FUTURE CAPITAL AND CREDIT NEEDS

FOR OKLAHOMA FARMS

By

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Capital and Credit Trends

The capital intensity of American agriculture has been steadily increasing since the late 1800's. Throughout this period the accumulation of sufficient capital to effectively control a viable production unit has been a primary concern to individual farm operators, agricultural policy makers and managers of agricultural credit institutions. Traditionally, farmers have been able to supply a large proportion of the funds essential for maintenance of a viable operation from their accumulated savings or equity. In the not to distant past, credit or debt was strictly a secondary source of funds. Recently, however, credit requirements have risen faster than capital requirements because many farmers have been unable to generate the capital necessary for growth from their cash flows. If the trends of the recent past continue into the future those associated with agriculture will and must become increasingly conscious of the growing capital and credit needs of farmers.

According to a study by Tostlebe,[1] the value of assets employed in the agricultural sector, measured in current prices, increased at

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[1] Alvin S. Tostlebe, Capital in Agriculture: Its Formation and Financing Since 1870 (Princeton, 1957), pp. 11-13.

an accelerating rate from 1870 to 1920. From 1920 to 1940 the use of capital in agriculture decreased, and then the capital intensity increased sharply from 1940 to 1950. Since 1950 this latter trend in capital intensity has continued and has actually accelerated. Total assets of the United States farming sector increased from $132.5 billion in 1950 to $311.4 billion in 1970.[2] This represents an increase of 135 percent. Increases during the period for different categories of assets amounted to 177 percent for real estate; 82 percent for livestock; and 181 percent for machinery and motor vehicles. Similar figures on an average per farm basis are of an even more dramatic nature. This is due, in part, to the 48 percent decline in U. S. farm numbers between 1950 and 1970.[3] The average value of production assets per farm rose from $17,200 in 1950 to $91,700 in 1970.[4] This is an astonishing increase of 433 percent. During the same period the average value of real estate per farm increased from $11,800 to $70,700--a change of almost 500 percent. The average value of livestock per farm increased 268 percent and the average value of machinery and motor vehicles rose by 405 percent from 1950 to 1970.

This increase in the value of assets used in farming has led to and been accompanied by increasing farm credit requirements. On

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[2]U. S. Department of Agriculture, The Balance Sheet of the Farming Sector, 1970, ERS Agriculture Information Bulletin No. 350 (Washington, 1971), p. 2.

[3]U. S. Department of Agriculture, Number of Farms, 1910-1959: Land in Farms, 1950-1959 by States, ERS Stat. Bul. No. 316 (Washington, 1962); "Number of Farms and Land in Farms," ERS SpSy (1-72) (Washington, 1972).

[4]U. S. Department of Agriculture, Balance Sheet of the Farming Sector, 1970, p. 22.

January 1, 1970, outstanding farm debt in the United States totaled $58.1 billion, an increase of 469 percent from 1950.[5] As farm debt increased the ratio of farm proprietors' equity to the value of farm assets declined from 90.6 percent in 1950 to 81.3 percent in 1970. This decline in the equity ratio was in part the result of the failure of increases in cash farm receipts plus government payments to keep pace with the increase in farm capital requirements.

On an average per farm basis, farmers' use of credit increased nine times from 1950 to 1970. During this period, debt per farm (including CCC debt) rose from $2,196 to $19,870. To appreciate the magnitude of the rapid growth in the use of farm credit, one need only note that the approximately $345 billion worth of credit used by the farming sector in the 1960's was more than the total accumulated amount of farm credit used in the 40-year period 1920-1959.[6]

Factors Influencing the Use of Capital and Credit

A number of factors have contributed to the past expansion in the use of capital and credit in agriculture. In general these factors are of two types. The first type includes factors that have tended to increase the cost of traditional input items over time. The second type consists of trends toward the use of new technologies and increased farm size.

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[5] Ibid., pp. 10-11.

[6] Ibid., p. 30.

Productivity and Price Increases of Traditional Inputs

The price appreciation in traditional input items can be attributed to two basic causal forces. One of these causal forces is the general trend toward higher prices that exists in the U. S. economy. This force of price appreciation can be termed the inflation component or the price component of rising prices. Much of the growth in the value of farmer's real estate investment from 1950 to date can be attributed to higher prices or inflation in land values. For machinery and equipment and other purchased inputs, a relatively smaller proportion of the increase in values can be associated with the price or inflation component.

The other causal force that has affected the value of traditional input items is the improved quality or the increased capacity of the inputs. This form of price appreciation can be termed the real component or the productivity component of higher prices. For example, the acreage in farm land has remained the same but the productivity of farm land has been increased through the use of drainage, irrigation, terracing, and other improved soil management practices. The real increases in the value of machinery and equipment are evidenced in the many efficiencies and the greater capacities that are found in today's machinery. New and improved herbicides, pesticides, fertilizers, and crop varieties have added to operating costs. A large part of the additional costs can be attributed to real increases in the value of the inputs.

In spite of the difficulties encountered, attempts have been made to empirically estimate the proportions of the increase in the value of

farm assets that are due to the real component and the price component. These estimates are made by comparing the total value of assets valued at current prices to the total value of assets valued at 1947-49 prices.[7] The difference in the two valuations reflects the increase in the value of assets that is due to the price or inflation component. The change in the value of assets at 1947-1949 prices reflects the real component. Analysis of this nature indicates that 87.6 percent of the total increase in the value of farm assets from 1950 to 1970 is due to price inflation.

The differences in the price components and real components for farm real estate and machinery and equipment are presented in Table I. The data in Table I indicate that 94.3 percent of the increase in the value of farm land from 1950 to 1970 is due to the price component. Only 71 percent of the increase in the value of machinery and motor vehicles is attributable to the price component. The real component accounts for only 5.6 percent of the increase in land values, and 28.9 percent of the increase in machinery values from 1950-1970.

Trends Toward New Technologies and Increased Farm Size

The second type of factor contributing to increased capital and credit requirements is the trend toward adopting new farm practices or methods of operation. Research and education have increased the rate of technological change in agriculture. The relative efficiency of the capital inputs that embody the new technology have, in turn, led to a

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[7] Ibid., p. 25, Table 26 and pp. 27-29, Table 27.

TABLE I

ESTIMATED SOURCES OF MAJOR CHANGES IN THE VALUE OF SELECTED AGRICULTURAL ASSETS--1950 AND 1970

	1950		1970		Net Increase 1950-1970		Percent Distribution of Net Increase 1950-1970	
	Land	Machinery	Land	Machinery	Land	Machinery	Land	Machinery
	(bil. $)	(bil. $)	(bil. $)	(bil. $)	(bil. $)	(bil. $)	(%)	(%)
Value of Assets, Current Prices, January 1	75.3	12.2	208.9	34.3	133.6	22.1	100.0	100.0
Assets, Valued at 1947-1949 Prices, January 1	74.8	11.0	82.3	17.4	7.5	6.4	5.6	28.9
Increase in value of assets, due to higher prices	0.5	1.2	126.6	16.9	126.1	15.7	94.3	71.0

Source: U. S. Department of Agriculture, Balance Sheet of the Farming Sector, 1970, pp. 27-29.

substitution of capital inputs for labor and land inputs.[8] In addition, the rapid rate of technological change causes the capital inputs to become obsolete more quickly. The end result is a much increased capital requirement for agriculture.

The increase in technology has also led to more specialization by individual farmers. Specialization is often accompanied by increased machanization which in itself requires increased capital outlays. Specialization also requires the farmer to purchase more of his inputs. In 1950, production expenses were 60 percent of gross income. By 1969, production expenses were 70 percent of gross income. As farm production expenses continue to increase faster than gross farm income, farmers will need additional amounts of debt and/or equity capital to finance their operating expenses.

Many of the above factors have indirectly led to increased capital requirements for agriculture by contributing to the increase in the size of individual farms. Improved production practices and equipment technologies have enabled farmers to expand their operations. The use of capital to purchase labor saving devices has made it possible for the farm operator to generate a larger volume of production. These developments have encouraged and enabled some farmers to expand, but, at the same time, they have caused others to leave farming because of the excessive investment requirements. In most cases, those who have left farming have been able to sell their land and equipment to their

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[8]Federal Reserve Bank of Kansas City, "Financial Requirements of Agriculture," Monthly Review (September-October 1964), p. 5.

expanding neighbors. Thus, there has been a trend toward steadily declining farm numbers and constantly increasing average farm sizes. This, coupled with increasing farm real estate and input prices, has led to the large increase in the value of assets per farm and has made it increasingly difficult for farmers to generate the amounts of capital that are required to operate today's farms.

Problem Statement

The results of recent studies, which will be reviewed later, and the projection of past trends suggest that the aggregate capital and credit needs of American agriculture will increase significantly in the future. These statistics indicate sizeable increases in the per farm capital and credit requirements in the years ahead. Some researchers made estimates of capital requirements per farm for different regions of the country. Others have projected the capital requirements of farms of various enterprise types. However, even with these disaggregated estimates, there are still no specific projections available for Oklahoma. Thus, the exact implications for Oklahoma agriculture and for the financial institutions serving Oklahoma agriculture of the projected national increases in capital and credit requirements have not been determined. Therefore, estimates are needed at both the macro and micro levels, of the future capital and credit requirements of the Oklahoma farm sector by size and type classification.

Those who are associated with Oklahoma agriculture are interested in more than just the state aggregate capital and credit requirements. They are aware of the fact that, in general, these requirements have been increasing over time. However, they do not have information on the

capital and credit needs of firms which are representative of the different sizes and the different enterprise types of farms that are found in Oklahoma. Estimates of this nature would allow comparisons of the changing capital and credit requirements of the different size classes of farm firms in Oklahoma. This data might indicate to policy makers that adjustments or changes in lending limits are needed to properly serve the larger, more capital intensive, farms of the future. Farmers could use this data to estimate the capital required to generate a given level of gross sales or income. Similar comparisons could also be made for firms engaged in different types of enterprises. Those entering farming could compare the capital needed to be successful in different types of operations. Estimates by type of enterprise might make lending institutions aware of the need to specialize in type-of-farming, package financing in addition to long- or short-term credit specialization. In addition, estimates on a size-type basis could furnish information that is needed by farm operators and lenders in their analysis of the current capital position and future capital and credit needs of individual firms. Estimates on a firm basis might also serve as guidelines and incentives for farm credit agencies to experiment with new innovations in the extension of agricultural credit.

Objectives

The primary goal of this study is to estimate the future capital requirements of the Oklahoma agricultural sector and to analyze the implications that such estimates have for the individual farm firm and for suppliers of agricultural capital. The specific objectives which will lead to the attainment of the primary goal are to:

(1) Estimate the future capital requirements of representative Oklahoma farm firms, cross-classified by economic class and enterprise type, and determine the proportion of the estimated per firm capital requirements that will be provided by farmers' equity and the proportion that must be provided by non-equity or debt.

(2) Estimate the future number of Oklahoma farm firms by economic class and enterprise type.

(3) Use data obtained in steps 1 and 2, along with aggregation procedures, to estimate the aggregate future capital requirements of Oklahoma farm firms by economic class and enterprise type and determine the proportion of these requirements that will be provided by debt and equity capital.

Previous Studies

The growth in the capital investment in agriculture that occurred during the 1950's and the early 1960's and the resulting credit demands led a number of researchers to inquire into the future capital and credit requirements of American agriculture. Most of the recent studies have projected the capital requirements of U. S. agriculture to some future date, usually 1980.

Aggregate Capital Projections

One of the earliest projections was published by Heady and Tweeten[9] in 1963. They projected the real value of the capital stocks in

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[9]Earl O. Heady and Luther G. Tweeten, Resource Demand and Structure of the Agricultural Industry (Ames, Iowa, 1963), pp. 400-492.

agriculture for 1960-80. The Heady-Tweeten projections were based on their extensive econometric analysis of the determinants of demand for various farm capital goods. Using 1950-1960 data they projected total stocks of productive farm assets of nearly $128 billion (1947-49 dollars) in 1980. This represents a 19 percent increase over 1960.

In 1966 Brake[10] published current dollar projections of 1980 stocks of agricultural assets. These projections were made using cash flows and projections of cash flows. This study estimated the amount of capital in agriculture to be $352 billion by 1980. In 1968 Brake[11] updated the real estate estimate. This raised the total value of the 1980 capital stocks to $358.9 billion in 1980 dollars.

In a project executed for the National Advisory Commission on Food and Fiber, Heady and Mayer[12] made several projections of real stocks of machinery and livestock and of price changes of real estate. The 1980 total U. S. capital requirements for these projections, which assumed a "feed-grain" type government program and 1950-65 trend level exports in 1980, were $275.6 billion in 1965 dollars.

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[10]John R. Brake, "Impact of Structural Changes on Capital and Credit Needs," Journal of Farm Economics, XLVIII (December, 1966), pp. 1536-1545.

[11]John R. Brake, "Dimensions of the Credit Door," unpublished speech at Blacksburg, Virginia, August 5, 1968, referenced in Emanuel Melichar and Raymond J. Doll, Fundamental Reappraisal of the Discount Mechanism: Capital and Credit Requirements of Agriculture, and Proposals to Increase Availability of Bank Credit, Board of Governors of the Federal Reserve System (November, 1969), pp. 21-23.

[12]Earl O. Heady and Leo V. Mayer, Food Needs and U. S. Agriculture in 1980, Technical Papers-Volume I, National Advisory Commission on Food and Fiber (Washington, 1967), pp. 70-75.

Melichar and Doll[13] modified, compared and contrasted the projections of Heady and Tweeten, Brake, and Heady and Mayer. To facilitate comparison with current values, they also presented the value of stocks if neither price nor real changes occurred after January 1, 1969. Melichar and Doll altered the real term Heady-Tweeten projections to reflect moderate price advances for machinery, financial assets and real estate values. From the altered real term projections they obtained projections for 1980 which were valued at $490.1 billion in current (1980) dollars.[14] Melichar and Doll also modified the Heady-Mayer projection to reflect increases in machinery and real estate prices. With this modification the Heady-Mayer projection indicated 1980 capital stocks valued at $409.7 billion in 1980 dollars.[15] This projection lies between the $490.1 billion that Melichar and Doll derived from the Heady-Tweeten estimates and the $358.9 billion estimated by Brake.[16] However, all three of the studies projected capital assets of substantially higher value than did the "no change" model used by Melichar and Doll. This model, which assumed no price or real changes after January 1, 1969, estimated farm assets of $281.1 billion in 1980.[17]

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[13] Melichar and Doll, pp. 1-64.

[14] Ibid., p. 22.

[15] Ibid.

[16] Ibid.

[17] Ibid.

Aggregate Credit Projections

In the study previously mentioned, Brake[18] also projected the future credit needs of American agriculture. Brake looked at the difference between the projected 1980 capital stock values and the amount of additional equity investment that farmers would be able to provide each year. He estimated that by 1980 there would be $59 billion of real estate debt and $41 billion of non-real estate debt outstanding in U. S. agriculture.

Melichar[19] built upon the Heady-Mayer capital projections and derived credit needs of agriculture for 1980. First he derived the capital flows that were implied by the projections of capital stocks. From the capital flows, Melichar estimated the credit flows. His projections of farm debt outstanding in 1980 were $140 billion and $136 billion depending upon whether or not non-farm income was included in the total cash flow. Melichar's estimates indicate a slowing in the rate of increase of outstanding debt from recent annual rates of 10 percent to around eight percent by 1980.[20]

In their comparison of the studies by Heady and Mayer, Brake, and Heady and Tweeten, Melichar and Doll[21] also analyzed the credit

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[18]Brake, "Impact of Structural Changes on Capital and Credit Needs," pp. 1539-1542.

[19]Emanuel Melichar, "Farm Capital and Credit Projections to 1980," American Journal of Agricultural Economics, LI (December, 1969), pp. 1172-1177.

[20]Ibid., pp. 1176.

[21]Melichar and Doll, p. 63.

requirements that would be implied by the different capital stock projections. Their findings indicated the following amounts of debt outstanding for each of the different models in 1980: $81.6 billion of debt for the no price change model, $108.1 billion of debt for the Heady-Tweeten model, $91.3 billion of debt for the Brake model, and $136.8 billion of debt for the Heady-Mayer model.

Per Farm Capital and Credit Projections

In addition to estimating the capital needs of U. S. agriculture, Heady and Mayer[22] also projected the per farm value of the real stocks of machinery and livestock and real estate by regions in 1980. They projected the capital invested in land and buildings, machinery and equipment, and livestock inventories per farm to more than double for average farms in the Northeast, Delta States and Southern Plains regions. All other regions, except Appalacian, would witness nearly doubled capital values per farm. For the Southern Plains (Oklahoma and Texas) the percentage change in total capital from 1965 to 1980 would be 117 percent. This would be an increase from $82,203 per farm in 1965 to $178,402 in 1980.

Nelson and Murray[23] have made projections of future per farm capital investments for several types of farms in different regions of the country. Their estimates are straight-line projections of 1955-65 trends. They found that the Southern Plains winter wheat farm would

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[22]Heady and Mayer, pp. 111-112.

[23]Aaron G. Nelson and William G. Murray, Agricultural Finance, (5th ed., Ames, Iowa, 1967), p. 16.

have a total capital investment of $194,000 by 1975. The medium sized, irrigated cotton-general crop farm in California would require a total capital investment of $487,000 in 1975. Baker and Tweeten[24] have made similar estimates of the current dollar capital investment in 1980 for selected enterprise types of commercial farms.

The cash flow procedure was used by Brake[25] to estimate average per farm capital requirements as well as aggregate U. S. requirements in 1980.[26] These estimates indicate that asset values would more than double by 1980 with total average assets per farm reaching $168,000. Brake's projections also indicated that debt per farm would increase from $11,100 in 1965 to $38,000 in 1980.

Daly, Dempsey and Cobb[27] have projected production assets per farm by economic size class for 1980. In general, they found that production

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[24] C. B. Baker and L. G. Tweeten, "Financial Requirements of the Farm Firm," Structural Changes in Commercial Agriculture, CAED Report No. 24 (Ames, Iowa, 1965), pp. 31-32.

[25] Brake, "Impact of Structural Changes on Capital and Credit Needs," p. 1541.

[26] Brake has used a similar cash flows model to project the future capital and credit needs of Canadian agriculture. The methods employed in the Canadian study were consistent with those used by Brake and Melichar in earlier studies. Actually, two projections were made, each reflecting alternative rates of change for some of the price variables. Brake's estimates indicated that capital and debt per farm would increase substantially for Canadian farms by 1980. See John R. Brake, Future Capital and Credit Needs of Canadian Agriculture, University of Guelph, Department of Agricultural Economics, Publication No. AE 7013, 1970.

[27] Rex F. Daly, J. A. Dempsey and C. W. Cobb, "Farm Numbers and Sizes in the Future," in A. Gordon Ball and Earl O. Heady (ed.), Size, Structure, and Future of Farms (Ames, 1972), pp. 325-330.

assets will rise about 20 percent from 1970 to 1980. They compare this increase in the value of assets with around a 30 percent increase from 1965 to 1970, when price advances were sharp. Benson[28] also projected and compared the future capital and credit requirements of different sizes and types of corn belt farms.

A number of other estimates of the future aggregate and per farm capital requirements in agriculture have been made. The National Advisory Commission on Food and Fiber has summarized the results of these studies and the implications of current and projected trends and causal forces as follows:

> There is little doubt that farming will continue to use more capital in the future.
>
> First, science and technology are continually advancing not only in application to farming but throughout the economy.
>
> Second, reflecting increased productivity, the relative cost of capital keeps declining. Capital becomes continually cheaper, compared with labor and land, so farmers will continue to use more capital.
>
> These changes not only make it possible for the individual farmer to increase his volume of operation--they make it necessary for him to do so. He must expand his investment and then spread costs over more units of product to remain competitive.[29]

Procedure and Organization

In Chapter II of the thesis a model will be conceptualized which can be used to estimate both the magnitude and the composition of the

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[28]Richard Arthur Benson, "A Comparative Analysis of Financing Requirements of Selected Types of Farm Operations in the Eastern Corn Belt for 1980," (unpub. Ph.D. dissertation, Michigan State University, 1970).

[29]National Advisory Commission on Food and Fiber, Food and Fiber for the Future (Washington, 1967), p. 240.

future capital requirements of Oklahoma agriculture. The model will include a cash flow type of analysis and will make use of estimates of farm and non-farm income, tax, consumption and savings expenditures, farm operating expenses and non-farm investment.

In Chapter III, the data sources for the variables in the conceptual model are identified and discussed. The estimates of future capital requirements are presented in Chapter IV. These projections are obtained from an empirical model based on the conceptualization discussed in Chapter II.

In Chapter V the results of the empirical projections for alternative rates of change in selected variables are presented. These alternative projections are compared and contrasted to the base projections. A summary of the findings and conclusions of the study appears in Chapter VI.

CHAPTER II

CONCEPTUAL MODEL

Equity Flow

Much of the past measurement, analysis, and projection of capital used in agriculture has dealt mainly with stocks of assets and with the past and expected future changes in these stocks. However, several researchers have suggested that investigations of the flows of capital into and out of agriculture would provide better indications of future capital and credit requirements of the farm sector.[1] Thus, a review of the theory and merits of a flow procedure compared to a stock procedure of estimation will be useful in the conceptualization of a capital and credit projection model.

In general, stocks are values at a point in time. Capital stocks have the dimension "dollars" or physical units. On the other hand, flows are values during a period of time. Capital flows have the dimension "dollars per unit of time" or capital services per unit of time. Melichar[2] has defined money flows as they pertain to agriculture as

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[1]Brake, "Impact of Structural Changes on Capital and Credit Needs," pp. 1544-1545; Melichar, "Farm Capital and Credit Projections to 1980," p. 1174; and Melichar and Doll, Fundamental Reappraisal of the Discount Mechanism: Capital and Credit Requirements of Agriculture, and Proposals to Increase Availability of Bank Credit, p. 13.

[2]Melichar, "Farm Capital and Credit Projections to 1980," p. 1174.

funds required for (a) replacement of buildings, land improvements, and machines that wear out or become obsolete; (b) physical additions to the stock of land, land improvements, buildings, machinery, livestock, stored crops, and working capital; and (c) transfer of real estate by sale rather than inheritance. Agricultural stocks can be defined as the value of land and buildings, machinery and equipment, and livestock and crop inventories at a point in time.

At the firm or micro level, cash flow analysis provides a means of directly comparing the stocks of the balance sheet with the flows of the income statement.[3] This comparison is achieved by converting the balance sheet into flows. The conversion is accomplished by showing the change in each balance sheet item between one point in time and a later point in time. The question arises as to why the use of flows and not stocks. Lindsay and Sametz[4] indicate that:

> The answer lies in the presumption that the values of stocks are rooted in the values of flows, rather than the other way around. An asset has value only as it promises to yield some kind of return... The point is that the expected flows from an asset are what make it desirable to own that asset. It thus makes sense to reconcile stocks and flows by making flows the common parlance of the two.

Brake[5] has pointed out that one problem in using projections of capital stocks to estimate future capital and credit needs is that the

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[3] J. Robert Lindsay and Arnold W. Sametz, Financial Management: An Analytical Approach (Homewood, Illinois, 1967), p. 18.

[4] Ibid., p. 19.

[5] Brake, Future Capital and Credit Needs of Canadian Agriculture, pp. 2-3.

financing of agricultural assets, whether from equity or debt capital, is done by cash flows, not stocks. He states that to go from one stock situation to another implies net cash flows into and out of the farm sector. According to Brake, the main problem becomes one of estimating the implied cash flows to go from the capital stock of a given year to the projected capital stock of a future year. On the same topic, Melichar[6] indicates that capital flows and not changes in stocks represent the capital requirements that must be financed and that can lead to demands for credit. He goes on to suggest that flows can be much different from the changes in stocks that accompany them.

Melichar and Doll[7] have pointed out the potential differences between flows and stocks as follows:

> The annual capital flows, though related to changes in the value of stocks, are not equivalent thereto. In particular, large amounts of capital are required annually to replace machinery that has worn out or become obsolete and to finance transfers of real estate. Thus in a given year the value of stocks could remain unchanged because of stable prices and no net real investment, but several billion dollars of capital would be required by replacement and transfer transactions. Conversely, although price increases of machinery or land that cause assets to be revalued upward would have the same proportional effect on replacement and transfer transactions, the dollar increase in the latter would be only a small fraction of that in stocks, because only a portion of the stocks is replaced or transferred in any given year.

These arguments suggest that the simple projection of stocks shows the value of assets in agriculture at a future date, but does not indicate

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[6]Melichar, "Farm Capital and Credit Projections to 1980," p. 1174.

[7]Melichar and Doll, Fundamental Reappraisal of the Discount Mechanism: Capital and Credit Requirements of Agriculture, and Proposals to Increase Availability of Bank Credit, p. 13.

what funds flow was necessary to attain this value.[8]

The model used in this study to predict and analyze the future capital and credit needs of Oklahoma farms will first project the past and future stocks of assets on Oklahoma farms. Then the flows which are implied by the movement from the past stock position to the future stock position will be analyzed. In this analysis the sources of cash or inflows and the uses of cash or outflows will be projected to determine what proportion of the stock of capital could be provided by the farmer's equity and what proportion of the stock would have to be provided by debt.

The Model

Micro-Equations

The purpose of the micro-equations is to derive estimates of future capital and credit needs for the representative classes and types of Oklahoma farm firms. The relationship that is assumed to exist between farm debt and equity capital has been conceptualized by Brake[9] as follows:

> The major sources of capital for agriculture are equity capital which comes mainly from farm and/or nonfarm income and debt capital which is borrowed from credit

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[8]Arguments for the use of flow concepts in aggregate analysis have been presented by other authors. See: Neil W. Chamberlain, The Firm: Micro-Economic Planning and Action (New York, 1962), p. 420; Allan G. Mueller, "Flow-of-Funds Analysis in Farm Financial Management," Journal of Farm Economics, LXVIII (August, 1966), p. 664; and William S. Vickrey, Metastatics and Macroeconomics (New York, 1964), P. 116.

[9]Brake, "Future Capital and Credit Needs of Canadian Agriculture," p. 2.

agencies. The total demand for agricultural purposes is supplied first from equity sources and second from debt sources. In this context, then, the demand [or need] for credit represents a residual demand for capital. If one were able to estimate the quantity of capital which could be supplied from equity sources, he could then estimate capital needed from debt or credit sources.

The micro portion of the model will consist of the following equations:

$$I_{ijt} = GFI_{ijt} + NFI_{ijt} \tag{2.1}$$

$$NFI_{ijt} = SI_{ijt} + GP_{ijt} \tag{2.2}$$

$$O_{ijt} = FOE_{ijt} + PW_{ijt} + OFI_{ijt} \tag{2.3}$$

$$E_{ijt} = I_{ijt} - O_{ijt} + \lambda LB_{ijt} \tag{2.4}$$

$$C_{ijt} = LB_{ijt} + ME_{ijt} + L_{ijt} \tag{2.5}$$

$$C_{ijt} = \overline{IE}_{ij1} + \sum_{t=1}^{t} E_{ijt} + NE_{ijt} \qquad (\text{for } t=k) \tag{2.5'}$$

$$NE_{ijt} = C_{ijt} - (\overline{IE}_{ij1} + \sum_{t=1}^{k} E_{ijt}) \qquad (\text{for } t=k) \tag{2.6}$$

Where

I_{ijt} = cash inflows into each firm in class i of type j in year t.

