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THE ECONOMICS OF FEDERAL SUBSIDY PROGRAMS

A COMPENDIUM OF PAPERS

SUBMITTED TO THE

SUBCOMMITTEE ON PRIORITIES AND ECONOMY IN GOVERNMENT

OF THE

JOINT ECONOMIC COMMITTEE CONGRESS OF THE UNITED STATES

PART 7—Agricultural Subsidies

APRIL 30, 1973

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LETTERS OF TRANSMITTAL

APRIL 27 1973.

To the Members of the Joint Economic Committee:

Transmitted herewith for the use of the members of the Joint Economic Committee and other Members of Congress is the seventh part of a compendium of papers, entitled "The Economics of Federal Subsidy Programs," submitted to the Joint Economic Committee.

The views expressed in these papers do not necessarily represent the views of members of the committee or the committee staff. They represent studies of a number of subsidy programs, which it is hoped will provide a focus for further hearings and public debate.

WRIGHT PATMAN,
Chairman, Joint Economic Committee.

APRIL 25, 1973.

Hon. WRIGHT PATMAN,
Chairman, Joint Economic Committee, Congress of the United States, Washington, D.C.

DEAR MR. CHAIRMAN: Transmitted herewith is the seventh part of a compendium of papers entitled "The Economics of Federal Subsidy Programs."

The Joint Economic Committee published a staff study in January 1972, entitled "The Economics of Federal Subsidy Programs," which identified the overall size and cost of Federal subsidies for fiscal 1970. The committee also invited some 40 experts to contribute papers to a compendium that would complement the staff study by evaluating particular aspects of the subsidy system. The papers in this seventh part discuss subsidies to agriculture.

The papers contained herein should be interpreted as representing only the opinions of their authors, and not necessarily reflective of the views of committee members or staff.

Sincerely yours,

WILLIAM PROXMIRE,
Chairman, Subcommittee on Priorities and Economy in Government.

APRIL 23, 1973.

Hon. WILLIAM PROXMIRE,
Chairman, Subcommittee on Priorities and Economy in Government Congress of the United States, Washington, D.C.

DEAR SENATOR PROXMIRE: Transmitted herewith is the seventh part of a compendium of papers entitled "The Economics of Federal Subsidy Programs."

The Joint Economic Committee has invited some 40 experts to contribute papers to this compendium which will be published in several parts.

The papers in this seventh part discuss susbidies to agriculture. The first paper is an overview of farm legislation—its effects in the past and the changes needed this year. Other papers evaluate and examine the distributional effect of commodity and conservation programs.

The committee is indebted to these authors for their excellent contributions which, in conjunction with the study prepared by the staff, should stimulate widespread discussion among economists, policymakers, and the general public on the Federal subsidy system. It is hoped that, by focusing attention on the subsidy system, this study will contribute substantially to improvements in public policy and the efficient management of public funds.

Mr. Jerry J. Jasinowski of the committee staff is responsible for planning and compiling this compendium with suggestions of other members of the staff. He was assisted in research and editorial work by Douglas Lee and in administrative and secretarial work by Beverly Park.

The papers contained herein should be interpreted as representing only the opinions of their authors, and not necessarily reflective of the views of committee members or staff.

Sincerely yours,

JOHN R. STARK,
Executive Director, Joint Economic Committee.

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CHANGES NEEDED IN FARM LEGISLATION

By JOHN A. SCHNITTKER*

I. INTRODUCTION

Agricultural products in the United States represent about 3 percent of the gross national product of the United States, and are produced by about 4 percent of the total civilian labor force. Federal expenditures for all programs of the Department of Agriculture have recently been in the range of $8.4 billion (1970) to over $11 billion (1972 and 1973). These expenditure levels have been around 4 percent of total Federal spending but some 7 percent of nondefense outlays.

To many persons this appears to be a high level of Federal spending, in view of the small role of agricultural production in the U.S. economy. However, it must be kept in mind that nearly one-half of the programs of the Department of Agriculture, from a functional standpoint, serve not only farmers, but the general public as well. Meat and poultry inspection, food distribution, and forestry programs are good examples. Only about half of all USDA expenditures made under the farm programs that are examined in this paper serve farmers principally and directly. Thus, expenditures whose benefits go principally to farmers are seen to be perhaps 2 to 3 percent of total Federal spending, and 3 to 4 percent of nondefense outlays. This is roughly proportional to the place of agricultural production in the U.S. economy. Such a comparison offers no guide to the efficiency with which Federal farm funds are spent or the merits of farm programs. Nor does it account for the fact that some farm sectors are largely independent of Federal price support and stabilization, while others have required, or at least received, massive Federal support. Farm programs are part of a large and unwieldy Federal budget, where billions are spent without serious review, especially for defense. In certain cases the same applies to farm programs.

There is a widely held view in the United States that we spend too much to stabilize the agricultural economy for the benefit of farmers and too little on many other programs. This concern over the place of agricultural spending in Federal budget priorities is rooted in three factors:

1. A judgment by many urban people that total benefits to farmers under existing farm programs are unnecessarily large, that the same benefits could be achieved at lower cost by the Government or that farm price and income stabilization is not really necessary. The view, "that farmers should depend on free market forces as the rest of the country does," is one version of this concern. Occasional mismanagement of farm programs is a related factor.
2. Dissatisfaction with the income distribution effects of Federal farm programs whose benefits go principally to larger

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farmers, while program justification by Congress and by farm groups continues to be based on helping small family farms.

3. Increasing competition for public funds as social programs expand and a clientele and a lobby develop to support them.

TABLE 1.—DIRECT GOVERNMENT PAYMENTS: TOTALS, AVERAGES PER FARM, AND PERCENTAGE DISTRIBUTION BY VALUE OF SALES CLASSES, 1960–71

Year	$40,000 and over	$20,000 to $39,999	$10,000 to $19,999	$5,000 to $9,999	$2,500 to $4,999	Less than $2,500	All farms
Totals (millions):							
1960	$107	$112	$160	$145	$81	$97	$702
1961	250	251	340	293	162	197	1,493
1962	301	310	421	323	172	220	1,747
1963	298	316	426	297	154	205	1,696
1964	382	415	565	371	190	258	2,181
1965	461	489	628	395	206	284	2,463
1966	896	723	714	405	245	294	3,277
1967	851	686	666	376	228	272	3,079
1968	1,012	791	720	401	249	289	3,462
1969	1,217	906	735	396	258	282	3,794
1970	1,238	904	696	370	246	263	3,717
1971	1,085	781	569	297	204	209	3,145
Averages per farm:							
1960	947	493	322	220	131	52	177
1961	2,033	1,050	688	469	281	112	391
1962	2,230	1,220	854	547	322	131	474
1963	2,069	1,184	868	532	310	128	476
1964	2,616	1,549	1,172	696	405	167	634
1965	2,828	1,734	1,348	778	450	194	738
1966	4,691	2,340	1,590	847	547	216	1,012
1967	4,503	2,249	1,528	814	523	206	979
1968	5,035	2,511	1,706	909	586	231	1,134
1969	5,314	2,649	1,801	959	617	243	1,277
1970	5,137	2,561	1,740	927	596	235	1,271
1971	4,289	2,140	1,452	771	499	195	1,093
Percentage distribution:							
1960	15.2	16.0	22.8	20.7	11.5	13.8	100
1961	16.7	16.8	22.8	19.6	10.9	13.2	100
1962	17.2	17.7	24.2	18.5	9.8	12.6	100
1963	17.6	18.6	25.2	17.5	9.1	12.0	100
1964	17.5	19.0	26.0	17.0	8.7	11.8	100
1965	18.7	19.9	25.5	16.0	8.4	11.5	100
1966	27.3	22.1	21.8	12.3	7.5	9.0	100
1967	27.6	22.3	21.6	12.2	7.4	8.9	100
1968	29.2	22.9	20.8	11.6	7.2	8.3	100
1969	32.1	23.9	19.4	10.4	6.8	7.4	100
1970	33.3	24.3	18.7	10.0	6.6	7.1	100
1971	34.5	24.8	18.1	9.5	6.5	6.6	100

Many people say Federal farm price and income stabilization programs should be terminated. Some urban people instinctively move to that conclusion upon learning that farming is now relatively concentrated. This view overlooks the fact that even with larger farms, much of the agricultural economy today remains in the hands of very small businesses, and would be hopelessly unstable without Federal Stabilization programs. This is especially true for the crops with low demand elasticities—wheat and cotton—and for those whose production is inherently unstable because of climatic variations.

In contrast, there is a strongly held minority view in the United States that farm incomes are still too low, and that they should be increased. Greater Federal expenditures and broader Federal actions are the usual prescription for raising farm incomes. This position is advocated principally by organized farmers, mostly from relatively large farms. The largest U.S. farm organization, however, has long favored selective reduction in Federal programs relating to farm commodities.

At present 90 percent of all farm marketings in the United States now originate on just over one-third of our farms. More than 50 percent of farm marketings come from only 6 percent of our farms. Since the farm program payments and other benefits, in most cases, go to farmers roughly in proportion to their output, most of the benefits go to a relatively small percentage of our farmers under existing programs, whatever the total level of spending. Table 1 shows the level of Federal farm payments received by farmers in various size groups.

The approach taken in this paper starts from a judgment that important parts of the farm economy are inherently unstable, even in a federally stabilized corporate economy. Thus Federal farm stabilization actions are legitimate and have been generally effective. The procedures used for farm price support and production stabilization have been reasonably satisfactory in recent years; even when some spending has been excessive to stabilization requirements it has usually been due to politics, and not program failure. The principal question examined here is: How should the Congress and the executive branch change the farm laws and the operations that arise from them so that they may either spend less Federal money on farm commodity programs, or get better results for farmers and consumers with expenditures for farm programs that are no higher than recent levels. This approach does not look to any fundamental restructuring of farm policy in 1973, nor are such fundamental changes needed or likely to be considered. Before examining these questions, a look at recent farm program history is in order.

A Brief Historical Sketch

Farm prices and incomes have been supported and stabilized under Federal programs since 1933. From that time to the present, the real objectives of farm legislation—apart from the rhetoric contained in the preambles and statements of purpose in farm laws—have been remarkably stable and consistent, and the means by which price and income support have been carried out in these programs have changed little over the years.

Congress has intended from the start to raise farm prices and/or incomes to levels somewhat above levels prevailing at the time the laws were enacted, but has not been seriously concerned with reaching such arbitrary targets as parity prices or parity incomes, which were established by the laws.

When the first modern-day farm programs became effective with the Agricultural Adjustment Act of 1933—AAA—farm people had per capita incomes only one-third as large as the average per capita incomes of non-farm people in the United States—table 2. A larger percentage of both groups were then at poverty levels, by today's standards. The sharp improvement in farm incomes in the past 40 years owes much to the stabilization of the agricultural economy, although other factors such as full employment policy have also been important in providing alternatives to farming for millions of farm people. Substantial income gains, as seen in table 2, are attributable not only to agricultural progress and stabilization, but especially to the fact that vast numbers of farm people entered the non-farm labor force after 1940, leaving a sharply reduced farm population to divide the growing overall profits from farming.

TABLE 2.—PER CAPITA PERSONAL INCOME OF FARM AND NONFARM POPULATION, 1934–71

Year	Personal income of farm population			Disposable personal income			Per capita disposable income all sources, farm as percentage of nonfarm
	From farm sources [1]	From nonfarm sources [2]	From all sources	Of farm population from all sources	Of nonfarm population from all sources	Of total population from all sources	
1934	$99	$68	$167	$163	$500	$414	32.6
1935	169	72	241	237	535	459	44.3
1936	145	83	228	224	614	518	36.5
1937	199	88	287	283	638	552	44.4
1938	152	80	232	227	590	504	38.5
1939	154	85	239	235	630	537	37.3
1940	158	91	249	245	671	573	36.5
1941	227	108	335	331	801	695	41.3
1942	351	136	487	480	973	867	49.3
1943	463	166	629	610	1,063	976	57.4
1944	492	179	671	630	1,151	1,057	54.7
1945	524	181	705	655	1,162	1,074	56.4
1946	609	179	788	742	1,217	1,132	61.0
1947	613	205	818	774	1,267	1,178	61.1
1948	737	239	976	913	1,365	1,290	66.9
1949	549	256	805	758	1,362	1,264	55.7
1950	612	272	884	841	1,458	1,364	57.7
1951	740	297	1,037	990	1,548	1,469	64.0
1952	706	309	1,015	952	1,609	1,518	59.2
1953	672	324	996	918	1,677	1,583	54.7
1954	658	312	970	886	1,678	1,585	52.8
1955	597	325	922	854	1,772	1,666	48.2
1956	600	352	952	885	1,850	1,743	47.8
1957	625	375	1,000	927	1,902	1,801	48.7
1958	747	390	1,137	1,062	1,915	1,831	55.5
1959	664	425	1,089	1,001	1,998	1,095	50.1
1960	737	458	1,195	1,100	2,017	1,937	54.5
1961	824	509	1,333	1,226	2,050	1,984	59.8
1962	856	573	1,429	1,308	2,128	2,065	61.5
1963	906	637	1,543	1,410	2,193	2,138	64.3
1964	875	718	1,593	1,462	2,343	2,283	62.4
1965	1,096	812	1,908	1,772	2,481	2,436	71.4
1966	1,243	903	2,146	1,985	2,643	2,604	75.1
1967	1,209	1,001	2,210	2,032	2,791	2,749	72.8
1968	1,266	1,137	2,403	2,200	2,985	2,945	73.7
1969	1,442	1,231	2,673	2,406	3,169	3,130	75.9
1970	1,546	1,357	2,903	2,600	3,404	3,366	76.4
1971	1,651	1,478	3,129	2,832	3,632	3,595	78.0
1972							82.0

[1] Includes returns from farming operations to resident farm operators for their capital, labor and management, after deduction of farm production expenses (there is no allowance in the item farm production expenses for a return on investment in farm capital). Also includes farm wages and other labor income received by hired farm-resident workers.

[2] Includes all income received by farm residents from nonfarm sources such as wages and salaries from nonfarm employment, nonfarm business and professional income, rents from nonfarm real estate, dividends, interest, royalties, unemployment compensation, and social security payments.

In 1972, people living on farms received, on the average, about 82 percent as much income as persons not living on farms (table 2). This occurred even though more than one-half of the farmers in the United States in 1972 earned below-subsistence incomes (tables 4 and 11), and as a group, marketed only about 10 percent of all agricultural products. Net incomes from farming and other sources of persons on the larger 600,000 farms (with sales in excess of $20,000 per year), which market most of our farm products, were substantially above the national average per capita incomes of nonfarm people. Net incomes from off-farm work for the smaller two-thirds of U.S. farmers were larger in 1971 than average net income from farming.

TABLE 3.—NUMBER OF FARMS BY VALUE OF SALES CLASSES, 1960–71

Year	Farms with sales: $40,000 and over	$20,000 to $39,999	$10,000 to $19,99	$5,000 to $9,999	$2,500 to $4,999	Less than $2,500	All farms
Thousands of farms:							
1960	113	227	497	660	617	1,848	3,962
1961	123	239	494	625	576	1,764	3,821
1962	135	254	493	590	534	1,679	3,685
1963	144	267	491	558	496	1,605	3,561
1964	146	268	482	533	469	1,544	3,442
1965	163	282	466	508	458	1,463	3,340
1966	191	309	449	478	448	1,364	3,239
1967	189	305	436	462	436	1,318	3,146
1968	201	315	422	441	425	1,250	3,054
1969	229	342	408	413	418	1,161	2,971
1970	241	353	400	399	413	1,118	2,924
1971	253	365	392	385	409	1,072	2,876
Percentage distribution:							
1960	2.9	5.7	12.5	16.7	15.6	46.6	100
1961	3.2	6.3	12.9	16.4	15.1	46.1	100
1962	3.7	6.9	13.4	16.0	14.5	45.5	100
1963	4.0	7.5	13.8	15.7	13.9	45.1	100
1964	4.2	7.8	14.0	15.5	13.6	44.9	100
1965	4.9	8.4	14.0	15.2	13.7	43.8	100
1966	5.9	9.5	13.9	14.8	13.8	42.1	100
1967	6.0	9.7	13.8	14.7	13.8	42.0	100
1968	6.6	10.3	13.8	14.5	13.9	40.9	100
1969	7.7	11.5	13.7	13.9	14.1	39.1	100
1970	8.2	12.1	13.7	13.6	14.1	38.3	100
1971	8.8	12.7	13.6	13.4	14.2	37.3	100

TABLE 4.—INCOME PER FARM OPERATOR FAMILY BY MAJOR SOURCE AND BY VALUE OF SALES CLASSES, 1960–71

Year	Farms with sales: $40,000 and over	$20,000 to $39,999	$10,000 to $19,999	$5,000 to $9,999	$2,500 to $4,999	Less than $2,500	All farms
Realized net income:[1]							
1960	$18,955	$8,652	$5,368	$3,305	$1,961	$850	$2,962
1961	21,309	9,293	5,739	3,501	2,057	905	3,309
1962	21,415	9,153	5,708	3,419	1,983	901	3,424
1963	21,902	9,061	5,648	3,312	1,901	901	3,533
1964	23,301	9,531	5,985	3,464	1,973	954	3,802
1965	25,712	9,911	6,198	3,523	1,976	973	4,190
1966	30,680	10,948	6,641	3,694	2,134	1,017	5,044
1967	25,815	9,809	6,058	3,394	1,970	974	4,520
1968	26,149	10,003	6,208	3,476	2,031	1,012	4,809
1969	29,389	10,731	6,616	3,702	2,165	1,084	5,652
1970	29,104	10,473	6,475	3,634	2,128	1,077	5,757
1971	27,289	9,721	6,026	3,397	1,993	1,039	5,581
Off-farm income:							
1960	2,177	1,678	1,258	1,573	1,849	2,731	2,140
1961	2,577	1,816	1,437	1,859	2,128	3,054	2,417
1962	3,007	1,953	1,629	2,158	2,414	3,388	2,702
1963	3,500	2,135	1,853	2,504	2,754	3,803	3,047
1964	3,959	2,313	2,062	2,827	3,064	4,139	3,349
1965	4,454	2,504	2,309	3,219	3,452	4,650	3,751
1966	4,476	2,605	2,481	3,527	3,808	5,284	4,129
1967	4,587	2,708	2,615	3,749	4,055	5,662	4,385
1968	5,104	3,003	2,879	4,098	4,452	6,278	4,824
1969	5,432	3,228	3,125	4,460	4,871	7,065	5,285
1970	6,141	3,629	3,495	4,972	5,455	7,977	5,921
1971	6,447	3,825	3,676	5,221	5,743	8,479	6,230
Total income including nonmoney income farm food and housing:[1]							
1960	21,132	10,330	6,626	4,878	3,810	3,581	5,102
1961	23,886	11,109	7,176	5,360	4,185	3,959	5,726
1962	24,422	11,106	7,337	5,577	4,397	4,289	6,126
1963	25,402	11,196	7,501	5,816	4,655	4,704	6,580
1964	27,260	11,844	8,047	6,291	5,037	5,093	7,151
1965	30,166	12,415	8,507	6,742	5,428	5,623	7,941
1966	35,156	13,553	9,122	7,221	5,942	6,301	9,173
1967	30,402	12,517	8,673	7,143	6,025	6,636	8,905
1968	31,253	13,006	9,087	7,574	6,483	7,290	9,633
1969	34,821	13,959	9,741	8,162	7,036	8,149	10,937
1970	35,245	14,102	9,970	8,606	7,583	9,054	11,678
1971	33,736	13,546	9,702	8,618	7,448	9,518	11,811

[1] Includes Government payments.

The original farm programs of 1933, and the years immediately following, gave way for various reasons to the Agricultural Act of 1938, which established basic procedures for supporting the prices of agricultural products, and for limiting the acreage of certain crops. Price support and stabilization through loans and purchases, and limitation of production through acreage controls have been the basic machinery of farm programs since the 1938 Act. For some commodities, especially rice and peanuts, changes in the programs have been so limited since 1938, as to be negligible. For others, such as tobacco, the method of production adjustment has shifted from reliance upon acreage restrictions alone to a combination of acreage and quantity restrictions, while the price support technique has been largely unchanged.

For the major agricultural commodities—feed grains, wheat, and cotton—both the methods applied to supporting prices and incomes and to stabilizing and controlling production were changed rather sharply in the 1960's. This occurred after provisions of the 1938 Agricultural Act, modified somewhat in the intervening years, had been operative for some 25 years, and had led to unmanageable surpluses of grains and cotton in the 1950's.

Dairy products represent the only major livestock product whose prices have been consistently supported by Federal action (through purchases) since the 1950's. The Wool Act has provided payments to sheep producers to offset low and unstable world wool prices, but not to producers of lamb or mutton. Beef, pork, and poultry producers have often benefited from stable grain supplies and Federal purchases of food products for use in the school lunch and family feeding programs, but direct price supports of the type applicable to dairy products or to most major crops have never been in effect for edible meat products.

The Wool program is largely a political anomaly, since wool is not a key agricultural product. Congress enacted it in 1954, providing direct Federal payments to producers amounting to the difference between a price target (per pound) and the average price received by farmers for wool during the marketing year. This reliance upon direct Treasury payments to producers rather than support of market prices at high levels became a partial pattern for the price and income support procedures applied to the major commodities in the 1960's. Continuation of the Wool Act will be considered along with wheat, cotton, and feed grains in 1973.

Goals and Objectives

The objectives of farm programs have been established in the various acts, usually in terms of achieving "parity prices" or "parity incomes." The parity price objective would return to each unit of the various agricultural commodities sold by farmers the same purchasing power that it had in a past period, basically 1910–14 in the case of agricultural products. The parity income objective looks to a situation in which the real incomes of farm people would move to the same average level as the incomes of people not on farms but doing work requiring comparable skill and effort. A report to Congress by the Department of Agriculture in 1967, provides the best available description of these two statutory objectives, as follows:

[NOTE.—From *Parity Returns Position of Farmers;* Report to the Congress by the Department of Agriculture, August 10, 1967]

Section I. Parity—Its History and Significance

Parity prices

Discussions of farm programs and policies usually involve some reference to "parity," a word which has come to mean "equality" or "equity" for agriculture in an economic sense. A landmark in the development of this concept was the pamphlet, "Equality for Agriculture," written by George Peek and Hugh Johnson in 1922.

The idea found its first legislative formulation in the Agricultural Adjustment Act of 1933, which stated that it was the policy of Congress to—

> (1) * * * reestablish prices to farmers at a level that will give agricultural commodities a purchasing power with respect to articles farmers buy equivalent to the purchasing power in the base period. The base period in the case of all agricultural commodities except tobacco shall be the prewar period, August 1909-July 1914 * * *

The parity price formula resulting from this legislation and subsequent amendments is a purchasing-power concept. Parity prices are those which will give farm products generally the same per unit purchasing power in terms of goods and services farmers buy as prevailed in the base period 1910–14.

The most important modification of this formula was its modernization in 1950 to incorporate the intercommodity relationships that prevailed the 10 years immediately preceding. However, the purchasing power of farm products in general continues to be measured in terms of 1910–14.

Parity income

Congress has defined parity income in three different acts. These are (1) the Soil Conservation and Domestic Allotment Act of 1936; (2) the Agricultural Adjustment Act of 1938; and (3) the Agricultural Act of 1948.

The 1936 and 1938 acts defined "parity income" in terms of the historical ratio (August 1909–July 1914) between the per capita income of the farm population and that of the nonfarm population. The use of this base period relationship called attention to the kinship between parity income and parity prices.

The 1936 definition included income of the farm population from both farm and nonfarm sources. In an earlier U.S. Department of Agriculture study [1] income of the farm population from nonfarm sources was assumed to average $1.5 billion in the base period. On this basis, per capita income of the farm population has been above parity every year since 1941, with the exception of 1956. It averaged about one-fifth above parity in the last 5 years and about one-third above in 1966.

In the 1938 definition, per capita income of the farm population was limited to income from farming. By this definition per capita income of the farm population averaged around 105 percent of parity in the last 5 years and 120 percent of parity in 1966.

Per capita personal income of the farm population was 61 percent of the per capita income of the nonfarm population in 1966. Despite this, farm income was well above parity according to both the 1936 and 1938 definitions.

The Agricultural Act of 1948 defined parity income as follows:

> (2) "Parity," as applied to income, shall be that gross income from agriculture which will provide the farm operator and his family with a standard of living equivalent to those afforded persons dependent on other gainful occupations. "Parity" as applied to income, from an agricultural commodity for any year, shall be that gross income which bears the same relationship to parity income from agriculture for such year as the average gross income from such commodity for the preceding 10 calendar years bears to the average gross income from agriculture for such 10 calendar years.

This definition puts parity income on the basis of a direct comparison of equivalent standards of living. This is substantially different from the historical ratio of prices or incomes embodied in the earlier definitions. Although "equivalent standard of living" is a welfare concept, parity income was defined in terms of gross income and a measure of parity incomes for commodities was provided. These provisions implied that the use of parity income was applicable to commodity programs. Congress did not, however, so provide.

Although no official measures of parity income according to the 1948 definition have been developed, some relevant data are available. Hathaway has estimated that farm families require 86 percent as much money income as nonfarm families

[1] "Possible Methods of Improving the Parity Formula," S. Doc. 18, 85th Cong., first sess., U.S. Government Printing Office, Washington, D.C., 1957.

to have comparable welfare or purchasing power.[2] This estimate includes the differences between farm and nonfarm families in purchasing power of money income, income tax payments, value of home-produced food, and family size. The median money income of families living on farms, as estimated by the Census Bureau, was $4,122 in 1965, or 55 percent of the income received by nonfarm families.

Neither Hathaway's estimates nor the 1965 data relate specifically to farm operators and their families as defined by the Agricultural Act of 1948. They do, however, suggest that in terms of money income only, families living on farms in 1965 were well below the level that would provide a standard of living equivalent to that of persons in other occupations.

Limitations of existing definitions

The approach of the 1936 and 1938 definitions accepts the historical base period relationship as being a valid goal. Presumably it was related to the parity price concept which assumed that the relationship between prices recieved and paid by farmers in 1910–14 was in some sense a "normal" one.

The principal disadvantages of the base period approach are the difficulty of determining what base period should be used in the first place and the reluctance to change the base period often enough to keep it meaningful as technology and economic conditions change. The fact that the parity price formula is still based on 1910–14 illustrates this point. Furthermore, the application of the base period definitions in the 1936 and 1938 legislation shows recent average levels of farm income to be above parity. This is obviously inconsistent with the fact that per capita farm income has ranged from one-half to two-thirds that of nonfarm income since 1959.

The focus of the parity income definition in the Agricultural Act of 1948 is that of an equivalent standard of living to be provided by a certain level of gross farm income. This avoids the problem of inappropriate or obsolete base periods but raises serious problems of measurement and interpretation.

For one thing, the definition appears to be in terms of averages for all farm operator families. This is not a satisfactory approach to the problem of parity income for farms that differ markedly in size and volume of sales. Also, it is not clear whether the gross income from agriculture needed to provide an equivalent standard of living for farm operators and their families should take off-farm income into account. Finally, the addition of a gross income concept for each commodity that bears a historical relationship to parity income for agriculture as a whole has little validity from either an economic or statistical viewpoint.

Parity returns

The approach to parity income presented in this report, includes comparisons for different size classes of farms, as well as for all farms. For each size class, a parity returns standard is calculated, reflecting the amount of annual return an "average" farmer in that size class could get by using his labor and capital in other employments. The actual return a farmer receives from farming is compared with the standard to measure his parity returns position. The expression "parity returns" will be used throughout this report to distinguish this concept from other definitions of parity income.

Although parity returns is a fairly simple concept, actual measurement involves numerous technical questions for which there appear to be no single right answers. However, this report does attempt to reduce the possible answers to such questions to a few reasonable alternatives.

Farmers' incomes do not come neatly packaged in separate compartments labeled "Return on Capital" and "Return for Labor." Farmers receive gross income, including nonmoney income. When production expenses are subtracted, the remaining net income constitutes the farmer's current return for his capital, for the labor which he and unpaid members of his family supplied, and for management. In addition to annual income, capital gains or losses have an important impact on the financial position of farm operators and their families.

This report examines several alternative ways of measuring a parity return on farm capital and develops a method of measuring a parity return to operator and unpaid family labor. In doing this, numerous assumptions were involved. The assumptions employed appear to be reasonable, but they are not the only reasonable ones that could have been used. Equally competent analysts might have chosen a substantially different approach to the question of parity income.

[2] Hathaway, Dale E., "Government and Agriculture," the Macmillan Co., New York, p. 38, 1963.

Both parity price and parity income objectives have important shortcomings, and neither has been pursued rigorously under the farm programs enacted by the Congress. Some idea of how far we are from realizing parity prices can be had from the fact that parity prices for wheat and corn were $3.10 and $2.07 per bushel at the end of 1972, while price support loan levels were $1.25 and $1.05 per bushel, respectively, or 40 and 50 percent of parity. The parity price doctrine has often been criticized as not taking account of increases in agricultural productivity, which makes it possible to lower production costs per unit and earn larger profits despite stable or lower prices. This is particularly serious in an era such as the past 25 years, when increases in yields and in output per unit of labor and land input have been particularly apparent.

The parity income objective for farmers has sometimes been related only to income earned from farming operations. To repeat, in the past 20 years part-time or full-time employment off the farm has become the most important contributor to the incomes of people on nearly two-thirds of the farms in the United States. Table 4 shows the spectacular rise in off-farm incomes in general, but especially on farms with sales of less than $10,000 per year. Some have criticized the gains farm people have made relative to the income levels of nonfarm people from nonfarm earnings as meaning that farmers are forced to hold extra jobs in order to keep their families together. Such a view overlooks the fact that at least two-thirds of all the farms in the United States simply are not large enough to provide anything like full-time employment to the farmer and those members of his family who are able to work. Since it would be impossible to enlarge all farms at the same time, the only alternative to many family farmers of low income is to turn to employment off the farm while continuing to live in the home farm and community. This has been an excellent resolution of a serious economic and social problem for many families who are living on small farms and are determined to stay there.

It can be seen from table 2 that a great deal of progress has been made in moving toward parity or comparable incomes for farm people, with a gain from 54.5 percent to 79 percent since 1960 in the average level of income of farm people relative to nonfarm people. It is well known that the parity price and parity income series have moved in opposite directions the past 10 to 15 years. There has been a relatively slow but steady decline in the parity price index, which relates prices received by farmers to prices paid by farmers over time. From an index level of 100 some 20 years ago near the end of the Korean war, it declined to slightly below 70 in some months of 1971 and 1972, but by the end of 1972, had climbed back to 78 on the strength of the sharp increases in farm price levels that followed the serious Russian crop failures of 1972. The opposing movements of parity prices and various measures of average farm incomes represent another serious indictment of parity prices as farm policy objectives.

It is ironic that parity income, the objective which has been to such a large extent achieved, has received so little attention. The farm organizations which have staked their faith in a parity concept have usually considered parity prices to be more important as an objective than parity incomes. Such a position has long been untenable.

It is impossible to overlook the steady and sometimes rapid increase in the average per capita incomes of farm people over the past 12 years. In the same period average farm prices rose only slightly and sometimes fell. They were nearly always declining relative to the costs farmers incurred. This was partly because increases in direct Government payments were substituted for previous high price guarantees, but it was also the result of sharply increased farm productivity concurrent with the continued declines in the number of farms and the number of workers on farms.

One additional word on farm incomes is required to provide the needed background for consideration of changes needed in farm programs for major crops. The only comprehensive study ever published of the parity returns position of farmers showed that in 1967, some 494,000 farms at the larger end of the size scale (sales of $20,000 per year or more, table 3) were earning slightly above parity incomes, while some 434,000 farms in the next size category (sales ranging from $10,000 to $19,999 per year) were only slightly below parity income levels. Some 2.2 million smaller farms, however, were far from the parity income level, and would have required sharp increases in prices (or payments) if parity incomes were to be achieved. This is explained below in excerpts from the parity income study report:

[NOTE.—From *Parity Returns Position of Farmers;* Report to the Congress by the Department of Agriculture, August 1967]

Parity returns for all farms

Under all four standards, the ratio of actual returns to parity returns increased from 1959 to 1966. In 1959, the percentage of parity returns ranges from 47 to 67 percent, while in 1966 it ranges from 79 to 96 percent, depending on which standard is used as the basis of comparison.

Several things stand out in these comparisons. First, realized net income per farm as a percentage of parity returns is consistently lower under the landlord standard, excluding capital gains, than under the stockholder standard, excluding such gains. The respective percentages were 56 and 67 in 1959 and 81 to 96 in 1966.

Second, the capital gains component under the landlord standard has not been greatly different from that in annual return from farming so that the inclusion of these gains in the parity return standard and in annual returns from farming doesn't materially change the figures for all farms combined. Thus, returns from farming are only 3 percent higher in relation to the parity returns standard in 1959 and 1964, and only 2 percent lower in 1966 when capital gains were excluded.

The contribution of capital gains under the stockholder standard is relatively large. When these are included, returns from farming were 20 percent lower in relation to the parity returns standard in 1959, 12 percent lower in 1964, and 14 percent lower in 1966.

Parity returns by value of sales

When the farms are divided into four major classes, according to value of sales, striking differences appear. For the larger farms—those with value of sales of $20,000 or more—returns from farming as a percentage of parity returns ranged from 61 to 129 percent in 1959 and from 107 to 167 percent in 1966.

Under the landlord standard, the ranges are narrower than under the stockholder standard. Under the landlord standard, the 1959 range is from 84 to 92 percent, and the 1966 range is from 107 to 129 percent. Under the stockholder standard, however, the 1959 range is from 61 to 129 percent while the 1966 range is from 112 to 167 percent. Under both standards, lower percentages of parity returns emerge when capital gains are included.

Further differences are evident as attention is focused on farms with a lower value of sales. One noticeable feature is the disappearance of returns which are as much as 100 percent of any of the four standards. Also, there is a rapid narrowing of the ranges between the various standards.

In the case of farms with value of sales of $10,000 to $19,999, returns from farming as a percentage of parity returns ranged from 54 to 83 percent in 1959

and from 81 to 98 percent in 1966. There was no instance in which these returns equaled or exceeded 100 percent of any of the parity returns. The closest approach was in 1966 under the stockholder standard, excluding capital gains, when the ratio of actual returns to parity was 98 percent.

These same characteristics are evident in the two smaller classes. For farms with value of sales in the $5,000 to $9,999 bracket, the range in 1959 was only from 46 to 62 percent and in 1966 was 62 to 70 percent. The latter percentage, which represents the stockholder standard excluding capital gains, was the highest attained, but still 30 percent below this particular standard.

The pattern is even more striking for farms with value of sales less than $5,000, particularly with respect to percentage of parity returns achieved. Even in the generally good year of 1966, the highest percentage attained was 43 percent under both the landlord and the stockholder standard, including capital gains. It is interesting to note that for this group of farms the inclusion of capital gains raises returns from farming as percentages of the parity returns standards in all but one instance. This is due to the shrinkage of realized net income in farming as compared with capital gains, even though these are computed from very low asset values.

Parity returns in relation to the parity price ratio

Parity prices and the parity price ratio are often used as measures of the economic situation in agriculture. For this reason, there is interest in the relation of parity returns positions of farms to the parity price ratio.

In 1966, the parity ratio was 80. This means that the per unit purchasing power of farm commodities was 80 percent of what it was in the base period 1910–14. The index of prices received by farmers was 265, while the index of prices paid was 334. This indicates that farm prices would have had to have been at least 25 percent higher to reach 100 percent of parity prices. Actually, an even greater increase would have been needed, because of related increases in food prices and the prices of the resources purchased directly or indirectly from other farmers. This causes the index of prices paid by farmers to rise slightly as farm prices increase. When these adjustments are taken into account, it appears that 1966 farm prices would need to have been about 33 percent higher to have achieved 100 percent parity prices.

Again taking these adjustments into account, a much smaller increase in farm prices—11 percent—would have been needed to provide 100 percent of parity returns for all farms on the average. This assumes the landlord standard, excluding capital gains, and no significant change in the volume of goods sold. This standard could be reached with a parity ratio of 86 as indicated in table 11.

TABLE 11.—PARITY RATIO REQUIRED TO PROVID 100 PERCENT OF PARITY RETURNS AND PRICE CHANGE REQUIRED TO ACHIEVE THIS RATIO, 1966

Values of sales class	Required change in prices received	Parity ratio[1]
$20,000 an over	−9	73
$10,000 to $19,999	+10	86
$5,000 to $9,999	+38	103
Under $5,000	+170	167
All farms	+11	86

[1] Index of prices received by farmers divide by the index of prices paid by farmers including interest, taxes, and farm wage rates.

It can also be seen from table 11 that 9 percent lower prices with a parity ratio of 73 percent would have been sufficient to provide parity returns to farms with value of sales of $20,000 or more. Farms with value of sales of $10,000 to $19,999 would have achieved parity returns in 1966 with prices received 10 percent higher averaging 86 percent of parity.

On the other hand, farmers with value of sales of $5,000 to $9,999 would have needed a 38-percent increase in prices received. Finally. farms with value of sales with less than $5,000 could have attained this particular parity return only if prices received had averaged 170 percent higher than prices in 1966.

This analysis indicates that the level of prices received by farmers relative to prices paid is only one factor in the achievement of returns from farming com-

parable to those obtained in other sectors of the economy. Of critical importance is the total value of sales, which in turn is largely a function of the amount of capital invested in land and other productive assets.

Any proposals to raise farm price guarantees, or to increase or to limit Federal payments to farmers, should be considered in a context of the income and size differences among farmers as described above. An increasingly larger share of U.S. farms is in the larger size groups. For example, in 1967, 15.7 percent of all farms had sales of $20,000 or more, but this percentage had risen to 21.5 by 1970. In 1967, 55.8 percent of U.S. farms had sales less than $5,000; this share had declined to 51.5 percent by 1971, and will continue to decline. If the parity returns study were repeated for 1972, when overall net farm income was at a record high, it is likely that the income position of some 600,000 of the largest farmers would average well above comparable nonfarm income levels; or above parity. The position of the farmers at the large and small extremes of size in that group are necessarily obscured by such aggregation. Yet it is clear that commercial family farms are generally doing well in today's markets, and with today's technology and stabilization programs. The objectives of farm programs need to be geared principally to larger farmers; employment policies and income maintenance programs have far more relation to mall farmers than do farm programs.

II. Production Adjustment, Price Support, and Costs Under the Agricultural Act of 1970

The price support and production adjustment programs for the major field crops under the 1970 Agricultural Act have operated for only 2 years. Programs announced in 1972 applicable to crops for harvest in 1973 represent the final year of operations under the Agricultural Act of 1970. No really clear picture emerges regarding the effectiveness of the 1970 act in achieving its key objectives. The past three years have seen external forces such as the corn leaf blight and crop failure in the U.S.S.R. far overshadow farm programs as factors in determining farm incomes and prices. Yet a number of important points can be made in respect to the effects of the Act on production, prices, and costs for the three major crops or group of crops covered.

Production Adjustment

It was generally understood that the production adjustment programs in the 1970 act would be either less effective in limiting agricultural output, or more costly to the Federal Government for any required level of production restriction than the predecessor programs under the Food and Agriculture Act of 1965. This reduced efficiency in respect to production adjustment applied principally to feed grains, but it arose out of provisions of "the set-aside" as distinguished from features of programs in the 1965 and earlier acts called "acreage diversion."

Under the set-aside feature of the 1970 act, a single bloc of acreage was established to be kept out of production on a cooperating farm. Once that acreage had been set aside, and an additional acreage that had previously been assigned to conservation crops was also accounted for, the farmer might plant any crop or combination of crops on the remaining acreage and be eligible for Federal payments and price supports. A USDA summary of the new act in November 1970 read as follows:

> The new legislation contains nine titles, the first being concerned with a limitation on the maximum payment a single producer could receive under any one of the commodity programs for wheat, feed grains, and cotton. These three commodity programs are the nucleus of the set-aside approach.
>
> The set-aside program eliminates the old individual crop-by-crop controls that have been part and parcel of past programs. It provides instead a single set aside of acreage that a cooperating farm would agree to keep out of production. In addition, the farm will maintain its conserving base—although this base might be updated in order to more accurately reflect the current farming practices.

A farmer whose land had been almost entirely devoted to corn in previous years, for example, under the set-aside could be a participant in the feed grain price support and payment program and at the same time shift his acreage principally to wheat and soybeans in 1971, 1972, or 1973. The same possibility applies to other crops such as oats, rye, and barley, but not to sugar, rice, peanuts, and tobacco. This greater flexibility for farmers has been widely advertised as unique to the 1970 act, but this is an overstatement. Actually, the set-aside is important principally in respect to the production relationship between corn and soybeans which are grown in the same areas. It had applied to wheat and feed grains under the name "substitution clause" since 1963. The 1963 Wheat Act, and the wheat program in the Food and Agriculture Act of 1965, made it possible for farmers with wheat and feed grain allotments to take part in both programs while planting any combination of the various grain crops on an acreage not in excess of the allowable acreage on the several allotments of the farm. Soybeans, however, were not included in this provision until the 1970 act.

