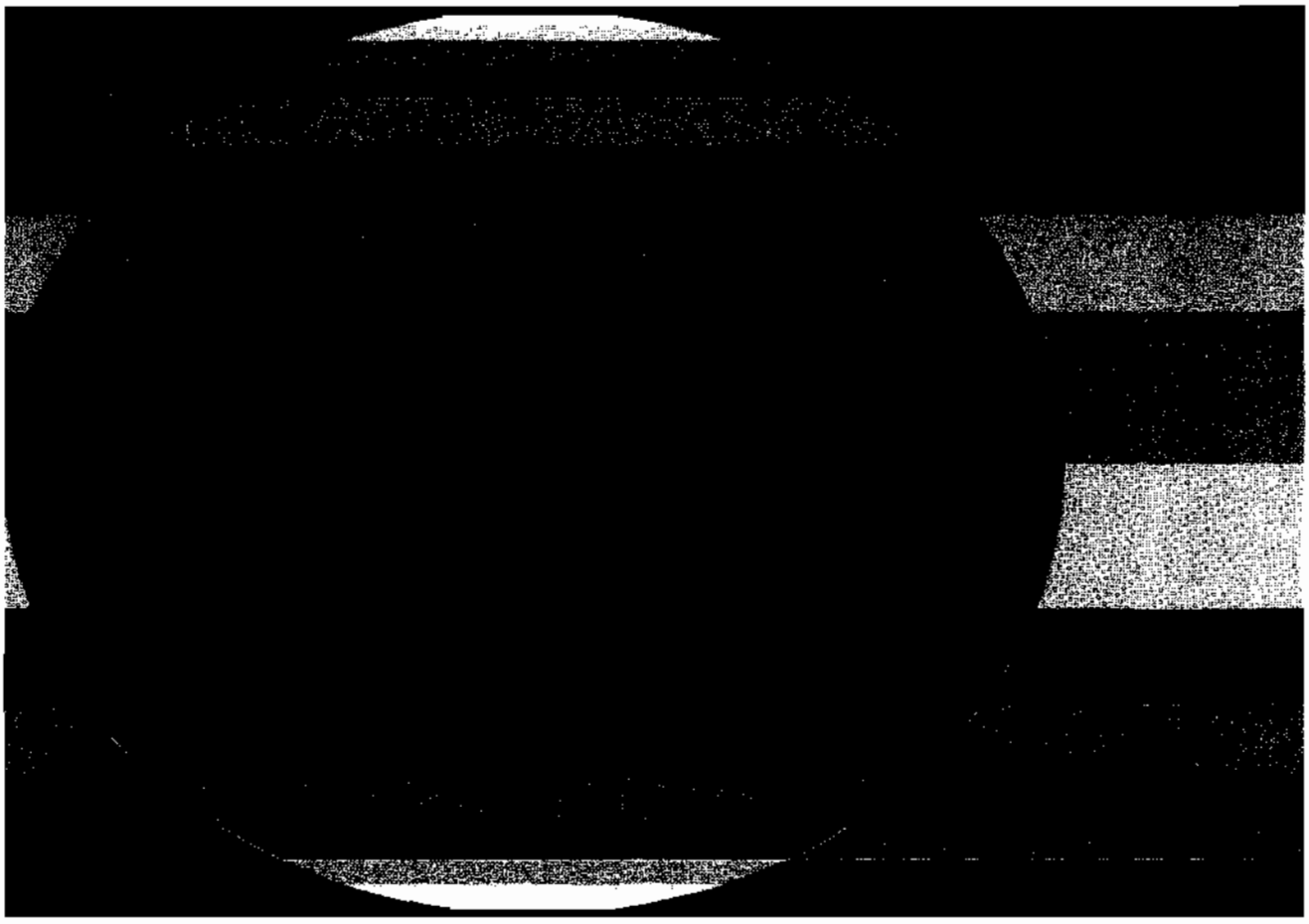
BACKGROUND PAPER

Public Policy and the Changing Structure of American Agriculture

September 1978



Congress of the United States
Congressional Budget Office

ERRATA

Public Policy and the Changing Structure of American Agriculture

The reader should be aware of errors on pages 46 and 47. On page 46, lines 4-6 of the first full paragraph should read "The value of government-held stocks peaked at slightly more than $8.0 billion in 1960 and 1961, and direct payments to farmers climbed to about $4.0 billion in 1972." On page 47, Table 8, insert 7.4 for 1965 and 5.4 for 1970 in column 3, "Government Commodity Stocks, Jan. 1." Column 4, "All Farms," should read as follows: 0.1, 0.7, 2.5, 3.7, 4.0, 2.6, 0.5, and 0.6.

PUBLIC POLICY AND THE CHANGING STRUCTURE OF AMERICAN AGRICULTURE

The Congress of the United States
Congressional Budget Office

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PREFACE

American agriculture is changing. Farms have become fewer and larger, capital-intensive, more specialized, and highly dependent on the nonfarm sector for production inputs. Marketing channels have changed to accommodate the demands of an urbanized society, sometimes greatly reducing the bargaining power of individual farmers. Public policies adopted by the Congress, though certainly not the only determinant of structure, have contributed to the changes described above. Commodity price and income supports, tax rules, agricultural credit, and research have been influential for many years. And legislation has recently been proposed to help young people get started in farming, to regulate contractual agreements between farmers and processors, and to prohibit the entry of "outside" capital into farming.

At the request of the House Subcommittee on Family Farms, Rural Development and Special Studies, the Congressional Budget Office has prepared this Background Paper, Public Policy and the Changing Structure of American Agriculture. The study discusses the changing structural organization of agriculture, factors that are causing it to change, and consequences of alternative future structures. Special attention is directed to the impact of public policies on the future of agriculture. In keeping with CBO's mandate to provide an objective and nonpartisan analysis of issues before the Congress, no recommendations are offered.

The principal author of this paper is Peter M. Emerson. The paper was prepared in CBO's Natural Resource and Commerce Division under the direction of Assistant Director Raymond C. Scheppach. The author particularly wishes to acknowledge the contributions of Lynn M. Daft, who initiated the project, and James G. Vertrees, who provided many constructive comments and suggestions. This paper has received extensive external review. Marion F. Houstoun edited the manuscript and Misi Lenci prepared it for publication.

Alice M. Rivlin
Director

August 1978

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SUMMARY

"Farmers are typically people whose assets are in real property and whose liabilities are in money."

—David Kirk

The structure of American agriculture is changing. Farms are becoming fewer in number, larger in size, highly specialized in production, and more dependent on the nonfarm sector. Old patterns of resource ownership, financing, and decision making are breaking down. And today some farmers who invested in new equipment and land to meet expanding export demand in the early 1970s face financial hardship due to lower world grain prices and inflation-fed production costs. These changes in the structural organization and performance of the U.S. farm sector raise three questions of interest to public policymakers:

- How and why is the structure of agriculture changing?
- What difference does it make--and to whom?
- Are the major changes in structure taking us where we want to go? If not, can public policy be used to do something about it?

The Changing Farm Sector

In 1945, there were 5.9 million farms, and a farm labor force (farm operators, hired workers, and unpaid family workers) of nearly 11 million; today, there are 2.7 million farms and about 4 million workers. Such substantial resource adjustments in farming are not surprising, given the steady introduction of new technology—particularly, farm mechanization. Big machines, such as a 4-wheel drive tractor, encourage farm-size growth by allowing a single operator to farm many more acres per unit of time. In what is described as "economic cannibalism from within agriculture," small farms are being replaced by much larger farms using modern machines and production practices to achieve higher incomes and a rising standard of living. As a result, a typical modern farm may now require sophisticated managerial skills and a capital investment of a half-million dollars or more.

The structure of agriculture is determined by the interaction of several factors, but public policy is one of the most important. Although nearly all public programs are enacted to help family owned and operated farms, benefits are generally distributed in direct proportion to their volume of output, leaving little doubt that public policy has discouraged small farms. Commodity programs, which have been used to support and stabilize farm prices and incomes since the 1930s, provide an excellent example of the way in which public policies have created greater concentration in farming. Expansion-oriented farmers have converted program benefits—reduced uncertainty, higher market prices, and government payments—into additional land, modern machines, and highly specialized production processes. Since the benefits of commodity programs have been capitalized into land values, the programs reward the role of landowner rather than the role of farm operator or farm worker.

Federal tax policy extends special treatment to individuals engaged in agricultural production; encourages the conversion of farm income into capital gain, which is taxable at a lower rate; and allows investment tax credits and accelerated depreciation. These provisions tend to attract additional capital into farming, encourage rapid mechanization, and yield absolute benefits in direct proportion to taxable income. Once again, the final outcome is a capital-intensive agriculture with high land prices and fewer farms.

The impact on farm structure of other public policies are best described as mixed. For example, government-subsidized agricultural credit assists young farmers and small-scale farmers who cannot obtain credit elsewhere, but it also increases the supply of credit, thereby promoting the expansion of existing farms. And while many aspects of agricultural research and extension are neutral with respect to farm size, relatively more attention has been directed to the production and marketing problems of large farms.

Consequences of Structural Change

Despite these structural changes, the U.S. farm sector is highly heterogeneous. Today, there are many sizes and types of farms and many different production practices and marketing arrangements; in addition, there are substantial variations in the level, source, and stability of farm family income.

In 1977, there were 162,000 farms with annual gross sales of $100,000 or more. These "large farms" accounted for only about 6 percent of all farms, though they contributed 53 percent of total cash receipts from

farming that year. Their average income per farm, which includes all off-farm income of the farm operator and his family, was nearly $48,000; 80 percent of that income came from farming.

About 70 percent of all farms in 1977--nearly 2 million farms--had annual gross sales of less than $20,000. These "small farms" accounted for only 11 percent of all cash receipts from farming. Their average income per farm operator family was estimated to be more than $15,000, but 85 percent of that income came from off-farm sources. Although the incidence of poverty among farm families has dropped dramatically during the last few decades, between 15 and 20 percent of the small-farm population today falls below the official "poverty line."

Farms can be classified according to the degree of their differentiation between capital ownership, management, and labor as well as according to the amount of their annual sales. Although there is no universally accepted definition of a family owned and operated farm, for statistical purposes, a family farm is commonly defined as any farm that annually uses less than 1.5 man-years of hired labor and is not operated by a hired manager. On the basis of that definition, an estimated 90 percent of all farms today are family farms. These farms play a leading role in food and feed grain production, dairying, most livestock enterprises, tobacco, and most diversified farming. Family farms vary widely according to their cash receipts; but together they account for 60 percent of total cash receipts from farming.

The remaining farms in U.S. agriculture today can be classified as industrialized farms, that is, farms that use assembly-line production techniques and have highly differentiated capital ownership, management, and labor; or larger-than-family farms--nonindustrialized farms that use more than 1.5 man-years of hired labor. Only 2 percent or less of all farms today are industrialized, but they account for from 15 to 20 percent of all cash receipts from farming. These farms are most often found in broiler chickens, sugar cane, citrus fruit, seed production, some processing fruits and vegetables, and cattle feeding. Larger-than-family farms (4 to 8 percent of all farms) contribute 20 to 25 percent of total cash receipts. These farms produce many kinds of agricultural commodities and they are most prevalent in the West and South, which have historically had larger than average farms.

As farms today are becoming more highly mechanized, specialized, and closely tied to the nonfarm sector, farmers compete vigorously for the limited amount of available farmland. The price of land is therefore rising, leaving established farm owners in a strong equity position, which they often

use to finance newer machinery and to expand their land base. Some probable consequences of this ongoing process are:

- o Increasing reliance on production and marketing practices that require large-scale and specialized farm operations;
- o Higher capital requirements for farming, making it difficult for young people to enter farming and creating cash flow problems for heavily indebted farmers when commodity prices fall;
- o Increasing displacement of farm operators and farmworkers who would prefer to remain in farming or who are not prepared for nonfarm employment;
- o Fewer farm families and workers to patronize businesses in rural communities, resulting in contraction of the local labor force, fewer public services, and reduced participation in social and civic organizations.
- o These steadily rising land prices, and favorable tax treatment, attract individuals and businesses to farmland as an investment opportunity and hedge against inflation rather than as a primary means of income. Pressure to separate land ownership from farming therefore mounts, and farmers may ultimately be outbid in the land market.

Alternative Future Structures

The public policies now in place ensure a continuation of the current trend toward fewer, larger and more specialized farms; nevertheless, the majority would continue to be family owned and operated. If current policies are pursued, there will be about 1.6 million farms in 2000, with returns to individual farmers varying greatly according to farm size and other farm resources. If policymakers desire, specific changes in public policies--for example, targeting the benefits of commodity programs to smaller, diversified farms--could decelerate the current structural trend and increase the number of farms, by .3 to .4 million, to 1.9 or 2.0 million in 2000. Alternatively, public policies could be used to reduce the production costs of large farms and encourage closer coordination with the nonfarm sector through contracting and direct ownership. These strategies would accelerate the current trend and would probably further decrease the number of farms, by .6 to .7 million, to 0.9 to 1.0 million in 2000.

Accelerating the current trend would primarily benefit the consumers and relatively few owners of the largest farms. Lower production costs and fewer farms might increase average net farm income by 25 percent and decrease retail food prices by 3 to 5 percent, as compared with continuing the current trend. This relative decline in retail food prices is based on the assumption that efficiencies gained from accelerating the current trend would be reflected forward to consumers. Under any alternative farm structure, retail food prices are expected to rise in future years, primarily because of increased processing and marketing services and higher wages.

Accelerating the current trend would, however, impose major costs on rural communities: total cash receipts to the farm sector would fall, farm employment would decline, and local economic activity would contract. Thus, though society would gain an efficiency-oriented farm sector under this option, farm income would be skewed in favor of a few large farms, rural communities would suffer, and the decrease in the number of farms would increase the possibility of interruptions in food supply.

Slowing down the current trend toward larger and fewer farms would stimulate income generation in local economies and rural communities, but this option would also lower average net farm income and raise food prices. As compared with continuing the current trend, the higher total cash receipts and higher employment in the farm sector under this option might cause secondary income generation to rise 15 percent, average net farm income might fall as much as 20 percent, and retail food prices might rise 3 percent. Federal budget costs would also increase, because decelerating the current structural trend would require more government support of farm incomes and rural industrialization. However, if continuing or accelerating the current trend led to substantial increases in federal spending in order to assist people displaced from farming, this difference could be reversed.

In short, in percentage terms, food price differences under the three alternatives considered here—continuing, decelerating, or accelerating the current trend toward larger and more specialized farms—appear modest, as compared with the trade-offs involved in total cash receipts to farming, the level and distribution of net farm income, and the viability of rural communities. Thus, the highly publicized conflict between farmers and consumers—higher commodity prices versus lower retail food prices—may not be a primary consideration in decisions concerning the future structure of agriculture.

CHAPTER I. INTRODUCTION

From its earliest days, American agriculture has been characterized by a large number of relatively small, family-owned and operated farms, and the "family farm" soon came to be viewed as an integral part of our cultural experience, as an American heritage. Similarly, from its very beginnings, U.S. agricultural policy has been dominated by the Jeffersonian principle, if not always the practice, that "small land holders are the most precious part of a state."

The U.S. farm sector today is one of the last surviving examples of an industry that even remotely resembles the textbook description of pure competition, in the sense that most farms remain relatively small, individual farmers continue to lack price-setting power, and they are comparatively free to enter or leave farming. Nevertheless, the U.S. farm sector is neither as stable nor as homogeneous as it appears in nostalgic, and often selective, memory.

This paper is concerned with the impact of public policy on American agriculture. More specifically, it seeks to describe the changing structure of agriculture (the number and size of farms, barriers to entry, resource ownership and control, modes of organization, and market power); present the key determinants of that structure; and outline public policy options that could be used to influence its future structure. Chapter I introduces the subject with a brief explanation of how and why the U.S. farm sector is changing and a discussion of several policy questions that suggest a relationship between farm structure and public policy.

Changes In the U.S. Farm Sector

Farming in the United States has changed greatly during the past few decades. In the late 1930s, the number of farms peaked at 6.8 million; by 1945, it had declined to 5.9 million; and in 1977, there were only 2.7 million farms (see Figure 1). Farm numbers today continue to decline, though at a much slower rate than prevailed in the 1950s. 1/ As the number of farms

1/ Figure 1 suggests, however, that the annual decline in farm numbers may now be accelerating again, bringing to an end a decelerating trend that lasted about 15 years.