GFI_{ijt} = gross farm income per firm in class i of type j in year t.

NFI_{ijt} = nonfarm income per firm in class i of type j in year t.

SI_{ijt} = supplementary income per firm in class i of type j in year t.

GP_{ijt} = government program payments per firm in class i of type j in year t.

O_{ijt} = cash outflows from each firm in class i of type j in year t.

FOE_{ijt} = farm operating expense per firm in class i of type j in year t.

PW_{ijt} = proprietor's withdrawals per firm in class i of type j in year t (taxes and consumption).

OFI_{ijt} = nonfarm or off-farm investments per firm in class i of type j in year t.

E_{ijt} = the change in equity per firm in class i of type j in year t.

C_{ijt} = capital per firm in class i of type j in year t.

LB_{ijt} = value of land and buildings per firm in class i of type j in year t.

ME_{ijt} = value of machinery and equipment per firm in class i of type j in year t.

L_{ijt} = value of livestock per firm in class i of type j in year t.

$\overline{IE}_{ij1}$ = initial equity capital per firm in class i of type j in year one.

NE_{ijt} = total non-equity capital per firm in class i of type j in year t.

λ = the price component or price appreciation factor for land and buildings.

i = economic class of firm.

j = enterprise type of firm.

t = time in years.

k = the specific year of interest.

In equation 2.1 the cash inflows into each representative firm during the year will consist of the sum of the gross income derived from farming plus the total income of all the family members derived from off-farm work or nonfarm sources.

Equation 2.2 indicates that nonfarm income (NFI_{ijt}) is composed of government farm program payments and supplementary income (SI_{ijt}) derived from sources not related to farming.

The outflows of equation 2.3 will be composed of the sum of farm operating expenses, proprietor's withdrawals (which include taxes and consumption) and nonfarm or off-farm investments.

The difference between equation 2.1 and 2.3 plus the price appreciation in land and buildings will be defined as the change in equity capital per firm per year. If the quantity derived in equation 2.4 is positive the individual farmer will have an increase in his equity for the year. If the quantity is negative the individual farmer will experience a decrease in his equity.

The total value of the stock of capital per firm per year is composed of the sum of the value of land and buildings per firm, the value of machinery and equipment per firm and the value of livestock per firm (equation 2.5). Equation 2.5' recognizes that the capital per firm of equation 2.5 also consists of the initial equity plus the cumulative changes in equity plus the non-equity capital per firm.

Equation 2.6 is simply a reformulation of equation 2.5' which denotes that the difference between the total capital per firm and the indicated sum of the initial equity per firm and the changes in equity per firm must be provided by some form of non-equity capital.

Macro-Equations

The macro-equations of the model will employ the micro-estimates for representative or benchmark farms and projections of future farm numbers to derive capital and credit requirements at different levels of

aggregation. The equations used to make the macro-projections include the following:

$$N_{ijt} = f(N_{ijt} - 1) \tag{2.7}$$

$$TE_{ijt} = [N_{ijt}(IE_{ij1} + \sum_{t=1}^{k} E_{ijt})] - IT_{ijt} + OI_{ijt} \tag{2.8}$$

(for t = k)

$$TNE_{ijt} = (N_{ijt}\ NE_{ijt}) \tag{2.9}$$

$$TC_t = \sum_{i=j}^{n} \sum_{j=1}^{m} (N_{ijt}\ C_{ijt}) \tag{2.10}$$

(n = number of classes; m = number of types)

Where

N_{ijt} = the number of firms in class i of type j in year t.

TE_{ijt} = total equity capital for all firms in class i of type j in year t.

IT_{ijt} = value of intergeneration transfers to all heirs for all firms in class i of type j in year t.

OI_{ijt} = value of other income (gifts and inheritances of farm property) for all firms in class i of type j in year t.

TNE_{ijt} = total non-equity capital for all firms in class i of type j in year t.

TC_t = total capital for all the studied types and classes of firms in year t.

Equation 2.7 indicates that the projected future numbers of farms are a function of or are dependent on the numbers of farms in past time periods. The specific functional relationships will be discussed later.

In equation 2.8 the total equity capital for all firms of a particular class and type is derived. The total equity figure is obtained by multiplying the indicated sum of the initial equity and the annual changes in equity by the number of firms and then subtracting

and adding respectively to this figure the value of intergeneration transfers to all heirs and the value of gifts and inheritances.

Equation 2.9 derives the total non-equity capital for all the firms of a particular class and type by multiplying the number of firms by the non-equity capital per firm. In equation 2.10 the total capital for all firms in all of the classes and types is derived by taking the product of the number of firms times the capital per firm and summing over the classes and types. To obtain estimates of the aggregate capital and credit requirements of Oklahoma farms and ranches, the representative farm estimates must be multiplied by an estimated number of farms for each of the enterprise types and economic classes.

Farm Numbers Projections

The method selected to project farm numbers utilizes the concept of a Markov chain process to trace the movement of groups or "states" over time.[10] Markov chains have been used by Krenz and Sobering[11] to estimate farm numbers in North Dakota and Southwestern Oklahoma, respectively. Judge and Swanson[12] have discussed the basic concepts of

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[10]For an excellent and relatively complete discussion of finite Markov processes see John G. Kemeny and J. Laurie Snell, Finite Markov Chains (Princeton, New Jersey, 1960); and John G. Kemeny et. al., Finite Mathematical Structures (Englewood Cliffs, New Jersey, 1959).

[11]Ronald D. Krenz, "Projection of Farm Numbers for North Dakota with Markov Chains," Agricultural Economics Research, XVI, ERS, USDA (July, 1964), pp. 77-83; Frederick David Sobering, "Adjustment Implications of Government Cotton Programs for Southwestern Oklahoma," (unpub. Ph.D. dissertation, Oklahoma State University, 1966), pp. 100-123.

[12]G. G. Judge and E. R. Swanson, "Markov Chains: Basic Concepts and Suggested Uses in Agricultural Economics," Illinois Experiment Station Research Report AERR-49 (December, 1961).

Markov chains and have suggested uses for this procedure in agricultural economics research.

Concept of Markov Chains

To use the Markov chain process the population under study must be grouped into a set of mutually exclusive and collectively exhaustive states. Thus, the states must be defined such that an observation can be in one and only one of the states at a given time. Given an initial starting state or distribution of the population, an observation within the Markov process is assumed to move successively from one state to another. The movement from a state S_i to a state S_j is regarded as a stochastic process in that the probability of the movement depends only on the state S_i that was occupied before the movement. For a given set of states (S_1, S_2, S_3, ..., S_n) it is possible to estimate the transition probability (p_{ij}) of firms moving from S_i to S_j in a particular time period. The transition probability (p_{ij}) is determined by the formula:

$$p_{ij} = \frac{a_{ij}}{\sum_{j=0}^{m} a_{ij}} \qquad (2.11)$$

where a_{ij} represents the number of firms moving from state i to state j during the time period under consideration and m refers to the number of states in the Markov chain process.

The transition probabilities (p_{ij}) can be estimated for every ordered pair of states and can be expressed in a transition probability matrix [P] as in equation 2.12.

$$P = \begin{array}{c} \\ S_1 \\ S_2 \\ \cdot \\ \cdot \\ \cdot \\ S_n \end{array} \begin{array}{c} \begin{array}{cccc} S_1 & S_2 & \cdots & S_n \end{array} \\ \begin{bmatrix} p_{11} & p_{12} & \cdots & p_{1n} \\ p_{21} & p_{22} & \cdots & p_{2n} \\ \cdot & \cdot & \cdots & \cdot \\ \cdot & \cdot & \cdots & \cdot \\ \cdot & \cdot & \cdots & \cdot \\ p_{n1} & p_{n2} & \cdots & p_{nn} \end{bmatrix} \end{array} \qquad (2.12)$$

Given the initial or known starting state and the transition probability matrix, the probability that an observation will be in any other state in the next period or any future period can be determined. This assumed that the transition probabilities are known and do not change over time. To determine the distribution of observations in time period n from a known starting distribution, the transition probability matrix [P] is multiplied by itself n times to obtain the probability of movements during n time periods.[13] This yields a new matrix $[P^n]$ which is then multiplied by the initial known distribution. An alternative method of computation is to multiply the distribution in a selected base time period by [P] to obtain projections for one period and continue to postmultiply the results by [P] for the desired number of periods. The latter procedure has the advantage of giving projections for each time period.

In projecting farm numbers for Oklahoma the states in the Markov chain process will consist of the economic classes and enterprise

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[13] This procedure is the matrix equivalent of taking a number to the n^{th} power. It would consist of the product of [P] times [P] multiplied by [P] again and so on for n times.

types of farms as denoted by the U. S. Census Bureau.

States are denoted as S_{ij} where i refers to economic class and j refers to enterprise type. The specific values of i and j are defined as follows:

	Gross farm sales of:
i = 1	$40,000 and over
2	$20,000 to $39,999
3	$10,000 to $19,999
4	$5,000 to $9,999
5	$2,500 to $4,999
6	$50 to $2,4999
	50% or more of sales derived from:
j = 1	cash grain
2	cotton
3	other field crops
4	poultry
5	dairy
6	livestock other than poultry & dairy
7	livestock ranches
8	general

Aggregation Problems[14]

Schaller has defined aggregation as the manipulation of data pertaining to single economic units or groups of units for the purpose of obtaining corresponding data or estimates for a larger group of units. This manipulation may be accomplished by using summation, averaging, or selection of representative units. Vickrey[15] has indicated that regardless of the method of manipulation, aggregation is essentially a

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[14]The following discussion of aggregation relies heavily upon an article by W. Neill Schaller, "Aggregation," Agricultural Production Systems Simulation, edited by V.R. Eidman, Oklahoma State University (May, 1971), pp. 142-163.

[15]Vickrey, p. 114.

process whereby simplicity is gained at the expense of precision and detail.

The approaches to the estimation of aggregates range from a pure micro approach to a pure macro approach. The pure micro approach involves the application of a micro model based on micro theory. It would include an analysis of every firm within the aggregate unit being studied. The pure macro approach uses macro data and the application of a macro model based on macro theory. Between the pure micro and the pure macro approaches are combination estimation procedures that exhibit both micro and macro properties.

The micro or the micro-oriented approach to aggregation appears to be the most frequently used.[16] In spite of its appeal, the micro approach has several "problems of aggregation." These aggregation problems can be classified as technical problems and data management problems. Data management problems refer to difficulties with the availability of data, the time required for analysis and the high cost associated with the analysis procedure.

Stovall[17] has described the technical problems of aggregation as being errors of specification, sampling and aggregation. Specification errors are the result of the model's failure to reflect the actual conditions facing the firm. For any given research project, specification errors will be greater if the intention is to predict actual behavior rather than optimum behavior.

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[16] R.G.D. Allen, Mathematical Economics (London, 1957), p. 694 and Randall Bacher and Bernard F. Stanton, "Estimation and Aggregation of Firm Supply Functions," Journal of Farm Economics XLVII (August, 1965), p. 712, quoted in Schaller, pp. 146 and 147.

[17] John G. Stovall, "Sources of Error in Aggregate Supply Estimates," Journal of Farm Economics, XLVIII (May, 1966), p. 478.

Sampling errors arise when data is taken from anything less than the total population and used to make inferences about the entire population. The degree of the sampling error can be influenced by the specification of the problem. For example, a highly simplified model will have fewer attributes to be measured and, therefore, for any given sample size, the results might be more reliable than if the model had been more complicated.

Aggregation error is the difference between aggregate estimates derived from the analysis and summation of data from all the individual firms and the estimates obtained using any other approach. Stovall[18] indicates that the magnitude of the aggregation error can be influenced by specification error and sampling error. This occurs because sampling and specification enter the overall procedure before aggregation. Stovall also suggests "that once the aggregation stage is reached no new empirical data are needed to eliminate the aggregation error. It is only a question of using all the empirical information available about the population of firms or to take short-cut computational methods at the expense of some aggregation error."[19] In light of this Stovall sees specification as being more of a major source of errors in aggregate estimates than either sampling or aggregation.

The following approach to aggregation will be used in this study. As a first step census averages will be used to formulate representative or benchmark farms for the five economic classes for eight enterprise

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[18] Ibid.

[19] Ibid., p. 479.

types of farms in Oklahoma. The equity flow projections for the benchmark farms will be multiplied by the Markov chain estimates of farm numbers for each class and type to obtain sub-aggregate data for each enterprise type and each economic class. Finally, the sub-aggregate data will be summed to derive aggregate estimates for all commercial farms in the state.

It is realized that there is ample opportunity for the introduction of error at every stage of the process, beginning with the initial error incorporated in the census samples. However, this study is a projection of past trends of a number of variables for several sizes and types of farms. Census data is the only feasible source of historical data that is representative of the farm sector of Oklahoma. The use of primary survey data for this study would not be a feasible alternative because of the numerous data management problems that would be involved. It is unlikely that data comparable to that in the census could be obtained even if the time and the funds were available for such an undertaking. In addition, the primary goal of this study is to make projections for benchmark farms and the state aggregates are of secondary interest. A micro-oriented approach is more suited to the attainment of this primary objective. The more aggregative estimates will have more potential for error, but they will still provide interesting insights into and comparisons of the trends in capital and credit requirements that are occuring within the Oklahoma farm sector.

CHAPTER III

EMPIRICAL MODEL

Underlying Assumptions

A number of assumptions must be made to facilitate the empirical analysis. First it is assumed that historical trends and relationships will be prevalent in the future. The use of linear regression with non-deflated data to project future income and asset values implies that historical rates of inflation and changes in input prices and quantities will continue into the future. Another implicit assumption is that the forms of land ownership and asset control that existed in agriculture during the data period (1959-1969) will not change within the projection interval. In addition, it is assumed that the past rates of change in the size structure of agriculture and the past trends in government farm programs and policies will continue into the future. In an effort to determine the significance of these basic assumptions, alternative projections will be made which allow varying rates of change in the price and real components of selected variables. These variables and their alternative levels will be discussed later in this chapter.

Farm Classification Scheme

The farm classification method employed cross-classifies farms according to economic class and enterprise type. The economic classes

used in this study are the first five of the six classes of farms delineated in the census.[1] The census classifies commercial farms on the basis of the total value of all farm products sold, as follows:

Class of Farm	Value of Sales
I	$40,000 or more
II	$20,000 to $39,999
III	$10,000 to $19,999
IV	$5,000 to $9,999
V	$2,500 to $4,999
VI	$50 to $2,499

The census classification of enterprise type of farm represents a description of the major source of income from farm sales. To be classified as a particular type, a farm must have sales of a product or group of products amounting in value to 50 percent or more of the total value of all farm products sold during the year.[2] The census types of farms used in this study and the products on which type classification is based are represented in Table II.

Utilizing 1969 census data,[3] this classification scheme accounts for 50,977 Oklahoma farms. The 1969 census reports 51,675 class I through V commercial farms in Oklahoma. The difference of 698 farms can be attributed to census types of farms (vegetable, fruit and nut,

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[1]U. S. Bureau of the Census, U. S. Census of Agriculture for Oklahoma, 1964 (Washington, D. C., 1967), I, Part 36, p. A-13.

[2]Ibid., p. A-14.

[3]U. S. Bureau of the Census, U. S. Census of Agriculture for Oklahoma, 1969 (Washington, D. C., 1972), I, Part 36, Section 2, pp. 1-4.

TABLE II

CLASSIFICATION OF FARMS BY TYPE

Type of Farm	Products With Sales Value Representing 50% or More of Total Value of All Farm Products Sold
Cash Grain	Corn, sorghums, small grains, soybeans for beans, cowpeas for peas, dry field and seed beans and peas.
Cotton	Cotton.
Other Field-Crop	Peanuts, potatoes, sugarcane for sugar or sirup, sweet sorghums for sirup, broomcorn, popcorn, sugar beets, mint hops, sugar beet seed and pineapples.
Poultry	Chickens, chicken eggs, turkeys and other poultry products.
Dairy	Milk and cream. The criterion of 50% of total sales was modified in the use of dairy farms. A farm having value of sales of dairy products amounting to less than 50% of the total value of farm products sold was classified as a dairy farm, if--(a) milk and cream sold accounted for more than 30% of the total value of products sold, and--(b) milk cows represented 50% or more of total cows, and--(c) the value of milk and cream sold plus the value of cattle and calves sold amounted to 50% or more of the total value of all farm products sold.
Livestock Other than Dairy and Poultry . .	Cattle, calves, hogs, sheep, goats, wool and mohair except for farms in the 17 Western States, Louisiana, Florida, Hawaii and Alaska that qualified as livestock ranches.
Livestock Ranches . . .	Farms in the 17 Western States, Louisiana, Florida, Hawaii and Alaska were classified as livestock ranches if the sales of livestock, wool and mohair represented 50% or more of the total value of farm products sold and if pastureland or grazing land amounted to 100 or more acres and was 10 or more times the acreage of cropland harvested.
General	Field seed crops, hay, grass and silage. A farm was also classified as general if it had cash income from three or more sources and did not meet the criteria for any other type.

Source: U. S. Bureau of the Census, U. S. Census of Agriculture for Oklahoma, 1964 (Washington, D.C., 1967), I, Part 36, pp. A14-A15.

and miscellaneous) not included in this study. The farms thus omitted make up only 1.35 percent of all Oklahoma farms in the first five classes of commercial farms.

The total number of Oklahoma farms reported by the 1969 Census is 83,037. The economic class I through V farms represent only 62.23 percent of this total. However, the market value of all agricultural products sold from these five classes of farms accounts for 96.29 percent of the total value of agricultural products sold from all Oklahoma farms. Therefore, the farm classification scheme employed in this study represents the major elements of Oklahoma agriculture.

Data Sources

Most of the data used in this study is taken directly from the Census of Agriculture for Oklahoma for the years 1959, 1964 and 1969. However, to be consistent with the conceptual model it is necessary to employ non-census data sources to complement and modify the basic census data. The data sources and methods of adjustment for the variables described in the conceptual model are outlined below. Only the data variables are discussed here. Values for the calculated variables are generated by the model as discussed in Chapter II.

Cash Inflows

Equation 2.1 of the conceptual model indicates that the total cash inflows (I_{ijt}) into each firm are calculated as the sum of gross farm income (GFI_{ijt}) and nonfarm income (NFI_{ijt}).

Farm Income

Data for the gross farm income variable are taken directly from the Oklahoma census observations on the value of farm products sold by economic class and enterprise type for the years 1959, 1964 and 1969. In the 1959 and 1964 census, this category is, in general, composed of the value of sales of grain and hay crops as determined by multiplying the state average prices times the quantities that farmers reported as sold or produced for sale. The 1964 census procedure obtained the value of livestock sales for all farms, whereas 1959 data were estimated for all farms based upon reports for a sample of farms.[4] For 1969 all data for the value of farm products sold were obtained by direct questioning.[5] The average per farm observations of the value of farm products sold for the years 1959, 1964 and 1969 from the Oklahoma census are used to derive linear regression equations for a representative farm for each of the cross-classified groups of farms studied. For the regressions the value of farm products sold is the dependent variable and the observation year is the independent variable.

Nonfarm Income

In the context of equation 2.2 of the conceptual model, nonfarm income (NFI_{ijt}) refers to the sum of government farm program payments (GP_{ijt}) and off-farm or, for clarity, supplementary income (SI_{ijt}).[6]

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[4] U. S. Census of Agriculture for Oklahoma, 1964, p. A-8.

[5] U. S. Census of Agriculture for Oklahoma, 1969, p. A-6.

[6] All items of income such as wages and salaries, nonfarm business or professional income, rent, interest and dividends, etc. will be grouped under the heading supplementary income.

Complete data are not reported for government program payments and supplementary income by economic class and enterprise type for Oklahoma farms. Therefore, a number of assumptions must be made in order to derive estimates for these variables. The assumptions made and the derivation of estimates of government program payments and supplementary income are discussed in detail in Appendix A. The derived data are used to develop separate linear regression equations for government payments and supplementary income for a representative farm for each of the types and classes of farms studied. For the regressions the supplementary income and government payments figures are the dependent variables and the observation years are the independent variables. After basic projections of future capital and credit requirements have been made using this derived data, additional projections will be made with different rates of change in government payments and supplementary income. The resulting alternative projections should be indicative both of the various types of government programs that have occurred in the past and that may occur in the future and of the changing trends in levels of supplementary income. At the same time, allowing these variables to change should give some indication of the significance they have in determining total capital and credit needs.

Cash Outflows

Equation 2.3 of the conceptual model, indicates that the total cash outflows (O_{ijt}) from each firm consist of the sum of farm operating expenses (FOE_{ijt}), proprietor's withdrawals (PW_{ijt}) and nonfarm investments (OFI_{ijt}).

Farm Operating Expenses

Data for the farm operating expense variable are based on the 1959 and 1964 census observations of specified farm expenditures and on the 1969 census observation of farm production expenditures. The 1959 and the 1964 census list feed, livestock and poultry, machine hire, hired labor, gasoline and other petroleum fuel and oil and seeds, bulbs, plants and trees under the category of specified farm expenditures. The 1964 specified farm expenditures also include fertilizer. The 1964 census category of farm production expenditures includes several items in addition to those reported in 1959 and 1964. These additional items are lime, other agricultural chemicals, contract labor and all other production expenses.

Two adjustments are made in the census information in an effort to make the observations for the three periods more comparable. First, the 1959 specified farm expenditure data are revised to include a fertilizer expense. To calculate this expense the value of lime used in Oklahoma in 1959 is subtracted from the total fertilizer and lime expense for Oklahoma in 1959.[7] The resulting value of fertilizer is divided by the tons of fertilizer used to obtain a dollar value per ton of fertilizer.[8] The derived dollar value per ton is multiplied times the average tons of fertilizer used as reported in the 1959 census, and this value of fertilizer is added to the 1959 specified farm

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[7]Total lime tonnage of 90,588 tons from p. 46 (1959 census) times the 1959 limestone price of $5.15 per ton from p. 79 of Prices Paid by Oklahoma Farmers, 1937-1961 by L. V. Blakley and J. R. Price gives $466,528 as the value of lime. Fertilizer and lime expense of $9,100,000 for 1959 is taken from Farm Income Situation Supplement, August, 1971.

[8]Calculated value of fertilizer of $8,633,472 is divided by 134,896 tons of fertilizer used in Oklahoma in 1959 (from p. 46 of 1959 census) to give a dollar value of fertilizer of $64 per ton.

expenditures by class and type.

The second revision made in the farm operating expense data is an attempt to adjust the 1959 and the 1964 data to reflect the additional expense reported as "all other production expenses" in 1969. To make this revision all other production expenses are subtracted from the total farm production expenditures for 1969. The ratios of "all other production expenses" to the total production expenses for 1959 and 1964 are calculated. These ratios or percentages are then multiplied times the previously adjusted 1959 and the 1964 census data and the resulting figures are added to the census observations. This procedure results in considerably greater expense values for 1959 and 1964. These data are used to derive linear regression equations for the representative farms. The dependent variable is the census data on farm expenditures and the independent variable is the observation year.

Proprietor's Withdrawals

The proprietor's withdrawals (PW_{ijt}) variable of equation 2.3 reflects the farm family's expenditures for income tax, social security, and consumption. To compute income tax for each representative firm, adjusted gross income is obtained by subtracting farm operating expenses and 10 percent of the value of machinery and equipment[9] from cash inflows. Taxable income is found by subtracting 10 percent of adjusted gross income and personal exemptions of $675 per person from adjusted gross income. The tax liability for a joint return based on taxable income is then computed using the 1971 tax schedule. Social

[9]This is machinery depreciation, assuming 10 year life for machinery and equipment and straight-line depreciation.

security tax is calculated as 7.5 percent of social security income (gross farm income minus farm operating expenses and depreciation) up to a maximum of $7,800.[10] Expenditures for family consumption are determined by equation 3.1.[11]

$$C = 22.96\ P^{.410}\ I^{.590}\ S^{.163} \qquad (3.1)$$

Where

C = current consumption.

I = after-tax income.

S = family size (held constant at 3).

P = ratio of current to 1961 price.[12]

The consumption function is based on an after-tax income figure which consists of adjusted gross income minus income and social security taxes. For use in the consumption function and for determining personal exemptions, a family size of three persons is assumed.[13]

Nonfarm Investments

It is hypothesized that the farm firm will experience outflows of cash in the form of nonfarm investments and, accordingly, a nonfarm

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[10] It is assumed that social security tax is not applicable to nonfarm income. A large portion of the income included in nonfarm income is attributable to dividends, interest and royalties, items to which social security tax is not applicable. In addition, most farmers pay the maximum amount of social security on their farm income and are thus not required to pay social security tax on their nonfarm income.

[11] John R. Brake, "Firm Growth Models Often Neglect Important Cash Withdrawals," American Journal of Agricultural Economics (August, 1968), pp. 769-772.

[12] Current price for future years is estimated by linear regression using the Consumer Price Index as the dependent variable and the observation year as the independent variable. The 1961 price is the 1961 Consumer Price Index.

[13] Based on 3.1 persons per commercial Oklahoma farm as derived from data reported in the U.S. Census of Agriculture for Oklahoma, 1964, p. 38.

investments variable (OFI_{ijt}) is included in equation 2.3 of the conceptual model. However, in a study of corn belt farmers, Williams[14] found that most farmers had about 96 percent of their resources invested in their farming operations. In an Illinois study which encompassed over 2,000 families and spanned four decades, it was found that there is no consistent relationship between savings and investments and total income.[15] Additional research did not result in information that was applicable to Oklahoma farm firms. Due to the lack of Oklahoma data and the implications of other studies, the nonfarm investments variable is omitted from the empirical model.

Change in Equity

Equation 2.4 of the conceptual model derives the future change in equity capital per firm (E_{ijt}) by taking the difference between the projected cash inflows per firm (I_{ijt}) and the projected cash outflows per firm (O_{ijt}) and adding to this difference the estimated change in equity due to any change in the value of land and buildings (λLB_{ijt}). Based on data for the 1959 to 1969 period, as indicated in Table III, 85.94 percent of the total increase in the value of land and buildings during this period was due to higher prices.

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[14]Dorwin Williams, "Financial Characteristics of Corn Belt Farmers," Special Report 140, University of Missouri, Agricultural Experiment Station (Columbia, 1972), p. 3.

[15]Marilyn M. Dunsing and Jeanne L. Hafstrom, "Income-Expenditure Patterns of Illinois Families, 1968," HEE-3785, Cooperative Extension Service, University of Illinois College of Agriculture (Urbana, Illinois, 1969), p. 22.