The greater freedom of choice available to farmers under the set-aside program is important, therefore, in the corn belt but of little importance where soybeans are not grown. Department of Agriculture officials have substantially overstated the difference between the set-aside and features of the acreage diversion programs of the 1960's. Interchangeability between wheat and feed grain acreages was widely practiced for more than 5 years prior to the 1970 act and, as were the set-asides, was a very popular feature with farmers.

It was feared by some that under the set-aside program, production adjustment would be ineffective and grain surpluses would again develop. Opponents of the set-aside were successful in introducing

into the legislation authority for the Secretary to "limit the acreage planted to feed grains on the farm to such percentage of the feed grain base as he determines necessary to provide an orderly transition to the program provided for under this section." This provision of the 1970 act has not been used as a means to insure effective production adjustment for feed grains, but as one means of getting larger plantings of soybeans.

The set-aside program undoubtedly encouraged corn production at the expense of needed expansion of soybean plantings in the United States in 1971 and 1972. The demand for soybeans is expanding more rapidly than for any other U.S. agricultural product. Soybean yields, however, have increased only very slowly, since there have been no major scientific breakthroughs in soybean breeding. Corn yields, on the other hand, have continued to rise at a rapid rate averaging nearly 2 bushels per acre per year. This has made corn extremely profitable on most Cornbelt farms, even at prices only slightly above $1 per bushel, but has not encouraged expansion of soybean acreage until prices go above $3.00 per bushel (or a soybean to corn ratio of 3 : 1). The set aside, by blending the acreage farmers had previously devoted to corn and soybeans on their farms, made it possible for a farmer to cooperate in the set-aside program; idle 20 or 25 percent of his past corn acreage, while actually increasing the acreage devoted to corn on the farm (and reducing soybeans or other crops).

Disturbances in the grain economy while the 1970 Agricultural Act was in effect make it extremely difficult to appraise the actual impact of the set-aside. The southern cornleaf blight outbreak struck in the United States in 1970, just before the set-aside program became effective; the massive crop damage in the U.S.S.R. came in its second year. The resulting increase required in 1971 corn production, the sharp rise in 1972–73 grain exports from the United States and the minimum level set-aside operating in 1973 all tend to obscure the impact of the set-aside. Similarly, factors were operating to affect cotton production, notably, extremely bad weather in 1971, and to a smaller extent again in 1972. It is seen in tables 5 and 6 that feed grain and wheat production and carryover stocks have changed sharply since the set aside was adopted late in 1970. Virtually none of these effects, however, are attributable to the special nature of the program itself. The program was flexible enough to permit a sharp expansion in acreage and production of feed grains in 1971, and a sharp reduction in acreage planted in 1972, with a smaller reduction in output because yields were exceptionally high. For wheat, by 1967 carryover stocks had begun to build up above the level of 500 to 600 million bushels commonly accepted as a safe reserve carryover. Carryover stocks also climbed rather sharply in 1971–72, the first year of the set-aside program, but stocks in the 1972–73 marketing year will be reduced by nearly 400 million bushels. Neither the increase in stocks in 1971–72 nor the decrease in 1972–73 can be attributed to the merits or shortcomings of the set-aside program.

TABLE 5.—WHEAT: SUPPLY, DISTRIBUTION AND PRICES, TOTAL AND BY CLASS JULY–JUNE AVERAGE 1965–69 AND ANNUAL 1969–72 [1]

Item and year	Average 1965–69	1969–70	1970–71	1971–72 preliminary	1972–73 projected
			Million bushels		
Beginning carryover	626	817	885	731	863
Production	1,426	1,443	1,351	1,618	1,545
Imports [2]	2	3	1	1	1
Total supply	2,054	2,263	2,237	2,350	2,409
Food [3]	515	521	519	526	525
Seed	66	57	63	64	68
Fees (residual) [4]	128	194	186	265	225
On farms where grown	(47)	(61)	(62)	(73)	
Domestic disappearance	709	772	768	855	818
Exports [2]	705	606	738	632	1,150
Total disappearance	1,414	1,378	1,506	1,487	1,968
Ending carryover	640	885	731	863	441
Privately owned—"Free"	(197)	(152)	(170)	(162)	
			Dollars per bushel		
Price support:					
National average loan rate	1.25	1.25	1.25	1.25	1.25
Average certificate payment	.54	.65	.75	.54	.47
Season average price received:					
By nonparticipants	1.37	1.24	1.33	1.34	1.67
By program participants	1.91	1.89	2.08	1.88	2.14
	Hard winter	Red winter	Hard spring [5]	Durum	White
			Million bushels		
1969–70:					
Beginning carryover	475	33	210	41	58
Production	785	186	190	108	174
Total supply	1,260	219	403	149	232
Domestic disappearance	350	168	136	35	83
Exports [2]	336	28	89	34	119
Total disappearance	686	196	225	69	202
1970–71:					
Beginning carryover	574	23	178	80	30
Production	755	174	198	53	171
Total supply	1,329	197	377	133	201
Domestic disappearance	387	156	118	36	71
Exports [2]	450	26	113	39	110
Total disappearance	837	182	231	75	181
1971–72 preliminary:					
Beginning carryover	492	15	146	58	20
Production	747	212	366	92	201
Total supply	1,239	227	513	150	221
Domestic disappearance	432	166	133	37	87
Exports [2]	337	43	104	44	104
Total disappearance	769	209	237	81	191
1972–73 projected:					
Beginning carryover	470	18	276	69	30
Production	764	227	274	73	207
Total supply	1,234	245	551	142	237
Domestic disappearance	342	166	190	38	82
Exports [2]	710	70	180	50	140
Total disappearance	1,052	236	370	88	222
Carryover	182	9	181	54	15

[1] Data by class, except production, are approximations. Projected disappearance figures should be regarded as midpoint of estimated ranges.
[2] Imports and exports include flour and other products in terms of wheat.
[3] Used for food in the United States, U.S. territories, and by the military at home and abroad.
[4] Assumed to roughly approximate total amount used for feed, including mixed and processed feed, also includes negligible quantities used in distilled spirits and beer.
[5] Total supply of Hard spring includes imports.

TABLE 6.—FEED GRAINS: SUPPLIES AND DISTRIBUTION, UNITED STATES

[Average 1965–69, Annually 1967–72]

Marketing year [1]	Supply				Distribution				
	Carry-over	Production	Imports	Total supply	Feed	Food, industry, and seed	Total domestic	Exports	Total use
	Million bushels								
Corn:									
1970	1,005	4,152	4	5,161	3,581	396	3,977	517	4,494
1971	667	5,641	1	6,309	3,980	407	4,387	796	5,183
1972 [2]	1,126	5,553	1	6,680	4,310	415	4,805	1,000	5,805
1973 [2]	875								
Grain sorghum:									
1970	244	684		928	685	9	694	144	838
1971	90	876		966	692	9	701	123	824
1972 [2]	142	822		964	754	10	764	145	909
1973 [2]	55								
Oats:									
1970	499	917	2	1,418	782	102	884	18	902
1971	516	881	4	1,401	737	99	836	24	860
1972 [2]	541	695	2	1,238	760	98	858	10	868
1973 [2]	370								
Barley:									
1970	236	416	9	661	288	140	428	78	506
1971	155	464	15	634	264	144	408	51	459
1972 [2]	175	423	10	608	280	148	428	40	478
1973 [2]	130								
	Million tons								
Total feed grains:									
1970	48.6	160.1	0.4	209.1	138.9	16.3	155.2	20.7	175.9
1971	33.2	207.7	.5	241.4	149.0	16.7	165.7	27.3	193.0
1972 [2]	48.4	199.8	.3	248.5	163.1	17.0	180.1	33.4	213.5
1973 [2]	35.0								

[1] Marketing year beginning October 1 for corn and grain sorghum; July 1 for oats and barley.
[2] Preliminary; based on January 1973 indications.

Restrictions on the extent to which wheat acreage can be reduced under the 1970 act do limit the Secretary of Agriculture in setting the wheat acreage that may be planted in any year in return for wheat certificate payments. If serious production restrictions were ever required under the wheat program, it would be a rather expensive operation, depending as it does upon offering farmers extra payments beyond the required wheat certificate payments for voluntarily reducing acreage below the level allowed under the set-aside provisions. Large increases in wheat carryovers probably could not have been avoided in 1973 and 1974 except for the extreme crop disaster that struck the U.S.S.R. and other countries of the world this past year. The 3 years under the set-aside will have produced the three largest wheat crops in history, assuming the 1973 crop reaches the targeted 1,700 to 1,800 million bushels, as would appear to be likely at this time. Fortunately, the demand for grain worldwide expanded sharply during the years in which the set-aside operated, so that no real test has yet been made of its production adjustment features. Surplus wheat stocks, or rising program costs would become a regular feature of the wheat economy under the set-aside, unless world demand continues very high.

There would appear to be enough flexibility under the feed grain features of the set-aside, if adequate budgetary funds are available, to continue effective production adjustment in the feed grain sector, even during somewhat more normal times. Feed grain provisions, in contrast to those for wheat, do not limit the Secretary of Agriculture in

requiring overall acreage reductions as needed to balance supply and demand. But they also do not insure that an increase in the set-aside for feed grains will generate much response in reducing feed grain plantings. For example, the set-aside in 1972 was 37 million acres, some 18 million acres more than in 1971. Yet the acreage planted to feed grains was reduced by only 12.5 million acres in 1972. "Slippage" of this type has always been a feature of voluntary acreage diversion programs. Its greater importance under the set-aside provides the basis for our statement that the set-aside is less efficient than predecessor programs. If enough money is spent, however, it can prevent an accumulation of surplus stocks. Even so, changes would appear to be wise, in 1973, to achieve greater efficiency of production adjustment in an era when limitations on Federal expenditures are expected to be increasingly important.

Price Supports and Payments

The price support features of the 1970 act differ relatively little from the price support provisions in effect in the 1960's. But the few differences are important. Beginning with the Food and Agriculture Act of 1965, and some of the predecessor acts which operated on a year-to-year basis in the early 1960's, price support for corn has been provided through nonrecourse loans at a minimum figure of around $1 per bushel for many years. Price support refers to the loan level, or the level at which market prices are protected. It does not relate to Federal farm payments. Sometimes the loan level plus the Federal payment applicable to the commodity is referred to as "price support." This is a confusing nomenclature, which refers to the total returns per unit of production on the farm, rather than to the minimum level of protection afforded to market prices.

For wheat, the loan level since 1963 has been based upon world market prices and the loan level for corn, taking into account the difference in weight per bushel and the feeding value of wheat in relation to feed grains. Present law states that "loans and purchases on each crop of wheat shall be made available at such levels as the Secretary determines appropriate, taking into consideration competitive world prices of wheat, the feeding value of wheat in relation to feed grains, and the level at which price support is made available for feed grains; provided, that in no event shall such level be in excess of the parity price for wheat or less than $1.25 per bushel." The actual price support loan level for wheat has been $1.25 per bushel since 1963, and probably can continue at that level for a number of years without serious difficulty. It could not be raised, however, unless the corn loan were also raised substantially, or unless the requirements in the law, to relate feed grain and wheat loan levels were simply overlooked.

Under the wheat program, producers also receive direct payments (called wheat marketing certificates as a result of certain complex features relating to payments required to be made by wheat processors under the act). The value per bushel of wheat market certificates under the 1970 Act is an amount which will return to farmers the parity price for wheat at the beginning of the marketing year, when taken in conjunction with the average price received by farmers for wheat during the first 5 months of the marketing year. Certificate

payments apply to the amount of wheat used for human food in the United States in any year, or less than one-third of a current crop. If farmers receive relatively high prices for their wheat, the payment (or domestic marketing certificate) will be less per bushel than if prices are near the support level. This feature of the program became applicable for the first time under the 1970 act. Prior to that, wheat payments were equal to the difference between the price support loan level of $1.25 per bushel and the parity price for wheat, $3.02 per bushel in July 1972 when the current marketing year began.

Beginning with the 1965 act, price supports for cotton were required to be set slightly below estimated world market prices for the year ahead, in much the same manner as for the grains. This provision was continued in the 1970 act. Payments were provided in both acts to supplement the price support.

Total payments to farmers under the three major price support programs covered in the Agricultural Act of 1970 have varied substantially from year to year in the case of feed grains, but have been rather constant in the case of wheat and cotton (table 7). In 1969 and 1970, the last 2 years of operation of the feed grain program under the Food and Agricultural Act of 1965, payments to farmers were $1,643 million and $1,504 million, respectively. In 1971, the first year under the set-aside program of the 1970 act, payments to farmers were only $1,504 million for feed grain diversion. An effort was made to attribute some of this reduction to the merits of the set aside. The payment reduction, however, was entirely attributable to the fact that the acreage diverted from feed grains in 1971 was less than one-half as large as the acreage diverted from feed grains during the previous 2 years. The 1969 and 1970 programs diverted 39.1 million and 37.4 million acres respectively under the feed grain program. The 1971 program diverted only 18.2 million acres. If the reduction in payments in 1971 had been proportional to the reduction in acreage diverted or set aside, the payment level would have been approximately $800 million; instead, it was $254 million higher than that. If the acreage diversion and payment features of the 1965 act had been in effect, the 1971 payment level could have been cut to $600–$700 million.

TABLE 7.—GOVERNMENT PAYMENTS, BY PROGRAMS, 1933-71[1]

[In millions of dollars]

Year	Conservation[2]	Soil bank	Sugar Act	Wool	Feed grain	Wheat	Cotton	Rental and benefits	Price adjustment and parity	Wartime product on subsidy	Cropland adjustment	Miscellaneous[3]	Total
1933								131					131
1934							51	395					446
1935							15	558					573
1936	24						41	213					278
1937	324							11					336
1938	309		22				114						446
1939	527		28				8		201				763
1940	496		27						200				723
1941	382		27						134				544
1942	450		25						175				650
1943	332		36						254	22			645
1944	378		27						1	370			776
1945	259		24							459			742
1946	285		31							456			772
1947	277		37										314
1948	218		39										257
1949	156		30										185
1950	246		37										283
1951	246		40										286
1952	242		33										275
1953	181		32										213
1954	217		40										257
1955	188		41										229
1956	220	243	37	54									554
1957	230	700	32	53									1,016
1958	215	815	44	14									1,089
1959	233	323	44	82									682
1960	223	370	59	51									702
1961	236	334	53	56	772	42							1,493
1962	230	304	64	54	841	253							1,747
1963	231	304	67	37	843	215							1,696
1964	236	199	79	25	1,163	438	39						2,181
1965	224	160	75	18	1,391	525	70						2,463
1966	231	145	71	34	1,293	679	773				51		3,277
1967	237	129	70	29	865	731	932				85		3,079
1968	229	112	75	66	1,366	747	787				81		3,462
1969	204	43	78	61	1,643	858	828				78		3,794
1970	208	2	88	49	1,504	871	919				76		3,717
1971	173		80	69	1,054	878	822				67	2	3,145
1972[4]					1,880	855	808						4,000
1973[4]					1,100	800	700						3,100

[1] Details may not add to totals due to rounding.
[2] Includes great plains and other conservation programs.
[3] Includes all other programs such as milk indemnity.
[4] Estimated.

In 1972, payments under feed grain programs totaled $1,880 million, a record high level. At the same time the acreage diverted (set aside) was 37 million, some 2 million less than the highest acreage diversion achieved under the 1969 program, when payments were $1,643 million. The output increasing features of the set-aside described earlier, continued yield increases, and political decisions to build a greater element of income subsidy over and above production adjustment needs into the feed grain program in 1972, account for the unusually high expenditure level. If program features applicable in 1969 had been in effect in 1972, the desired acreage diversion could have cost $200 to $300 million less.

For 1973, feed grain program payments are estimated at about $1.10 billion, to encourage farmers to divert about 10 million acres from feed grains. If that level of acreage diversion and the proposed level of payments are achieved, the reduction in payments compared with 1972 will be proportionately far smaller than the reduction in acreage diversion. An early error in announcing too great an acreage set-aside target and various rigidities in the laws have left the 1973 feed grain program costing some $500 million more than was necessary, despite the stringent overall budget limitations imposed by the President.

It will be seen in table 7 that wheat payments have ranged from about $747 million to $878 million in most recent years. This relative stability is the result of wheat payments being fixed by formula rather than being related directly to acreage diversion requirements. The payment estimated for 1973 is a very rough figure, and is dependent upon movements in market prices for wheat beginning July 1, 1973. If wheat prices fall to 1970–71 levels, payments will again be higher than in previous years, as a result of the built-in parity escalation. But if July–November 1973 prices are far above the $1.25 loan level, 1973 payments would be substantially lower than in 1972, when market prices did not peak until after November and payments were not greatly reduced.

The relative stability of cotton payments (table 7) is also the result of rather fixed payment formulas in the law, and the fact that cotton payments are not in any substantial way linked to acreage diversion requirements, as feed grain payments are.

Serious inequities among commodities and regions would be perpetuated if the 1970 act were continued without major amendments to payments formulas. The fixed statutory payment formulas noted above for cotton and wheat require sizable income subsidies to producers of cotton and wheat, apart from acreage diversion incentives. The limited discretion given the Secretary of Agriculture in the payment formula for feed grains, coupled with powerful competition for Federal funds over the past several years, has usually denied large income subsidies to feed grain producers, with 1972 and 1973 the principal exceptions.

These differences in payment formulas for the three major commodities are important to future policies and programs. They are illustrated by data made available a few years ago by the Department of Agriculture, separating the functions which direct Federal payments served in 1968 into "supply management" and "income subsidy" functions. "Supply management" payments represent the level of

payment required to keep production at the level achieved in 1968. The remainder is classified functionally as an income subsidy. The production and price stabilization aspects would function as well or better if the subsidy payments were ended or reduced.

Program	Total payments	Supply management		Income subsidy	
	Million dollars	Million dollars	Percent	Million dollars	Percent
Cotton	787	277	35	510	65
Feed grains	1, 366	1, 218	89	148	11
Wheat	747	385	51	362	49
Total	2, 900	1, 880	65	1, 020	35

Note that feed grain payments in 1968 were devoted almost entirely to limiting output (supply management). Only 11 percent of the very large total feed grain payments was a direct income subsidy, while 65 percent of total payments to cotton producers was classified as a subsidy. Cotton was at the other extreme even in 1968; by 1970, cotton payments were straight income subsidies.

One-half of all wheat payments in 1968 were income or subsidies, and that ratio has applied generally since 1968. With wheat acreage limits suspended for 1973, however, all wheat payments will be direct income supplements, from a functional standpoint.

These estimates have not been made public by USDA for crop years since 1968, but rough calculations indicate that for 1972 wheat and cotton payments were again straight subsidies, and that feed grain payments were predominately an income subsidy and contributed negligibly to production control.

III. Legislative Changes Needed in 1973

The recommended changes in farm laws take as their basepoint the Agricultural Act of 1970, which itself was developed directly out of the Food and Agriculture Act of 1965. The 1965 act represented a grouping and consolidating of new legislation passed in the early 1960's, to reduce grain and cotton surpluses, improve the operation of markets, and raise overall farm incomes.

An Agricultural Act of 1973 based to any substantial degree on these recommendations would be another link in a long and consistent chain of program actions that began in the early 1960's. It would also represent considerable continuity with farm program features dating even further back. This continuity is justified because farm programs have worked reasonably well, except when congressional rigidity or executive intransigence have prevented it. It is Congress and the executive branch, not inoperative concepts of farm programs, which must take the blame for the one long period when farm programs were failing in nearly every respect. This was in the 1950's, when farm price supports were reduced by enough to make the farmers angry, but not enough to cause them to reduce production. At the same time, Congress established minimum acreage allotments for major crops. Neither the Executive nor Congress would give way in the interest of effective programs. As a result, surpluses and costs mounted, and U.S. farm policy has been more or less in bad odor since.

This attitude has been overcome, to a degree, by the program revisions of the 1965 and 1970 acts, at least so far as effective control of surpluses and stabilization of farm incomes are concerned. The fact that large farmers (when compared with most farmers) get most of the program benefits and the aggregate level of farm program expenditures, have become the two main sources of public concern over farm programs.

If agricultural stabilization efforts are to continue, the basic features of recent or existing program should be continued. In saying this, a judgment is made that agricultural stabilization can be worth its costs, but no special stamp of approval is given to the level of spending of recent years on farm programs. Costs could have been higher or lower, depending upon the administrative decisions taken.

The changes proposed below for the three major field crops under Federal farm programs are designed to make it possible to continue to support and stabilize farm prices and incomes, to make effective and efficient use of the Federal funds spent on agricultural stabilization, to help shift the benefits of farm programs somewhat more toward those family farmers at the smaller end of the size scale but who rely upon farming for all or most of their incomes, and to continue to foster the operation of the open market in farm products for those crops where it remains the principal marketing institution. Legislative changes are discussed separately for wheat, feed grains, and cotton, even though they are related in some cases. Limited comments of a relatively general nature are made also for programs applicable to other crops and livestock products, but few detailed recommendations are made in those areas.

Wheat

Price support for wheat should continue to be provided through loans and purchases at a level based upon longtime world values for wheat and the price support levels in effect for feed grains. It would be advisable, in the interest of flexibility, to remove the $1.25 minimum applied in the 1970 act, so that the proper relationship can be maintained between corn and wheat loan levels, especially if it becomes necessary to reduce the corn loan to $1 or lower.

Payments to farmers under the wheat program should be limited, at the discretion of the Secretary, to the level required in any year to achieve needed production adjustments. This should apply to all payments, whatever their source. Wheat payments have been financed about equally by the Treasury, and by consumers through a marketing certificate arrangement under which processors of wheat, principally flour millers, pay into the U.S. Treasury $0.75 per bushel of wheat processed for human food. This fund is then passed on to farmers by USDA. As noted earlier, total payments to wheatgrowers have been at least 50 percent larger in most recent years than would have been required to keep production in line with requirements. In 1973, all restrictions were eliminated on spring wheat plantings, but the shift from a fairly restrictive acreage program came too late to generate the needed expansion in winter wheat plantings.

It would be constructive public policy, in view of the extremely tight budgetary situation, to reduce the required wheat payments to about half recent levels, while leaving the Secretary enough discretion to

expend a somewhat larger, but yet limited, amount out of CCC funds in years when surpluses become a serious threat. This feature would reduce program costs by about $400 million per year when fully in operation, although its effect on net Federal expenditures might be less than that.

A difficult choice would need to be made by Congress regarding the method of financing payments to wheat farmers under the suggested program. Millers and bakers will propose to end the payments they make, in the amount of $0.75 per bushel on about 530 million bushels, or nearly $400 million. Farmers would have no reason to resist such a change if they could be assured that the Government would continue the payments at past levels. High wheat prices in 1972–73 with resulting high flour prices make the processor's plea especially timely in 1973. At the same time, if processor (consumer) financing is ended, and payments to wheat farmers are continued, the entire payment amount must come out of Treasury expenditures. The administration would be hard pressed to increase its expenditures to wheat farmers by $400 million when it has cut many social and development programs indiscriminately. One compromise would be to reduce Treasury and processor costs equally, if total wheat payment levels are cut back.

The "set-aside" feature of the 1970 act should be replaced by acreage diversion provisions, applicable to both wheat and feed grains, similar to those that were incorporated in the Food and Agriculture Act of 1965. The set-aside feature weakens the capacity of Government and farmers to control production. It permits land not included in the conserving base or in the crop base to be brought into production and thus may contribute in normal times to commodity price and income instability. By permitting acres to be shifted among the grains and oilseeds without reference to specific national needs, the set-aside tends to unbalance agricultural production relative to demand. In particular, it has been responsible for the all-too-slow expansion in soybean acreage the past 2 years. It does give farmers slightly more freedom to farm, but the supply management programs are already voluntary as far as participation is concerned. Further, the feature in effect since 1963 permitting wheat and feed grain acreages to be interchanged incorporated much of the flexibility that has been attributed to the set-aside. The set-aside feature will continue to result in slippage in production control, and either excessive costs or buildups of stocks. It is not an efficient surplus management device, and should be continued only with great caution.

Land removed from production under supply management programs for major crops should in some years be withheld from other crops. It should be planted to cover crops for erosion control and wildlife habitat, or used for grazing to expand cattle herds. The surplus problem of one commodity should not be transferred to another. In other words, the aggregate effect of individual commodity acreage reduction programs must be taken into account in an effective manner.

The feature of the 1970 act limiting the extent of any reduction the Secretary of Agriculture may make in wheat acreage, should be removed. Some of the greatest damage ever done to U.S. farm programs has come out of well-meaning legislation in the 1950's setting minimum acreages for key crops while yields per acre climbed, or while export

markets sagged. Congress is in no position to administer the program from year to year and should not fix either payment levels or acreages.

The amendments cited above, together with a payment limitation of $20,000 per farm (as described in another section), would materially improve the wheat price support and stabilization program from the standpoint of public welfare. Since it would limit total subsidy payments, there is no assurance that aggregate farm incomes would be maintained or would rise. But a healthy wheat producing sector—one already earning good incomes—would be sustained. As export markets grow and as wheat is increasingly used as livestock feed, the wheat economy would also expand.

A "permanent" wheat program dating back 10 years remains in the law. It includes mandatory acreage allotments and marketing quotas, and approval of two-thirds of producers voting in a referendum; this program was turned down in 1963, and should not be the standby wheat program in 1973. Wheat price support and production adjustment laws should expire every 3 to 4 years, so that amendment and reenactment can be carried on out of the shadow of obsolete legislation that slips into gear if Congress fails to act. Even the price support level applicable under permanent legislation when no acreage control program is in effect, should be ended. It would require price support at 50 percent of parity or about $1.65 per bushel for the 1974 crop; it is not a workable standby wheat program in normal times even though it might not result in surpluses or require export subsidies in times such as 1972–73.

Feed Grains

Price support for corn has been set at $1.05 per bushel for many years. The 1970 act prescribes a minimum level of $1 per bushel. Apparently, the U.S. farm economy, principally the Midwest, continues to have the capacity to produce substantially more corn and other feed grains at or near the minimum statutory level of price support, since between 19 and 38 million acres have been diverted from feed grains production each year for over 10 years.

It is not likely that conditions will arise within the next 3 to 4 years in which corn price support would need to be reduced by more than 5 percent in order to limit surpluses or to remain competitive in world markets. If Federal expenditures had to be cut, however, reducing the price support level below $1 in order to encourage consumption and discourage production, would be one possibility for action. It would be constructive if the Secretary of Agriculture had some additional discretion in the matter, beyond the present legal minimum. The minimum price support for corn should either be deleted from the law, or set some 10 to 15 percent lower over the next few years.

Payments to feed grain producers were also fixed by law in the 1970 act, at a level which taken together with the average market price for corn in the first 5 months of the marketing year, would return to producers in 1973 about $1.47 per bushel for that part of the crop eligible for Federal payments. This provision has made it extremely awkward for the USDA to develop feed grain acreage reduction programs suited to the varying conditions that have prevailed since 1970. For example, when it became necessary to reduce the 1973 set-aside in order to expand feed grain production, it was difficult to design a simple program, because payment levels could be decreased

only slightly under the law. Payment levels should be tailored directly to diversion requirements under normal conditions, just as they were for feed grains during the 1960's. Any minimum payment level introduces needless inflexibility that damages program operations and farmers in the long run; it wastes money on direct subsidies to producers which could better be spent on limiting production in the interest of supporting prices when surpluses threaten.

The "set-aside" for feed grains should be made optional, and probably should be ended for a few years in favor of an acreage diversion program patterned more nearly to the one developed in the 1960's. The provision allowing interchangeability of all grains on crop acres should be retained, and soybeans could be added to the interchangeable crops at the discretion of the Secretary. The principal effect of this change would be to expand the production of soybeans, and to limit the rate of output expansion for corn. The set-aside should be used only in circumstances judged by Congress and the USDA to clearly encourage the needed acreage expansion in soybeans.

Grazing the acreage diverted from field crops has long been a desirable policy, but organized cattle groups have successfully discouraged such action. Even so, the Secretary was authorized in the 1970 act to allow set-aside lands to be grazed, at his discretion. This authority is being used for 1973 crops for the first time, based on the January announcements generally relaxing restrictions on farm production. It will not expand beef production quickly, but it will add needed forage supplies to our depleted rangelands to help encourage expansion of cattle numbers in the long run. It should be continued.

Cotton

The cotton program requires some changes to move it into accord with national budgetary policy, and to aline it with other major commodity programs. For several years, cotton producers have received Federal subsidies (payments) far out of line with payments made to producers of other commodities, as cited earlier. With little need to limit cotton acreage to keep production in line with demand, and with cotton production more highly concentrated on large farms than other major crops, 1973 would be an appropriate time for amending the cotton program.

The national cotton production goal in the 1970 act calls for the United States to produce all cotton needed for U.S. consumption, and an amount for export as estimated by USDA. Payment formulas in the law were designed to provide farmers the income incentives needed to produce that amount of cotton each year. Unlike the feed grain and wheat payments, which apply to less than half the normal production on the farm, cotton payments apply to all the cotton normally grown on the allotted cotton acreage. This has the effect of subsidizing the production of cotton for export as well as for domestic use. In the case of wheat and feed grains, payments to producers are limited to an amount of grain equal to or less than the amount used in the United States. Farmers deciding to produce wheat or corn on an acreage greater than that to which payments apply receive only the world market price for the extra output and thus compete on even terms with producers in other countries. The same provisions should apply to cotton.

This distinction is important in several ways: (1) Subsidizing the production of cotton for export is a practice distinctly at odds with world trading rules and principles which the United States generally supports; (2) subsidizing cotton exports works against U.S. programs which provide economic assistance to developing countries, many of which are struggling to expand cotton exports; and (3) equity among farm programs and farming regions, quite apart from the competition for public funds, demands that Federal expenditures for cotton payments be curtailed. They represent nearly one-half the total value of an average cotton crop, compared with 15 percent for feed grains and 35 percent for wheat.

Congress should reduce cotton payment levels to about one-third of recent high levels, or to about $300 million a year at least by 1976. It should also make payments applicable only to an amount of cotton used in the United States, roughly 8 million bales per year. The reduction in payments could be phased over a 2- to 3-year period, unless budgetary pressures were such that this was not feasible.

Price support for cotton should be continued under a formula similar to that in effect since 1965, keeping the loan level slightly below anticipated world market prices. This is the same approach as used for the grains.

The "permanent" cotton program is as obsolete as plowing with a mule or picking cotton by hand and should be ended. It includes rigid acreage allotments and marketing quotas, and price supports geared to parity at a level some 12 to 17 cents per pound above average world values. It is a cotton program that already failed in the 1950's, and no one seriously wants to go back to it. Cotton legislation should be considered on its merits every 3 to 4 years.

Commodity Reserves

Maintenance of a reserve of storable commodities has been regarded as appropriate public policy for nearly 40 years. Yet no specific authority has ever been granted the Secretary of Agriculture to acquire and maintain such reserves. Lacking clear authority, various officials have relied upon the 1948 Charter Act of the Commodity Credit Corporation and various price support laws which give great discretion in handling and disposing of surpluses acquired as a by-product of price support operations.

A number of studies over the past 20 years have established the range of 500 to 600 million bushels of wheat, 35 to 40 million tons of feed grains, 5 to 6 million bales of cotton, and 100 to 150 million bushels of soybeans as reserve levels needed to insure against unusual crop disasters at home or abroad, and to meet unusual demands arising out of national security requirements. These are not immutable estimates; they need to be reviewed from time to time, especially as the size of the market changes. But they do serve as useful guides to needed reserve levels.

At least four major bills have been presented to Congress in the past 10 years to establish rather formal procedures for acquiring and using commodity reserves. All but one failed to get even committee approval, while the Strategic Storable Agricultural Commodities Act of 1971 secured only the approval of the House of Representatives, and died in the Senate Committee on Agriculture and Forestry. Congress

finds it difficult to focus on reserves when there are visible crop surpluses. And when crops are short, how to feed the reserves into the market becomes so controversial that little can be agreed upon.

In 1973, Congress should consider a very simple approach to the question of stabilization reserves. A statement of policy could be written into the 1973 agricultural act, declaring it to be the intent of Congress that the Secretary of Agriculture should maintain adequate reserves of storable commodities at levels to be determined and announced by the Secretary and further, that the reserves should be acquired, managed, and disposed of under authority presently available to the Secretary. Such authority is found in the CCC Charter Act and in the price support and acreage adjustment laws of past acts and the proposed Agricultural Act of 1973.

In doing this, Congress should not attempt to set out the exact procedures for handling the reserve, nor should reserve stocks in any way be distinguished from carryovers acquired through normal price support operations, as was proposed in the half-successful 1971 bill. Attempting to legislate complex issues of this kind simply insures that policy with respect to commodity reserves will continue to be exercised in a vacuum. Congress should designate authority presently available to USDA secretaries for managing commodity reserve stocks as the appropriate authority for carrying out a reserve carryover policy. A series of operating guidelines would be useful, if they were general enough to guide, and not limit or predetermine what the Secretary should do in future, unpredictable commodity situations.

A simple approach to the reserve question could end long years of effort by Congress and continuing uncertainty on the part of USDA.

Export Subsidies

Export subsidies were once a necessary adjunct of U.S. farm policy. Before the sixties, price supports for major export crops were geared to fixed percentages of parity prices, and were substantially higher than world price levels. With price supports fixing minimum market prices above world values, export subsidies were the only means by which some U.S. commodities could be made competitive in world markets. Continued and even growing excess production capacity on farms in the United States, partly the result of the high, rigid price guarantees of the fifties, made it necessary to tap all available markets. Hence, export subsidies became a routine byproduct of farm programs until the early sixties.

The wheat, corn, cotton, and rice sectors have been the principal beneficiaries of export subsidies. Wheat prices were supported for a number of years in the 1950's at around $2 per bushel; subsidies in the range of 50 to 60 cents per bushel and higher were common, since world values were only about two-thirds to three-fourths as high as U.S. price supports. Corn prices were less seriously out of line with world values, and direct cash subsidies on exports were never as high per unit as for wheat. Both wheat and corn subsidies were variable, being quoted daily in the case of wheat, and offered—usually—on a periodic bid basis in the case of corn. The export subsidy for cotton was fixed in advance of the marketing year at a basic rate per pound of lint, and was left unchanged for the year. The cotton subsidy was typically at the rate of 6 to 8 cents per pound in the late

fifties and early sixties, when average cotton prices were more or less fixed by the price support program in the range of 30 to 32 cents per pound. It was generally understood that the method of handling the cotton export subsidy left the United States as the world's residual supplier of cotton.

The export subsidy for corn was terminated in 1963 after a major policy review by USDA, and after changes in the level of price support had made U.S. corn prices fully competitive with world prices. Our feed grains have been priced very competitively in world markets without any export subsidy for nearly 10 years.

Modifications in the wheat price support system in the 1963 act, as subsequently continued in the 1965 and 1970 acts, set the stage for terminating or at least minimizing the export subsidy for wheat in the same way as for corn. It was determined, however, in view of the need for U.S. wheat prices to be fully competitive with Canada, Australia, and Argentina, and the fact that the United States was not in the same dominant position in the world wheat trade as for corn, that the export subsidy machinery should be maintained. This was done, and the machinery was used. In retrospect, it appears to have been used unnecessarily and sometimes unwisely.

During most of the late sixties, wheat export subsidies were quite low on a per bushel basis. In fact, for long periods, some daily subsidy quotations were zero, and for a time, daily quotations for certain export wheats were negative under an ingenious and disputed provision of the then current Food and Agricultural Act of 1965 which allowed an inverse subsidy, when U.S. prices were very low, as a means of keeping export prices above minimum levels prescribed by the International Wheat Agreement of 1963 and the International Grains Arrangement which became effective in 1968.

Several major exceptions were made to the general rule of low export subsidies on wheat in the late sixties. In 1964, U.S. wheat was found to be overpriced relative to Canadian and Australian wheat in European markets. When consultations with those countries failed to achieve an increase in their export prices, U.S. export prices were cut sharply through increases in export subsidies. In 1966, U.S. crops were reduced while world demand for grain was very strong; U.S. market prices rose sharply, especially for wheat. Department officials operating the export subsidy program tried for a few days to keep export prices stable at levels prevailing prior to the apparent demand-supply squeeze. This was done by raising the export subsidy each time U.S. market prices rose. It was found, however, that this process simply encouraged further pyramiding of U.S. market prices. Each time the subsidy was raised, market prices rose again. So increases in the subsidy were limited or halted, or the game would have gone on. This raised export prices, and after a time put a damper on further escalation in U.S. wheat prices.

The most famous use of the U.S. wheat export subsidy took place in 1972 in connection with the sale of some 11 million tons of U.S. wheat to the U.S.S.R. Subsidy quotations had been rather low during the previous year—July 1971 to June 1972—as shown in attached table 8. In the final days of June 1972, daily subsidy quotations for key export wheats ranged from zero to only a few cents per bushel. The price at gulf ports for hard winter wheat, the largest category or

class of wheat grown in the United States and the principal export wheat, was $1.63 per bushel in June 1972. This was one of the lowest levels in recent years, and was well below the minimum price that would have applied had the pricing provisions of the International Grain Arrangement of 1968 been operating in 1972.

TABLE 8.—WHEAT: MONTHLY AVERAGE EXPORT PRICES AND EXPORT SUBSIDIES FOR MAJOR CLASSES, 1971-72, AND JULY-DECEMBER 1972-73

	No. 1 hard ordinary Gulf		No. 2 Soft Red Balt.		No. 2 Western White Portland		No. 1 Dk. N. Spring 14 percent Prot. Duluth	
	Price	Subsidy	Price	Subsidy	Price	Subsidy	Price	Subsidy
1971-72								
July	$1.68	$0.02	$1.63	0	$1.59	$0.04	$1.73	0
August	1.67	.05	1.54	0	1.60	.01	1.64	0
September	1.66	.04	1.56	0	1.59	.01	1.61	$0.03
October	1.64	.08	1.62	$0.02	1.58	.04	1.60	.10
November	1.64	.08	1.67	.08	1.57	.02	1.63	.05
December	1.64	.11	1.69	.11	1.57	.01	1.63	.06
January	1.64	.11	1.67	.11	1.58	.03	1.61	.06
February	1.64	.10	1.65	.09	1.58	.02	1.62	.02
March	1.64	.12	1.64	.12	1.59	.03	1.61	.03
April	1.65	.15	1.65	.15	1.62	.11	1.63	.02
May	1.63	.12	1.63	.12	1.62	.15	1.65	.01
June	1.63	.04	1.53	0	1.62	.09	1.62	0
1972-73								
July	1.64	.12	1.59	.02	1.61	.03	1.65	.05
August	1.72	.33	1.65	.18	1.71	.16	1.63	.25
September	2.14	.18	2.00	.09	2.07	.14	1.92	.13
October	2.38	0	2.24	0	2.37	0	2.13	0
November	2.46	0	2.43	0	2.63	0	2.19	0
December	2.83	0	2.74	0	2.87	0	2.44	0

At that point, the U.S.S.R. arranged with one or more commercial grain exporters to buy a large volume of U.S. wheat, and received a line of credit from CCC of $500 million for grain purchases over a 3-year period. The key factor in the arrangement, however, arrived at informally between USDA officials and grain exporting companies—but probably well known to the Russians—was that the USDA had committed itself to keeping world wheat prices at mid-1972 levels while the unprecedented Russian purchases took place. Apparently no limit was placed on the amount of purchases by Russia that would be protected by the flat price guarantee. In effect, USDA said that no matter how far U.S. wheat prices rose, the export subsidy would be increased by an equal amount to prevent any rise in world prices.

Prices of wheat in U.S. markets began a rapid rise early in July, and took an even more rapid upturn in August after it became apparent that Russian purchases had been as large as 8 million tons of wheat, with lesser amounts of corn and soybeans. In an effort to keep its commitment to hold export prices for U.S. wheat at end-of-June levels, USDA pushed the daily subsidy quotations higher and higher, yet could not keep up with U.S. prices. World price quotations rose as a result. This process ended in an unprecedented opportunity afforded grain exporters late in August 1972 to register for wheat export subsidy grants at a recent record high level of 47 cents per bushel, applicable to sales already made. Future registration for export subsidies were at lower per bushel rates, and were reduced to zero in September.

As shown on table 8, export subsidies for all classes of U.S. wheat have been at zero, on a monthly average basis, since October. This practice will undoubtedly continue until the wheat supply-demand balance again reverts to a more normal condition, at which time the USDA, barring a major policy review or an arbitrary determination to end all export subsidies, could again begin to quote export subsidies on wheat.