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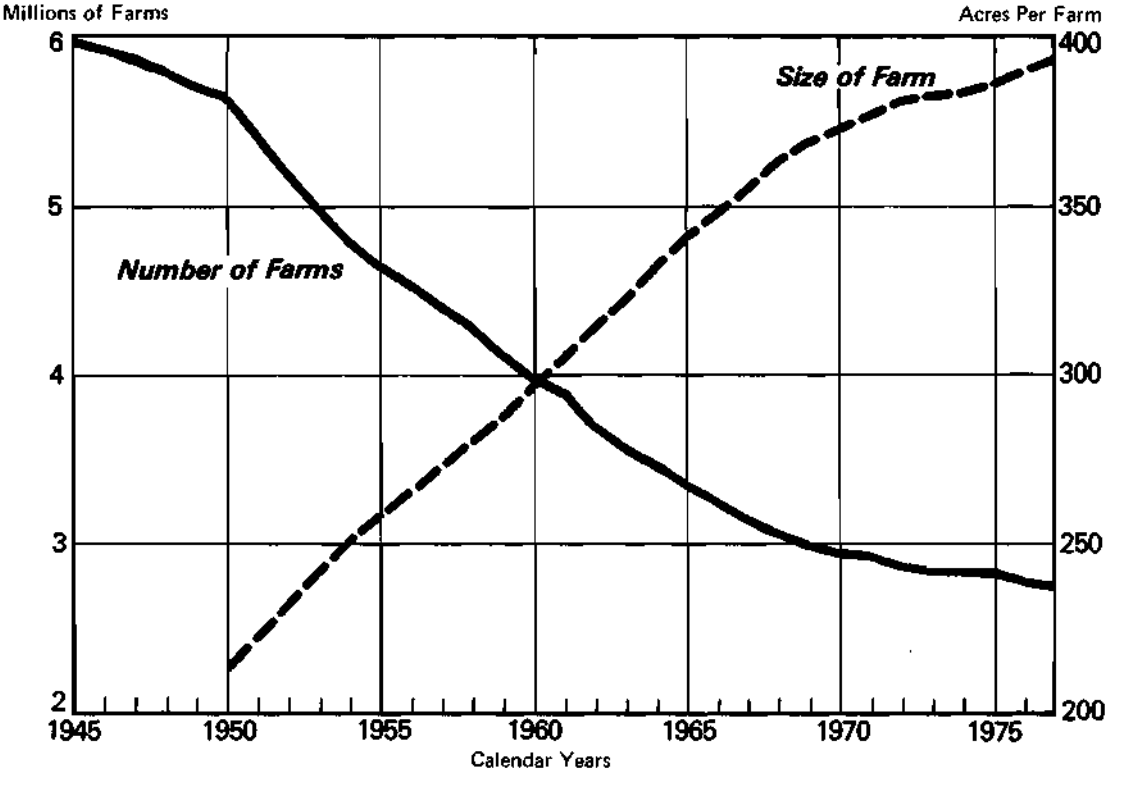
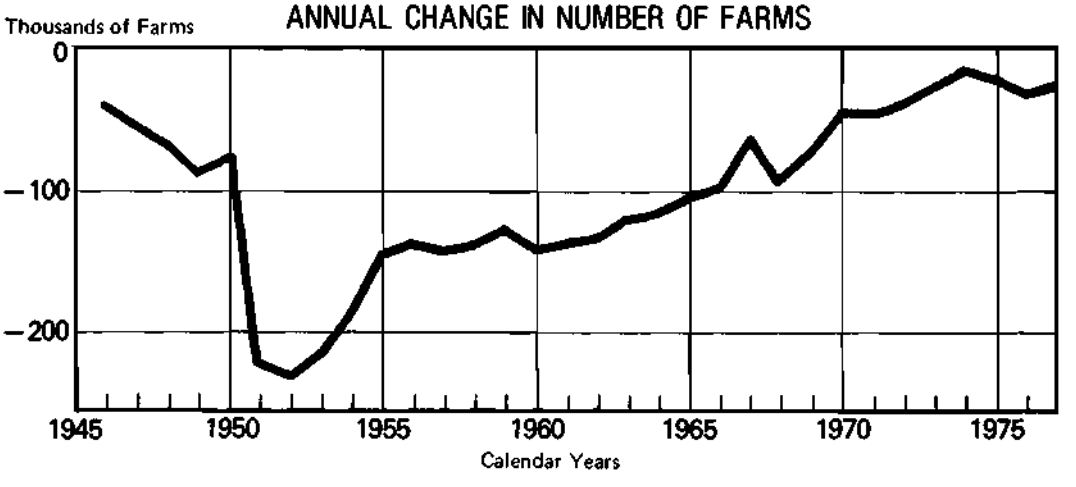
Figure 1.

The Changing U.S. Farm Sector, 1945 - 1977

NUMBER OF FARMS AND NUMBER OF ACRES PER FARM



ANNUAL CHANGE IN NUMBER OF FARMS



Source: U.S. Department of Agriculture, *Agricultural Statistics, 1977,* p. 422.

decreased, their average size and value increased. In 1950, all farms averaged about 210 acres and $43,000 in total assets; today, the average farm has around 400 acres and $106,000 in total assets (farm assets are valued in 1967 prices for comparability). Moreover, during the last two decades, the number of farms of 500 acres or more increased, while the number of farms of less than 180 acres fell sharply. Between 1945 and 1977, the total farm labor force (that is, all farm operators, hired workers, and unpaid family workers) also declined precipitously, from nearly 11 million to only slightly more than 4 million workers. Opportunities to enter farming likewise decreased--and modern farm technology and management increasingly require large capital investments, sophisticated managerial skills, and a high level of technical expertise from farm owners and operators.

Modern technology and postwar industrialization have profoundly affected farming, farm productivity, and the organization and control of farm resources—and there is considerable evidence to suggest that such structural changes will continue to occur. 2/ The prosperous but labor-scarce years of World War II helped initiate a wave of farm mechanization, which radically increased farm productivity. To utilize the new machines fully, farmers purchased or leased land previously farmed by their neighbors. Hence, mechanization not only displaced farmworkers, it also led to an increase in the size of farms and in the amount of capital and the kinds of skills needed to sustain them. This, in turn, led to a decrease in the number of both farms and farmers.

Important functions once performed on the farm--such as the manufacture of feed, fertilizer, seeds, and fuel, and the processing, storing, distribution, and marketing of farm products—shifted from the farm to the nonfarm sector. Purchased inputs, for example, now account for about 55 percent of the total farm input bundle, as compared with 44 percent in 1950. 3/ Further, as specialization increased and agribusiness flourished, jobs moved away from rural communities as well as off the farm.

In addition, farm product prices since the Korean War have declined relative to the prices that farmers pay for production inputs, such as farm machines, fertilizer, and feed. This relative price decline led farmers to increase efficiency and to expand the volume of farm production, in order to

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2/ Peter Dorner, "Transformation of U.S. Agriculture: The Past Forty Years," Agricultural Economics Staff Paper No. 126, University of Wisconsin, Madison, June 1977, pp. 1-22.

3/ Purchased inputs include all inputs except operator and unpaid family labor and operator-owned real estate and other capital inputs.

maintain their farm income. The steady rise in wages and salaries in the nonfarm sector also increased the pressure on those who remained in farming to buy more machines and to expand their land base. And, finally, the farm sector today is contracting, in the sense that, as real per capita income increases, consumers spend a declining fraction of their income on food and other farm products. In the economist's jargon, the income elasticity of demand for farm products (at the farm) is less than unity. Given growth in real per capita income and in population, over time, the demand for farm products increases less than the demand for all other goods and services, requiring continuous resource adjustment in farming. 4/ Much of that adjustment has occurred through an outflow of labor from the farm sector.

In short, American farms today are left with the single task of providing raw materials for processing, distributing, and marketing by nonfarm industries, upon whom they have become highly dependent. To a significant degree, this new structure of U.S. agriculture both reflects and is a consequence of an urbanized and industrialized society, which more often than not demands products that offer uniformity for efficient handling, extensive shelflife for shipping and storage, and a high degree of processing for consumer convenience. Similarly, modern farms are themselves more specialized than they were in the past: A farmer is now far more likely to concentrate on the production of one or two commodities than to engage in general farming. And today the farm population--farm operators and their families living on farms--is less easily distinguished from the nonfarm population. Indeed, increasing numbers of farm people engage in non-agricultural employment, on either a part-time or a full-time basis.

Public Policy and the Farm Sector

But are these ongoing changes in the organization and control of farm resources in the public interest? In particular, is the family farm--a farming operation in which a single family provides most of the labor, capital, and management--economically feasible today? How has the decline in the number of small farms affected the viability of rural communities and the effectiveness of local governments? How has the distribution of farm program benefits affected farm resource ownership and how will it affect future ownership and organizational patterns? In the

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4/ D. Gale Johnson, Farm Commodity Programs, American Enterprise Institute for Public Policy Research, Washington, D.C. (May 1973), pp. 16-19.

future, who will make key management decisions in agriculture--farm owners and operators, agribusiness executives, or government officials?

Public policy is by no means the only determinant of the structure of agriculture, but existing research indicates that it was a significant element in shaping the current structure and the changes now underway. Over the years, the Congress has insisted that the Jeffersonian goal of supporting the family farm remain a central theme in agricultural policy, and most experts agree that family farms have benefited from publicly supported farm credit, land grant colleges, and the agricultural extension service. On the other hand, commodity price supports, tax policy, and most government programs provide farm benefits in direct proportion to farm output; they have therefore encouraged farms—including family owned and operated farms--to grow large in size.

What happens to the American farm will, in large measure, depend upon the future direction of U.S. agricultural policy. But before policy decisions are made concerning the future structure of agriculture, it may be desirable to determine what type of structure is preferred. The options include continuing the current trend toward fewer, larger, and more specialized farms; slowing down the current trend, which would help preserve the relatively large number of small farms that now exist and keep more management decisions in the hands of individual farmers; or accelerating the current trend, which would produce a farm sector in which a small number of very large farms would account for nearly all production.

A wide variety of policy tools are available to help achieve the preferred structure. Large farms could be discouraged from further growth through a progressive property tax, or a special tax levied on the sale of large-scale farm machinery. Businesses with nonfarm assets exceeding a certain amount could be prohibited from engaging in farming. Aliens could be subject to special disclosure laws or prohibited from buying farmland. Alternatively, the trend toward fewer and larger farms could be encouraged by relaxing commodity program payment limitations, focusing public research and extension activities exclusively on the needs of large farms, or by encouraging greater integration of the farm and the nonfarm sectors through the promotion of contracting and direct ownership rather than open markets.

The central purpose of this paper is to provide the Congress with background information concerning the future of the American farm by examining two questions:

- What are the major implications of the structure of agriculture as it is now evolving? and

- If an alternative structure is desired, what are the public policy options for altering the current structure?

CHAPTER II. CURRENT STRUCTURE AND FUTURE TRENDS OF AMERICAN AGRICULTURE

The U.S. farm sector today is highly heterogeneous. A review of available data shows a confusing multitude of sizes and types of farms, many different technologies and production practices, and farm people with different characteristics, pursuing diverse and sometimes conflicting objectives. Furthermore, different segments of the farm sector are changing at different rates and even in different directions. While some farmers are rapidly adopting new production and marketing practices, others are trying to preserve or revert back to the "old ways" of farming. And, lastly, the multiple concepts and definitions used in describing the farm sector are themselves often a major source of confusion. Specific topics discussed in this chapter include: the census definition of a farm, characteristics of selected farm types, types of linkages between the farm and nonfarm sectors, and some future prospects for farming.

CHARACTERISTICS AND TYPES OF U.S. FARMS TODAY

The Definition of a Farm. The task of defining a farm is to some extent simplified by familiarity--nearly everyone thinks he knows what a farm is--but it is also complicated by obsolete perceptions and a tendency for attention to shift from the characteristics of the impersonal farm to problems of farm people.

In general, we may think of a farm as a production unit, or business enterprise, that brings together a pool of resources (principally, capital, land, labor, technical knowledge, and management expertise) in order to produce "agricultural products"--that is, crops, livestock, dairy products, or poultry. Within this broad functional concept are included all farms, both traditional and nontraditional; for example, family-owned and operated farms and ranches, part-time farms, specialized fruit or vegetable farms, highly industrialized cattle feedlots and poultry operations, and many others. Some depend completely on family labor, others hire many workers; some own the land they farm, others rent land; and some are financed through equity capital supplied by the farmer, while others depend heavily on borrowed capital.

The major way in which farms are defined and classified for statistical purposes is according to the size of their annual gross sales. 1/ In 1850, the Census Bureau of the U.S. Department of Commerce first defined a farm as a place of any size producing at least $100 worth of agricultural products each year. Over the years, however, the official definition of a farm has been changed frequently, generally to exclude operations thought to be too small to be considered farms. 2/ Census agricultural data for 1959 through 1974 are based on the following definition:

> "A farm is any place that sells (or normally would sell) $250 or more in agricultural products during the census year; or any place of 10 acres or more that sells $50 or more."

It is important to note that this definition, which underlies all farm data series found in this report, is based on an operational rather than an ownership definition of a farm unit. Thus, for example, four tenants operating separate subunits of one ownership tract are counted as four farms.

In August 1975, the Census Bureau and the Department of Agriculture (USDA) announced a new definition of a farm, one that excludes farms selling less than $1,000 worth of agricultural products a year, on the grounds that more accurate data on the current structure of farming could be obtained by excluding farms making only a minor contribution to total agricultural production. Opponents of this new definition contended that it would "count out farmers" and reduce the number of farms by 27 percent; they also argued that, given the diversity of the farm sector, more--not less--information is needed. 3/ Neither proponents of the definition, who wanted to exclude very small farms, nor opponents, who projected a large decline in the number of farms, fully anticipated, however, the effects of the 79-percent increase in farm product prices between 1969 and 1974. The resulting higher annual gross sales for all farms significantly offset the

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1/ Annual gross sales includes total cash receipts from farming, government payments to farmers, and other farm income from sources such as recreation, machine hire, and custom work.

2/ David E. Brewster, "Some Historical Notes on the Farm Definition," Agricultural Economics Research, vol. 29 (January 1977), p. 28.

3/ Jim Hightower and Susan Sechler, "Counting Out Farmers," Agribusiness Accountability Project, 1000 Wisconsin Avenue, N.W. Washington, D.C., February 1973.

decline in farm numbers that was expected to follow from the new definition. An examination of total farm numbers reported by the Census Bureau in 1974 4/ shows that the change in definition actually resulted in only a 6-percent decline in the total number of farms.

Characteristics of Farms, By Size of Sales

The distribution of farms by the size of their annual gross sales, presented in Table 1, reveals the remarkable diversity among U.S. farms today. Although almost 1.0 million, or 35 percent, of the 2.7 million farms in 1977 had annual gross sales of less than $2,500, the remaining 1.7 million were fairly evenly distributed over the five larger sales classes, with the notable exception of the $100,000 or more sales class, which had the smallest number of farms (162,000 or only 6 percent of all farms).

There were also remarkable differences among sales classes with respect to their relative contribution to total cash receipts from farming. 5/ In particular, the nearly 1.0 million farms with annual gross sales of $2,500 or less accounted for only slightly more than 1 percent of all cash receipts from farming; the 162,000 farms with annual gross sales of $100,000 or more accounted for 53 percent.

Capital gain on real estate per farm in 1977 also varied widely, and according to sales size. Not surprisingly, farms in the highest sales class showed the greatest capital gain on real estate; those in the lowest, the least. Although Table 1 provides only a one-time snapshot of the magnitude and distribution of capital gain in farming, substantial benefits appear to accrue today to the owners of farming operations with extensive acreage.

Table 1 also shows wide variations in both the level and the source of income per farm operator family, and indicates substantial differences in the degree to which these families today depend on income from nonfarm sources. For many farmers, farming is clearly a sideline activity and not a

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4/ Farm data for 1974 are published for both the old (1959) and new definitions. The Census Bureau and USDA have not yet revised their time series data according to the new definition.

5/ Cash receipts include gross receipts from commercial market sales of farm products as well as loans (net of redemptions) made or guaranteed by the Commodity Credit Corporation and other purchases under price support programs.

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TABLE 1. DISTRIBUTION OF FARMS, CASH RECEIPTS, INCOME, AND CAPITAL GAIN ON REAL ESTATE BY ANNUAL GROSS SALES, 1977

Annual Gross Sales a/	Number of Farms b/	Percent of All Farms	Percent of Total Cash Receipts from Farming c/	Average Income per Farm Operator Family d/	Percent of Average Income from Farming	Capital Gain on Real Estate per Farm e/
	(thousands)			(dollars)		(dollars)
$100,000 or More	162	6.0	52.6	47,946	80	74,586
$ 40,000 to $ 99,999	348	12.9	25.6	24,513	75	30,586
$ 20,000 to $ 39,999	321	11.9	11.1	16,946	59	18,209
$ 10,000 to $ 19,999	311	11.5	5.4	14,453	35	12,482
$ 5,000 to $ 9,999	302	11.2	2.7	14,875	18	9,099
$ 2,500 to $ 4,999	304	11.2	1.4	16,067	9	8,036
Less than $ 2,500	958	35.3	1.4	16,595	9	6,238
Total or All Farms	2,706	100.0	100.0	19,035	39	16,120

SOURCE: U.S. Department of Agriculture, Farm Income Statistics, Statistical Bulletin No. 609, (July 1978), pp. 53-60.

U.S. Department of Agriculture, Balance Sheet of the Farming Sector, 1978, (forthcoming October 1977).

a/ Includes total cash receipts from farming, government payments to farmers, and other farm income from sources such as recreation, machine hire, and custom work.

b/ A farm is any place that sells (or normally would sell) $250 or more in agricultural products, or any place of 10 acres or more that sells $50 or more.

c/ Includes gross receipts from commercial market sales of farm products as well as loans (net of redemptions) made or guaranteed by the Commodity Credit Corporation and other purchases under price support programs.

d/ Realized net income from farming plus off-farm income of farm operator family divided by number of farms. For the purpose of these calculations, it is assumed that each farm has 1 resident farm operator family.

e/ Annual change in the value of farm real estate less the net investment in farm real estate.

very important one at that. In fact, as a group, the farm population is more dependent on income from nonfarm sources than from farming. In 1977, only 39 percent of all farmers' income came from farming. On average, only operators of farms with annual gross sales of $20,000 or more derived the major component of their income from farming. Further, although the average income of farm operator families was $19,035, it ranged by sales class from $48,000 to $16,595.

Selected Farm Types

Four types of farms are of special interest to policymakers concerned about the future structure of agriculture and the well-being of the farm population: family farms, small farms, part-time farms, and corporate farms. This section attempts to describe and quantify the role of these often overlapping farm types in the current structure of agriculture; review the major economic and social issues that each raises; and, lastly, show how each fits into a typology that classifies all farms in terms of their degree of differentiation between capital ownership, management, and labor.