TABLE III

ESTIMATED SOURCES OF CHANGES IN THE VALUE OF OKLAHOMA FARM REAL ESTATE, 1957-59, 1959, AND 1969

Item	1957-59 Average	1959	1969	Net Increase 1957-59 to 1969	Net Increase 1959 to 1969	Percentage Distribution of Net Increase 1957-59 to 1969	Percentage Distribution of Net Increase 1959 to 1969
	Mil. $	Mil. $	Mil. $	Mil. $	Mil. $	Percent	Percent
Total value of land and buildings current prices, March 1	2,641.7[a]	2,854.0[a]	6,617.0[c]	3,975.3	3,763.0	100.00	100.00
Land and buildings, valued at 1957-59 prices, March 1	2,641.7[a]	2,667.3[b]	3,196.6[d]	554.9	529.3	13.95	14.06
Increase in value of land and buildings, due to higher prices	0	186.7	3,420.4	3,420.4	3,233.7	86.05	85.94

[a]U. S. Department of Agriculture, ERS, Farm Real Estate Market Developments (Washington, D. C., August, 1963), p. 38.

[b]$2,854 deflated by the 1959 index (1.07) of average land value per acre for Oklahoma. U. S. Department of Agriculture, ERS, Farm Real Estate Market Developments (Washington, D. C., August, 1963), p. 34.

[c]U. S. Department of Agriculture, ERS, Farm Real Estate Market Developments (Washington, D. C., July, 1972), pp. 17 and 19.

[d]$6,617 deflated by 1969 (March) index (2.07) of average land value per acre for Oklahoma. U. S. Department of Agriculture, ERS, Farm Real Estate Market Developments (Washington, D. C., September, 1970), p. 9.

Capital per Firm

As indicated in equation 2.5, the total capital requirement (C_{ijt}) is the sum of the value of land and buildings (LB_{ijt}) plus the value of machinery and equipment (ME_{ijt}) plus the value of livestock (L_{ijt}).

Land and Buildings

Data for the value of land and buildings (LB_{ijt}) are taken from the average values of land and buildings per farm that are presented in the 1959, 1964 and 1969 Census of Agriculture for Oklahoma.[16] These data are used to estimate linear regression equations for the representative farms.

Machinery and Equipment

The 1969 Census of Agriculture reports an estimated market value of all machinery and equipment. This figure for each class and type of farm is averaged over the number of farms for the particular class and type and is used as the 1969 observation for the per farm value of machinery and equipment. Data for the value of machinery and equipment are not reported in the 1959 and the 1964 Census of Agriculture.[17]

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[16]The census appendixes indicate that some of the land values were obtained from samples rather than by complete enumeration of all census farms. For an explanation of the possible biases that occur, see: U. S. Bureau of the Census, U. S. Census of Agriculture for Oklahoma, 1959 (Washington, D. C., 1961), I, Part 36, p. XVII.

[17]The lack of reported, cross-classified data for Oklahoma necessitates the formulation of a procedure to estimate the value of machinery and equipment on Oklahoma farms. Several methods of estimating this data were considered. The method presented is a feasible way to derive the average per farm value of machinery and equipment and preserve the economic class-enterprise type classification scheme.

To derive data on an economic class-enterprise type basis, a machinery and equipment index is calculated based on the number of tractors (other than garden tractors) reported in the census. This procedure assumes that there is a somewhat uniform valued equipment complement for each tractor.

Data on tractor numbers are reported by economic class and enterprise type in the 1959 and the 1964 census. To assign dollar values to the stock numbers of tractors, data from the Balance Sheet of the Farming Sector[18] is first used to determine the value of machinery and motor vehicles on farms for the Southern Plains (Oklahoma and Texas) for 1959 and 1964. These values are divided by the number of tractors reported for the Southern Plains in Machines and Equipment on Farms with Related Data, 1964 and 1959[19] to obtain an average value per tractor of machinery and motor vehicles for 1959 and 1964. The per farm cross-classified values of machinery and equipment for 1959 and 1964 are presented in Tables IV and V.[20] The machinery and equipment values

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[18]U. S. Department of Agriculture, The Balance Sheet of the Farming Sector, 1970, ERS, Bulletin No. 350 (Washington, D. C., 1971), pp. 7, 24.

[19]U. S. Department of Agriculture, Machines and Equipment on Farms with Related Data, 1964 and 1959, ERS Statistical Bulletin No. 401 (Washington, D. C., 1967), p. 7.

[20]In 1959 census data on specified equipment and facilities were obtained for only a sample of farms. Farm operators were asked to report equipment that was on the farm at the time of enumeration, regardless of ownership. Items that were temporarily out of order were to be included but not any items that were worn out (see U. S. Census of Agriculture for Oklahoma, 1959, p. XVII). For the 1964 census farm operators were asked to report equipment that was on the farm at the time of enumeration, regardless of ownership. Items that were in operating order and that were used during 1963 and 1964 were to be included.

TABLE IV

ESTIMATES OF VALUE OF MACHINERY AND EQUIPMENT FOR OKLAHOMA FARMS BY ECONOMIC CLASS AND ENTERPRISE TYPE, 1959

Enterprise Type	Economic Class				
	I	II	III	IV	V
Cash Grain	16,670	11,043	8,716	7,023	5,543
Cotton	16,797	11,635	9,674	6,854	5,500
Other Field Crop	12,693	9,647	7,404	6,347	4,823
Poultry	4,950	3,596	3,808	2,623	2,073
Dairy	12,524	9,943	7,235	5,585	4,273
Livestock	14,047	10,070	8,335	6,643	5,246
Livestock Ranches	8,462	6,177	5,754	4,316	3,427
General	19,378	11,762	8,926	7,320	5,712

Source: Author's estimates.

TABLE V

ESTIMATES OF VALUE OF MACHINERY AND EQUIPMENT FOR OKLAHOMA FARMS BY ECONOMIC CLASS AND ENTEPRISE TYPE, 1964

Enterprise Type	Economic Class				
	I	II	III	IV	V
Cash Grain	22,376	17,623	12,348	10,261	7,884
Cotton	20,463	16,116	12,058	10,319	8,174
Other Field Crop	17,855	11,594	8,414	8,985	7,362
Poultry	8,696	4,812	3,536	3,130	2,841
Dairy	20,463	12,753	9,971	9,971	7,246
Livestock	20,174	14,724	10,782	10,145	7,130
Livestock Ranches	13,507	9,507	7,652	6,667	5,159
General	22,087	16,116	13,565	10,319	9,101

Source: Author's estimates.

in these tables are used to estimate linear regression equations for representative farms.

Livestock

Data for the value of livestock are obtained by assigning state average values to the stock numbers of livestock reported in the 1959, 1964 and 1969 Census of Agriculture. The livestock classes included are cattle and calves, sheep and lambs, and hogs and pigs. In 1959 and 1964 census data for livestock on farms relate to the number on hand at the time of enumeration (November and December of 1964 and October and November of 1959). The 1969 census data relate to inventory numbers for livestock as of December 31, 1969. For each census, livestock were to be enumerated on the farm or ranch where they were, regardless of who owned them.[21]

The stock census numbers of livestock per farm are multiplied by the average per head values of the various classes of livestock for Oklahoma. These values are obtained from the Livestock and Poultry Inventory.[22] To more nearly correspond with the fall census enumeration date, the livestock values as of January 1 of the year following the census are used to derive the census year values. These values are used

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[21]U. S. Census of Agriculture for Oklahoma, 1959, p. XXII; 1964, p. A-7; and 1969, p. V.

[22]U. S. Department of Agriculture, Livestock and Poultry Inventory, (1970), pp. 14-24; Revised Estimates 1961-65, Statistical Bulletin 389 (1967), pp. 12-17; Statistical Bulletin 278 (1961), pp. 7-22, SRS, Crop Reporting Board, Washington, D. C.

as dependent variables to derive linear regression equations for the livestock classes on representative farms for each of the economic classes and enterprise types analyzed.

Sources of Capital

As indicated by equation 2.5' the capital requirements (C_{ijt}) in future years for representative firms are composed of the firm's initial equity position ($\overline{IE}_{ij1}$) plus the summation of the changes in equity (E_{ijt}) during the studied years plus non-equity capital (NE_{ijt})

Initial Equity

Initial equity is estimated for each economic class in the following manner. Debt as a percentage of assets for the Southern Plains (Oklahoma and Texas) on January 1, 1970 was 16.13 percent.[23] The same figure for the United States was 18.67 percent.[24] Therefore, the Southern Plains debt to asset ratio was 86.40 percent of the United States debt to asset ratio. It is assumed that the same relationship exists between the economic classes of the Southern Plains and the economic classes for the United States. Consequently by multiplying the U. S. debt to asset ratios for each economic class by 86.40, the Southern Plains debt to asset ratios can be determined. It is further assumed that these ratios hold for Oklahoma economic classes and are constant for all enterprise types. The debt to asset ratios for the United States and for the Southern Plains are presented in Table VI.

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[23] Balance Sheet of the Farming Sector, 1970, p. 24.

[24] Ibid.

TABLE VI

FARM DEBT AND PROPRIETOR'S EQUITIES AS A PERCENTAGE OF TOTAL ASSETS BY ECONOMIC CLASS, JANUARY 1, 1970

	I[a]	II	III	IV	V
U. S. Debt to Assets	24 16.9	19	18.3	21.9	15.7
South Plains Debt to Assets[b]	20.74 14.60	16.42	15.81	18.92	13.56
South Plains Proprietor's Equities	79.26 85.40	83.58	84.19	81.08	86.44

Source: U. S. Department of Agriculture, The Balance Sheet of the Farming Sector, 1970, ERS Agriculture Information Bulletin No. 350 (Washington, D. C., 1971), p. 25.

[a]Class I is divided into two segments. The first refers to farms with gross sales equal to or exceeding $100,000. The second refers to farms with gross sales greater than $40,000 but less than $100,000.

[b]Calculated by taking 86.40 percent of the U. S. figures.

Farm Numbers

Equation 2.7 of the conceptual model symbolizes the projection of future farm numbers based on the changes in farm numbers that have been observed in the past. The Markov chain process is used to make the farm number projections. To accurately estimate the transition matrix for the chaining process, data are needed that delineate the actual movements of individual farms among classes and types over time. With data of this nature it is a simple process to estimate transition probabilities by averaging the movements. The data source used, the U. S. Census of Agriculture, records only the number of farms in each of the economic classes and enterprise types on the date of enumeration. This

data does not delineate actual movements between class-type cells over time, thus making it more difficult to use the Markov process an an analytical tool. However, with specific assumptions the census data can be used to make a Markov chain analysis. The following assumptions regarding the movement of farms between class-type cells or states are made:

1. Operators of any type of farm in Oklahoma will increase their gross sales, if possible. Generally a larger net income from farming is positively correlated with a higher level of gross sales and an attempt to increase income is consistent with the general assumption of non-satiety.

2. Increases in farm size as measured by gross sales may be substantial during a given five year census time interval. This is likely because factors such as weather and prices, in addition to farmers' inherent desire to increase sales, have a measurable effect on gross sales. Thus, it is possible for a class III farm to become a class I farm during a five year time period.

3. While the farms most likely to expand are those that initially have larger than average gross sales, it is conceivable that farms in all class-type states are capable of movement to higher sales classes. For example, a class V farm may become a class III farm.

4. Decreases in size of farms as measured by acres operated are not likely to occur. However, adverse price and weather conditions may cause farm size as measured by gross sales to decrease during a five year census interval. For this reason, some farms may drop to lower sales classes during a given time period.

5. In addition to movements between sales classes, movements can occur between enterprise types over time. This occurs because the census type classifications are based upon the criteria of 50 percent or more of a farm's gross sales. Thus, a cotton farm in one census period may become a general farm in the next census period.

These assumptions lead to the following general rules for determining the transition of farms between class-type states.

1. Farms in the largest class category can remain in that category, move to the next lower category, or can move to class state VI.[25]

2. Farms in the class II through V categories can move up one or two class states, move down one state, move to state VI or remain in the same class state.

3. There can be a movement between types for all farms except livestock ranches and poultry farms.

Details of the procedure employed to derive the transition probability matrix are presented in Appendix B. In general, a transition table is computed for each of the two five year intervals using the above rules on farm movements. The transition table outlines the hypothesized movements of farms from class-type state to class-type state between the time periods. A transition probability matrix is developed from the transition table and is multiplied by the initial distribution vector to obtain estimates of future farm numbers. The

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[25] In the Markov chain analysis class state VI is defined as a group or pool of farms of all types with gross sales of less than $2,500. It is assumed that farms of all classes and types can move into or out of the pool of class VI farms.

farm numbers projected by the Markov chain process are averaged over the five year projection intervals to derive numbers for each year from 1969 to 1980. The yearly estimates are incorporated into the macro equations of the capital and credit projection model and are used to estimate total equity and total non-equity by class and type and total capital for all firms for future years. The estimates of future Oklahoma farm numbers are presented in Chapter IV.

Aggregate Capital Relationships

Equation 2.8 of the conceptual model calculates the total equity capital for all the firms of a particular class-type group. To calculate this aggregate, adjustments must be made to take account of intergeneration transfers to all heirs (IT_{ijt}) and the value of gifts and inheritances (OI_{ijt}). The intergeneration transfer variable is based on the estimated number of farm title transfers per 1,000 of all farms as reported in Farm Real Estate Market Developments.[26] This figure is multiplied by the percentage distribution of farm real estate transfers by estates which is also reported in Farm Real Estate Market Developments. The numbers thus obtained are regressed on the observation year in order to derive the number of transfers by estates for future years. Estate transfers per thousand Oklahoma farms are obtained and multiplied by the capital projections for each class-type of farm to derive an estimate of the value of intergeneration transfers to all heirs.

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[26] Farm Real Estate Market Developments, CD-73, pp. 19 and 30; CD-67, p. 31; CD-66, p. 25; CD-56, p. 12; and CD-55, p. 29.

The intergeneration transfer variable is also used to develop the other income (OI_{ijt}) variable which reflects gifts and inheritances of farm property. The proportion of intergeneration transfers that accrue to farm heirs as gifts and inheritances and thus remain in agriculture is derived in the following manner. Lu, Horne, and Tweeten[27] (p. 11) have found that 24 percent of the farm boys in the state of Oklahoma will find an economic farming opportunity. Assuming that farm children are 50 percent girls and 50 percent boys, 12 percent of all farm children will remain on the farm and eventually become farm heirs. If gifts and inheritances are distributed equally to all heirs, then 12 percent of the intergeneration transfers represent inherited capital to farmers. Therefore, the intergeneration transfer variable is multiplied by .12 to derive the other income or gifts and inheritance variable.

Alternative Rates of Change for Selected Variables

The assumptions made and the projection methods used throughout this study imply that the trends of the recent past in price relationships, technological changes and government policies will continue into the immediate future. Rates of change and policies which differ from those of the past may occur in the future. Therefore, it seems imperative to analyze the effect on the future capital and credit estimates of alternative rates of change in several of the variables of the projection model.

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[27] Yao-Chi Lu, James Horne, and Luther Tweeten, "Farming Opportunities for Farm Youth in Oklahoma and the United States," Agricultural Experiment Station, Bul. B-683, Oklahoma State University, (Stillwater, 1970). p. 11.

The value of some of the variables that will be analyzed in this light has two component parts. These parts are a price or inflation component and a real component as is discussed in Chapter II. The variables of this nature which have the greatest impact on the future capital and credit estimates are value of land and buildings (LB_{ijt}) and value of machinery and equipment (ME_{ijt}). Projections will be made which will incorporate alternative rates of change in the inflation component of the value of land and buildings.

Both the government payments and the supplementary income portions of the nonfarm income variable will be varied in an effort to determine their influence on future credit requirements. Consequently alternative projections will be made for different rates of change in price appreciation for land and buildings, government program payments and supplementary income. The rates of change for each of these variables in the alternative projections are presented in Table VII.

TABLE VII

ALTERNATIVE PROJECTIONS

Alternatives Analyzed	Variable and % of Historical Trend		
	LB_{ijt}	GP_{ijt}	SI_{ijt}
Base	100%	100%	100%
1	100	0[a]	100
2	100	50	100
3	100	100	0[a]
4	100	100	50
5	100	100	150
6	0[a]	100	100
7	50	100	100
8	200	100	100

[a]Indicates "no change" in the variable after 1969.

CHAPTER IV

PROJECTED CAPITAL AND CREDIT REQUIREMENTS

In this chapter, the magnitude and composition of the current and future capital and credit requirements of Oklahoma farms will be discussed. Attention will be given to both representative firms and state and class-type aggregates.

Representative Farm Projections

Total Capital

Estimates of total capital required per representative firm for selected years up to and including 1980 are presented in Table VIII.[1] The years 1974 and 1979 are concurrent with the enumeration of the quinquennial U. S. Census of Agriculture and are presented for this reason. The projections for 1972 are included because they provide current data on capital requirements.

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[1]The figures presented for 1969 in Table VIII and in other tables in this chapter, are not actual 1969 Census figures but are estimates derived from the regression equations. The presentation of estimates for 1969, rather than the actual data, is made in order to facilitate comparisons of changes over time. There is some residual difference between the observed data and the predicted value for each observation year. Therefore, the use of actual 1969 data for comparative purposes would give more weight to the 1969 observations than to the trend that existed from 1959 to 1969. Rates of change reflected by the use of actual 1969 data would be significantly different from those indicated by the regression or trend line. For reference, 1969 data are presented in Appendix C.

TABLE VIII

TOTAL CAPITAL FOR REPRESENTATIVE FARMS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	495,212	274,775	171,416	105,801	64,501
	1972	557,576	310,007	193,730	118,998	71,845
	1974	599,152	333,495	208,606	127,796	76,745
	1979	703,137	392,215	245,796	149,791	89,005
	1980	723,942	403,959	253,234	154,190	91,457
	Δ	228,730	129,184	81,818	48,389	26,956
	% Δ/yr.	4.20	4.27	4.33	4.15	3.79
Cotton	1969	439,813	215,976	120,063	69,115	43,334
	1972	503,803	246,525	137,520	77,187	47,895
	1974	546,463	266,891	149,158	82,569	50,937
	1979	653,151	317,806	178,253	96,033	58,542
	1980	674,491	327,989	184,072	98,727	60,063
	Δ	234,678	112,013	64,009	29,016	16,729
	% Δ/yr.	4.85	4.71	4.84	3.89	3.50
Other Field Crop	1969	304,751	132,595	86,074	50,716	54,710
	1972	357,503	151,588	95,458	56,387	66,316
	1974	392,671	164,250	101,714	60,187	74,062
	1979	480,627	195,905	117,354	69,687	93,427
	1980	498,219	202,236	120,482	71,587	97,300
	Δ	193,468	69,641	34,408	20,871	42,590
	% Δ/yr.	5.77	4.77	3.63	3.74	7.07
Poultry	1969	80,043	47,851	39,555	29,544	23,357
	1972	81,687	54,445	41,832	31,584	25,706
	1974	82,783	58,849	43,372	32,944	27,280
	1979	85,523	69,879	47,227	36,344	31,219
	1980	86,071	72,085	47,998	37,024	32,008
	Δ	6,028	24,234	8,443	7,480	8,651
	% Δ/yr.	.68	4.60	1.94	2.30	3.36
Dairy	1969	221,912	122,913	75,620	47,064	39,893
	1972	231,308	128,424	80,882	49,886	44,258
	1974	237,572	132,098	84,390	51,768	47,168
	1979	253,232	141,283	93,160	56,473	54,443
	1980	256,364	143,120	94,914	57,414	55,900
	Δ	34,452	20,207	19,294	10,350	16,007
	% Δ/yr.	1.41	1.49	2.31	1.99	3.64
Livestock	1969	452,508	223,263	131,669	81,271	51,849
	1972	510,954	250,032	145,064	89,101	56,481
	1974	549,918	267,878	154,012	94,324	59,569
	1979	647,328	312,493	176,407	107,409	67,289
	1980	666,810	321,416	180,886	110,026	68,833
	Δ	214,302	98,153	49,217	28,755	16,984
	% Δ/yr.	4.31	4.0	3.39	3.21	2.97
Livestock Ranches	1969	715,313	275,728	165,886	103,978	66,936
	1972	781,031	300,472	180,349	115,774	76,032
	1974	824,843	316,968	189,991	123,638	82,096
	1979	934,373	358,208	214,096	143,298	97,265
	1980	956,279	366,456	218,917	147,230	100,299
	Δ	240,966	90,728	53,031	43,252	33,363
	% Δ/yr.	3.06	2.99	2.90	3.78	4.53
General	1969	442,340	231,368	140,425	87,355	58,803
	1972	482,369	258,110	158,161	98,422	67,356
	1974	509,055	275,938	169,985	105,800	73,058
	1979	575,808	320,508	199,590	124,246	87,333
	1980	589,160	329,422	205,512	127,941	90,189
	Δ	146,820	98,054	65,087	40,586	31,386
	% Δ/yr.	3.02	3.85	4.21	4.22	4.85

*The figures presented for 1969 are derived from the regression equation used to make all projections; they are not actual census data reported for 1969.

The annual estimates presented in Table VIII are current dollar values for the average total capital (C_{ijt}) that is controlled by each representative farm. Thus, the 1972 observation for a class I cash grain farm indicates that those Oklahoma farmers who derive 50 percent or more of their farm revenues from cash grain operations and have at least $40,000 of gross farm sales control an estimated average of $557,576 of total farm capital or assets in 1972. This does not necessarily mean that the representative class I cash grain farmer has $557,576 of his own savings invested in the farm business. Part of this total capital value may be in the form of land or equipment which the representative farmer rents or leases from others. Also, part of this capital value represents assets purchased with debt funds. In addition a proportion of the total capital value is attributable to price appreciation.

Table VIII also reports the change (Δ) and the annual percentage change ($\%\Delta$/yr.) in capital for representative farms in each size-type classification. The change in capital (Δ) refers to the difference between the capital requirement projected for 1980 and the estimated capital requirement in 1969. The total percentage change in capital is divided by 11, the number of years during the period to obtain the annual percentage change. This figure reflects the percentage of the estimated 1969 capital requirement that must be added to the 1969 total each year in order to obtain the projected 1980 capital requirement.

Class I livestock ranches require the largest amount of projected total capital in 1980.[2] The $956,279 of capital they require in 1980 exceeds the capital required by the next most capital intensive class-type of farm by more than $200,000. The absolute change in the projected capital needs of class I livestock ranches from 1969 to 1980 ($240,966) is greater than the total capital required by most farms of classes II through V in 1969. The annual percentage change, however, for class I livestock ranches is a modest 3.06 percent. At the opposite end of the capital requirements spectrum are class I dairy farms. Projected capital needed by this class-type in 1980 is $256,364, which is only a $34,452 increase from 1969. The projected annual percentage increase in capital requirements for class I dairy farms is a relatively low 1.41 percent.

Comparisons of the different economic classes within enterprise types reveal rates of change that are in some cases unexpected. The class V livestock ranches exhibit annual rates of change that are considerably higher than the other classes within this enterprise type. A similar phenomenon is exhibited by dairy farms. The projected annual rate of change in the total capital required by class V dairy farms is 3.64 percent. The rate of growth for all other classes of dairy farms

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[2]Throughout this chapter an attempt is made to discuss the classes and types of farms that are expected to be important in terms of actual numbers of farms in the future. For this reason several of the class-types of farms are discussed more frequently than others.

(except class III) does not exceed two percent per year. Likewise, the 4.53 percent projected annual rate of growth for class V livestock ranches is almost a full percentage point higher than the rate of change for any other sales class of livestock ranch. The class I and V other field crop farms have projected annual rates of growth equal to 7.07 and 5.77 percent respectively. These rates of change are not only the highest rates within this enterprise type, but are also the highest rates of change for all classes and types of farms evaluated.

Comparisons among enterprise types within economic classes reveal that class I dairy and poultry farms have extremely low projected annual rates of change in total capital requirements compared to other class I farms. The estimated growth rates of .68 percent for class I poultry farms and 1.41 percent for class I dairy farms are not only low for class I farms, but are also the lowest rates of change for all classes and types of farms. Class II dairy farms and class II livestock ranches also exhibit low annual rates of change in comparison with other class II farms. However, the absolute change in the amount of total capital required by class II livestock ranches from 1969 to 1980 ($90,728) is large enough to be significant irrespective of the annual percentage rate of change.

The data of Table VIII can also be used to estimate the total additional capital and the annual increment in capital that is needed to make the transition from one class-type of farm to a different class-type of farm during a period of years. Movements of this

nature[3] are of interest to expanding farmers and to agricultural lending institutions. The transition from a class II livestock farm to a class I livestock farm during the period 1972 to 1980 might be a typical movement. In 1972 a representative class II livestock farm requires an estimated $250,032 of capital. A class I livestock farm is expected to need $666,810 of total capital in 1980. This difference of $416,778 would require an increase of 166.69 percent in total capital to move from a class II to a class I livestock farm by 1980. To accomplish such a movement would require annual increases in total capital equal to 20.84 percent of the 1972 class II capital requirement. Thus, approximately $52,106 of capital per year would be needed to move from a class II livestock farm in 1972 to a class I livestock farm in 1980.[4] The projections of Table VIII indicate that the movement from a class II dairy farm in 1972 to a class I dairy farm in 1980 will require $15,992 of capital in each of the eight years. This increase amounts to 12.45 percent of the $128.424 required by a representative class II dairy in 1972. The total projected increment in capital required for this transition is $127,940.

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[3]Movements from lower to higher sales classes are essential to and are indicated by the Markov chain procedure used to estimate future farm numbers. The transition probability matrix presented in Appendix B denotes those classes and types of farms that experience movements of this nature.

[4]This figure of $52,106 must be interpreted carefully. This estimate of the capital required to make a transition from an average class II farm to an average class I farm may be biased upward. Many transitions that will occur will be from an above average class II livestock farm in 1972 to a below average class I livestock farm in 1980. Transitions of this nature will be possible with somewhat less additional capital than is indicated by our estimates.

Value of Land and Buildings

The values of land and buildings per representative farm firm (LB_{ijt}) for selected years are presented in Table IX. As would be expected, the value of land and buildings comprises the major portion of the total capital required by all class-types of representative farms. In all economic classes, cotton and cash grains farms consistently exhibit value of land and buildings to total capital ratios that are a few percentage points higher than the other types. The value of land and buildings accounts for 87 percent of the total capital required for class I cotton farms. If poultry farms are excluded, dairy and livestock farms set the lower bounds for all classes on the value of land and buildings as a percentage of total capital. It is interesting to note that in general the value of land and buildings ranges from 74 to 87 percent of total capital required for all classes and types of farms in all years. This indicates that no matter what the size or type of farm operation, the value of land and buildings is projected to be about 80 percent of the total capital requirement. Thus, the magnitude of the changes in the value of land and buildings from 1969 to 1980 is very similar to the changes in total capital for each respective class and type of farm.

The data in Table IX indicate that high annual percentage rates of change in land and building values are projected for class I and class V other field crop farms from 1969 to 1980. By 1980, representative class I other field crop farms will have a land and buildings value of $406,900, an increase of $153,868 over 1969. The value of land and buildings for class V other field crop farms increases at an even faster rate of 8.22 percent.

