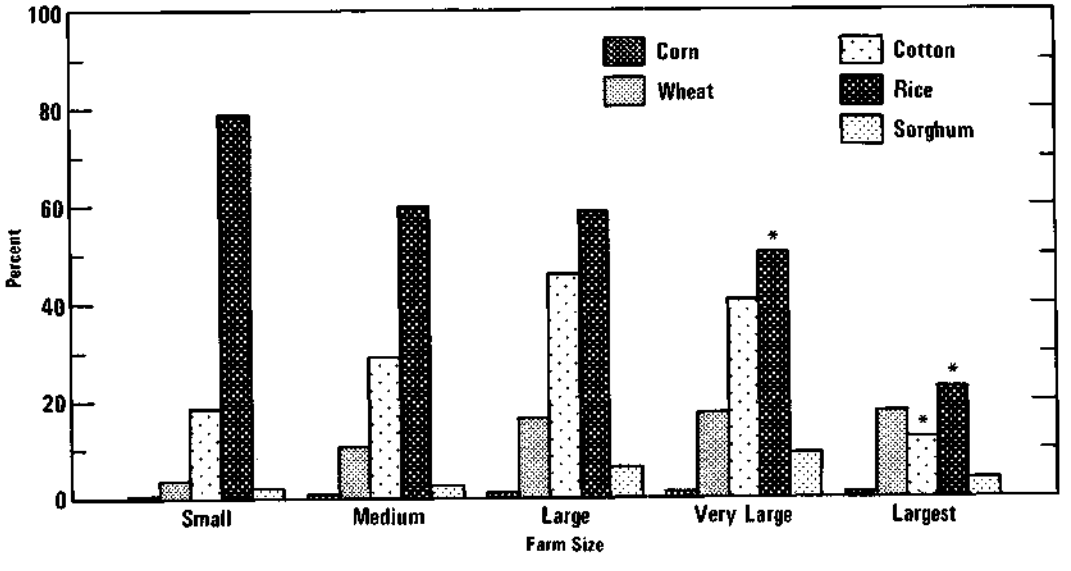
These data demonstrate the uneven income effects of deficiency payments among different types and sizes of crop farms.

THE INCOME-SUPPORT OBJECTIVE

Income-support programs in their present form often benefit farmers with relatively high incomes while providing little if any benefit to low-income farmers. In addition, the support is biased toward larger-sized farms that have a preponderance of the harvested acreage. Most of these larger farms are family farms. However, there is no economic reason to channel support preferentially to them. These inconsistencies suggest several possible responses.

One response would be simply to eliminate deficiency payments. This would have a varying impact, depending on both farm type and size. As Figure 6 shows, the farms most negatively affected would be cotton and rice farms. The elimination of payments would not only reduce farm family incomes, but would also tend to reduce returns to their assets. Under current conditions this would further depress cropland values.

Figure 6.
Estimated Share of Net Cash Farm Income from Deficiency Payments for Crop Farms in 1982



* With $50,000 payment limitation.

Deficiency payments may be thought of as a special "safety net" for crop producers. Eliminating the payments would not have much effect on low-income farm families. To the extent that it did so, they would have access to other federal programs, such as food stamps and the school lunch program. Eligibility for many means-tested programs is determined by family composition, current income, and ownership of assets. For some programs, the last criterion might disqualify some farm families whose incomes are low but who have substantial assets in their farms.

Deficiency Payment Options

Another alternative would be to continue the present system of deficiency payments but to allocate the payments differently, though still on the basis of farm size. In the absence of a means test, however, these options would not be an effective way of targeting income support to low-income farm families.

A Lower Payment Maximum. The current limit on deficiency payments is $50,000 per person--that is, no person can receive more than $50,000 of deficiency (and acreage diversion) payments from all program crops together. Rice and cotton farms are most affected by this limit; because of higher per-acre payment rates, it takes a smaller acreage of rice and cotton than of other crops to reach the maximum amount (see Table 9).

TABLE 9. ACREAGE AT WHICH PAYMENT LIMITS WOULD BE REACHED a/

Payment Limit (dollars)	Acres			
	Corn	Wheat	Rice	Cotton
10,000	206	278	52	72
20,000	412	555	104	144
30,000	617	833	157	216
40,000	824	1,110	208	288
50,000	1,028	1,389	262	359

a. Based on 1984 programs. The payment per acre is the per-unit deficiency payment (the difference between the target price and the loan rate) times the national average program yield.

One option would be to reduce the maximum, perhaps as low as $10,000. The rationale for this would be that some farmers are receiving more income support than they need. A $10,000 maximum would have the greatest impact on rice and cotton farmers.