Family Farms. Notwithstanding the significance that public policymakers have always accorded the American family farm, there is today no universally accepted, or statistically adequate, definition of the term. Typically, however, this concept is used to refer to farms that are characterized by a dependence on family labor, except for seasonal work; family ownership of land or other capital items; and family control of management decisions. As such, a farm is considered to be family owned and operated if its resources are under the independent control of the farm operator and family, regardless of that farm's mode of business organization.

This concept of a family farm has intuitive appeal, but it is not well suited to quantification. To resolve this problem, it has become common practice to define a family farm as any farm that annually uses less than 1.5 man-years of hired labor and is not operated by a hired manager.

Using this definition, Nikolitch has estimated that family farms accounted for 95 percent of all farms and more than 60 percent of all cash receipts from 1949 through 1969 (the most recent data available, see Table 2). The share of cash receipts by family farms varies, however, a great deal by commodity. For cash grain farms, 85 percent of all cash receipts came from family farms in 1964. In contrast, family farms accounted for only 15 percent of cash receipts from vegetable farms and 29 percent of fruit and nut farm cash receipts that year. Along with these commodity differences, there are also significant regional differences. In the Midwest, family farms

TABLE 2. ESTIMATES OF THE SHARE OF ALL FARMS AND TOTAL CASH RECEIPTS ACCOUNTED FOR BY FAMILY FARMS, FOR SELECTED YEARS: IN PERCENTS

	Nikolitch's Estimate a/		Rodefeld's Estimate b/	
Year	Farms	Cash Receipts from Farming	Farms	Cash Receipts from Farming
1949 c/	95	63	—	—
1959	95	70	76	50
1964	95	65	79	49
1969 d/	95	62	—	—

SOURCES: Radoje Nikolitch, Family-Size Farms in U.S. Agriculture, U.S. Department of Agriculture, ERS 499, February 1972, p. 4; Richard D. Rodefeld, "Trends in U.S. Farm Organizational Structure and Type," Priorities in Agricultural Research of the U.S. Department of Agriculture, Hearing before the Subcommittee on Administrative Practice and Procedure of the Committee on the Judiciary, United States Senate, Ninety-Fifth Congress, First Session, October, 1977, p. 377.

a/ Any farm not operated by a hired manager and using less than 1.5 man-years of hired labor is classified as a family farm.

b/ Any farm not operated by a hired manager, or a tenant, and using less than 1.5 man-years of hired labor is classified as a family farm.

c/ Data for 1949 corrected for change in farm definition in 1959. Sharecropper operations are not considered as independent farms but as parts of their respective multiple-unit operations.

d/ Estimated by projecting census information.

accounted for over 80 percent of all cash receipts from farming in most states in 1964 and closer to 90 percent in the major farm states of Indiana, Illinois, and Iowa. In the South, Southeast, and West, the share is far lower, with family farms accounting for only 20 percent of cash receipts in Florida and 21 percent in California. These regional differences are a consequence of earlier settlement and cultural patterns as well as a result of variations in the labor requirements of different commodities.

Although widely used, Nikolitch's findings have been criticized as resting on an imperfect statistical indicator of family owned and operated farms. On the basis of a somewhat revised definition--one that corrects for census changes in the definition of a farm and excludes farms operated by tenants as well as those operated by hired managers--Rodefeld has estimated that family farms accounted for slightly less than 80 percent of all farms and about 50 percent of all cash receipts in both 1959 and 1964 (see Table 2 for a comparison of these two estimates).

On the other hand, however, the statistical definition of a family farm may also be criticized on the ground that its selection of 1.5 man-years as the upper limit of family farm dependency on hired labor understates the number of family farms and their contribution to cash receipts. This criterion was selected on the basis of two assumptions: that the average farm family supplies about 1.5 man-years of labor annually, and that a farm on which an operator and his family supply less than half the total labor is not a family farm. But there is no reason to believe that a family-owned and operated farm which uses, for example, as much as 5 man-years of hired labor is fundamentally different from one that uses less than 1.5 man-years of hired labor. And if this alternative criterion were adopted, it would raise the family farm share of all farms in 1964 to 98 percent and its share of all cash receipts to around 80 percent.

The public policy objective of maintaining the family farm as the dominant type of farm in U.S. agriculture appears quite successful, if measured simply in terms of farm numbers according to any of the definitions of family farm discussed above. Nevertheless, their considerably smaller share of total cash receipts indicates that they have not dominated U.S. agriculture to the extent generally believed. If, however, the upper limit of their use of hired labor is expanded to 5 man-years, family farms can be viewed as heavily dominant on both dimensions. As emphasized earlier, farming has changed. Many family owned and operated farms have grown larger in size, use more purchased inputs, require a tremendous amount of scientific expertise, and have become more dependent on nonfarm income. But perhaps the greatest change is that all farmers (including family farmers) must now interface with farm input and food processing industries, which to a large extent, are best described as

oligopoly-like structures. 6/ Thus, the modern family farm, with negligible market power, operates in an environment where other business firms have sufficient power to engage in noncompetitive behavior and influence the terms of trade.

In addition to its value as a social institution, the family farm has historically provided society with at least one important economic benefit--guaranteed continuity in agricultural output. 7/ With its relatively low variable costs, a high commitment of family labor and family-owned capital, and a capacity to defer fixed costs, the family farm has a strong incentive to maintain output even if farm product prices are very low. Stories of the resilience and staying power of the small family farm, particularly during periods of economic adversity, abound. Because of its ability to absorb economic errors and miscalculations, the family farm has either made a great social contribution or has been inordinately exploited by society, depending on one's viewpoint. It seems likely that many farm families will continue to work in the farm sector in the future. But their willingness and ability to defer production costs will diminish and society will lose some of the continuity that has characterized farming, as the U.S. increasingly moves away from small-scale production units.

Small Farms. The recent revival of interest in small-scale farming is heavily laden with value judgments. But rising energy prices, pollution abatement costs, and increasing recognition of the social costs created by the massive displacement of farm people as farms have become larger have led many to question seriously the conventional wisdom that large-scale farms are more efficient. 8/

For illustrative purposes, a profile of small farms--which are commonly defined as those with annual gross sales of less than $20,000--was

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6/ Forrest E. Walters, "Impact of Changing Structure of the Food Industries on Food Supply and Prices," American Journal of Agricultural Economics, vol. 57 (May 1974), p. 193.

7/ Paul W. Barkley, "A Contemporary Political Economy of Family Farming," American Journal of Agricultural Economics, vol. 58 (December 1976), pp. 812-817.

8/ Ray Marshall and Allen Thompson, Status and Prospects of Small Farmers In The South, (Atlanta, Ga: Southern Regional Council, Inc., 1977), pp. 1-17.

constructed (see Table 3). 9/ On the basis of this profile, small farms can be characterized as follows:

- Though they represent just over 70 percent of the total number of farms, small farms are not a major factor in food and fiber production, accounting for only 11 percent of total cash receipts from farming.

- Nevertheless, small-scale farmers control 31 percent of total farm assets, their assets are relatively unencumbered by debt, as compared with larger farms, and proprietor's equity per farm averages a little more than $80,000.

- The small-farm population is extremely diverse. Some small-farm families are completely dependent on income from farming; some use nonfarm earnings to supplement their farm income; others work mainly off the farm. A few may be classified as retirement homes, rural residences, or hobby farms.

- The average small-scale farmer is slightly older and less well educated than other farmers.

Small-scale farms are heavily concentrated in such commodities as cotton, tobacco, and labor-intensive specialty crops; but many small-scale farmers also raise beef cattle and feeder pigs. Approximately 70 percent of the small-farm population is found in the Southeast and the North Central states. Only 4 percent of the small-farm population are minority-group members, but more than 90 percent of all minority farmers fall in the small farm category. As compared with other small-scale farmers, minority operators are generally older, work fewer days off-farm, have smaller farms, and tend to be engaged primarily in crop production. 10/ Minority small-farm families are also probably somewhat more dependent on farm earnings as a component of total income than other small-scale farmers.

9/ This criterion, of course, excludes the larger farms, which account for most of total farm sales and realize a substantial majority of their net income from farming.

10/ James A. Lewis, White and Minority Small Farm Operators in the South, U.S. Department of Agriculture, AER-353, December 1976. p.iii.

TABLE 3. SMALL FARM PROFILE: SELECTED CHARACTERISTICS OF FARMS AND FARM OPERATORS WITH ANNUAL GROSS SALES OF LESS THAN $20,000

Characteristics of Farms with Annual Gross Sales of Less than $20,000	
Number of Farms, 1976	1,917,000
Percent of Total Number of Farms, 1976	71
Percent of Total Farm Assets, 1976	31
Percent of Total Farm Liabilities, 1976	17
Percent of Total Cash Receipts, 1976	11
Percent of Total Federal Farm Program Payments, 1976	25
Average Value of Cash Receipts, 1976 ($)	5,516
Average Net Income from Farming, 1976 ($)	2,206
Proprietor's Equity per Farm, 1976 ($)	82,902
Average Income per Farm Operator Family, 1976 a/ ($)	15,169
Percent of Family Income from Off-Farm Sources 1976	85
Percent of Families in Poverty, 1976	15-20
Average Age of Operator, 1974	52
Percent of Operators under 35 Years, 1974	13
Percent of Operators 65 Years or Older, 1974	23
Percent of Operators with Less than High School Education, 1970	67
Percent of Operators Working Off-Farm 200 Days or More, 1974	40
Percent of Operators who are Minorities, 1974	4

a/ Estimated by summing realized net income from farming and off-farm income, dividing by the number of farms, and assuming one family per farm.

SOURCE: U.S. Department of Agriculture, Economic Research Service, Farm Income Statistics (July 1978) and Balance Sheet of Farming Sector (September 1977). U.S. Department of Commerce, Bureau of the Census, U.S. Census of Agriculture, 1974. U.S. Department of Commerce, Bureau of the Census, Current Population Reports (September 1977).

Since more than 80 percent of the income of all small farm families comes from nonfarm sources, low annual gross farm sales does not necessarily imply family poverty. In 1976, the average family income for small farms was $15,169. Nevertheless, an estimated 15 to 20 percent of the small-scale farm population in 1976 fell below the "poverty line." 11/ More generally, in a recent assessment of farm poverty, Edwards and Coffman report five major findings:

- The incidence of poverty among farmers has dropped dramatically—farm people constituted 19 percent of the total poverty population in 1960, but only 5 percent in 1976.

- But 15 percent of the farm population, as compared with 12 percent of the nonfarm population, were poor in 1976.

- Farm poverty has a distinct regional distribution. Over half of the nation's poor farm people live in the South. Many of the remaining poor are located in such marginal farming areas as the Ozark Mountain region and the cutover areas of Michigan, Wisconsin, and Minnesota.

- Thirty-one percent of the farm households in poverty have a black or female head of household. Nevertheless, although a strong link remains between race and low income in farming, over time the racial dimension is becoming less important in farm poverty.

- Farming operations of farmers in poverty are characterized by very limited capital and land resources; most poor farmers do not have any farm debt; and their low average crop yields suggest that their managerial ability could be improved. 12/

Part-time Farms. In 1974, 961,000 farm operators (or, 39 percent of all farmers responding to the Census of Agriculture) described their

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11/ In 1976, slightly more than 15 percent of all families and unrelated individuals reporting a farm residence were poor. U.S. Bureau of the Census, "Consumer Income," Current Population Reports, Series P-60, No. 107, September 1977, p. 28.

12/ Richard J. Edwards and George W. Coffman, "Farm Poverty: A Current Assessment and Research Focus," NEAD Working Paper, U.S. Department of Agriculture, September, 1977.

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principal occupation as "other than farming." Defining a part-time farm as a farm on which the operator is employed off-farm 200 days or more, part-time farms accounted for 28 percent of all farms and 20 percent of total cash receipts in 1974. Not surprisingly, many small-scale farms--an estimated 40 percent--are operated by part-timers who are highly dependent on off-farm earnings. As noted in Table 1, off-farm income increases in relative importance as farm size declines. In 1977, families living on the smallest farms (those with annual sales of less than $2,500) received 91 percent of their average per farm income from off-farm sources. In fact, the share of income from off-farm sources for all farms has been rising over time and it now exceeds half (61 percent).

During the 1950s and 1960s, part-time farming was viewed as a temporary condition, serving as either a means of transition from farming to nonfarm employment or as a way of accumulating enough capital to enter full-time farming. Increasingly, however, part-time farming seems to have become an end in itself. For many of today's small- and medium-sized farms, off-farm employment for the operator or his family members is a feasible alternative to leaving farming altogether. Similarly, it is also an option for those in nonfarm employment who wish to be involved in farming without committing themselves full-time. If industries continue to decentralize and if the metropolitan population continues to migrate to nonmetropolitan areas, the proportion of farm families earning a major part of their income from off-farm employment is likely to rise. In fact, the part-time farm may become the most viable type of farm, precisely because it does not depend solely on farm income. 13/ Further, the existence of part-time farms probably enhances the stability of agriculture and its resiliency to changing economic circumstances. For example, part-time farmers can shift family labor back and forth between farm and nonfarm employment in response to changing farm prices more readily than can full-time farmers. Off-farm earnings may also provide part-time farmers with a supplementary source of capital, making them less dependent on short-term conditions in both credit and commodity markets.

Corporate Farms. The corporate farm issue or debate is generally held to be concerned with "nonfarm interests who have invested in farming through a corporate structure for the purpose of profit, capital gain, tax

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13/ Harold F. Breimyer, "The Changing American Farm," The Annals, AAPSS, vol. 429 (January 1977), p. 22.

breaks, or further control within the food and fiber industry." 14/ Contrary to popular opinion, however, corporate farms—any farm operated under a certificate of incorporation, or charter, issued by a state--are not coterminous with either large-scale or nonfarm-owned farming. In fact, the term "corporate farm" embraces many different sizes and types of farming enterprises, including family farm corporations, incorporated landlords who rent to tenants, and a much smaller number of nonfarm-owned corporations engaged in farming.

Although the number of corporate farms has risen from about 8,200 in 1957 to 28,090 in 1974, it is estimated they now account for only slightly more than 1 percent of all farms—but 15 percent of total cash receipts. Over 90 percent of the 21,500 farm corporations operating in 1969 (and accounting for about 80 percent of all corporate farm sales) were "closely held," that is, each was owned by not more than 10 shareholders. 15/ Thus, on the assumption that closely-held corporations are family-owned businesses, most corporate farms are family owned and operated.

Farm families generally incorporate to facilitate intergenerational transfers, to obtain better financing, or for income tax reasons. In times of high farm incomes, the opportunity to retain earnings and use corporate income tax rates may offer an important advantage. For example, "a one person farming operation netting $75,000 can alter sharply the federal income tax liability by incorporating and paying a salary of $25,000. The highest marginal rate would probably not exceed 24 percent, certainly not more than 30 percent. This assumes, of course, that the family is willing to leave $50,000 in the corporation for expansion." 16/ If the farm corporation is small (15 or fewer shareholders), income gains or losses may be passed directly to the shareholder, thus avoiding the "double taxation" that characterizes an ordinary business corporation. And after incorporation, fringe benefits, such as medical and life insurance, become deductible costs.

14/ Kevin F. Goss and Richard D. Rodefeld, Corporate Farming in the United States: A Guide to Current Literature, 1967-1977, Rural Sociology Report, Pennsylvania State University, (forthcoming 1978), p. 7.

15/ George Coffman, "Agriculture Unincorporated," Farm Index, U.S. Department of Agriculture, (July 1973), p. 10.

16/ Neil E. Harl, "Corporation Farms and 1977 Farm Legislation," Seminar Paper, Library of Congress, (May 1977), p. 12.

One of the consequences of farm families' increasing use of the corporate form of organization may be the preservation of family owned and operated farms and hence maintenance of a heterogeneous farm structure.

In 1969, 1,797 corporations with more than 10 shareholders each were engaged in farming; these corporations accounted for 2.9 percent of total cash receipts. Most of these farms were in California, Texas, Hawaii, and Florida. In general, large corporations become involved in farming in order to provide a guaranteed market for the sale of feed, breeding stock, and other farm inputs; in addition, some food processors move backward into farming in order to obtain the stable supply of raw products needed to coordinate processing and marketing.

The goal of such conglomerates—to obtain market power and play a more active coordinating role—is perhaps best expressed by Tenneco's 1970 statement that "our goal in agriculture is integration from the seedling to the supermarket". 17/ Their success in farming has been greatest where product perishability created a need to link production directly with processing and marketing, where there was a need for highly technical management and equipment, and where opportunities existed to create a distinct brand image for the final product. At this time, however, there is no evidence that large corporations are taking over farming. In fact, several highly publicized conglomerates—Ralston Purina, Gates Rubber, and CBK, Inc.—have sold their farming operations, presumably because these firms believe they can earn a higher rate of return in other investment opportunities.

Nevertheless, several midwestern states have enacted statutes restricting corporate ownership and operation of farms. In North Dakota, a farm business cannot be incorporated. Most other states with anti-corporate farm laws allow independent farmers to incorporate, subject to certain rules. For example:

- In Kansas, farming corporations are limited to 10 shareholders, are permitted to own or control no more than 5,000 acres, and all incorporators must reside in the state.

- In Minnesota, at least one family member must reside on or actively operate a corporate farm.

17/ William Robbins, The American Food Scandal: Why You Can't Eat Well on What You Earn (William Morrow, 1974), p. 64.

- In Oklahoma, there is a 10-shareholder limit and no more than 20 percent of corporate gross receipts can come from a source other than farming, ranching, or mineral rights.

- South Dakota applies the same rules and allows only a 20-percent increase in acres in any five-year period.

A Typology of Farms. Although no single conceptual system adequately embraces all aspects of agriculture, modern-day farms may be roughly divided into three mutually exclusive categories--family farms, industrialized farms, and larger-than-family farms--according to their degree of differentiation between labor, capital ownership, and management. At least one of the selected farm types discussed above, corporate farms, may be found in all three categories; while other farm types, such as small-scale farms, are found exclusively in a single category.