TABLE IX

VALUE OF LAND AND BUILDINGS FOR REPRESENTATIVE FARMS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	432,855	237,958	148,559	91,484	55,871
	1972	484,857	267,490	168,020	103,589	63,062
	1974	519,525	287,178	180,994	111,659	67,856
	1979	606,195	336,398	213,429	131,834	79,841
	1980	625,529	346,242	219,916	135,869	82,238
	Δ	192,674	108,284	71,357	44,385	26,367
	% Δ/yr.	4.04	4.13	4.36	4.41	4.29
Cotton	1969	381,001	185,838	101,500	58,036	36,671
	1972	432,988	211,629	116,926	65,817	41,672
	1974	467,646	228,823	127,210	71,005	45,006
	1979	554,291	271,808	152,062	83,975	53,341
	1980	571,620	280,405	148,062	86,569	55,008
	Δ	190,619	94,567	56,562	28,534	18,337
	% Δ/yr.	4.54	4.62	5.06	4.46	4.54
Other Field Crop	1969	253,032	106,693	68,409	38,589	46,602
	1972	294,996	121,564	75,768	43,626	58,107
	1974	322,972	131,478	80,674	46,984	65,777
	1979	392,972	156,263	92,939	55,379	84,952
	1980	406,900	161,220	95,392	57,058	88,787
	Δ	153,868	54,527	26,983	18,469	42,185
	% Δ/yr.	5.52	4.64	3.58	4.35	8.22
Poultry	1969	55,325	37,899	30,751	24,156	18,878
	1972	52,175	43,524	32,041	26,016	20,918
	1974	50,075	47,274	32,901	27,256	22,278
	1979	44,825	56,649	35,051	30,356	25,678
	1980	43,775	58,524	35,481	30,976	26,358
	Δ	-11,550	20,625	4,730	6,820	7,480
	% Δ/yr.	-1.89	4.95	1.39	2.56	3.60
Dairy	1969	172,370	97,798	58,963	35,232	30,737
	1972	178,169	102,733	63,823	38,208	34,925
	1974	182,035	106,023	67,063	40,192	37,717
	1979	191,700	114,248	75,163	45,152	44,697
	1980	193,633	115,893	76,783	46,144	46,093
	Δ	21,263	18,095	17,820	10,912	15,356
	% Δ/yr.	1.12	1.68	2.74	2.81	4.54
Livestock	1969	349,544	182,273	105,727	64,268	40,551
	1972	392,669	204,866	117,289	71,576	44,997
	1974	421,419	219,928	124,997	76,448	47,961
	1979	493,294	257,583	144,267	88,628	55,371
	1980	407,669	264,114	148,121	91,064	56,853
	Δ	158,125	82,841	42,394	26,796	16,302
	% Δ/yr.	4.11	4.13	3.64	3.79	3.65
Livestock Ranches	1969	586,323	229,949	136,919	85,773	54,666
	1972	642,990	252,935	150,479	96,756	63,141
	1974	680,768	268,259	159,519	104,078	68,791
	1979	775,213	306,569	182,119	122,383	82,916
	1980	794,102	314,231	186,639	126,044	85,741
	Δ	207,779	84,282	49,720	40,271	31,075
	% Δ/yr.	3.22	3.33	3.30	4.26	5.16
General	1969	380,671	193,640	116,900	72,630	48,760
	1972	413,302	218,503	132,266	83,049	57,235
	1974	435,056	233,745	142,510	89,995	62,885
	1979	489,441	271,850	168,120	107,360	77,010
	1980	500,318	279,471	173,242	110,833	79,835
	Δ	119,647	83,831	56,342	38,203	31,075
	% Δ/yr.	2.85	3.90	4.38	4.78	5.79

*The figures presented for 1969 are derived from the regression equation used to make all projections; they are not actual census data reported for 1969.

Comparisons of Table IX data among enterprise types within economic classes reveal that in general class V farms have projected annual rates of increase in the value of land and buildings that exceed the rates of change for other classes. Comparisons among the different economic classes within enterprise types indicate that the annual growth rates in the value of land and buildings range from a low of 2.85 percent of the 1969 value for class I general farms to a high of 5.79 percent of the 1969 value for class I general farms.

Value of Machinery and Equipment

The value of machinery and equipment (ME_{ijt}) for each class and type of representative farm is presented in Table X. In general, capital in the form of machinery and equipment does not compare in magnitude with the land and buildings capital requirement.

The average ratio of machinery and equipment to total capital for all types of class I farms increases from 9.47 percent in 1969 to 12.29 percent in 1980. This would seem to indicate that the largest farms are substituting more and more machinery and equipment for other capital inputs. The ratio of machinery and equipment to total capital for all types of class II and class III farms remains fairly constant from 1969 to 1980. In 1969 machinery and equipment capital averages 8.90 percent of total capital for all class II farms. In 1980 this percentage is projected to be 8.71 percent. The average ratio of machinery and equipment capital to total capital declines from 9.87 percent in 1969 to 9.31 percent in 1980 for all class III farms. The class IV and V farms show a decrease in machinery and equipment as a percentage of total capital from 1969 to 1980. For both classes this percentage declines from about

TABLE X

VALUE OF MACHINERY AND EQUIPMENT FOR REPRESENTATIVE FARMS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	40,230	24,245	15,376	10,160	6,532
	1972	48,027	28,208	17,338	10,901	6,607
	1974	53,225	30,850	18,646	11,395	6,657
	1979	66,220	37,455	21,916	12,630	6,782
	1980	68,819	38,776	22,570	12,877	6,807
	Δ	28,589	14,531	7,194	2,717	275
	% Δ/yr.	6.46	5.45	4.25	2.43	.38
Cotton	1969	38,585	21,120	13,144	8,309	5,441
	1972	45,989	23,997	14,347	8,417	5,099
	1974	50,925	25,915	15,149	8,489	4,301
	1979	63,733	30,710	17,154	8,669	4,301
	1980	65,733	31,669	17,555	8,705	4,187
	Δ	27,148	10,549	4,411	396	-1,254
	% Δ/yr.	6.40	4.54	3.05	.43	-2.10
Other Field Crop	1969	33,997	16,729	10,815	7,501	5,461
	1972	41,047	19,045	11,916	7,600	5,386
	1974	45,747	20,589	12,650	7,666	5,336
	1979	57,497	24,449	14,485	7,831	5,211
	1980	59,847	25,221	14,852	7,864	5,186
	Δ	25,850	8,492	4,037	363	-275
	% Δ/yr.	6.91	4.61	3.39	.44	-.46
Poultry	1969	16,564	5,044	4,993	3,493	2,095
	1972	20,296	5,419	5,452	3,745	2,011
	1974	22,784	5,669	5,758	3,913	1,955
	1979	29,004	6,294	6,523	4,333	1,815
	1980	30,248	6,419	6,676	4,417	1,787
	Δ	13,684	1,375	1,683	924	-308
	% Δ/yr.	7.51	2.48	3.06	2.40	-1.34
Dairy	1969	23,461	11,887	8,851	6,812	5,690
	1972	26,446	12,250	8,737	6,728	5,843
	1974	28,436	12,492	8,841	6,672	5,945
	1979	33,411	13,097	9,101	6,532	6,200
	1980	34,406	13,218	9,153	6,504	6,251
	Δ	10,945	1,331	572	-308	561
	% Δ/yr.	4.24	1.02	.61	-.41	.90
Livestock	1969	28,390	17,037	10,800	7,695	5,291
	1972	32,818	18,987	11,394	7,653	5,081
	1974	35,770	20,287	11,790	7,625	4,941
	1979	43,150	23,537	12,780	7,555	4,591
	1980	44,626	24,187	12,978	7,541	4,521
	Δ	16,236	7,140	2,178	-154	-770
	% Δ/yr.	5.20	3.82	1.83	-.18	-1.32
Livestock Ranches	1969	17,576	9,629	7,537	5,591	4,438
	1972	20,252	10,472	7,951	5,768	4,594
	1974	22,036	11,034	8,227	5,886	4,698
	1979	26,496	12,439	8,917	6,181	4,958
	1980	27,388	12,720	9,055	6,240	5,010
	Δ	9,812	3,091	1,518	649	572
	% Δ/yr.	5.08	2.92	1.83	1.06	1.17
General	1969	34,182	20,071	13,806	8,979	6,650
	1972	39,186	22,540	15,006	9,216	6,581
	1974	42,522	24,186	15,806	9,374	6,535
	1979	50,862	28,301	17,806	9,769	6,420
	1980	52,530	29,124	18,206	9,848	6,397
	Δ	18,348	9,053	4,400	869	-253
	% Δ/yr.	4.88	4.10	2.90	.88	-.35

*The figures presented for 1969 are derived from the regression equation used to make all projections; they are not actual census data reported for 1969.

10.5 percent in 1969 to about 7 percent in 1980. These figures might suggest that little, if any, investment is being made in new machinery and equipment on these lower sales classes of farms.

Even if the ratio of machinery and equipment capital to total capital is only about 10 percent, machinery and equipment does represent a large investment for some representative farms. For example, it is estimated that the machinery and equipment component of total capital will be $68,819 for a representative class I cash grain farm in 1980. This is an increase of $28,589 compared to the 1969 machinery and equipment value of $40,230, or an annual increase of 6.46 percent.

The data in Table X can also be used to estimate the additional amounts of machinery and equipment capital that a representative farmer would need if he moved from a low sales class to a higher sales class during a period of years. For example, the representative class II general farmer has an estimated $22,540 of machinery and equipment in 1972. It is projected that the representative class I general farmer will have $52,530 of machinery and equipment in 1980. This indicates that the 1972 class II general farmer will need to acquire $29,990 of machinery and equipment by 1980 if he makes the transition from a class II to a class I operator. This is an increase of 133 percent of the value of his 1972 machinery and equipment investment or an annual increase of 16.62 percent per year. The 16.62 percent per year represents an annual growth rate considerably greater than the 4.10 percent that is projected for class II general farmers who remain in class II from 1969 to 1980.

Value of Livestock

The value of livestock on representative farms by economic class and enterprise type is presented in Table XI. Although values are reported for both hogs and sheep these classes of livestock are an insignificant portion of the total value of livestock on representative farms for all enterprise types and economic classes. Therefore, comparisons and trends will be discussed for only the cattle component of the total value of livestock.

For most types of representative farms the value of cattle is only four to six percent of the total capital required. Only for the types of farms that derive the major portion of their gross sales from livestock (dairy, livestock, and livestock ranches) does the livestock or cattle component of total capital exceed the machinery and equipment component. For example, for class I livestock farms in both 1969 and 1980, the ratio of the value of cattle to total capital exceeds 16 percent. This compares to about 6 percent for the ratio of machinery and equipment to total capital for this class and type of representative farm.

Comparisons of the different types of farms reveal that from 1969 to 1980, the value of cattle per representative farm is projected to increase most rapidly on cotton and other field crop farms. Class I, II, and III cotton farms are projected to have an annual percentage increase in the value of cattle from 1969 to 1980 of more than five percent of the value of cattle on these farms in 1969. Representative class I and class II other field crop farms have a projected annual increase in the value of cattle per farm of 7.09 and 6.56 percent respectively.

TABLE XI

VALUE OF LIVESTOCK FOR REPRESENTATIVE FARMS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	21,859	12,248	7,308	4,092	2,082
	1972	24,476	13,976	8,205	4,455	2,172
	1974	26,219	15,128	8,803	4,697	2,232
	1979	30,579	18,008	10,298	5,302	2,382
	1980	31,451	18,584	10,597	5,423	2,412
	Δ	9,592	6,336	3,289	1,331	330
	% Δ/yr.	3.99	4.70	4.09	2.95	1.44
Cotton	1969	20,147	8,859	5,357	2,749	1,220
	1972	24,770	10,716	6,185	2,941	1,124
	1974	27,852	11,954	6,737	3,069	1,060
	1979	35,557	15,049	8,117	3,389	900
	1980	37,098	15,668	8,393	3,453	868
	Δ	16,951	6,809	3,036	704	-352
	% Δ/yr.	7.65	6.99	5.15	2.32	-2.62
Other Field Crop	1969	17,678	9,065	6,726	4,590	2,634
	1972	21,440	10,850	7,650	5,154	2,823
	1974	23,948	12,040	8,266	5,530	2,949
	1979	30,218	15,015	9,806	6,470	3,264
	1980	31,472	15,610	10,114	6,658	3,327
	Δ	13,794	6,545	3,388	2,068	693
	% Δ/yr.	7.09	6.56	4.57	4.09	2.39
Poultry	1969	7,860	4,828	3,773	1,810	2,356
	1972	8,868	5,440	4,337	1,732	2,767
	1974	9,540	5,848	4,713	1,680	3,041
	1979	11,220	6,868	5,653	1,550	3,726
	1980	11,556	7,072	5,841	1,524	3,863
	Δ	3,696	2,249	2,068	-286	1,507
	% Δ/yr.	4.27	4.24	4.98	-1.43	5.81
Dairy	1969	25,929	13,123	7,977	4,958	3,421
	1972	26,532	13,327	8,214	4,883	3,454
	1974	26,934	13,463	8,372	4,833	3,476
	1979	27,939	13,803	8,767	4,708	3,531
	1980	28,140	13,871	8,846	4,683	3,542
	Δ	2,211	748	869	-275	121
	% Δ/yr.	.78	.52	.99	-.50	.32
Livestock	1969	72,992	23,132	14,764	9,094	5,897
	1972	83,570	25,226	16,024	9,670	6,308
	1974	90,622	26,622	16,864	10,054	6,582
	1979	108,252	30,112	18,964	11,014	7,267
	1980	111,778	30,810	19,384	11,206	7,404
	Δ	38,786	7,678	4,620	2,112	1,507
	% Δ/yr.	4.83	3.02	2.84	2.11	2.32
Livestock Ranches	1969	110,998	35,850	21,191	12,511	7,784
	1972	117,319	36,735	21,647	13,150	8,264
	1974	121,533	37,325	21,951	13,576	8,584
	1979	132,068	38,800	22,711	14,641	9,384
	1980	134,175	39,095	22,863	14,854	9,544
	Δ	23,177	3,245	1,672	2,343	1,760
	% Δ/yr.	1.90	.82	.71	1.70	2.05
General	1969	27,157	15,349	9,555	5,664	3,344
	1972	29,545	16,750	10,764	6,099	3,509
	1974	31,137	17,684	11,570	6,389	3,619
	1979	35,117	20,019	13,585	7,114	3,894
	1980	35,913	20,486	13,988	7,259	3,949
	Δ	8,756	5,137	4,433	1,595	605
	% Δ/yr.	2.93	3.04	4.21	2.56	1.64

*The figures presented for 1969 are derived from the regression equation used to make all projections; they are not actual census data reported for 1969.

Within class and between type comparisons of the projections in Table XI indicate that the value of cattle should increase considerably more rapidly from 1969 to 1980 on all representative class I, II, and III farms than on class IV and class V farms. In fact, several types of class IV and class V farms are expected to experience a decrease in the value of cattle per farm from 1969 to 1980.

Cash Inflows and Outflows

Estimates for 1969 and projections to 1980 of cash inflows and outflows for representative classes and types of Oklahoma farms are presented and discussed below.

Cash Inflows

Total cash inflows for the representative farm firms are presented in Table XII. Comparisons reveal that class I livestock farms have the highest projected 1980 total cash inflows. The annual percentage increase in cash inflows is 4.42 percent for class I livestock farms. Class I cotton farms also exhibit a relatively high rate of increase in cash inflows of 4.15 percent.

Comparing the economic classes within enterprise types, class I and class V farms are projected to have a higher annual rate of growth in total cash inflows than are the class II, III, and IV farms for most enterprise types. Cash inflows for class I livestock ranches are projected to increase each year from 1969 to 1980 by 3.70 percent. An even greater annual change of 4.20 percent is projected for class V livestock ranches. Class II, III and IV livestock ranches have projected annual rates of change in cash inflows of 1.02, 2.48, and 3.40 percent respectively.

TABLE XII

CASH INFLOWS FOR REPRESENTATIVE FARMS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	72,134	33,140	18,087	11,648	9,180
	1972	77,861	35,051	19,050	12,533	10,239
	1974	81,679	36,325	19,692	13,123	10,945
	1979	91,224	39,510	21,297	14,598	12,710
	1980	93,133	40,147	21,618	14,893	13,063
	Δ	20,999	7,007	3,531	3,245	3,883
	% Δ/yr.	2.64	1.92	1.77	2.53	3.84
Cotton	1969	98,234	37,041	19,015	9,920	6,327
	1972	110,477	40,110	20,503	10,442	6,729
	1974	118,639	42,156	21,495	10,790	6,997
	1979	139,044	47,271	23,975	11,660	7,667
	1980	143,125	48,294	24,471	11,834	7,801
	Δ	44,891	11,253	5,456	1,914	1,474
	% Δ/yr.	4.15	2.76	2.60	1.75	2.11
Other Field Crop	1969	66,783	31,009	16,221	9,653	6,426
	1972	70,911	32,659	16,776	10,208	6,993
	1974	73,663	33,759	17,146	10,578	7,371
	1979	80,543	36,509	18,071	11,503	8,316
	1980	81,919	37,059	18,256	11,688	8,505
	Δ	15,136	6,050	2,035	2,035	2,079
	% Δ/yr.	2.06	1.77	1.14	1.91	2.94
Poultry	1969	102,791	31,209	18,830	10,176	9,089
	1972	108,539	31,800	19,205	10,740	10,127
	1974	112,371	32,194	19,455	11,116	10,819
	1979	121,951	33,179	20,080	12,056	12,549
	1980	123,867	33,376	20,205	12,244	12,895
	Δ	21,076	2,167	1,375	2,068	3,806
	% Δ/yr.	1.86	.63	.66	1.84	3.80
Dairy	1969	70,249	31,054	18,028	10,709	7,124
	1972	74,500	32,215	18,970	11,309	7,820
	1974	77,334	32,989	19,598	11,709	8,284
	1979	84,419	34,924	21,168	12,709	9,444
	1980	85,836	35,311	21,482	12,909	9,676
	Δ	15,587	4,257	3,454	2,200	2,552
	% Δ/yr.	2.01	1.24	1.74	1.87	3.25
Livestock	1969	162,938	34,054	19,588	12,942	9,614
	1972	184,553	35,215	20,725	14,163	10,805
	1974	198,963	35,989	21,483	14,977	11,599
	1979	234,988	37,924	23,378	17,012	13,584
	1980	242,193	38,311	23,757	17,419	13,981
	Δ	79,255	4,257	4,169	4,477	4,367
	% Δ/yr.	4.42	1.13	1.93	3.14	4.12
Livestock Ranches	1969	165,622	33,318	21,444	13,466	9,700
	1972	184,036	34,347	23,040	14,840	10,924
	1974	196,312	35,033	24,104	15,756	11,740
	1979	227,002	36,748	26,764	18,046	13,780
	1980	233,140	37,091	27,296	18,504	14,188
	Δ	67,518	3,773	5,852	5,038	4,488
	% Δ/yr.	3.70	1.02	2.48	3.40	4.20
General	1969	73,430	33,113	19,144	12,895	8,087
	1972	77,015	34,718	20,392	14,203	8,918
	1974	79,405	35,788	21,224	15,075	9,472
	1979	85,380	38,463	23,304	17,255	10,857
	1980	86,575	38,998	23,720	17,691	11,134
	Δ	13,145	5,885	4,576	4,796	3,047
	% Δ/yr.	1.62	1.61	2.17	3.38	3.42

*The figures presented for 1969 are derived from the regression equation used to make all projections; they are not actual census data reported for 1969.

Gross Farm Income. Gross farm income is one component of total cash inflows. Estimates and projections of gross farm income for Oklahoma farms by economic class and enterprise type are presented in Table XIII. In analyzing the annual growth rates in gross farm income it is apparent that class I general farms have a projected annual increase that is low in comparison to other class I farms. Gross farm income for representative class I general farms is projected to increase by less than 1 percent from 1969 to 1980. In contrast, class I livestock farms have a projected annual rate of increase of 4.27 percent.

Nonfarm Income. Nonfarm income is composed of government farm program payments and supplementary income. Estimates of these sources of income for 1969 and projections to 1980 are presented in Table XIV.

Government farm program payments are relatively more important in all years than supplementary income on the representative farms of the first three size classes for cash grain, cotton and general farms. Class I cotton farms receive the highest estimated level of government payments in both 1969 and 1980. During the eleven year period program payments for representative class I cotton farms more than double. Government payments received by class I cash grain farms also more than double from 1969 to 1980.[5] In contrast to class I and class II farms, government program payments are not as important on representative class IV and class V farms. For example, class V representative livestock farms are expected to receive only $543 in government payments in

[5]It must be remembered that government program payments have been projected by the model to increase at the historical rate of growth. The impact of alternative growth rates in government farm program payments on cash inflows and capital requirements is discussed in the next chapter.

TABLE XIII

GROSS FARM INCOME FOR REPRESENTATIVE FARMS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	61,841	27,046	14,075	7,252	3,574
	1972	64,802	27,359	14,213	7,249	3,220
	1974	66,776	27,901	14,305	7,247	3,484
	1979	71,711	29,756	14,535	7,242	3,394
	1980	72,698	28,927	14,581	7,241	3,376
	Δ	10,857	1,881	506	-11	-198
	% Δ/yr.	1.59	.63	.32	-.01	-.50
Cotton	1969	75,670	27,348	14,057	7,346	2,948
	1972	80,578	27,633	14,204	7,367	2,681
	1974	83,850	27,823	14,302	7,381	2,503
	1979	92,030	28,298	14,547	7,416	2,058
	1980	93,666	28,393	14,596	7,423	1,969
	Δ	17,996	1,045	539	77	-979
	% Δ/yr.	2.16	.34	.34	.09	-3.01
Other Field Crop	1969	61,618	28,120	14,584	7,334	3,663
	1972	64,615	29,230	14,803	7,412	3,681
	1974	66,613	29,970	14,949	7,464	3,693
	1979	71,608	31,820	15,314	7,594	3,723
	1980	72,607	32,190	15,387	7,620	3,729
	Δ	10,989	4,070	803	286	66
	% Δ/yr.	1.62	1.31	.50	.35	.16
Poultry	1969	98,462	28,803	14,402	7,480	3,593
	1972	103,394	28,971	13,889	7,486	3,539
	1974	106,682	29,083	13,547	7,490	3,503
	1979	114,902	29,363	12,692	7,500	3,413
	1980	116,546	29,419	12,521	7,502	3,395
	Δ	18,084	616	-1,991	22	-198
	% Δ/yr.	1.66	.19	-1.18	.02	-.50
Dairy	1969	65,391	28,759	15,141	7,307	3,845
	1972	68,661	29,497	15,501	7,205	3,890
	1974	70,841	29,938	15,741	7,137	3,920
	1979	76,291	31,219	16,341	6,967	3,995
	1980	77,381	31,465	16,461	6,933	4,010
	Δ	11,990	2,706	1,320	-374	165
	% Δ/yr.	1.66	.85	.79	-.46	.39
Livestock	1969	155,392	27,775	14,030	7,051	3,530
	1972	175,339	27,754	14,045	7,060	3,512
	1974	188,637	27,740	14,055	7,066	3,500
	1979	221,882	27,705	14,080	7,081	3,470
	1980	228,531	27,698	14,085	7,084	3,464
	Δ	73,139	-77	55	33	-66
	% Δ/yr.	4.27	-.02	.03	.04	-.16
Livestock Ranches	1969	143,681	27,259	13,847	6,942	3,448
	1972	147,964	27,223	13,922	6,966	3,430
	1974	167,486	27,199	13,972	6,982	3,418
	1979	191,291	27,139	14,097	7,022	3,388
	1980	196,052	27,127	14,122	7,030	3,382
	Δ	52,371	-132	275	88	-66
	% Δ/yr.	3.31	-.04	.18	.11	-.17
General	1969	64,691	27,503	14,292	7,242	3,566
	1972	66,260	27,977	14,520	7,263	3,500
	1974	67,306	28,293	14,672	7,277	3,456
	1979	69,921	29,083	15,052	7,312	3,346
	1980	70,444	29,241	15,128	7,319	3,324
	Δ	5,753	1,738	836	77	-242
	% Δ/yr.	.80	.57	.53	.09	-.61

*The figures presented for 1969 are derived from the regression equation used to make all projections; they are not actual census data reported for 1969.