It is of the greatest importance to the future of U.S. trade policy, to the improved functioning of the open market system for grains, to the enhancement of the ability of U.S. and other international commodity exporters to sell into centrally planned economies, and to Federal fiscal efficiency, to export U.S. wheat without subsidy. This procedure deserves a long test under normal circumstances until it can be demonstrated that it will not price U.S. wheat competitively.

In getting a policy decision on this score, it is extremely fortuitous that all export subsidies on agricultural products have been terminated in recent months, either on fiscal grounds, because world prices had risen sharply, or to help stabilize U.S. food prices. For rice, tobacco, poultry, and lard, export subsidies had operated more or less consistently for many years, until they were terminated near the end of 1972 or the early days of 1973. None of those commodities are as important in world trade as wheat, nor is the U.S. share of total trade in them appreciable, except for tobacco. Thus, none of these actions will attract the public attention that was given last year to the ill-advised effort to prevent a higher world price in connection with the 1972 sale to Russia.

Congress should conduct a thorough review in 1973 of the export subsidy programs that have been temporarily terminated, in order to bring to bear the best available information on the effects of past export subsidies, and the risks that may be associated with indefinite suspension of such subsidies. In the case of wheat, both government spokesmen and the trade have often expressed great confidence in the open market system as the best means for pricing commodities competitively. Government spokesmen last year rejected any possibility that large potential sales to Russia would have to be handled by CCC because their size might be so great as to discourage the private trade from carrying it off. Given the degree of optimism that exists regarding the adaptability and usefulness of the U.S. marketing system, it should be given every opportunity to work. The market can establish world values for U.S. wheat as well as it establishes world values for corn, soybeans, or cotton without daily or weekly subsidy quotations.

It would appear useful to announce well ahead of the next marketing season that no export subsidies would apply to wheat during the period July 1, 1973, to June 30, 1974. Thus, the grain sector would know the rules of the export game. If U.S. prices became so high as to be noncompetitive in world trade, the appropriate reaction would be for market prices to decline, rather than for the Federal Government to raise the wheat export subsidy. That is what "market orientation" is all about, and it should be given a chance to work.

That procedure works well for feed grains and soybeans; it should be tested for wheat in normal times, just as it has been tested and found workable in current abnormal times. The USDA might still be

providing export subsidies for wheat if an outcry by the public and the press against the exorbitant subsidies, and budgetary restraint had not forced the issue. If the maximum (47 cents per bushel) subsidy of August 1972 were in effect early in 1973, 1972 crop wheat at Kansas City would have been priced at around $3.10–$3.20 per bushel, some 50 cents per bushel higher than actually prevailed. And there is no reason to believe it would have stopped there. Pursuing higher prices with higher export subsidies is a self-perpetuating and silly exercise. Had the USDA not been forced to curtail the subsidy, no one can predict where the effort to tame world wheat prices would have ended. This would have been fine for farmers, who are the ultimate gainers when export subsidies pyramid domestic prices instead of restraining world prices. But export subsidies are not essential to competitive wheat exports, and that is the real test of their usefulness.

Limiting Federal Payments to Individual Farmers

The effort to limit Federal payments to individual farmers was the principal reform proposed when the Agricultural Act of 1970 was debated, but the idea goes back at least 6 or 8 years, to the early 1960's, when direct Federal payments to farmers first became a major source of farm income and budgetary expenditures. The reform effort failed in 1970, as it had before, even though a nominal payment limitation was enacted. It failed, not for lack of merit, but because the administration did not support it, and because the great power blocs in Congress and the farm organizations lined up against it. The same coalition had prevented its consideration in the 1960's.

Disastrous consequences were predicted by Members of Congress if an effective limit were to be placed on farm payments at a level as low as $10,000 or $20,000 per farmer. These consequences ranged from an end to the family farm in America, to the greatest surplus glut we have ever known, to serious damage to our balance of payments because U.S. cotton farmers could not (that is, were too inefficient to) produce cotton for export without large subsidies in the form of Federal cotton payments. Small farmers were said to be endangered if large farmers had their subsidies cut.

These claims were almost entirely without foundation, but they did divert the Congress from a significant reform that could have directed farm payments to relatively small farmers and reduced Federal expenditures without lessening the effectiveness of production adjustment and price stabilization, which are the basic functions of farm programs.

The effect of any limit on Federal farm payments to individuals depends upon:

(1) The overall level of Federal payments authorized by law or administrative regulations.

(2) The distribution of production of the affected crops by size of farm, and the resulting distribution of payments by size, prior to any limit on payments.

(3) The opportunity afforded to farmers to divide their large farms in order to avoid the effects of a limitation on payments.

Tables 9, 10, and 11 show very simply the distribution of Federal farm payments by size group for 1969. These data have not been

issued by USDA for later years, but changes would not be vary large, since farm size structure has changed only slowly (except as altered strictly to circumvent payment limitations), and payment formulas have not changed drastically.

TABLE 9.—PRODUCERS EARNING ASCS PROGRAM PAYMENTS GREATER THAN INDICATED AMOUNTS, SPECIFIED PROGRAMS, CALENDAR YEAR 1969[1]

Program	All producers	Producers receiving $10,000 or more[2]	Producers receiving $20,000 or more[2]
All programs	2,517,304	44,665	12,921
Cotton	445,155	17,008	6,194
Feed grain	1,641,863	8,378	1,482
Wheat	995,371	6,797	1,123
Wool	193,544	897	243
Sugar	29,971	1,039	290
Cotton, feed grain, and wheat total	2,125,491	40,007	11,733
Cotton, feed grain, wheat, wool, and sugar total	2,252,287	42,570	12,499

[1] This table summarizes participating producers by programs and combinations as shown. The "All programs" line includes the 11 programs: Cotton, feed grain, wheat, wool, sugar, cropland adjustment, agricultural conservation, emergency conservation, Appalachia, cropland conversion, and conservation reserve; but excludes commodity loans.
[2] See tables 7 and 8 for a breakdown of these data by states.

TABLE 10.—NUMBER OF PRODUCERS AND AMOUNT OF PAYMENTS BY SIZE OF PAYMENT, FOR EACH OF 5 PROGRAMS AND SELECTED PROGRAM COMBINATIONS, CALENDAR YEAR 1969

Program	Payments of indicated amount or more					
	$3,000	$5,000	$10,000	$20,000	$30,000	$50,000
Cotton:						
Number	56,446	36,583	17,008	6,194	3,075	1,141
Amount (thousands)	$626,479	$549,531	$412,229	$262,623	$187,072	$113,808
Feed grain:						
Number	104,608	39,726	8,378	1,482	478	115
Amount (thousands)	$593,454	$347,447	$138,657	$48,212	$24,252	$10,750
Wheat:						
Number	63,500	28,078	6,797	1,123	309	72
Amount (thousands)	$388,373	$252,955	$109,148	$34,131	$14,716	$6,002
Wool:						
Number	3,780	2,262	897	243	90	25
Amount (thousands)	$32,100	$26,247	$16,638	$7,681	$4,019	$1,584
Sugar:						
Number	5,830	3,022	1,039	290	140	74
Amount (thousands)	$56,302	$45,557	$32,031	$21,852	$18,295	$15,794
Cotton, feed grain, and wheat:						
Number	250,334	122,110	40,007	11,733	5,170	1,734
Amount (thousands)	$1,884,350	$1,393,460	$834,484	$451,444	$293,049	$164,223
Cotton, feed grain, wheat, wool, and sugar:						
Number	261,038	128,518	42,570	12,499	5,567	1,904
Amount (thousands)	$1,993,752	$1,486,168	$900,543	$492,942	$325,688	$188,449

Source: ERS, USDA.

TABLE 11.—PERCENTAGES OF TOTAL NUMBER OF PRODUCERS AND AMOUNT OF PAYMENTS, BY PROGRAMS, BY SIZE OF PAYMENT FOR EACH PROGRAM AND SPECIFIED COMBINATION OF PROGRAMS, CALENDAR YEAR 1969

Program	Payments of indicated amount or more					
	$3,000	$5,000	$10,000	$20,000	$30,000	$50,000
Cotton:						
Number	12.7	8.2	3.8	1.4	0.7	0.3
Amount	75.7	66.4	49.8	31.7	22.6	13.7
Feed grain:						
Number	6.4	2.4	.5	.1	.03	.01
Amount	36.0	21.1	8.4	2.9	1.50	.70
Wheat:						
Number	6.4	2.8	.7	.1	.03	.01
Amount	45.3	29.5	12.7	4.0	1.70	.70
Wool:						
Number	2.0	1.2	.5	.1	.05	.01
Amount	52.3	42.8	27.1	12.5	6.60	2.60
Sugar:						
Number	19.5	10.1	3.5	1.0	.5	.2
Amount	72.4	58.6	41.2	28.1	23.4	20.3
Cotton, feed grain, and wheat:						
Number	11.8	5.7	1.9	.6	.2	.1
Amount	56.5	41.8	25.0	13.5	8.8	4.9
Cotton, feed grain, wheat, wool, and sugar:						
Number	11.6	5.7	1.9	.6	.2	.1
Amount	57.4	42.8	25.9	14.2	9.4	5.4

Source: ERS, USDA.

What is important is that for wheat and feed grains respectively, only 4 percent and 2.9 percent of all payments were made to farmers receiving payments of $20,000 per year or more under those 1969 programs (table 11). For cotton, however, 31.7 percent of all payments went to farmers receiving $20,000 or more under provisions of the 1969 cotton program.

The payment structure developed directly out of the farm size structure shown in table 12, which shows 54,000 farms with sales over $100,000 in 1970, and 169,000 farms with sales ranging from $40,000 to $99,999. Most of the farms in tables 9, 10, and 11, with payments of $20,000 or more undoubtedly came from the class of farms with sales of $100,000 or more per year.

TABLE 12.—NUMBER OF FARMS AND INCOME, BY VALUE OF SALES CLASSES, 1970

Item	Total	Value of sales					
		Less than $5,000	$5,000 to $9,999	$10,000 to $19,999	$20,000 to $39,999	$40,000 to $99,999 [1]	$100,000 and over [1]
Number of farms (thousands)	2,924	1,444	370	513	374	169	54
Percent of total	100	50.4	12.7	17.5	12.8	5.8	1.8
Cash receipts from marketings, (millions)	$52.948	$2,457	$3,060	$8,259	$11,346	$10,599	$17,227
Percent of total	100	4.6	5.8	15.6	21.4	20.0	32.6
Realized gross farm income (millions)	$56,580	$3,895	$3,450	$8,952	$12,004	$11,182	$17,097
Percent of total	100	6.9	6.1	15.8	21.2	19.8	30.2
Farm production expenses (millions)	$40,867	$2,108	$2,158	$5,767	$8,278	$8,250	$14,306
Percent of total	100	5.2	5.3	14.1	20.2	20.2	35.0
Realized net income (millions)	$15,713	$1,787	$1,292	$3,185	$3,726	$2,932	$2,791
Percent of total	100	11.4	8.2	20.3	23.7	18.6	17.8
Realized net income per farm from farming	$5,374	$1,238	$3,492	$6,208	$9,962	$17,349	$51,685
Off-farm income per farm	$5,833	$7,506	$4,984	$3,452	$3,503	[2] $5,803	[2] $5,803
Total income per farm, dollars	$11,207	$8,744	$8,476	$9,660	$13,465	$23,152	$57,488

[1] Estimated from totals of farms with sales of $40,000 or more.
[2] Average off-farm income of farms with sales of $40,000 or more.

Source: USDA, ERS, Farm Income Situation, July 1971.

The inter-year stability of past payments is illustrated by the distribution of payments of $20,000 as shown below for cotton, wheat and feed grains for 1971, when the set-aside and the $55,000 payment limitation were in effect. The results are substantially the same as for 1969, even though program provisions had changed somewhat. The fact that only a negligible part of all grain production, but nearly one-third of cotton production, is on very large farms leads inevitably to the conclusion that a $20,000 limit on Federal payments in the 1973 act (including firm rules against farm splitting) would:

(1) Affect few farmers;

(2) Leave unimpaired the ability of farm programs to restrain production;

(3) Be important only to cotton growers, who have not been asked to restrain production for several years, but have been paid large sums to encourage greater production.

The Department of Agriculture in 1972 studied the effect of a $20,000 limitation on payments assuming (1) that farmers would be permitted to split farms indiscriminately to evade the intent of limiting payment size, and (2) that total payment levels would be at about the levels reached in 1971, 1972, and 1973. USDA concluded as follows in the report entitled "Farm Payment Limitations," March 16, 1972, Senate Committee on Agriculture and Forestry Print:

PROBABLE IMPACT OF A $20,000 PAYMENT LIMIT IN SUBSEQUENT YEARS

If the maximum payment to any one person had been $20,000 in 1971, some 10,000 persons would have been affected compared with about 1,350 affected in 1971 by the $55,000 limit (based on 1970 data). A small part of the feed grain and wheat program payments went to persons receiving more than $20,000, and they accounted for a small part of United States production of corn, grain sorghum, and wheat as implied in the following table. Thus, the major impact of a $20,000 payment limitation in subsequent programs which were otherwise similar to the 1971 programs would fall on the cotton program and cotton producers.

NUMBER OF PERSONS, AND PAYMENTS AND ALLOTMENTS OR BASES OF PERSONS RECEIVING $20,000 OR MORE FROM COTTON, FEED GRAIN, AND WHEAT PROGRAM PAYMENTS IN 1971

Program	Persons		Payments		Allotment or base	
	Number	Percent of U.S. total	Amount (thousands)	Percent of U.S. total	Acreage (thousands)	Percent of U.S. total
Cotton	8,742	2.6	$308,117	37.7	3,231	31.3
Feed grains	247	.1	7,186	.7	627	.7
Wheat	1,112	.9	32,009	3.6	741	4.1
Total	[1] 10,012		347,312		4,599	

[1] Net number, some persons received $20,000 or more from 2 or 3 programs.

In adjusting from unlimited payment in 1970 to the $55,000 limit in 1971, the affected producers reduced their cotton allotment acreage by 324 thousand acres, or 45 percent, from 715 thousand acres they drew payments on in 1970. Most of the reduction was brought about by leasing land and allotments to producers earning less than the limit.[1] However, based on 1970 data, only 14.3 percent of the cotton payments went to producers who received in excess of $55,000. But, as indicated in the table above, 37.7 percent of the cotton payments in 1971 went to producers who received between $20,000 and $55,000.

[1] Rented-in allotments increased from 58 thousand acres in 1970 to 90 thousand acres in 1971. But this increase resulted from the greater ease with which allotments could be transferred for 1971 and not from any effect of payment limitation.

With a further reduction to a $20,000 limit the supply of allotments for lease or sale without or with the land could be expected to increase without any comparable increase in demand for these allotments. Thus, the rent that allotment owners could receive from their allotments would very likely drop from the amount received in 1971 when it ran between three and ten cents a pound. This would result in a readjustment in the benefits from the program—with the holders of the allotments to be leased out receiving a smaller share of the benefits.

Another problem would arise in those areas where there is a heavy concentration of large producers. In such cases, there might not be a market for all the leases made available as a result of a $20,000 payment limitation.

Under the rules in effect for the 1972 programs, a producer would need to establish up to nine separate corporations if that method were chosen to minimize effects of the limit on him as an individual, because if a producer has more than a 20 percent interest in a corporation, his proportionate income from the corporation would count toward his total payments. It would, of course, be difficult, if not impossible, to organize several corporations by an individual who would perforce be a minority stockholder in each.

As required by law, the cotton program provides the option of leasing or selling allotments. Such an option is not available to feed grain or wheat producers. Therefore, relatively more leasing out of land by feed grain and wheat producers subject to a $20,000 limit could be expected. Others might adjust by dropping the leases on land they were renting in order to cut the size of their farming operation down (c.f. Exhibit 4 with Exhibits 6 and 8). However, the sum total would apparently not be large since if a $20,000 limit had been in effect in 1971 only about one percent of the feed grain base acreage and four percent of the wheat allotment acreage was on farms that would have been affected.

The 10,000 producers in 1971 that received more than $20,000 operated 30,000 farms. There were 20.4 million acres of cropland on these farms. Their planting pattern was as follows:

	Million acres
Feed grains (all four)	2.9
Wheat	2.7
Total grains	5.6
Soybeans	2.4
Cotton	4.5
Other crops	.9
Conserving base	3.2
Set-aside	1.9

The experience with the $55,000 limit in 1971 indicates that many farmers would adjust to a lower limit by dropping leases, leasing out allotments with or without land, or outright sale of farms or farmland. These kinds of adjustments reduce the impact on production; however, they also preclude any reduction in total government payments under the farm program due to the limitation.

What size of farm would be affected by a $20,000 limit, given the payment rates provided for in the 1972 program? In the case of corn on a farm that has a hundred bushel yield, a $20,000 limitation would become effective on a payment base of 500 acres (1,000 acre corn base) if the producer signs up for the minimum set-aside of 25 percent. If he wished to sign up at the maximum, it would become effective on a corn base of 625 acres (a payment base of 312.5 acres). In the case of wheat with a 60 bushel yield, the limit would be effective on a farm having a wheat allotment of 198 acres at the minimum level of participation; at the maximum level of participation, a farm of only 140 acres of wheat allotment would be affected. Cotton with a 500 pound yield would be affected on a farm with a cotton allotment of 267 acres.

The number of producers and the acreage affected in the 1972 feed grain and wheat programs would be somewhat larger than in 1971—because payments under the 1972 feed grain and wheat programs will be larger. First, the minimum set-aside acreage for feed grain was revised from 20 percent to 25 percent of the

base and payments increased proportionately. Furthermore, farmers are offered additional set-aside for both feed grains and wheat. However, if the required set-aside raised a person's payment to the limit he could not be expected to volunteer additional set-aside. Thus, the limitation would reduce the total set-aside on these farms below what it otherwise would be. On the one hand, this would reduce the total payments to these producers—but it would also require increased set-aside (at increased costs per acre) by other producers to offset the resulting reduction in the supply management aspects of the program.

In 1970, when barley was included in the feed grain program and producers could voluntarily divert additional land, 1,425 grain producers (0.09 percent) and 1,273 wheat producers (0.13 percent) received payments in excess of $20,000 each. With greater participation expected in the 1972 program, the number of producers with payments in excess of $20,000 each is expected to be somewhat larger than it was in 1970.

The increase in required set-aside in the 1972 program could increase the number of feed grain producers receiving $20,000 or more by some 25 percent above the number affected in 1971, as the acreage required to set-aside per farm also is about 25 percent larger—or about 350 producers more. The number of wheat producers would be perhaps 10 to 15 percent greater—or 150 to 200 more. Estimating the number who would move up to $20,000 or more because of additional voluntary set-aside is much more difficult; there is no solid basis for estimating ahead of actual signup the number who would voluntarily set-aside additional acreage under the several available options even if there were no limit on payments.

Reducing the limit from $55,000 to $20,000 would reveal some differences in kind as well as degree. A substantial part of the hardships resulting from the 1971 crop limits fell on a relatively few producers who operated farms on such a scale that the entrepreneur himself was required to devote most of his time to the management and direction of the farm operations, as opposed to actually driving the tractor, combine, or cotton picker. However, producers affected by a $20,000 limit, as opposed to the $55,000 maximum, would, to a large extent, be farmers who, with their family members, actually perform a significant portion of the basic farm labor requirements themselves. These are mostly family farms; not typical, but generally efficient, unusually productive and progressive—but certainly few would be large corporate operations.

This report has approached the probable impact of a $20,000 limitation as it would have related to the programs in effect in 1971 and 1972. Since it is impossible to precisely foresee future program changes, this statement, of necessity, outlines maintains the direction rather than the specific magnitude of the possible effects.

In summary, the anticipated impact of a $20,000 limit in subsequent crop years would be:

(1) Slightly reduced participation in the set-aside programs.

(2) A slight increase in grain production which at present is surplus to our needs.

(3) A modest decrease in cotton production which at present is short of our requirements.

(4) A nominal decrease in government payments under the set-aside programs.

(5) Increases in cotton production for a considerable number of small operators who would increase production by renting acreage from farmers with payments above $20,000.

EXHIBIT 1

SUMMARY OF 1970–71 COTTON PAYMENTS AND DOMESTIC ALLOTMENT ACRES (PAYMENT ACRES) FOR FARMING OPERATIONS OF PRODUCERS WHO RECEIVED MORE THAN $55,000 IN 1970

State	Number of counties	Farming operations			Payments to producers who received more than $55,000 in 1970		
		Total	Did not change	Did change	1970	1971	Percent decrease[1]
Alabama	22	46	5	41	$2,014,650	$1,484,104	26.4
Arizona	6	209	39	170	22,030,359	9,080,799	58.8
Arkansas	19	109	34	75	6,635,695	4,600,325	30.7
California	8	306	44	262	43,623,920	17,382,360	60.2
Florida[2]	1	1	0	1	4,463	6,326	(+41.7)
Georgia	14	20	1	19	1,157,658	686,629	40.7
Kentucky[2]	1	1	0	1	10,815	0	100.0
Louisiana	16	45	7	38	2,828,764	1,844,266	34.9
Mississippi	34	404	72	332	28,767,485	16,695,095	42.0
Missouri	5	9	5	4	188,390	153,672	18.4
Nevada	1	1	1	0	63,636	54,300	14.7
New Mexico	7	10	0	10	536,555	272,755	59.2
North Carolina	4	15	1	14	651,343	230,798	64.6
Oklahoma	2	3	0	3	158,409	72,471	54.3
South Carolina	10	34	6	28	1,820,744	1,265,402	30.6
Tennessee	7	14	3	11	435,937	352,977	19.1
Texas	47	235	60	175	14,221,386	8,236,379	42.1
Total	204	1,462	278	1,184	125,150,209	62,419,658	$62,730,551
Breakdown:							
Operations not changed			278		14,927,695	13,339,444	1,588,251
Operations changed				1,184	$110,222,514	$49,080,214	$61,142,300
Payment acres					715,405	391,233	324,172
Average per acre payment rate					$154.07	$125.45	$28.62

[1] Average decrease 50.2 percent.
[2] Producers also had farming operations in other States.

The USDA assumptions substantially alter their conclusions. If the law not only limited payments to $20,000 per farm, but made any land removed from farms subject to the limit ineligible for crop payments, the effect on budgetary savings would be quite different. With 8,742 cotton farmers getting an average of $35,000 in payments in 1970, some $15,000 per farm, or $131 million could be saved on cotton alone (based on 1970 payment formulas). Savings in wheat and feed grains would be very small, since only about 1,400 farmers would be affected.

But if total cotton payments were to be reduced substantially through an amended payment formula as suggested earlier in this paper, the savings arising out of a stringent per farm limitation would be smaller.

If Congress is not willing to enact strict controls on farm splitting and to require USDA to enforce it, there is no point in a payment limitation on individual farms at any level. The real outcome of an exercise such as the $55,000 limitation in the 1970 act is to make it inconvenient for farmers to collect their welfare grants for growing cotton, but not so inconvenient as to stop the payments.

In summary, limiting overall subsidy levels, as described earlier, is the best approach to getting farm payments into a position where they function almost entirely as production adjustment payments. If that fails, rigorous individual farm limitations should be passed.

Other Agricultural Commodities

The Wool Act of 1948, as amended, continues to pursue the objective of bringing wool production in the United States back to U.S. requirements. Yet U.S. wool production has declined for 25 years, despite price and income guarantees, through Federal payments, averaging about twice world price levels.

The Wool Act has never had a chance to achieve its objective of bringing the U.S. sheep industry back to health and it will not succeed in the 1970's. Its objectives should be altered to help adapt the U.S. sheep-raising industry to the real world situation, and to reduce wool subsidies, most of which go to very large growers in a few Western States.

Milk price supports are not covered by the 1970 act. Present law requires the price of milk used for the manufactured dairy products to be supported in a range of 75 to 90 percent of parity. With parity levels escalating as costs rise, USDA must raise the price support level each March 31, until the law is changed to provide a lower minimum percentage of parity or to drop the parity guideline.

Rice, tobacco, and peanut programs have changed little in 25 years, but have been reasonably effective in controlling surpluses, since the producers do accept mandatory acreage restrictions (poundage limits, too, for tobacco). Even so, the programs badly need serious review and amendment, to limit automatic price support increases, remove minimum acreage allotments, provide more discretion in program decisions, avoid or reduce export subsidies, and generally adapt programs dating back to the 1930's and 1940's, to the conditions of the 1970's. USDA has conducted a number of useful interval studies of alternative programs for these commodities in recent years. It would be constructive for Congress to ask USDA to bring those studies up-to-date so that public discussion, including possibly congressional hearings, could begin, looking toward program amendments in 1974.

THE DISTRIBUTIONAL IMPLICATIONS OF AGRICULTURAL COMMODITY PROGRAMS

By RUSSELL LIDMAN*

ABSTRACT

This paper examines agricultural commodity programs primarily from the perspective of their distributional implications among producers. Farm programs have a minor effect on the distribution of income among these units. At the very most about $500 million or about 10 percent of the total long-run annual benefits of farm programs accrues to approximately 29 percent of the total farm operator population who are poor. Furthermore, farm-program benefits supplement the total income of the agricultural poor by a relatively small amount. Benefits are only 4 percent of total income for operators of the smallest sized units. The comparable figure for operators of the largest units is 25 percent.

Because of the way they are structured, the benefits of farm programs bypass the landless in agriculture—for example, hired hands, migrant workers, tenants and sharecroppers. In addition, the structure of farm programs virtually dictates that the benefits become capitalized into land values. This means that even current landowners may receive a small share of the intended benefits. Previous landowners in many cases have received some part of the discounted value of future farm-program benefits by selling the land at elevated prices to the current generation of operators.

Though farm programs have other goals aside from income maintenance, they remain as one of the foremost mechanisms addressed to the rural poverty problem. They are out of date and inadequate for the task. Even recent reforms, such as payment limitations, offer little scope for improvement since they do not affect the basic mechanisms of the programs—and it is these mechanisms which must be substantially altered.

INTRODUCTION

This paper examines agricultural commodity programs primarily from the point of view of the implications of these programs on income distribution among producers. From a brief historical introduction to agricultural policy it is shown that U.S. policies have considerable precedent. The examination of U.S. practices outlines the evolution of policy from the New Deal, when direct intervention was initiated.

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Considerable attention is devoted to analyzing the mechanisms of supply-control programs. The wheat program is used as an illustration. Current mechanisms of supply-control were developed in part by an empirical approach—trial and error. For example, government purchases and consequently the large publicly owned surplus of the late 1950's demonstrated the pitfalls of a high loan rate and inadequate incentive to divert acreage from production. Consequently policies after the mid-1960's emphasized low loan rates, substantial direct payments for participating, and the opportunity to voluntarily divert additional acreage for payment.

An analysis of the potential effects of commodity programs on farmers' income demonstrates some of the shortcomings of the present technique. The benefits of U.S. farm programs tend to be capitalized into land values; farm programs are in part responsible for the dramatic increases in land prices over the last 40 years. Since these benefits of farm programs represent returns to land ownership, this mechanism offers insignificant income assistance to the landless, for example, hired farmworkers and tenants. Also, the programs offer the greatest income supplement to those who are allotment holders when the programs are introduced. This generation of holders may capture a considerable share of future benefits when they sell their land to a later generation. The benefits of farm programs are reduced for later generations when account is taken of the interest charges, real or imputed, they must pay on the higher cost land.

This paper reports on a study of the distribution of farm-program benefits for 1969. The benefits of farm programs in effect represent the annual income accruing in the long run to each value-of-sales class in excess of that which would prevail were there considerably less Government involvement in agriculture. Crops on which the analysis is based include corn, oats, grain sorghum, barley, wheat, soybeans, and cotton. The benefits of these programs are composed of two elements. The greater part of the benefits are direct payments; a smaller part are somewhat indirect and are termed price-support benefits. This latter type results from the effect of supply restriction in raising the market price of supported crops above their free-market levels. A published USDA source is used to distribute direct payments by income classes. Output from the Iowa State University spatial linear programing model, along with various published sources, is used to estimate the distribution of price-support benefits.

The long-run annual benefits of farm programs in 1969 totaled $5.3 billion. Of this, $3.8 billion are direct payments and $1.5 billion are attributable to the effects of price-supports and acreage allotments. At the most, about $500 million or one-tenth of the total accrues to those farmers who are officially classed as poor. The poor farm population is 29 percent of the total. Over all, farm programs have a minor effect on the distribution of income among producing units.

This paper represents an examination of farm programs only from the perspective of their impact on income distribution. There are other goals of farm programs which are not considered in this paper, for example, price stabilization and planning for future domestic and world demand. Consequently, no specific measures for reform are proposed within this paper. Rather, it is hoped that the present demonstration of the inadequacy and ineffectiveness of existing farm policy in dealing

with the farm and rural poor will stimulate agricultural policy makers to take explicit note of the distributional implications of future agricultural programs.

An Historical Introduction to Agricultural Policy

Governments have intervened in their agricultural sectors for thousands of years. Frequently the motivation has been to assure an adequate and stable flow of food to some group or region.[1] In other cases the interaction between the State and agriculture has been directed toward securing the primacy of a particular group or class of growers.[2] Only relatively recently has one of the arguments for intervention been the perceived need to undo certain consequences of abundance. Regardless of the intent, underlying policy, and control, history seems to indicate that no nation-state has chosen to rely on providence and a free market for assuring the output and composition of its agricultural sector.

Commodity programs similar to those presently in effect were first introduced in this country about 40 years ago. Policies similar to these were practiced throughout the world at various times. An economist has written of the 18th century Dahomean Kingdom of Africa:

> The permanent administration of agricultural affairs was in the hands of the "Minister of Agriculture," the Tokpo; under him were the Xeni, the chief of the great farmers or *gletanu*, and his assistant * * *. It was the duty of the agricultural officials to insure a balanced production of crops and adjust resources to requirements * * *. If there was over production or under production of any crop, the farmers were ordered to shift from one crop to another.
>
> Annual inspection of the crops took place, permitting changes in production of various crops to be commanded. Changes in "supply" did not as a rule result from local price changes but rather from administrative decisions.[3]

The agricultural "problem" has been a concern of governments for millenia. U.S. experience with this matter is relatively brief. A cynic might remark that the results of U.S. agricultural policy demonstrates this.

The current type of farm program dates from the Depression. Following World War I, agriculture, and in particular the wheat sector, was in serious decline. Throughout the 1920's, farm income was well below that of the war years and this presaged the decline beginning in 1929. Cash income in agriculture fell from $12 billion in 1929 to $4.7 billion in 1932. During this period, the farm income from the sale of wheat fell from $850 million to $289 million.

The results of this dramatic decline in income were severe. Farmers couldn't meet their mortgage payments or tax bills. Foreclosures and tax sales of farms became regular. It is against this backdrop that President Roosevelt and his Secretary of Agriculture, Henry Wallace, attempted to formulate a program which would aid the agricultural

[1] An example is the Ptolemaic Kingdom in Egypt. Their agriculture was so centralized that all transport of the major food crops was carried out by the state. "Prices for the most important provisions, like bread, were steadily balanced for more than 300 years . . . ." See Fritz M. Heichelheim, "An Ancient Economic History," vol. III. (Leyden, A. W. Sijthoff, 1970), p. 89.

[2] Ibid., p. 160. For example, Roman conquests in the 3d and 2d centuries B.C. resulted in the availability of thousands of slaves. Slavery made plantations possible and hence the domination of Roman agriculture by the upper class.

[3] Karl Polanyi, "Dahomey and the Slave Trade" (Seattle: University of Washington Press, 1966), p. 90.

community. A major purpose of the program was to bring emergency relief to growers through cash-benefit payments in order to keep farm property intact.[4] Over the long run, the program was aimed at restricting output and stabilizing farm income so that an agricultural depression could be avoided in the future.

Roosevelt and Wallace, using as a mechanism the Agricultural Adjustment Act, attempted to tackle the farm problem in a way which would meet with the approval of the major farm organizations.[5] In essence, this act produced a melange of programs, most of which had surfaced for consideration during the 1920's but were not adopted by the Republican administrations. The various commodity programs were similar in most respects; the program which was formulated for wheat for 1933–1935 is outlined below.

Farmers who chose to participate in the wheat program were guaranteed a bit less than 30 cents per bushel for 54 percent of their average 1928–32 output from their base acreage; the base was calculated as the average acreage of the period 1930–32. In order to participate, a grower was required to limit his planting to 85 percent of his base in 1934, and 90 percent in 1935. No limitation on acreage was applied in 1933 because the program went into effect after the planting time.

Two features of the program are particularly interesting. The per-bushel payment to growers was designed to augment the price of wheat used for domestic purposes (about 50 percent of the crop was used domestically). In essence, this payment was intended to untie the domestic price of wheat from the low world level. Throughout the 1920's, one contention of growers' organizations was that the lack of protection from the low world price was injurious to domestic growers. The payment to producers was supported by a tax on food processors for each unit of the supported crops they purchased for sale ultimately in domestic markets. In all likelihood, most of the burden of this tax was passed on to consumers.

A second feature of interest is that the planners of the program anticipated that a disproportionate share of the benefit payments might devolve to the landowners. Thus the contracts were drawn in such a way that renters and cash tenants received their benefit payments (and price increases) directly. Share tenants received that proportion of the benefit payment corresponding to their share of the crop. Thus, if there were no rise in rents or no shift to more stringent contracts, the actual growers of the crop would have been beneficiaries of the program. However, no rent controls accompanied the program, and numerous writers have speculated that rents were raised, causing benefits to flow to the landowners.

Numerous alternatives to benefit payments and processing taxes were discussed during the period of the initial program's operation. The agricultural policymakers realized that controlling output via incentives to restrict production was costly and somewhat unpredictable. Wallace advanced the idea in 1934 that the Government might find it more desirable to purchase submarginal land outright. He felt that over the long run it would be cheaper and more effective in stabilizing

[4] Edwin Nourse, Joseph S. Davis, and John D. Black, "Three Years of the Agricultural Adjustment Administration" (Washington, D.C.: The Brookings Institution, 1937), p. 23.

[5] See Don F. Hadwiger, "Federal Wheat Commodity Programs" (Ames: Iowa State University Press; 1970), for an interesting political history of the Agricultural Adjustment Act (AAA).

fluctuating farm income.[6] Mordecai Ezekiel, Wallace's economic adviser, reiterated this point the following year,[7] but added that removing only submarginal land would not be sufficient. He indicated that only a very small proportion of commercial crops are produced on submarginal land. He noted, too, that land purchase deals with only a fraction of the problem of rural America and some provision would have to be made for the displaced agriculturalists. Ezekiel anticipated more difficulty in rehabilitating that population, particularly in a labor-abundant economy, than in purchasing the land.

In addition to the desirability of scrapping entirely the benefit-payment processing-tax program, Ezekiel and Wallace emphasized the need for reforming the existing system of supporting the program. Wallace noted, in 1935, that processing taxes tended to be passed on to consumers and thus had relatively greater impact on the poor.[8] Wallace advanced for consideration, among other possible measures, an increase in the income tax or a general sales tax.[9] Both he and Ezekiel conceded the difficulty of implementing such alternatives, but stressed the need for their development.

Before any such alternatives were implemented, the processing tax was declared unconstitutional. This occurred in early 1936. Policymakers did not avail themselves of this opportunity to develop a a more equitable system of financing the program. When the agricultural program was reinstituted with the AAA of 1938, essentially the same processing tax was employed, though the stated intent of the tax was changed.[10]

Thus Wallace's and Ezekiel's discussion of alternatives to the processing tax was little more than academic. They recognized many of the shortcomings of the tax and sought alternatives which were more equitable. In their discussions, they emphasized the nationwide importance and impact of the farm problem and sought revenue sources which were compatible with this. They suggested that the tying of taxes to farm products was dictated by the ease of collection and political expedience and not by a more equitable criterion which reflected the scope of the problem—that is, that the welfare of the rural sector is important to all Americans.

Justification of Continued Controls

Commodity programs have been in continuous operation since 1938. Their survival has been challenged by often stinging criticism and yet the programs have persevered.

Continued control over a substantial part of American agriculture has been justified largely on the basis of safeguarding the family farm.[11] More precisely, economists and others have recognized that U.S. agriculture has been characterized by rapidly rising productivity confronting a relatively inelastic and slowly growing demand. This process would have resulted in a continuous decline in income to agriculture had there been no government intervention. There are other arguments on behalf of farm programs. Some feel that such

[6] U.S. Department of Agriculture (USDA), "Yearbook of Agriculture," 1934, pp. 21, 22.
[7] U.S. Department of Agriculture (USDA), "Yearbook of Agriculture," 1935, 144 ff.
[8] Ibid., p. 35.
[9] Ibid., pp. 31, 115.
[10] Hadwiger, "Federal Wheat Commodity Programs," 137 ff.
[11] D. Gale Johnson has put this succinctly in "Efficiency and Welfare Considerations of U.S. Agricultural Policy," "Journal of Farm Economics," 45, No. 2 (May 1963): p. 332. "The rationale for extensive governmental involvement has been that the income of farm families remains below that of nonfarm families."

programs are required in order to stabilize farm prices; stable prices assist in making investment decisions. A final justification is that agricultural policy is required to avoid the possibility of future shortages of food and fiber by reducing current output and, through diversion and other conservation practices, storing productivity in the soil.

Mechanisms of Supply Control

Currently commodity programs operate in such a way as to supplement farm incomes without resulting in enormous government purchases. It is important to understand the mechanisms governing the operation of these programs if one is to understand how their benefits are distributed. Since this paper is directed toward an analysis of the distribution of commodity program benefits in 1969, the following discussion will focus on the mechanism of farm programs in that year and the years immediately preceding it. In addition, this discussion will focus on the wheat program. Shifts in policy have been nearly parallel among the various commodity programs and the implications of the distribution of benefits are nearly identical for each of them.

The announced intent of the wheat program has been to secure an equitable and moderately stable income for growers who can and do participate.[12] In the past, and still to some extent currently, definitions of equity have been intimately related to the concept of parity price.[13]

Parity price is itself a vague concept. Thomson and Foote contend it is nothing more than "* * * an arithmetical rationalization of prices that farmers, farm leaders, and political leaders consider high enough to be satisfactory." [14] It has been calculated in a variety of ways since 1933. In principle it is intended to make a unit of a crop have equal purchasing power in a given year to the purchasing power of that unit in 1910–14. Considerable criticism of this concept has developed, of course. The typical criticism is that parity price does not take into account the dramatic yield increases in the decades since 1910–14; these prewar years were among the best for agriculture.[15]

In the Agricultural Adjustment Act of 1938 the Secretary of Agriculture was directed to support wheat prices for growers who were eligible to and did in fact participate in the wheat program at between 52 and 75 percent of parity. In 1941 this was raised to not less than 85 percent, in 1942 to 90 percent, and in 1944 to 92½ percent. For 1949 it was lowered to 90 percent. Throughout the 1950's the level of support varied between 75 and 90 percent. For 1960, 1961, and 1962 the actual level of support was 76, 76, and 83 percent of parity respectively; and for 1967, 1968, and 1969 it was 66, 68, and 69 percent respectively.

[12] See for example, "The 1969 Voluntary Feed Grain and Wheat Programs," PA-906, Agricultural Stabilization and Conservation Service, U.S. Department of Agriculture, January 1969.

[13] See Wayne D. Rasmussen and Gladys Baker, "Programs for Agriculture 1933-1965," Agricultural Economics Research (July 1966), Economic Research Service, U.S. Department of Agriculture, reprinted in Vernon Ruttan et al., "Agricultural Policy in an Affluent Society" (New York: W. W. Norton, 1969) pp. 69–88. Also see in this same volume F. L. Thomson and R. J. Foote, "Parity Prices," pp. 90-95.

[14] Ruttan et al., "Agricultural Policy," p. 94.

[15] See National Advisory Commission on Food and Fiber, "Parity: New Concept Needed," reprinted n Ruttan et al., Agricultural Policy, pp. 96-98.

The wheat program has provided for growers who can and do participate a guaranteed price for their crop. It also provides an average income from the sale of their crop above that which a competitive market would provide, but generally below full parity levels. Until the Kennedy programs of the 1960's, the Government's relative success in raising farmers' income in the post-war period was confounded by the problem of sizable Government-owned stocks. By the late 1950's, govenment stocks of over 1 billion bushels equaled annual output.

Government purchases during this period were a consequence of the high loan levels which had been established. The loan level represented a guarantee to participating growers of a price per bushel at which the Government would take possession of all or part of their output. The grower had the options of selling his crop outright to the Commodity Credit Corporation (CCC) or using it as collateral for a nonrecourse loan. Since throughout much of the 1950's, the loan level exceeded market price, many growers sold their output directly to the Government's agent, the CCC. The enormous Government-owned stocks which resulted from this policy demonstrated the need for the further refinements in agricultural policy. In the decade of the 1960's increased reliance was placed in mechanisms which provided incentives to growers to lower their production.