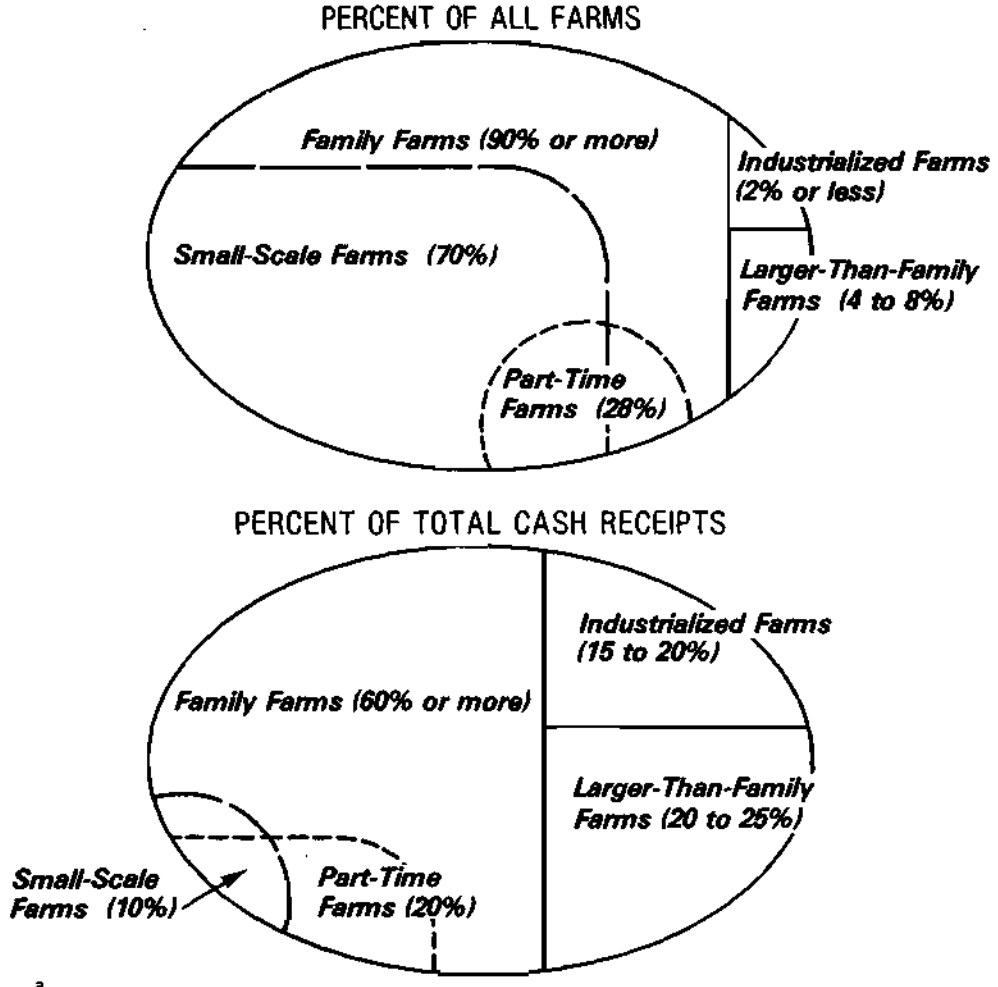
Figure 2 provides a summary of these major farm types as a percent of all farms and total cash receipts. Available data suggest that family farms (defined as any farm that uses less than 1.5 man-years of hired labor and is not operated by a hired manager) currently account for at least 90 percent of all farms and 60 percent of total cash receipts. These farms play a leading role in food and feed grain production, dairying, most livestock enterprises, tobacco, and much of diversified farming. As noted, these numbers would increase if the definition of family farm were to shift to more than 1.5 man-years of hired labor. A small but growing number of family farms are incorporated, and they represent 90 percent of all corporate farms. Many family farms are relatively small businesses; in fact, an estimated 70 percent of all farms have annual gross sales of less than $20,000. Despite their large numbers, these small farms account for only 11 percent of total cash receipts, and about 15 to 20 percent of all small-farm families are poor. A substantial portion of family farms are part-time operations. Part-time farms (defined as any farm on which the operator is employed off-farm 200 days or more) now account for 28 percent of all farms and 20 percent of total cash receipts.

The remaining farms can be classified as industrialized farms, that is, farms that use assembly-line production techniques and have a high degree of differentiation between capital ownership, management, and labor; or larger-than-family farms--nonindustrialized farms that use more than 1.5 man-years of hired labor. Together, these two types of farms account for slightly less than 10 percent of all farms but 40 percent of total cash receipts.

It is estimated that only 2 percent or less of all farms today are industrialized, but they produce 15 to 20 percent of total cash receipts.

Figure 2.

Estimated Current Share of Number of All Farms and of Total Cash Receipts, by Major Farm Types[a]



[a] These estimates are extrapolated from several sources and limitations exist with respect to both the data and the definitions. Revisions can therefore be expected as new data become available and special tabulations are completed. All farms can be classified, though somewhat arbitrarily, as either family, industrialized, or larger-than-family farms. **Family farms** are farms that use less than 1.5 man-years of hired labor and are not operated by a hired manager; **industrialized farms** use assembly-line production techniques and their capital ownership, management, and labor are highly differentiated; **larger-than-family farms** are nonindustrialized farms that use more than 1.5 man-years of hired labor. Farms can also be classified and defined according to their annual amount of sales or the annual number of days their operator is employed off the farm. In particular, **small-scale farms** are farms with annual gross sales of less than $20,000; **part-time farms** are farms whose operator is employed off-farm 200 or more days per year. The precise overlap between these two types of farms and the other types is not known.

Industrialized farms are found in broilers, sugar cane, citrus fruit, seed production, and some processing fruits and vegetables, where highly specialized equipment and management is needed and where operations are repetitive and standardized. Some experts believe that cattle feeding and hog production will be the next activities that industrialized farms will dominate.

Larger-than-family farms (4 to 8 percent of all farms) are more numerous than industrialized farms, but contribute only a slightly greater share of farm sales (20 to 25 percent of total cash receipts). They are often found in the West, where large ranches had their origin in the Spanish hacienda, and in the South, where they grew out of the plantation system. A few larger-than-family farms exist simply because wealthy individuals, both Americans and foreigners, are interested in farming. Some larger-than-family farms are managed by the landowner; in other cases, absentee landlords or owners without farming experience rely on hired managers. And a small number of these farms are operated by institutions (universities, prisons, and hospitals).

Current Modes of Coordinating the Farm and Nonfarm Sectors

From an economic and social viewpoint, another important structural dimension of agriculture is the nature of its linkage to other sectors of the economy. In both the purchase of farm inputs and the sale of farm products, farms interface with nonfarm business enterprises through either traditional open markets; contractual agreements, which specify a buyer-seller relationship; or "vertically integrated systems," which link two or more related functions in the food and fiber production chain by direct ownership.

When viewed in terms of total value of cash receipts from farming, only about 22 percent of U.S. agricultural production in 1970 was produced either under contract or through vertical integration. 18/ But their share of total cash receipts varied widely among commodities. For livestock, the estimate was 36 percent, while for crops it was only 14 percent. More specifically, for sugar cane and sugar beets, the figure was 100 percent; for processing vegetables, 95 percent; and for citrus fruits, 85 percent. Among livestock products, 98 percent of milk for drinking was produced under contract or in vertically integrated enterprises; 97 percent of all broilers; 54

18/ Ronald L. Mighell and William S. Hoofnagle, "Contract Production and Vertical Integration in Farming, 1960 and 1970," ERS-479, U.S. Department of Agriculture (April 1972), p. 4.

percent of all turkeys; 40 percent of all eggs; 22 percent of fed cattle; but only 2 percent of hogs.

Farmers and society at large derive many benefits from contracting and vertical integration. In highly perishable commodities, such as processing fruits and vegetables, production contracts are entered into before planting in order to control the quality and timing of production. The elimination of expenses associated with intermediate storage, assembly, and handling, as well as reduced uncertainty, are other possible benefits. When forward contracts are used in cotton, they are frequently entered into after planting, to reduce price risk and ensure a market outlet. And capital requirements for the most efficient-size production units and technical managerial skills sometimes exceed those which most farmers acting alone can mobilize. Because of the demands of our urbanized, industrial society and the characteristics of modern technology, there will be increasing pressure for planning and close coordination in the use of agricultural resources.

Nevertheless, contracting and vertical integration have both attracted considerable criticism because they require that farmers relinquish some (or all) of their independent decision-making responsibility and because, in purchasing inputs (such as land) and in selling, these two types of linkage sometimes pit large nonfarm firms with substantial economic power against much smaller family farms. Others have argued that a few huge agribusiness firms may use these coordinating devices to dominate agricultural production and secure unnecessarily high food and fiber product prices from the American public.

The degree of control over farm production exercised by input-supplying or output-processing firms varies greatly with the nature of the contractual arrangements. 19/ For example, production contracts place broiler growers in a seemingly vulnerable position. Growers typically do not own the broilers they feed, and they are usually obligated to buy feed supplies from designated suppliers and to sell the broilers only to a specified processor. Furthermore, broiler growers have few, if any, alternative uses for their broiler houses, and producer bargaining associations and marketing cooperatives are of little significance. In some types of field crops (canning peas, canning corn, potatoes), growers are restricted by their production contracts only during a given season; hence they have more bargaining

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19/ Bruce W. Marion ed., Coordination and Exchange In Agricultural Subsectors, North Central Regional Research Publication 228 (University of Wisconsin, January 1976), pp. 5-9.

power with their suppliers and processors because they usually have alternative uses for their land.

FUTURE PROSPECTS

The trends toward fewer, larger, and more specialized farms that are increasingly dependent on the nonfarm sector are long-term in nature. Most have been underway for three decades or more. Yet, in the past seven or eight years, events have occurred which may ultimately cause some of these trends to change. The dollar was twice devalued in relation to gold, grain exports expanded rapidly, net farm income reached a very favorable level in 1973-1974, and there was a marked decline in outmigration from agriculture. More recently, however, a decline in farm productivity growth, persistent price inflation, and good weather abroad have brought about a painful cost-price squeeze for many U.S. farmers, and there is now talk that our energy-intensive agriculture will soon be obsolete. At this time, however, it is not clear whether the effects of these events are temporary or if they signal a significant turning point in the structure of agriculture.

Such uncertainty emphasizes the importance of formulating some general ideas about the future prospects for farming. First, the decline in number of farms will continue, but at a slower pace than in the 1950s and 1960s. Census of Agriculture data show that farm numbers declined 15 percent between 1969 and 1974. More recent USDA estimates suggest, however, that it may not be realistic to assume that the rate of decline in farm numbers will continue to slow (see Figure 1).

Projecting historical trends, one USDA researcher has estimated that there will be 2.5 million farms in 1980, and 2.0 millon farms in 1990. By 1990, about 20 percent of all farms will have annual gross sales exceeding $100,000; and 50 percent will have annual gross sales of less than $20,000. 20/ About 1.6 million or fewer farms are estimated for the year 2000, absent major policy changes, war, or other disruptions.

Second, there has been a notable increase in the number of younger persons entering farming. Between 1970 and 1976, the number of persons self-employed in agriculture and under 35 years of age rose from 265,000 to

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20/ Letter and attached materials from William W. Lin, U.S. Department of Agriculture, January 9, 1978.

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359,000--a gain of 35 percent. 21/ Although farmers under 35 years represent only about one-fifth of all farmers in 1976, that percentage is larger than it was in 1970, and this increase occurred during a period when the total number of farm operators declined and the number of farmers age 60 and over fell by nearly one-quarter. This combination of more younger farmers and fewer oldsters caused the median age of persons self-employed in agriculture to reverse its historic pattern and fall from 53 years to 50 years between 1970 and 1976. Contrary to popular opinion, a substantial number of young people have entered farming in recent years, and many of the new entrants will probably attempt to expand the size of their farming operations rapidly.

Third, the gradual trend toward greater specialization in farming is likely to continue. In a recent analysis of 1959 and 1969 Census of Agriculture data, Marion found a modest increase in the degree of specialization for all farm types and concluded that "smaller cash grain and dairy farms (low specialization) are apparently better able to survive than smaller vegetable, poultry, or fruit and nut farms (high specialization)". 22/ As farms become larger and more specialized, most experts believe that the resulting increased risk exposure (see Chapter III) will give rise to greater use of futures contracts, farm-processor contracts, and other risk-sharing mechanisms. Because of increasing dependence on purchased inputs, net farm income as a proportion of cash receipts has steadily declined, and price variations may cause relatively large changes in farm income. In 1977, a 5-percent variation in commodity prices caused an estimated 20- to 25-percent variation in net farm income, depending on changes in production plans.

Fourth, the combination of continued general price inflation and tax rules that favor landholding over operatorship in the farm sector has led some to argue that the traditional family owned and operated farm is

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21/ Information supplied by Calvin Beale, U.S. Department of Agriculture, January 15, 1978. Based on data from Employment and Earnings, U.S. Department of Labor, January 1971 and January 1977.

22/ Bruce W. Marion, "Structural Changes in Agriculture," North Central Regional Farm Management Workshop, Madison, Wisconsin, May 1976, p. 11.

ultimately doomed. 23/ When money is pumped into the economy to finance cost-induced inflation, highly fixed assets, such as farmland, tend to appreciate in value relative to other investment opportunities. Thus, as Raup has noted, "In the past decade, farm land values have tripled, but there has been virtually no appreciation in the capital value of common stocks...." 24/If this situation continues, many more nonfarm investors—including foreigners—will actively seek to participate in the capital gains to be found in investments in farmland. 25/ Furthermore, since existing laws tax long-term capital gain at a lower effective rate than ordinary income, a bias is created which favors landholding over farming. If these forces continue unchecked, the likelihood that a farm operator will own at least part of the land he farms can be expected to decline in the future.

Finally, the importance of agricultural exports in the U.S. trade balance increases the vulnerability of farmers and the general economy to unexpected shocks arising from the agricultural sectors and trade policies of other countries. For example, good weather and bumper crops in the Soviet Union may result in depressed incomes for U.S. grain farmers; heavy taxpayer outlays, to acquire grain surpluses and withdraw farm land; unemployment in farm machinery manufacturing; a reduction in foreign exchange earnings; overexpansion of the domestic livestock industry; pressure to curb meat imports; and additional taxpayer outlays to support dairy prices. If ignored, the uncertainties associated with greater reliance on foreign markets may also slow the rate of adoption of new technology and increase the real cost of food to U.S. consumers.

23/ Harold F. Breimyer, "Farm Policy, 1978: Recycled Old or Innovative New?" Visiting Scholar Lecture, College of Agriculture, Oklahoma State University, March 7, 1978, p. 14.

24/ Philip M. Raup, "Some Questions of Value and Scale in American Agriculture," American Journal of Agricultural Economics, vol. 60 (May 1978), p. 307.

25 Foreign investors have recently been attracted to the U.S. land market by its rapidly appreciating land values, the devaluation of the dollar, and by the political and economic stability found in this country. Foreign ownership of U.S. farmland is now attracting considerable attention, but unfortunately there are almost no reliable data on this subject. In a recent study of 25 counties in five farm states, the General Accounting Office found that only .3 percent of the farmland surveyed was owned by foreigners. Real estate experts have estimated, however, that foreign buyers invested $.8 to $1 billion in farmlands in 1977, during which period the total value of U.S. farmland sales was slightly more than $15 billion.

CHAPTER III. DETERMINANTS OF STRUCTURE

The changing structure of American agriculture—in brief, the trend towards larger, fewer, and more specialized farms and the growing economic dependency of the farm upon the nonfarm sector—is primarily a function of five highly interactive factors: technology, resource mobility, financing, risk and uncertainty, and public policy. Other equally pervasive but less influential forces, such as market demand for farm as compared with nonfarm products, physical and climatic conditions, property rights, and a host of sociopolitical institutions, set the stage on which these structural changes have been occurring.

In order to assess the opportunities for and consequences of using public policy to shape the farm structure of the future, this chapter briefly surveys the effects of each of these five structural determinants. Perhaps the single most important lesson to be learned from such an exercise is that the joint interaction of structural change factors may result in a net effect quite different from—indeed, sometimes contrary to—the effect anticipated when a single factor is considered in isolation.

Technology

The new technology embodied in modern farming techniques, production inputs, and managerial skills substantially increased efficiency in converting resources into farm output. As a consequence, U.S. farm productivity skyrocketed. Since 1950, crop and livestock production has increased more than 40 percent, while the total bundle of inputs used by farmers remained about constant (see Table 4). As a result of this increase in efficiency, one measure of the real price of farm products, the parity ratio (prices received by, divided by prices paid by, farmers), declined about 30 percent over the last 25 years.

Increases in farm output due to technological change tended to move slightly ahead of market demand through the mid-1960s, resulting in a problem of excess capacity and low returns to resources in farming. This problem may, however, now be obsolete, since the rate of increase in farm productivity has declined to a level approximately equal to the rate of growth in the domestic population, and because of the development of export markets. After increasing at an average annual rate of more than 2 percent from 1950 to 1966, beginning in 1967, the annual rate of increase in

farm productivity has dropped below 2 percent. And during the last five years, as discussed in Chapter II, agricultural exports (in particular, food and feed grains) increased dramatically, by more than 10 percent a year.