TABLE XIV

NONFARM INCOME FOR REPRESENTATIVE FARMS

Enterprise Type		Economic Class I GP	I SI	II GP	II SI	III GP	III SI	IV GP	IV SI	V GP	V SI
Cash Grain	1969	7,661	2,632	4,909	1,285	3,013	999	1,760	2,636	999	4,610
	1972	10,010	3,049	6,009	1,483	3,754	1,083	2,162	3,122	1,233	5,486
	1974	11,576	3,327	6,809	1,615	4,248	1,139	2,430	3,446	2,430	3,446
	1979	15,491	4,022	8,809	1,945	5,483	1,279	3,100	4,256	4,256	7,530
	1980	16,274	4,161	9,209	2,011	5,730	1,307	3,234	4,418	1,418	7,822
	Δ	8,613	1,529	4,400	726	2,717	308	1,474	1,782	869	3,212
	% Δ/yr.	10.22	5.28	8.31	5.14	8.19	2.80	7.61	6.14	7.93	6.33
Cotton	1969	20,796	1,768	8,368	1,325	4,510	448	2,442	132	1,137	2,242
	1972	27,873	2,026	11,047	1,430	5,857	442	3,000	75	1,407	2,641
	1974	32,591	2,198	12,833	1,500	6,755	438	3,372	37	1,587	2,907
	1979	44,386	2,628	17,298	1,675	9,000	428	4,302	-58	2,037	3,572
	1980	46,745	2,714	18,191	1,710	9,449	426	4,488	(0)	2,127	3,705
	Δ	25,949	946	9,823	385	4,939	-22	2,046	-132	990	1,064
	% Δ/yr.	11.34	4.86	10.67	2.64	9.95	-.45	7.61	-.09	7.91	3.66
Other Field Crop	1969	3,067	2,098	1,154	1,735	878	759	301	2,018	278	2,485
	1972	3,862	2,434	1,442	1,987	1,094	874	370	2,426	344	2,968
	1974	4,392	2,658	1,634	2,155	1,238	959	416	2,698	388	3,290
	1979	5,717	3,218	2,114	2,575	1,598	1,159	531	3,378	498	4,095
	1980	5,982	3,330	2,210	2,659	1,670	1,199	554	3,514	520	4,256
	Δ	2,915	1,232	1,056	924	792	440	253	1,496	242	1,771
	% Δ/yr.	8.64	5.34	8.31	4.84	8.20	5.27	7.64	6.74	7.91	6.48
Poultry	1969	220	4,109	192	2,214	159	4,269	105	2,591	163	5,333
	1972	227	4,868	240	2,589	198	5,118	129	3,125	202	6,386
	1974	315	5,374	272	2,839	224	5,684	145	3,481	228	7,088
	1979	410	6,639	352	3,464	289	7,099	185	4,371	293	8,843
	1980	429	6,892	368	3,589	302	7,382	198	4,549	306	9,194
	Δ	209	2,783	176	1,375	143	1,958	93	1,958	143	3,861
	% Δ/yr.	8.63	6.16	8.33	5.65	8.17	6.87	8.05	6.87	7.97	6.58
Dairy	1969	1,412	3,446	746	1,549	439	2,448	250	3,152	127	3,152
	1972	1,778	4,061	932	1,786	547	2,922	307	3,797	157	3,773
	1974	2,022	4,471	1,056	1,944	619	3,238	345	4,227	177	4,187
	1979	2,632	5,496	1,366	2,339	799	4,028	440	5,302	227	5,222
	1980	2,754	5,701	1,428	2,418	835	4,186	459	5,517	237	5,429
	Δ	1,342	2,255	682	869	396	2,392	209	2,365	110	2,277
	% Δ/yr.	8.64	5.95	8.31	5.10	8.20	6.96	7.60	6.82	7.87	6.57
Livestock	1969	5,463	2,083	2,730	3,549	1,488	4,070	722	5,169	290	5,794
	1972	6,879	2,335	3,411	4,050	1,854	4,826	887	6,216	359	6,934
	1974	7,823	2,503	3,865	4,384	2,098	5,330	997	6,914	405	7,594
	1979	10,183	2,923	5,000	5,219	2,708	6,590	1,272	8,659	520	9,594
	1980	10,655	3,007	5,227	5,386	2,830	6,842	1,327	9,008	543	9,974
	Δ	5,192	924	2,497	1,837	1,342	3,839	605	3,839	253	4,180
	% Δ/yr.	8.63	4.03	8.31	4.71	8.19	6.15	7.61	6.75	7.93	6.56
Livestock Ranches	1969	1,030	20,911	529	5,530	378	7,219	222	6,302	153	6,099
	1972	1,297	24,775	661	6,463	471	8,647	273	7,601	189	7,305
	1974	1,475	27,351	749	7,085	533	9,599	307	8,467	213	8,109
	1979	1,920	33,791	969	8,640	688	11,979	392	10,633	273	10,119
	1980	2,009	35,079	1,013	8,951	719	12,455	409	11,065	285	10,521
	Δ	979	14,168	484	3,421	341	4,763	187	4,763	132	4,422
	% Δ/yr.	8.64	6.16	8.31	5.62	8.20	6.87	7.65	6.87	7.84	6.59
General	1969	7,832	907	4,522	1,088	2,573	2,279	1,301	4,352	708	3,813
	1972	9,824	931	5,650	1,091	3,206	2,666	1,598	5,342	876	4,542
	1974	11,152	947	6,402	1,093	3,628	2,924	1,796	6,002	988	5,028
	1979	14,472	987	8,282	1,098	4,683	3,569	2,291	7,652	1,268	6,243
	1980	15,136	995	8,658	1,099	4,894	3,630	2,390	7,982	1,324	6,486
	Δ	7,304	88	4,136	11	2,321	3,630	1,089	3,632	616	2,673
	% Δ/yr.	8.47	.88	8.31	.09	8.20	7.58	7.60	7.58	7.90	6.37

*The figures presented for 1969 are derived from the regression equation used to make all projections; they are not actual data reported for 1969.

1980, and class IV livestock farms are projected to receive $1,327 in government payments in 1980.

Supplementary income is of major importance as a source of cash inflows in all years for representative farms of the lower sales classes. In particular, the class IV and class V livestock farms, dairy farms, and livestock ranches appear to be greatly dependent on supplementary income. Representative class IV livestock ranches received an estimated $6,302 of supplementary income in 1969. It is projected that in 1980 these ranches will receive $11,065 of supplementary income. Class V livestock farms are expected to receive $9,974 of supplementary income by 1980.

Relative Importance of the Components of Cash Inflows. The relative importance of the components of total cash inflows varies substantially among the different enterprise types and economic classes of farms. For example, gross farm income is estimated to have been 86.75 percent of cash inflows for class I livestock ranches in 1969. For this same class-type farm, gross farm income is projected to be 84.09 percent of cash inflows in 1980. In contrast, the ratio of gross farm income to cash inflows for class IV livestock ranches was 51.55 percent in 1969. This ratio is expected to decline to 37.99 percent in 1980. Comparisons within enterprise types reveal that the ratio of gross farm income to cash inflows is greater for the higher sales class farms than for the lower sales class farms.

The components of nonfarm income also have varying degrees of importance to different economic classes and enterprise types of farms. As an example, the data in Table XIV indicate that in 1980 class I livestock ranches will receive 5.42 percent of their nonfarm income

from government program payments and 94.58 percent from supplementary income. In contrast, the projections indicate that class I livestock farms will receive 77.99 percent of their nonfarm income from government payments and 22.01 percent of their nonfarm income from supplementary income in 1980. Class II cotton, general, and cash grain farms will also receive relatively more nonfarm income from government payments compared to supplementary income while class II livestock ranches, livestock farms and dairy farms receive relatively more income from supplementary sources. Most class IV farms receive the majority of their nonfarm income from supplementary income sources.

Cash Outflows

Total cash outflows for representative Oklahoma farms by economic class and enterprise type are presented in Table XV. Class I livestock farms have the highest projected rate of increase in total cash outflows from 1969 to 1980. Their cash outflows increase by 4.82 percent per year. One of the lower rates of increase in cash outflows, 1.13 percent, is projected for class I general farms.

Farm operating expenses for representative Oklahoma farms by economic class and enterprise type appear in Table XVI. Comparisons between economic classes within enterprise types indicate that farm operating expenses for class I cotton farms are projected to increase from 1969 to 1980 at a higher rate (5.49 percent) than expenses on other classes of cotton farms. In contrast, class I general farms have a much lower rate of increase in expenses (.42 percent) than do other classes of general farms. In comparing enterprise types within economic classes, one notes that while most class I farms exhibit rates of increase in farm operating expenses of 4 to 5 percent, class I dairy

TABLE XV

CASH OUTFLOWS FOR REPRESENTATIVE FARMS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	59,089	28,439	15,916	10,403	8,261
	1972	64,129	30,336	16,871	11,207	9,133
	1974	67,487	31,592	17,506	11,749	9,713
	1979	75,710	34,824	19,128	13,105	11,161
	1980	77,343	35,463	19,448	13,376	11,451
	Δ	18,245	7,024	3,532	2,973	3,190
	% Δ/yr.	2.81	2.25	2.02	2.60	3.51
Cotton	1969	80,109	30,874	17,014	9,202	6,190
	1972	90,976	32,948	18,454	9,685	6,584
	1974	98,127	34,336	19,436	10,007	6,846
	1979	11,617	37,833	21,880	10,813	7,496
	1980	120,206	38,548	22,368	10,974	7,625
	Δ	32,097	7,674	5,354	1,772	1,435
	% Δ/yr.	3.64	2.26	2.86	1.75	2.11
Other Field Crop	1969	55,198	26,120	14,632	9,026	6,501
	1972	59,717	27,736	15,180	9,535	7,029
	1974	62,715	28,809	15,543	9,874	7,418
	1979	70,094	31,449	16,446	10,722	8,389
	1980	71,520	31,973	16,625	10,892	8,583
	Δ	16,322	5,853	1,993	1,866	2,080
	% Δ/yr.	2.69	2.04	1.24	1.88	2.91
Poultry	1969	99,694	30,977	18,031	10,347	8,907
	1972	104,281	31,788	18,169	10,738	9,331
	1974	107,324	32,312	18,260	10,985	9,581
	1979	114,912	34,441	18,488	11,582	10,187
	1980	116,407	34,868	18,535	11,697	10,301
	Δ	16,713	3,891	504	1,350	1,394
	% Δ/yr.	1.52	1.14	.25	1.19	1.42
Dairy	1969	59,500	27,615	16,298	9,878	6,953
	1972	61,296	28,650	16,924	10,222	7,527
	1974	62,505	29,339	17,339	10,445	7,905
	1979	65,610	31,064	18,365	10,997	8,836
	1980	66,250	31,410	18,569	11,106	9,021
	Δ	6,750	3,795	2,271	1,228	2,068
	% Δ/yr.	1.03	1.25	1.27	1.13	2.70
Livestock	1969	155,530	30,798	17,488	11,359	8,665
	1972	178,114	31,866	18,421	12,248	9,593
	1974	193,147	32,591	19,042	12,840	10,208
	1979	230,656	34,440	20,623	14,315	11,743
	1980	238,065	34,808	20,940	14,608	12,048
	Δ	6,750	3,795	2,271	1,228	2,068
	% Δ/yr.	1.03	1.25	1.27	1.13	2.70
Livestock Ranches	1969	150,129	30,736	18,914	11,869	8,940
	1972	167,933	31,514	19,907	12,785	9,883
	1974	179,725	32,033	20,562	18,389	10,508
	1979	209,217	33,329	22,205	14,882	12,067
	1980	215,169	33,589	22,532	15,180	12,378
	Δ	65,040	2,853	3,618	3,311	3,438
	% Δ/yr.	3.94	.84	1.74	2.54	3.50
General	1969	60,038	28,516	16,735	11,201	7,686
	1972	62,054	29,817	17,740	12,177	8,456
	1974	63,400	30,683	18,409	12,830	8,967
	1979	66,805	32,855	20,083	14,465	10,241
	1980	67,494	33,290	20,417	14,790	10,495
	Δ	7,456	4,774	3,682	3,589	2,809
	% Δ/yr.	1.13	1.52	2.00	2.91	3.32

*The figures presented for 1969 are derived from the regression equation used to make all projections; they are not actual census data reported for 1969.

TABLE XVI

FARM OPERATING EXPENSES FOR REPRESENTATIVE FARMS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	44,855	21,016	10,721	5,962	3,783
	1972	49,553	23,248	11,795	6,523	4,116
	1974	52,685	24,736	12,511	6,897	4,338
	1979	60,515	28,456	14,301	7,832	4,893
	1980	62,081	29,200	14,549	8,019	5,004
	Δ	17,226	5,184	3,938	2,057	1,221
	% Δ/yr.	3.49	3.54	3.34	3.14	2.93
Cotton	1969	61,356	21,597	11,821	5,286	3,029
	1972	71,478	22,755	13,183	5,478	3,062
	1974	78,226	23,527	14,091	5,606	3,084
	1979	95,096	25,457	16,361	5,926	3,139
	1980	98,470	25,843	16,815	5,990	3,150
	Δ	37,114	4,246	4,994	704	121
	% Δ/yr.	5.49	1.79	3.84	1.21	.36
Other Field Crop	1969	41,693	17,309	9,423	5,107	3,752
	1972	46,802	18,815	9,900	5,305	4,085
	1974	50,208	19,819	10,218	5,437	4,307
	1979	58,723	22,329	11,031	5,767	4,862
	1980	60,426	22,831	11,172	5,833	4,973
	Δ	18,733	5,522	1,749	726	1,221
	% Δ/yr.	4.08	2.90	1.69	1.29	2.96
Poultry	1969	93,260	27,422	13,461	7,507	4,935
	1972	96,500	28,703	13,059	7,234	4,089
	1974	98,660	29,557	12,791	7,052	3,525
	1979	104,060	31,692	12,121	6,597	2,115
	1980	105,140	32,119	11,987	6,506	1,833
	Δ	11,880	4,697	-1,474	-1,001	-3,102
	% Δ/yr.	1.16	1.56	-.99	-1.21	-5.71
Dairy	1969	45,804	19,849	10,602	5,495	3,770
	1972	45,276	20,479	10,503	5,129	3,836
	1974	44,924	20,899	10,437	4,885	3,880
	1979	44,044	21,949	10,272	4,275	3,990
	1980	43,868	22,159	10,239	4,153	4,012
	Δ	-1.936	2,310	-363	-1,342	242
	% Δ/yr.	-.38	1.06	-.31	-2.22	.58
Livestock	1969	145,436	24,393	11,820	6,049	3,946
	1972	169,532	25,416	12,330	6,223	4,192
	1974	185,596	26,098	12,670	6,339	4,356
	1979	225,756	27,803	13,520	6,629	4,766
	1980	233,788	28,144	13,690	6,687	4,848
	Δ	88,352	3,751	1,870	638	902
	% Δ/yr.	5.52	1.41	1.43	1.15	2.08
Livestock Ranches	1969	131,827	24,212	12,321	6,269	4,381
	1972	148,909	24,542	12,375	6,335	4,660
	1974	160,297	24,762	12,411	6,379	4,846
	1979	188,767	25,312	12,501	6,489	5,311
	1980	194,461	25,422	12,519	6,511	5,404
	Δ	62,634	1,210	198	242	1,023
	% Δ/yr.	4.32	.45	.14	.35	2.12
General	1969	44,984	20,638	10,984	5,896	4,190
	1972	45,611	21,643	11,590	6,208	4,559
	1974	46,029	22,313	11,994	6,416	4,805
	1979	47,074	23,988	13,004	6,936	5,420
	1980	47,283	24,323	13,206	7,040	5,543
	Δ	2,299	3,685	2,222	1,144	1,353
	% Δ/yr.	.46	1.62	1.83	1.76	2.92

*The figures presented for 1969 are derived from the regression equation used to make all projections; they are not actual census data reported for 1969.

farms have a decreasing rate of change in farm operating expense of -.38 percent. This decline occurs because a projection of historical trends indicates that both acreage and cow numbers for class I dairy farms are expected to decrease during the 1969 to 1980 period. Comparisons among the class II farms indicate that farm operating expenses increase relatively more rapidly on representative class II cash grain farms than on other class II farms.

Estimates of farm proprietor's withdrawals for family consumption and income and social security tax are presented in Table XVII. These figures are calculated within the capital and credit projection model and are basically dependent upon the annual difference between the projections of cash inflows and farm operating expenses. Negative changes and rates of change in proprietor's withdrawals during the period 1969 to 1980 indicate that increases in total cash inflows from farm and nonfarm sources are not keeping pace with increases in farm operating expenses. The result of these trends is a decrease in the amount of funds that are available for farm family consumption and income and social security taxes. Class I livestock farms are an example of rapidly decreasing proprietor's withdrawals. The calculated withdrawals for these representative farms decrease at an annual rate of 5.24 percent. Comparisons of the different classes of farms within enterprise types reveal that class IV and class V farms have substantial increases, both in absolute and percentage terms, in proprietor's withdrawals from 1969 to 1980. For example, class IV livestock farms are expected to have an annual increase in withdrawals of 4.47 percent. Comparisons of different enterprise types of farms within size classes indicate that cash grain and other field crop farms are not able to increase

TABLE XVII

PROPRIETOR'S WITHDRAWALS FOR REPRESENTATIVE FARMS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	14,234	7,423	5,195	4,441	4,478
	1972	14,576	7,088	5,176	4,684	5,071
	1974	14,802	6,856	4,995	4,852	5,375
	1979	15,195	6,368	4,827	5,273	6,268
	1980	15,262	6,263	4,789	5,357	6,447
	Δ	1,028	-1,160	-406	916	1,969
	% Δ/yr.	.66	-1.42	-.71	1.88	3.99
Cotton	1969	18,753	9,277	5,193	3,916	3,161
	1972	19,498	10,193	5,271	4,207	3,522
	1974	19,901	10,809	5,344	4,401	3,762
	1979	21,421	12,376	5,519	4,887	4,357
	1980	21,736	12,705	5,553	4,984	4,475
	Δ	2,983	3,425	360	1,068	1,314
	% Δ/yr.	1.45	3.36	.63	2.48	3.28
Other Field Crop	1969	13,505	8,811	5,209	3,919	2,749
	1972	12,915	8,921	5,280	4,230	2,944
	1974	12,507	8,990	5,325	4,437	3,111
	1979	11,371	9,120	5,433	4,955	3,527
	1980	11,094	9,142	5,453	5,059	3,610
	Δ	-2,411	331	244	1,140	861
	% Δ/yr.	-1.62	.34	.42	2.64	2.85
Poultry	1969	6,434	3,555	4,570	2,840	3,972
	1972	7,781	3,085	5,110	3,504	5,242
	1974	8,664	2,755	5,469	3,933	6,056
	1979	10,852	2,749	6,367	4,985	8,072
	1980	11,267	2,749	6,548	5,191	8,468
	Δ	4,833	-806	1,978	2,351	4,496
	% Δ/yr.	6.83	-2.06	3.93	7.52	10.29
Dairy	1969	13,696	7,766	5,696	4,383	3,183
	1972	16,020	8,171	6,421	5,093	3,691
	1974	17,581	8,440	6,902	5,560	4,025
	1979	21,566	9,115	8,093	6,722	4,846
	1980	22,382	9,251	8,330	6,953	5,009
	Δ	8,686	1,485	2,634	2,570	1,826
	% Δ/yr.	5.76	1.74	4.20	5.33	5.22
Livestock	1969	10,094	6,405	5,668	5,310	4,719
	1972	8,582	6,450	6,091	6,025	5,401
	1974	7,551	6,493	6,372	6,501	5,852
	1979	4,900	6,637	7,103	7,686	6,977
	1980	4,277	6,664	7,250	7,921	7,200
	Δ	-5,817	259	1,582	2,611	2,481
	% Δ/yr.	-5.24	.37	2.54	4.47	4.78
Livestock Ranches	1969	18,302	6,524	6,593	5,600	4,559
	1972	19,024	6,972	7,532	6,450	5,223
	1974	19,428	7,271	8,151	7,010	5,662
	1979	20,450	8,017	9,704	8,393	6,756
	1980	20,708	8,167	10,013	8,669	6,974
	Δ	2,406	1,643	3,420	3,069	2,415
	% Δ/yr.	1.20	2.29	4.72	4.98	4.82
General	1969	15,054	7,878	5,751	5,305	3,496
	1972	16,443	8,174	6,150	5,969	3,897
	1974	17,371	8,370	6,415	6,414	4,162
	1979	19,731	8,867	7,079	7,529	4,821
	1980	20,211	8,967	7,211	7,750	4,952
	Δ	5,157	1,089	1,460	2,445	1,456
	% Δ/yr.	3.11	1.26	2.31	4.19	3.79

*The figures presented for 1969 are derived from the regression equation used to make all projections; they are not actual census data reported for 1969.

proprietor's withdrawals as much as the other types of farms.

In general, comparisons of data from Tables XII and XV indicate that cash inflows always exceed cash outflows. The only exception to this relationship are class V other field crop farms and class II poultry farms. Therefore, it is apparent that there is nearly always a positive net difference between cash inflows and cash outflows.

Equity Capital

Values of the 1969 or initial amounts of equity capital are presented in Table XVIII for each class and type of representative farm. These initial equity figures are derived in the manner described in Chapter III. The debt-equity ratios which correspond to the initial equity figures for all enterprise types within economic classes are 26.17 percent and 17.10 percent for the two categories of class I farms (over $100,000 gross sales and between $40,000 and $100,000 gross sales respectively) and 19.65 percent, 18.78 percent, 23.33 percent and 15.69 percent for classes II through V, respectively.

Total equity capital per representative farm at the end of 1972 is equal to the initial equity in 1969 plus the changes in equity that occurred during 1969, 1970, 1971 and 1972. The change in equity capital per year will be defined in two alternative manners, thus resulting in unadjusted and adjusted estimates of total equity capital. First it is postulated that the change in equity capital during a given year is simply the difference between cash inflows and cash outflows. This definition of the change in equity capital indicates that any funds remaining after all family and farm expenses are subtracted from total farm and nonfarm revenues are available for reinvestment in the farm

TABLE XVIII

ESTIMATES OF INITIAL EQUITY CAPITAL FOR REPRESENTATIVE OKLAHOMA FARMS BY ECONOMIC CLASS AND ENTERPRISE TYPE, 1969

Enterprise Type	Economic Class				
	I	II	III	IV	V
Cash Grain	$422,911	$229,657	$144,315	$85,783	$55,755
Cotton	375,600	180,513	101,081	56,038	37,458
Other Field Crop	260,257	110,823	72,466	41,121	47,291
Poultry	68,357	39,994	33,301	23,954	20,190
Dairy	189,513	102,731	63,664	38,159	34,484
Livestock	358,658	186,603	110,852	65,896	44,818
Livestock Ranches	566,957	230,453	139,659	84,305	57,859
General	377,748	193,377	118,224	70,827	50,829

business, payment of debt, or for investment in nonfarm sectors of the economy. Estimates of total unadjusted equity capital per representative farm for selected years, as determined by this definition of the change in equity capital, are presented in Table XIX. The estimates in Table XIX show a representative farmer's equity position at any point in time if he does not consider appreciation in the value of assets he owns as additions to his total equity capital.

Comparisons of the economic classes within enterprise types reveal that representative class I general farms have a larger indicated annual rate of change in unadjusted equity capital than do the other classes of general farms. Within economic class and between enterprise type comparisons reveal that the annual rates of increase in unadjusted equity capital are low for class II livestock farms and class II livestock ranches relative to other types of class II farms.

An alternative measure of the change in equity capital during a given year considers any price appreciation in the value of an asset owned by the representative farmer as an addition to the farmer's total equity position. This estimate will be referred to as adjusted equity capital. While an increase in the value of an asset does not represent liquid funds that are available for reinvestment in the farm business or for investment in the nonfarm sector, it does represent equity that could be obtained if the farm assets are liquidated. If appreciation of owned assets is included in equity then a portion of the current total value of capital required does not have to be supplied by non-equity or debt funds. In the capital and credit projection model only price increases of land and buildings are assigned to equity. The

TABLE XIX

UNADJUSTED EQUITY CAPITAL FOR REPRESENTATIVE FARMS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	435,956	234,358	146,486	87,029	56,674
	1972	476,463	248,848	153,012	90,932	59,804
	1974	504,616	257,941	157,382	93,656	62,205
	1979	579,448	281,443	168,248	100,883	69,319
	1980	595,237	286,127	170,418	102,400	70,931
	Δ	159,281	51,769	23,932	15,371	14,257
	% Δ/yr.	3.32	2.01	1.48	1.61	2.29
Cotton	1969	393,725	186,680	103,082	56,756	37,595
	1972	450,747	207,168	109,195	58,987	38,021
	1974	491,266	222,484	113,310	60,540	38,320
	1979	599,930	266,456	123,712	64,648	39,134
	1980	622,849	276,202	125,815	65,509	39,309
	Δ	229,124	89,522	22,733	8,753	1,714
	% Δ/yr.	5.29	4.36	2.01	1.40	.41
Other Field Crop	1969	271,843	115,712	74,054	41,748	47,216
	1972	305,806	130,445	78,834	43,721	47,123
	1974	327,823	140,331	82,036	45,114	47,034
	1979	380,956	165,382	90,114	48,865	46,718
	1980	391,355	170,368	91,745	49,661	46,640
	Δ	119,512	54,756	17,691	7,913	-576
	% Δ/yr.	4.00	4.30	2.17	1.72	-.11
Poultry	1969	71,453	40,226	34,100	23,783	20,372
	1972	83,058	40,477	36,969	23,608	22,127
	1974	92,758	40,303	39,279	23,804	24,381
	1979	123,936	36,293	46,450	25,476	33,923
	1980	131,395	34,801	48,120	26,023	36,517
	Δ	59,942	-5,425	14,020	2,240	16,145
	% Δ/yr.	7.63	-1.23	3.74	.86	7.20
Dairy	1969	200,262	106,169	65,395	38,990	34,654
	1972	237,429	116,738	71,216	41,993	35,408
	1974	266,277	123,995	75,628	44,431	36,123
	1979	352,400	142,881	88,550	52,094	38,700
	1980	371,986	146,783	91,463	53,897	39,355
	Δ	171,724	40,614	26,068	14,907	4,701
	% Δ/yr.	7.80	3.48	3.62	3.48	1.23
Livestock	1969	366,066	189,859	112,952	67,477	45,767
	1972	386,329	199,813	119,661	72,892	49,138
	1974	398,281	206,591	124,475	77,055	51,831
	1979	422,669	223,833	137,638	89,414	60,129
	1980	426,796	227,336	140,455	92,225	62,061
	Δ	61,120	37,477	27,503	24,748	16,294
	% Δ/yr.	1.52	1.79	2.21	3.33	3.24
Livestock Ranches	1969	582,451	233,036	142,189	85,902	58,620
	1972	630,108	241,284	150,982	91,605	61,461
	1974	663,042	247,200	157,860	96,183	63,829
	1979	749,585	263,456	178,618	110,402	71,430
	1980	767,556	266,958	183,382	113,726	73,240
	Δ	185,105	33,922	41,193	27,824	14,620
	% Δ/yr.	2.89	1.32	2.63	2.94	2.27
General	1969	391,150	197,974	120,633	72,521	51,230
	1972	43,446	212,375	128,346	78,268	52,555
	1974	465,953	222,482	133,894	82,650	53,544
	1979	553,686	249,516	149,186	95,506	56,402
	1980	572,767	255,225	152,489	98,407	57,041
	Δ	181,617	57,251	31,856	25,886	5,811
	% Δ/yr.	4.27	2.63	2.40	3.24	1.03

*The figures presented for 1969 are derived from the regression equation used to make all projections; they are not actual census data reported for 1969.

proportion of the annual price increase of land and buildings which is assigned to the change in equity is 85.94 percent, as derived in Chapter III.

Estimates of total adjusted equity capital per representative farm for selected years are presented in Table XX. These estimates indicate the total equity capital that can be accumulated by the representative full-owner farmer who adjusts his annual balance sheet value of land and buildings to include price appreciation. To the individual who desires to enter farming at any point in time in the future, the adjusted equity figures represent the amount of equity that must be put into the farm operation to have the same debt-equity ratio as the representative farmer who has been farming since 1969.

The estimates of Table XX indicate that equity is accumulated faster when price appreciation is considered compared to ignoring price appreciation. For example, the annual percentage rate of increase in total adjusted equity for class I dairy farms is 8.62 percent of the 1969 total adjusted equity. The percentage increase in unadjusted equity for these same farms amounts to 7.80 percent per year.

Comparisons between economic classes within enterprise types reveal that the annual rate of increase in adjusted equity is lower for class I livestock farms than for other classes of livestock farms. Adjusted equity of class I livestock farms increases at an annual rate of 4.88 percent of the 1969 adjusted equity capital. The annual rate of increase in adjusted equity for class I livestock farms is also low relative to other class I types of farms.