Alternatively, deficiency payments could be restricted to small, medium, and large farms, as measured by the acreage harvested of the principal crop, with a maximum of $10,000 for a person. This approach would limit payments to a maximum of about 350 acres of the principal crop, and farmers with larger acreage would be ineligible.

Lowering the maximum payment in either of these ways would reduce or eliminate payments to larger farms. Thus it would tend to make farm income more even, but would not transfer more income to low-income farmers. Moreover, farm size as measured by harvested acreage of the principal crop (or by units of output) is not a satisfactory measure of economic performance, and hence it is inadequate as a basis for determining the need for income support. Another consideration is that a lower payment limit could be circumvented by most farms, simply by letting more persons become eligible for payments by demonstrating that they have a "production interest" in the farm. Assuming that this did not occur, reducing the maximum to $10,000 might save about $4 billion over fiscal years 1987 through 1990. 5/

An Acreage Maximum. Payments might also be reduced by placing limits on acreage (or units of production, such as bushels). Under this approach, the per-unit deficiency payment would be made on a maximum acreage for each program crop. For example, if the maximum was set at the average acreage of large crop farms (about 350 acres for corn, wheat, grain sorghum, rice, and cotton), the limits on payments would range from $12,600 for wheat to $66,850 for rice. 6/

An acreage maximum could be applied in two ways: (1) all persons with production interests in farms would receive payments on acreage not to exceed the maximum; or (2) persons with acreages larger than the maximum would not receive payments. In other respects, an acreage limit would have the same problems as a dollar limit.

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5. See Congressional Budget Office, *Reducing the Deficit: Spending and Revenue Options* (February 1985), p. 158.

6. Based on 1984 programs.

Inverse Scaling. A dollar or acreage maximum would reduce the income transfer received by the largest farms, but would not transfer more money to smaller farms. If the objective was to channel more income to small and medium farms, they could be given a larger per-unit deficiency payment than they currently receive. For example, farmers with small and medium wheat farms might receive a payment of $2.00 per bushel, compared with the $1.08 per bushel they now receive. This "inverse-scaling" approach would distribute payments inversely to production volume, with per-unit payments decreasing as farm size increased. It would transfer more income than do current programs to many smaller crop farmers. But it would also extend support to several thousand of the nation's largest farms that harvest relatively small crop acreages. These farms are mainly livestock or dairy farms with sales of $500,000 or more (see Table 8). This inconsistency illustrates the difficulties that would arise from using farm size as a proxy for economic need in targeting income support.

Targeted Income Maintenance

A different response to the problem of low farm incomes would be to target support directly to those most in need. From the perspective of national policy, raising the incomes of such farm families would serve to keep more families in agricultural production and to stimulate rural economies. As shown in Chapter III, many crop farms have relatively low net cash incomes from their farming operations, as compared with crop farms in general; the net cash incomes of many were below the U.S. median family income of $24,000 in 1982. A case might be made for giving direct assistance to low-income farm families, although this would mean treating them differently from their nonfarm counterparts.

The most effective way to target income support to low-income farm families would be through a means test, independent of their production. Those qualified by the means test would receive payments to keep their family income at or above a minimum level. The minimum income could be scaled according to family size, location, and other factors, including the availability of other public assistance programs.

All sources of income would need to be considered, because many families that operate crop farms also have significant off-farm income. (In 1982, farms with sales of $20,000 to $39,999 received virtually all their net income from off-farm sources, and those with sales of $40,000 to $99,999 earned about 65 percent of their net income off the farm. Even farms with sales of $100,000 to $199,999 received about a third of their income from

off-farm sources.) 7/ Moreover, the assets of the farm business would have to be taken account of in a way that would not exclude low-income families while at the same time prohibiting payments to wealthy families.

This approach is not without problems. A means-tested program would not be acceptable to many farm families accustomed to being paid on the basis of their production. Further, to define a "farm family" for the purposes of such a program would in itself be difficult. Another difficulty would lie in determining income. A farm family's income--to the extent that it is earned from farming--is both an earned income and a return on the assets invested in the farm business.

Despite these problems, a means-tested income maintenance program would be an effective way of directing income support to low-income farm families--probably the only way of targeting income support in today's widely diverse agricultural sector. The feasibility of this approach was demonstrated by experimental rural income-maintenance programs in the late 1960s and early 1970s. 8/

MESHING INCOME SUPPORT WITH OVERALL POLICY

Many farm families who do not have chronically low incomes have highly variable incomes because of the nature of agriculture. Farm markets have always been volatile, for a number of reasons: the unpredictable effects of weather and biological factors on production; the time lags between farmers' production decisions and their ensuing marketing decisions; and the relatively great fluctuations of prices in response to changes in supply and demand. Commercial farmers operate in a risky environment; they face a high degree of uncertainty as to next year's prices and incomes. Public policy has long acknowledged this risk and uncertainty, and one purpose of the crop programs is to stabilize agricultural prices and incomes.