Allotments.—Each year, generally before time for spring wheat, the Secretary of Agriculture announces the national allotment for wheat. In many U.S. Department of Agriculture (USDA) publications the national allotment is said to have been determined on the basis of what is required to equate consumption and export demand with productive capacity. "The goal of the 1969 wheat program is to strengthen prices from year-earlier levels through policies designed to balance production with anticipated domestic use and export." [16] This of course means that the USDA has opted to bypass the market mechansim. The implicit assumption behind the quote is that domestic and export demand are nearly perfectly inelastic. Supply would in a free market at any "reasonable" price exceed the aggregate demand. The market prices resulting from the operation of the law of supply and demand would be ruinous to growers.

The announced national allotment is allocated on a historical basis first to the States, then ultimately through county committees to the farmer. The individual farmer's allotment is based on the county committee's calculation of his average recent history of acreage devoted to wheat. To participate in the program a grower must limit his plantings to his allotment and divert to conservation uses some acreage equal to an annually determined percentage of his allotment (see table 1). A grower, during most years from 1933 (except 1953–64), did not have to participate or even be eligible to participate in order to plant wheat acreage outside of the commodity program. He could grow any amount of wheat, but would have to depend on market prices. In 1969 the announced national allotment was 51.6 million acres and the required conservation acreage was 15 percent or 7.7 million acres above the allotment (see table 1).

[16] "The 1969 Voluntary Feed Grain and Wheat Programs," p. 8.

TABLE 1.—WHEAT PROGRAM PROVISIONS

	1963	1964	1965	1966	1967	1968	1969	1970
1. (a) Loan rate (per bushel)	$1.82	$1.30	$1.25	$1.25	$1.25	$1.25	$1.25	$1.25
(b) Support price including certificate (per bushel)	1.82	1.73	1.69	1.84	1.73	1.80	1.90	
2. Market price (per bushel)	1.85	1.37	1.35	1.63	1.39	1.22	1.24	
3. Certificates payments	None							
(a) Domestic:								
1. Percent of output covered		45	45	45	35	40	43	48
2. Payment (per bushel)		70	75	1.32	1.36	1.38	1.52	
(b) Export				Yes [1]	None	None	None	None
1. Percent of output covered		45	35					
2. Payment (per bushel)		.25	.30					
4. Required conservation acreage as percent of allotment	None	11.11	11.11	15	0	0	15	30.3
5. Additional voluntary conservation acreage	None				None	None		
(a) Limits		[2]	[3]	[4]			[5]	[6]
(b) Payment (percent of line 2)		20	50	40	0	0	50	50
6. National allotment (million acres):								
(a) Announced	55	49.5	49.5	47.8	68.2	59.3	51.6	45.5
(b) Effective	55	[7] 53.2	[7] 53	[7] 51.7	68.2	59.3	51.6	45.5
7. National wheat acreage (million acres):								
(a) Planted	53.4	55.67	57.36	54.38	67.79	62.59	54.3	49.0
(b) Harvested	45.5	49.76	49.56	49.86	58.77	55.31	47.57	43.6
8. Participation:								
(a) Percent of wheat farms	24	34	48	48	45	47	57	56
(b) Enrolled farmers' acreage as a percent of effective national wheat allotment	46	74	82	82	84	84	82	89

[1] No payment rate was established. Growers got a share of exporters' contributions and the pool based on the size of their allotment.
[2] 1964: to larger of 15 acres or 20 percent of allotment.
[3] 1965: to 15 acres or between 10 and 20 percent of allotment.
[4] 1966: to larger of 15 acres or 21.7 percent of allotment.
[5] 1969: 50 percent of allotment.
[6] 1960: to 19.2 acres or 50 percent of allotment.
[7] The effective allotment exceeded the nationally announced allotments because the allotments to small-scale growers were raised during these years.

Source: Lines (1)-(7) USDA, ASCS, "Commodity Program Fact Sheets," (1963-7 0), annual general explanations prepared for ASCS committeemen. Lines 8a and 8b. Letter from K. Hoover, director of Wisconsin's ASCS office.

Price-support mechanisms.—In return for agreeing to plant within his allotment and meet certain other requirements, a farmer is guaranteed a loan rate for his commodity. In addition to this, since 1964 the participating grower has been guaranteed income for marketing certificates; this payment is in addition to the loan price to which he can avail himself. Domestic marketing certificates are per-bushel direct payments to the grower on a fraction of his expected output. The fraction to which the domestic marketing certificate applies is approximately equal to that fraction of the national wheat production used as a food grain for domestic consumption. The farmer's expected output is calculated as his allotment times his expected yield, as determined by his county committee. Since the expected output need not equal actual, these certificates represent a form of insurance against crop failure. In 1964 the domestic marketing certificates covered 45 percent of "expected" production and paid $0.70 per bushel. This payment is received by the grower regardless of the buyer of his output. By 1969, this payment had risen to $1.52 per bushel for 43 percent of the expected output.

When first introduced for 1964 the domestic marketing certificate was accompanied by an export marketing certificate. This certificate in 1964 paid $0.25 per bushel for 45 percent of the calculated "expected" output of wheat. This payment was paid almost directly to farmers by commercial exporters and in essence represented the amount by which U.S. wheat prices would have been below world levels. After

1966 this device was abandoned because U.S. export prices including transport have since approached and, at times, exceeded world levels.

The domestic marketing certificate when first introduced was virtually a direct payment to farmers from processors of food for domestic use. Food processors were thereafter required to purchase a certificate for about $0.70 per bushel for all wheat used for domestic food purposes. The fund into which these payments were made was distributed among participating growers. Since 1966 the payment rate has been increased to the difference between parity and $1.25 (this difference is currently about $1.30 to $1.60) of which $0.75 has been paid by processors and the remainder by the Government out of CCC appropriations.

During all of the period 1964–69 the market price per bushel was above or within $0.03 of the loan rate. This contrasts with earlier periods when the loan rate was above the market price; during the 1950's the market price rose above the loan rate but once and then by $0.01 per bushel. Because the market price was above the loan level during much of the period 1964–69 the Government purchased little wheat and was able to reduce its stocks, in part through Public Law 480. The relatively high market price can be attributed to the effect of the wheat commodity program and in part the high export level.

In particular, two measures originated after 1963 probably contributed to the success of the Freeman programs. (1) The high value of marketing certificates drew farmers into the program and worked in the direction of keeping actual planting near the national allotment. (2) Payments were offered to program participants to divert voluntarily some part of their acreage from wheat to conservation use. This second measure is elaborated below.

In 1964 a grower could divert the greater of 15 acres or 20 percen of his allotment and receive 20 percent of his expected (determined a described above) gross income from wheat from the diverted acres For 1970 the grower could receive 50 percent of his expected gross from diverted land up to the larger of 50 percent of his allotted acreage or 19.2 acres. This option provided the opportunity to not plant wheat on the relatively less profitable acreage.

Thus the general effort behind the wheat program of recent years has been directed toward raising prices through reduced production. Plantings have been discouraged by providing economic incentives to eligible producers to participate in the programs. Production by participating growers has been further reduced through voluntary diversion provisions. Also, production by nonparticipants would seem to have been curtailed. Since certificates, as opposed to price, came to be the mechanism of assuring equitable incomes to participants, the loan levels have come to be relatively low (the average level between 1964–70 was about 60 percent of the level of the 1950s). Consequently, Government purchases didn't act as a magnet in raising the market price to the high support level, and lower prices should have discouraged nonparticipants' production. The program since 1964 seems to have been effective in reducing output and Government stocks.

Participation in the program has been raised from 34 percent of wheatgrowers in 1964 to 56 percent in 1970. Of acreage eligible to participate in the program 74 percent participated in 1964 and 89

percent participated in 1970. In some ways the programs have been tailored to increase participation by small-scale growers. Circumstantial evidence can be brought to bear on this. Between 1964 and 1970 the farms participating increased 65 percent while acreages of participants rose by only 20 percent. This would seem to indicate that the program has been successful in attracting small-scale growers.

There are other relatively minor provisions in the program and these can be found in the annual Agricultural Stabilization and Commodity Service (ASCS) brochures.

Effects of Supply Control

Supply control as currently practiced does produce the desired effect of increasing the gross incomes to participating growers both through higher prices and direct payments. The higher market price for output of supported crops results from the impact of supply control. It has been noted that the demands for major foodstuffs are relatively inelastic. This means that the smaller the total number of units reaching the market, the higher the price per unit and the greater the total amount paid for all such units. Since commodity programs have tended to restrict aggregate output below that level which the growers under a free market would produce, they have resulted in a higher gross income from the sale of output. This increase in gross income is supplemented with direct payments.

The objective is, of course, not only to raise gross incomes; the success of farm programs must be judged from their impact on the profitability of the farm operation. Such a criterion raises indirectly one of the critical questions of farm programs. It might appear obvious that higher farm prices and direct payments should lead to higher annual net farm incomes to participating farms. However, many contend, following the reasoning of orthodox economic theory, that the nature of supply control programs leads to farm profits being supplemented to a considerably smaller degree than gross incomes.

This result can be demonstrated for both the effects of direct payments and higher-than-free-market prices. Since it is easier to demonstrate how direct payments need not necessarily result in higher net incomes to participating farmers, it is that case which is explored here.

For commodity programs to lead to higher net farm profits, it is required that production costs rise less than gross income. Let

$$GY - C = NP.$$

where GY = annual gross income
C = annual costs
NP = annual farm profit

If both gross income and costs were to rise by the same amount there would be no change in profit. (Profit is used in an economic as opposed to a legal sense. Profit, specifically, is net income, conventionally defined, less the opportunity cost of owned resources.) If gross income increases, say through direct payments, then this would be translated fully into a rise in profits only if costs remained constant.

Included in costs are both the actual and opportunity costs of production. Actual costs include expenditures on seed, fertilizer, nondurable equipment, and other similar inputs. Opportunity costs include the income foregone, for example, by the owner's spending his labor on the farm instead of in off-farm employment. Another opportunity cost is the return on his capital which a farmer foregoes by investing it in his operation instead of in stocks, bonds, or other interest bearing assets. This latter opportunity cost is of particular importance in the subsequent argument. So long as NP is greater than or equal to zero, the grower is doing at least as well by investing his time and capital in his operation as he could do by allocating his resources elsewhere.

The theory which underlies the above observations on the potentially small impact of direct payments on farm profit is illustrated by the following example. Consider a landowner farmer who operates 1 acre of land valued at $400. Assume that ordinarily this grower grosses $100 and earns (net of all imputations to his labor as well as other input costs) $20 from this acre. Further assume that in advance of crop year 1969, the grower is told by his USDA county committee that in crop year 1969 and forever thereafter he will receive $10 (current dollars) per year in direct payments on this acre. (Actually it could be assumed for added realism that he would earn $15 in direct payments in return for performing certain tasks which would cost, perhaps in the value of his expenditure of time, $5.)

This grower receives the benefits on the acre because he possesses title to the land at the time the program is implemented. The benefits he receives are not diminished if he rents the land to another farmer or if he sells it outright.

The program represents a perpetuity. The annual direct payments of $10 when capitalized over all time at a constant interest rate of, say, 5 percent represent a present value of $200. That is, the value of the land increases by $200 after the program is announced. The fact that the payment takes the form of $10 this year and $10 next year and so on is not important. The $10 in 1969 is worth $10 to the grower. Likewise, the $10 payment in 1970 is worth $10 divided by 1.05, about $9.50, to the grower in 1969 ($9.50 represents the amount which if invested today at 5 percent would become $10 in a year.) The $10 payment in 1971 is worth $10 divided by 1.05^2 in 1969, and so on. The landowner is benefited in the same way either if the program involves an outright one-time-only gift of $200 or if he can receive $10 annually forever. In the latter case he can capitalize on the $200 gift by selling his land at any time for $200 more than he otherwise could have.

In this example, then, the effect of the program can be seen as raising the price of land by $200, from $400 to $600. The benefits for all time are realized by the person who is titleholder to the land at the time of the program's inception. What then of a grower who purchases the land from this original landholder? He will receive no benefits from the program if it is continued at an unchanged level. Although he will receive $10 annually in direct payments, thus raising his gross by $10, his costs rise by a like amount and consequently on net he would be unaffected by the program. The $10 rise in annual operating costs consists of the opportunity cost of capital. To purchase the land he must pay $200 more than he otherwise would have; the op-

portunity cost of this, for example, the income foregone by not investing this elsewhere at the interest rate of 5 percent, is just $10.

Likewise a nonlandowning renter receives no benefits from the program. Assuming a perfect rental market in land, renters' bids for the allotment land would exceed by $10 the amount they would pay for similar land not covered by the farm program. Any year the farmer in the above example chose to rent out the acre he would still receive the benefit payment; the form would be higher rents as opposed to a check from the Treasury.

Theory, then, predicts that farm program benefits will be capitalized into higher land values and realized by the landholders of record at the time the program begun. Reality may appear to contradict this theory for a number of reasons.

(1) Buyers or sellers of land may feel insecure about the duration and payment levels of the farm programs. Thus, land prices may not rise by the full capitalized value.

(2) Markets may not be perfect; rents or the sale price of land might be constrained by tradition and consequently might not rise by the full amount anticipated.

Clearly, the implementation of commodity programs has been accompanied by considerable uncertainty. These programs have involved experimentation with a variety of methods of operation: for example, large purchases of output by the CCC in the 1950's and high direct payments in the 1960's. Additionally, legislation governing these programs has to be enacted regularly, and in some cases farmers' referendums are required for a program's operation. To this uncertainty is added lack of foreknowledge of payment levels in future years.

All of this prevents the complete capitalization of program benefits into land values. Thus, later generations of farmowners have received and will continue to receive some farm program benefits. Nonetheless, any rise in land values will diminish the benefits of farm programs reaching those purchasing land after the capitalization process has occurred. Noted below is a study which has examined the relation between the benefits of farm programs and the value of agricultural acreage.

Drawing from work by Bruce Johnson [17] Charles Schultze has noted that the benefits of farm programs have indeed been capitalized into land values.[18] He argues that the benefits of farm programs have been added as a residual to returns to land and the increase in this figured since the inception of this program has paralleled the increase in land values (see table 2). He notes that the high program benefits of the 1960's coupled with increasing optimism about the continuation of these programs somewhat accelerated the capitalization process. Schultze said of this result, "The first-generation owners capture the benefits when they sell. Second-generation owners lose many of the benefits to higher carrying charges." Note that this result is verified in line 3 of table 2: the large increase in net returns to land, 444 percent, just about equals the 420 percent rise in land values from 1935 to 1967.

[17] Bruce B. Johnson, "An Active Land Market in Perspective," "Farm Real Estate Market Developments," CD-71 (December 1968), pp. 27-35.

[18] Charles Schultze, "The Distribution of Farm Subsidies," (Washington, D.C.: The Brookings Institution, 1971), ch. 4.

TABLE 2.—CHANGE IN LAND VALUE OVER TIME

Period	Percentage increases per acre		
	Increase in net farm income	Increase in net return to land	Increase in land values
1938–39 to 1952–54	160	124	160
1952–54 to 1965–67	18	143	100
1935–39 to 1965–67	206	444	420

Source: Schultze, The Distribution of Farm Subsidies, (1971), p. 35.

Later in this paper it is shown that approximately three-fourths of the benefits of farm programs in 1969 are attributable to direct payments. The remaining fraction results from the higher farm prices produced by commodity programs compared to those resulting from an otherwise free market. These benefits, too, are capitalized in part into land values since they are included in the residual returns to land upon which the capitalization, reported above, takes place.

Distribution of Farm-Program Benefits

This paper examines the distribution of farm-program benefits for 1969. The benefits of farm programs are defined as the excess of actual gross farm income over hypothetical longrun, free-market gross farm income. The benefits of farm programs are composed of both elements: The hihger market prices prevailing because of the effects of supply control and the direct payments for participation.

The crops upon which the analysis is based are feedgrains (corn, oats, grain sorghum and barley), wheat, soybeans and cotton. These crops constitute a substantial portion of the cash-crop sector of the economy. Of the nearly 300 million acres harvested in 1969 these crops accounted for about 205 million acres. Of the gross cash receipts from crops (not including direct payments) for 1969 of $22 billion, these seven crops accounted for about $12.5 billion. Additionally, in 1969 these crops accounted for over $3.3 billion—88 percent—of the total $3.75 billion in direct Government payments to farmers.

The annual benefits of farm programs in effect represent the annual income accruing in the long run to each value-of-sales class (see table 3) in excess of that which would prevail if there were considerably less Government involvement in agriculture. Specifically, the study compares the actual distribution of gross farm income from the seven crops studied in the 48 contiguous continental States to that distribution which would prevail if the primary involvement of Government with agriculture were limited to maintaining a modest acreage conservation program. It is assumed that growers have sufficient time to adjust to the equilibrium free-market prices. Under this latter condition, prices are set in the market and cultivation of crops is free to migrate to those geographical regions where it can be carried out most efficiently. Cultivation would be restricted to those regions which in the long run could produce profitably.

TABLE 3.—ASPECTS AND DEFINITION OF VALUE-OF-SALES CLASS

	Value of sales (thousands)	Percent of total farm sales, 1969	Percent of total number of farms, 1969
Class I	>$40.0	51.3	7.1
Class II	$20.0–$39.0	21.3	12.0
Class III	$10.0–$19.0	16.0	17.0
Class IV	$5.0–$10.0	6.3	13.1
Class V	$2.5–$5.0	2.4	9.6
Class VI	<$2.5	2.7	41.2

Note: Class VI includes a number of categories that the Bureau of the Census shows separately (small commercial farms, part-time farms, etc.), with 1 very minor exception, these categories all have the common characteristic of selling less than $2,500 farm products each year.

Source: Schultze, Distribution of Farm Subsidies, (1971), p. 25.

Price-support benefits.—The distribution of gross farm income from the sale of crops among the sales classes was calculated for 1969. This distribution was calculated assuming that the relative distribution of acreage among sales classes reported for each State for each crop in the 1964 Census of Agriculture also prevailed in 1969. (This assumption was required since the results of the 1969 census were unavailable at the time this research was performed.) The fraction of total acreage harvested for each class for each of the crops studied in each State was multiplied by the gross value of the sale of each crop in each State to determine the share of sales attributable to each class. Summing these quantities across all crops and all 48 continental States provided the distribution of actual gross sales in 1969.

Obtaining the free-market distribution of gross income from the sale of crops required the use of a model capable of generating a free-market distribution of output. For this the Iowa State University (ISU) general equilibrium linear programing model was used.

The spatial linear programing model in use at Iowa State's Center for Agricultural and Economic Development is a versatile tool. It has been used to study such matters as the impact of eliminating chemical fertilizers and the impact of water-resource projects on American agriculture. It has also been used to study the impact of changes in farm legislation on output in the near and relatively distant future.[19]

In conjunction with a demand model, the programing model permits one to determine the spatial distribution of output among producing regions under the assumption that long-run equilibrium prevails. The long-run equilibrium condition requires that no region produce any of the crops (feedgrains, wheat, soybeans, and cotton) covered by the model at a loss. The model can provide both the equilibrium prices which prevail in 1969, under the free-market conditions specified, as well as the most efficient distribution of output among producing regions. Alternatively, using a different formulation of the model, one can specify a set of input prices and various constraints in determining the optimal distribution of output.

This paper reports results based on the latter formulation. The input prices used, however, approximate the free-market levels

[19] See L. V. Mayer et al., "Farm Programs for the 1970's," Center for Agricultural and Economic Development Report No. 32, (Ames: Iowa State University, 1968). E. O. Heady, et al., "Analysis of Some Farm Program Alternatives for the Future," Center for Agricultural and Economic Development Report No. 34, (Ames: Iowa State University, 1969). Howard Madsen, et al., "Trade-offs in Farm Policy," Center for Agricultural and Economic Development Report No. 36, (Ames: Iowa State University, 1970).

calculated by other researchers using the ISU model.[20] The long-run levels of free-market prices for crops were calculated to be:

Soybeans, per bushel	$1.85
Wheat, per bushel	1.06
Feedgrains, per bushel (average)	.85
Cotton, per pound	.22

Output from the ISU model provided information on the distribution of output among States. It is assumed that for each crop, the distribution of output among sales classes prevailing within a State in 1964 continued to 1969 and that distribution of planting among classes would also have prevailed under a free market in 1969. The free market distribution among sales classes was calculated employing the same methodology described for the distribution of actual gross income from the sale of the seven crops. The difference between the actual and hypothetical gross incomes from the sale of the crops provides a measure of the price-support benefits of farm programs. Such distribution among sales classes have been calculated by others, the most notable work having been done by Charles Schultze. The present work reported has two primary advantages: (1) the model employed is spatial, and consequently permits an optimal allocation of cultivation among States. This affects the results of the distribution of farm income, since the economic classes produce differing shares of output of the seven crops in different States; (2) the present work calculates a distribution of price-support benefits assuming long-run equilibrium. The long-run formulation is superior if one is interested in knowing how actual 1969 farm income compares with the hypothetical distribution—assuming programs were terminated sufficiently in advance of that year to leave in production only those areas for which production of each crop is at zero or positive profits.

In table 4, the results of the calculations on the price-support benefits of farm programs are presented. These benefits are calculated for each class as the difference between actual and free market 1969 farm income.

TABLE 4.—DISTRIBUTION OF PRICE SUPPORT BENEFITS ATTRIBUTABLE TO FEEDGRAINS, WHEAT, SOYBEANS, AND COTTON IN 1969

[In millions of Dollars]

	Value-of-sales class						
	I	II	III	IV	V	VI	Total
1. Gross benefit	600	250	250	170	110	100	1,480
2. Actual gross from included crops	2,930	3,970	3,410	2,030	830	570	12,840
3. Benefits as a percent of gross	20	8	7	8	13	18	12

Sources: Lines (1)-(2), output of Iowa State University Model. Line (3) Farm Income Situation, FIS 216, July 1970.

The above table cannot give a complete picture of the impact of farm programs on the sale of crops since nowhere above are cost estimates included. However, the ISU model predicts that under long-run equilibrium conditions, free market production costs would about equal current actual costs.[21] Additionally, analysis underlying the

[20] See Mayer, "Farm Programs for the 1970's," p. 33.
[21] Ibid., p. 34.

work in this report indicates that output shares of the crops studied would shift only a little among economic classes with the end of price supports. It can thus be assumed that costs to each economic class will be approximately unchanged. This permits the assumption that the calculated changes in gross income can be fully translated into equal changes in net income.

This report looks only at the price-support benefits of the seven major crops. For further analysis, it is assumed that the price-support benefits attributable to other crops are negligible. This assumption is necessitated because of the limited coverage of the ISU model. However, it is justified because of the minimal controls over, and/or the relative unimportance of, other crops. Price-support benefits are not calculated for the following: sugar, wool and mohair, tobacco, rice, and other relatively minor crops.

Note that the price-support benefits represent the lower bound of the costs of farm programs to the public in their roles as consumer. The $1.48 billion represents the higher price middlemen must pay farmers for commodities because of supply control. The cost borne by consumers will exceed this amount if the intermediaries pursue a markup policy in setting their prices.

Direct payment benefits.—Direct payments of slightly under $3.8 billion were distributed to all farms in 1969. The USDA has broken down total benefit payments among value-of-sales classes.[22] Of those seven crops presently considered, only soybeans and oats did not have direct payments associated with them. The other feedgrains along with wheat and cotton accounted for $3.32 billion of the direct payments. Other programs such as the wool, mohair, sugar, and acreage conservation account for the difference.

The total of direct Government payments are distributed as follows:

TABLE 5.—DISTRIBUTION OF DIRECT PAYMENTS, 1969

	Value-of-sales class						
	I	II	III	IV	V	VI	Total
Direct payments (dollars in millions)	1,114	939	903	371	176	291	3,794
Number of farms (1,000)	211	357	505	389	286	1,223	2,971
Percent of payments	29.4	24.7	23.8	9.8	4.6	7.7	100
Percent of farms	7.1	12.0	16.8	13.1	9.8	41.0	100

Source: U.S. Department of Agriculture, Economic Research Service (ERS), Farm Income Situation, FIS 216, July 1970.

The considerable inequality among farms in the distribution of direct payments is reflected in the top 7 percent of growers receiving almost four times the payments of the bottom 41 percent.

Total benefits.—Assumptions made to this point permit the calculation of the total benefits of farm programs as the sum of price-support benefits, the first line of table 4, plus direct payments benefits, the first line of table 5. Total benefits by class are presented as line 1 of table 6.

Longrun total benefits of farm programs add up to $5.27 billion (line 1). Of this amount, about one-third accrues to class I and about

[22] U.S. Department of Agriculture, Economic Research Service, "Farm Income Situation," (FIS 216), July 1970.

three-fourths to classes I–III taken together. Class VI derives 7 percent of the total benefits (line 3). Compared to their shares of gross farm income, classes II–VI all derive a higher percentage share of benefits (lines 5 and 3). That the low-gross growers derive relatively higher benefits as a percentage of gross farm income is also illustrated in line 8. Here it is shown that for class VI, benefits represent about one-seventh of gross income; and for class V, about one-fifth; while for classes II and I, benefits represent but one-tenth and one-sixteenth respectively.

There appears to be a relatively greater supplement to the incomes of the lower gross farms in a comparison between benefits and gross income. However, this progressivity largely vanishes when one compares benefits to realized net farm income (line 9). Such a comparison shows that farm programs supplement net income of the sales classes fairly uniformly. All but one class would experience about a one-third decline in net farm income with the termination of commodity programs; the sole exception is class V—which would experience a decline of about one-half. The relative differences among classes between the ratios of benefits to gross versus benefits to net farm income, results from the lower margins of the higher sales-class farms (line 10).

Total benefits per farm are another aspect of the equity of farm programs. Table 6 shows that the benefits to class I farms average more than $8,000, while those to class VI but $320 (line 13). The benefits per farm decline uniformly, moving from class I to class VI.

TABLE 6.—IMPACT OF AGRICULTURAL PROGRAMS, 1969

Item	Value-of-sales class						
	I	II	III	IV	V	VI	Total
1. Total benefits [1]	1,710	1,190	1,150	540	290	390	5,270
2. Direct payment benefits as a percent of total	65	79	78	68	62	74	72
3. Percent of benefits	32	23	22	10	6	7	100
4. Realized gross farm income [1]	26,530	11,480	8,840	3,630	1,490	2,630	54,600
5. Percent of realized gross income	49	21	16	7	3	5	100
6. Realized net income (including payments) [1]	5,800	3,740	3,270	1,410	610	1,320	16,150
7. Percent of realized net income	36	23	20	9	4	8	100
8. Benefits as a percent of realized gross	6.4	10	13	15	19	15	9.6
9. Benefits as a percent of realized net	29	32	35	38	48	29	32
10. Net as a percent of gross	22	32	37	39	41	50	30
11. Number of farms [2]	211	357	505	389	286	1,223	2,971
12. Percent of farms	7	12	17	13	10	41	100
13. Total benefits per farm [2]	8.1	3.3	2.3	1.4	1.0	.32	1.77
14. Realized gross farm income per farm [2]	125.7	32.2	17.5	9.34	5.20	2.15	18.4
15. Production expenses per farm [2]	98.2	21.7	11.0	5.71	3.08	1.07	12.9
16. Realized net farm income per farm [2]	27.5	10.5	6.48	6.63	2.12	1.08	5.44
17. Direct payments per farm [2]	5.3	2.6	1.8	0.95	0.62	0.24	1.28
18. Price support and spatial benefits per farm [2]	2.8	0.70	0.50	0.45	0.38	0.08	0.49
19. Off-farm income per farm [2]	5.46	3.24	3.14	4.49	4.90	7.01	5.26
20. Total money income per farm [2]	33.0	13.7	9.62	8.12	7.02	8.09	10.7
21. Benefits as a percent of total income	25	24	24	17	14	4	16

[1] In millions of dollars.
[2] In thousands of dollars.

Sources: Economic Research Service, U.S. Department of Agriculture, Farm Income Situation, FIS 216, July 1970, Tables 4 and 5.

A considerable portion of farm operators derive some off-farm income. Line 19 indicates how much accrues on average to farms by value-of-sales class. The highest average off-farm income accrues to class VI growers. This can be attributed largely to the fact that about three-fourths of the farms in this class are not commercial; that is, they are either part-time or part-retirement farms.[23] One would suspect that for this bottom class, well over three-fourths of the off-farm earnings accrue to noncommercial farms. The lumping together of commercial with noncommercial farms, forced by the form of the presentation of direct payments data in the "Farm Income Situation" of July 1970, obscures the reliance of low-gross commercial farms on farm income.

Combining the data on farm and off-farm income and comparing the resulting magnitude with total benefits (line 21), demonstrates the decreasing relative liability, moving from high- to low-gross farms, on total income consequent upon the termination of farm programs. Because low-gross farms rely to a lesser extent on farm income this liability is correspondingly lower. This last line presents strong evidence against the notion that farm programs are responsible for the continued existence of the small and, in particular, the poor farms.

One way economists examine the equality of a distribution is by means of a Gini coefficient. A coefficient of 0 indicates a perfectly even distribution of a quantity among a population. A coefficient of 1.00 indicates complete inequality; that is, one person has every unit of that which the distribution is looking at while everyone else has nothing. For comparative purposes, the Gini coefficients of percent distribution of family personal income in this country in 1954 and 1956 was 0.39, and in 1962 was 0.40.[24]

Over all, farm programs have only a small effect on the distribution of income within agriculture. The Gini coefficient of the total benefit distribution indicates slightly greater equality than the actual 1969 distribution of realized net farm income. Subtracting for each class total annual benefits from actual 1969 realized net farm income results in a distribution of hypothetical realized net farm income, the Gini coefficient for which is 0.58. Terminating farm programs would have the effect of worsening the distribution of net farm income by two points (see table 7). Highly concentrated farm programs improve the distribution of net farm income only because net farm income is itself so highly concentrated.

TABLE 7.—*Gini coefficients of various distributions*

Distribution:	*Coefficient*
Direct payments	0. 53
Price support and spatial benefits	. 51
Total benefits	. 52
Realized net farm income	. 56
Hypothetical realized net farm income	. 58

Benefits and land ownership.—It has been argued that much of the benefits from direct payments and price supports have been capitalized into land values and rents. This would imply that farm operators who have acquired their land following the capitalization process and farm renters, would not receive the benefits attributed to them. Even if it

[23] See 1964 U.S. Census of Agriculture, vol. II, chap. 6, p. 599. Based on figures for 1964.
[24] See Edward Budd, "Inequality and Poverty" (New York: W. W. Norton, 1967), p. xii.

were true that the benefits were fully capitalized into land values, the meaningfulness of the results of this section would not be negated. The benefits distribution is open to two interpretations:

1. It tells the annual benefits to farm operators by economic class from farm programs, assuming no gains were capitalized into land values; and

2. It tells the annual loss by economic class incurred, assuming a capitalization process drove up land values in the past.

This latter interpretation looks at the benefit distribution in the sense of an opportunity cost. The benefits received by each class are measured by how much higher their income is under the actual as opposed to the hypothetical situation. This calculation does not assume that current operators are actually receiving benefits from the Government programs. It does assume that they will be worse off after the programs are terminated since their net farm income, in particular the return to the land, will fall, and this will lead to a decline in land values.

In the hypothetical example illustrating the capitalization of direct payments benefits, it was noted that a later purchase would be unaffected by the farm programs if they were continued at constant levels. However, the termination of farm programs would result in a loss to the later purchaser of land of $200, or $10 per year. Thus, although a current landholder may receive no actual benefit from the farm programs, he may lose considerably when and if they are terminated. It is in this sense that a decline in income, which would be a consequence of the termination of farm programs, is termed a benefit. Renters in each economic class will not be similarly affected. However, the owners of the land which they operate will suffer a capital loss.

Thus, the benefit distribution, if properly adjusted for the economic class of the landowner, is a good indication of the annual benefits of the programs or, looked at alternatively, the costs of terminating them.

Tenurial patterns do not appear to differ considerably among commercial economic classes. The 1964 U.S. Census of Agriculture indicates that 75 percent or more of the operators in each class had ownership status.[25] This is not to say, however, that three-fourths of the land they farmed was owned within the economic class since (1) owned farms could on the average be larger or smaller than rented farms, and (2) land rented by part owners could be owned outside their own economic class.

Significantly, the highest rates of full ownership occur among growers of the lowest economic classes.

If it can be assumed that owners' and nonowners' farms are approximately equal in acreage, then it follows that growers in the bottom, economic classes realize nearly the full amount of annual benefits (or will realize nearly the entire annual losses) which have been calculated (table 6, line 1). This statement holds with a lesser degree of certainty to the high economic classes, since full ownership occurs with lower frequency. On the other hand, it seem plausible, though it cannot be ascertained, that ownership of land rented by part owners and tenants, is concentrated in the higher economic classes.

[25] 1964 U.S. Census of Agriculture, vol. II, chap. 6, p. 638.

Conclusion

This paper has evaluated commodity programs in terms of their impact on the distribution of income within agriculture. It has been shown that these programs redistribute relatively little income to the lower tail of the income distribution. However, few would claim that the sole, or even central, rationale of commodity programs has been their potential usefulness as surrogate welfare programs. Rather, the primary purpose of these programs seems to have been to maintain farm income in the aggregate. This objective, the paper demonstrates, has to a degree been attained by supply-control programs.

Nonetheless, commodity programs remain as one of the foremost mechanisms addressed to the rural poverty problem. The President's National Advisory Commission on Rural Poverty said of them:

> * * * our public programs in rural America are woefully out of date. Many of them, especially your farm programs and vocational agriculture programs, are relics from an earlier era. They were developed during a period when there was a strong belief that people born in rural America should stay there and work on farms, or in farm-related occupations. The programs emerged from legislation which equated the welfare of farm families with conditions on farms and the welfare of rural communities with the incomes of farms. These conditions no longer prevail.
>
> * * * instead of combating low incomes among rural people, these programs have helped to increase the wealth of landowners while largely bypassing the rural poor.[26]

The data presented in tables 4, 5, and 6 demonstrate the concentration of benefits among the farm population. The bottom 41 percent (1,223,000 farms) of the producing units, class VI, receive only 7 percent ($390 billion) of the benefits. The bottom 63 percent (1,898,000 farms), classes IV–VI, receive only 23 percent ($1,220 million) of the benefits. Included among these farms are many nonpoor operators, since the mean total money income to operators of class IV, V, and VI, is $8,120, $7,020, and $8,090 respectively. The 29 percent of the farm population which is poor [27] receives only a small share of the benefits of farm programs.

A rough calculation will illustrate this. Assume the poor 29 percent constitute a like percentage of the operators and receive a proportionate share of benefits accruing to the bottom 63 percent of operators. The benefits of farm programs reaching this population then totals about $560 million. This extremely liberal estimate of the benefits reaching the rural poor, even assuming further that these benefits were not largely capitalized into land values before the land came into the hands of the poor, is indicative of the inadequacy of farm programs in dealing with the rural poverty. The President's Commission has estimated that, "To close the income gap for the rural poor alone would cost nearly $5 billion." [28] It should be stressed that closing the income gap means bringing the rural poverty population up to the equivalent of 85 percent of the urban poverty line.

Farm programs, at the very most, contribute to closing this gap by 10 percent. The cost of these programs to the public, $5.25 billion annually, exceeds the size of the rural poverty gap by a quarter billion dollars.

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[26] "The People Left Behind" (Washington, D.C.: U.S. Government Printing Office, 1967), p. 13.
[27] Ibid., chap. 1, table 1.
[28] Ibid., p. 7.

Charles Schultze has pointed out another fault in the present approach. He has correctly commented that the concept of parity income is an unattainable goal of farm policy.[29] Briefly, he argues that farmers are willing to stay in that occupation at below parity incomes. Any attempt to raise their incomes above this level will result in a rise in land rents and ultimately a rise in land values. A later calculation of parity income will show that it has risen, because of a higher input cost, and the farmer will appear to be little, if at all, better off in a comparison between actual and parity incomes.

The implication of his argument is that only those subsidies granted to individuals instead of to salable assets will not be capitalized into land values.

This insight is both an important criticism of past programs and a beacon to light the way to further reforms. Future farm policy must recognize the important limitations of supply control in influencing incomes of the farm population.

Of course, increasing the benefits of the current type of farm programs would increase the dollar benefits reaching poor landowning farmers. However, this approach to income maintenance is undesirable for four reasons. First, it would still not channel income to all those in need, since the mechanism is selective and bypasses tenants, hired farm workers, and the other landless agriculturalists. Second, it is an inefficient way of redistributing income since the bulk of the increased benefits would accrue to the higher-income growers. Third, the capitalization of benefits into land values remains a problem. Lastly, supply controls tend to result in farm prices above free-market levels. Since this is translated into higher food prices, a relatively great burden from this rise is borne by low-income consumers. It is this group whose food budget tends to be a relatively large share of their income.

An attempt has been made to reduce the amount of farm program direct-payment benefits accruing to the biggest growers. Currently, a grower is limited to $50,000 in direct payments per crop. In theory, such a limitation would offer a means to defend the current type of program from the charge that it is "woefully out of date" and unable to deal with the problems posed by the poor within agriculture. A limitation on individual payments would permit increased benefit levels without the amount going to the biggest farms growing way out of publicly acceptable bounds. Furthermore, a payments limitation works in the direction of evening the distribution of benefits. However, the limit of $50,000 per farmer per crop is so high that it will have minimal impact on the over all distributional consequences of the present type of farm program.

In the 1968 wheat program, only 41 growers received more than $50,000 in direct payments, only 8 of these more than $100,000 and only one of these received between $500,000 and $1,000,000.[30] In 1968, for all major programs combined, only 1,274 producing units received more than $50,000; the total payments they received were slightly more than $100 million.[31] The vast bulk of the benefits, about 78 percent, was received by those whose benefits were in the range of $1,000 to $49,999. (See table 8.) Consequently, a uniform increase in benefits,

[29] Charles Schultze, "The Distribution of Farm Subsidies," p. 40.
[30] U. S. Department of Agriculture, Economic Research Service, unpublished tables.
[31] U. S. Department of Agriculture, Economic Research Service, unpublished tables (dated July 1, 1969).

even with a limitation would still be accompanied by the overwhelming majority of the payments flowing to the large-scale growers. An additional defect of payment limitations is that most growers can effectively short circuit the limitation by splitting their holdings among such units as family trusts.[32]

Future farm policy must take a considerably different course if it is to have a meaningful impact on the poor within agriculture. It is well beyond the scope of the present work to specify the details required of such a policy. However, this paper has pointed out the limitations of present policies and this should serve as a guide to what has been ineffective.

TABLE 8.—FREQUENCY DISTRIBUTION OF PRODUCER PAYMENTS, EXCLUDING WOOL AND SUGAR, UNITED STATES, CALENDAR YEAR 1968

Payment range	Producers percent distribution	Total amount of payments percent distribution
Less than $100	11.9	0.4
$100 to $499	33.8	6.9
$500 to $999	21.2	11.4
$1,000 to $4,999	28.7	44.3
$5,000 to $9,999	3.1	15.8
$10,000 to $24,999	1.1	12.6
$25,000 to $49,999	.2	4.8
$50,000 to $99,999	(1)	2.1
$100,000 and over	(1)	1.6
Total percentage	100.0	100.0
Total numbers	2,371,634	$3,187,300,000

[1] Less than 0.1 percent.

Source: Unpublished tables, ERS, USDA (July 1, 1969).

[32] "The People Left Behind," p. 145. The President's Commission recognized this potential drawback to a payments limitation scheme.

THE IMPACT OF FEDERAL COTTON PRICE AND PRODUCTION PROGRAMS ON FARMERS' INCOMES IN 1969 AND 1971

By DALE M. HOOVER*

I. INTRODUCTION

Over the past four decades a variety of Federal programs have been employed to raise the incomes of cotton producers in one way or another.[1] During this period very few formal analyses of the net effects of the programs on income distribution have been made.[2] The failure to carefully analyze the behavior of the programs probably stems about equally from two factors:

(1) The price of cotton in the United States was held above world market levels for many years and the average cotton allotment was relatively small. The per capita income of farmers was low relative to nonfarmers. In the face of these conditions it was easy to conclude that the program was redistributing income from the rich to the poor. On the average redistributive goals were apparently being met and questions of alternative, more efficient transfer mechanisms were not raised.

(2) Formal analysis of the impact of the cotton programs is extremely complicated both because the program rules are complex and because there is considerable interaction of cotton production with other agricultural activities. The estimation of cotton income that would exist in the absence of the various Federal programs requires that a number of important assumptions be made about supply and demand conditions. Furthermore with program provisions shifting every 3 or 4 years, an income analysis for one period would not necessarily fit another period.