TABLE XX

ADJUSTED EQUITY CAPITAL FOR REPRESENTATIVE FARMS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	435,956	234,358	146,486	87,029	56,674
	1972	521,154	273,864	169,737	101,335	65,984
	1974	579,100	300,240	185,256	110,994	72,505
	1979	728,416	366,042	223,997	135,560	89,919
	1980	759,102	379,186	231,742	140,544	93,591
	Δ	323,146	144,828	85,256	53,515	36,917
	% Δ/yr.	6.75	5.62	5.29	5.59	5.92
Cotton	1969	393,725	186,680	103,082	56,756	37,595
	1972	495,425	229,333	122,452	65,675	42,319
	1974	565,729	259,425	135,405	71,686	45,483
	1979	748,855	340,339	167,903	86,941	53,460
	1980	786,667	357,473	174,424	90,031	55,068
	Δ	392,942	170,793	71,342	33,275	17,473
	% Δ/yr.	9.07	8.32	6.29	5.33	4.22
Other Field Crop	1969	271,843	115,712	74,054	41,748	47,216
	1972	341,870	143,225	85,158	48,050	57,010
	1974	387,930	161,631	92,576	52,329	63,513
	1979	501,169	207,983	111,195	63,294	79,676
	1980	523,589	217,328	114,934	65,533	82,893
	Δ	251,746	101,616	40,880	23,785	35,677
	% Δ/yr.	8.42	7.98	5.02	5.18	6.87
Poultry	1969	71,453	40,226	34,100	23,783	20,372
	1972	80,351	45,311	38,078	25,206	23,880
	1974	88,246	48,360	41,126	26,468	27,303
	1979	114,912	52,407	50,146	30,804	39,767
	1980	121,469	52,527	52,185	31,884	42,945
	Δ	50,016	12,301	18,085	8,101	22,573
	% Δ/yr.	6.36	2.78	4.82	3.10	1.01
Dairy	1969	200,262	106,169	65,395	38,990	34,654
	1972	242,413	120,979	75,393	44,550	39,007
	1974	274,583	131,064	82,589	48,694	42,121
	1979	369,012	157,018	102,472	60,619	50,697
	1980	390,260	162,333	106,778	63,275	52,552
	Δ	189,998	56,164	41,383	24,285	17,898
	% Δ/yr.	8.62	4.81	5.80	5.66	4.70
Livestock	1969	366,066	189,859	112,952	67,477	45,767
	1972	423,391	219,229	129,598	79,172	52,959
	1974	460,050	238,952	141,036	87,523	58,199
	1979	546,207	288,554	170,759	110,349	72,865
	1980	562,689	298,529	176,888	115,254	76,071
	Δ	196,623	108,670	63,936	47,777	30,304
	% Δ/yr.	4.88	5.20	5.14	6.44	6.02
Livestock Ranches	1969	582,451	233,036	142,189	85,902	58,620
	1972	678,807	261,038	162,635	101,044	68,744
	1974	744,208	280,124	177,283	111,914	75,968
	1979	911,917	329,303	217,463	141,865	95,708
	1980	946,121	339,390	226,111	148,336	99,946
	Δ	363,670	106,354	83,922	62,433	41,326
	% Δ/yr.	5.68	4.15	5.36	6.61	6.41
General	1969	391,150	197,974	120,633	72,521	51,230
	1972	462,506	232,023	141,552	87,222	59,838
	1974	512,691	255,230	155,903	97,574	65,683
	1979	657,163	315,011	193,205	125,353	80,680
	1980	675,591	327,269	200,909	131,239	83,747
	Δ	284,441	129,295	80,276	58,718	32,517
	% Δ/yr.	6.61	5.94	6.05	7.36	5.77

*The figures presented for 1969 are derived from the regression equation used to make all projections; they are not actual census data reported for 1969.

Non-Equity Capital

Two sets of non-equity estimates are generated to correspond with the unadjusted (Table XIX) and adjusted (Table XX) methods of projecting equity capital. The unadjusted non-equity estimates, which do not consider the price appreciation in land and buildings as part of total equity, are presented in Table XXI. This table reveals rates of change in unadjusted non-equity capital for class I and class V other field crop farms of 20.43 percent and 51.72 percent respectively. The livestock ranch offers an interesting comparison of unadjusted non-equity capital between economic classes within enterprise types. The annual rate of increase in unadjusted non-equity capital of 3.82 percent for class I livestock ranches is the lowest rate of increase for the classes within this type. In contrast, class V livestock ranches have a projected annual rate of increase in unadjusted non-equity capital of 73.32 percent.

The values presented in Table XXI probably overstate the non-equity capital requirements of representative farms. To illustrate, the data for class II cash grain farms indicate that the increase in total capital from 1969 to 1980 is almost entirely due to the increase in the value of land and buildings. In addition, total capital for a representative class II cash grain farm increases faster than unadjusted non-equity capital from 1969 to 1980. The data of Table XXI show an increase in unadjusted non-equity capital of $77,415 from $40,417 in 1969 to $117,832 in 1980 for class II cash grain farms. If the increase in the value of land and buildings is entirely due to the purchase of additional land, part of which is paid for with the annual

TABLE XXI

UNADJUSTED NON-EQUITY CAPITAL FOR REPRESENTATIVE FARMS

Enterprise Type		Economic Class				
		I	II	III	IV	V
Cash Grain	1969	59,256	40,417	24,930	18,773	6,082
	1972	81,113	61,523	40,718	28,066	12,041
	1974	94,536	75,554	51,225	34,140	14,540
	1979	123,690	110,772	77,548	48,908	19,686
	1980	128,705	117,832	82,816	51,790	20,526
	Δ	69,449	77,415	47,886	33,017	14,444
	% Δ/yr.	10.66	17.41	21.11	15.99	21.59
Cotton	1969	46,088	29,296	16,981	12,359	8,316
	1972	53,056	39,357	28,325	18,200	9,874
	1974	55,197	44,407	35,848	22,029	12,617
	1979	53,221	51,350	54,541	31,385	19,408
	1980	51,642	51,787	58,257	33,218	20,754
	Δ	5,554	22,491	41,276	20,859	12,438
	% Δ/yr.	1.10	6.98	15.34	15.34	13.60
Other Field Crop	1969	32,090	16,884	12,020	8,968	7,573
	1972	51,697	21,143	16,624	12,666	19,193
	1974	64,848	23,919	19,678	15,073	27,028
	1979	99,671	30,523	27,240	20,822	46,709
	1980	106,864	31,768	28,737	21,926	50,660
	Δ	73,955	14,884	16,717	12,958	43,087
	% Δ/yr.	20.43	8.01	12.64	13.14	51.72
Poultry	1969	8,590	7,625	5,455	5,761	7,827
	1972	-1,371	13,968	4,863	7,976	3,579
	1974	-9,975	18,546	4,093	9,140	2,899
	1979	-38,413	33,586	777	10,868	-2,704
	1980	-45,324	37,284	-122	11,001	-4,509
	Δ	-53,914	29,659	-5,577	5,240	-12,336
	% Δ/yr.	-57.06	35.36	-9.29	8.27	-14.33
Dairy	1969	21,650	16,744	10,255	8,074	5,739
	1972	-6,121	11,686	9,666	7,893	8,850
	1974	-28,705	8,103	8,762	7,337	11,045
	1979	-99,168	-1,598	4,610	4,379	15,743
	1980	-115,622	-3,663	3,451	3,517	16,545
	Δ	-137,272	-20,407	-6,774	-4,557	10,829
	% Δ/yr.	-57.64	-11.08	-6.02	-5.13	17.15
Livestock	1969	86,442	33,404	18,717	13,794	7,494
	1972	124,625	50,219	25,403	16,209	7,343
	1974	151,637	61,287	29,537	17,269	7,738
	1979	224,660	88,600	38,769	17,801	7,160
	1980	240,014	94,080	40,431	17,801	6,772
	Δ	153,572	60,676	21,714	4,007	-722
	% Δ/yr.	16.15	16.15	10.55	2.64	-.88
Livestock Ranches	1969	132,862	42,692	23,697	18,076	2,985
	1972	150,923	59,188	29,367	24,169	14,571
	1974	161,801	69,768	32,131	27,455	18,267
	1979	184,788	94,498	35,478	32,896	25,835
	1980	188,724	99,498	35,535	33,504	27,059
	Δ	55,862	56,806	11,838	15,425	24,074
	% Δ/yr.	3.82	12.10	4.54	7.76	73.32
General	1969	51,190	33,394	19,792	14,834	5,239
	1972	47,906	45,736	29,815	20,154	14,801
	1974	43,102	53,456	36,091	23,150	19,514
	1979	22,122	70,992	50,404	28,740	30,931
	1980	16,393	74,197	53,023	29,534	33,148
	Δ	-34,797	40,803	33,231	14,700	27,909
	% Δ/yr.	-6.18	11.11	1.53	9.01	48.43

*The negative signs in Table XXI indicate that representative farmers of the classes and types of farms for which negative entries appear are able to "pay off" their non-equity or debt and accumulate total farm and nonfarm equity or net worth (the opposite of non-equity) which exceeds the total capital required by, or the total value of, their farm operations.

difference between inflows and outflows and part of which is financed through a non-equity source, this estimate would accurately represent non-equity capital. However, the average number of acres for a representative class II cash grain farm actually decreased slightly from 1959 to 1969.[6] This trend is implicitly projected into the future, and consequently average acreage for a representative class II cash grain farm is not projected to increase from 1969 to 1980. Thus, a major part of the unadjusted non-equity capital must be attributed to the price appreciation in land and buildings controlled by the farmer. If the representative farmer is a full-owner then all of the appreciation in the value of land and buildings actually accrues to him as equity. Obviously, if the representative farmer rents or leases part of his land he does not receive the benefit of price appreciation on the rented portion of the real estate he controls. Even in a case such as this, however, the actual amount of non-equity capital at any point in time is overestimated by the unadjusted projections. Consequently adjusted estimates of non-equity capital are made which include the price appreciation in land and buildings. The adjusted estimates of non-equity capital are presented in Table XXII.

The negative signs in Table XXII indicate that certain representative farmers are able to "pay off" their non-equity or debt and accumulate total equity or net worth which exceeds the total capital required by their farm operations. The fact that some representative farms

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[6]Census data indicate that the average number of acres for class II cash grain farms was 1,106 acres in 1959 and 1,084 acres in 1969. U. S. Bureau of the Census, Census of Agriculture for Oklahoma, 1959, p. 44, Census of Agriculture for Oklahoma, 1969, p. 154.

TABLE XXII

ADJUSTED NON-EQUITY CAPITAL FOR REPRESENTATIVE FARMS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	59,256	40,417	24,930	18,773	7,827
	1972	36,422	35,143	23,993	17,663	5,861
	1974	20,052	33,255	23,350	16,802	4,240
	1979	-25,279	26,173	21,799	14,232	-914
	1980	-35,160	24,773	21,492	13,646	-2,134
	Δ	-94,416	-15,644	-3,438	-5,127	-9,961
	% Δ/yr.	-14.49	-3.52	-1.25	-2.48	-11.57
Cotton	1969	46,088	29,296	16,981	12,359	5,739
	1972	8,378	17,192	15,068	11,512	5,576
	1974	-19,266	7,466	13,753	10,883	5,454
	1979	-95,704	-22,533	10,351	9,092	5,082
	1980	-112,176	-29,484	9,648	8,696	4,995
	Δ	-158,264	-58,780	-7,333	-3,663	-744
	% Δ/yr.	-31.22	-18.24	-3.93	-2.69	-1.18
Other Field Crop	1969	32,909	16,884	12,020	8,968	7,494
	1972	15,633	8,363	10,300	8,337	9,306
	1974	4,741	2,619	9,138	7,858	10,549
	1979	-20,542	-12,078	6,159	6,393	13,751
	1980	-25,370	-15,093	5,548	6,054	14,407
	Δ	-58,279	-31,977	-6,472	-2,914	6,913
	% Δ/yr.	-16.09	-18.24	-4.90	-2.95	8.39
Poultry	1969	8,590	7,652	5,455	5,761	2,985
	1972	1,337	9,134	3,754	6,378	1,826
	1974	-5,463	10,489	2,246	6,476	-23
	1979	-29,389	17,472	-2,919	5,540	-8,548
	1980	-35,398	19,558	-4,187	5,140	-10,937
	Δ	-43,988	11,933	-9,642	-621	-13,922
	% Δ/yr.	-46.55	14.23	-16.07	-.98	-42.40
Dairy	1969	21,650	16,744	10,225	8,074	5,239
	1972	-11,105	7,445	5,489	5,336	5,251
	1974	-37,011	1,034	1,801	3,074	5,047
	1979	-111,780	-15,735	-9,312	-4,146	3,746
	1980	-133,896	-19,213	-11,864	-5,861	3,348
	Δ	-155,546	-35,957	-22,089	-13,935	-1,891
	% Δ/yr.	-65.31	-19.52	-19.64	-15.69	-3.28
Livestock	1969	86,442	33,404	18,717	13,794	6,082
	1972	87,563	30,803	15,466	9,929	3,522
	1974	89,868	28,926	12,976	6,802	1,370
	1979	101,121	23,939	5,648	-2,940	-5,576
	1980	104,122	22,887	3,998	-5,228	-7,238
	Δ	17,680	-10,517	-14,719	-19,022	-13,320
	% Δ/yr.	1.86	-2.86	-7.15	-12.54	-19.91
Livestock Ranches	1969	132,862	42,692	23,697	18,076	8,316
	1972	102,224	39,434	17,714	14,730	7,288
	1974	80,635	36,844	12,708	11,724	6,128
	1979	22,456	28,905	-3,367	1,433	1,557
	1980	10,158	27,066	-7,194	-1,105	353
	Δ	-122,704	-15,626	-30,891	-19,181	-7,963
	% Δ/yr.	-8.40	-3.33	-11.85	-9.65	-8.70
General	1969	51,190	33,394	19,794	14,834	7,573
	1972	19,863	26,087	16,609	11,200	7,518
	1974	-3,636	20,709	14,082	8,226	7,376
	1979	-71,355	5,497	6,385	-1,107	6,653
	1980	-86,431	2,153	4,603	-3,298	6,442
	Δ	-137,621	-31,241	-15,189	-18,132	-1,131
	% Δ/yr.	-24.44	-8.51	-6.98	-11.11	-1.36

*The negative signs in Table XXII indicate that representative farmers of the classes and types of farms for which negative entries appear are able to "pay off" their non-equity or debt and accumulate total farm and nonfarm equity or net worth, (the opposite of non-equity) which exceeds the total capital required by, or the total value of, their farm operations.

accumulate equity in excess of their projected capital needs indicates that these farms are capable of expanding, either in the farm or the nonfarm sector, at a rate significantly greater than the historical trend from 1959 to 1969. Representative class I cash grain farms are an example of this phenomena. In 1969, the adjusted non-equity capital for class I cash grain farms is estimated at $59,256. It is projected that this adjusted non-equity capital will be reduced to $20,052 by the end of 1974. By 1979 the representative class I cash grain farmer will have eliminated his adjusted non-equity capital and will have accumulated adjusted equity capital that exceeds the value of his farm assets by $25,279. It is projected that by 1980 this excess capital will have reached $35,160. This "surplus" equity can be used for farm expansion that exceeds the historical rate of growth or for investment in the nonfarm sector.

Comparisons of Table XXII data between enterprise types within economic classes reveal that class I livestock farms are the only representative class I farms that are projected to have an increase in adjusted non-equity capital from 1969 to 1980. In fact, all class I farms except livestock ranches and livestock farms completely eliminate their adjusted non-equity capital and accumulate adjusted equity capital in excess of the value of their farm operations. Comparisons between economic classes within enterprise types indicate that class IV and class V livestock farms accumulate excess adjusted equity capital from 1969 to 1980 while class II and III livestock farms just reduce their adjusted non-equity capital.

A graphical presentation of the relationships between total capital (TC_{ijt}) and its major component land and buildings (LB_{ijt}), total

adjusted equity capital (TAEC) and the resulting adjusted non-equity capital (ANEC) is provided in Figure 1 for the representative class II Oklahoma cash grain farm discussed earlier. The total capital (TC) line illustrates the current value in any given year of the farm assets controlled by the representative class II cash grain farmer. The equity capital due to land and building price appreciation line (TELB) represents the additions to a full-owner farmer's equity capital that result from the price appreciation in real estate he owns. Since this line is 85.94 percent of the land and buildings (LB) line, the distance between TELB and the total capital (TC) line will increase over time for all class-type farms. The distance between the total capital (TC) line and the equity capital due to price appreciation in land and buildings line (TELB) represents farm capital that must be provided by either net cash inflows or non-equity sources. If net cash inflows are zero, that is if the annual differences between cash inflows and cash outflows are negative or zero, then the distance between the TC line and the TELB line represents non-equity capital. However, for representative class II cash grain farms the annual differences between cash inflows and cash outflows are positive and are therefore available to furnish some of the needed farm capital. The total adjusted equity capital line (TAEC) in Figure 1 represents total equity capital from the surplus of cash inflows over cash outflows and from price appreciation in land and buildings. The distance between the TC line and the TAEC line then indicates the amount of capital that is or must be furnished by non-equity sources. Thus, Figure 1 and Table XXII suggest that adjusted non-equity capital for representative class II cash grain farms

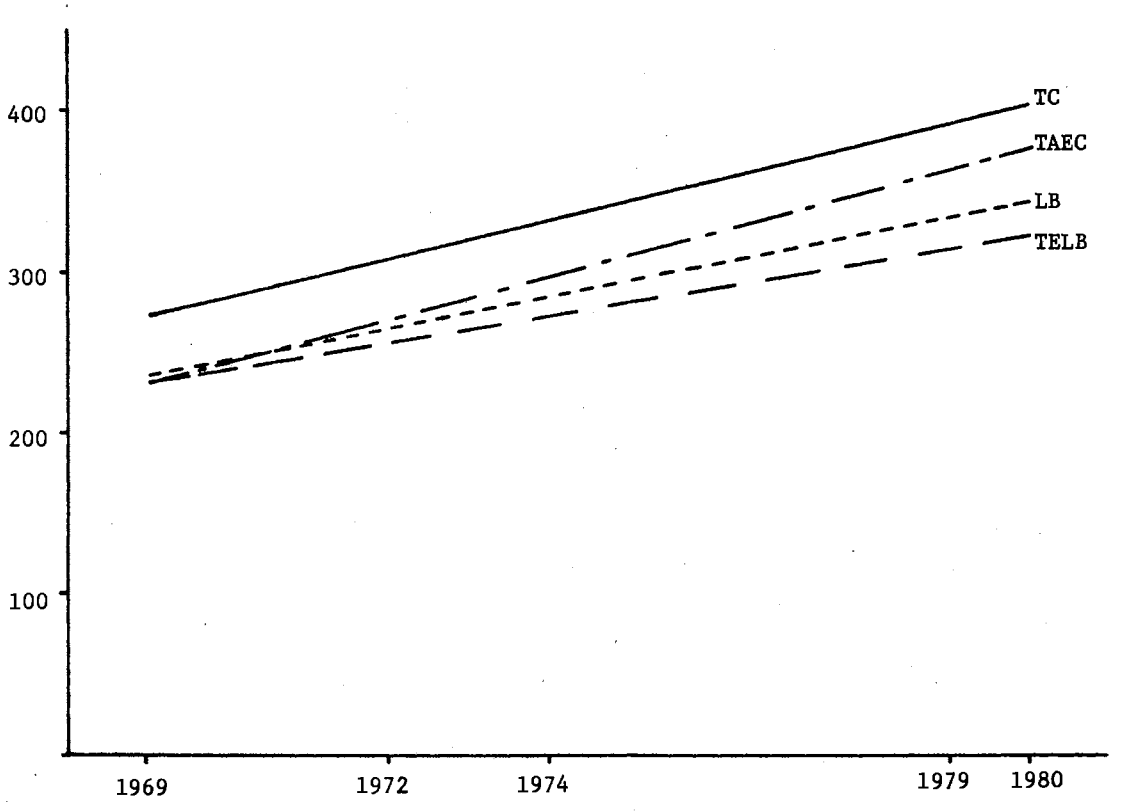

Figure 1. Relationships Between Total Capital, Value of Land and Buildings, Adjusted Equity Capital, and Adjusted Non-Equity Capital for a Class II Oklahoma Cash Grain Farm

will be $24,773 in 1980. This is a reduction in adjusted non-equity capital of $15,644 from the 1969 level of $40,417.

Comparisons of unadjusted and adjusted estimates of equity capital reveal that some types of representative farms receive most of their annual change in equity capital from cash flow while other types of representative farms receive most of their annual change in equity capital from price appreciation of owned land and buildings. Class I livestock farms and class I dairy farms are examples of this phenomena. The unadjusted change in equity capital for class I dairy farms from 1969 to 1980 is $171,724 (Table XIX). The unadjusted change in equity capital for class I livestock farms is $61,120. Thus, the class I dairy farm receives $110,604 more equity capital from cash flow during the 1969 to 1980 period than does the class I livestock farm. The data in Table XX, which include price appreciation of land and buildings, indicate that the change in adjusted equity capital from 1969 to 1980 is $196,623 for class I livestock farms. The change in adjusted equity capital for class I dairy farms is $189,998. Thus, when land price appreciation is considered, the land intensive class I livestock farm accumulates $6,625 more equity capital from 1969 to 1980 than the class I dairy farm.

Similar relationships are reflected in comparisons of unadjusted and adjusted non-equity capital. For example, the representative class I cotton farm has a projected increase in unadjusted non-equity capital of $5,554 from 1969 to 1980. The class I dairy farm is expected to eliminate its unadjusted non-equity capital and accumulate $115,622 of surplus equity capital between 1969 and 1980. This indicates a difference of $121,176 between the unadjusted non-equity capital of class I

cotton farms and the unadjusted surplus equity capital of class I dairy farms. However, when land price appreciation is considered in determining non-equity capital requirements, the class I cotton farm also eliminates its non-equity capital and accumulates an estimated $112,176 of surplus equity capital by 1980. The class I dairy farm, which is not as land intensive as the class I cotton farm, eliminates its adjusted non-equity capital and accumulates $133,896 of surplus equity capital. Thus, it is evident that there is a difference of only $21,720 of surplus equity capital between class I dairy farms and class I cotton farms when adjusted non-equity capital is compared.

Number of Oklahoma Farm Firms

The Markov chain procedure used to estimate future Oklahoma farm numbers projects a total of 55,606 farms in 1980 for the five economic classes and eight enterprise types of farms analyzed in this study. This represents an increase of 9.1 percent over the 50,977 farms in the 1969 base period. Table XXIII summarizes the changes during this period in future Oklahoma farm numbers by economic classes and enterprise types.

The largest increase in farm numbers occurs in economic class I farms. This class of farms is projected to increase by 5,419 units from 1969 to 1980. This brings the number of class I Oklahoma farms to 9,090 by 1980, an increase of 147.62 percent over the 3,671 class I farms in 1969. Class II and class III farms are also expected to increase in number from 1969 to 1980. It is estimated that economic class II farms will increase by 2,645 units from 1969 to 1980. This is an increase of 39.52 percent and brings the 1980 total of class II farms

TABLE XXIII

NUMBER OF OKLAHOMA FARMS

Enterprise Type		Economic Class I	II	III	IV	V	Enterprise Type Totals
Cash Grain	1969	333	1,344	2,667	3,054	2,613	10,011
	1972	372	1,352	2,635	2,658	2,411	
	1974	397	1,358	2,164	2,393	2,277	
	1979	458	1,360	1,756	1,876	1,983	
	1980	470	1,359	1,689	1,795	1,932	7,245
	Δ	137	15	-978	-1,259	-681	-2,766
	% Δ	41.14	1.11	-36.67	-41.22	-26.06	-27.63
Cotton	1969	27	92	194	273	496	1,082
	1972	21	68	131	178	372	
	1974	17	52	89	115	284	
	1979	11	29	41	49	169	
	1980	10	26	36	43	155	270
	Δ	-17	-66	-158	-230	-341	-812
	% Δ	-62.96	-71.73	-81.44	-84.24	-68.75	-75.05
Other Field Crop	1969	134	305	389	300	252	1,380
	1972	185	340	382	273	236	
	1974	220	363	371	255	225	
	1979	316	400	352	215	194	
	1980	337	404	346	209	188	1,484
	Δ	203	99	-43	-91	-64	104
	% Δ	151.49	32.45	-11.05	-30.33	-25.39	7.54
Poultry	1969	230	151	78	41	36	536
	1972	297	120	54	28	44	
	1974	342	100	38	19	49	
	1979	417	55	18	20	44	
	1980	425	50	17	19	43	554
	Δ	195	-101	-61	-22	7	18
	% Δ	84.78	-66.88	-78.20	-53.65	19.44	3.36
Dairy	1969	547	912	529	326	130	2,444
	1972	743	843	408	227	81	
	1974	873	796	327	162	48	
	1979	1,159	642	199	80	17	
	1980	1,205	612	183	72	15	2,087
	Δ	658	-300	-346	-254	-115	-357
	% Δ	120.29	-32.89	-65.40	-77.91	-88.46	-14.61
Livestock	1969	1,522	2,399	3,788	5,365	6,466	19,540
	1972	2,223	2,807	4,214	5,556	6,212	
	1974	2,690	3,078	4,498	5,684	6,043	
	1979	4,142	3,676	4,883	5,513	5,104	
	1980	4,481	3,766	4,896	5,401	4,934	23,478
	Δ	2,959	1,367	1,108	36	-1,532	3,938
	% Δ	190.44	56.98	29.25	.67	-23.69	20.15
Livestock Ranches	1969	628	796	1,649	3,274	4,707	11,054
	1972	819	1,090	2,125	3,782	4,769	
	1974	947	1,287	2,442	4,121	4,810	
	1979	1,469	1,932	3,196	4,467	4,165	
	1980	1,625	2,068	3,291	4,429	4,036	15,449
	Δ	997	1,272	1,642	1,155	-671	4,395
	% Δ	158.75	159.79	99.57	35.27	-14.25	39.76
General	1969	250	693	1,388	1,473	1,126	4,930
	1972	320	787	1,458	1,360	994	
	1974	366	850	1,505	1,285	907	
	1979	505	1,017	1,619	1,132	732	
	1980	537	1,052	1,639	1,107	704	5,039
	Δ	287	359	251	-366	-422	109
	% Δ	114.80	51.80	18.08	-24.84	-37.47	2.21
Economic Class Totals	1969	3,671	6,692	10,682	14,106	15,826	
	1980	9,090	9,337	12,097	13,075	12,007	
	Δ	5,419	2,645	1,415	-1,031	-3,819	
	% Δ	147.62	39.52	13.25	-7.31	-24.13	

*These are actual census data for 1969.

to 9,337. Class III farms are projected to increase by 1,415 units from 10,682 farms in 1969 to 12,097 farms in 1980. This is an increase of 13.24 percent.

The transition probabilities of the Markov chain process indicate that 4,629 farms will enter economic classes IV and V from class VI between 1969 and 1980. However, class IV and class V farms are also moving up to higher sales classes during the period. The net result is a decrease in class IV and class V farms from 1969 to 1980. Economic class IV farms are projected to decline in number from 14,106 farms in 1969 to 13,075 farms in 1980. This is a decrease of 7.31 percent. Class V farms exhibit a decline in number of 3,819 units, a decrease of 24.13 percent from 15,826 farms in 1969 to 12,007 farms in 1980.

Table XXIII also suggests that by far the largest part of the projected increase in the classes and types of farms studied occurs in the livestock ranch and livestock farm types. It is estimated that livestock ranches will increase by 4,395 units from 11,054 ranches in 1969 to 15,449 ranches in 1980. This is an increase of 39.76 percent. Livestock farms will total 23,478 in 1980, an increase of 3,938 units from the 19,540 farms in this type in 1969. This is a 20.15 percent increase. It is projected that other field crop, poultry and general farm numbers will increase slightly from 1969 to 1980.