TABLE 4. INDEXES OF FARM PRODUCTION, FARM INPUTS, AND PARITY RATIO, 1950-1976 (1967=100)

Year	Crop Production	Livestock Production	Total Farm Inputs	Parity Ratio a/
1950	76	75	104	137
1960	93	87	101	108
1970	101	105	99	98
1975	121	101	100	103
1976	120	105	101	96

SOURCES: Donald D. Durost and Evelyn T. Black, Changes In Farm Production and Efficiency, U.S. Department of Agriculture, Statistical Bulletin No. 581, November 1977, p. 7.
U.S. Department of Agriculture, Agricultural Statistics, 1976, pp. 453-6.

a/ Index of prices received by farmers divided by the index of prices paid by farmers.

Irrespective of such industry-wide problems as excess capacity and export market instability, individual farmers, acting as price takers, have a strong incentive to adopt new technology rapidly. The early innovator achieves lower per unit production costs and increased profits, at least for a short time, before other farmers follow his example. Rodewald and Folwell show that a Washington State winter wheat and pea farmer with 2,500 acres can reduce his average cost of machinery per acre by 9 percent if he replaces a conventional crawler tractor with a 4-wheel drive tractor; if he

also expands the size of his farm to 3,900 acres, he can reduce that cost by an additional 18 percent. 1/ This nearly 60-percent increase in farm size can be made without additional labor. Once innovation begins to be adopted, other crop farmers generally have two options: purchase a 4-wheel drive tractor and expand the size of their farm, or accept a lower net income as market prices for their crops fall. In short, new technology plays an important role in determining acreage and capital requirements; often that role can be described as "labor saving and farm-size increasing."

Past, and somewhat dated, studies of the relationship between average production costs and farm size support two major conclusions. First, most economies of size are apparently captured by the modern one-, two-, or three-man farm. Most of these farms are family-size operations. Second, while the lowest average cost of production may be attainable on a two-man farm, average cost tends to remain relatively constant over a wide range of farm sizes. Figure 3 illustrates these conclusions for Texas irrigated cotton farms.

Since average cost of production levels off, the point of minimum average cost is realized at a smaller farm size than that at which profit is maximized. Thus, farmers have a strong incentive to expand the size of their farms in order to increase total profits. In the words of an Indiana farmer, Eugene Smith: "The more I expand, the more that cost curve stays flat out." 2/ And research studies support Mr. Smith's argument that higher total profits can be achieved through larger farm size. A USDA study using data for 1970 found that the rate of return to equity capital ranged from -6.1 percent for farms with sales of less than $2,500 to 6.9 percent for farms with sales of $100,000 and more. 3/ Adding in return from land appreciation increased these rates to -3.2 percent and 10.8 percent, respectively.

It is worth noting that the earlier economies of size studies have several limitations. External economies gained from buying and selling in large volumes and access to credit have usually been ignored. Common

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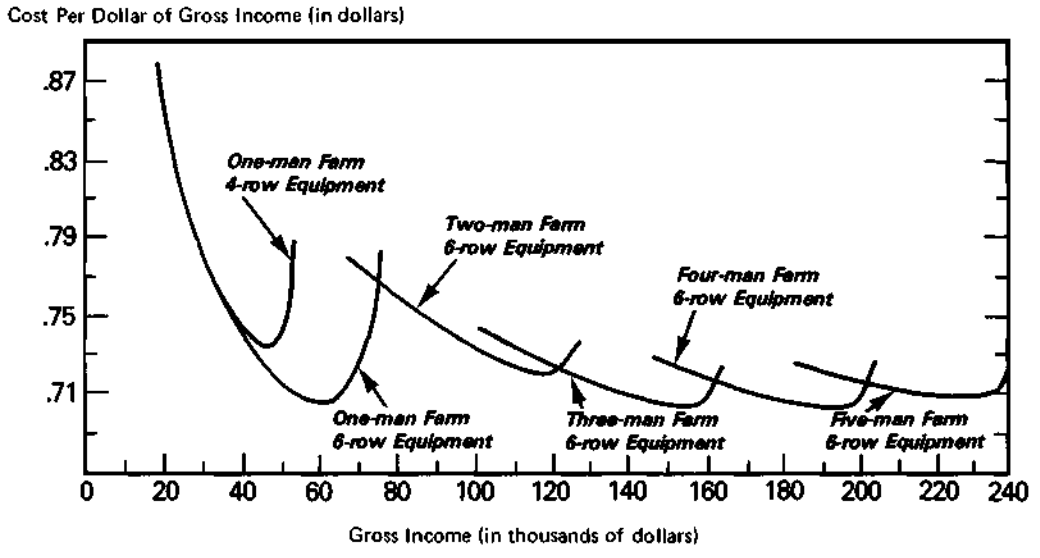
1/ Gordon E. Rodewald, Jr. and Raymond J. Folwell, "Farm Size and Tractor Technology," Agricultural Economics Research, vol. 29 (July 1977), p. 89.

2/ "How the Family Farm Can Harvest Millions," Business Week (July 4, 1977), p. 69.

3/ J. Bruce Hottel and Robert D. Reinsel, Returns to Equity Capital by Economic Class of Farm, U.S. Department of Agriculture, ERS-347, September 1976, p. 14.

Figure 3.
Average Cost Curves For Irrigated Cotton Farms, Texas High Plains, 1967



Source: J. Patrick Madden, *Economies of Size in Farming*, U. S. Department of Agriculture, AER No. 107 (February 1967), p. 44.

ownership of related farm and nonfarm activities has not been considered. Nor have most studies included the possibility of hiring custom work and off-farm employment. Further, relatively little attention has been directed to livestock enterprises and specialty crops, where small-scale farms may have an advantage.

In fact, perhaps one of the most unique aspects of resource use in agriculture, and one that has a significant impact on structural organization, is the husbandry function performed by the individual farmer. Personal experiences, endows a farmer with special farming knowledge and skills, which may significantly increase production efficiency. For example, he may know that some parts of a field require more frequent irrigation, or that the milking time for a certain dairy cow is very short. Where resources lack uniformity and production conditions are not homogeneous, such special skills and insights are very important, and it is often not economically feasible to break the husbandry function down into smaller, more specialized

steps. 4/ Under these conditions, husbandry places an upper limit on farm size, and large-scale, industrial-type production is not feasible. However, a steady stream of new management technologies—CB radios, mini-computers, and closed circuit television—are now being developed, making it possible for a single operator to coordinate a larger production unit.

The mix and type of production inputs used in farming have substantially changed as a result of the adoption of modern technology (Table 5). In general, farmers have substituted capital and energy-intensive inputs 5/and scientific knowledge for physical labor and land. Table 6 provides a general notion of the farm product mix, physical size, capital and labor requirements, and annual cash receipts of a regional cross-section of farms that use modern technology and management practices. The seven farms described in Table 6 are "typical" in the sense that they fall into the size interval containing the largest number of farms in the regions they represent. Of course, profitability varies with product and input prices, operator equity, management ability, weather, and many other factors.

4/ J. Patrick Madden and Earl J. Partenheimer, "Evidence of Economies and Diseconomies of Farm Size," in A. Gordon Ball and Earl O. Heady, eds., Size, Structure, and Future of Farms (Iowa State University Press, 1972), pp. 100-104.

5/ Because of recent energy and environmental problems, some experts have hypothesized that technology and resource use may shift in favor of organic farming methods requiring little, or no, inorganic fertilizer or chemical pesticides. A comparative study of 14 organic and 14 conventional corn belt farms in 1974 and 1975 indicates that organic farming merits further study. Net returns to crop production were about the same for the two groups, with the organic farms using considerably less energy input and slightly more labor input per acre of cropland. Both the organic and conventional farms included in the study were large-scale, mechanized, and well-managed. Since farm output accounts for only about 2 to 3 percent of total U.S. energy consumption, a shift to organic methods of farming would not, however, result in large energy savings. Robert Klepper, et. al., "Economic Performance and Energy Intensiveness on Organic and Conventional Farms in the Corn Belt: A Preliminary Comparison," American Journal of Agricultural Economics, vol. 59 (February 1977), pp. 1-12.

TABLE 5. INDEXES OF USE OF SELECTED FARM INPUTS, 1950 TO 1976 (1967=100)

Year	Labor a/	Real Estate	Mechanical Power	Fertilizer, Lime, and Pesticides	Feed, Seed, and Livestock Purchases
1950	217	105	84	29	63
1960	145	100	97	49	84
1970	90	98	100	115	104
1975	80	93	112	127	100
2976	78	94	113	141	107

SOURCE: Donald D. Durost and Evelyn T. Black, Changes In Farm Production and Efficiency, U.S. Department of Agriculture, Statistical Bulletin No. 581, November 1977, p. 57.

a/ Includes hired, operator, and unpaid family labor.

Resource Mobility

Despite the strong pressures on farmers to increase their productivity by adopting new technology and expanding their land base, the farm sector today remains, as discussed in the preceding chapter, remarkably heterogeneous with respect to size. A review of farm data reveals the persistence of a surprisingly large number of smaller farms, which accounting analysis would suggest cannot now exist. This anomaly can largely be explained by two factors:

- The tendency of certain farm resources—such as operator labor, buildings, land improvements, and other specialized capital assets—to become "trapped" or fixed in farming; and
- The availability of nonfarm employment to farm operators and workers.

Technically, a resource is fixed in production when its use value is less than its replacement cost and greater than its salvage value. Under such circumstances, a farmer has no incentive to either expand or to contract his use of such a resource. Take the case of a farm operator who is strongly committed to farming as "a way of life." Because of life style preferences, this individual views the salvage value of his labor (off-farm employment) as very low, even zero. Thus when net income from farming drops, he does not exit from farming, but simply reduces his payments to himself and other fixed resources, and continues to produce.

More generally, the inability of resources committed to agricultural production to shift easily out of farming results in an extremely inelastic short-run supply of farm products (if farm prices fall 10 percent, market supply declines only 1 or 2 percent). Cochrane and Ryan summarize the situation as follows:

> Farm labor is tied to family patterns of living, with increases and decreases in response to family growth cycles, rather than to price level changes except when the whole family decides to move. Farm land cannot pick up and move to urban areas when farm prices fall; it shifts into nonfarm uses only when those uses come to it. Capital sunk into farm buildings, irrigation and drainage works, tractors and combines does not move easily or have ready uses in nonfarm industries. Most resources employed in farming move only slowly, as equipment and the like are worn out and not replaced, or as human resources come of age and break away from the family.6/

Given sufficient time, however, resources used in farming do adjust to changing economic conditions. As pointed out in Chapter I and shown in Table 5, much of the adjustment burden has fallen on labor. In terms of employment, American agriculture was a contracting industry from about 1920 to 1973. Many people who moved out of farming were attracted by good job opportunities and have substantially improved their economic well-being. Those without the skills and talents required for nonfarm employment were less fortunate. One well-documented example of such farm labor displacement is the postwar shift of cotton production from the Deep South to the High Plains of Texas and the Southwest as a result of developments in mechanization and irrigation. In the process, thousands of cotton workers were left jobless.

6/ Willard W. Cochrane and Mary E. Ryan, American Farm Policy, 1948-1973 (University of Minnesota Press, Minneapolis, 1976, pp. 16-17.

TABLE 6. SEVEN TYPICAL FARMING OPERATIONS, BY TYPE OF FARM PRODUCTS AND REGION, 1975

	New York a/	Central Illinois b/	Mississippi Delta b/
Farm Products	Dairy	Corn and soybeans	Cotton and soybeans
Farm Size	71 cows and 304 acres	400 acres	900 acres
Crop Mix	117 acres of hay; 63 acres, corn silage; 53 acres, grain corn	200 acres of corn; 180 acres, soybeans	360 acres of cotton; 370 acres, soybeans; 80 acres, wheat
Capital Requirements:			
Land	$140,000	$500,000	$514,000
Other	124,000	130,000	280,000
Total	$264,000	$630,000	$794,000
Labor Requirement	2.5 man-year equivalent d/	Full-time operator, family labor (120 hrs.), and hired labor (100 hrs.)	Full-time operator, family labor (510 hrs.), 3 full-time hired workers, and seasonal labor (310 hrs.)
Annual Cash Receipts	$103,000	$ 96,500	$139,000

SOURCES: C.A. Bratton, Dairy Farm Management: Business Summary, New York, 1976, A.E. Res. 77-9, Cornell University, June 1977.

P. Leo Strickland and David Fawcett, "U.S. Typical Farming Operations, 1975," unpublished manuscript, U.S. Department of Agriculture, September 1977.

U.S. Department of Agriculture, The U.S. Department of the Interior's Proposed Rules for Enforcement of the Reclamation Act of 1902: An Economic Impact Analysis, January 1978, pp. 17-23.

TABLE 6. (Continued)

Southwestern Oklahoma b/	Texas High Plains b/	Montana b/	California c/
Cotton, wheat, and beef cattle	Cotton and sorghum	Wheat	Irrigated field crops
960 acres and 30 head of beef	720 acres, including 450 irrigated	2,720 acres, including 1,360 in fallow land	640 acres
140 acres of cotton, 420 acres, winter wheat; 50 acres, alfalfa hay; 320 acres, pasture	300 acres of cotton (200 irrigated and 100 dryland acres); 340 acres, grain sorghum (250 irrigated and 90 dryland)	940 acres of winter wheat; 220 acres barley; 200 acres, spring wheat	111 acres of processing tomatoes; 222 acres, cotton; 111 acres, alfalfa hay; 148 acres, barley
$432,000 139,000 $571,000	$254,000 212,000 $466,000	$594,000 159,000 $753,000	$960,000 171,000 $1,131,000
Full-time operator, family labor (260 hrs.), and hired labor (40 hrs.)	Full-time operator, family labor (290 hrs.), full-time hired worker, and seasonal labor (330 hrs.)	Full-time operator, family labor (420 hrs.), and seasonal labor (300 hrs.)	4.0 man-year equivalent d/
$ 58,300	$ 95,500	$178,000	$391,000

a/ Average data for 615 farms participating in a Cornell University farm management project in 1976. These farms were considered to "represent a good cross-section of better than average commercial operators in the State."

b/ Derived from USDA's 1975 typical farm series.

c/ Based on cropping patterns, yields, production costs, and prices received in the Westlands Water District in 1976.

d/ It is often assumed that the average farm family supplies 1.5 man-years of labor annually.

For those who remain in farming, the outmigration of labor and increase in labor productivity has been sufficient to increase the real wages of farmworkers and the real net income of farm operators (Table 7). Another general indicator shows the disposable income of farm people—farm operators and their families who live on farms—increasing relative to that of nonfarm people. These data indicate that farm families are sharing in the fruits of economic growth. Nevertheless, their income is more unstable and somewhat lower than the income of the nonfarm population.

Aggregate entry and exit data for farming hide some troublesome social problems. For example, in spite of the risks of leaving the farm in middle age, there is evidence that many farmers in this age bracket do, indeed, leave. But many of those who leave fail to achieve their nonfarm employment objectives; consequently, they soon return to farming. An analysis of social security data for 1957 to 1963 indicated that a slight (less than 2 percent) net off-farm mobility rate concealed a much larger gross movement. During the period under study, a 14-percent gross off-farm rate was largely offset by a 12 percent gross in-farm rate. 7/ Most of those moving to farms had previously been in agriculture. This return labor migration suggests that the relatively slow rate of human resource adjustment in agriculture is not so much a problem of farm people being unwilling to make occupational changes as it is their inability to make a successful adjustment to nonfarm employment. In addition, entry into farming has become more difficult because of higher capital costs, more demanding managerial skills, and fewer opportunities to obtain a farm large enough to provide a farm operator and his family a standard of living comparable to that available in the nonfarm sector. There is little doubt that the number of potential entrants far exceeds the number of opportunities to obtain an adequate size farm.

Financing

Farm finance has also played a major role in determining the current structure of agriculture. In order to adopt new technologies needed to reduce per unit production costs and to expand output, farmers have borrowed large amounts of capital. During the 1950s and 1960s, farm debts grew slightly faster than assets (see Figure 4), farmers experienced rela-

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7/ Dale E. Hathaway and Brian B. Perkins, "Occupational Mobility and Migration from Agriculture," Rural Poverty in the United States, a report by the President's National Advisory Commission on Rural Poverty, Washington, D.C., May 1968, pp. 185-237.

TABLE 7. REAL WAGES AND INCOME EARNED IN FARMING AND DISPOSABLE INCOME OF FARM PEOPLE a/ RELATIVE TO NONFARM PEOPLE, 1950-1976: IN DOLLARS

Year	Farmworkers Hourly Wage Rate b/	Realized Net Income from Farming per Farm Operator c/	Farm as a Percent of Nonfarm per Capita Disposable Income
1950	0.91	3,180	58.1
1960	1.08	3,118	53.9
1970	1.44	4,202	74.0
1975	2.43	4,464	88.0
1976	2.88	4,480	81.4

SOURCES: Council of Economic Advisers, Economic Report of the President, January 1977, p. 293.
U.S. Department of Agriculture, Farm Income Statistics, Statistical Bulletin No. 576, July 1977, pp. 36 and 56.