In this paper estimates of the effects of the Federal cotton allotment program for 1969 and the set-aside program for 1971 on the aggregate net farm income from cotton as well as the regional and personal distribution of program benefits are presented. The analysis is made using the assumption that commodity programs were in force for wheat and feed grains and that all other Federal efforts to promote domestic use, export, and quality improvement of cotton were continued. The

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[1] Summaries of Federal programs for cotton can be found in: Cable, C. Curtis, Jr. "A Chronology of Government Programs for American Upland Cotton," Bulletin 587, Arkansas Agricultural Experiment Station, April 1957; and Strickland, P. L., W. H. Brown, W. C. McArthur and W. W. Pawson, "Cotton Production and Farm Income Estimates Under Selected Alternative Farm Programs," Agricultural Economics Report No. 212, USDA, ERS, September 1971.

[2] The two major studies which concentrated on cotton program benefits were concerned with the 1964 program (Bonnen, James T. "The Distribution of Benefits from Cotton Price Supports" in Samuel B. Chase Jr., ed., *Problems in Public Expenditure Analysis*, Brookings, 1968) and the 1968 program (Hill, Roger P., "The Distribution of Benefits from the 1968 Upland Cotton Program," *Southern Journal of Agricultural Economics*, 2 [December, 1970]: 83-90). These studies produce estimates of the impact of the programs on the personal distribution of income which broadly resemble the one presented in this paper. Production costs and supply responses were not dealt with in either of the earlier studies, probably resulting in an overstatement of the aggregate U.S. and Southeastern region benefits of the programs.

analysis necessarily relates to income from cotton rather than to the income of cotton producers from all sources. There is no necessary relationship between cotton income and noncotton income of cotton producers but the correlation is probably high. This makes our measurements partial and indicative rather than conclusive.

The focus in our work is on farm operator net income, on the assumption that other resources affected by the programs have alternative uses equal to their addition to cotton production costs. A full analysis of the income distribution effects would require a consideration of the distribution of the costs of the program among taxpayers and consumers; however, this side of the analysis is beyond the scope of this paper.

The plan of the paper is to: (1) sketch the history of the cotton program with emphasis on the period since 1964; (2) analyze the impact of the operations of the programs on the aggregate net income from cotton of producers in 1969 and 1971 and to note its regional distribution; (3) specify the personal distribution of net benefits by size of allotment acreage; and (4) note the probable effect of some future alternative cotton provisions, particularly the effect of payment limitations.

II. Cotton Farm Price and Production Programs

Two issues have dominated the history of the cotton programs. One is the problem of choosing an instrument to constrain the use of land so that production is reduced and the market price is raised: This is the question of voluntary land diversion versus binding allotments. The other issue is the mode of income supplementation: High market prices versus low market prices accompanied by direct payments. These two issues are discussed separately below.

A feeble price support effort was undertaken in 1929 but serious Federal efforts did not begin until 4 years later. Beginning in 1933 voluntary diversion payments were used to get farmers to reduce cotton production by reducing planted acreage. With reduced output, prices and revenues would be increased. Through a series of acts the voluntary acreage restrictions evolved into a binding acreage allotment programs by 1938. Penalties for over-planting were set so high that no producer could afford to exceed his allotted acreage.

The allotment program was on and off in response to war-related demand conditions in the 1940's and 1950's but it continued to exist as the nominal form of control through 1970. However, even before the formal end of allotments, the voluntary diversion programs developed in the early 1930's had been reinstituted. First, the soil bank induced farmers to voluntarily reduce planted acreage sharply in 1956–58 and to a lesser degree through the 1960's. Second, voluntary diversion was obtained by use of direct payments and diversion payments between 1964 and 1970. The direct payments are generally referred to as price support payments because they are based on a price goal defined in the legislation. Enacted for the 1971–73 production years, the set-aside program represents a full return to the voluntary diversion concept. Farmers are assigned a base acreage (unfortunately called an allotment) which is the basis for determining

land diversion and direct payments. The base acreage does not restrain the amount of cotton acreage planted as did old-style allotments.

Two important lessons emerge from the various attempts to restrain production. First, unlike allotments, voluntary diversion allows some geographic reallocation of production which is needed for efficiency in a dynamic economy. Second, neither type of constraint was completely effective in reducing total output given the potential for increasing yield per acre and the existence of a high, guaranteed price for the product. This failure to restrain production as fully as desired limited the amount of income that could be transferred to farmers through the market for cotton, assuming an inelastic demand for the product.

The other primary political issue over the life of the program has been the price policy for cotton. The alternatives broadly stated are: (1) a high market price which operates as a tax on consumers which is collected by producers, and (2) a market price set by supply conditions, both inside the United States and in other countries, with income transferred in the form of direct cash payments to producers from funds collected by the Treasury. Until 1966 some portions of of the high market price policy were maintained by a combination of restraint on planting and price supports that led to accumulation of large government-owned stocks at various times. Since 1966 the support price has been set slightly below the expected world price level and direct payments have been used to transfer income to cotton producers.

In retrospect it is clear that a high market price policy was inappropriate for cotton. If high prices are to transfer income to producers over the years, there must be few good consumption substitutes for the product and little supply response among foreign producers. Neither condition held for cotton. At high cotton prices, synthetics were highly competitive with cotton. Since 1950 cotton's share of total fiber usage in the United States measured in pounds has fallen dramatically (table 1): From two-thirds to about three-eights of total fiber consumption. Of course even at low cotton prices synthetics would have displaced some cotton but less than has occurred. Simultaneously, foreign suppliers were expanding production. The share of world production supplied by the United States fell from one-third to one-fifth between 1955 and 1970 (table 2). To be sure, some of this expansion would have occurred at lower cotton prices, but less than has occurred.

TABLE 1.—U.S. MILL CONSUMPTION OF FIBERS IN SELECTED YEARS, 1950-70 [1]

Year	All fibers pounds/ capita	Cotton pounds/ capita	Cotton percent of all fibers
1950	45.2	30.9	68.3
1955	40.6	26.5	65.2
1960	35.9	23.2	64.6
1965	43.7	23.1	52.7
1970	46.7	18.6	39:9

[1] Source: Cotton Situation, Economic Research Service, U.S. Department of Agriculture, April 1972, p. 24.

TABLE 2.—DOMESTIC AND FOREIGN PRODUCTION OF COTTON, SELECTED YEARS, 1955-70 [1]

Year	Millions of bales— United States	Foreign	World	U.S. share of total production (percent)
1955	14.7	29.0	43.7	34
1960	14.2	32.2	46.4	31
1965	14.9	39.1	54.0	28
1970	10.2	41.1	51.3	20

[1] Source: Cotton Situation, Economic Research Service, U.S. Department of Agriculture, October 1971, p. 32.

An awareness of the effects of the high price policy began to affect cotton price policies as early as 1955. To retain the shrinking foreign markets, a subsidy of 7½ cents per pound was paid on exported raw cotton. The textiles manufacturers soon recognized that subsidized American cotton was being processed and sent back to the United States in manufactured form. The U.S. textile industry lobbied for, and won, a subsidy on the U.S. cotton they purchased in 1964 and 1965. With all U.S. production subsidized, the high price policy had been discarded in effect, if not in form. Embarrassed by the public awareness of the subsidy, the textile industry backed the move to get the subsidy paid directly to farmers as a "price support payment." The farmer subsidy which began at a low rate in 1964, jumped in 1966 with the end of subsidization of the miller and exporter. Simultaneously, the high loan rate operating as a floor on market price was lowered. Since that time, direct payments have been the object of much public concern and debate. The public awareness of Treasury payments was essentially responsible for the adoption of limitations on Treasury payments per farm of $55,000 for the 1971 crop.

In summary, cotton programs spanning nearly 40 years have employed land-use constraints which have done more to limit the relocation of the crop than they have done to limit total output. The high price policy adversely affected the market for U.S. cotton and has gradually been abandoned. The incomes of U.S. producers were raised by these programs in the short run by high prices. The longrun effects are not so clear. Direct payments, whether received by the exporter, the domestic textile mill, or directly by the farmer, raised the price producers received. The net effect of this kind of subsidization is not equal, however, to the gross amounts of direct payments received. Attention is given to this problem in a later section. Although production constraint was practiced earlier, it is no longer an efficient tool to raise farm income.

III. Impact of the Programs on Producers' Incomes in the Aggregate and by Regions

In this paper, subsidization is defined to mean the increase in producers' income brought about by governmental activity. The primary forms of subsidization in the cotton programs have been: (1) an increase in market price, (2) diversion payments for land, and (3) direct payments from the U.S. Treasury based on pounds of cotton produced or purchased. The impact of income-increasing

programs has usually been detected in one of two ways: (1) allotment land has taken on sales or rental value, which reflects its earnings in excess of an alternative crop, and (2) estimates of net farm income which would exist in the absence of the program are lower than observed net farm income. Both of these measures will be considered in this section.

While cotton allotment sales values have been estimated for some areas, none have been estimated that account for the entire United States.[3] However, estimates of rental rates per pound of cotton leased separate and apart from land for 1966 and 1969 have been made for each of a number of production areas (table 3). These data are not necessarily equal to the mean rental value of cotton allotment because the reported data are computed from a small number of observations. Nevertheless, they suggest that, in many areas, the rental returns are substantially less than the direct payment rate of 9.42 and 14.73 cents per pound of projected yield for 1966 and 1969, respectively. It seems very likely that the direct payment provisions have caused farmers to engage in production above the level that would have occurred in the absence of direct payments. Consider a farmer with expectation of (1) production costs of 25 cents a pound, (2) the market price at 21 cents, and (3) no direct payments. The farmer would forego production. With direct payments of 14 cents per pound, his net returns over costs would be 10 cents, and it would pay him to undertake production. Under these circumstances, the net value of the subsidy received by farmers would be considerably less than the $821.6 million Treasury outlay in 1969.

TABLE 3.—MEAN RENTAL RATES PER POUND OF PROJECTED YIELD AND NUMBERS OF OBSERVATIONS FOR LEASED COTTON ALLOTMENT FOR 1966 AND 1969[1]

Area[2]	1966		1969	
	Mean rental rate (cents/pound)	Number of observations	Mean rental rate (cents/pound)	Number of observations
Southeast:				
Southern Piedmont	3.2	36	2.9	28
Eastern Coastal Plains	2.9	27	2.4	27
Southern Coastal Plains	3.0	18	3.0	38
Limestone Valley-Sand Mountain	4.5	73	3.7	46
Clay Hills	4.3	34	4.0	37
Black Belt	3.8	20	3.6	29
Brown Loan	5.8	34	5.0	21
South Central:				
Mississippi Delta	4.5	6	4.6	11
Northeast Arkansas	4.7	21	3.0	15
Black Prairie	2.4	47	2.0	44
Coastal Prairie	6.2	15	5.0	14
Lower Rio Grande Valley	2.7	27	4.0	27
Rolling Plains	4.8	38	6.0	36
High Plains	5.8	15	7.0	31
West:				
San Joaquin Valley	8.0	26	6.0	33
Southern California and Southwest Arizona	5.4	9	5.3	12
Central Arizona	6.0	16	7.0	10
High Southern Desert			6.0	14
Upper Rio Grande and Pecos Valleys	4.3	24	5.0	38
Trans Pecos	8.8	10	3.5	19

[1] Source: Unpublished data from nationwide surveys of cotton costs in 1966 and 1969 conducted by the U.S. Department of Agriculture.

[2] For a fuller definition of the areas see U.S. Department of Agriculture, Cost of Producing Upland Cotton in the United States, 1964, Agricultural Economic Report No. 99, Washington, D.C.

[3] Travena, Billy J. and Luther H. Keller, "Lease and Sale Transfers of Cotton Allotment in Tennessee," Bulletin 468, Tennessee Agricultural Experiment Station, 1970; and Penn, J.B., Bill Bolton, and Willard F. Wolf, "The Farmland Market in the Mississippi River Delta Cotton Region, 1964-64," Research Report No. 372, Mississippi State University Department of Agricultural Economics, April 1968.

The 1969 Allotment and Direct Payment Program

The 1969 lease rates reported in table 3 may understate the expected mean rental value of cotton per pound arising from direct payments because renters may have been less productive than owner-operators on the average, and because risk of crop failure may have caused renters to bid less than the expected mean rate of return. In addition, in some instances, cash renters may have agreed to pass on a part of the direct payment to the allotment owner. Consequently, to estimate the level of net benefit accruing from direct payments from the rental data, a several-step adjustment process was undertaken. First, the rental rates were increased by 50 percent to account for the possible downward bias in rental rates. Then, the rental rate was divided by the 1969 direct payment rate to produce a rate which net benefits were of direct payments.

Next, data on the planted acreage of cotton in 1971 as a percent of base were obtained from official statistics.[4] They are useful because in that year, for the first time in over a decade, producers were essentially free of acreage restrictions. Production in excess of base was made in response to market price expectations since direct payments were made only on base production. Consequently, substantial overplanting was a sign that mean costs were at or below market prices. Had direct payments been made, they would have been received fully as program benefits. For States planting less than 110 percent of their base, the ratio of rental rates to the 1969 direct payment rate was accepted as the factor for computation of mean net benefits. For States planting more than 110 percent of their base, the State mean benefit ratio of benefits to payments was raised, roughly in a linear fashion, so that at about 130 percent of base, the ratio was adjusted to 1.00. In no case was the rate set above 1.00. The resulting adjustment factors are reported in table 4. If there is a bias in the factors, it is probably in the direction of making the mean program benefits appear to be higher than they actually were.

TABLE 4.—*Adjustment factors developed for the estimation of net benefits accruing from direct payments made during the 1969 and 1971 cotton programs*

State:	*Ratio of net to gross benefits*
Alabama	0. 41
Arizona	. 68
Arkansas	1. 00
California	1. 00
Florida	. 27
Georgia	. 29
Illinois	. 31
Kansas	. 27
Kentucky	. 48
Louisiana	1. 00
Mississippi	1. 00
Missouri	1. 00
Nevada	. 27
New Mexico	. 68
North Carolina	. 27
Oklahoma	. 61
South Carolina	. 27
Tennessee	. 82
Texas	. 82
Virginia	. 27

[4] Agricultural Stabilization and Conservation Service, *Frequency Distributions of Participating Farms in the 1971 Feed Grain, Wheat and Cotton Set-Aside Programs*, U.S.D.A., Washington, D.C., December 1971

Special "small farmer" payments were made in 1969, irrespective of production, so long as the allotment was not leased to another producer. There was no need to undertake expensive production to obtain these benefits. Hence, these payments were credited as full value benefits in table 5.

The relationship between estimated 1969 rent per pound and the Treasury "price support" payment per pound for each State was used to estimate aggregate benefits for the four major production regions for 1969. The results are recorded in table 5 and are contrasted to total Treasury cotton payments. The differences in the two numbers arise because of high costs of production in some regions, especially in the case of the Southeast region.

One of the important underlying assumptions in the previous analysis is that the market price 1969, in the absence of the program, would have been about the same level as with the program, and that output would have fallen in high-cost areas and expanded some or remained constant in low-cost areas. The importance and implications of this assumption are considered next.

Suppose that, in the absence of the 1969 program, the low-cost areas would have expanded production considerably, and that after accounting for other crop adjustments and all expenses, net income from cotton sales in those areas would have been greater than under the program. This potential increase in net income through expanded production was, in a sense, forgone by producers in the low-cost area because of the program. The boost in income which was potentially available should be deducted from the benefits of the program accruing to low-cost producers reported in table 5. Symmetrically, if market income were to be expected to fall as a result of the suspension of the program, the potential decline in income should be added as a positive quantity to the net benefits from direct payments to produce an estimate of total program benefits.

TABLE 5.—NET PRODUCER BENEFITS AND TREASURY OUTLAYS FOR THE 1969 COTTON PROGRAM, BY REGIONS[1]

Area[2]	Treasury outlays	Net benefits	Percent benefits were of outlays	Number of recipients	Net benefits per recipient	Regional share of net benefits
Southeast	$128,598,965	$50,629,416	39.4	187,934	$269.40	7.6
Delta	272,769,261	266,098,668	97.8	151,244	1,764.76	40.1
Southwest	290,508,486	234,344,520	80.7	123,587	1,896.19	35.3
West	129,455,095	113,085,778	87.4	12,780	8,848.65	17.0
United States	821,331,807	664,968,382	81.0	475,545	1,398.33	100.0

[1] Procedure used in deriving these data are reported in appendix A.
[2] Southeastern States are Alabama, Florida, Georgia, North Carolina, South Carolina, and Virginia. Delta States are Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee. Southwestern States are Kansas, Oklahoma, and Texas. Western States are Arizona, California, Nevada, and New Mexico.

Thus far we have assumed that total output and market price would have been essentially unaltered in the absence of the 1969 cotton programs. A simulation—linear programing—model of the U.S. cotton sector was constructed and used by the USDA [5] to project unrestrained production under three possible market prices for cotton. Using 22 cents per pound, the most realistic of their estimates judged in the light of 1970 and 1971 prices, cotton producers' net income

[5] Strickland, P. L., *et al.*, *op. cit.*, p. 24.

would have fallen $610 million. This number is $110 million less than Treasury payments but probably $26 million more than the net benefits arising from payments.[6] Hence, on balance market, income was essentially unaffected by the 1969 program. No addition to meet benefits—market losses avoided—or subtraction from net benefits—market gains forgone—is required for the U.S. net benefits estimate. However, the USDA study suggests that some market income was forgone in the West and the delta requiring a reduction in their 1969 program benefits and vice versa in the other regions.

The 1971 Set-Aside Program

In 1970 agricultural legislation for 1971 through 1973 was enacted. The basic change from the program existing in 1969 was the provision for land diversion—set-aside—on a voluntary basis and the end of binding restrictions on plantings. A farm with cotton and feed grains, for example, might set aside the required land and then grow only cotton or only feed grain on his remaining cropland, exceeding the base of one or the other of the crops. As a consequence planted acreage of cotton expanded in some regions, reflecting those regions' comparative advantage.

TABLE 6.—NET PRODUCER BENEFITS AND TREASURY OUTLAYS FOR THE 1971 COTTON PROGRAM, BY REGION[1]

Area[2]	Treasury outlays	Net benefits	Percent benefits were of outlays	Number of recipients	Net benefits per recipient	Regional share of net benefits
Southeast	$120,984,418	$39,505,003	32.6	77,703	$508.41	6.0
Delta	269,786,332	264,027,498	97.9	107,805	2,449.12	40.2
Southwest	296,736,033	238,760,772	80.5	98,636	2,420.62	36.4
West	130,801,509	114,562,956	87.6	10,852	10,556.85	17.4
United States	818,308,292	656,856,229	80.3	294,996	2,226.66	100.0

[1] Procedure used in deriving these data are reported in Appendix A.
[2] Southeastern States are Alabama, Florida, Georgia, North Carolina, South Carolina, and Virginia. Delta States are Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee. Southwestern States are Kansas, Oklahoma, and Texas. Western States are Arizona, California, Nevada, and New Mexico.

One provision of the cotton set-aside program operated to maintain production in high-cost areas: Full direct payments—now referred to as "set-aside" payments—amounting to 15 cents per pound based on projected yield and base acreage could be made only if 90 percent of the base acreage was planted. This powerful incentive was enough to maintain production in virtually every area. In 1969 additional payments had been made to small farmers. The 1971 program provided for a 30-percent add on to direct payments for many persons receiving this supplement in earlier years, but the qualification that cotton be the major source of income made the small-farmer provision a dead letter.

The percentage which net benefits were of direct payments developed for the 1969 analysis were applied to 1971 payments to produce the estimates of aggregate and regional net benefits appearing in table 6. The results as regards regional benefits differ some from 1969

[6] This last number was derived by applying the ratio of net to gross benefit from table 5, .81, to the USDA study's direct payments estimate of $721 million. The resulting number, $584 million program payments loss was subtracted from $610 million, program and market loss to derive the estimate of $26 million market loss. This procedure assumes that our estimates of rents and those implicit in the USDA study are the same.

because the small-farmer benefits available only in the earlier year were largely concentrated in the Southeast. With almost no change in aggregate benefits the Southeast lost about 20 percent of its benefits. In addition, the percent of direct payments that were net benefits to farmers fell because all of the 1971 benefits in high-cost regions were subject to production losses—costs exceeding market prices—while in 1969 small-farmer benefits were not subject to losses. In addition, the benefits per farmer were much greater in 1971 than in 1969. This is due almost entirely to the dropping out of about 180,000 small farmers who received benefits in 1969 but who had been dropped from the roles or chose not to produce high-cost cotton in 1971. Because cotton production was not constrained in 1971 there is no need to account for possible increase in market-oriented income in the absence of the program as was the case for the 1969 program.

IV. The Personal Distribution of Cotton Program Benefits

The aggregate distribution of benefits is of interest in arriving at an overall measure of the efficiency of a given program. But neither it nor the regional distribution produce a very precise notion of the personal distribution of program benefits. To move to an analysis of the personal distribution of benefits, it would be ideal to know the structure of factor ownership and to identify individuals so that some sort of group or class aggregation could be made. As regards cotton production, the only practical way to proceed is to assume that input ownership units are distributed in the same fashion as the 1969 operating units and to accept the published allotment size classes as an appropriate way of aggregating the population into a manageable number of groups.[7] This brings us to 180 groups of individuals in 20 States for which mean net benefits were generated for both 1969 and 1971 by the procedure described above.

1969 Program Benefits

The mean net program benefits for successive groups of recipients are found in the second column of table 7. The distribution of the net benefits is highly skewed to large allotment holders in low-cost production areas, even more so than is the distribution of gross Government payments found in column 1 of table 7. The coefficients of concentration for the groups are found in table 8 for both the net benefits and gross Government payments. Using net benefits as an example—column 2—persons within the lowest 10 percent of the population of recipients got only .03—3 percent—of the mean benefit—defined equal to $1—while those in the top 1 percent got 26 times the mean net

[7] There is some evidence that under the terms of the programs the number of "operating units" exceeds the number of persons, particularly for large allotment units. The measures of income distribution derived in this paper will show more concentration than actually exists if this is the case. The nature of the bias is difficult to assess because the total population of recipients is understated, but less so than the number of recipients in the upper payments brackets. Data available on persons rather than firms may be available in the A.S.C.S. data banks. A correction of our estimates to account for the undercounting of persons at the upper range would be to regard the persons in the top two receipts groups of tables 4 and 5 as 6 and 2 percent of the population rather than 4 (95 to 99) and 2 (highest 1) percent of the population. This treatment would not alter drastically the basic income distribution picture emerging from this study.

Costs probably vary within States and within allotment size classes so that net benefits of smaller farms are probably even less than we have estimated. This force would tend to offset the undercounting of persons at the top end of the benefits range in computing an overall income distribution statistic.

benefit. In addition, the transfers to the smallest allotment units are very costly in the sense that approximately $2.50 must be paid per $1 of benefits. This estimate is derived from the third column of table 5 which shows that slightly less than 40 percent of payments were received as net benefits by farmers. This is the case because high-cost production had to be undertaken to receive Government payments by Southeasterners who constitute this group.

TABLE 7.—MEAN PROGRAM PAYMENTS AND BENEFITS FROM THE 1969 AND 1971 COTTON PROGRAMS BY GROUPS OF RECIPIENTS, ARRANGED FROM LOWEST TO HIGHEST BENEFIT GROUPS

Groups of recipients	Gross payments, 1969 program	Net benefits, 1969 program	Net benefits, 1971 program, 1969 population	Net benefits, 1971 program, 1971 population [1]
Lowest 10 percent	$60.31	$46.44	$0.00	$85.85
10 to 20 percent	119.95	100.80	.00	157.84
20 to 30 percent	238.43	156.24	4.55	242.38
30 to 40 percent	352.61	202.15	47.88	395.71
40 to 50 percent	443.69	290.88	189.40	545.07
50 to 60 percent	572.80	476.20	187.65	859.33
60 to 70 percent	810.96	597.83	535.95	1,374.34
70 to 80 percent	1,289.40	1,048.43	1,009.83	1,864.90
80 to 90 percent	2,603.21	1,967.26	1,967.26	3,330.65
90 to 95 percent	5,085.62	4,137.98	4,137.98	6,557.08
95 to 99 percent	10,566.34	9,654.92	9,654.92	[3] 13,985.99
Highest 1 percent	40,575.89	36,650.81	36,650.81	50,824.46

[1] Computations based on net benefit factors from table 2 and official statistics on direct payments.
[2] Because 23.8 percent received no payments under our assumptions, this rate applies to the group between approximately 24 and 30 percent of the population.
[3] Reinterpretation of the data to account for a greater number of "persons" than "operating units" in the official statistics on payments would be on the order of reducing the benefit entries ⅛ and ½ respectively in the next to highest and highest categories of income recipients. Such a reinterpretation of the data would err on the side of an egalitarian distribution rather than on the side of concentrated benefits.

TABLE 8.—RATE OF PAYMENTS AND BENEFITS FROM THE 1969 AND 1971 COTTON PROGRAMS RECEIVED BY GROUPS OF RECIPIENTS, ARRANGED FROM LOWEST TO HIGHEST BENEFIT GROUPS, WHERE A VALUE OF 1.0 REPRESENTS AVERAGE BENEFITS [1]

Groups of recipients	Gross payments, 1969 program	Net benefits, 1969 program	Net benefits, 1971 program, 1969 population	Net benefits 1971 program, 1971 population
Lowest 10 percent	0.03	0.03	0.00	0.04
10 to 20 percent	.07	.07	.00	.07
20 to 30 percent	.14	.11	[2] .00	.11
30 to 40 percent	.20	.14	.04	.18
40 to 50 percent	.26	.21	.14	.24
50 to 60 percent	.33	.34	.14	.39
60 to 70 percent	.47	.43	.41	.62
70 to 80 percent	.75	.75	.77	.84
80 to 90 percent	1.51	1.41	1.50	1.50
90 to 95 percent	2.94	2.96	3.17	2.94
95 to 99 percent	6.12	6.90	7.28	[3] 6.28
Highest 1 percent	23.49	26.21	28.03	22.82

[1] Computations based on net benefit factors from table 2 and official statistics on direct payments.
[2] This number is positive but closer to 0.00 than to 0.01.
[3] Reinterpretation of the data to account for a greater number of "persons" than "operating units" in the official statistics on payments would be on the order of reducing the benefit entries ⅛ and ½ respectively in the next to highest and highest categories of income recipients. Such a reinterpretation of the data would err on the side of an egalitarian distribution rather than on the side of concentrated benefits.

1971 Program Benefits

Constructing the personal distribution of net benefits for 1971 in a manner which allows direct comparisons to 1969 is complicated by the fact that over 180,000 small farmers with 1969 allotments either lost their base or chose not to plant it in 1971. A relatively arbitrary

procedure was used to approximate 1971 payments for the 1969 population of cotton program beneficiaries. All of the allotment units with less than 5½ acres of those between 5 and 10 acres were assumed to have dropped out of the program by 1971. This assumption in effect reduced the 1969 population to about the observed 1971 level. The aggregate direct payments of this group in 1969 were about equal to the set-aside payments of 1971. This procedure also excludes 1969 small-farmer payments which had been eliminated by 1971. The distributions in column 3 of tables 7 and 8 were derived using these assumptions and the procedure discussed for the 1969 program computations. Using this procedure to maintain comparable populations, the benefits are much more concentrated in 1971 than in 1969. This is a contrast not evident in the 1969 and 1971 official statistics. The problem of maintaining a constant population over time is common to all income analyses in which exit, entry and reorganization are going on continuously.

The personal distribution of the benefits of the 1971 cotton program for the 1971 population of beneficiaries appears in column 4 of tables 7 and 8. Payment rates were raised some but the main change was the reduction in numbers of beneficiaries. The 1971 distribution is somewhat more equal than for the 1969 program but the benefits are still highly skewed. Distributionally, the elimination of many small units from the population of recipients was offset some by the elimination of the special supplementary payment to small farmers. The cost of transferring income to the smallest farmers was high because high-cost production had to be undertaken to obtain any of the direct payments. The apparent reduction in concentration on the upper end of the scale is discussed below.

1971 Direct Payment Limitations

A major innovation in Federal farm programs which was introduced in 1971 was the limitation of Treasury payments to $55,000 per farm per supported crop. The limitation was advocated primarily as a means of decreasing the concentration of program benefits. However, its effect on distribution in 1971 was negligible. Approximately five-sixths of the firms that received more than $55,000 in 1970 reorganized their operations by 1971 to avoid or reduce the impact of the $55,000 limit.[8] Some 413 firms lost a total of $1.3 million or about $3,150 each by failing to avoid the limitation. That is a small amount relative to the $55,000 they did receive. Reorganization of firms allowed the payment of an estimated $40.6 million of Treasury payments which would have been blocked under the rules and 1970 firm sizes.

One could argue that the reorganization of firms led to a redistribution of benefits. There are two counts on which this argument can be largely rejected. First, sale of land or the cash lease of cotton-base land essentially changed the name of the recipient of the Treasury check but the value of net benefits to the pre-1971 owner were unaltered. The asset-input market acted to transfer a major share of the benefits; only to the extent that the sales or rental market was affected adversely did the Treasury benefits get redistributed.

[8] U.S. Senate, 92d Congress, second sess., Farm Payment Limitations, Committee Print, March 16, 1972, Committee on Agriculture and Forestry, GPO, prepared by the USDA.

The second reason the $55,000 limit didn't significantly affect distribution is related to firm size that probably resulted from reorganization. Assume that the 1,000 or so farm reorganizations which kept the Treasury from "saving" $40.6 million each created two new firms. On the average the 2,000 new firms would receive $20,300 in Treasury payments. Increasing the number of large recipients while reducing benefits of 1,000 of the biggest firms would not noticeably alter the basic pattern of program benefits. A more careful analysis of the size distribution of firms would require more data than are available in published statistics.

IV. Summary of the Past and a Look Ahead

(1) In the aggregate the cotton programs of the late 1960's and early 1970's have been inefficient income transfer mechanisms. By making production a condition for receiving Treasury payments, high-cost production has been encouraged. Our estimate is that about 20 percent of Treasury outlays were not received as benefits by cotton producers nationally in recent years. In the Southeast less than half the outlays were received as producer benefits.

(2) The net benefits of past programs by areas reflect both the concentration of small allotments and relatively high costs of production. The relative share of benefits received by producers in the Southeast declined between 1969 and 1971.

(3) The cotton program provisions have generally retarded the geographic shift in the location of cotton production. The set-aside program has allowed for expansion in low-cost areas since 1971 but not for desirable contraction in high-cost areas.

(4) The personal distribution of cotton program benefits has been even more concentrated than both direct payments and production in the past several years. This is a consequence of the pattern of production costs and of program provisions.

(5) Between 1969 and 1971 there was a considerable shift toward greater concentration of benefits if one uses the 1969 population of recipients as the basis for analysis. Because the population of recipients was sharply altered in 1971 the greater concentration is not readily observable in the published summaries of the program.

(6) Payment limitations, instituted in 1971, had little impact on the overall pattern of the distribution of benefits. This is the case even though some recipients experienced a reduction in their benefits. To a considerable extent farm reorganization and the workings of the rental (land input) market reduced the effectiveness of payment limitations.

(7) If payment limitations were to be put at $20,000 or some lower level per crop per year, the net benefits would be altered some but not nearly to the extent of the apparent shift in Treasury payments. New, risk-bearing, cash-rental, farm-operating units could be organized to legally circumvent the limitations provisions for a large number of the affected firms.

(8) If direct payments per pound are reduced sharply, base owners will realize capital losses. They may or may not have been the persons who realized the earlier capital gains associated with the cotton programs. Policy toward both income flows and capital values is at base a political problem outside the realm of economic science. However,

economists are equipped to predict the probable capital losses associated with each specific policy proposal.

(9) Any proposal to reduce direct payments will be challenged on the grounds that producers need the payments to maintain output and that U.S. mills need the product. Two points need to be made with respect to this argument. First, overplanting without direct payments is already occurring in a number of important cotton States indicating they can cover costs at market prices. Disappearance of direct payments would cause capital losses and some bankruptcies. Reorganized firms would, however, shortly enter production and cover their costs as current overplanting indicates. As noted above some reduction in output in high-cost areas would occur. This brings us to the second part of the argument: U.S. mills need cotton. There are no special reasons why U.S. farmers should be bribed into inefficient production of cotton. Market forces, including foreign production and consumption, if left free to operate will determine the optimum quantity and location of cotton production.

(10) Each of the analyses presented in this paper are related to the distribution of cotton program benefits. Analysis of the impact of the cotton programs on the incomes of cotton producers, all income sources included, would be more interesting. Such a study would require estimates of all other sources of farm income as well as the increasingly important nonfarm incomes of farm families. In addition, a balanced evaluation of the cotton programs would require an analysis of the distribution of program costs (taxpayers and consumers) as well as benefits (producers). Given the very partial measure used here, the cotton programs come off as inefficient regarding their impact on total resource use and with benefits highly skewed to a relatively small number of large firms despite the introduction of payment limitations.

INCOME DISTRIBUTION EFFECTS OF THE MAJOR FEDERAL AGRICULTURAL COMMODITY PROGRAMS IN 1966

By DALE M. HOOVER *and* BRUCE L. GARDNER*

The activities of the U.S. Government in agricultural commodity and input markets over the past several decades have been directed at increasing farm prices, and hence, average farm income. But, since the rationale for these activities has been to solve a low income problem, the question naturally arises as to the distributional as well as the aggregate effects upon the farm population. The present research is an attempt to answer this question.

The distributional question we will ask is: How would the inequality of the size distribution of net farm income have differed if the major agricultural commodity programs had not existed in 1966? We direct our attention to the impact of the Federal commodity and input programs on the income of farmers from farming, assuming no change in the farm population or in the technical conditions of production, but assuming that the short-run problems of moving away from programs had been solved. We chose this procedure because the distributional aspects of the transitory problems of adjustment are of less importance than the continuing ones. Longer-run analyses involving possible migration and farm reorganization are of considerable interest and importance but they are beyond the scope of this study.

The changes in the distribution of farm income within each State which would have occurred if the programs had not been in effect in 1966 are analyzed and reported. An analysis encompassing all sources of income, farm as well as nonfarm, would be desirable but lies beyond the capabilities of the present work. We do not address the question of the distribution of the costs of the farm program among taxpayers and consumers. The impact of the programs on resource efficiency is not considered, either, although it is clear that the total costs of the programs exceed the total benefits received by farmers.

This report consists of five main sections. First, we set forth a general framework for analyzing the impact of Government programs on farm incomes, noting briefly the alternative approaches. Second, we discuss the income distribution measure we use. Third, we estimate the impact the programs have had on farm product prices and on allotment and quota values. Fourth, the distribution of farm income in the absence of the programs is developed. The final section consists of an evaluation of our results and the implications of probable farm program changes.

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I. The Problems and Alternatives in Analyzing the Impact of the Farm Programs

The Federal commodity and input programs have had a thoroughgoing impact on the agricultural sector. Many product prices and quantities have been directly affected by price support and supply-reducing activities, with secondary effects spilling over onto most substitute crops and products. Both directly and indirectly, input prices, particularly land, have been affected by the programs. A literature too extensive to detail here has been developed around one or more aspects of the programs. In some of the studies, interesting and useful income distribution implications have been identified. Generally, however, the conclusions of these studies cannot be extended with safety or accuracy beyond their original focus to encompass the sum of the distributional impacts of Federal programs. The major types of program analyses have been:

(1) The value added to artificially scarce resources: real estate, allotments, quotas. To be sure, a considerable portion of income added to an industry through restrained output shows up in the value of some input made scarce by diversion or allotment rules. However, under some conditions, the value of other inputs will benefit from increased gross receipts in the sector. In addition, allotment values reflect differences in cost conditions among alternative parcels of land, whereas the interesting contrast should be between all parcels with and without the programs.

(2) Models of the functional distribution of gross receipts. With the acceptance of a small number of assumptions concerning the manner in which factors share in gross income, and an estimate of the effect of Government programs on gross income, the income implications of the programs can be derived. However, historically these studies have failed to account for the fact that there are some Government payments which are more related to one factor than another for which special allowance must be made. Even with revised factor income estimates at hand, knowledge of the personal income distribution remains unknown until factor ownership is determined.

(3) Analysis of Government payments. Because Treasury payments have been sizable in recent years and because these are so visible, it has been tempting to examine the size distribution of those payments. This approach fails to account for additional market income which is sometimes generated by the supply restraint side of the programs. There are times when farm production costs exceed market prices so that net farmer benefits are less than Treasury payments. Usually, not more than one crop can be analyzed at a time, even though a number of crops on a given farm are affected simultaneously.

(4) Regional and aggregate analysis of product supply and demand. The generation of area, State, regional, and aggregate U.S. supply curves through the use of linear programing has made it possible to estimate the interaction between crops and competing areas under various assumptions. Coupled with demand elasticity assumptions, aggregate area estimates of gross receipts and net receipts can be generated. The results of the programing analysis then become the basis for approximating the changes in the size distribution of net

income for firms. Since there is little correspondence between the firm sizes used in the programing model and those existing in the sector, use must be made of some previously existing size classes to complete the analysis. Frequently, gross sales classes (0–$2,500, $2,500–$5,000, $5,000–$10,000, etc.) are used along with some assumption of average cost differences among firm sizes to distribute the change in income among the operating firms.

This same kind of device is used frequently for distributing Government payments over allotment size classes. In all its forms it has a serious flaw: the range of net incomes or benefits of the population is not bounded by the range of the sizes in the allotment or annual income classes. Measures of income variation based on the distribution of size classes would be understatements, while the impact of the proposed change in policy could be underestimated or overestimated.[1]

There is an additional problem in using groups of farms classed on the basis of annual income. Annual income itself has important drawbacks for income analysis because there are important variations in income arising from transitory forces. Good or bad weather, unusual pest problems, variations in farming scale due to health or alternative uses of labor are a few of the possible forces. In addition, if the classificatory variable is net income, tax provisions for losses and depreciation can cause deviations which are not closely related to permanent income or welfare.

II. Income Variance Measures as a Procedure for Analyzing Federal Programs

The distribution of income at a specific point in time is a function of the distribution of the ownership of factors and the rates of remuneration of those inputs. With the elimination of the programs, agricultural output, product prices, and the rates of remuneration for inputs would change, yielding a new distribution of income. Our basic procedure is to estimate the returns to classes of inputs in the presence of the programs. Next, we estimate the product market and net income consequences of ending the major programs, again dividing income among inputs. These data are necessary ingredients for a measure of the change in income distribution. The present task is to specify a measure of income distribution built on input ownership distribution data. Among the many possible measures of income distribution, we have chosen a single-statistic measure: the variance of the logarithm of income.

The generation of the single-statistic measure of the distribution of income is somewhat complicated. Consequently, the technical exposition has been relegated to the appendix. The basic notions, however, are not complex. Suppose all individuals in an area receive the same income. There is no variation from person to person and the "index" or single-statistic measure of income variation (variance) would be zero. If some individuals have incomes above average and some below, then the variance would be computed as some positive number. Variance is computed by squaring the deviation from the

[1] Data of "The Farm Income Situation" (July 1966) yield a log variance of net income by "economic" class of .44. Population census data for both 1950 and 1960 yield a log variance of the size distribution of total income (including that earned off farms) of over 1.0 (for both "rural-farm residents" and "farm operators"). Assuming that net income from farming is at least as unequally distributed as the total income of farmers ,it follows that at least half of the variance of income takes place within sales classes.

mean; so it is always a positive number. This number would grow if the distance from the average for each deviation increases.

The variance of a distribution is a function of the absolute size of the numbers. In comparing states to one another, it would be desirable to use a measure that reflects the relative magnitude of the variation. The variance of the logarithms is such a number. Under the assumption of an approximately normal distribution of the logarithms of the size distribution of income, there is a one-to-one correspondence between the logarithmic standard deviation and the Gini ratio, which is frequently used to represent income distributions.[2] For this reason, we use the variance of the logarithm or its square root, the standard deviation of the logarithms, throughout this paper.

Because each farmer owns more than one input, the variances of ownership of the various inputs must be combined to derive an overall variance of income. In the log-normal model, the logarithmic variance of each factor and covariance between each pair of factors, weighted by the square of its share in income, may be summed to obtain the log variance of total factor income. This step in the process requires data on the covariance of the pairs of factors. However, the calculations are not difficult to make. We consider two basic factors, land and other factors,[3] though the method of variance calculation can be expanded to account for various kinds of land (cropland, allotment, "other") as well as for several kinds of factors where data are available.

Throughout the analysis we will use income estimates which might be said to represent "permanent" income, taken to mean income free of transitory components for that year. This concept is useful to us for several reasons. The first is that, for some classes of land, we will need to use real estate values to work back to rents, which by the capitalization procedure can be taken as "permanent." Second, "permanent" income for labor can be estimated which is freer of transitory elements by taking the residual between net farm income and "permanent" land income. Third, the estimates for the 1966 situation without farm programs are necessarily made as if they were free of transitory elements. For meaningful comparisons 1966 income with the program should exclude transitory incomes. The exact procedures used in estimating permanent income are described in the next two sections.