Cash grain farms have the largest projected decrease in numbers from 1969 to 1980. The decrease in cash grain farm numbers of 2,766 units from 10,011 farms in 1969 to 7,245 farms in 1980 is a decline of 27.63 percent. Cotton farms are projected to decrease in number by 75.05 percent from 1,082 farms in 1969 to 270 farms in 1980. Dairy farms are expected to decline in number by 14.61 percent from 1969 to

1980. This is a decrease of 357 units from 2,444 farms in 1969 to 2,087 farms in 1980.

Analysis of future farm numbers for individual class-types indicates that of the class I farms, only cotton farms are projected to decline in number from 1969 to 1980. It is estimated that there will be only 10 class I farms in 1980 that derive more than 50 percent of their gross farm sales from cotton. This is a decrease of 62.96 percent from the 27 class I cotton farms in 1969. Class I livestock farms are expected to increase in number by 2,959 units from 1,522 farms in 1969 to 4,481 farms in 1980. This is an increase of 190.44 percent. It is estimated that there will be 5,401 class IV livestock farms in 1980. This represents the largest absolute number of farms projected for any class-type of farm for 1980. However, it is an increase of only 36 farms over the 5,365 farms in 1969, a change of .67 percent. Class I dairy farms are expected to increase 120.29 percent from 547 farms in 1969 to 1,205 farms in 1980. This represents an increase of 658 units.

Aggregate Projections

The projected numbers of Oklahoma farms derived from the Markov chain process and the projections of future capital and non-equity capital needs of representative Oklahoma farms are used to calculate aggregate capital and credit requirements for the state of Oklahoma.

Total Capital Projections

The aggregate capital requirements for all farms in the 40 individual class-types analyzed are presented in Table XXIV. These

TABLE XXIV

AGGREGATE TOTAL CAPITAL

Enterprise Type		Economic Class I	II	III	IV	V	Enterprise Type Totals
Cash Grain	1969	164,905,500	369,297,400	457,166,300	323,116,000	168,541,100	1,483,026,300
	1972	207,418,200	419,129,300	458,171,100	316,296,400	173,218,100	
	1974	227,078,500	452,886,000	451,423,200	305,815,500	174,748,200	
	1979	322,036,400	533,412,000	431,617,500	281,007,600	176,496,700	
	1980	340,252,600	548,979,900	427,711,900	276,770,800	176,694,800	1,770,410,000
	Δ	175,347,100	179,682,500	-29,454,400	-46,345,200	8,153,700	287,383,700
	% Δ	106.00	48	-6	14	4	19
Cotton	1969	11,874,950	19,869,790	23,292,200	18,868,380	21,493,660	95,398,980
	1972	10,579,860	16,763,690	18,015,100	13,739,270	17,816,920	
	1974	9,289,869	13,878,320	13,275,050	9,495,427	14,720,790	
	1979	7,184,660	9,216,372	7,308,370	4,705,613	9,893,597	
	1980	6,744,909	8,527,712	6,626,589	4,245,258	9,309,764	35,454,232
	Δ	-5,130,041	-11,342,078	-16,665,611	-14,623,122	-12,183,896	-59,944,748
	% Δ	-43	-57	-71	-77	-56	-62
Other Field Crop	1969	40,836,620	40,441,470	33,482,780	15,214,800	13,786,920	143,762,590
	1972	66,138,030	51,539,880	36,464,920	15,393,640	15,650,560	
	1974	86,387,600	59,622,720	38,346,140	15,347,680	16,663,930	
	1979	151,878,100	78,361,960	41,308,570	14,982,690	18,124,810	
	1980	167,899,700	81,703,310	41,686,730	14,961,660	18,292,380	324,543,780
	Δ	127,063,080	41,261,840	8,203,950	-253,140	4,505,460	180,781,190
	% Δ	311	102	24	-1	32	125
Poultry	1969	18,409,880	7,225,501	3,085,290	1,211,304	840,852	30,772,827
	1972	24,261,020	6,533,399	2,258,927	884,352	1,131,063	
	1974	28,311,770	5,884,899	1,648,135	625,936	1,367,190	
	1979	35,663,080	3,843,341	850,086	726,880	1,373,635	
	1980	36,580,160	3,604,246	815,966	703,456	1,376,343	43,080,171
	Δ	18,170,280	-3,621,255	-2,269,324	-507,848	-535,491	12,307,344
	% Δ	98	-50	-73	-41	63	39
Dairy	1969	121,385,800	112,096,600	40,002,970	15,342,860	5,186,090	294,014,320
	1972	171,861,700	108,261,300	32,999,820	11,324,120	3,584,897	
	1974	207,400,200	105,149,900	27,595,500	8,386,415	2,264,063	
	1979	293,495,800	90,703,630	18,538,810	4,517,839	925,531	
	1980	308,918,500	87,589,390	17,369,240	4,133,807	838,500	418,849,437
	Δ	187,532,700	-24,507,210	-22,633,730	-11,209,053	-4,347,590	124,835,117
	% Δ	154	-21	-56	-73	-83	42
Livestock	1969	688,717,000	535,607,800	498,761,900	436,018,600	335,255,500	2,494,360,800
	1972	1,135,850,000	701,839,600	611,299,300	495,044,600	350,859,700	
	1974	1,479,279,000	824,528,100	692,745,400	536,137,200	359,975,400	
	1979	2,681,232,000	1,148,723,000	861,394,900	592,145,400	343,442,600	
	1980	2,987,975,000	1,210,452,000	885,617,400	594,249,900	339,621,600	6,017,915,900
	Δ	2,299,258,000	674,844,200	386,855,500	158,231,300	4,366,100	3,523,555,100
	% Δ	333	125	77	36	1	141
Livestock Ranches	1969	445,639,900	219,479,400	273,545,900	340,423,900	315,067,600	1,594,156,700
	1972	639,664,100	327,514,300	383,241,400	437,857,000	362,596,000	
	1974	781,126,100	407,937,500	463,957,700	509,511,900	394,881,200	
	1979	1,372,593,000	692,057,500	684,250,300	640,111,800	405,108,200	
	1980	1,553,953,000	757,830,600	720,455,400	652,081,100	404,806,300	4,089,126,400
	Δ	1,108,313,100	538,351,200	446,909,500	311,657,200	89,738,700	2,494,969,700
	% Δ	248	245	163	91	28	156
General	1969	110,584,900	160,338,000	194,909,800	128,673,900	66,212,170	660,718,770
	1972	154,358,000	203,132,500	230,598,600	133,853,800	66,951,790	
	1974	186,314,000	234,547,200	255,827,300	135,952,900	66,263,530	
	1979	290,782,900	325,956,300	323,135,900	140,646,400	63,927,690	
	1980	316,378,800	346,551,800	336,834,000	141,630,600	63,493,000	1,204,888,200
	Δ	205,793,900	186,213,800	141,924,200	12,956,700	-2,719,170	544,169,430
	% Δ	186	116	72	10	-4	82
Economic Class Totals	1969	1,602,354,550	1,464,355,961	1,524,247,140	1,278,869,744	926,383,892	6,796,211,287
	1980	5,718,702,669	3,045,238,958	2,437,117,225	1,688,776,581	1,014,432,687	13,904,268,120
	Δ	4,116,348,119	2,898,802,997	912,870,085	409,906,837	88,048,795	7,108,056,833
	% Δ	256	197	59	32	9	104

figures indicate that class I livestock farms required an estimated $688.7 million of total capital in 1969. It is projected that through increased per farm capital requirements and increased numbers of farms, this category of farms will require $2,987.9 million of capital in 1980. This is an increase of 333 percent from 1969 to 1980. In contrast, the capital required by all class I cotton farms decreases by 43 percent from 1969 to 1980. Class I cotton farms required a total of $11.8 million of capital in 1969. This capital requirement is expected to decline, due to decreasing numbers of class I cotton farms, to $6.7 million in 1980, an absolute decrease of $5.1 million. Due to the number of farms involved, class II general farms and class II cash grain farms are expected to control more capital than the class I farms of their respective types by 1980.

Comparisons of the aggregate capital requirements of the eight enterprise types of farms reveal that livestock farms and livestock ranches are projected to control more capital than all the other types of farms combined. It is estimated that in 1969 livestock farms controlled $2,494.4 million of capital and livestock ranches controlled $1,594.2 million of capital. It is projected that by 1980 the capital requirements of livestock farms and livestock ranches will reach $6,017.9 million and $4,089.1 million, respectively. This represents an increase in capital required of 141 percent for livestock farms and 156 percent for livestock ranches. It is estimated that in 1980 livestock farms and livestock ranches will control 73 percent of the total capital required by Oklahoma farms.

Although the increase in aggregate capital requirements is greatest for livestock farms and livestock ranches, aggregate capital

requirements also increase for all other types of farms except cotton farms. The aggregate capital requirements of cotton farms decrease 62 percent from $95.4 million in 1969 to $35.5 million in 1980. The capital required by cotton farms in 1980 is only .25 percent of the total capital required by all classes and types of farms analyzed.

Comparisons of the total capital requirements of the five economic classes of farms reveal that all class I Oklahoma farms are expected to control $5,718.7 million of capital in 1980, an increase over 1969 of $4,116.3 million or 256 percent. These figures are significant for several reasons. It is projected that in 1980 class I farms will control 41 percent of the capital required by the Oklahoma farms analyzed. Also, the percentage increase in capital required by class I farms from 1969 to 1980 represents the largest increase among the five economic classes studied. But perhaps the most interesting aspect of the economic class I capital requirements is the fact that the projected increase in these requirements of $4,116.3 million is greater than the combined increases in the capital requirements of all farms in classes II through V.

Total Equity Projections

The total unadjusted equity capital accumulated by all farms in the 40 class-types analyzed and the unadjusted equity capital of the five economic classes and the eight enterprise types are presented in Table XXV. As is discussed later, the estimates of unadjusted equity capital represent a possible minimum level of future equity capital. Comparisons among the eight enterprise types of farms reveal that unadjusted equity capital is expected to increase for all types of farms

TABLE XXV

AGGREGATE UNADJUSTED EQUITY CAPITAL

Enterprise Type		Economic Class I	II	III	IV	V	Enterprise Type Totals
Cash Grain	1969	143,914,700	312,157,900	387,187,700	263,318,800	146,802,900	1,253,382,000
	1972						
	1974						
	1979						
	1980	275,848,100	382,532,600	282,916,600	180,624,800	135,006,600	1,256,928,700
	Δ	131,933,400	70,374,700	-104,271,100	-82,694,000	-11,796,300	3,546,700
	% Δ	91.6	22.5	-26.9	-31.4	-8.0	.2
Cotton	1969	10,539,940	17,022,840	19,820,090	15,350,460	18,483,080	81,216,410
	1972						
	1974						
	1979						
	1980	6,150,920	7,083,187	4,453,128	2,768,055	5,985,877	26,441,167
	Δ	-4,389,020	-9,939,653	-15,366,962	-12,582,405	-12,497,203	-54,775,243
	% Δ	-41.6	-58.3	-77.5	-81.9	-67.6	-67.4
Other Field Crop	1969	36,115,200	34,983,320	28,551,520	12,408,250	11,793,280	123,851,570
	1972						
	1974						
	1979						
	1980	129,955,600	67,929,360	31,264,410	10,207,060	8,557,875	247,914,305
	Δ	93,840,400	32,946,040	2,712,890	-2,201,190	-3,235,405	124,062,735
	% Δ	259.8	94.1	9.5	-17.7	-27.4	100.1
Poultry	1969	16,293,750	6,018,985	2,636,270	965,853	726,964	26,641,822
	1972						
	1974						
	1979						
	1980	55,422,350	1,698,619	808,656	486,345	1,554,408	59,970,378
	Δ	39,128,600	-4,320,366	-1,827,614	-479,508	827,444	33,328,556
	% Δ	240.1	-71.7	-69.3	-49.6	113.8	125.0
Dairy	1969	108,616,700	95,970,940	34,288,410	12,593,790	4,465,477	255,935,317
	1972						
	1974						
	1979						
	1980	444,690,400	88,823,640	16,537,970	3,833,040	580,681	554,465,731
	Δ	336,073,700	-7,147,300	-17,750,440	-8,760,750	-3,884,796	298,530,414
	% Δ	309.4	-7.4	-51.7	-69.5	-86.9	116.6
Livestock	1969	551,895,200	451,384,300	424,056,300	358,687,700	293,370,600	2,079,394,100
	1972						
	1974						
	1979						
	1980	1,878,111,000	842,225,600	677,480,400	491,274,200	302,304,500	4,191,395,700
	Δ	1,326,215,800	390,841,300	253,424,100	132,586,500	8,933,900	2,112,001,600
	% Δ	240.3	86.5	59.7	36.9	3.0	101.5
Livestock Ranches	1969	359,465,200	183,821,300	232,382,100	278,643,900	273,518,500	1,327,831,000
	1972						
	1974						
	1979						
	1980	1,229,406,000	543,353,800	595,224,800	496,191,900	290,941,400	3,155,117,900
	Δ	869,940,800	359,532,500	362,842,700	217,548,000	17,422,900	1,827,286,900
	% Δ	242.0	195.5	156.1	78.0	6.3	137.6
General	1969	96,943,520	135,972,500	165,950,600	105,841,600	57,179,390	561,887,610
	1972						
	1974						
	1979						
	1980	303,937,200	264,510,600	246,055,700	107,307,800	39,426,990	961,238,290
	Δ	206,993,680	128,538,100	80,105,100	1,466,200	-17,752,400	399,350,680
	% Δ	213.5	94.5	48.2	1.3	-31.0	71
Economic Class Totals	1969	1,323,784,210	1,237,332,085	1,294,872,990	1,047,810,353	806,340,191	5,710,139,829
	1980	4,323,521,570	2,198,157,406	1,854,741,664	1,292,693,200	784,358,331	10,453,472,171
	Δ	2,999,737,360	960,825,321	559,868,674	244,882,847	-21,981,860	4,743,332,342
	% Δ	226.6	77.6	43.2	23.3	-2.7	83

except cotton farms. The increases from 1969 to 1980 in unadjusted equity capital for the various enterprise types range from .2 percent for cash grain farms to 137.6 percent for livestock ranches. Table XXV also indicates that changes in unadjusted equity capital for the five economic classes range from an increase of 226.6 percent for all class I farms to a decrease of 2.7 percent for all class V farms. Unadjusted equity for class I Oklahoma farms increases to $4,323.5 million in 1980 which amounts to 41 percent of the unadjusted equity capital for all classes of farms in that year. Unadjusted equity capital for class V farms decreases from 1969 to 1980 and amounts to only 8 percent of the unadjusted equity capital for all classes of farms in that year. The increase in unadjusted equity capital for class I farms of $2,999.7 million represents more than half of the projected increase in unadjusted equity capital for all classes of farms.

Estimates of total adjusted equity capital are presented in Table XXVI. It will be recalled from earlier discussions that adjusted equity capital includes the price appreciation in land and buildings as part of farmer's equity. Thus, the adjusted equity capital estimates represent a possible maximum amount of future equity capital. Comparisons among the eight enterprise types reveal that adjusted equity capital for all livestock ranches is expected to increase by 200.9 percent from 1969 to 1980. The adjusted equity capital of livestock ranches is expected to be 30 percent of the adjusted equity capital of all Oklahoma farms in 1980. The $5,440.3 million of adjusted equity capital of all livestock farms in 1980 is expected to be 41 percent of the adjusted equity capital of all types of farms. Adjusted equity for cotton farms is expected to decrease from 1969 to 1980 and is projected to be only

TABLE XXVI

AGGREGATE ADJUSTED EQUITY CAPITAL

Enterprise Type		Economic Class I	II	III	IV	V	Enterprise Type Totals
Cash Grain	1969	143,914,700	312,157,900	387,187,700	263,318,800	146,802,900	1,253,382,000
	1972						
	1974						
	1979						
	1980	352,864,500	508,999,600	386,493,100	249,094,100	178,785,300	1,676,236,600
	Δ	208,949,800	196,841,700	-694,600	-14,224,700	31,982,400	422,854,600
	% Δ	145.1	63.0	.1	-5.4	21.7	33.7
Cotton	1969	10,539,940	17,022,840	19,820,090	15,350,460	18,483,080	81,216,410
	1972						
	1974						
	1979						
	1980	7,789,095	9,196,226	6,203,061	3,822,504	8,428,490	35,439,376
	Δ	-2,750,845	-7,826,614	-13,617,029	-11,527,956	-10,054,590	-45,777,034
	% Δ	-26	-45.9	-68.7	-75.0	-54.3	-56.3
Other Field Crop	1969	36,115,200	34,983,320	28,551,520	12,408,250	11,793,280	123,851,570
	1972						
	1974						
	1979						
	1980	174,518,400	86,860,940	39,287,870	13,524,360	15,373,570	329,565,140
	Δ	138,403,200	51,877,620	10,736,350	1,116,110	3,580,290	205,713,570
	% Δ	383.2	148.2	37.6	8.9	30.3	166.0
Poultry	1969	16,293,750	6,018,985	2,636,270	965,853	726,964	26,641,822
	1972						
	1974						
	1979						
	1980	51,203,740	2,584,874	877,760	597,706	1,830,825	57,094,905
	Δ	34,909,990	-3,434,111	-1,758,510	-368,147	1,103,861	30,453,083
	% Δ	214.2	-57.0	-66.7	-38.1	151.8	114.3
Dairy	1969	108,616,700	95,970,940	34,288,410	12,593,790	4,465,477	255,935,317
	1972						
	1974						
	1979						
	1980	466,709,700	98,340,730	19,340,510	4,508,239	778,634	589,677,813
	Δ	358,093,000	2,369,790	-14,947,900	-8,085,551	-3,686,843	333,742,496
	% Δ	329.6	2.4	-43.5	-64.2	-82.5	130.4
Livestock	1969	551,895,200	451,384,300	424,056,300	358,687,700	293,370,600	2,079,394,100
	1972						
	1974						
	1979						
	1980	2,487,044,000	1,110,340,000	855,858,400	615,650,800	371,429,300	5,440,322,500
	Δ	1,935,148,800	658,955,700	431,802,100	256,963,100	78,058,700	3,360,928,400
	% Δ	350.6	145.9	101.8	71.6	26.6	161.6
Livestock Ranches	1969	359,465,200	183,821,300	232,382,100	278,643,900	273,518,500	1,327,831,000
	1972						
	1974						
	1979						
	1980	1,519,574,000	693,142,700	735,846,600	649,474,500	398,726,100	3,996,763,900
	Δ	1,160,108,800	509,321,400	503,464,500	370,830,600	125,207,600	2,668,932,900
	% Δ	322.7	277.0	216.6	133.0	45.7	200.9
General	1969	96,943,520	135,972,500	165,950,600	105,841,600	57,179,390	561,887,610
	1972						
	1974						
	1979						
	1980	359,153,900	340,300,700	325,415,900	143,652,400	58,227,880	1,226,750,780
	Δ	262,210,380	204,328,200	159,465,300	37,810,800	1,048,490	664,863,170
	% Δ	270.4	150.2	96.0	35.7	1.8	1.183
Economic Class Totals	1969	1,323,784,210	1,237,332,085	1,294,872,990	1,047,810,353	806,340,191	5,710,139,829
	1980	5,418,857,335	2,849,765,770	2,369,323,201	1,680,324,609	830,992,739	13,149,263,654
	Δ	4,095,073,125	1,612,433,685	1,074,450,211	632,514,256	24,652,548	7,439,123,825
	% Δ	309.3	130.3	82.9	60.3	3.0	130.0

.62 percent of the adjusted equity capital of all types of farms.

Comparisons of the five economic classes indicate that adjusted equity capital is expected to increase for all classes from 1969 to 1980. Class I farms have the largest projected percentage increase (309.3 percent) and class farms have the lowest projected percentage increase (3 percent). Adjusted equity capital for class II farms is expected to increase by 130.3 percent from 1969 to 1980.

Total Non-Equity Projections

Estimates of aggregate unadjusted non-equity capital for Oklahoma farms are presented in Table XXVII. These estimates suggest a possible maximum amount of future non-equity capital needs. Comparisons among different enterprise types of farms reveal that some types are projected to have increasing unadjusted non-equity capital needs from 1969 to 1980 and other types are expected to experience decreasing unadjusted non-equity capital needs. It is projected that livestock farms will increase their unadjusted non-equity capital by 343 percent from 1969 to 1980. In 1980 livestock farms will require 51 percent of the unadjusted non-equity capital of all Oklahoma farms. In contrast, the unadjusted non-equity capital required by dairy farms is projected to decrease by 94 percent from 1969 to 1980. The unadjusted non-equity capital of dairy farms will be .03 percent of the unadjusted non-equity capital of all farms in 1980. The aggregate unadjusted non-equity capital needs of all five economic classes of farms increase from 1969 to 1980. The rates of increase range from a high of 458 percent for class I farms to a low of 70 percent for class IV farms. Class I farms will require 43 percent of the unadjusted non-equity capital of

TABLE XXVII

AGGREGATE UNADJUSTED NON-EQUITY CAPITAL

Enterprise Type		Economic Class I	II	III	IV	V	Enterprise Type Totals
Cash Grain	1969	19,732,190	54,320,600	66,488,970	57,331,200	20,451,800	218,324,760
	1972						
	1974						
	1979						
	1980	60,491,310	160,133,900	139,876,300	92,963,150	39,656,220	493,120,880
	Δ	40,759,120	105,813,300	73,387,330	35,631,950	19,204,420	274,796,120
	% Δ	206.0	194.0	110	62	93	125
Cotton	1969	1,244,372	2,695,266	3,294,338	3,373,923	2,846,518	13,454,417
	1972						
	1974						
	1979						
	1980	516,420	1,346,453	2,097,254	1,428,382	3,216,820	8,605,329
	Δ	-727,952	-1,348,813	-1,197,084	-1,945,541	370,302	-4,849,088
	% Δ	-58	-50	-36	-57	13	-36
Other Field Crop	1969	4,409,739	5,149,467	9,675,682	2,690,425	1,888,406	18,813,719
	1972						
	1974						
	1979						
	1980	36,013,200	12,834,340	9,942,915	4,582,552	9,524,154	72,897,161
	Δ	31,603,461	7,684,873	5,267,233	1,892,127	7,635,748	54,083,442
	% Δ	716	149	112	70	404	287
Poultry	1969	1,975,628	1,151,368	425,471	236,206	107,470	3,896,143
	1972						
	1974						
	1979						
	1980	-19,262,880	1,846,179	-2,074	209,021	-193,894	2,073,200
	Δ	-21,238,508	712,811	-427,545	-27,185	-301,364	-1,822,943
	% Δ	-1,075	61	-100.48	-11	-280	-46
Dairy	1969	11,842,680	15,270,120	5,409,221	2,631,967	681,030	20,564,898
	1972						
	1974						
	1979						
	1980	-139,324,800	-2,241,526	631,533	253,227	248,176	1,132,936
	Δ	-151,167,400	-17,511,646	-4,777,688	-2,378,740	-432,854	-19,431,962
	% Δ	-1,276	-115	-88	-90	-63	-94
Livestock	1969	131,565,100	80,135,440	70,898,800	74,003,120	39,325,520	395,927,980
	1972						
	1974						
	1979						
	1980	1,075,500,000	354,305,700	197,952,000	96,141,840	33,411,370	1,757,310,910
	Δ	943,934,900	274,170,260	127,053,200	22,138,720	-5,914,150	1,361,382,930
	% Δ	717	342	179	29	-15	343
Livestock Ranches	1969	82,773,290	33,982,970	39,076,030	59,181,230	39,143,840	254,157,360
	1972						
	1974						
	1979						
	1980	306,675,400	205,761,600	116,945,000	148,390,000	109,209,300	886,981,300
	Δ	223,902,110	171,778,630	77,868,970	89,208,770	70,065,460	632,823,940
	% Δ	270	505	199	150	178	248
General	1969	12,797,450	23,141,720	27,471,630	21,850,190	8,527,404	93,788,394
	1972						
	1974						
	1979						
	1980	8,803,108	78,055,630	86,904,680	32,693,980	23,335,840	229,793,238
	Δ	-3,994,342	54,913,910	59,433,050	10,843,790	14,808,436	136,004,844
	% Δ	-31	237	216	49	173	145
Economic Class Totals	1969	266,340,449	215,846,951	217,740,142	221,298,261	112,971,988	1,034,197,791
	1980	1,487,999,438	814,301,802	554,349,682	376,662,152	218,601,880	3,451,914,954
	Δ	1,221,658,989	598,454,851	336,609,540	155,363,891	105,629,892	2,417,717,163
	% Δ	458	277	154	70	93	233

all farms in 1980 whereas class IV farms will require only 10.9 percent of the unadjusted non-equity capital of all farms.

Estimates of adjusted non-equity capital for Oklahoma farms are presented in Table XXVIII. These figures represent possible minimum future non-equity capital requirements. Analysis of Table XXVIII indicates that many class-types of farms completely eliminate the need for adjusted non-equity capital between 1969 and 1980. This is evidenced by the negative adjusted non-equity capital entries. These negative entries indicate that the class-type farms have accumulated equity capital that exceeds the aggregate value of their farm operations and are thus able to either expand their farm operations faster than the historical rate or invest in the non-farm sector of the economy. For example, class I dairy farms are expected to have eliminated their 1969 adjusted non-equity capital of $11.8 million and accumulated $161.3 million in surplus equity by 1980. In contrast, the adjusted non-equity capital requirements of class I livestock farms are projected to increase by 254 percent or $335 million from 1969 to 1980. In 1980 class I livestock farms will require 61 percent of the adjusted non-equity capital required by all Oklahoma farms.