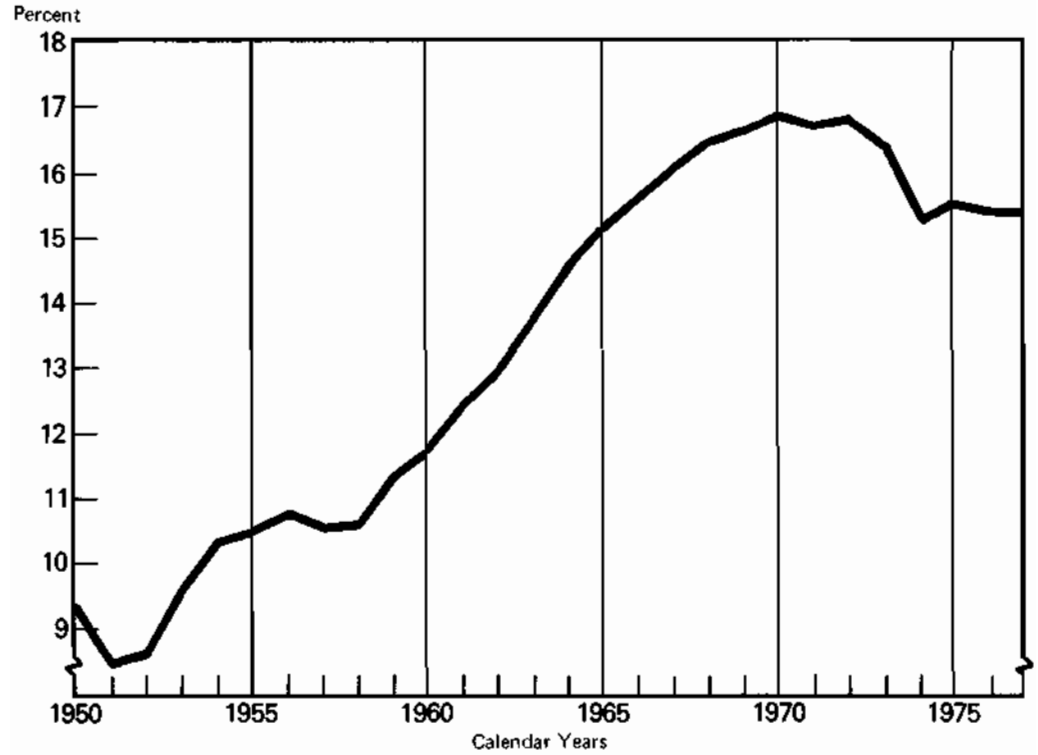
a/ All people living on farms.

b/ Average hourly wage rate for all hired farmworkers (without room or board) deflated by the index of prices paid by farmers for family living items (1967=100).

c/ Realized gross farm income minus farm production expenses deflated by the index of prices paid by farmers for family living items (1967=100).

Figure 4.

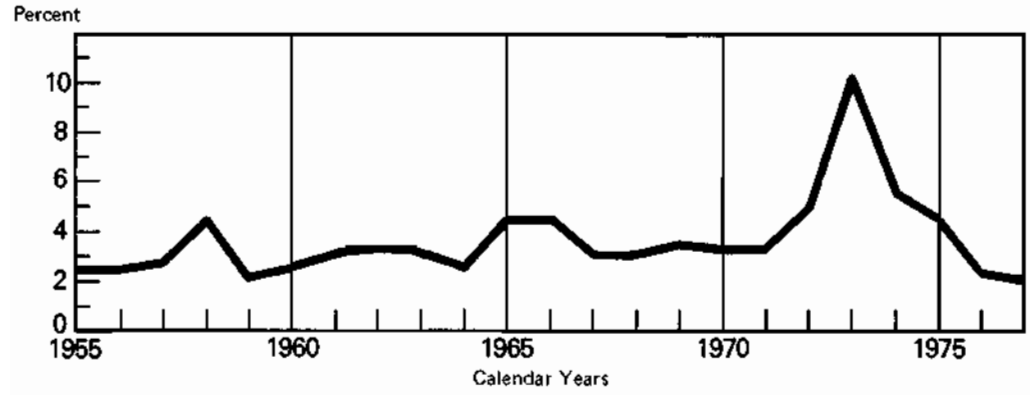
Farm Debt/Asset Ratio



Source: Emanuel Melichar and Marian Sayre, *Agricultural Finance Data Book*, Division of Research and Statistics, Board of Governors of the Federal Reserve System, Washington, D.C. (November 1977), p. 40.

Figure 5.

Net Return to Equity in Production Assets



Source: U.S. Department of Agriculture, *Balance Sheet of the Farming Sector, 1977* (October 1977), p.24.

tively stable product prices and net incomes, and a very impressive farm loan repayment record was achieved. Steady upward pressure on land prices during that period can also be traced to farm expansion buyers and net return to equity in production assets averaged around 3 percent (see Figure 5).

These conditions set the stage for an unprecedented boom in capital expenditures and land prices, fed by rising net farm income in 1972 and 1973, and optimistic expectations. Since 1972, land values in the Corn Belt increased by an average of 180 percent, more than tripling in Iowa. In fact, most of the recent gains in the value of farm assets are the result of higher land prices, as was indicated in Table 1. Sophisticated, management-oriented, independent farmers were able to use their income flows and substantial equity in debt-free land to obtain the financing needed to acquire more land and expand their output. Thus, rapidly rising land prices and cooperative lending institutions contributed to what is now described as "economic cannibalism from within agriculture." 8/

Although agriculture continues to show a high level of equity, indicating a strong financial position, net return to equity in production assets is now less than 2 percent, and, since 1974, there has been a very rapid increase in debt financing relative to the net income stream. The extent to which debt financing has replaced internal financing in farming has been recently noted by Melichar:

> The relative role of debt in financing capital formation during 1972-1975 (64%) is the highest since that found by Tostlebe for 1915-1919 (76%) and in particular far exceeds that during even the final stages of the last boom (28% in 1950-1952). In short, the current capital spending and land price boom has been debt financed to an extent not experienced since 1920. Thus, some apprehension about the near-term finances of the farming sector appears justified.9/

8/ See Business Week's description of how a 31-year-old Indiana farmer turned 450 acres into an 8,000-acre farming operation and more than doubled his net worth each year since 1968. "How the Family Farm Can Harvest Millions," Business Week (July 4, 1977), p. 68.

9/ Emanuel Melichar, "Some Current Aspects of Agricultural Finance and Banking in the United States," American Journal of Agricultural Economics, vol. 59 (December 1977), p. 970.

In a rapidly appreciating land market, it seems likely that the rise in the price of land is explained less by its income-generating potential in farming and more by anticipated capital gain. Furthermore, nonfarm investors have recently been attracted because the rate of appreciation in land prices in recent years has far exceeded the rate of inflation in the general economy. Such forces place land acquisition out of the reach of many farmers.

Current financial trends may have important implications for the future structure of farming. The vulnerability of large, more highly levered (indebted) farmers and young farmers who have just purchased land to a downward fluctuation in net farm income is apparent. These farmers are likely to turn to the federal government for production controls and income subsidies, or mandatory parity prices, to ease their difficulty in meeting their financial obligations. Failure to provide assistance might lead to farm foreclosures, further concentration of land ownership, and a shifting of adverse consequences through the grain and livestock sectors to consumers.

There is already evidence that the rate of appreciation in land values is slowing down and some analysts believe that the full gain in current land values will not be preserved. The ultimate outcome probably depends largely on buyers' expectations of capital gain. But the rate at which current landholdings can be levered into the ownership of additional land may have slowed.

There is also evidence that heavy farm lending has placed some small rural banks in a vulnerable position. About 2,100 of the nation's banks have more than half of their loans in farming, and their liquidity has been drastically reduced as a result of the adverse impact of falling farm income on deposits and loan repayment. 10/ Although these institutions account for less than 3 percent of total bank deposits, they are expected to play an important role in the future financing of farms and rural communities.

Risk and Uncertainty

Farmers have always faced the hazards of weather, biological processes, and uncertain markets. But today there are several forces at work which may increase the impact of instability on the structure of agriculture. New technologies often lead to more highly specialized production, which

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10/ Ibid., p. 971.

can mean greater instability. A specialized grain farmer is not able to offset the effect of drastically low corn prices with a higher income earned from selling hogs. And the impact of a single calamitous event--a contagious disease in a beef feedlot, or a machine breakdown during a tomato harvest—is greatly increased under specialization. Furthermore, the steady growth in grain exports and the shift to a floating exchange rate now rapidly transmits fluctuations in weather conditions and overseas trade policy to the U.S. food and fiber sector. Although U.S. farmers today face greater uncertainties, posed by a more open world economy, than in the 1950s and 1960s, they receive somewhat less price and income support through commodity programs.

Dealing with risk and uncertainty is an important function of entrepreneurship. Confronted with uncertain outcomes, the amount of risk an entrepreneur perceives and is willing to tolerate is largely determined by his knowledge, psychological make-up, spending plans, and the level and liquidity of his financial reserves. Researchers have found that farmers, like most individuals, tend to be risk-adverse. That is, other things constant, perceived risk creates a state of psychological tension (disequilibrium), which the individual seeks to reduce. Risk-reducing strategies used by farmers include:

- Collecting production and marketing information, including highly technical knowledge provided by input suppliers, processors, and management firms.

- Diversification into commodities with low, or inversely related, net-income variability; investment in land, building and machinery that allow enterprise flexibility; non-farm employment.

- Operating with less borrowed capital or increasing the share of investment in the farm business held as a financial reserve.

- Use of one or more of the options provided by the government—commodity programs, crop insurance, disaster payments, emergency loans, and marketing orders and agreements.

- Use of private sector risk-sharing arrangements—insurance, futures contracts, farmer-processor contracts, and buying and selling through cooperatives.

According to conventional reasoning, a reduction in uncertainty in farming, through government programs or private sector arrangements, tends to increase the level of investment and current input expenditure for

any given level of average price and income expectations. 11/ Thus, reducing uncertainty promotes investment and the adoption of new technology, which yield lower average costs and tend to speed the rate of growth in farm size and the resulting decline in farm numbers. In addition, small farms may be especially responsive to such reductions, in that small-scale, low-income farmers with no margin to absorb a downward fluctuation in income may be more risk adverse than farmers with more favorable operating margins. 12/ Irrespective of the distribution of benefits, most economists believe that reduced uncertainty tends to free venture capital for the pursuit of new activities, leading to an increase in net investment and economic growth.

Although the empirical findings are far from conclusive, Robinson has proposed "an alternative hypothesis linking capital investment positively with price instability." 13/ He argues that much of the investment in agriculture occurs in years of high prices when farmers have both the capacity to invest and an incentive to avoid taxation by retaining earnings for modernization and expansion. Robinson further reasons that low prices have a positive effect on efficiency if they force farmers to modernize and weed out inferior (high cost) producers. In short, he has proposed "a cyclical theory of changes in investment and efficiency in agriculture. Investment comes in lumpy forms and is facilitated by high prices; inefficiency is squeezed out in periods of low prices. Stability can lead to complacency rather than to efficiency although this certainly is not always the case."

Although it is not possible to obtain consensus, an argument can be put forth that current trends toward enterprise specialization and greater reliance on export markets imply increased risk exposure in agricultural production. As farmers pursue risk-reducing strategies, the demand for

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11/ Frederick J. Nelson and Willard W. Cochrane, "Economic Consequences of Federal Farm Commodity Programs, 1953-1972" Agricultural Economics Research, vol. 28 (April 1976), p. 56.

12/ The link between risk perception and farm size is not well understood. One argument is that risk perception is greatest for farms that are most vulnerable to price and income fluctuations. This could include small-scale, low-income farmers; rapidly expanding farmers; and large-scale, highly specialized farmers.

13/ K.L. Robinson, "Unstable Farm Prices: Economic Consequences and Policy Options," American Journal of Agricultural Economics, vol. 57 (December 1975), p. 769-77.

government intervention and private sector risk-sharing arrangements is likely to increase. To allow increases in net investment and economic growth, new institutions need to be developed to spread the financial commitment associated with hazardous undertakings. In considering the impact of risk-reduction strategies on the structure of agriculture, it should be noted that most private sector risk-sharing arrangements favor large-scale producers because the cost of entering into such arrangements is largely fixed and specialized knowledge is often required; and further risk reduction through government intervention or a private sector arrangement eliminates an inherent advantage of the family-size farm—its ability and willingness to absorb losses in the short run.

Public Policy

Federal policy has affected the structure of farming in many ways and it often creates forces pulling in opposite directions, making it exceedingly difficult to measure any net effect. For example, although most public programs for agriculture are allegedly designed to help family owned and operated farms, benefits are nevertheless generally distributed in direct proportion to volume of output, which encourages farm size growth.

In this section, six areas of public policy involvement that affect the structure of farming are examined. A major conclusion is that federal policy has on the whole discouraged small farm operations and led to greater concentration in farming. Small farms have undoubtedly been helped by certain programs, but most programs have facilitated the adjustment processes initiated by technological change and the other determinants of structure discussed above. Within the farm sector, the greatest benefits have gone to farmers possessing the motivation and resources to use commodity programs, tax laws, and low-cost credit to expand their land-holdings and size of business.

Commodity Programs. Beginning with the Agricultural Adjustment Act of 1933, a series of commodity programs have evolved to deal with price and income problems in farming. These programs have covered such commodities as wheat, feed grains, cotton, wool, sugar, rice, peanuts, tobacco, and dairy products. They have used a variety of program tools—price supports, direct payments, acreage allotments, set-asides, conservation reserves, surplus disposal, and stock accumulation—to stabilize and increase farm prices and incomes.

When commodity programs are in effect, income gains accrue to farmers through higher market prices, resulting from price support action,

and through government payments. Schultze found that higher market prices and government payments each contributed about $3.7 billion to farm income in 1969. 14/ Further, farms with sales over $20,000 (18 percent of all farms) received 75 percent of the benefits due to higher market prices and 53 percent of all government payments. The distribution of government payments is somewhat less concentrated, because a relatively large proportion of the payments were distributed through wheat and feed grain programs, where small farmers account for a larger share of production than in other commodities. Wilcox's study of the size and distribution of government payments for 1968 shows that "most farmers received small to medium-size payments. Only a few farmers, less than 1 percent, received payments of $15,000 or more. But, the great bulk of funds paid out as payments to producers (some 67 percent) went to 33 percent of the producers in payments ranging from $1,000 per year to $15,000 per year." 15/

A general notion of the extent of government intervention in farming during the past 20 years is provided in Table 8. Between 1961 and 1972, supply-control activities idled about 15 percent of all U.S. cropland each year. The value of government-held stocks peaked at slightly more than $80 billion in the mid-1960s, and direct payments to farmers climbed to about $40 billion in 1972. Because of favorable market conditions, the need for government intervention was largely eliminated from 1974 to 1976.

Evidence that commodity programs provide benefits in direct proportion to the amount sold is readily forthcoming--"they were designed to benefit the fellow with something to sell, and obviously the more he had to sell the more he benefited." 16/ This outcome is most apparent in the case of income gains derived from higher market prices. Government program payments per se do not necessarily cause farm size growth. Analysis of direct government payments per farm by value of sales class for 1968, 1972, and 1976 show that government payments are a smaller percentage of net receipts on large farms than on small farms. 17/ Therefore, the net receipt

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14/ Charles L. Schultze, The Distribution of Farm Subsidies: Who Gets The Benefits? (Brookings Institution, 1971), p. 30.

15/ Willard W. Cochrane and Mary E. Ryan, American Farm Policy, 1948-1973, p. 366.

16/ Ibid., p. 364.

17/ U.S. Department of Agriculture, Farm Income Statistics, Statistical Bulletin No. 576, July 1977, pp. 54-57.

TABLE 8. CROPLAND IDLED BY GOVERNMENT PROGRAMS, COMMODITY CREDIT CORPORATION STOCKS, AND GOVERNMENT PAYMENTS, 1955-1975

Year	Acres of Cropland Idled (millions)	Government Commodity Stocks, Jan. 1 a/ (billion $)	Government Payments		
			All Farms (billions $)	Farms With Annual Gross Sales $20,000 or More	
				Percent of All Payments	Percent of All Farms
1955	0	6.9	0 b/	N.A.	N.A.
1960	28.7	8.1	0	31	9
1965	57.4	6.7	2	38	13
1970	57.1	4.6	3	56	19
1972	62.1	4.3	4	61	22
1973	19.6	3.3	2	69	28
1974	2.7	1.7	0	67	29
1975	2.4	0.9	0	71	28

SOURCES: U.S. Department of Agriculture, Agricultural Statistics, 1972 and 1976, U.S. Department of Agriculture, Farm Income Statistics, Statistical Bulletin No. 609, July 1978, p. 61.

a/ Commodities owned by or under loan to the Commodity Credit Corporation.

b/ Payments to producers of sugar beets and sugar cane.

advantage of large farms over small farms increases slightly if direct government payments are eliminated, other things constant.

Some commodity programs have contained provisions expressly designed to provide smaller operators with proportionately higher benefits. Acreage allotments for burley tobacco made it possible for many small farmers to continue operating, and for many years they were used to shift most of the burden of supply control to large farmers. In 1970, an annual maximum limit on government payments of $55,000 per farmer was introduced. Subsequent farm legislation has maintained a payment limitation provision, but studies by the General Accounting Office and USDA show that aggregate budget outlays (income transfers to the farm sector) have been reduced by only a small amount.

Over time, the level of price support provided through commodity programs has been gradually adjusted downward toward the long-run market equilibrium price. This reflects a compromise solution that reduces government acquisition and storage costs and provides farmers with direct payments to maintain their incomes in low price years and induce them to participate in supply-control activities. The Agriculture and Consumer Protection Act of 1973 initiated a target price-deficiency payment scheme, 18/ and under the 1977 Food and Agriculture Act, target prices are adjusted annually for changes in the national average cost of production, excluding changes in management and land costs. Note, however, that if economies of size in farming tend to reach a minimum and flatten out, as suggested in Figure 2, then target prices based on national average cost of production guarantee a windfall subsidy to the more efficient farmers who operate below the average cost of production. 19/ Thus, if the windfall subsidies are capitalized into land values, the resulting higher capital requirements make it more difficult for new producers to enter farming and the cost situation of all producers deteriorates relative to target prices that are not adjusted for rising land costs. Apparently, then, the current commodity program has

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18/ If the market price of a commodity falls below its target price, participating farmers receive a deficiency payment equal to the price differential times normal production from a specified acreage. Because of the introduction of deficiency payments, the effective level of price support is greater than that implied by the loan rates.