Once permanent income is estimated for 1966 with and without programs, the log variance for each will be estimated. Change in the variance measure will be attributed to the programs. In principle, the change can be either positive or negative. There would generally be a decline in variance if an input whose ownership is concentrated were to have a decline in income relative to an evenly owned input. The reverse would occur if the relative income of the input whose ownership is concentrated rose.

[2] J. Aitchison and J. A. C. Brown, *The Lognormal Distribution*, Cambridge, at the University Press, 1957.

[3] The use of an additional factor class is considered in an extended version of this paper (forthcoming). Some differences occur from State to State but the overall level of the log variance was not much different than the evidence presented later in this paper. Throughout this paper, "land" is used to refer to real estate since building and land ownership distributions are not reported separately. Also, the second input class, "other inputs," is virtually "labor" as utilized here.

In the present case, if the farm commodity programs were abandoned, net farm income would decline. The log variance would decline if high incomes fall more than low incomes. This is the focus of our work. It would be desirable to know how many families' incomes would fall below some predetermined level designated as poverty, but our method does not allow us to make estimates of this sort.

III. Consequences in Farm Product Markets if the Federal Commodity Programs Had Not Been in Force in 1966

Our analysis is based on the ending of the following programs: peanut allotments, rice allotments, cotton allotments, burley tobacco allotments, Flue-cured tobacco quotas, voluntary feed grain diversion, voluntary wheat diversion, the Conservation Reserve of the Soil Bank, and the cropland adjustment program. Programs assumed to continue are: sugar, wool, classified milk pricing, ASCS Agricultural Conservation Payments, and, marketing orders for fruits and vegetables.

The neglect of these minor programs would problably not greatly alter estimates which follow. Other governmental activities which affect agricultural markets, such as special tax provisions (accelerated depreciation and expensing of farm ponds, irrigation facilities and other land improvements, capital gains taxation of certain returns) and restrictions on international trade of agricultural products, are assumed to continue.

In estimating free market prices and quantities, we first estimate the effect of the end of the crop quota and allotment programs on prices and quantities of the affected crops under the assumption that the feed grain, wheat and other voluntary diversion programs were maintained. Second, we estimate the change in revenue occurring with the end of the voluntary programs. Here we must consider not only wheat and feed grains, but also all crops which can be readily substituted in production with wheat and feed grains.

Allotment Programs

An allotment restriction raises market prices above equilibrium levels and gives rise to observed allotment rental values in these instances in which the allotment is allowed to be exchanged free of the associated land. Simultaneously, revenue is increased if the product is essential to its purchasers. The impact of an allotment on factor income is discussed with regard to each major allotment crop.

Peanuts.—With the end of the allotment program, the price of peanuts would fall to the level of world prices. Peanut acreage might expand or contract depending on the returns to production of the closest substitute. At world prices and acreage unchanged, peanut revenues might fall to 50 percent the current level of gross receipts. The estimate is compatible with 1966 returns from soybeans, the best

substitute crop, as well as with the observed rental rate for peanut allotment in the Virginia-North Carolina production belt. By implication, the supply of U.S. peanuts would be greatly reduced if domestic prices were to fall to the world price level. We estimate the value of peanut allotment to be roughly 2 cents per pound.

Rice.—With the end of the allotment program, acreage and output would expand with the reduction in the acreage of some other crops. Changes in gross receipts from rice and the crop it partially displaces would probably be small and perhaps zero if the allotment program were to end. Consequently, no adjustments in farm receipts were projected from the end of this allotment crop. Even so the annual returns to allotment were estimated to be 1.25 cents per pound, or roughly $50 per acre assuming a yield of 40 cwt./acre.

Burley Tobacco.—The price of each of the major types would fall about the same amount, an estimated 16 cents from the 1966 levels. Little substitution in usage would occur among major types with burley and Flue-cured both about $.51 a pound. As output expanded 18 percent, allotment values would go to zero and total gross receipts for burley would fall 11 percent. The distribution of the change in income over various inputs is discussed later.

Quota: Flue-Cured Tobacco

In many ways, quota and allotment programs act in the same manner. They both reduce output below free market levels and therefore raise the price of the product. At this point, however, differences arise: an allotment program increases the use of all inputs except land. On the margin, the cost of an extra unit of output per acre is equal to the price of the product. By contrast, in a quota program, cost per unit is minimized with factors combined freely. The difference between cost and price is the value of the unit of quota which if a quota market exists is observed for the marginal unit of quota exchanged. The ownership of quota is identical to the ownership of land, and a loss of quota value is a loss of income to the landowner. Thus, with the end of the quota program, landowners would lose as quota owners. In addition, the income of factors would change in response to changes in production-oriented revenues, where production-oriented revenue is gross receipts less quota rent under the program and equal to total gross receipts in the absence of the quota program. Using an average value of quota of 16 cents per pound and an 11 percent decline in gross receipts, the following aggregate U.S. results were obtained:

(1) Land-income losses due to a fall in quota value: $191.1 million.

(2) Decline in gross receipts: $83.5 million.

(3) Gain in market-oriented returns of all factors (because (1) exceeds (2)), land included: $107.6 million.

Cotton: The Allotment Crop With Directed-Payment Features

For several reasons, cotton cannot be treated as an allotment crop. While it is true that allotments existed in 1966 and may have limited production somewhat in a few areas, there are areas in which cotton allotment has been underplanted in most years over the past decade. Further, in the absence of direct Treasury payments based on projected yields, underplanting probably would have been much larger. The features of the cotton program lead to the following results.[4]

a. In high-cost areas, the market price plus the direct (price-support) payments jointly with costs determine allotment values. Allotment rents ran much below direct payments in all but the westernmost States in 1966. Data from the cotton cost survey led us to conclude that allotment rents were about 4 cents per pound in all States east of New Mexico, except for Georgia and Carolinas where 3 cents per pound was used as the estimate of allotment rent. These rents would fall to zero in the absence of the program.

b. In the westernmost States we estimate that planted acreage would have been about constant in the absence of the allotment program. Under such a circumstance, the 1966 allotment program was essentially void. Price support payments, limited to projected yield and base acreage, were allocatable wholly to land and did not affect market-oriented income and the returns to labor and capital.

c. We assume that supply adjustment in the United States would be small relative to world production, so that the prevailing world price would continue to exist in the free market situation.

The set of assumptions reviewed above leads to three results: (i) The Southeastern States would find their gross receipts from cotton reduced approximately 8 percent with the end of the direct payments program. The way in which this loss would be shared among resources depends upon the elasticity of substitution among the factors of production. (ii) Similarly, the South Central States would lose 13 percent of their gross receipts from cotton. (iii) The loss in the Southwestern States would be somewhat larger, approximately 28 percent but all of the loss would be borne by landowners.

Voluntary Land Diversion Programs

Cropland idled under the various voluntary land diversion programs has ranged from 40 to 60 million acres over the past decade. Some of the programs (e.g., conservation reserve of the soil bank, the cropland adjustment program, and the Cropland conversion program) have provided for the reduction of one or more crops for a several-year

[4] An analysis of the 1969 and 1971 cotton program which shared some but not all of the features of the 1966 program appears in a companion article in this volume. The cotton cost survey referred to below was conducted by the USDA.

period. The wheat and feed grain programs have provided the opportunity for year-by-year diversion for specific crops, each crop contract negotiated separately. Nevertheless, since there is considerable substitution among crops in production, the aggregate effect of the programs needs to be assessed. We reasoned that many field crops are close substitutes in production so that a decline in the price of one would be matched by a similar price decline in all of its production substitutes. Thus, a projection to a free market situation was generated by specifying a list of reasonably close substitutes and assuming that the equilibrium returns to and price of all land use in the production of these crops would be affected in the same way by a cessation of the voluntary programs.

The increase in cropland use was estimated at 15 percent, an increase of 45 million acres over the approximately 300 million acres harvested in 1966. The decline in rent per acre was estimated conservatively at 10 percent. To derive this estimate it was necessary to estimate the elasticity of demand for land. This task was completed by using Allen's formulation [5] and assumptions concerning the elasticity of demand for agricultural output and an elasticity of substitution of land for nonland factors in agricultural production. Essentially land use expanded, the quantity of purchased goods decreased, output expanded somewhat with a decline in product prices.

Summary of Farm Product Market Changes

Our analysis of farm product markets in the absence of the commodity programs has yielded two kinds of information. First, we have an estimate of the change that would occur in land's income directly. These are shown by State in table 1. Second, we have estimates of revenue changes from various crops. In what follows immediately, we use only the first data.

[5] The elasticity of the demand for land was estimated using Allen's formula (R. G. D. Allen, *Mathematical Analysis for Economists*, p. 343, Macmillan, London, 1938): $E = s_L\eta - (1-s_L)\sigma$, where E is the elasticity of factor demand with respect to factor price, in this case the flow of land returns, s_L is the relative share of land in gross receipts, η is the own-price elasticity of demand for crops, and σ is the elasticity of substitution between land and all other inputs in crop production. Land's share in net income has been estimated to be 0.39. Purchased inputs are of great importance in gross receipts, ranging up to 70 percent in recent years. At this rate, land's share in gross income would be only 0.09. Allen's framework fits in well with our approach; he assumes given prices of other factors just as we do, and σ and s_L are determined by what we have already done. The Cobb-Douglas assumption gives us $\sigma=1$ and s_L has been estimated above. The only additional information we need, then, is an estimate of η. For this parameter we take $-.25$ as a "concensus" value for the U.S. The preceding approach yields an estimate of $.09(-.25) - .91(1) = -.93$ as the elasticity of demand for land. This procedure produces an estimate of a decline in rent of 16 percent. With an elasticity of substitution less than one this number would be smaller. This decline was adjusted downward to a 10 percent change in value to reflect the lower value-rent ratio that owners apparently use in handling the relatively transitory elements in this rate of income. For empirical evidence on this point see Johnson, S. R. and Haigh, Peter A. "Agricultural Land Price Differentials and their Relationship to Potentially Modifiable Aspects of the Climate," *Review of Economics and Statistics* 52 (May, 1970); 173-180.

TABLE 1.—RETURNS TO LAND AND ALLOTMENT OWNERS FROM U.S. FARM COMMODITY PROGRAMS, 1966

[In millions of dollars]

Region and State	Direct payments	Estimated rental value of allotments for—			
		Cotton	Tobacco	Peanuts	Rice
	(1)	(2)	(3)	(4)	(5)
North Atlantic:					
Maine	0.9				
New Hampshire	.1				
Vermont	.4				
Massachusetts	.1				
Connecticut	.4				
New York	17.2				
New Jersey	4.1				
Pennsylvania	17.3				
East North Central:					
Ohio	72.4				
Indiana	86.0				
Illinois	111.8				
Michigan	54.3				
Wisconsin	47.6				
West North Central:					
Minnesota	125.4				
Iowa	198.5				
Missouri	107.7	3.1			
North Dakota	130.1				
South Dakota	71.4				
Nebraska	164.3				
Kansas	215.1				
South Atlantic:					
Delaware	1.6				
Maryland	4.6				
Virginia	11.9		18.7	5.0	
West Virginia	2.0				
North Carolina	36.0	1.3	124.4	8.1	
South Carolina	21.3	.4	20.3		
Georgia	38.8	.4	15.7	16.2	
Florida	8.3		4.3		
South Central:					
Kentucky	35.8		60.0		
Tennessee	28.4	7.0	15.7		
Alabama	25.7	8.0		4.4	
Mississippi	16.3	25.9			
Arkansas	7.0	14.0			26.8
Louisiana	5.6	8.5			27.5
Oklahoma	76.5	3.4		4.0	
Texas	177.8	61.0			7.8
Western:					
Montana	55.8				
Idaho	26.5				
Wyoming	4.5				
Colorado	49.0				
New Mexico	32.9				
Arizona	41.6				
Utah	5.7				
Nevada	.6				
Washington	18.0				
Oregon	43.5				
California	83.5				
Total, United States	2,284.3	133.0	259.1	37.7	62.1

The second set of data is used below when we consider the change in the variance of land ownership induced by changes in the relative prices of different kinds of land. Most of the specific assumptions and estimates of parameter values that we made will influence only the second data set.

IV. Estimates of the Variance of Farm Income in the Absence of Commodity Programs

In this section we utilize the product-market effects just estimated, particularly the data of table 1, to estimate the distributional consequences of eliminating commodity programs. We consider, first, the implications for land's share; then, through the use of the variance equations, the effects on the log variance of farm income. We also estimate the consequences, which turn out to be minor, of changes in the relative rents of different kinds of land that would be induced by an end to farm programs.

Changes in Land's Share

The transition from an analysis of product markets to factor markets is simplest if the income shares are constant (an agricultural production function of the Cobb-Douglas form). Even under this simplifying assumption, however, land's share within a State is affected by receipts accruing in forms other than market returns; namely by the rental value of allotments and quotas created by the programs, and by the voluntary diversion payments made by the Government to farmers.[6]

[6] In 1966 direct payments were also made for the Soil Bank, the cropland adjustment program, the feed grain program, and the wheat program. In the latter two, payments commonly called price-support payments were made which were not nominally made for diversion. In fact they were made only if a portion of the base was diverted and their amount was unaffected by current yield. The use of a "normal" or "projected" yield concept to determine payment rate per acre means nonland factor use and yield per acre were unaffected. For this reason the price-support payments were added to the diversion payments in estimating the returns to landowners from the wheat and feed grain programs. It should also be noted that in some instances the diversion payments were limited to a portion of the "base" acreage but the rate of payment was in excess of the opportunity cost of using the land in production. This portion of the direct payments may be regarded as direct income supplementation; but as with the land-rental portion of the payments only the owners of land are benefited.

Calculation of Land's Share

Consider what the elimination of government programs would have done to the U.S. aggregate share of land in net farm income as of 1966. As a preliminary step we must calculate what land's share (land income/net farm income) actually was in 1966. Our first problem is how to measure land income, which is not separately estimated in any USDA or census data. Use of the variance equations requires data on each factor's income as its quantity times its price or rental rate. For land this would be acres times annual rent per acre. But rents vary so greatly by quality and use made of the land, and the existing data are so sketchy, that this approach is not feasible.

The most reliable data available pertain to the value of farm real estate. To convert this stock to a flow of land income we multiply value by the appropriate rate of return. Since we want to leave out of account transitory returns, this should be an equilibrium rate of return, yielding an estimate of permanent income from land. We will take the interest rate on farm real estate debt as the best market data pertaining to this equilibrium rate of return.

Several more steps are required to get to an estimate for the population of interest, farm operators. The steps include:

(*a*) Subtraction of the value of land debt.

(*b*) Adjustment of the rental flow to account for nonfarm ownership of some land.

(*c*) Addition of the capital gains portion of ownership returns to total farm income since it is already included in land's income

(*d*) Upward adjustment in the discount rate to account for the portion of income coming from relatively uncertain sources such as allotments and direct payments.

(*e*) Estimation of equilibrium net income for nonland factors so that land's share would be based on a consistent measure of income. For labor returns, operator and family labor were multiplied by a wage rate adjusted for the schooling of farm operators. For other resources, estimates of the value of machinery and the value of crop, livestock, and other resource inventories on farms were multiplied by .08, a shorter-term interest rate, to get an equilibrium flow of net returns from these resources.[7]

The resulting share of land in farmer's income is 0.32.

Arriving at a share of income in the absence of programs requires the elimination of direct payments attributable wholly to land from both the land and total farm income accounts. The relevance data appear in column 1 of table 1. These changes bring land's share to .25 in the absence of the programs.

Similar before-and-after calculations for 47 States (Rhode Island excluded) are presented in table 2. The procedures used were the same as discussed above. The effect of the programs on land's share varied quite widely, with almost no impact on North Atlantic States.

[7] The procedures are spelled out in greater detail in our extended version. Basic data are drawn primarily from Bruce Gardner, *An Analysis of U.S. Farm Family Income Inequality, 1950–60*, unpublished dissertation, Chicago, 1968.

TABLE 2.—ESTIMATES OF LAND'S RELATIVE SHARE IN NET FARM INCOME IN 1966 AND THE LOG VARIANCE OF INCOME IN THE PRESENCE AND ABSENCE OF THE COMMODITY PROGRAMS

Region and state	Permanent income share		Standard deviation of the logarithm of farm income	
	Programs present	Programs absent	Programs present	Programs absent[1]
	(1)	(2)	(3)	(4)
North Atlantic:				
Maine	0.234	0.222	0.655	0.655
New Hampshire	.211	.207	.593	.593
Vermont	.209	.204	.621	.620
Massachusetts	.263	.262	.719	.717
Connecticut	.302	.299	.773	.769
New York	.259	.230	.653	.647
New Jersey	.369	.346	.871	.846
Pennsylvania	.244	.220	.678	.670
East North Central:				
Ohio	.399	.339	.850	.798
Indiana	.421	.353	.898	.835
Illinois	.442	.396	1.046	.977
Michigan	.326	.257	.733	.720
Wisconsin	.185	.143	.648	.649
West North Central:				
Minnesota	.266	.182	.752	.732
Idaho	.319	.238	.884	.829
Missouri	.376	.282	.848	.818
North Dakota	.347	.180	.843	.766
South Dakota	.294	.207	.835	.784
Nebraska	.342	.225	.897	.810
Kansas	.431	.285	.910	.831
South Atlantic:				
Delaware	.386	.357	.917	.880
Maryland	.398	.383	1.017	.993
Virginia	.390	.325	.876	.832
West Virginia	.275	.259	.602	.600
North Carolina	.465	.288	.996	.860
South Carolina	.477	.348	1.020	.937
Georgia	.495	.349	.989	.866
Florida	.710	.699	1.276	1.258
South Central:				
Kentucky	.428	.303	.787	.713
Tennessee	.471	.389	.823	.753
Alabama	.430	.343	.900	.864
Mississippi	.460	.393	.990	.957
Arkansas	.467	.432	.900	.860
Louisiana	.504	.473	1.022	.994
Oklahoma	.504	.473	.948	.848
Texas	.595	.527	1.142	1.048
Western:				
Montana	.485	.394	.861	.769
Idaho	.394	.334	.754	.697
Wyoming	.422	.401	.945	.914
Colorado	.431	.348	.813	.735
New Mexico	.622	.533	1.205	1.093
Arizona	.651	.568	1.479	1.338
Utah	.428	.399	.703	.679
Nevada	.449	.441	1.158	1.144
Washington	.427	.358	.771	.726
Oregon	.414	.377	.745	.718
California	.669	.649	1.022	.996
Total, United States	.321	.253	.869	.829

[1] Differences from column (3) arise because of changes in land's share with the end of the programs.

The Size Distribution of Factor Ownership

Given a change in land's share, the results for the log variance of the size distribution of farm income can be calculated from the basic equations found in the appendix. To evaluate these expressions we need information on the log variance of land ownership, of other owned inputs, and the covariance between them.

The only available information pertaining to the size distribution of land ownership by States is that of the 1964 Census of Agriculture. The census contains a size distribution of the value of land and buildings for "commercial farms" of three tenure groups: full owners, part owners, and tenants. For full owners, this gives us directly a size distribution of land ownership. But for part-owners and tenants,

much of the land operated is not owned by the farm operator. Thus it is necessary to convert the figures on value of land on farms to the value actually owned by operators. The methods and data used to derive a size distribution of land ownership are spelled out in the more extensive version of this paper referred to earlier.

For the size distribution of ownership of resources other than land the data available are more limited. The main non-land resource, and the only one for which size distribution estimates can be made, is labor. Of course, since every farm operator is exactly one, the variance of labor ownership in a very crude sense is zero. But farm operators vary in the time they devote to farmwork, their schooling, their age and experience, and the amount of work supplied by other family members. Thus the variance of all earnings from human capital may be considerable. The task of estimating this variance was undertaken in Gardner's earlier work.[8] We use the results from that study to generate a variance of permanent returns. State estimates of the covariance between land ownership and human capital were also taken from this source. The basic data for the covariance estimates come from punched cards of individual observations of the 1960 matched sample of the censuses of population and agriculture.[9]

Using these data, and the estimates of land's share with and without Government programs, we can calculate variances with and without programs to get the estimated impact of the farm programs. The results are shown in the last two columns of table 2. Eliminating the farm programs generally reduces income inequality, basically because land's share is reduced and land ownership is more unequally distributed than are the returns from human capital. The greatest changes occurred in states which had large amounts of direct payments and high log variance of land ownership relative to labor ownership.

Relative Land Price Changes and the Variance of Land Ownership

We have yet to consider the possibly important consequences of the elimination of farm programs arising from changes in the relative rents of various kinds of land, particularly allotment cropland. For example, the elimination of the tobacco program would reduce the relative rent of land presently in tobacco. If this land is owned predominantly by poorer-than-average farmers, the result will be an increase in the variance of land returns and hence farm income. Formally accounting for specific classes of land parallels the handling of land and labor as outlined in the appendix.

The specific kinds of cropland whose rents relative to other kinds of cropland we expect to fall are the allotment crops: Cotton, peanuts, rice, and tobacco. Our method of estimating the decline in the rent per acre of these kinds of land required the estimation of rent for all classes of land with the programs. From scattered observation on allotment and quota rental rates and estimates of rent-value ratios on all classes of land reported in the previous section, rental values were derived for cropland and special classes of land in each State—

[8] *Ibid.*, p. 38.

[9] The data on the variance of non-land farm resources owned by farm operators were too poor, when they existed at all, to be of any use. However, we do not believe our exclusion of these resources has affected our results appreciably.

table 3. First the changes in rent with the end of the allotments and quotas were estimated. Then the change in rent on cropland with the end of the general cropland diversion programs was estimated, also reported in table 3, using the assumption that substitution among crops would leave all land in a state equally affected. The elasticity of demand for land developed in the previous section was used to estimate a decline in land rent for the United States. The decline was assumed to affect the price of cropland relative to all other land equally in all States: 10 percent.

TABLE 3.—ESTIMATED PERCENTAGE REDUCTION IN THE PRICE OF DIFFERENT KINDS OF LAND CAUSED BY ELIMINATION OF COMMODITY PROGRAMS, WITH THE CORRESPONDING SHARE OF EACH STATE'S LAND

Region and State	Allotment affected			Share of cropland in State's land
	Crop	Percent price decline	Share of crop in State's land	
	(1)	(2)	(3)	(4)
North Atlantic:				
Maine				22.9
New Hampshire				18.6
Vermont				26.0
Massachusetts				26.1
Connecticut				28.5
New York				38.6
New Jersey				48.5
Pennsylvania				42.0
East North Central:				
Ohio				52.9
Indiana				57.4
Illinois				66.7
Michigan				49.7
Wisconsin				44.2
West North Central:				
Minnesota				56.9
Iowa				59.2
Missouri	Cotton	12	0.011	33.9
North Dakota				41.4
South Dakota				31.7
Nebraska				31.9
Kansas				36.1
South Atlantic:				
Delaware				58.3
Maryland				44.7
Virginia	Tobacco	78	.007	21.4
West Virginia				13.9
North Carolina	Tobacco	71	.028	27.8
	Cotton	6	.025	
South Carolina	Tobacco	70	.009	28.0
	Cotton	5	.065	
Georgia	Peanuts	31	.026	22.1
	Cotton	6	.020	
Florida	Tobacco	54	.001	14.3
South Central:				
Kentucky	Tobacco	82	.013	21.4
Tennessee	Tobacco	80	.004	23.9
	Cotton	12	.032	
Alabama	Cotton	14	.053	19.7
Mississippi	Cotton	20	.081	24.8
Arkansas	Rice	36	.026	36.8
	Cotton	11	.087	36.8
Louisiana	Rice	33	.049	25.6
	Cotton	15	.049	
Oklahoma	Cotton	7	.017	25.5
Texas	Cotton	13	.040	13.7
Western:				
Montana				11.9
Idaho				25.7
Wyoming				4.6
Colorado				12.4
New Mexico	Cotton	0	.004	1.9
Arizona	Cotton	0	.009	2.5
Utah				8.1
Nevada				4.8
Washington				23.2
Oregon				14.9
California	Cotton	0	.021	21.2

One measure of the effect of the changes in rent for the set of specific kinds of cropland discussed above is reported in table 4 by States. The log variance of the size distribution of value of land owned, programs present and programs absent, is presented. The contrast in the two columns is due wholly to the decline in the relative price of the cited land groups relative to other farmland. The log variance data in table 4 differ from those in other tables in that they relate to land ownership only, while all other log variance data presented in this paper are for permanent farm income from both land and other inputs.

The effects upon cropland rents of program elimination are equalizing in practically every State. The exceptions are the States where the tobacco program is important, and to a lesser extent, the cotton program. The peanut and rice programs, however, have increased the inequality of wealth ownership because these crop acres are relatively more important on larger farms.

TABLE 4.—ESTIMATED LOG VARIANCE OF OWNERSHIP OF LAND WITH AND WITHOUT COMMODITY PROGRAMS

Region and State	Programs present (1)	Programs absent (2)
North Atlantic:		
Maine	1.222	1.192
New Hampshire	1.139	1.094
Vermont	1.499	1.453
Massachusetts	2.032	1.988
Connecticut	2.170	2.128
New York	1.494	1.448
New Jersey	2.689	2.639
Pennsylvania	1.918	1.888
East North Central:		
Ohio	2.650	2.616
Indiana	2.796	2.759
Illinois	3.894	3.865
Michigan	1.677	1.643
Wisconsin	1.742	1.707
West North Central:		
Minnesota	2.456	2.428
Idaho	3.626	3.596
Missouri	2.177	2.150
North Dakota	2.855	2.824
South Dakota	3.482	3.479
Nebraska	3.721	3.706
Kansas	2.597	2.566
South Atlantic:		
Delaware	3.021	2.973
Maryland	3.454	3.405
Virginia	2.302	2.500
West Virginia	.869	.859
North Carolina	2.570	2.674
South Carolina	2.438	2.467
Georgia	2.502	2.464
Florida	2.717	2.728
South Central		
Kentucky	1.900	2.174
Tennessee	1.931	2.018
Alabama	1.820	1.847
Mississippi	2.181	2.213
Arkansas	2.357	2.346
Louisiana	2.543	2.503
Oklahoma	2.757	2.710
Texas	2.986	2.975
Western:		
Montana	2.395	2.400
Idaho	2.443	2.406
Wyoming	3.901	3.947
Colorado	2.446	2.467
New Mexico	3.078	3.164
Arizona	4.495	4.560
Utah	1.791	1.818
Nevada	4.934	4.996
Washington	1.894	1.859
Oregon	1.946	1.911
California	1.912	1.901

In general, the changes induced in the variance of land ownership are quite small as percentages of the total variances of the value of land owned. This simply reflects the fact that, by far, the greater part of the dispersion of land ownership results from variation in the number of acres owned, especially due to the large fraction of farmers who own no land at all. Moreover, a good deal of the variation in the price of land is due to quality and locational factors which would remain in the absence of commodity programs.

Summary of Change in Variance of Farm Income

The net results of the preceding analysis are presented in table 5. The change in inequality due to the decline in land's share are repeated from table 2 in the first two columns of table 5. The changes in the values of the variance of income between the second and third columns of table 5 represent the impact of the decline in relative rents of selected classes of land. This is the same force reported in table 4, but in table 5 it is related to the item of primary emphasis in this study: the log variance of permanent income.

In practically every State, we find that the absence of farm commodity programs makes the distribution of farm income more equal. In many cases the differences are quite large. For the "average" State, the absence of farm commodity programs would have reduced the standard deviation of the log of farm income by approximately 6 percent.

We have chosen to conduct our analysis at the State level primarily in order to show how the impact of commodity program elimination differs with the particular characteristics of the various States. In addition, the treatment of the State as the "unit of account" is of inherent interest for many policy issues. Nonetheless, the distributional consequences at the aggregate U.S. level, which are also presented in our tables, are perhaps the most useful numbers we could generate. Using the aggregate U.S. share estimates derived above and variances of factor ownership, we estimated independently aggregate U.S. figures in tables 3 and 5. The result was a reduction in the standard deviation of the logarithm of farm income from .869 to .828, or about 5%, with the elimination of commodity programs.

The size of both the State and aggregate U.S. reductions are all the more striking in view of the considerable stability of indexes of inequality in other studies of the size distribution of income. For example, compare the effects of our Federal income tax, with its progressive features and very large take. Data by Okner indicate that, in 1965, the income tax reduced the log standard deviation of the U.S. size distribution of income by about 5%.[10] Thus, the elimination of U.S. agricultural commodity programs would have equalizing effects upon the distribution of farm income of the same order of magnitude that the Federal income tax has an all incomes.

[10] Benjamin A. Okner (*Income Distribution and the Federal Income Tax*, Michigan Governmental Studies No. 47, The University of Michigan, 1966) compares the Gini coefficients of before-and-after-tax size distributions of income. These were converted to logarithmic standard deviations by means of Aitchison and Brown's (*op. cit.*, p. 154) formula. Okner also computes a Gini coefficient for a "reformed" personal income tax eliminating many "loopholes" in order to increase the progressivity of the tax. Even this reformed tax reduces income inequality by only about 9½%, not much more than what the elimination of commodity programs would do for farm income in most states.

TABLE 5.—STANDARD DEVIATION OF THE LOGARITHM OF THE PERMANENT FARM INCOME RECEIVED BY FARM OPERATORS [1]

Region and State	Programs present	Programs absent		Percentage change from adjustments [2]
		Adjusted for change in land's share	Additional adjustment for values of land classes	
	(1)	(2)	(3)	(4)
North Atlantic:				
Maine	0.655	0.655	0.654	−0.2
New Hampshire	.593	.593	.591	−.3
Vermont	.621	.620	.619	−.4
Massachusetts	.719	.717	.715	−.5
Connecticut	.773	.769	.767	−.8
New York	.653	.647	.645	−1.3
New Jersey	.871	.846	.843	−3.2
Pennsylvania	.678	.670	.669	−1.4
East North Central:				
Ohio	.850	.798	.796	−6.4
Indiana	.898	.835	.833	−7.2
Illinois	1.046	.977	.975	−6.8
Michigan	.733	.720	.719	−1.9
Wisconsin	.648	.649	.649	−.1
West North Central:				
Minnesota	.752	.732	.732	−2.6
Iowa	.884	.829	.828	−6.3
Missouri	.848	.818	.817	−3.7
North Dakota	.843	.766	.766	−9.2
South Dakota	.835	.784	.784	−6.2
Nebraska	.897	.810	.810	−9.7
Kansas	.910	.831	.830	−8.9
South Atlantic:				
Delaware	.917	.880	.876	−4.5
Maryland	1.017	.993	.990	−2.7
Virginia	.876	.832	.833	−6.1
West Virginia	.602	.600	.599	−.4
North Carolina	.996	.860	.860	−13.9
South Carolina	1.020	.937	.937	−8.4
Georgia	.989	.866	.864	−12.6
Florida	1.276	1.258	1.260	−1.3
South Central:				
Kentucky	.787	.713	.714	−12.3
Tennessee	.823	.753	.753	−9.4
Alabama	.900	.864	.864	−4.2
Mississippi	.990	.957	.957	−3.6
Arkansas	.900	.860	.858	−4.5
Louisiana	1.022	.994	.992	−2.9
Oklahoma	.948	.848	.844	−11.0
Texas	1.142	1.048	1.046	−8.4
Western:				
Montana	.861	.769	.770	−10.6
Idaho	.754	.697	.694	−8.0
Wyoming	.945	.914	.918	−2.9
Colorado	.813	.735	.736	−9.4
New Mexico	1.205	1.093	1.104	−8.4
Arizona	1.479	1.338	1.345	−9.0
Utah	.703	.679	.682	−2.9
Nevada	1.158	1.144	1.149	−.7
Washington	.771	.726	.723	−6.3
Oregon	.745	.718	.714	−4.1
California	1.022	.996	.994	−2.7
Total, United States	.869	.829	.828	−4.7

[1] The standard deviation is the square root of the variance.
[2] Column (1) minus column (3) divided by column (1).

V. Evaluation of the Results

Our results indicate that the elimination of U.S. agricultural commodity programs as they existed in 1966, substantially as they existed in 1972,[11] would reduce the inequality of the distribution of farm

[11] Minor changes include the switch from an allotment to a quota program for burley tobacco and from an allotment to "set-aside" for cotton. The shift in the type of cotton program is less substantial than it might appear because the cotton allotment was a mixture of voluntary diversion, direct payments *and* acreage control in its last decade. The operation of the set-aside program for wheat and feed grains has not differed much thus far from the voluntary diversion programs of the 1960's.

incomes considerably. Since these results were obtained by means of a quite involved analytical procedure, and employed assumptions and parameter estimates which surely contain error, the question naturally arises as to the degree of confidence that can be placed in our answers. To what extent might our results be merely artifacts of error in our assumptions?

In the course of the analysis, we made two basic kinds of assumptions. The first were a set of general analytical assumptions that allowed us to make inferences about what would have been the case in the absence of commodity programs. They were embodied in the general framework we used in describing the operation of agricultural product and factor markets. The second set of assumptions concerned particular parameter values that we had to use owing to our ignorance of true values. Some of these were simply guesses. Probably the most crucial concern the elasticity of substitution between land and all other inputs, and the independence of nonland input prices from the commodity programs.

It might be objected that if we are going to guess about parameter values within our model, we might just as well guess our final result, and save a lot of trouble. However, we have grounds for "educated" guesses in the cases where we make them that we do not have for the final outcome of the guesses. Moreover, many of our parameter values were generated by formal statistical methods, *i.e.*, by "higher-educated" guesses. But we do undoubtedly owe some justification for the assumptions whose failure most easily could change our results.

The first of these is the assumption that land's share of net production income would be the same with and without the programs after adjustment for allotments, quotas and direct payments. The share of net income that a factor receives is a function of the relative quantities of factors and the rate that factor prices change as the relative quantities of factors change. Some work related to the analysis reported in this paper suggests that as the quantity of land increases relative to labor, its share falls. Its price per unit, assumed to equal its productivity, declines more rapidly than its quantity increases. If this condition held in 1966, the reduction in income inequality would be *greater* than shown in table 5. This issue is being investigated in an extended version of the present paper. Thus, the findings in table 5 can be taken as a conservative statement of the decrease in inequality that would occur if the programs had been discontinued.

The second basic assumption is that only land's relative price will change when commodity programs end—that all other resources are perfectly elastic in supply to the agricultural sector. This assumption seems to us quite plausible, at least in a long-run context, but it could well be that for a fairly long intermediate period, the assumption fails. This possibility appears especially likely for farm operator labor, particularly older farmers. If labor returns were appreciably lower in the absence of commodity programs, land's relative price, and consequently its share of farm income, would not fall by as much as the data of table 5 indicate. Again, however, it is necessary to distinguish the quantitative from the qualitative results we have obtained. Our qualitative results will still hold so long as the supply curve of land is *less elastic* than that of labor.

Third, we made a whole set of analytical and parameter value assumptions in estimating changes in relative prices of different kinds of land. However, the many opportunities for slips in this part of our analysis cannot very well have had a quantitatively large influence. This is apparent from the fact that even the quite large relative price changes between cropland and noncropland that we estimate in many States had only a small impact on the variance of farm income, as shown by the contrast between columns (2) and (3) of table 5. Thus, our results are quite insensitive to possible errors in this part of the analysis.

Finally, we have to consider the consequences of any serious inadequacies that may exist in the data on the distribution of factor ownership. This rather complicated task is undertaken in a forthcoming extended version of this paper. The result is, again, that although the numerical estimates of table 5 may well be erroneous, our qualitative results stand; they depend only on the log variance of land ownership being greater than that of all other resources taken together.

To sum up, then, it seems clear that the direction of our results is quite "robust" in the sense of insensitivity to error in our assumptions. It seems clear because the two basic facts required—that commodity programs have increased land's relative share, and that land is more unequally distributed than is the ownership of other factors of production—would survive any plausible revisions of our assumptions.

Direct Evidence on Commodity Programs and Income Inequality

In spite of the robustness of our general results, one still might be skeptical on account of the hypothetical nature of this whole exercise. We can, however, offer one bit of direct evidence. Although commodity programs were ubiquitous in the United States in the late sixties, their importance varied considerably from State to State. We can, then, by means of cross-sectional regression analysis, see to what extent any differences in the inequality of the size distribution of farm income are associated with differences in the extent of farms programs. In contrast to the analysis up to this point, we give no formal structural model, but simply ask if the States in which commodity programs are most important have greater income inequality.

Of course this question only makes sense in an "other things equal" context, so that simple correlation is not sufficient. The things we want to hold constant are those factors which influence inequality but are not influenced by commodity programs. In terms of our focus in this paper, these would be the variances of nonland factors. We, therefore, use the variance of human capital as an independent variable, entered along with Government payments.

The dependent variable we can obtain as a direct measure of inequality is the size distribution of rural farm family incomes from the U.S. Census of Population. Three indexes of inequality are used: The Gini coefficient of concentration, the logarithmic standard deviation, and the percentage of families receiving less than one-half of the mean income per family in the State. Because family

income as reported in the census is annual money income, there many factors involved in its determination that are not considered in this analysis. Most importantly, all transitory and short-run returns are omitted from our permanent income framework. Commodity programs may influence transitory returns as well as permanent returns, though we have no strong a priori expectations as to how. In any event, we cannot hold these short-run factors constant in the regression analysis. Therefore our reduced form approach may capture some different kinds of influences of commodity programs upon income inequality than those our log variance analysis has considered.

The regression analysis[12] essentially estimates the strength of the association of the various measures of the distribution of family income with government payments while holding constant the effect of the within-State variance in human productivity. In all three regressions government payments had a significantly positive influence upon inequality. As the level of government payments increased, inequality increased. While the measures of income equality are correlated, they are not all of equal interest. The percentage of families with less than one half of the State's average family income is most closely related to most concepts of poverty. It was this measure that had the strongest statistical relationship to government payments; this suggests that the impact of programs in worsening the relative positions of the lower tail is even greater than their impact in increasing the incomes of the upper tail relative to mean income.

Because of the ad hoc nature of these regressions, by itself the significance of the "government payments" variable might not be convincing. But as corroborating and independent evidence for what the previous analysis in this paper predicted, we find it highly gratifying.[13]

Inferences About Economic Welfare

The preceding section completes our answer to the distributional question posed in the introduction to this paper; namely, how would the absence of commodity programs alter the inequality of the size distribution of farm income. As an exercise in positive economics, we consider this an interesting issue, and we feel the analysis is helpful in exploring the ways in which farm programs have affected the agricultural sector. With respect of the welfare implications of our results, however, it remains to consider whether this question is the right one to ask.

[12] The regression results are:

$$G = .25 + \underset{(2.7)}{.020}\ GOV + \underset{(5.9)}{0.600}\ VH. \quad R^2 = .45$$

$$SD = .41 + \underset{(2.7)}{.045}\ GOV + \underset{(5.9)}{1.31}\ VH. \quad R^2 = .46$$

$$PV = .09 + \underset{(3.2)}{.021}\ GOV + \underset{(7.7)}{0.703}\ VH. \quad R^2 = .60$$

The dependent variables are: G, the Gini coefficient of inequality of the size distribution of rural farm family income (data from U.S. Bureau of the Census, 1960, vol. I, parts 2-52, table 65); SD, the standard deviation of the logarithms of income, from the same source; and PV, the percentage of families having incomes less than one-half the mean of the State's size distribution. GOV is the logarithm of government payments per farm, from USDA, "The Farm Income Situation," August 1963, table 4. VH is the estimated log variance of human capital ownership, from Gardner (1968, p. 38). The numbers in parentheses are "t" statistics.

[13] In one sense this regression result is even stronger than our results of table 3; namely, the dependent variables in the regressions in the inequality of the total income of farm residents including their nonfarm earnings. But we have considered throughout this paper agricultural income only. The regression indicates that even when we include off-farm income, which is especially important for low-income farmers, income inequality is increaxed by farm commodity programs.

Certainly there are other questions that could be asked about the welfare consequences of commodity programs. We have not discussed at all the welfare costs of the misallocation of resources generated by commodity programs. And even with respect to the distributional issue itself, our analysis does not provide a compeltely satisfying answer.

First, a lot of recent discussion has focused, with good reason, on poverty rather than the whole size distribution of income. With respect to poverty in the relative sense—the position of the poor relative to the mean—the regressions of the position of the preceding section suggest that our results apply to poverty just as strongly as to overall inequality. But with respect to poverty in the absolute sense—the fraction of the farm population below some poverty line, our analysis has nothing very useful to say. The equalizing of the size distribution would not be enough to offset the decline of average income with the end of the programs. Consequently, the number of farmers observed below any given level of farm income would probably increase but it might be quite small.