A policy of targeting income support to low-income farmers need not conflict with the overall policy of stabilizing prices and incomes. The latter end could be pursued by price supports that take account of market condi-

7. U.S. Department of Agriculture, *Economic Indicators of the Farm Sector: Income and Balance Sheet Statistics, 1983* (September 1984).

8. See U.S. Department of Health, Education and Welfare, *Rural Income Maintenance Experiment, Summary Report* (November 1976).

tions--particularly conditions in export markets, where prices have sometimes been lower than in the domestic market. Flexible price supports could be coupled with a targeted income maintenance program. Or the latter could be combined with income stabilization measures such as farm revenue insurance or a program fashioned after Canada's Western Grain Stabilization Program. 9/

Through targeting, income support would be separated from the effort to stabilize prices. However, eliminating or reducing deficiency payments might discourage the largest producers from participating in reduced acreage programs, which have been an important tool of supply management. Withdrawal of the largest producers would decrease the already limited effectiveness of voluntary supply management.

CONCLUSION

The great diversity in American agriculture means that programs concerned mainly with stabilizing incomes on the basis of production do not offer much assistance to low-income farm families. Such families could be helped directly through a means-tested program that would target income support to low-income farm families. Another alternative would be to modify the current deficiency payment program so as to channel payments to smaller farms, but this would not help all who need assistance and it would extend support to some who do not need it.

9. See Congressional Budget Office, *Farm Revenue Insurance: An Alternative Risk-Management Option for Crop Farmers* (August 1983), and *Canada's Western Grain Stabilization Program: An Option for U.S. Policy?* (November 1984).

APPENDIXES

APPENDIX A

SPECIAL TABULATION OF THE 1982 CENSUS OF AGRICULTURE

At the request of the Congressional Budget Office, the Bureau of the Census prepared a special tabulation of preliminary data from the 1982 Census of Agriculture. (Differences between preliminary and final data are generally less than 5 percent for major items.) Farms with sales of less than $20,000 in 1982 were excluded from the tabulation. These farms represented 60 percent of all U.S. census farms, but they accounted for a very small share of the production of the principal crops--corn, soybeans, wheat, cotton, rice, and grain sorghum.

Farm type and size were defined by CBO in terms of the acreage harvested of the principal crop. For example, a "corn only" farm harvested only corn of the six major crops; a "corn plus" farm harvested corn and one or more of the other major crops but corn was the largest acreage. As shown in Table A-1, this definition gave 12 types of farms, two for each crop. (In the study, the "only" and "plus" farms were combined.) Farm size was defined by acreage harvested of the principal crop in 1982. There were five size intervals: less than 100 acres; 100-249; 250-499; 500-749; and 750 or more (see Table A-2). For each farm type the number of farms that did and did not set aside acreage in 1982 was also reported.

The general form of the census tabulation was as follows for each farm type:

		Farms		Size (Harvested acres of the principal crop)				
Data	All Farms	Set-Aside	No Set-Aside	Less Than 100	100-249	250-499	500-749	750 or More
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TABLE A-1. NUMBERS OF CROP FARMS WITH SALES OF $20,000 OR MORE

	Total	Only	Plus
Corn	328,347	134,094	194,253
Wheat	136,835	83,722	53,113
Soybeans	147,707	17,225	130,482
Cotton	15,739	6,739	9,000
Rice	3,820	1,816	2,004
Sorghum	19,911	4,036	15,875
All Crops	652,359	247,632	404,727

SOURCE: Congressional Budget Office, based on 1982 Census of Agriculture.

The census data in the special tabulation are those shown in Table 50, page 116, Volume 1, Part 51, of the 1982 Census of Agriculture. [1]

1. Department of Commerce, Bureau of the Census, *1982 Census of Agriculture, Volume 1, Part 51, United States Summary and State Data* (October 1984).

TABLE A-2. CROP FARMS BY SIZE AND TYPE, 1982 a/
(In thousands)

Type	Farms					
	Small (1-99.9)	Medium (100-249.9)	Large (250-499.9)	Very Large (500-749.9)	Largest (750 or more)	All
Corn	162.9	109.3	40.8	9.7	5.6	328.3
Soybeans	42.6	59.8	29.2	8.9	7.1	147.7
Wheat	31.0	38.8	35.6	15.7	15.7	136.8
Cotton	2.5	4.6	4.4	2.1	2.2	15.7
Rice	0.5	1.2	1.1	0.5	0.5	3.8
Grain Sorghum	5.2	7.5	4.2	1.5	1.5	19.9
Total	244.8	221.1	115.5	38.4	32.6	652.4

SOURCE: Congressional Budget Office, based on 1982 Census of Agriculture.

a. Based on acres harvested of principal crop in 1982.