19/ J.B. Penn and William T. Boehm, "Research Issues Re-emphasized by 1977 Food Policy Legislation," Agricultural Economics Research, vol. 30 (January 1978), p. 6.

a built-in provision which, over a period of time, may impede entry into farming and hasten the exit of small-scale farmers.

As mentioned in the preceding section, it is widely believed that the reduced price and income uncertainty associated with commodity programs has significantly contributed to the increase in the size of farms. Society has shared some of the risks inherent in farming and has facilitated the movement of capital into the farm sector, thereby encouraging the adoption of new technology and specialization among the larger and more efficient farming operations. Price supports may also have sheltered some obsolete technology and protected some smaller farms from failure; but, in recent years, price supports have been too low to protect highly inefficient units. The use of land diversion as a means of reducing production has similarly encouraged consolidation and farm growth. Reduced acreage in farms optimally organized before land diversion means underutilized labor and machinery; expanded land holdings offer a ready solution.

It has been suggested that federal commodity programs could be used to support farm prices at higher levels, which would increase average farm income and thereby reduce the pressure on farmers to increase output. Raising support prices is one means of providing income assistance. But it would give the greatest absolute help to farmers who have the most to sell. Program benefits are tied to the production of certain commodities or to land ownership, they are not tied to farmers themselves. Furthermore, high support prices would require strict production controls or large taxpayer outlays to store and dispose of surplus commodities.

Nelson simulated the 1953-1972 farm economy and examined the economic consequences of eliminating all major commodity programs. 20/Some major findings of Nelson's study, which assumed a free market was established in 1953, are:

- o A larger supply of farm products would have caused farm prices and incomes to fall at least 20 percent below actual historical levels by 1957. But supply would ultimately lag, causing farm prices and incomes to rise at least 6 percent above actual levels in 1968 to 1972.

- o Lower incomes and increased farm price variability would substantially reduce capital investment. Land in farms relative to

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20/ Frederick J. Nelson and Willard W. Cochrane, "Economic Consequences of Federal Farm Commodity Programs 1953-1972," pp. 52-64.

other assets would increase as farmers substituted cropland and labor for machinery, fertilizer, and other purchased inputs. Overall farm productivity would have declined about 11 percent below actual levels by 1972.

- The number of farms would have declined at a slower rate, leaving 24 percent more farms with an average size 20 percent smaller than actually occurred in 1972.

Commodity programs have significantly influenced the structure of farming. The most dramatic consequences are reflected in the behavior of large-scale and expanding farm operators, who levered income gains and reduced uncertainty into additional land, rapid adoption of new technology, and highly specialized production processes, at the expense of smaller, less aggressive farmers. Ultimately, the windfall subsidies generated by commodity programs are distributed in proportion to land ownership and capitalized into land values.

Taxation. Federal tax laws have historically extended special treatment to individuals engaged in agricultural production. To simplify record keeping, farmers are allowed to use the cash method of accounting, as opposed to the more complicated accrual method used in other businesses. And farm outlays for certain land improvements and conservation practices can be deducted as current expenses, rather than being capitalized. Such provisions encourage taxpayers to offset income fluctuations with current production expenses and to convert ordinary income into capital gain, taxable at a lower rate. As a result, individuals identified with farming may have a lower tax burden than other individuals, and the difference between farm and nonfarm tax burdens appears to widen with increasing income. 21/Since marginal tax rates increase as taxable income rises, special tax preferences provide greater absolute benefits to individuals in high income tax brackets. During the past decade, federal income tax legislation has aimed at neutralizing tax-motivated resource shifts in farming.

Tax preferences associated with farming are generally believed to create an incentive for the entry of capital from outside agriculture. Individuals with nonfarm income seek farm tax preferences to reduce their effective tax rate and postpone payment of taxes. This demand for "tax-

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21/ Charles A. Sisson, "Tax Burdens and American Agriculture: A Micro Study," (Ph.D. Dissertation, American University, Washington, D.C., 1977).

loss farming" opportunities appears to be a function of: the availability of cash accounting and prepaid production expenses to generate annual farm losses that can be deducted from nonfarm income; a low tax rate on capital gain relative to ordinary income; and high nonfarm income. These tax shelters have contributed to the rising demand for agricultural land and may be viewed as generating unfair competition for individuals who depend on farm income for a major portion of their livelihood. There is also evidence indicating that tax shelter syndicates contributed to overcapacity and depressed farm prices in cattle feeding, grapes, and other tree crops. 22/ The Tax Reform Act of 1976 is expected to curb some of these activities. Starting in 1977, losses of partnership investors are generally limited to amounts "at risk," deductions cannot be claimed for feed, seed, fertilizer and other farm supplies until they are actually used, and farm corporations with gross receipts of more than $10 million per year must use accrual accounting.

Among individual farmers, tax considerations are only one of many factors affecting the decision to expand or contract the size of a farm operation. Although special tax provisions are open to virtually everyone in agricultural production, ability to reap their benefits is directly related to a farmer's marginal income tax rate. The example presented in Chapter II (page 19)demonstrates that an individual with a high farm income can realize a substantial tax saving by incorporating and expanding his farm through retained earnings. In this process, current income is transferred into additional real property and land ownership may tend to become more concentrated in the hands of a few wealthy people. Other aspects of tax law, such as investment tax credits and accelerated depreciation, encourage rapid mechanization of farming by shifting a part of machinery costs to the public. This amounts to a subsidy on capital inputs relative to labor inputs, and the subsidy is most readily available to large farmers who can afford expensive equipment. Clearly, when these tax provisions are combined with a graduated federal income tax schedule, high-income farmers receive much greater benefits than do low-income farmers.

The 1976 Tax Reform Act also substantially changed the valuation procedure for farm real estate in calculating federal estate taxes. The net

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22/ Mathews and Rhodes have described the operation of a cattle feeding fund, the relationship between federal income taxation and use of limited partnerships, and some of their effects on agriculture. See Stephan F. Mathews and James Rhodes, The Use of Public Limited Partnerships Financing in Agriculture for Income Tax Shelter, North Central Regional Research Publication 223, University of Wisconsin, July 1975, pp. 1-42.

result is a decline in farm estate values for tax purposes, which is expected to lead individual farmers, as they grow older, to shift capital investment into land and away from non-land assets. 23/ Benefits of this new provision will probably be capitalized into farm land values, as farmers with family heirs who plan to continue farming bid land away from other potential buyers. In fact, the estate tax shelter may serve as an incentive for the movement of more tax-motivated capital into farming.

Agricultural Credit. Public policy directly influences the supply of capital to farmers through the USDA's Farmers Home Administration (FmHA) and the Farm Credit System, which includes the Federal Land Bank, Production Credit Association, and Bank for Cooperatives. The original capital for the Farm Credit System was supplied by the federal government, but the system is now wholly owned by its borrowers. On January 1, 1977, the FmHA and Farm Credit System together accounted for slightly more than one-third of total farm debt outstanding—6 percent and 30 percent, respectively.

The FmHA makes low interest loans to family farmers who cannot obtain credit elsewhere. Borrowers may obtain farm ownership loans carrying a maximum limit of $200,000, financed over 40 years at 8½-percent interest; and operating loans not exceeding $100,000, financed over 1 to 7 years at 8½ percent interest. To the extent the FmHA clients would not be served by other credit sources, the program reduces an entry barrier and thereby results in a net increase in relatively small farms. Because of steadily increasing capital requirements, however, the effectiveness of FmHA in the future may depend on raising the maximum loan limits.

Lending institutions of the Farm Credit System are considered to be highly competitive with commercial banks and insurance companies. Though their impact on the structure of agriculture is not easily determined, it seems reasonable to infer "that credit is more easily available and at relatively lower interest rates to agricultural borrowers than it would have been in the absence of the Farm Credit System." 24/ If this inference is correct, the Farm Credit System has encouraged entry into farming and

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23/ Neil E. Harl, "Corporation Farms and 1977 Farm Legislation," p. 7.

24/ Charles V. Moore, "Effects of Federal Programs and Policies on the Structure of Agriculture," NEAD Working Paper, U.S. Department of Agriculture (January 1977), p. 12.

promoted expansion of existing farms. Certainly, it has supported the objectives of the more aggressive, expansion-oriented farmers and its net effect on structure is probably to increase farm size.

Rural Development. There is growing recognition of a mutual interdependence between the structure of farming and the viability of rural communities, and a wide variety of federal programs have aimed at encouraging rural development. Community planning, technical assistance, business and industrial loans, public works grants, and highway construction have been among the most important federal rural development activities.

The availability of rural nonfarm employment increases the options of farm people and directly influences the structure of farming. In 1930, less than one in six farms were part-time farms. 25/ In 1977, an estimated 61 percent of the total income of farm operator families came from nonfarm sources, and 40 percent of the 1974 Census of Agriculture farm operators reported their principal occupation to be "other than farming." Nonfarm income helps some people remain in farming; others sell out to a neighbor in order to work full time off the farm. In addition, the business activity generated by farming has economic and social effects that spread out into the community. Sociologists recently examined the relationship between the control of major agricultural resources, namely land and water, and the quality of community life in 130 San Joaquin Valley towns. 26/They concluded that rural communities derive greater benefits from a large number of relatively small, family-owned and operated farms than from a few large-scale farms. Data are presented which show that the communities surrounded by small farms offer more diversified and stable employment, a larger volume of local business activity, more schools, parks, and other public services, and more participation in social and civic organizations.

The initial argument that federal assistance was needed to stem the long-time rural to urban migration was dampened when demographers reported that population growth rates in nonmetropolitan counties began to

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25/ D. Gale Johnson, Farm Commodity Programs: An Opportunity for Change, p. 15.

26/ Community Services Task Force Report, The Family Farm in California, State of California, Sacramento, California (November 1977), pp. 1-36.

exceed metropolitan counties in the early 1970s. 27/ But the critical question remains: To what extent have federal rural development programs shifted the distribution of economic activity in favor of rural areas and delivered net benefits to farm families and other rural residents? Very few studies address this difficult question in an objective and comprehensive manner. A statistical analysis of 319 counties receiving assistance through the Department of Commerce and 982 other counties in 13 southeastern states from 1959 to 1969 shows that the assisted counties did not experience significantly higher employment increases than the unassisted counties. Instead, changes in employment were significantly related to the amount of previous industrialization in the counties, the rate of unemployment in 1960, and the availability of TVA power. 28/

The recent trend toward rural industrialization in the South and migration to the Sun Belt is probably more a consequence of low wage rates, "right to work" laws, rising external costs of operating in northern urban centers, and the increased availability of retirement benefits than of federal rural development programs. Federal programs have certainly influenced the development of selected local communities and the resulting improvements in infrastructure (highways, sewer systems, and so forth) have clearly enhanced the quality of rural life. But, at this time, there is no evidence of a net increase in employment and population in rural America, nor of subsequent effects on the structure of farming, over what would have occurred in the absence of special federal rural development activities.

Research, Extension, and Information. Publicly supported research, extension, and information activities have greatly increased agricultural productivity. Research results and other types of agricultural information share a characteristic of all public goods—if farmer A "consumes" a market news report, its utility to other farmers is not destroyed--and they are more widely distributed as a result of government involvement. Estimates of the

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27/ Calvin L. Beale, "A Further Look at Nonmetropolitan Population Growth Since 1970," American Journal of Agricultural Economics, vol. 58 (December 1976), p. 953.

28/ Thomas Till, Development in Counties of Thirteen Southern States with Respect to EDA/ARA Program Effects, U.S. Department of Commerce, September 1973.

social rate of return on public investment in agricultural research are very favorable, ranging from 30 to 55 percent. 29/

Research, extension, and information activities have probably promoted the trend toward fewer and larger farms. Research results are put to work by innovative farmers through new machinery, seeds, breeding techniques, and production practices. Some technologies, such as a 4-wheel drive tractor, are clearly biased in favor of larger operating units. But most scientific improvements can be used effectively regardless of farm size. One consequence is that early adopters—of, say, an improved variety of corn—place downward pressure on prices and all farmers must expand their output to maintain a given level of net income. Even technology that appears to be "neutral" with respect to farm size causes some farmers to expand and forces others to accept low returns until they retire or find alternative employment.

In addition, the USDA and land grant colleges have been widely criticized for ignoring the research needs of small farm operators, farm workers, and others who fall outside the contemporary economic and political power structure, of which they are themselves members. According to Hightower:

> Land grant policy is the product of a closed community. The administrators, academics, and scientists, along with the USDA officials and corporate executives, have locked themselves into an inbred and even incestuous complex, and they are incapable of thinking beyond their self-interest and traditional concepts of agricultural research. 30/

A closely related consequence is a failure to allocate public resources to assess the economic and social impact of new farm technology on those individuals adversely affected by such changes.

29/ Robert Evenson, "The Contribution of Agricultural Research to Production," Journal of Farm Economics, vol. 49 (1967), pp. 1415-1425. Zui Griliches, "Rearch Costs and Social Returns: Hybrid Corn and Related Innovations," Journal of Political Economy, vol. 66 (1958), pp. 419-431.

30/ Jim Hightower, "A Summary of Hard Tomatoes, Hard Times," Agribusiness Accountability Project, Washington, D.C., 1972, p. 15.

The Extension Service has played a vital role in transmitting scientific knowledge to farmers. And, today, there is ample reason to believe that the level of knowledge and technical skill required to succeed in farming may have a greater impact on structual organization than the increase in capital requirements caused by the growth in farm size. Dependent on the use of "change agents" as the most cost-effective conduits for disseminating information, the Extension Service has focused most of its resources on farms of medium to large size. In a few states, however, such as Missouri and Texas, the Extension Service uses paraprofessionals and other program techniques aimed specifically at small-scale farmers. Working intensively with small farmers on a one-on-one basis, assistance in improving their production practices, marketing, and knowledge of available services is provided. Although only a small amount of funds have been devoted to such programs, moderate increases in participants' income have been reported.

Information on current market prices and shipments, crop planting intentions, numbers of livestock on feed, exports, and many other factors are supplied by the USDA to help farmers formulate their production and marketing plans. Publicly supplied information has value to the extent it is used to improve decisionmaking. Society as a whole benefits when any farmer is assured of accurate, timely, and relevant information. Since the cost of obtaining and using this information is fairly constant with respect to output, large farms can spread the fixed cost over more output. Other things constant, greater absolute value accrues to large farms relative to small farms.

Environmental Protection. Federal environmental regulations affecting agricultural production are still evolving and their structural consequences are therefore unknown. The final outcome will depend largely on the cost structure of pollution abatement technology and the administrative rules used to enforce environmental standards. For example, if dairy farms with fewer than 30 cows are exempt from water pollution regulations, they may even gain an advantage relative to large dairy farms.

Most pollution abatement technology requires a relatively heavy initial capital outlay and usually does not produce additional revenue. Lagoons for cattle feedlots and the protective clothing and training required in applying pesticides are good examples. To the extent that economies of size exist in pollution abatement, the enforcement of environmental standards will tend to increase concentration in farming.

Others. Many other government policies and programs influence the structure of the farm sector. Federal irrigation projects distribute massive

subsidies to landowners in the western states. 31/ This program gives farmers in federal project service areas a cost advantage over other farmers and shifts the location of agricultural production in favor of the irrigated West. Grazing fees for the use of public land are another kind of federal subsidy, which are distributed to ranchers in direct proportion to the number of animals grazed.

The federal government also helps farmers deal with natural hazards through crop insurance, emergency loans, and disaster payments. These programs have helped some farmers stay in operation and have encouraged others to expand. But since the level of risk assumed by the government is small relative to the total liability, the net effect of these programs on farm structure has not been very significant.

In future years, public policy related to nutrition, diet, and consumer attitudes may have an important impact on American agriculture. For example, concern over increased consumption of meat and other sources of saturated fat and cholesterol could mean greater emphasis on new grain products for human consumption.

31/ The U.S. Department of the Interior estimates that the present value of the water subsidy in California's Westlands Water District is $1,540 per acre.

CHAPTER IV. CURRENT POLICY OPTIONS CONCERNING THE FUTURE STRUCTURE OF AGRICULTURE

In designing a policy to influence the future structure of agriculture, policymakers must deal with two difficult questions. First, what structure is desired? And second, what policy tools are best for achieving it? To help answer these questions, this chapter considers three alternative farm structures, policy tools that could be used to achieve them, and some of the economic implications of each of these three structures.

A few preliminary words of caution may, however, be appropriate. The amount of hard, quantitative research on which to base conclusions about the future structure and performance of the farm sector is quite limited. This is a particularly serious limitation, because the current farm sector is highly heterogeneous by size and type of farm, capital requirements, production practices, linkages with the nonfarm sector, and off-farm employment. Further, although public policies certainly influence the structure of agriculture, they must interact with structural determinants arising out of the private sector (see Chapter III). While public and private forces are often complementary, they are also sometimes conflicting; hence the objectives of public policy may be completely negated. Conclusions concerning the future of the U.S. farm sector and alternative policies that seek to influence it therefore inevitably involve an element of "crystal ball gazing."

Alternative Structures

The choice concerning the future structure of agriculture currently available to policymakers is not really a choice between the two extremes of many small family farms, on the one hand, or a few giant conglomerates, on the other. Rather, the pertinent choice is between the different rates at

which our heterogeneous farm sector will continue to be transformed during the next 20 to 30 years. 1/

The current trend in the pluralistic farm structure that has evolved is toward fewer, larger, and more specialized farms, greater use of manufactured inputs, a smaller farm labor force, and closer ties to the rest of society. Despite the strength of this trend, it seems likely that the farm structure for many years into the future will continue to reflect the heterogeneity that is so characteristic of the mold from which it must be cast. It therefore seems reasonable to assume that there are today three alternative farm structures from which policymakers may choose: a continuation of the current trend toward fewer and larger farms, a deceleration of the current trend, or an acceleration of this trend. 2/ The choice between these alternative structures will, in turn, be largely determined by the relative weights assigned to certain key objectives, namely: production efficiency, the level of farm family income, consumer food prices, the economic health of rural communities, and federal budget costs. Because some of these objectives are nearly always in conflict, choice among the alternative farm structures requires that some objectives be traded off against others.