Second, one should ideally look at the inequality of the size distribution of income for the entire U.S. population; whereas, we considered only the farm income of farm operators. The main distributional consequences of agricultural commodity programs that we have left out pertain to: (1) inequality between the farm and nonfarm sectors, (2) farm income received by nonfarm residents, (3) nonfarm income earned by farm operators, and (4) effects on consumers of farm product prices. While each of these factors should be considered for a complete analysis they lie beyond our current work.

One final welfare issue that deserves comment is the fact that the gainers from the introduction of commodity programs will in many cases not be the same people as the losers from their elimination. The current owner of an acre of land can capture the entire currently-expected flow of future benefits discounted to reflect the associated risk by selling his land. The new owner gains little or nothing from the programs but takes a capital loss if they are eliminated. This kind of case would not affect any of our estimates of aggregate inequality nor should it. This kind of reshuffling resulting from expectations not being borne out occurs constantly, and for many reasons. Every risky investment results in such inequality, because risk implies winners and losers. Conceivably, one might want to compensate for this chance element in the distribution of income, but it represents a different kind of problem than the one analyzed here.

Appendix

Derivation of Variance Equations

If we treat farm income as generated by a log-linear function of resources owned, then the variance of the log of income can be analyzed in the two-factor case as:

$$(1)\quad \text{Var}\ (Y') = s_L^2\ \text{Var}\ (V') + (1-s_L)^2\ \text{Var}\ (O') + 2s_L(1-s_L)\ \text{Cov}\ (V', O')$$

where V represents the value of land, O other inputs, s_L the relative share of land, and the primes denote logs. This equation gives the variance of returns to farm-owned resources, not of gross output. The main effect that factor market conditions can have upon equation (1) is to change the relative shares of land and non-land inputs.

The effect of a change in land's share is:

(2)
$$\frac{\partial \text{ Var } (Y')}{\partial s_L} = 2s_L \text{ Var } (V') - 2(1-s_L) \text{ Var } (O') + 2(1-2s_L) \text{ Cov } (V', O').$$

To make use of this formula we need data on the variance of and covariance between the ownership of land and other factors, the share of land, and the effects of commodity programs on that share. We have noted in the text that quota rental values and direct payments to farmers associated with land retirement should be counted as land income. These can be added directly to land's share because they are not a part of any market-induced relative factor price changes that would lead to substitution among inputs. On the other hand, insofar as the programs increase product prices, and hence bid up land prices in general, it will pay to increase the use of other resources per acre of land. The results for land's share depend on the elasticity of substitution between land and other inputs (σ). In the text we take σ as unity, so that land's share is independent of factor price changes.

Changes in Relative Prices of Different Kinds of Land and the Variance of Land Ownership

When we allow the possibility of changes in the prices of, say, cropland relative to noncropland as a result of the absence of commodity programs, the essential change in the model required is an expansion of the Var (V') term of equation (1). This allows the separation of price (P) and quantity (L) components for different kinds of land. Var (V') can be expanded as:

(3)
$$\begin{aligned} \text{Var } (V') &= \text{Var } ((P.L)') \\ &= \text{Var } (P'+L') \\ &= \text{Var } (P') + \text{Var } (L') + 2 \text{ Cov } (P', L'). \end{aligned}$$

The variance of P' measures the extent of inequality of prices per acre of farmland. If all such land were of equal quality, had equal site value, and no market distortions existed, all acres of land would sell for approximately the same price and this variance would approach zero. The various agricultural commodity programs will have changed Var (V') insofar as they provide benefits to farmers tied to particular past uses of a farmer's land.

The variance of L' measures the inequality of ownership of acres of land. This variance is not expected to be significantly affected by the elimination of commodity programs. The *value* of a farmer's particular set of acres may change, but not the number of acres owned at a point in time.

The covariance term will be changed whenever Var (P') changes, except in the extreme case in which every farmland owner owns land, has the same average price per acre; *i.e.*, when the covariance is zero.

In the estimation of how the absence of agricultural commodity programs would affect (a) the Var (P') term and (b) the covariance term, each presents special problems. We therefore take them up separately.

(a) Changes in the variance of land prices: Many of the things that make some land more valuable than others, *e.g.*, its location, are unaffected by commodity programs. We are only interested in the variance that such programs might induce. This variance presumably arises between land used in the production of crops covered by commodity programs and land used for other purposes. Cotton land becomes more valuable per acre because the ownership of such land carries with it the right to grow cotton, a right not freely available to everybody. Similarly, farmers owning cropland used in producing feed grains have a right to rent a certain acreage to the government under voluntary diversion programs. The variance in the price of land introduced by such governmental activities can be represented by expanding the Var (P') term of equation (2) as:

(4)
$$\text{Var } (P') = \sum_{i=1}^{m} f_i (P'_i - \overline{P}')^2,$$

where the i^{th} class refers to kinds of land differentially affected by governmental activity, *e.g.*, tobacco land, and f_i denotes the fraction of all land in that class.

(b) Changes in the covariance between land price and size of farm owned: The covariance term of equation (4) can be written out as:

$$\text{Cov}\ (P', L') = \sum_{j=1}^{n} g_j (P_j' - \overline{P}')\,(L_j' - \overline{L}') \tag{5}$$

where the j refers to size class of ownership of land, *e.g.*, 40 to 80 acres, and g is the fraction of farms in each size class.

Because the i and j classifications are not the same, some variance of P' will be left out of equation (6). Specifically, we lose the variance of P' *within* size classes. To include this variance we must substitute for P'_j:

$$P_j' = \sum_{i=1}^{m} \alpha_{ij} P_i' \tag{6}$$

where α_i refers to the fraction of, say, tobacco land in the j^{th} size class of land ownership. Thus, equation (5) becomes:

$$\text{Cov}\ (P', L') = \sum_{j=1}^{n} g_j \left(\sum_{i=1}^{m} \alpha_{ij} P_i' - \overline{P}' \right) (L_j' - \overline{L}'). \tag{7}$$

Our procedure for estimating equation (4) is to use Hoover's [14] state figures as giving roughly the undistorted percentage difference between cropland and other land, then introducing the 10% price change derived above.[15] Var (P') is calculated before and after, and the difference is our estimate of the change in Var (P') that would obtain in the absence of the commodity programs.

The covariance term (equation (7)) presents even greater difficulties in that it requires us to know differences in cropland-noncropland price differentials on farms in the various size classes. On this we have no information. However, this problem is avoidable since we are only interested in *changes* in the covariance as the prices of cropland, tobacco land, etc. change. In this context, the need for price data by size-of-farm class disappears, as is apparent when equation (7) is differentiated with respect to the price of the i^{th} category of land (*e.g.*, cropland):

$$\frac{\partial\ \text{Cov}\ (P', L')}{\partial P'} = \sum_{j=1}^{n} g_j (\alpha_{ij} - f_i)\,(\overline{L}' - \overline{L}'). \tag{8}$$

To estimate this equation we need the fraction of farms in each size class (g_j), the fraction of land in cropland (f_i), the mean acreage of each size class (L_j), and the fraction of land in each size class devoted to cropland (α_{ij}). These data are all available in the 1964 Census of Agriculture for each state of the U.S. Multiplying the derivative by the price change (dp_i) for cropland gives us approximately the change in covariance resulting from the absence of commodity programs.

The change in covariance is positive in those states and for those crops where α_{ij} is larger for small than for large farms. For example, the elimination of the tobacco program would increase the covariance term by enough to offset the Var (P') term for North Carolina, thus increasing the overall variance of land ownership, as calculated by equation (3). This results from the much greater share (α_{ij}) of tobacco on small than on large farms.

The summary of this work is reported in Table 4 and utilized in Table 5 in the text.

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[14] Dale M. Hoover. *A Study of Agricultural Land Prices in the United States, 1911–1958*, unpublished Ph. D. dissertation, University of Chicago, 1961.

[15] The varying endowments of land of differnt types and quality among the various states could lead to the 10% figure being not uniformly applicable. For example, states with a high fraction of land which is of poor quality yet is eligible for diversion might have gained more than 10% in cropland price. However, a large part of these differences is presumably eliminated by basing diversion payments per acre on historical yield. Therefore, we do not expect large state-specific errors to be introduced by our procedure.

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AN EVALUATION OF SUBSIDY FORMS FOR SOIL AND WATER CONSERVATION

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SUMMARY AND CONCLUSIONS

In focusing attention on program accomplishments, the consequences of decisions about alternative means for achieving given policy objectives are frequently overlooked. Within limits, there are usually choices open in the selection of policy instruments. In this paper we evaluate two forms of Federal subsidy—direct cost-sharing under the agricultural conservation program (ACP) of the Department of Agriculture and a tax incentive under section 175 of the Internal Revenue Code—as alternative means or policy instruments for influencing farmer decisions to invest in soil and water conservation.

In comparison with most Federal subsidy programs, neither the ACP nor section 175 can be considered large programs. Relative to total Federal investments in soil and water conservation, however, the ACP program accounts for a substantial portion of all Federal funding and it is by far the largest of the direct payment, natural resource programs listed in the recent Joint Economic Committee staff study. In 1968, the most recent year for which relevant income data are available from the Internal Revenue Service, slightly over 951,000 farms participated in the ACP and slightly over 190,000 farm proprietors claimed conservation deductions for tax purposes. Three-fourths of proprietors reporting conservation deductions also reported some type of agricultural program payments, so some overlap is likely between farm proprietors receiving ACP assistance and those reporting conservation deductions.

The subsidy under ACP is provided in the form of cost-sharing (in cash or in materials and services) on conservation measures approved by Agricultural Stabilization and Conservation Committees. The section 175 tax subsidy is an implicit payment to farmers through an election to deduct certain conservation expenditures from ordinary income rather than to capitalize them.

In general, economic theory suggests that section 175 is potentially more valuable (and hence may be expected to provide greater incentive for conservation) to farmers in higher income tax brackets than for farmers in lower tax brackets. Conversely, the net financial incentive of the ACP direct cost-sharing may be reduced for farmers in higher tax brackets because of the requirement that Government conservation payments must be reported as taxable income. By the same reasoning, ACP can be expected to offer relatively more incentive for conservation than section 175 for taxpayers in the lower tax

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brackets. The two programs are complementary in that farmers receiving ACP assistance may also elect to deduct, under section 175 their share of the cost of the conservation investment; thus partially or entirely offsetting any income tax liability associated with the receipt of Federal assistance.

In 1968, the ACP paid out about $183 million in cost-share assistance. At the usual or average cost-share rate of 50 percent, this implies that about $366 million in conservation expenditures resulted from the program. Farm proprietors reported $80.5 million in conservation expenditures on their 1968 tax returns; we estimate the Treasury cost in terms of tax revenues foregone to be between $9.3 million (estimated at average tax rates) and $16.6 million (estimated at marginal tax rates).

At an implied average "cost-share" rate of 12 or 20 percent, the section 175 tax incentive appears to have stimulated more private conservation investment per dollar of Federal expenditures than did the ACP at an average 50 percent cost-share rate, but it is not clear that this necessarily holds. The ACP, as it operated prior to 1971, was characterized by wide distribution of small amounts of cost-share assistance; it is difficult to imagine that such payment frequently induce conservation practices to which the investor was not already favorably disposed. The average cost-share payment under ACP in 1968 was $193. Incomplete data on the distribution of ACP payments in 1970 indicates that about 58 percent of the direct payments in that year were under $100 and 90 percent were under $500.

By the same reasoning, about 43 percent of the deductions claimed under section 175 were for less than $100 and 78 percent were under $500. It would seem reasonable that tax-saving considerations at this level of investment were largely incidental to the conservation decision. On the other hand, the large conservation expenditures reported under section 175 tended to be reported by propietors with large farm operations (measured by business receipts) or with large off-farm incomes. It is possible that many of these investments would not have been undertaken without section 175, but these also tended to be the more expensive investments in terms of tax revenues foregone. In contrast to the statutory payment limitation for the ACP, deductions under section 175 are essentially open-ended over time. In 1968, less than 1 percent of proprietors claiming conservation deductions accounted for 14 percent of all deductions claimed.

In general, the farm proprietors who elected to take the section 175 deductions tended to be more successful than other farm proprietors in terms of farm profits or off-farm income. A disproportionately large amount of total conservation deductions were claimed by proprietors reporting farm losses. These factors tend to suggest that farmers electing section 175 were, as a class, more sophisticated in tax matters or had access to professional tax advisers.

Administrative and fiscal control over conservation investments is greater under the ACP than under section 175 but this control is accomplished at the cost of more complex organizational arrangements extending to individual farmers. This, of course, affords the ACP greater opportunity to match private conservation investments with public conservation needs and priorities.

Introduction

For some 40 years, public policy has been to encourage the conservation of the Nation's soil.[1] In pursuit of this objective, the Federal Government has developed a number of soil and water conservation programs involving at least three of the six subsidy forms identified by the staff of the Joint Economic Committee.[2] In this paper we are specifically concerned with two of these forms: [3]

(1) Implicit payments to farmers through a reduction in income tax liability under section 175 of the Internal Revenue Code of 1954.

(2) Explicit cash payments under the agricultural conservation program (now rural environmental assistance program) of the U.S. Department of Agriculture.

There is a substantial body of attitudinal and economic studies which establishes the need for some form of financial assistance if individual landowners are to be persuaded to undertake many soil conservation practices judged to be in the long run interest of society.[4] In the paper, therefore, we take the rationale for Federal programs to promote private investments in soil conservation as given.[5] Clearly, there are circumstances where it is in the landowner's self-interest to implement a conservation practice,[6] and a subsidy may only amount to a transfer payment. More typically, however, we may assume that the subsidy does purchase conservation that would not otherwise be provided.

The primary focus of this paper is on an evaluation of the relative effectiveness of the two incentive "programs" [7] in influencing farmers' decisions to implement soil conservation measures. First, we consider the theoretical effect of these programs in modifying farmer's expected financial returns from investments in soil conservation. Secondly, we examine income tax returns data on farm proprietors for evidence of their response to the tax subsidy, and compare this response with data on farmer participation in cost-sharing under the agricultural conservation program. We analyze data from the Internal

[1] "A Brief History of the Committee on Agriculture and Forestry United States Senate and Landmark Legislation 1825–1970," S. Doc. No. 91–107, 91st Cong., second session 18–22 (1970). R. Burnell Held and Marion Clawson, "Soil Conservation in Perspective" (Baltimore: Johns Hopkins Press for Resources for the Future, Inc., 1965), pp. 41–56.

[2] The six forms of assistance classified are:

"(a) Explicit cash payments;

"(b) Implicit payments through a reduction of a specific tax liability;

"(c) Implicit payments by means of loans at interest rates below the Government borrowing rate or from loan guarantees;

"(d) Implicit payments through provisions of goods and services at prices or fees below market value;

"(e) Implicit payments through Government purchases of goods and services above market prices; and

"(f) Implicit payments through certain Government regulatory actions that alter particular market prices."

(Staff of Joint Econ. Comm., 92d Cong., first session, "The Economics of Federal Subsidy Programs" 18 (Joint Comm. Print 1972).

[3] A third form, not analyzed, is the soil and water conservation loan program of the Farmers Home Administration, U.S. Department of Agriculture. *Id.* at 34. A fourth form of assistance, the technical assistance program of the Soil Conservation Service, has also not been evaluated and probably qualifies within the staff definition of benefit-in-kind subsidies. *Id.* at 35–38.

[4] See generally, R. Burnell Held and Marion Clawson, "Soil Conservation in Perspective" (Baltimore: Johns Hopkins Press for Resources for the Future, Inc., 1965). Raleigh Barlowe, "Land Resource Economics: The Political Economy of Rural and Urban Resource Use" (Englewood Cliffs: Prentice-Hall, Inc., 1958), pp. 283–315. Earl O. Heady, "Economics of Agricultural Production and Resource Use" (Englewood Cliffs: Prentice-Hall, Inc., 1952), pp. 763–793.

[5] We assume that a substantive treatment of the subject will appear in a companion study paper in this series by Darwin W. Daicoff.

[6] For a major study of the benefits and costs of conservation see H. W. Grubb and G. S. Tolley, "Benefits and Costs of Soil Conservation in the South and its Subregions," Tech. Bul. No. 172 (Raleigh, N.C.: North Carolina Agricultural Experiment Station, 1966).

[7] Subsequent text discussion will refer to both the income tax subsidy under section 175 and the cost-share assistance under the agricultural conservation program as "programs".

Revenue Service and the Agricultural Stabilization and Conservation Service to identify the dollar expenditures on soil conservation associated with each program in 1968 and derive estimates of direct Treasury costs. We also consider some equity issues inherent in the programs. We do not attempt to evaluate the conservation accomplishments resulting from investments induced by these two incentive programs, nor do we attempt to determine whether the benefits of the conservation achieved outweigh the costs.

A Description of the Programs

In this section we briefly review the legislative background of section 175 and the agricultural conservation program, and describe the mechanics of program administration.

Section 175 of the Internal Revenue Code

In the debates over the major revision of the Internal Revenue Code in 1954, relatively little attention was focused specifically on section 175.[8] In terms of revenue effects, that provision was a minor item with respect to the total changes proposed.[9] The estimated revenue loss under section 175 for fiscal year 1955 was $10 million; an estimated 500,000 taxpayers were expected to be affected. In a legislative proposal that distributed benefits rather widely throughout the economy, section 175 was the only provision that specifically benefited the farm sector.[10]

Although the special tax treatment for soil and water conservation expenditures would result in an initial revenue loss to the Treasury, the House report considered the change to be one of a class which would ultimately have favorable revenue effects, "by encouraging production and employment and thereby expanding the tax base." [11]

The legislative intent with respect to section 175 was (1) to clarify the confusion in the existing law as to the tax treatment of soil and water conservation expenditures,[12] and (2) to encourage sound conservation practices.[13]

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[8] *See* 100 Congressional Record 3418-3464, 3516-3565 (1954) (discussion in the House), 100 Congressional Record 8978- 8993-9619 (1954) (inclusive citation to intermittent Senate discussion). For references to the soil and water conservation deduction in the House discussion see *id.* at 3423 (remarks of Representative Reed), 3431 (remarks of Representative Cooper), 3442 (remarks of Representative Jenkins), 3449 (remarks of Representative Halleck), 3456 (remarks of Representative Sadlak), 3458 (remarks of Representative Martin), 3536 (remarks of Representative Aspinall), 3554 (remarks of Representative Younger); in the Senate *id.* at 8993, 8996, 9594, 9598, 9599 (remarks of Senator Millikin), 9280 (remarks of Senator Robertson), 9297, 9463 (remarks of Senator Humphrey), 9461 (remarks of Senator Dirksen), 9594 (remarks of Senator Douglas), 9594 (remarks of Senator Long), 9597, 9598 (remarks of Senator Magnuson), 9610 (remarks of Senator Johnson of Colorado), 9611 (remarks of Senator Carlson), 9614 (remarks of Senator Holland). See also, *id.* at 12408 (statement by the managers on the part of the House accompanying the conference report, H. Rept. No. 2543), 12526 (discussion of the conference report by Senator Millikin), 12541 (remarks of Senator Humphrey).

[9] Under the House version of the bill, individual taxpayers would receive reductions in fiscal year 1955 amounting to an estimated $778 million; corporations $592 million. An extension of the 52 percent corporation income tax rate was to produce $1.2 billion in increased revenue, leaving a net loss from the bill of $170 million. The estimates for the Senate version were reductions to individuals of $849 million; corporations $622 million, leaving a net loss of $277 million. S. Rept. No. 1622, 83d Cong., 2d sess. 3, 4 (1954).

[10] Because of the structure of assets, farmers would also benefit substantially from the liberalized depreciation rules. See, *e.g.*, 100 Congressional Record 3442 (remarks of Congressman Jenkins), 3458 (remarks of Congressman Martin) (1954). However, this was a benefit shared with other taxpayers similarly situated. *See, id.* at 1598, 1599 (remarks of Senator Millikin). An amendment permitting farmers to elect to expense rather than capitalize the cost of farm machinery was introduced in the Senate but did not pass. *Id.* at 9591-9502. A Senate amendment providing similar treatment for grain storage facilities, *id.* at 9507-9510, was rejected by the House conferees. *Id.* at 12408.

Of the tax reductions benefiting individuals as opposed to corporations, *supra* note 9, the conservation deduction was regarded as one of a class benefiting small as well as large taxpayers, *e.g.*, *id.* at 12537 (remarks of Senator Morse), or stated more specifically, the deduction would benefit small as well as large farmers. *Id.* at 9614 (remarks of Senator Holland).

[11] H. Rept. No. 1337, 83d Cong., 2d sess. 4 (1954). Also, it was considered to be merely a shift in timing between taxable years rather than a net revenue loss. *Id.* at 3.

[12] *Id.* at 28.

[13] *Id.* at 29.

Prior to the change in the code, soil and water conservation expenditures had been generally treated as capital improvements and farm taxpayers were required to add the cost of the improvements to their tax basis in the farmland. Tax savings on such investments were realized only on sale of the land.[14]

However, a 1953 Tax Court decision held, in a case where the taxpayer established that terracing to prevent erosion did not increase the value of land, that such a conservation expenditure was deductible as an ordinary business.[15] A Revenue Ruling limited this holding to substantially similar facts.[16] To clarify the status of soil and water conservation expenditures generally, Section 175 of the revised Code permitted farmers to elect to expense rather than capitalize these investments.[17]

The scope of qualifying expenditures is sufficiently broad to cover most conservation practices [18] except that depreciable items must be depreciated rather than expensed and expenses otherwise deductible are not deductible as conservation expenses.[19]

There are at least two important qualifications on the application of section 175. First, the taxpayer must be engaged in the business of farming.[20] Hobby or recreation farming does not qualify; nor does forestry or the growing of timber. Also, the fixed-rent landlord is not eligible for the deduction unless he participates to a material extent in the operation or management of the farm. Second, the conservation expenditure must be on land used in farming.[21] In general, if land is being prepared for a different use or for its initial farming use, expenses incurred are considered development expenses and are not conservation deductions.[22]

Soil and water conservation deductions claimed in any one year cannot exceed 25 percent of the gross income from farming.[23] However, expenditures in excess of the limitation can be carried forward (subject to the same limitation) in subsequent years. The legislative intent in relating the limitation to farm income was specifically to prevent the current deduction of substantial investments of funds from nonfarm sources in farmlands.[24]

Under the Tax Reform Act of 1969, gains on the disposition of farmland held 5 years or less are completely recaptured as ordinary

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[14] For a brief discussion see John C. O'Byrne, "Farm Income Tax Manual," 4th ed. (Indianapolis: Allen Smith Company, 1970), p. 384. [hereinafter cited as O'Byrne]

[15] J. H. Collingwood, 20 T. C. 937 (1953).

[16] Rev. Rul. 54-191, 1954-1 Cum. Bull. 68.

[17] Section 175 is not unique in providing for an election to deduct currently an expense which improves farmland and might be capitalized. *See* Int. Rev. Code of 1954, § 180 (fertilizer and lime expenses), § 182 (land-clearing expenses). To some extent, special treatment may be attributed to the fact that farmland is not depreciable for tax purposes. The interrelationship of Sections 175, 180, and 182 is fairly important in tax planning and tax administration. For a discussion see Comment, "Deductible Development and Conservation Expenditures for Farmers," 7 *Houston L. Rev.* 227 (1969); Comment, Sections 175 and 182: "Farmers' Deductions for Capital Improvements to Land," 19 *Hastings L. J.* 446 (1968); Note, "Taxation Affecting Agricultural Land Use," 50 *Iowa L. Rev.* (1965).

[18] It includes conservation expenditures made for "(i) the treatment or moving of earth, (ii) the construction, control, and protection of diversion channels, drainage ditches, irrigation ditches, earthen dams, watercourses, outlets, and ponds, (iii) the eradication of brush, and (iv) the planting of windbreaks. Expenditures for the treatment or moving of earth include but are not limited to expenditures for leveling, conditioning, grading, terracing, contour furrowing, and the restoration of soil fertility." Treas. Reg. § 1.175-2(a) (1957).

[19] Int. Rev. Code of 1954 § 175 (c) (1). A 1968 amendment extended coverage to assessments for acquisition of depreciable property by soil and water conservation or drainage districts with certain limitations. P.L. 90-630, § 5, 90th Cong. 2d Sess. (1969).

[20] For a detailed analysis see O'Byrne, *supra* note 14 at 387.

[21] *Id.* at 388.

[22] Treasury Regulation § 1.175-4(a)(2).

[23] Internal Revenue Code of 1954 § 175(b).

[24] H. R. 1337, 83d Cong. 2d Sess. 29 (1954).

income up to the amount of soil and water conservation deductions previously taken.[25] If the land is held more than 5 but less than 10 years, the gain is partially recaptured.[26]

Agricultural Conservation Program

The agricultural conservation program (ACP) was authorized by a 1936 amendment [27] to the Soil Conservation and Domestic Allotment Act of 1935.[28] The amendment immediately followed the invalidation by the Supreme Court of certain portions of Agricultural Adjustment Act of 1933.[29] Thus the legislative purposes included improvement of farm income as well as soil and water conservation.[30]

The objectives of the program that evolved were to "(1) restore and improve soil fertility; (2) minimize erosion caused by wind and water, and (3) conserve water on the land." [31] The approach was to share with farmers and ranchers the costs of soil-building and soil-and water-conserving practices, including related wildlife conserving practices.[32]

In 1971 the agricultural conservation program was renamed the rural environmental assistance program (REAP) and changes were made in the program to emphasize environmental protection and improvement.[33] REAP operates under the same cost-share principles as ACP but, since tax data on the use of section 175 are available only for 1968, this paper will analyze the agricultural conservation program as it operated in that year.

The ACP program is administered by State, county, and community-farmer Agricultural Stabilization and Conservation Committees under the general direction of the Agricultural Stabilization and Conservation Service.[34] Program funds are allocated to States based primarily on an evaluation of conservation needs as determined by the Secretary of Agriculture.[35] State committees, in turn, allot funds to the county committees. State and local programs are based on selections made from a list of specific National program practices that are eligible for cost sharing assistance.[36]

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[25] For a brief discussion see Internal Revenue Service, Department of the Treasury, *Farmer's Tax Guide* 46 (pub. No. 225, 1972 ed., 1971).

[26] The amount to be reported as ordinary income is reduced by 20 percent a year for property held more than 5 but less than 10 years. *Id.* at 36.

[27] 49 Stat. 1148.

[28] 16 USCA 590a.

[29] See Agriculture Stabilization and Conservation Service, *Compilation of Statutes*, Agriculture handbook No. 408, (Washington, D.C.: Government Printing Office, 1971), p. 1.

[30] Soil Conservation and Domestic Allotment Act § 7(a), 16 U.S.C. 590g(a).

[31] Agricultural Stabilization and Conservation Service, *Farm Commodity and Related Programs*, Agriculture handbook No. 345 (Washington, D.C.: Government Printing Office, 1967), p. 39.

[32] *Ibid.*

[33] Agricultural Stabilization and Conservation Service, *Rebuilding A Quality Environment Through Rural Environmental Assistance Program* (Washington, D.C.: Government Printing Office, 1971).

[34] Agricultural Stabilization and Conservation Service, *Rural Environmental Assistance Program*, ASCS Background Information—BI No. 12—Feb. 1971.

[35] *Ibid.* There are statutory limits on the reduction that can be made from the previous year allocation. Soil Conservation and Domestic Allotment Act § 15, 16 U.S.C. 590o.

[36] During the latter years of ACP, more than 50 specific practices were listed. These were categorized as practices primarily for (1) Establishment of Permanent Protective Cover, (2) Improvement and Protection of Established Vegetative Cover, (3) Conservation and Disposal of Water, (4) Establishing Temporary Protective Cover, (5) Temporary Protection of Soil from Wind and Water Erosion; also (6) Practices to Meet Special County Conservation Needs, (7) Wildlife Conservation Practices with Soil and Water Conservation Benefits, and (8) Conservation Practices with Substantial Beatification Benefits. *See* 32 Federal Register 11117–11119 (1967). Changes were made in a number of practices in shifting to REAP. About one-sixth of the program funds were shifted to higher priority measures. Agricultural Stabilization and Conservation Service, *Agricultural Conservation Program: Annual Report for 1970* (May 1971), p. 6. For a detailed description of changes in the practices see Agricultural Stabilization and Conservation Service, Notice RE–2 (Washington, D.C.: 1971).

A farmer desiring cost-sharing assistance files a request with a county committee prior to undertaking a conservation practice.[37] If assistance is to be provided, the applicant is notified. Upon completion of a practice according to technical specifications, the Federal cost share is issued in the form of cash or a purchase order for service or material.

The Federal cost-share rate generally does not exceed 50 percent.[38] Higher rates are authorized for low income farmers and for certain high priority and emergency practices.[39] There is an upper limit of $2,500 annual Federal assistance per farmer, except for certain group enterprises. Local committees have the option of further cost rationing as to share rates or to payment limits.

The Federal Government has not deliberately attempted to relate tax assistance to cost-share assistance or vice versa.[40] Conservation practices may, and in a majority of cases do, qualify for assistance of both types.[41] A farmer taxpayer must declare Government payments for conservation (whether in cash, materials, or services) as income in the tax year they are actually or constructively received.[42] He may elect to deduct his share of the cost of the cost-shared practice under section 175.[43]

Conservation Investment: A Decision Model

In this section we first construct a simple decision model for an investment in soil conservation; we then introduce the two subsidy programs and observe the ways they can be expected to affect the profitability of a conservation investment. By comparing the models, we can draw inferences regarding conditions under which we would expect an investor to respond to either or both programs. Presumably, an investor makes a similar evaluation of the subsidy programs in weighing a conservation investment decision—although his "model" may be more or less complex than ours. Our purpose, however, is not to explain how investment decisions typically are made; rather we seek to identify those features of the subsidy programs that can be expected to bear on a conservation decision. We then examine the available empirical data for each program and, to the extent the data permit, evaluate actual program performance within the general framework provided by the theoretical models.

[37] *Rural Environmental Assistance Program, supra* note 34, at 3.

[38] *Id.* at 4.

[39] *Ibid.*

[40] However, an argument was made in support of section 175 that, "It will reduce the necessity for direct government aid to farmers for these [sound conservation practices] purposes." 100 Congressional Record 3423 (1954) (remarks of Representative Reed).

[41] As one might expect, the regulations under section 175, supra note 18, are far more general than the description and specifications for practices qualifying for ACP cost-sharing assistance. 32 Federal Register 11117, 11118 (1967). Thus, in order to qualify for assistance under both, a given practice must meet the ACP specifications. In addition there are ACP practices which do not qualify under section 175. For example, establishing or improving a stand of trees for purposes other than wind or water erosion, Practices A–7 and B–10, would not qualify. Compare 32 Federal Register 11117 with pp. 4, 5 and note 20, supra. ACP practices using depreciable items would also not qualify. See, *e.g.*, practice B–8 (installing pipelines, supplemental water storage, etc.), practice B–9 (constructing permanent fences as a means of protecting vegetative cover), practice C–7 (constructing channel lining, etc.), practice C–15 (lining irrigation ditches). It is not possible to determine in the abstract whether certain other practices would qualify, for example, as "conservation" under section 175. It has been held that the conclusion by an agency of the U.S. Department of Agriculture that a particular practice is soil conservation is not proof for purposes of section 175 that it is soil conservation, although factual findings in support of the former conclusion are relevant to the latter determination. Herndon v. U.S., 203 F. Supp. 536 (E.D. S.C., 1962).

[42] "Farmer's Tax Guide," *supra* note 25, at 18.

[43] See, *e.g.*, Winfield A. Coffin, 41 T.C. 83 (1963).

A Simple Investment Model

As with most capital investments, time is a key element in a conservation decision. An investment in a conservation practice involves the commitment of funds in the present, in exchange for some future returns. In order to evaluate the desirability of the investment, it is necessary to reduce present and future dollar amounts to some common basis. A simple investment model,[44] based on present values, can be expressed as:

$$I \leq Vo = \sum_{t=1}^{k} \frac{Eo(Y_t)}{(1+i)^t} + \frac{Eo(M_k)}{(1+i)^k} \qquad [1]$$

where:

I = the investment cost
Vo = the value of the investment to the investor at t_o
$(Eo(Y_t)$ = the expectation at t_o on income to be generated in t
$Eo(M_k)$ = the expectation at t_o on the market or salvage value of I at the end of year k
i = the opportunity cost of investor's capital
t = unit of time
k = the number of years in the planning horizon.

The decision rule expressed by equation [1] states that an investment is justified if the investment cost (I) is less than the expected present value of the investment (Vo). The present value is a function of 2 components: (1) The expected flow of income from the investment, discounted for time and (2) the expected salvage value of the investment at the end of the investor's planning horizon, also discounted for time.

The Investment Model With Income Taxation

Income taxes introduce several complexities to decision making. In general, and to the extent that income from an investment is taxable, taxation reduces the net return that can be realized. However, this "disincentive" effect of income taxes (relative to a situation of no taxes or relative to a tax-free alternative investment) may be partially or wholly offset by other revenue code provisions, such as an investment credit or accelerated depreciation. The attractiveness of an investment may be further modified by the tax consequences of any capital gain or loss associated with the salvage value of the asset at t_k.

Various classes of investments are treated in different ways for purposes of calculating investment credits, depreciation, or capital gains and losses. To introduce specificity into the model, therefore, we base it on the provisions of the Internal Revenue Code relating specifically to soil and water conservation expenditures that qualify for treatment under section 175:

$$I \leq \sum_{t=1}^{k} \frac{Eo(Y_t)(1-Tr)}{(1+i)^t} + \frac{Eo(M_k) - Tc[Eo(M_k) - I]}{(1+i)^k} \qquad [2]$$

[44] The literature is replete with investment models. Ours is notationally close to one used by Gordon E. Rodewald, Jr., "A Method for Analyzing the Effect of Taxes and Financing on Investment Decisions," 51 *American Journal of Agricultural Economics* 1178–1181 (December 1969), as corrected by Gary T. Devino in 53 *American Journal of Agricultural Economics* 134–135 (February 1971).

where:

I=an investment in a non-depreciable conservation practice
Tr=the marginal income tax rate
Tc=the effective tax rate for capital gains
$Tc=0.50\ Tr$ if $0.50Tr<0.25$
$=0.25$ otherwise

Comparison of equations [1] and [2] indicates the effects of ordinary income and capital gains taxes. One effect (expressed in the first element of equation [2] is that the annual returns available to the investor are reduced by the amount of taxes that must be paid on the investment yield. The net return after taxes is a function of the tax rate (Tr). Obviously, the higher the investor's tax bracket, the greater must be the expected income stream, *ceteris paribus*, if the conservation investment is to be as financially attractive as it would be in the absence of the tax.

The second element of equation [2] indicates the effect of income (capital gains) taxes on the salvage value of the investment.[45] In general, any gain or profit from the sale of an asset is treated as income for tax purposes. If the asset has been held for more than 6 months, the gain may be treated as a long-term capital gain subject, in effect, to lower tax rates. In the case of a non-depreciable asset (such as the type that would qualify for treatment under section 175), the investment cost is taken as the basis for determining capital gains or losses.

The mechanics of calculating capital gains liability are illustrated in the second part of equation [2]. The investor first subtracts the investment cost [I] from the expected salvage value [$Eo(M_k)$]. The difference, if positive, is subject to tax at rate [Tc]; this tax liability must be subtracted from the expected salvage value to determine the present value of the investment net of tax liability.

Thus, the consequences of introducing income taxes into the basic decision model are 2: (1) The annual returns realizable by the investor are reduced by the amount of expected income tax liability; and (2) the net return to be realized from capital gain on the investment, if any, is reduced by the amount of the tax liability created by the gain.

The Investment Model With Section 175

Equation [2] reflects the tax treatment of conservation investments prior to the 1954 revision, or current tax treatment if the farmer does not elect to deduct the expenditure under section 175. Section 175 provides farm operators the option of deducting soil and water conservation expenditures from gross income, subject to a limitation of 25 percent of gross farm income in the taxable year.

Consider first the case where the cost of the conservation practice is less than 25 percent of gross farm income. The decision model is:

$$I \leq \sum_{t=1}^{k} \frac{Eo(Y_t)(1-Tr)}{(1+i)^t} + Tr(I) + \frac{Eo(Mk)-Tc[Eo(M_k)]}{(1+i)^k} \qquad [3a]$$

[45] In this case, "salvage value" refers to the difference in sale value of improved and unimproved land that is attributable to the conservation investment. The specification of equation [2] and subsequent equations applies only to the case of capital gains. The case of capital losses could also be considered but would require a slightly different formulation of the model. The possibility of capital losses would not substantially alter conclusions from this analysis. For simplicity, therefore, we model only the case of zero or positive capital gains.

Comparison of equations [2] and [3a] indicates that an election to deduct conservation expenditures under section 175 has two offsetting—but not necessarily equal—effects. By deducting the cost of the investment from gross income in the year the expenditure is made, the investor realizes a tax savings of $Tr(I)$. Therefore, the present value of the investment is increased by the amount of the tax saved from claiming the deduction. Since the deduction is taken entirely in the year of the expenditure, this saving is not discounted.

On the other hand, the full amount of any salvage value realized at the end of the investor's planning horizon is subject to a capital gains tax. (Since the investment was taken as a deduction in t_o rather than added to the basis, the entire value of the investment is subject to taxation when recovered in t_k). This is in contrast to the simple model with income taxation where only the excess of salvage value over investment cost is subject to a capital gains tax. This additional capital gains tax liability from election of section 175 reduces the present value of the investment relative to the previous model. In general, however, the reduction in present value of the investment resulting from the tax liability for capital gains in period t_k will be less than the increase in present value from the tax savings in period t_o. This follows because (a) the capital gains tax liability is discounted and (b) the effective capital gains tax rates are usually lower than ordinary income tax rates.

If the investment in conservation exceeds 25 percent of gross farm income in the taxable year, the model becomes more complicated although the results are similar:

$$I \leq \sum_{t=1}^{k} \frac{Eo(Y_t)(1-Tr)}{(1+i)^t} + \sum_{t=1}^{m-1} \frac{Tr(0.25G_t)}{(1+i)^t} + \frac{Tr\ (I - \sum_{t=1}^{m-1} 0.25\,G_t)}{(1+i)^m} + \frac{Eo(Mk) - Tc[Eo(Mk)]}{(1+i)^k} \qquad [3b]$$

where:

G_t=gross farm income in year t.

$$0.25\,Gm > I - \sum_{t=1}^{m-1} 0.25\,G_t > 0$$

The major difference between equation [3a] and [3b] is that in [3a] the deduction is taken in 1 year, whereas in [3b] it is spread over several years. Even if the total tax saving is the same in both cases, its present value under [3b] is less because of the discounting of the deferred deductions. Therefore, this section 175 limitation tends to restrict the financial attractiveness the tax subsidy for investors with small gross farm incomes.

The Investment Decision Model With ACP

Another consideration influencing soil and water conservation investment decisions is the availability of Federal cost-sharing assistance under the agricultural conservation program (ACP). Under the ACP program, payment is made directly to the farmer, as opposed to the implicit payment under section 175. A farmer receiving ACP assistance however, may also deduct his share of the cost of the conservation practice under section 175 in computing his income tax liability.

We consider first the consequences of ACP cost-sharing on the investment decision model if the farmer does not elect to take the section 175 deduction. The decision model is:

$$I \leq \sum_{t=1}^{k} \frac{E_o(Y_t)(1-Tr)}{(1-s)(1+i)^t} + (1-Tr)(s)I + \frac{E_o(M_k) - Tc[E_o(M_k) - (1-s)I]}{(1+i)^k} \qquad [4]$$

where:

s = the Federal cost-share rate under ACP

$$(0.0 < s < 1.0)$$

An obvious consequence of any cost-sharing conservation program financed from general revenues is that, from a private investor's standpoint, the total investment need return only enough to cover the investor's contribution to the cost. Since this contribution is less than the total investment cost, we would expect, ceteris paribus, that a wider range of measures would be undertaken by private landowners with ACP than without it. This effect of cost-sharing is shown in the first element of equation [4]. Since the Federal Government bears s percent of the investment cost, the individual supplies only (1–s) percent. From the investor's viewpoint, the conservation practice must cover only his opportunity cost in order to be a profitable investment.

The second element of equation [4] reflects the fact that Federal cost-sharing under the ACP program, including assistance in money or in kind, is considered taxable income in the year received. Thus, the Federal Government recovers through income taxes a portion of its contribution to the cost of the conservation practice, and the value of the cost-share assistance to the individual is reduced.

The third element of equation [4], the present value of the expected salvage value of the investment, has been modified to incorporate the tax rule that only the investor's contribution to the cost of the practice can be added to his basis. If the salvage value of the practice exceeds the investor's contribution to the cost, a capital gain will be realized and will be taxed at the capital gains rate. Thus, the Federal Government stands to regain a further portion of its cost-share contribution. These recoupments probably reduce the financial attractiveness of cost-sharing for taxpayers in the high tax brackets.