APPENDIX B

ESTIMATION METHODS

The 1982 Census of Agriculture did not provide all the data used in this study. Some variables were estimated from census and other data. This appendix shows the estimation methods used. Unless otherwise noted, data were from the census, and values are in dollars.

FARM INCOME

Net cash farm income for each type and size group	=	farm product sales + net income gain from deficiency payments - cash production expenses 1/

Where:

Net income gain from deficiency payments	=	deficiency payments - income forgone from participating in commodity program
Deficiency payments	=	DPHA x harvested crop acreage x %FP

Where:

DPHA	=	deficiency payment per unit x program yield per acre 2/ (See Table B-1.)
%FP	=	number of farms in group that diverted acreage/total farms in group
Income forgone per farm	=	(LMS x AL)/ total number of farms

1. Deficiency payments were based on 1982 program provisions. Most 1982 program payments would have accrued in calendar year 1983, not 1982.

2. Information from Department of Agriculture, Agricultural Information Bulletins (September 1984).

TABLE B-1. 1982 PROGRAM DATA

Crop	Deficiency Payment (dollars per unit)	Program Yield (units per acre) a/	Deficiency Payment per Acre (dollars per acre)	Market Value per Acre (dollars per acre) b/	Ratio of Payment to Market Value (percent)
Corn (bushels)	0.15	95.5	14.33	303.40	4.7
Wheat (bushels)	0.50	32.5	16.25	126.03	12.9
Cotton (pounds)	0.14	581.0	80.76	384.12	21.0
Rice (cwt)	2.71	48.0	130.73	382.00	34.2
Sorghum (bushels)	0.18	54.1	9.74	148.90	6.5

SOURCE: Department of Agriculture.

a. Program yield is the individual farm yield based upon recent experience.

b. Excludes government payments. U.S. average farm price times average yield per harvested acre.

Where:

Set-aside acreage, AL = (set-aside requirement in percent/ 1-set-aside requirement) x harvested acreage of crop x participation rate in percent

Forgone market share per acre, LMS = (1 - PSTP) x return above cash expenses per-unit of production x yield per harvested acre 3/

3. Information from Department of Agriculture, Agricultural Information Bulletins (September 1984).

PSTP	=	government payments / (farm value + government payments)
Cash production expenses		
Cash rent	=	0.053 x VRA 4/

Where:

Value of rented assets, VRA	=	PRF x value of land and building assets
Share of farmland that is rented, PRF	=	RF / TLF
Rented farmland in acres, RF	=	total land in farms (TLF) - land owned - land rented to others
Business taxes	=	0.005 x value of land, buildings, machinery, and equipment 5/
Miscellaneous expenses	=	0.003 x farm product sales 6/

INCOME RETURN TO ASSETS

Rate of return to operator's assets for each farm type and size group, in percent	=	(net cash farm income, excluding interest, - total depreciation) / value of operator's land and buildings, machinery and equipment, and livestock 7/

4. The ratio of cash rent to asset value of 0.053 is an average for 1982 for cropland rented for cash in several regions: Lake States, Corn Belt, Northern Plains, Delta States, and Southern Plains. See U.S. Department of Agriculture, *Farm Real Estate, Outlook and Summary* (May 1984).

5. Coefficient 0.005 based on Department of Agriculture, *Economic Indicators of the Farm Sector, Income, and Balance Sheet Statistics, 1983*, ECIFS 3-3 (September 1984).

6. Coefficient 0.003 from Department of Agriculture, ECIFS 3-3.

7. The value of rented land was subtracted from total value of assets. The value of livestock per unit was estimated from Department of Agriculture data.

Where:

Total depreciation	=	depreciation on machinery and equipment + depreciation on operator's land and buildings
Machinery and equipment depreciation	=	0.152 x value of machinery and equipment 8/
Land and building depreciation (nonrented)	=	value of land and buildings x (1 - PRF) x 0.01 9/

INCOME RETURN TO EQUITY

Rate of income return to operator's equity for each type and size group, in percent	=	(net cash farm income - depreciation)/ (operator's total assets - operator's debt)

Where:

Operator's Debt	=	total interest expense reported by operator / 0.11 10/

8. Coefficient 0.152 based on Department of Agriculture, ECIFS 3-3.

9. Depreciation was estimated at 1 percent of asset values owned by the operator. Based on Department of Agriculture, ECIFS 3-3.

10. Assumed average interest rate on outstanding debt for all farms.