Continue Current Trend. Continuation of the current trend would result in a wide range of farm sizes, with substantial variation by type of agricultural product and region of the country. If this alternative were

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1/ Some analysts do not agree with this statement. Belden has proposed a restructuring of agriculture that would involve decentralized production of most crops on small, multi-crop farms; labor-intensive methods of production; public control of agricultural exports; and direct income supplements. Joe Belden with Gregg Forte, Toward A National Food Policy, Exploratory Project for Economic Alternatives, 2000 P Street N.W., Suite 515, Washington, D.C., 1976.

2/ Of course, there are many other possible farm structures. Here it is assumed that Congress may be interested in adopting public policies that would influence the rate, but not completely alter the direction, of change in the farm structure.

selected, there would probably be about 1.6 million farms in 2000. 3/ Approximately 50 percent of these farms would be small (that is, have annual sales of less than $20,000 in 1976 dollars), including many highly successful part-time farms. An estimated 300,000 large farms (those with annual sales greater than $100,000) would account for 80 percent or more of total cash receipts from farming. A large proportion of all farm labor would continue to be supplied by farm operators and family members. Most of the land used in farming would be owned by independent landholders, although leasing would probably become more prevalent.

Steadily increasing capital and management requirements would greatly limit opportunities to enter farming on a full-time basis. Furthermore, pressure for better coordination of the food and fiber system would probably reduce the managerial independence of individual farmers. In some farming areas, traditional open markets would disappear and farmers would have fewer alternatives for purchasing inputs and selling their products. For some commodities, such as broilers, turkeys, sugarcane, sugarbeets, seed production, citrus fruit, and processing fruits and vegetables, concentration and control by large-scale integrators would need to be carefully watched for signs of anticompetitive behavior. But, the production of most other commodities would be dominated by large capital-intensive family farms. Overall, food processors, distributors, and production input suppliers would be in a stronger position to gain market control than would farmers. These firms would be likely to place high priority on market security and controlled growth through product differentiation and advertising, with less emphasis on price competition.

Decelerate Current Trend. Slowing down the current trend would result in a larger number of small and medium-size farms, with more management decisions in the hands of individual farmers. Under this alternative, there would probably be about 1.9 to 2.0 million farms in 2000;

3/ This projection is extrapolated from a Markov Chain analysis conducted by William W. Lin, U.S. Department of Agriculture, January 9, 1978. In 1974, Sonka and Heady projected 1.8 million farms in 1980 under a "typical farm structure" consistent with current trends. Steven T. Sonka and Earl O. Heady, American Farm-Size Structure In Relation to Income and Employment Opportunities of Farms, Rural Communities and Other Sectors, Center for Agricultural and Rural Development, Iowa State University, Card Report 48, (June, 1974), p. 62.

10 percent or fewer would have annual gross sales greater than $100,000. 4/ In order to attain an acceptable standard of living, most of the families living on smaller farms would be highly dependent on nonfarm income. But medium-size farms would contribute somewhat more to total farm output than under the current trend. There would also be fewer hired farmworkers, no separate landholding class, and the role of professional farm managers would be reduced. Some family labor would be substituted for purchased inputs, open market trading would expand, and there would tend to be a larger number of alternative markets.

Accelerate Current Trend. Accelerating the current trend means that a greater share of agricultural production would be under the control of very large family owned and operated farms and industrialized farms. Nevertheless, there would still be many farms--about 0.9 to 1.0 million farms in 2000. 5/ But this option would probably reduce the number of farms with annual gross sales of less than $100,000 by 50 percent or more, as compared with continuing the current trend. Land ownership would tend to become more concentrated and large-scale farmers would lease land from ex-farmers, farm widows, and urban investors. The differentation between those who work the land, manage it, and own it would increase. The open market aspect of agriculture would disappear, farmers would receive more management supervision from creditors and processors, and capital would be increasingly transmitted to farming through stocks, bonds, and mutual funds. Large farmers would engage in collective bargaining through their commodity organizations or cooperatives. In short, the structure of agriculture would involve a relatively small number of very large production units accounting for nearly all farm output and a substantial number of small and part-time farms. The latter group would not represent an economically strong or stable part of the farm structure.

4/ A USDA study projected 2.4 million farms in 1985 and 2.1 million farms in 2010 under " a set of programs designed to preserve the maximum feasible number of farms." U.S. Department of Agriculture, Alternative Futures For U.S. Agriculture: A Progress Report, Printed for the use of the Committee on Agriculture and Forestry, U.S. Government Printing Office, (September 1975), p. viii.

5/ In 1975, the USDA projected 1.0 million farms in 1985 and 0.9 million farms in 2010, assuming maximum efficiency through a free market. A year earlier, Sonka and Heady projected 1.3 million farms in 1980 with a large farm structure composed entirely of farms with annual gross sales over $40,000.

Policy Tools

Policy tools that could be used to achieve each of the alternative farm structures are discussed below. These policy tools are neither exhaustive nor representative of a major break with past policies. Instead, they are selected to indicate the type of public policy that might emerge from the Congress, if a particular farm structure were preferred. The policy tools presented here are not analyzed in depth, but are proposed as representative of the type of public policy needed to achieve a particular type of farm structure.

The public policy tools needed to ensure continuation of the current structural trend are now in place. Commodity programs would provide price supports as a percentage of average production cost and would supplement low incomes with deficiency payments. Uncertainty in the market place would be reduced and program benefits would be distributed in proportion to volume of output. Export market expansion would be pursued by negotiating reduced trade barriers and more long-term trade agreements. The Farm Credit System would be sufficiently expanded to satisfy the increasing credit needs of larger farms. Tax provisions applying to farmers would be similar to other businesses, but the lower tax rate on capital gain would be maintained. Some additional attention would be directed to the research and information needs of smaller farms. And existing anti-trust laws would be used to maintain reasonably competitive checks and balances in the food and fiber system. This might involve prohibiting further acquisitions and mergers by the largest corporations and cooperatives.

Public policy strategies that would decelerate the current trend require the most substantial revisions of traditional farm policy. Specific changes would be needed to discourage the expansion of family-size farms into larger-than-family-size farms, to encourage some large farms to disaggregate, and to diffuse economic power. A set of policy tools to achieve this structure might include the following:

- Commodity program benefits could be targeted to small, diversified farms. This could be accomplished by gearing program payments to farm size or existing ownership patterns, and by requiring two or three enterprises per farm for program eligibility. Transferability of program benefits should then be prohibited, because large farmers would tend to bid land away from small farmers.

- Another option would be simply to eliminate the commodity programs and provide direct income subsidies to poor farm (and nonfarm) people.

- Public research and information could be aimed exclusively at small and part-time farmers. Diversified farming, labor-intensive production practices, organic farming, and direct marketing would be key research topics.

- Liberal government credit could be used to reduce the cost of debt capital to small farms relative to large farms. A new program enabling the government to purchase land and lease at favorable terms to small farm operators might be introduced.

- Tax laws could be changed to prohibit the use of farm losses to offset nonfarm income, to increase the capital gain tax, and to eliminate the investment tax credit. To further retard farm growth, a graduated property tax might be introduced and a special tax levied on the manufacture or use of size-increasing technology.

- Agribusiness corporations could be prohibited from engaging in farming and using contracts that severely impair the managerial independence of the farmer, and a large proportion of farm inputs and products could be required to move through open markets.

- Government subsidies could be used to promote dispersed rural industrialization to ensure farm families employment opportunities without leaving their farms.

Moving in the opposite direction, policy tools to accelerate the current trend would attempt to reduce steadily the cost of production on large farms and encourage the development of a closely coordinated food and fiber system. Modifications of existing policies and programs might include the following:

- Commodity programs could be used to eliminate the risk of decreases in farm prices and incomes, with no maximum limit on government payments per farm. The level of price support could be kept low enough to avoid encouraging small operators to stay in farming.

- Public research and information would focus on the needs of large-scale farms. FmHA programs would be phased out, as would any special help for small farmers through the Extension Service and other agencies.

- o Vertical coordination of food and fiber production would be encouraged through contracting, direct ownership, and government regulation of business activity.

- o Higher minimum wages and unionization of farm workers would promote mechanization and farm growth.

- o Industrialization and employment opportunities would be subsidized in "growth centers" away from prime farming areas.

Consequences

Some likely consequences of the alternative farm structures are discussed by comparing the consequences of slowing down or accelerating the current trend with the consequences of continuing the current trend (Table 9). Using the alternative of continuing the current trend as a benchmark serves to highlight the nature and relative magnitude of the trade-offs among important objectives.

Under a continuation of the current trend (1.6 million farms in 2000), aggressive and innovative farmers are likely to earn incomes comparable to opportunities in the nonfarm sector. Reasonably efficient and competitive conditions are expected to prevail, with consumers paying about 12 to 14 percent of their disposable personal income for food and fiber products. Federal program costs would depend largely on supply and demand conditions, particularly in the major export markets. Other things constant, increased exports would result in more farms and higher net income per farm.

With respect to production efficiency and farm income, slowing down the current trend (1.9 to 2.0 million farms in 2000) would result in slightly higher average production costs and total cash receipts to the farm sector would rise. As compared with continuing the current trend, average farm prices might rise 8 to 10 percent, 6/ and average net farm income would fall

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6/ Steven T. Sonka and Earl O. Heady, American Farm-Size Structure in Relation to Income and Employment Opportunities of Farms, Rural Communities and Other Sectors, p. 33.

TABLE 9. COMPARATIVE CONSEQUENCES OF ALTERNATIVE FARM POLICIES

Consequences	Policy Options: Decelerating as Compared with Continuing the Current Trend Toward Larger and Fewer Farms	Policy Options: Accelerating as Compared with Continuing the Current Trend Toward Larger and Fewer Farms
Expected Change in:		
Average Costs of Farm Production	Slightly Higher	Slightly Lower
Total Cash Receipts to Farming	Higher	Lower
Average Net Farm Income	Substantially Lower	Substantially Higher
Retail Food Prices	Higher a/	Lower a/
Economic Activity in Rural Communities	Increased	Decreased
Federal Budget Costs	Higher	Lower

a/ It is estimated that slowing the current trend would increase retail food prices by 3 percent and that accelerating the current trend would decrease retail food prices by 3 to 5 percent. These estimates are based on the assumption that on-farm economies of size, discounts earned through volume buying of production inputs, and lower costs of volume selling are not absorbed in higher processing and marketing margins.

about 15 to 20 percent, due to higher costs and a larger number of farms. 7/ Labor requirements would be at least 10 percent higher.

Under the alternative of accelerating the current trend (0.9 to 1.0 million farms in 2000), lower per unit production costs might enable average farm prices to be reduced by 10 to 15 percent. 8/ Total cash receipts to the farm sector would fall as compared with continuing the current trend, but average net farm income might rise 25 percent. In effect, average farm income would be increased as a result of the elimination of some small- and medium-sized farms, and the distribution of farm income would be skewed in favor of a relatively small number of large farms. In addition, as the price of land is bid up, fewer farm people would benefit.

These initial consequences reveal some of the important trade-offs involved in deciding among alternative farm structures. Accelerating the trend toward larger and fewer farms causes a sacrifice in total cash receipts to the farm sector and in farm employment, but results in higher incomes to farmers who operate the larger units. Society gains an efficiency-oriented farm sector with the skills and resources required to adopt and use new technology rapidly, but individual farmers may have to give up much of their managerial independence and proprietary status.

Most experts believe that decelerating the current trend means higher consumer prices and accelerating the current trend means lower prices. A 1-percent change in average farm prices is generally reflected as a 0.3 to 0.4 percent change in the food expenditure component of the Consumer Price Index. Therefore, accelerating the current trend would probably decrease retail food prices by 3 to 5 percent, while slowing the current

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7/ In the USDA study, an additional 0.3 million farms in 1985 would cause average net farm income to fall 28 percent. U.S. Department of Agriculture, Alternative Future for U.S. Agriculture: A Progress Report, p. viii.

8/ Steven T. Sonka and Earl O. Heady, American Farm-Size Structure in Relation to Income and Employment Opportunities of Farms, Rural Commuities and Other Sectors, p. 33.

trend might increase food prices by 3 percent. 9/ If public policies are adopted to accelerate the current trend, it seems likely that consumers would obtain a larger supply of food and fiber products at slightly lower prices. And with lower farm prices, more agricultural commodities would be sold abroad, which might increase foreign exchange earnings and make it easier for Americans to purchase imported goods. However, accelerating the current trend would create a greater threat of interrupted food supplies. With greater concentration of production and more farmworkers unionized, consumers would be more likely to experience major interruptions in farm work, input supplies, or processing at critical times. Dispersed ownership, small farms, and heavy reliance on owner-operator labor rather than borrowed capital and hired labor provides a cushion of fixed costs that can be absorbed, or postponed, during times of adversity. This guarantees continuity in food supply, even if the economy is in the midst of a severe depression.

Policies to slow down the current trend would favorably affect economic activity in rural communities because higher total cash receipts flowing to the farm sector support more local service businesses, and more farm families and workers purchase more consumer goods and services from local merchants. Furthermore, greater industrialization of rural areas would tend to increase the nonfarm income of many farm families, offsetting, at least to a degree, the reduction in net income from farming. Larger farms result in lower production costs, fewer farms, and less labor input, which tend to dampen local economic activity. Large-scale operators often find it feasible and advantageous to go outside their rural community to deal directly with machinery manufacturers, feed and seed companies, and major city banks. In projecting to 1980, Sonka and Heady found that secondary-income generation increased 16 percent with a small farm structure and decreased 15 percent with a large farm structure. 10/ Although

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9/ Other experts do not believe that retail food prices would differ under the alternative farm structures considered here. They argue that any economies of size realized by a shift toward larger farms would be offset as the processing and marketing of food is further transformed toward promotional instead of price-based competition. Harold F. Breimyer and Wallace Barr, "Issues In Concentration Versus Dispersion," Who Will Control U.S. Agriculture? North Central Regional Extension Publication 32, (Urbana-Champaign: University of Illinois, August 1972), pp. 13-22.

10/ Steven T. Sonka and Earl O. Heady, American Farm-Size Structure in Relation to Income and Employment Opportunities of Farms, Rural Communities and Other Sectors, p. 49.

there are differences in assumptions, similar consequences might be expected from slowing down the current trend (a small-farm structure) and accelerating the current trend (a large-farm structure).

The federal budget costs of alternative farm structures depend on market conditions and the policy tools adopted. Many factors influencing supply and demand, such as weather and the foreign trade policy of other countries, are not subject to control by the U.S. government. This makes it very difficult to project budget costs reliably. Nevertheless, decelerating--as opposed to continuing or accelerating--the current structural trend, using policy tools such as those described in the preceding section, is likely to require the most government intervention and the largest taxpayer outlay. 11/ Budget costs would be incurred for deficiency payments (or some other type of income maintenance), expanded research and extension activities to help small farm families, and intensified rural development. USDA analysts have concluded that 1985 federal budget costs would be at least twice as high under a set of programs designed to preserve the maximum feasible number of farms, as compared with either a maximum efficiency or a supply management alternative. 12/ On the other hand, the federal budget costs of implementing public policies to accelerate the current structural trend would probably not be great. Commodity programs would be used only to stabilize farm prices. With reduced market risk, large farmers would expand rapidly by taking advantage of accelerated depreciation, investment tax credit, preferential taxation of capital gain, and other institutional factors that enhance their purchasing power. Government outlays would not be used to provide the income supplements, research, or nonfarm jobs that would strengthen the competitive position of smaller farms. Although direct government outlays to farming would be reduced, substantial increases in federal spending might ultimately be needed to assist displaced farm people and economically depressed rural communities.

One final consequence, relating to the reversibility of farm structures, is noteworthy. If policymakers at this time do not strongly prefer any one of the three farm structures presented here, they may want to consider

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11/ On the other hand, Paarlberg argues that ending existing programs that contribute to continuing the current structural trend would simultaneously slow the trend to fewer and larger farms and save money.

12/ U.S. Department of Agriculture, Alternative Futures for U.S. Agriculture: A Progress Report, p. viii.

slowing down the current trend, since this option provides the greatest degree of reversibility in farming. If, in future years, a particular farm structure becomes highly preferred over all others, it is probably far easier to consolidate small units than to break up large units. A decision to decelerate the current trend in agriculture would provide policymakers with more policy options in the future.

General Implications

Public policy can be used to influence the rate of change in farm structure and the consequences that emerge from that change in structure. The different consequences of alternative farm structures reflect different distributions of benefits and costs to consumers, farmers, and rural residents. If policymakers decide to accelerate the current structural trend, benefits go to the relatively small number of individuals who own the largest farms and to consumers, who pay lower food prices. Major costs are imposed on rural communities as total cash receipts to the farm sector fall, farm employment declines, and local economic activity contracts. Decelerating the current trend, on the other hand, stimulates income generation in local economies and rural communities, but results in a much lower average net farm income, which would be a serious burden for many farm families. Further, this alternative of slowing down the current trend conflicts with the efforts of farm families who seek to increase their income and improve their standard of living by increasing the size of their farm.

Available research suggests, however, that the differences in retail food and fiber costs under alternative farm structures would be quite modest, relative to those between total cash receipts to farming, average net farm income, farm employment, and the viability of rural communities. Perhaps public policy can be used to help achieve a farm structure sufficiently diverse to absorb economic shocks and provide a reliable food supply, without isolating farming from changes in the rest of the economy.