The Investment Model With Section 175 and ACP

As a further possibility, an investor receiving cost-share assistance under ACP may also elect to deduct his contribution to the cost of the practice under section 175. In effect, the investor offsets (more or less depending on cost-sharing rates) the ACP payment, which must be reported as income, with a deduction for his contribution to the investment cost. The decision model is:

$$I \leq \sum_{t=1}^{k} \frac{Eo(Y_t)(1-Tr)}{(1-s)(1+i)^t} + (1-Tr)(s)(I) + Tr(1-s)I + \frac{Eo(Mk) - Tc[Eo(Mk)]}{(1+i)^k} \quad [5]$$

The model represented by equation [5] is essentially an amalgamation of equations [3] and [4] (For simplicity, we consider the case of an investment costing less than 25 percent of gross farm income.) As equation [5] indicates, the present value of the conservation investment is a function of (a) the expected income stream from the investment, discounted for the investor's contribution to the investment cost; (b) the value of the Federal cost-share assistance, net of tax liability; (c) the value of the tax savings associated with the investor's election of section 175 for his contribution to the investment cost; and (d) the expected salvage value of the investment. The entire salvage value is subject to capital gains taxation because investment costs were either paid by the government or deducted in the year they occurred.

The Programs Compared

By comparing the investment decision models just developed, we can draw certain inferences about the circumstances under which investors could be expected to respond to section 175 and to ACP. From this type of analysis, we can further specify conditions where a tax-based subsidy is likely to be preferred to a subsidy through direct cost-shares.

From the viewpoint of a profit-maximizing investor and under general *ceteris paribus* conditions we should expect that:

1. Private investors will prefer either or both programs to neither.— This can be seen by comparing equation [2] to equations [3], [4] and [5]. Both section 175 and ACP contribute positively to the present value of a conservation investment.[46] Under section 175, the gain to the investor is equivalent to the tax savings realized by deducting the investment cost from gross farm income. Under ACP, the present value of the investment is increased by the amount of the Federal cost-share contribution (net of income taxes). While the salvage value of the investment may be subject to a capital gains tax under either section 175 of ACP, the net benefits to the investor from either program should be positive.

2. Section 175 is preferred to ACP by investors in upper tax brackets.— We would expect this to hold generally because the amount of tax

[46] In the case of section 175, this statement assumes the investor does not anticipate being in a substantially higher tax bracket at the end of the planning period so that ordinary income tax savings are negated by higher capital gains taxes.

savings depends on the investor's tax bracket. Conceivably, an investor in the 70-percent tax bracket could write off up to 70 percent of the cost of the investment; whereas the average cost-share rate is 50 percent. Conversely, the value of direct cost-sharing under ACP is negatively associated with the investor's tax bracket because the cost share must be reported (and taxed) as ordinary income.

Because of the nature of the conservation practices that qualify for section 175, it is possible that section 175 may be used to convert ordinary income into capital gains income. In general, most practices that qualify for section 175 are longlasting and nondeteriorating. Therefore, if the practice was intrinsically worthwhile when undertaken, the cost of the investment should be recoverable through the increased value of the improved land. Thus, investors in upper tax brackets may find it profitable to buy unimproved land; improve it with conservation practices qualifying for deduction under section 175; and, after a sufficient period to qualify for capital gains treatment, sell the improved land at a price that allows recovery of the original conservation investment.[47] The capital gains possibilities would be most attractive, of course, to investors in upper income tax brackets.

3. ACP is preferred to section 175 by investors in low tax brackets.—This inference is obviously true for the investor with no taxable income. Section 175 would convey no financial incentive, whereas the entire ACP payment would be received free of taxes (assuming the payment itself did not raise income to a taxable level). In general, because ACP payments must be reported as ordinary income when received, direct cost-sharing may be substantially less attractive financially to upper tax bracket investors than to investors in the lower tax brackets because of progressivity of income tax rates.

4. ACP and section 175 combined is preferred by investors to ACP alone, but section 175 may be preferred to either ACP or ACP and section 175.—This inference should hold in general because features of the two programs complement each other. For example, the fact that an investor can deduct his contribution to the cost of the practice by electing section 175 tends to offset the requirement that the ACP cost-share assistance must be reported as taxable income. However, since ACP cost-sharing assistance averages 50 percent while section 175 is based on marginal tax rates that theoretically extend to 70 percent, election of section 175 alone might be preferred in some instances to either ACP or ACP plus section 175.

Conservation Deductions Claimed Under Section 175, 1969[48]

In 1969, slightly over 3 million proprietors filed farm income schedules (1040–F) with the Internal Revenue Service.[49] Most returns (over 99 percent) covered the calendar year 1968. Sole proprietorships

[47] The recapture provisions under the Tax Reform Act of 1969 substantially eliminate capital gain opportunities for investors holding the improved land for 5 years or less, and reduces the opportunity for investors holding land for more than 5 but less than 10 years. See notes 25, 26, *supra*.

[48] All tabular data in this section were obtained from special tabulations of the 1968 proprietorship tax model developed by the Statistic Division, Internal Revenue Service. The model is a stratified sample of about 45,000 farm tax returns. As is true for all estimates developed from a sample, estimates from the tax model are subject to sampling variability. For example, the estimated number of farm proprietorships (3,042,564) is subject to a relative sampling variability of 0.76 percent at the one standard deviation level. The relative sampling variability for the number of farm proprietors reporting conservation expenditures (190,325) is approximately 3.5 percent. For a description of the sampling method and sample variability, see U.S. Department of the Treasury, Internal Revenue Service, "Statistics of Income—1968: Business Income Tax Returns," Publication 438 (1–72), (Washington, D.C.: Government Printing Office, 1972) pp. 259–268.

[49] *Id.* table 2.3, p. 35.

accounted by far for the majority of the returns reporting farm earnings. Less than 80,000 partnerships and less than 20,000 corporations reported farm incomes in 1968.[50] Of the 3 million farm proprietors, 1.8 million (61 percent) reported net profits from farming (table 1).

Only 190,325 farm proprietors claimed conservation deductions in 1968. Of these, nearly 120,000 reported net profits—about the same percentage (63 percent) as for all farms. Total conservation expenditures claimed were $80.5 million. Farms with net losses accounted for 44 percent of the conservation deductions. The average deduction per return was $377 for those farms reporting profits, and $499 for those reporting losses.

TABLE 1.—NUMBER OF FARM PROPRIETORSHIPS WITH PROFITS, LOSSES, AND CONSERVATION DEDUCTIONS AND AMOUNTS OF CONSERVATION INVESTMENTS DEDUCTED, 1968

Item	Number or amount	Percent
All farm proprietors	3,042,564	100
With net profits	1,850,058	61
With net losses	1,192,506	39
All farms with conservation:		
Deductions	190,325	100
With net profits	119,520	63
With net losses	70,805	36
Total conservation deductions	$80,470,000	100
By farms with profits	45,123,000	56
By farms with losses	35,347,000	44

Source: Special tabulations, 1968 Proprietorship Tax Model, Internal Revenue Service.

Farm Business Receipts

Over half (56 percent) of the proprietors reporting 1968 farm earnings had business receipts of less than $5,000 (table 2). Forty-one percent reported less than $2,500 in receipts and more than half of this group (59 percent) reported net losses from farming. Less than 5 percent of farms with business receipts under $5,000 reported conservation deductions. This may indicate that small farmers infrequently undertake conservation; or, if undertaken, do not report it on their returns because they are unaware of the tax advantages or would gain no tax advantage from section 175. This latter possibility is consistent with the inferences drawn previously. Whatever the explanation, over half of all farm proprietors in 1968 were in business receipt classes with the lowest frequency of election of section 175.

TABLE 2.—NUMBER OF FARMS AND PERCENT WITH PROFITS AND WITH CONSERVATION DEDUCTIONS, BY SIZE OF BUSINESS RECEIPTS, 1968

Size of business receipts	Number of farms	Percent with profits	Percent with conservation
Less than $2,500	1,258,105	41.0	4.1
$2,500 under $5,000	442,558	62.0	5.1
$5,000 under $10,000	442,627	70.6	7.3
$10,000 under $20,000	449,291	81.6	8.3
$40,000 under $4C,000	293,941	85.2	10.0
$10,000 under $100,000	127,214	84.3	10.2
$200,000 and over	28,828	79.1	12.6
All	3,042,564	60.8	6.2

Source: Special tabulations, 1968 Proprietorship Tax Model, Internal Revenue Service.

[50] *Id.* table 3.1 p. 129; table 5.1, p. 215.

The proportion of proprietors claiming conservation deductions increases as the size of the business increases; 12.6 percent of those with business receipts of $100,000 or more reported conservation deductions. In subsequent sections we present data on farm profits and losses and off-farm income which also have a bearing on farmer election of section 175 but, in general, a positive relationship between farm business receipts and proportion of proprietors claiming conservation deductions is consistent with expectations derived from the models.

Table 3 presents frequency distributions of four categories of farm businesses: those with and without farm profits and those with and without conservation deductions. The significant comparisons in table 3 are between farms with and without conservation deductions. In both cases—whether the farms reported profits or losses—the distribution of farms reporting conservation expenditures is more heavily weighed toward farms with larger business receipts. Among the farms with net profits, a third of those with conservation deductions had gross receipts of $20,000 or more; less than a fifth of the farms without conservation reported comparable receipts. Several explanations of this difference are possible. First, high levels of entrepreneurship and business acumen are generally associated with large farming operations. These operators also may be more likely to receive professional tax advice, and therefore are likely to be more generally aware of provisions such as section 175. Second, proprietors of the larger business operations may, in general, be in better financial position to take advantage of tax-saving opportunities provided by section 175; also, the tax savings may be more valuable to them than to smaller operators, as suggested by the investment decision model.

TABLE 3.—FREQUENCY DISTRIBUTION OF FARMS WITH AND WITHOUT PROFITS AND WITH AND WITHOUT CONSERVATION DEDUCTIONS, BY SIZE OF BUSINESS RECEIPTS, 1968

[In percent]

Size of business receipts	Farms with profit		Farms with loss	
	With conservation	Without conservation	With conservation	Without conservation
Less than $2,500	16.4	28.6	44.8	63.4
$2,500 under $5,000	9.2	15.2	16.4	13.9
$5,000 under $10,000	18.9	16.8	14.4	10.7
$10,000 under $20,000	22.3	19.7	15.4	6.4
$20,000 under $40,000	21.4	13.0	5.4	3.5
$40,000 under $100,000	9.5	5.5	2.3	1.6
$100,000 and over	2.3	1.2	1.3	.5
Total	100.0	100.0	100.0	100.0

Source: Special tabulations, 1968 Proprietorship Tax Model, Internal Revenue Service.

The distribution of farms reporting net farm losses and conservation expenditures is also heavily weighed toward larger farm businesses as measured by gross receipts. Fifty-five percent of farms with both losses and conservation deductions had business receipts of $2,500 or more; less than 37 percent of the farms without conservation deductions had business receipts this large. As we will explain, many of the proprietors reporting farm losses also had substantial income from off-farm sources and presumably could use the farm loss (including the conservation deduction) to reduce income tax liabilities on total income.

Farm and Off-Farm Income

Tables 4 and 5 present income statements for proprietors reporting profits and losses from the farm business.[51] Nearly all farmers with profits (over 99 percent) also had off-farm income from salaries, wages, dividends, interest, or other miscellaneous sources.[52] Almost 80 percent of the farmers with conservation deductions reported income from agricultural programs.[53] From 5 to 21 percent, depending on size of the farm operation, reported other business income.

TABLE 4.—FARM AND OFF-FARM INCOME FOR FARMS WITH NET PROFIT AND WITH AND WITHOUT CONSERVATION EXPENDITURES, BY SIZE OF FARM BUSINESS RECEIPTS, 1968

Size of farm business receipts	Average farm profit	Average off-farm income[1]	Agricultural program payments[2]			Other business income		
			Participants (percent)	Average payment		Percent reporting[3]	Average	
				Per farm	Per participant		Profit[4]	Loss[4]
Farms with profit and with conservation:								
Less than $2,500	$413	$5,063	78.4	$404	$516	12.6	$4,757	(5)
$2,500 under $5,000	932	4,003	76.4	824	1,078	20.8	6,246	(5)
$5,000 under $10,000	1,716	3,108	72.6	864	1,196	10.2	5,709	(5)
$10,000 under $20,000	3,602	2,670	79.5	1,730	2,176	9.4	4,034	(5)
$20,000 under $40,000	5,970	2,006	79.6	2,840	3,567	5.2	4,978	(5)
$40,000 under $100,000	9,554	3,282	84.9	4,594	5,411	13.2	5,646	(5)
$100,000 or more	17,944	5,314	78.3	9,971	12,732	16.2	7,365	(5)
Total, all farms with profit and:								
Without conservation	3,876	3,245	78.2	1,964	2,511	10.7	5,159	4,621
Without conservation	2,933	3,530	56.0	1,056	1,886	12.8	5,003	3,179

[1] Includes salary and wages, dividends, interest and miscellaneous income (rents, royalties, etc.) but excludes other business income or loss.
[2] Includes price support, diversion and cost share payments received in cash; amounts paid by the Department of Agriculture for benefits received in material or services; and Commodity Credit Corporation loans forfeited or under election.
[3] Percent reporting either profit or loss.
[4] Average for those reporting profit and loss.
[5] Not reported because of sampling variability.

Source: Special tabulations, 1968 Proprietorship Tax Model, Internal Revenue Service.

Average off-farm income was highest for proprietors reporting either small or very large business receipts from farming (less than $2,500 or more than $100,000). This suggests that farming may be an incidental or supplemental income source on the small operations and, second, that proprietors of very large operations tend also to have other major sources of income. These two classes of farm proprietors are most likely to be affected by the limitation on the section 175 deduction.[54] Operators of farms with business receipts of $10,000 to $40,000 had relatively low off-farm incomes, and relatively few of them reported other business income. Proprietors in the intermediate business receipt classes ($10,000 to $40,000 or $100,000) appear to be predominately full-time farm operators.

[51] For an evaluation of the coverage of farm businesses by Federal tax return data, see Economic Research Service, "Farm and Off-Farm Income Reported on Federal Tax Returns," ERS-383 (Washington, D.C.: Government Printing Office, August 1968).
[52] In order to simplify tables 4 and 5, distributional data by size of business receipts are presented only for farms claiming conservation deductions. Significant distributional differences between farms with and without conservation deductions, if any, are noted in the text.
[53] Agricultural program income, as classified by Internal Revenue Service, includes price support payments, diversion payments and cost share payments received in cash; amounts paid by the Department of Agriculture for benefits received in material or services; and Commodity Credit Corporation loans forfeited or under election. Internal Revenue Service, "Statistics of Income-1968, Business Income Tax Returns" (Washington, D.C.: Government Printing Office, 1972), p. 249.
[54] The House report recognized the potential in section 175 for diverting nonfarm income into farmland improvement, and to discourage this the committee limited the amount of the deduction to 25 percent of gross income from farming. See pages 956, 957 and notes 23, 24 *supra*.

TABLE 5.—FARM AND OFF-FARM INCOME FOR FARMS WITH LOSS AND WITH AND WITHOUT CONSERVATION EXPENDITURES, BY SIZE OF FARM BUSINESS RECEIPTS, 1968

Size of farm business receipts	Average farm profit	Average off-farm income[1]	Agricultural program payments[2]			Other business income		
			Participants (percent)	Average payment		Percent reporting[3]	Average	
				Per farm	Per participant		Profit[4]	Loss[4]
Farms with loss and with conservation:								
Less than $2,500	$1,186	$11,184	65.4	$315	$481	14.6	$14,036	(5)
$2,500 under $5,000	2,266	9,768	77.9	678	871	19.6	14,213	(5)
$5,000 under $10,000	2,850	9,987	70.9	918	1,295	14.6	16,859	(5)
$10,000 under $20,000	3,777	8,848	85.5	1,872	2,189	28.3	9,220	(5)
$20,000 under $40,000	6,762	12,281	94.0	2,958	3,146	32.7	16,849	(5)
$40,000 under $100,000	12,018	28,171	66.4	3,971	5,983	38.7	21,637	(5)
$100,000 or more	23,678	39,791	82.7	4,711	5,732	54.1	87,063	(5)
Total, all farms with loss and:								
With conservation	2,936	11,244	73.2	987	1,349	19.6	16,763	10,857
Without conservation	1,967	9,137	36.6	408	1,115	22.5	9,575	5,169

[1] Includes salary and wages, dividends, interest and miscellaneous income (rents, royalties, etc.) but excludes other business profit or loss.
[2] Includes price support, diversion and cost share payments received in cash; amounts paid by the Department of Agriculture for benefits received in material or services; and Commodity Credit Corporation loans forfeited or under election.
[3] Average for those reporting profit and loss.
[4] Average for those reporting profit and loss.
[5] Not reported because of sampling variability.

Source: Special tabulations, 1968 proprietorship tax model, Internal Revenue Service.

Profitable farmers with deductions for conservation expenditures are apparently more successful as farmers than those without deductions. They reported greater farm profits, higher participation rates in agricultural programs and larger agricultural program payments They received slightly less income, on the average, from off-farm sources and fewer reported other business income.

Among proprietors reporting farm losses, there are substantial differences in income statements for those with and without conservation deductions (table 5). As a group, farmers reporting conservation expenditures appear to be more successful in terms of off-farm income. They reported substantially higher average off-farm incomes and greater profits (or losses) from other business sources. Against this they reported nearly $1,000 more in farm losses, on the average, than did farm proprietors without conservation deductions.

For every size of farm business, average off-farm income substantially exceeded the average farm loss. The presumption, therefore, is that farm losses, including the deduction for conservation, were used to offset income from off-farm or other business sources. This does not necessarily imply that conservation was undertaken in order to generate a farm business loss, or that every farmer had sufficient off-farm income against which he could offset the farm loss. In aggregate, however, it appears that substantial potential existed in 1968 for proprietors with net losses from farming to realize tax-savings from conservation expenditures, since they had substantial amounts of off-farm income.

Direct Treasury Costs

The costs of section 175 can be valued in terms of Treasury revenues foregone. Table 6, shows two estimates of these costs. The first, based on average tax rates paid by all farm proprietors in 1968, suggests that

the Federal income rax receipts were reduced that year by about $9.0 million. This estimate was made by computing, for each size of business receipts class, the net farm profit or loss (and, hence, total adjusted gross income) that would have been reported if the conservation expenditures had not been taken as deductions. Average tax rates (income taxes paid less credits as a percent of adjusted gross income) were then determined from published sources for each business-size class and used to estimate Treasury costs.[55]

The average tax rates reported in table 6 are based on actual taxes paid by all proprietors reporting farm earnings in 1968. Therefore, they reflect tax liabilities for "typical" agricultural proprietorship returns in that year. In evaluating a (small) change in tax receipts, however, it may be more appropriate to measure it at marginal tax rates. Therefore, the second estimate of Treasury cost in table 6 assumes that conservation is the marginal deduction; the implied Treasury cost is $16.6 million.[56]

TABLE 6.—COMPUTATION OF TREASURY COSTS FROM CONSERVATION DEDUCTIONS, 1968

Size of business receipts	Conservation deductions (thousands)	Average adjusted gross income			Estimated tax rate		Estimated Treasury costs	
		Farm [1]	Other [2]	Total	Average [3] (percent)	Marginal [4] (percent)	At average (thousands)	At margin (thousands)
Business with profits:								
Under $2,500	$1,953	$512	$5,634	$6,165	8.0	16	$156	$312
$2,500 under $5,000	2,938	1,198	5,026	6,224	8.1	16	238	470
$5,000 under $10,000	4,357	1,908	3,419	5,328	7.4	15	322	654
$10,000 under $20,000	8,730	3,930	3,046	6,977	8.6	16	751	1,397
$20,000 under $40,000	13,063	6,480	2,199	8,679	10.0	18	1,306	2,351
$40,000 under $100,000	7,747	10,237	3,916	13,153	13.8	22	1,069	1,704
$100,000 or more	6,335	20,264	4,453	24,718	18.6	32	1,178	2,027
Business with losses:								
Under $2,500	7,653	(1,139)	12,831	11,692	12.0	22	918	1,684
$2,500 under $5,000	4,653	(1,865)	11,864	9,999	11.0	19	512	884
$5,000 under $10,000	7,009	(2,162)	11,888	9,727	10.8	19	757	1,332
$10,000 under $20,000	6,341	(3,196)	10,702	7,506	9.0	18	571	1,141
$20,000 under $40,000	5,613	(5,314)	15,586	10,272	11.1	19	623	1,066
$40,000 under $100,000	2,070	(10,750)	29,912	19,162	16.0	28	331	580
$100,000 or more	2,008	(21,497)	79,896	58,489	29.0	50	582	1,004
All businesses:								
With profits	45,123	4,254	3,657	7,911			5,020	8,915
With losses	35,347	(2,437)	13,627	11,190			4,294	7,691
Total	80,470	1,765	7,366	9,131			9,314	16,606

[1] Farm profit or loss before deducting conservation expenses.
[2] Salaries and wages, interest, dividends, miscellaneous income and other business income less other business losses
[3] Estimated from Statistics of Income, 1968, Business Income Tax Returns, table 2.9, pp. 98–99.
[4] Estimated from Statistics of Income, 1968, Individual Income Tax Returns, table 3.3, pp. 100–102.

Source: Special tabulations, 1968 proprietorship tax model, Internal Revenue Service except as noted.

[55] Average tax rates were computed from data for all farm proprietorships taken from table 2.9, Business Income Tax Returns, *supra* note 53, at pages 98-99. Data from table 2.9 are presented y adjusted gross income (AGI) classes, rather than by size of business receipt classes used in table 6 above. In order to link the two ways of classifying data, the average (AGI) (and associated tax rate) was determined for each AGI class of table 2.9. Average tax rates for average AGI associated with the business receipt classes in table 6 were then estimated by interpolation.

[56] For this paper, we defined the marginal tax rate as the highest marginal rate paid by 50 percent or more of taxpayers in a given AGI class. It is not necessarily the highest rate paid by any taxpayer in a given AGI class but rather is the marginal rate paid by the majority of taxpayers in that class. Marginal rates were estimated from table 3.3. Internal Revenue Service, "Statistics of Income–1968, Individual Income Tax Returns" (Washington, D.C.: Government Printing Office, 1970).

In 1968, farm proprietors with AGI of less than $10,000 paid income taxes at slightly lower average rates than did all individuals with AGI under $10,000. Some small adjustments, on a judgment basis, were made in the marginal rates in order to maintain consistent relationships between the average and marginal tax rates reported in table 6.

The marginal rates used in table 6 are probably somewhat conservatively estimated. Thus, it seems reasonable to suggest that direct Treasury costs of section 175 in 1968 were between $9.3 and $16.6 million. In theory, a part of this revenue loss may be recaptured by the Treasury in the form of higher long-term earnings from the conservation practice, as suggested by the House report,[57] or in capital gains taxes on higher sale values of the improved land. Others have noted that the complementary effect of increasing soil productivity could, in the long run, also contribute to other agricultural program costs.[58] Therefore, any attempt to derive empirical estimates of long-run revenue effects of the conservation practices appears tenuous.

The Agricultural Conservation Program and Section 175

In 1968, there were 951,331 farms in the 50 States, Puerto Rico, and the Virgin Islands participating in regular ACP.[59] They received over $183 million in cost-shares—an average of $193 per farm. Assuming an average Federal cost-share rate of 50 percent, this implies that the 1968 ACP program induced or shared in the undertaking of $366 million in conservation practices at an average investment of $386 per farm.[60] ACP, or REAP, is by far the largest of the direct payment, natural resource programs listed by the Joint Economic Committee staff.[61]

The ACP program has attracted relatively little attention from economists or program analysts.[62] In 1965, Held and Clawson included a review of ACP in their comprehensive analysis of soil conservation programs but they were primarily concerned with the physical accomplishments of the program since its beginning.[63] They note, however, that the original ACP program included elements of income assistance as well as soil conservation. Since farmers have to perform some soil conservation action in order to qualify for payment, they argue that: "Under these circumstances it seems fairly certain that the program stimulated some soil conservation that otherwise would not have taken place; how much, it is very difficult to say." [64]

Unfortunately for our purposes, information about participants in ACP comparable to the tax data on farm proprietors is not available.[65]

[57] See note 11, *supra*.

[58] *See* Melvin L. Cotner, "The Impact of the Agricultural Conservation Program in Selected Farm Policy Problem Areas," *Agricultural Economics* Mimeo. 943 (East Lansing Mich.: Department of Agricultural Economics, Michigan State University, 1964), p. 11.

[59] Agricultural Stabilization and Conservation Service, "1968 Agricultural Conservation Program Accomplishments" (Washington, D.C.: ASCS, April 1969).

[60] The assumption of private investments approximately matching Federal expenditures on a national basis has been used by the Agricultural Stabilization and Conservation Service. See Agricultural Stabilization and Conservation Service, "Agricultural Conservation Program: Annual Report for 1970" (May 1971), p. 1.

[61] Staff of Joint Economic Committee, 92d Congress, first session, "The Economics of Federal Subsidy Programs" 167 (Joint Committee Print 1972).

[62] For a discussion of the problems inherent in measuring the accomplishments of soil conservation programs see R. Burnell Held and Marion Clawson, "Soil Conservation in Perspective" (Baltimore: Johns Hopkins Press for Resources for the Future, Inc., 1965), pp. 152–154.

[63] *Id.* at 175–192.

[64] *Id.* at 176.

[65] Some evidence about participants in a Federal cost sharing program is available from a study of the Great Plains conservation program (GPCP). The GPCP, created by Public Law 84–1021 in 1956, was specifically designed for special conservation problems of the 10 Great Plains States but has operational features similar to ACP. A study of a 14-county area in Kansas and Colorado found that participants in the GPCP tended to operate larger farms, have a higher proportion of farms with large annual gross sales, be slightly better educated and have more experience in other Government programs than did the nonparticipants. See, James Kasal and W. B. Back, "An Economic Evaluation of the Great Plains Conservation Program." ERS-440 (Washington, D.C.: Economic Research Service, U.S. Department of Agriculture, July 1970).

Consequently, it is not possible to make direct comparisons of income levels or similar characteristics of participants in the two programs. However, based on the Agricultural Stabilization and Conservation Service records of annual program expenditures, we can compare several features of the two programs; in the following section we compare section 175 and ACP in terms of incentives for conservation, distributive equity, and program control.

Incentives for Conservation

It is difficult to definitively evaluate the incentive effect of either ACP or section 175 because we are unable to determine how much of the conservation associated with the two programs would have been undertaken without them. If individuals would have undertaken comparable amounts of conservation without ACP or a tax subsidy, the programs must be judged ineffective in inducing conservation and should be evaluated in terms of income transfers or other goals.[66]

Since a 50-percent cost-share rate is higher than the marginal tax rate for the majority of farmer-landowners, one might expect ACP to be relatively more effective in encouraging conservation practices than section 175. On the other hand, ACP has been characterized by small cost-share payments and it seems unlikely that such payments would generally induce conservation practices to which the investor was not already favorably disposed. Recent data on the distribution of ACP payments are limited; however, a partial accounting of 1970 ACP payments [67] indicates that about 58 percent of the direct payments in that year were under $100 and averaged only $36 (table 7). Over 90 percent of the 1970 participants received less than $500.[68]

TABLE 7.—DISTRIBUTION OF ACP PAYMENTS, CALENDAR YEAR 1970

Size of total payment	Farms		Average ACP payment
	Number	Percent	
Under $100	324,216	57.9	$36
$100 under $200	98,213	17.5	142
$200 under $500	92,229	16.5	303
$500 under $700	18,171	3.2	580
$700 under $1,000	12,694	2.3	826
$1,000 under $2,000	11,807	2.1	1,288
$2,000 under $5,000	2,457	.4	2,531
$5,000 or more	90	.1	4,756
Total	559,877	100.0	173

Source: From data supplied by Agricultural Stabilization and Conservation Service, USDA. Does not include vendor payments for conservation supplies and materials. Data are based on calendar year and may not agree with published ASCS data for the "program" year.

[66] For further discussion of this point see Melvin L. Cotner, "The Impact of the Agricultural Conservation Program in Selected Farm Policy Areas," *Agricultural Economics* Mimeo. 943 (East Lansing, Mich.: Department of Agricultural Economics, Michigan State University, 1964), p. 13.

[67] Unpublished data obtained from the Agricultural Stabilization and Conservation Service. These data include only direct payments to farmer participants, including small cost-share increases for low-income farmers, and exclude payments to vendors for conservation supplies and material. Therefore, the percentage distribution and average payments may vary if all payments (direct and vendor) were included. In particular, it is possible that many farmers who undertake small conservation practices elect to receive assistance in materials or services rather than cash. Therefore, the average payments in the smallest payment classes of table 7 conceivably could be larger if the cash value of conservation materials and services were included.

[68] It is generally recognized by ASCS officials that typical payments under ACP may have been too small, in many cases, to effectively accomplish needed farm conservation practices. Under the rural environmental assistance program, policy has been shifted to encourage flexibility in the annual distribution of State or county funds to concentrate assistance on more effective environmental improvement projects. In the first year of REAP, 1971, the average cost-share payment was $233, as compared to $173 in 1970.

For Section 175, we may reasonably presume that most deductions of less than $100 are investments that would have been made without the section. This is particularly true for proprietors reporting conservation expenditures and low gross incomes, since their low effective tax rate would reduce any tax savings to insignificant levels.

For taxpayers reporting large deductions, the presumption is that potential tax savings were a factor in the decision and, therefore, section 175 was successful in inducing conservation. Although the total number of proprietors claiming conservation deductions in 1968 was only a fifth the number of landowners receiving ACP assistance for conservation in 1970, the number of proprietors reporting conservation investments over $1,000 to IRS appears to substantially exceed the number receiving ACP assistance of $1,000 or more, after allowing for the incomplete reporting of 1970 ACP payments. Even if matching investor contributions to ACP are included, it continues to appear that section 175 is relatively more effective than ACP at inducing large conservation investments.

Proprietors claiming large conservation deductions tend to have large farming operations, as measured by business receipts—table 8. Since the $2,500 cost-share limitation of the ACP program would be expected to be most limiting to the large farm operations—particularly for large acreage farms—section 175 may be a useful complement to the ACP in inducing conservation on large farms. However, because the large farms tend also to have high combined farm and off-farm income, the large deductions under section 175 are also the most expensive in terms of revenue costs. These benefits are received by few investors. For example, 0.7 percent of all farm proprietors claiming deductions under section 175—1,349 farmers—accounted for 14.3 percent of all deductions claimed.

TABLE 8.—FARM BUSINESSES WITH CONSERVATION DEDUCTIONS AND WITH NET PROFITS OR LOSSES; BY SIZE OF CONSERVATION DEDUCTION, 1968

Size of deduction	Farms		Average		
	Number	Percent	Business receipts	Profit (loss)	Conservation deduction
Businesses with profit:					
Under $100	54,246	45.4	$15,078	$3,246	$31
$100 under $500	42,447	35.5	18,876	3,436	238
$500 under $1,000	10,659	8.9	32,141	5,555	706
$1,000 under $5,000	11,468	9.6	39,763	6,320	1,741
$5,000 under $10,000	559	.5	155,129	14,050	6,256
$10,000 or more	141	.1	137,921	13,128	16,624
All	119,520	100.0	21,117	3,876	377
Businesses with losses:					
Under $100	27,077	38.2	5,080	(1,768)	37
$100 under $500	24,490	34.6	9,999	(2,279)	244
$500 under $1,000	9,420	13.3	8,421	(3,481)	672
$1,000 under $5,000	9,169	12.9	18,224	(4,965)	1,788
$5,000 under $10,000	550	.8	46,891	(30,562)	6,753
$10,000 or more	99	.9	201,747	(91,626)	19,495
All	70,805	100.0	9,525	(2,937)	499

Source: Special tabulations, 1968 Proprietorship Tax Model, Internal Revenue Service.

The data do not permit an empirical examination of the extent to which the two programs reinforce each other in practice, although it is reasonable to expect that most recipients of ACP assistance also elect

to deduct their contribution to the cost of the practice—assuming awareness of section 175—in order to offset the tax liability created by the cost sharing. But, again, for the majority of investors receiving small amounts of ACP assistance, the tax considerations are probably minor.

Distributive Equity

In 1964, ASCS undertook a study that matched frequency distributions of farms and farmland of participants in the 1964 ACP program with data on all farms from the 1964 Census of Agriculture.[69] As the Lorenz curves in figure 1 indicate,[70] the distribution of farmland among farmer-participants in ACP was very similar to the distribution of all farmland among all farm operators in 1964. The similarity of the two distributions suggests that large and small farm operators, measured by acres of land operated, participated in the 1964 ACP about in proportion to their presence in the universe of all farm operators.

James Bonnen has analyzed the distribution of program benefits from a number of farm programs and concludes that payments under ACP have been much more equally distributed—less concentrated—than have most farm subsidy payments.[71] He found, for example, that the top 20 percent of all farmers, ranked by size of farm, received 39.2 percent of ACP payments. This is a much less concentrated distribution than payments under some commodity price-support programs; for example, the top 20 percent of farmers participating in the 1965 sugar cane program received 83.1 percent of the payments of that program. Comparable figures for the 1964 cotton program and the 1963 rice program were 69.2 and 65.3 percent, respectively.[72]

Bonnen noted that the ACP was administered in a manner to assure the largest number of participants and that program features such as the payment limitation tended to give a more nearly equal distribution of program benefits among program participants. This effect shows in the relative concentration ratios—Gini coefficients [73]—implied by the Lorenze curve for ACP payments in figure 1. The Gini coefficient for the distribution of ACP payments among participating farm operators—ranked by size of farm—was 0.27. In contrast, the Gini coefficients for the distributions of farmland among ACP participants and all 1964 farm operators were 0.66 and 0.69, respectively. Thus, the ACP payments were much less concentrated—more equitably distributed—than was land in farms in 1964. Bonnen noted, however, that payment limitations on a per farm basis regardless of size of farm are not necessarily efficient or effective from a conservative viewpoint.[74]

[69] Agricultural Conservation and Stabilization Service, *Agricultural Conservation Program: 1964 Frequency Distribution of Farms and Farmland* (Washington, D.C.: Government Printing Office, January 1966).

[70] A Lorenz curve is a graphical representation of the way some quantity, such as land in farms or ACP payments, is distributed among some population, such as farmers. The curve is obtained by plotting the cumulative percentage of persons (farmers) against the cumulative percentage of land operated or ACP payments received. The diagonal line in fig. 1 represents the Lorenz curve if income is equally distributed. The more the computed Lorenz curve falls away from the diagonal, the more unequal is the land or income distributed.

[71] James T. Bonnen, "The Absence of Knowledge of Distributional Impacts: An Obstacle to Effective Public Program Analysis and Decisions," "The Analysis and Evaluation of Public Expenditures: The PPB System," I, 440-441, 91st Cong., first sess. (Joint Committee Print 1969).

[72] *Id.* at 440.

[73] Gini coefficient are based on Lorenz curves and are measures of the area between the diagonal and the Lorenz curve expressed as a ratio to the total area under the diagonal. If income or land is exactly equally distributed, the Gini coefficient would be zero. The higher the Gini coefficient the more concentrated or unequally distributed is the attribute being measured.

[74] Bonnen, *supra* note 71 at 442.

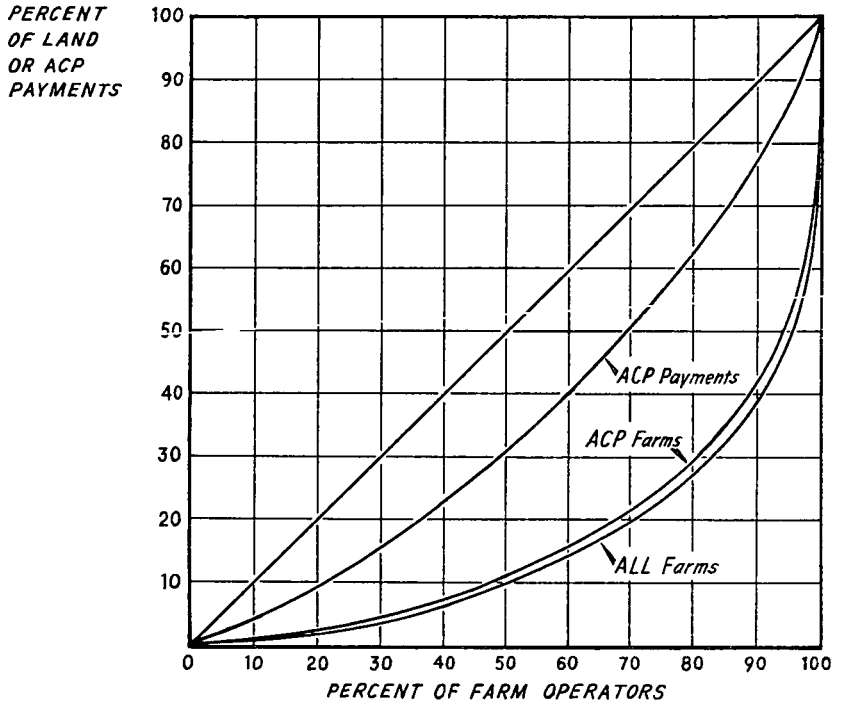

FIGURE 1.—Lorenz curves for the distribution of ACP payments and of land in farms for ACP participants and all farmers, 1964.

We do not have a comparable ranking by farm size for proprietors claiming conservation deductions, but the tax data suggest that the distribution of benefits is more concentrated under section 175 than under ACP. This is clearly true when the recipients are ranked by size of payment, table 9. By this measure of concentration, the Gini coefficient is 0.58 for ACP payments and 0.67 for the section 175 deductions.

TABLE 9.—CUMULATIVE DISTRIBUTIONS OF RECIPIENTS AND ACP PAYMENTS, 1970, CONSERVATION DEDUCTIONS, 1968, BY SIZE OF PAYMENT OR DEDUCTION

[In percent]

Size of payment or deduction	ACP		Section 175	
	Number of payees	Amount of assistance	Number of claimees	Amount of deduction
Under $100	57.9	12.1	42.7	3.4
$100 under $500	91.9	55.4	77.9	23.3
$500 under $1,000	97.4	77.1	88.5	40.6
$1,000 under $5,000	99.9	99.2	99.3	85.7
$5,000 or more	100.0	100.0	100.0	100.0
Gini coefficient	0.58		0.67	

Source: See tables 7 and 8.

Control Over Programs

The degree of control over program costs and program implementation is obviously high for ACP. Since the cost-share applications and agreements are evaluated individually, county ASC committees determine rather specifically cost-share practices and the number and dollar magnitude of the cost-share agreements. They have authority to insure that practices are actually installed. Within political and legislative constraints, State and national ASCS officials have discretion in determining levels and geographic distribution of ACP funds. Finally, of course, the Office of Management and Budget and the Congress determine ACP funding levels and scope of operation.

In contrast, as is generally recognized,[75] it is much more difficult to exercise effective administrative control over tax incentive programs. Within general legislative and administrative constraints, the qualifying farmer has considerable discretion as to the type and location of conservation measures undertaken under section 175. Investments made are based on the farmer's perception of his need with no consideration given to social needs or priorities for conservation among farmers or among farmlands.

Certain qualifications on the application of section 175, which are justified for tax reasons, can be undesirable from the standpoint of conservation. For example, since the deduction can be used only for nondepreciable conservation expenditures, it discourages investments in depreciable items which may in some cases be more effective as conservation measures.[76] From a Federal policy standpoint, the only control over the timing and scope of individual investments is the farm income limitation and there may be no relationship between socially desired levels of conservation and farmers' income. Further, costs to the Treasury are unpredictable and not subject to Treasury control. Actual performance of the conservation can be assured only through enforcement of the income tax law and there are no requirements that the conservation measures meet technical standards.

[75] Daniel M. Holland, "An Evaluation of Tax Incentives for On-the-Job Training of the Disadvantaged," 2 the *Bell Journal of Economics and Management Science* (Spring 1971), pp. 296–299. Annual Report of the Secretary of the Treasury on the State of Finances for the Fiscal Year Ended June 30, 1968, Treasury Document No. 3245 (Washington, D.C.: Government Printing Office, 1969), p. 325 (remarks by Assistant Secretary Surrey).

[76] For example, open irrigation ditches qualify under section 175 but underground tile or concrete pipelines do not. The latter is a more efficient means of distributing water from a water conservation standpoint. See Hearings on H.R. 8300 Before the Senate Committee on Finance, 83d Cong., 2d Sess. 2114, 2345–2348 (1954). As has been previously noted, depreciable items are included in a number of practices recommended and cost-shared by the Agricultural Stabilization and Conservation Service under ACP. See, *e.g.* note 41 *supra*.

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