Livestock farms are the only enterprise type of farms that have a projected increase in adjusted non-equity capital from 1969 to 1980. Adjusted non-equity capital for livestock farms is expected to increase $176.4 million or 44 percent from 1969 to 1980. In 1980 livestock farms will account for 75 percent of the adjusted non-equity capital of all Oklahoma farms. Comparisons among the five economic classes reveal that only class I farms are expected to experience increases in adjusted non-equity capital between 1969 and 1980. The projected increase of $216.7

TABLE XXVIII

AGGREGATE ADJUSTED NON-EQUITY CAPITAL

Enterprise Type		Economic Class I	II	III	IV	V	Enterprise Type Totals
Cash Grain	1969	19,732,190	54,320,600	66,488,970	57,331,200	20,451,800	218,324,760
	1972						
	1974						
	1979						
	1980	-16,525,220	33,666,670	36,299,870	24,493,880	-4,122,525	94,460,420
	Δ	-36,257,410	-20,653,930	-30,189,100	-32,837,320	-24,574,325	-123,864,340
	% Δ	-184	-38	-45	-57	-120	-56
Cotton	1969	1,244,372	2,695,266	3,294,338	3,373,923	2,846,518	13,454,417
	1972						
	1974						
	1979						
	1980	-1,121,755	-766,586	347,321	373,933	774,207	1,495,461
	Δ	-2,366,127	-3,461,852	-2,947,017	-2,999,990	-2,072,311	-11,958,956
	% Δ	-190	-128	-89	-88	-72	-88
Other Field Crop	1969	4,409,739	5,149,467	4,675,682	2,690,425	1,888,406	18,813,719
	1972						
	1974						
	1979						
	1980	-8,549,605	-6,097,243	1,919,456	1,265,256	2,708,457	5,893,169
	Δ	-12,959,344	-12,246,710	-2,756,226	-1,425,169	820,051	-12,920,550
	% Δ	-294	-218	-58	-52	43	-68
Poultry	1969	1,975,628	1,151,368	425,471	236,206	107,470	3,896,143
	1972						
	1974						
	1979						
	1980	-15,044,280	977,925	-71,178	97,660	-470,311	1,075,585
	Δ	-17,019,908	-173,443	-496,649	-138,546	-577,781	-2,820,558
	% Δ	-861.49	-15	-117	-58	-538	-72
Dairy	1969	11,842,680	15,270,120	5,409,221	2,631,967	681,030	35,835,018
	1972						
	1974						
	1979						
	1980	-161,344,000	-11,758,620	-2,171,020	-421,972	50,223	50,223
	Δ	-173,186,600	-27,028,740	-7,580,241	-3,053,939	-630,807	-35,784,795
	% Δ	-1,462.40	-177	-140.14	116.03	-92	-99
Livestock	1969	131,565,100	80,135,440	70,898,800	74,003,120	39,325,520	395,927,980
	1972						
	1974						
	1979						
	1980	466,568,100	86,191,480	19,574,200	-28,234,730	-35,713,520	572,333,780
	Δ	335,003,000	6,056,040	-51,324,600	-87,415,960	-75,039,040	176,405,800
	% Δ	254	7	-72	-390.60	-190.82	44
Livestock Ranches	1969	82,773,290	33,982,970	39,076,030	59,181,230	39,143,840	254,157,360
	1972						
	1974						
	1979						
	1980	16,307,460	55,972,600	-23,676,680	-4,892,660	1,424,708	73,904,768
	Δ	-66,265,830	21,989,630	-62,752,710	-64,073,890	-37,719,132	-180,252,592
	% Δ	-80	64	-160.59	-108.27	-96	-70
General	1969	12,797,450	23,141,720	27,471,630	21,850,190	8,527,404	93,788,394
	1972						
	1974						
	1979						
	1980	-46,413,680	2,265,153	7,544,009	-3,650,609	4,534,948	14,344,110
	Δ	-59,211,131	-20,876,567	-19,927,621	-25,500,799	-3,992,456	-79,444,284
	% Δ	-462.68	-90	-72	-116.71	-46	-84
Economic Class Totals	1969	266,340,449	215,826,951	217,740,142	221,298,261	112,971,988	1,034,177,791
	1980	483,075,560	179,073,828	65,684,856	26,230,729	9,492,543	763,557,516
	Δ	216,735,111	-36,753,123	-152,055,286	-195,067,532	-103,479,445	-270,620,275
	% Δ	81	-17	-69	-88	-91	-26

million in class I adjusted non-equity capital is entirely attributable to the increase in adjusted non-equity capital of class I livestock farms. Economic class II farms are expected to decrease the adjusted non-equity capital they require by 17 percent from 1969 to 1980. Economic class V farms are expected to experience the largest percentage decrease in adjusted non-equity capital during this period. Adjusted non-equity capital for class V farms is projected to decrease 91 percent from 1969 to 1980.

Projections for the State of Oklahoma

It is estimated that the total value of land and buildings, machinery and equipment and livestock on all of the Oklahoma farms analyzed in this study was $6,796.2 million in 1969. It is projected that the value of these assets on the same classes and types of Oklahoma farms will be $13,904.3 million in 1980. This is a projected increase of $7,108.1 million or a 104 percent increase in the total capital required by Oklahoma commercial farm firms from 1969 to 1980. Using unadjusted equity capital and non-equity capital estimates, it is projected that the total capital required by these Oklahoma farms in 1980 will be composed of $10,453.4 million of farmer's equity and $3,451.9 million of non-equity capital. These figures represent an 83 percent increase in farmer's unadjusted equity capital from 1969 to 1980 and a 233 percent increase in unadjusted non-equity capital. The adjusted estimates of equity capital suggest that Oklahoma farmer's farm and nonfarm equity will total $13,149.3 million in 1980. It is projected that adjusted non-equity capital will total $763.5 million in 1980. These figures represent a 130 percent increase in farmer's adjusted equity capital and

a 26 percent decrease in adjusted non-equity capital.

The projections of aggregate unadjusted non-equity capital represent what might be considered a maximum estimate of future non-equity capital requirements. The unadjusted non-equity capital projections may be approached if farmers have to finance a large portion of the projected increase in the value of land and buildings from non-equity sources. This type of situation may develop if a large amount of farm land is transferred by sale in the future. This type of situation may also arise if active farmers rent a large proportion of the total farm land in the future and thus are unable to receive the benefits of land price appreciation. The projections of aggregate adjusted non-equity capital suggest a possible minimum amount of future non-equity capital requirements. The adjusted non-equity capital projections may materialize if most of the projected increase in the value of land and buildings accrues to future active farmers who are already land owners. If there is little transfer of farm land by sale in the future or if there is a minimum of land rental by farmers, the adjusted non-equity capital projections may be the more realistic.

CHAPTER V

ALTERNATIVE PROJECTIONS

The projections of the capital and credit needs of Oklahoma farms that are presented in Chapter IV are highly dependent upon the continuation of past trends into the future. In this chapter, alternative estimates of future capital and credit needs are made, assuming non-historical rates of change in government farm program payments, supplementary income and the value of land and buildings.

Alternative Levels of Government Program Payments

No Change in Government Payments After 1969

Representative Farm Projections

When government farm program payments are not allowed to increase at the historical rate, the levels of cash inflows and the equity and non-equity capital needs for the representative farms are affected. The projections of future cash inflows, unadjusted and adjusted equity capital and unadjusted and adjusted non-equity with 1969 level government payments are presented in Appendix D. A discussion of these alternative projections is presented below.

When government farm program payments are held constant at the 1969 payment level, cash inflows (Table XLVI, Appendix D) for representative class I livestock farms are projected to increase by $74,063, or at an

annual rate of increase of 4.13 percent.[1] This absolute and percentage change in cash inflows is about six percent less than the changes in the base projections. Other classes of livestock farms exhibit similar relationships between the base and alternative projections. In contrast to the livestock types of farms, cotton, cash grain, and general farms have a greater variation between these two projections of cash inflows. For example, cash inflows for representative class I cash grain farms are 41 percent less for the alternative compared to the base projection. In general, the cash inflows of the larger sales class farms and, in particular, the cash grain, cotton and general farms are more dependent on government farm program payments than are the cash inflows of the lower sales class farms and the livestock types of farms.

The projections of unadjusted equity capital when government program payments are held constant at the 1969 payment level are presented in Table XLVII of Appendix D. By comparing the data from the base (Table XIX) and alternative (Table XLVII) projections, it is evident that holding government farm program payments constant at 1969 levels has a greater effect on the accumulation of unadjusted equity capital for representative class I general farms compared to representative class I dairy farms. In general, all classes of cash grain, cotton and general class-types of farms are more dependent on government farm program payments as an aid to unadjusted equity capital

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[1] Annual rates of increase for the alternative projections can be obtained by dividing the % Δ figure presented in the appendix tables by 11.

accumulation than are all classes of the livestock farms. Consequently the unadjusted equity for these crop farms expands much slower when the growth in government program payments is restricted.

Estimates of adjusted equity capital under the alternative projections which hold government program payments constant at 1969 levels appear in Table XLVIII of Appendix D. As with unadjusted equity capital, the accumulation of adjusted equity capital is more dependent upon government farm program payments for all classes of the cash grain, general and cotton class-types of farms than for all classes of the livestock types of farms.

The no change in government program payments projections of unadjusted and adjusted non-equity capital appear in Tablex XLIX and L of Appendix D respectively. The comparisons of the base (Table XXII) and alternative projections indicate that government program payments are relatively more important as a determinant of unadjusted and adjusted non-equity capital for livestock farms than for livestock ranches. The relatively nominal difference between the class I livestock ranch absolute and percentage changes in adjusted non-equity capital for the base and alternative projections is in part due to the large land base of livestock ranches which is a major contributor to the magnitude of change for both projections.

Aggregate Projections

The alternative projections, assuming no change in government payments after 1969, of aggregate unadjusted equity capital are presented in Table LI of Appendix D. These projections indicate that all class I farms will increase their unadjusted equity capital by $2,893.9

million from $1,323.8 million in 1969 to $4,217.7 million in 1980. This is a 218.6 percent increase during the eleven year period. This increase is only 3 percent less than the $2,999.7 million increase indicated by the base projections of Table XXV.

The state aggregate estimates of unadjusted equity capital, assuming no change in government payments after 1969, suggest an increase from $5,710.1 million in 1969 to $10,223.6 in 1980. This is a projected absolute increase of $4,513.5 million or a change over the period of 79 percent. These changes are 5 percent less than the changes indicated by the base projections (Table XXV). Comparisons between these projections thus suggest that even though some class-type aggregates have significant changes in unadjusted equity capital when government program payments are held constant at the 1969 level, the effect on the state aggregate is rather minimal.

The state aggregate adjusted equity capital under the alternative assumption of no change in government program payments after 1969 is expected to increase 129.8 percent from 1969 to 1980. This increase is 3.3 percent less than the $7,641.7 million increase indicated for the state by the base projections (Table XXVI). Thus, like the alternative estimates of unadjusted equity capital, even though significant differences exist between the alternative and base projections for some class-types, the state aggregates are almost identical irrespective of the historical rate of increase in government program payments. For this reason this data is not presented in tabular form.

Alternative projections, assuming no change in government program payments after 1969, of aggregate unadjusted non-equity capital are presented in Table LII of Appendix D. The increase in unadjusted

non-equity capital, from 1969 to 1980 for the state, as indicated by the base projections of Table XXVII, is 233 percent ($2,417.7 million). This base estimate is 8.7 percent less than the increase of 255.4 percent ($2,641.1 million) indicated by the alternative projections. These comparisons thus indicate that elimination of increases in government program payments significantly increases the aggregate unadjusted non-equity capital requirements for Oklahoma farm firms.

Alternative projections of aggregate adjusted non-equity capital are presented in Table LIII of Appendix D. These alternative projections indicate that the state aggregate adjusted non-equity capital requirements for all farms will decrease 9.91 percent ($102.5 million) from $1,034.2 million in 1969 to $931.7 million in 1980. This decrease is 62 percent less than the 26 percent decline in the state requirements for adjusted non-equity capital indicated by the base projections (Table XXVIII). These comparisons indicate that without historical rates of increase in government program payments, adjusted non-equity capital requirements will not decrease nearly as rapidly as indicated by the base projections.

In summary, the elimination of historical increases in government farm program payments after 1969 has little effect on the state aggregate accumulation of equity capital. However, due to the relatively smaller absolute level of non-equity capital, holding government program payments constant at 1969 levels does significantly alter the state aggregate non-equity capital requirements.

This same general conclusion can be drawn from alternative projections that limit increases in government farm program payments after 1969 to half the historical rate of increase. These projections

indicate that the class-types of farms that eliminate their need for non-equity capital and accumulate surplus equity are not able to accumulate as much surplus equity when the rate of increase in government program payments is restricted. The higher sales classes of farms in general, and all cotton farms in particular, are more dependent on government farm program payments than are the lower sales classes and the non-cotton farms. In general limiting the rate of increase in government program payments to half the historical rate results in the need for substantially more adjusted non-equity capital in 1980 for all farms in the state of Oklahoma.

Alternative Rates of Change in Supplementary Income

Supplementary Income Increasing at One and One-Half the Historical Rate of Growth

Representative Farm Projections

Alternative projections of cash inflows when supplementary income is allowed to increase at 150 percent of the historical rate of growth appear in Table LIV of Appendix D. Comparisons between the alternative projections and the base projections (Table XII) suggest that an increase in supplementary income at greater than the historical rate of growth will increase the cash inflows of both high and low sales class farms. However, the increases are considerably greater for the lower sales class farms.

Alternative projections of unadjusted equity capital, assuming 150 percent of the historical rate of increase in supplementary income, are

presented in Table LV of Appendix D. When compared to the base projections (Table XIX) these data suggest that the lower sales class farms will be able to increase their unadjusted equity capital at a relatively faster rate than the historical rate. There is little variation in the differences between the base and alternative projections when comparisons are made between enterprise types within economic classes. The alternative estimates of adjusted equity capital lead to the same conclusions when compared to the base projections (Table XIX) and are, therefore, not presented in tabular form.

Alternative projections of unadjusted non-equity capital appear in Table LVI of Appendix D. These data, when compared to the base projections (Table XXI), indicate that future increases in supplementary income which exceed historical rates of growth will be of more benefit to lower classes than to higher sales class farms in decreasing the unadjusted non-equity capital requirements. When the alternative projections of adjusted non-equity capital (Table LVII of Appendix D) are contrasted with the base projections (Table XXII) similar conclusions are reached. Thus, the lower sales class farms will be able to reduce their non-equity capital requirements and increase their surplus equity capital by a greater amount than the higher sales class farms if supplementary income increases at more than its historical rate of growth.

Aggregate Projections

Alternative aggregate projections of unadjusted equity capital with 1.5 times the historical rate of increase in supplementary income are presented in Table LVIII of Appendix D. Comparisons of the base projections (Table XXV) with these data indicate that 1.5 times the

historical rate of increase in supplementary income increases the rate of accumulation of aggregate unadjusted equity capital for the lower sales classes but has little effect on the unadjusted equity capital accumulation of the higher sales classes. Comparisons between enterprise types indicate only slight differences in the aggregate unadjusted equity accumulation under the alternative assumption. Alternative projections of aggregate adjusted equity capital, assuming 1.5 times the historical rate of increase in supplementary income suggest similar conclusions when compared to the base projections (Table XXVI).

Aggregate projections of unadjusted and adjusted non-equity capital are presented in Table LIX and Table LX, respectively. Base projections (Table XXVII) compared to these data indicate that all classes and types of farms have reduced aggregate unadjusted non-equity capital requirements when supplementary income is allowed to increase at 1.5 times the historical rate of increase. However, the lower sales classes have greater reductions than the higher sales classes and some class-types, such as class I other field crop farms, have only slight reductions in aggregate unadjusted non-equity requirements from the base projections. In addition, adjusted non-equity capital is reduced by a greater amount or more surplus equity capital is accumulated for the alternative compared to the base projection for all classes and types of farms.

Additional projections were made with supplementary income held constant at 1969 levels and with supplementary income increasing at half the historical rate of growth. Comparisons of the no change projections with the base estimates indicate that without the historical rates of increase in supplementary income, the lower sales class farms

will require substantially more non-equity capital in the future. On the other hand, the non-equity capital requirements of the higher sales class farms are not affected to a great extent by a zero rate of growth in supplementary income.

At the aggregate level, limiting supplementary income to a zero rate of growth has little affect on the accumulation of aggregate adjusted equity capital by the higher sales classes and by some enterprise types, particularly cotton farms. Limited supplementary income proves to have more effect on the lower sales classes and the livestock types of farms. However, no change in supplementary income does have a major effect on aggregate adjusted non-equity capital. Non-equity needs are significantly increased for the lower sales classes and the livestock farms under the alternative assumptions. The projections assuming half the historical rate of growth in supplementary income provide the same general conclusions as have been drawn from the no change and the 150 percent projections.

Alternative Rates of Price Appreciation for Land and Buildings

Twice the Historical Census Rate of Price Appreciation for Land and Buildings

Representative Farm Estimates

Alternative projections of total capital which assume price appreciation of land and buildings at twice the historical rate

are presented in Table LXI of Appendix D.[2] These projections indicate that total capital required by representative class I other field crop farms is estimated to increase at an annual rate of 9.7 percent from 1969 to 1980. The base projection changes in total capital (Table VIII) for this class-type farm are 40 percent less than these alternative changes. The alternative projections also indicate that representative class I livestock farms will have an estimated increase in capital requirements of $350,195 from 1969 to 1980. This is an annual rate of growth of 7 percent. The base projection changes (Table VIII) are 38 percent lower than the alternative projections for these farms. Representative class IV cash grain farms will have an annual rate of increase of 7.44 percent in total capital from 1969 to 1980. The base projection increase (Table VIII) of 4.15 percent is substantially less for this representative farm. These comparisons suggest that when land price appreciation increases at twice the historical census rate, the total capital requirements of representative Oklahoma farms increase significantly. There is little difference in the relative magnitude of the increase for the different class-type farms.

Alternative projections of unadjusted equity capital are not presented because these estimates are identical to the base projections of unadjusted equity capital (Table XIX). This identity occurs because

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[2]The historical census rate of price appreciation in land and buildings in Oklahoma is approximately 2.7 percent per year. The annual percentage changes in Oklahoma farm real estate values from 1959 to 1969 as reported in Farm Real Estate Market Developments and the Balance Sheet of the Farming Sector are at least double the census rates. Therefore, alternative projections are made with twice the historical census rate of price appreciation for land and buildings.

the increased price appreciation of land and buildings does not affect unadjusted equity capital accumulation.

Estimates of adjusted equity capital when land is allowed to appreciate at twice the historical rate are presented in Table LXII of Appendix D. These projections indicate that representative class I other field crop farms will have an increase in adjusted equity capital from $271,843 in 1969 to $637,231 in 1980. This is an absolute increase of $337,231 or an annual rate of growth of 12.2 percent. The base projection changes in adjusted equity capital (Table XX) for this class-type of farm are 31 percent less than the alternative projections. Other comparisons with the base projections (Table XX) indicate that considerably more adjusted equity capital is accumulated by the representative farms when land appreciates at twice the historical rate.

Alternative projections of unadjusted non-equity capital are presented in Table LXIII of Appendix D. The alternative projections for representative class IV cash grain farms indicate a 34.4 percent annual increase in unadjusted non-equity capital requirements from 1969 to 1980. The base projection (Table XXI) changes are 53.3 percent less than the alternative changes. These and other comparisons of the base and alternative estimates suggest significantly larger future increases in unadjusted non-equity capital requirements if land price appreciation occurs at twice the historical census rate.

Alternative projections of adjusted non-equity capital are presented in Table LXIV of Appendix D. These estimates indicate that adjusted non-equity capital requirements of representative class I other field crop farms will decrease from $32,909 in 1969 to an accumulated surplus equity capital level of $6,778 in 1980. This is 73

percent less surplus equity capital than is indicated by the base projection of Table XXII. In general, if land appreciates at twice the historical census rate in the future, the need for adjusted non-equity capital will be increased for some farms such as cash grain operations, and the ability to accumulate surplus equity capital on other farms such as other field crop operations will be substantially reduced.

Aggregate Projections

Alternative projections of aggregate total capital, assuming twice the historical census rate of price appreciation in land and buildings, are presented in Table LXV of Appendix D. These projections indicate a 422.26 percent ($2,908.2 million) increase in aggregate total capital for all class I livestock farms from 1969 to 1980. The base projection increase of $2,299.3 million is 21 percent less than that indicated by the alternative projection (Table XXIV). The alternative projections also indicate a 36.41 percent increase in the aggregate total capital of all class V farms from 1969 to 1980. This is 400 percent greater than the base projection increase ($88 million) of Table XXIV. In addition, the alternative projections indicate a 47.65 percent ($706.7 million) increase in aggregate total capital for all cash grain farms from 1969 to 1980. The base projection increase of $287.4 million (19 percent) is 60 percent less than the alternative projection (Table XXIV).

The alternative projections indicate an increase in aggregate total capital for the state of $10,006.4 million (147.24 percent) from $6,796.2 million in 1969 to $16,802.7 million in 1980. This increase is 29 percent greater than the base projection increase of $7,108.1

million (104 percent). These comparsions clearly indicate that the total capital requirements of all class-types, economic classes and enterprise types are significantly increased when land price appreciation occurs at twice the historical census rate.

Alternative projections of aggregate adjusted equity capital, assuming twice the historical rate of price appreciation for land and buildings, are presented in Table LXVI of Appendix D.[3] These data indicate that all classes of dairy farms will have a 142 percent ($363.6 million) increase in aggregate adjusted equity capital from 1969 to 1980. The base projection increase of $333.7 million (130.4 percent) is 8.5 percent less than the increase suggested by the alternative projections (Table XXVI). Under this alternative assumption the state aggregate increase in aggregate adjusted equity capital ($10,099.2 million) is 24 percent greater than the base projection increase of $7,641.7 million (Table XXVI). The comparison of this and other data from the base and alternative projections indicate that increased price appreciation in land and buildings leads to greater aggregate adjusted equity capital accumulation for all class-types, economic classes and enterprise types. However, the dairy farms tend to have a lower relative increase than do other types of farms.

Alternative projections of aggregate unadjusted non-equity capital are presented in Table LXVII of Appendix D. These projections

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[3]Alternative projections of aggregate unadjusted total equity capital are not presented. As was indicated earlier, because of the definition of unadjusted equity capital, these projections are virtually identical to the base projections of Table XXV.

indicate a 1,180.31 percent ($1,552.9 million) increase in aggregate unadjusted non-equity capital for all class I livestock farms from 1969 to 1980. This increase is 164 percent greater than the $943.9 million increase indicated by the base projections (Table XXVII). The alternative projections also indicate a 247.46 percent ($279.6 million) increase in aggregate unadjusted non-equity capital for all class V farms from 1969 to 1980. The base projection increase of $105.6 million (93 percent) is 62 percent less. In addition, the alternative projections indicate that all classes of cash grain farms will have an estimated 28 percent ($619 million) increase in aggregate unadjusted non-equity capital from 1969 to 1980. The base projection increase is 56 percent less than the increase suggested by the alternative projections (Table XXVII).

The alternative projections indicate a 505 percent ($5,220.8 million) increase in state aggregate unadjusted non-equity capital from $1,034.2 million in 1969 to $6,254.9 million in 1980. The base projection increase of $2,417.7 (233 percent) is 54 percent less than the alternative projection increase (Table XXVII). These comparisons indicate significant increases in aggregate unadjusted non-equity capital requirements for all Oklahoma farms when land price appreciation is twice the historical census rate. The increases for livestock farms are greater than for the other class-types of farms.

Alternative projections of aggregate adjusted total non-equity capital are presented in Table LXVIII of Appendix D. These projections indicate that all class V general farms will have a .15 percent decrease ($1.3 million) in aggregate adjusted non-equity capital from 1969 to 1980. This decrease is 67 percent less than the base

projection decrease (Table XXVIII). The alternative projections also indicate that all class I farms will have a 129 percent ($343.1 million) increase in aggregate adjusted non-equity capital from 1969 to 1980. This is a 37 percent greater increase than the base projection increase of $216.7 million. In addition, the alternative projections indicate that all dairy farms will have a 100 percent decrease ($35.8 million) in aggregate adjusted non-equity capital from 1969 to 1980. This is approximately the same decrease that is indicated by the base projections (Table XXVIII).

For the state aggregate, the alternative projections indicate a 4.33 percent increase in aggregate adjusted non-equity capital from $1,034.2 million in 1969 to $1,079 million in 1980. This is in contrast to the 26 percent decrease in aggregate adjusted non-equity capital indicated by the base projections (Table XXVIII). These comparisons indicate, in general, that price appreciation in land and buildings at twice the historical rate leads to increased aggregate adjusted non-equity capital requirements of Oklahoma farms. However, the increased role of price appreciation has little effect on the aggregate adjusted non-equity capital requirements of dairy farms.

To further evaluate the impact of land and building price appreciation on capital and credit needs, additional alternative projections were made with no price appreciation and half the historical rate of price appreciation after 1969. As would be expected the no price appreciation projections result in substantial reductions in the rate of growth in future capital requirements and adjusted equity capital accumulation for all representative farms. Unadjusted and adjusted non-equity capital requirements are virtually eliminated for

most representative farms if no price appreciation occurs after 1969. The rate of growth in aggregate total equity and non-equity capital requirements are also reduced substantially. When land and buildings are assumed to appreciate at half the historical rate, the growth rate in capital requirements from 1969 to 1980 is also significantly reduced.

CHAPTER VI

SUMMARY AND CONCLUSIONS

Nature of the Study

During the past twenty years farm operators have been confronted with a continuously changing environment. They have witnessed engineering and scientific discoveries which have increased the productivity and the prices of their machinery, equipment and other inputs. In addition, farmers have increased the use of purchased inputs and expanded the size of their farms. These changes have required the farmer to employ capital, both debt and equity, in amounts that far exceed those employed in past decades. The recent rapid increases in agricultural capital and credit requirements raise questions to the the extent of future agricultural capital and credit needs.

The goal of this study was to provide Oklahoma farmers and the financial institutions serving Oklahoma agriculture with estimates of the future capital requirements of the Oklahoma farm sector. Information of this nature will enable these groups to better acquire, manage and supply agricultural capital in the future. The study had four objectives: (1) to project total capital needs for representative size-type farms in Oklahoma to 1980, (2) to determine the proportion of the future estimated capital requirements that will be provided by equity and the proportion that must be provided by non-equity or debt, (3) to

estimate the future number of Oklahoma farm firms by economic class and enterprise type, and (4) using the estimates of representative farm capital and credit requirements and the projected future farm numbers, to determine the aggregate future capital and credit requirements of Oklahoma farms.

Theoretical principles were used to develop the relationships among the stock of capital assets, the cash or equity flows of the farm firm and the debt or non-equity capital requirements. The value of the stock of capital assets at any point in time represents the amount of capital that must be controlled by the representative farm operator. The surplus of cash inflows over cash outflows during any period of time determines the equity capital that is available for reinvestment in the farm operation or for investment in the nonfarm sector of the economy. Debt or non-equity capital requirements at any point in time are hypothesized to be the residual difference between the value of the stock of capital assets and the accumulated equity or surplus cash flows.

Data for the empirical model were taken primarily from the U. S. Census of Agriculture for Oklahoma. Observations for each variable were obtained (when available) for the census enumeration years 1959, 1964, and 1969. Using a linear regression procedure, future values of the cash flow and capital variables were estimated. These estimates were used to predict the future representative firm capital and credit requirements of Oklahoma farms. A Markov chain procedure, which utilizes past changes in farm numbers, was employed to estimate the future number of Oklahoma farms for the aggregate capital and credit estimates. Alternative projections were then made to evaluate the effect on future

capital and credit requirements of non-historical rates of change for selected variables.

Summary of Empirical Results

Capital and Credit Requirements for Representative Farms

Base Projections

The total capital requirements per representative firm are projected to increase during the 11 year period from 1969 to 1980 for each of the 40 classes and types of farms analyzed. The increases range from an estimated $6,028 for class I poultry farms to $240,966 for class I livestock ranches. Annual rates of increase in total capital range from a low of .68 percent for class I poultry farms to a high of 7.07 percent for class V other field crop farms.

When the change in equity capital is assumed to be the difference between cash inflows and cash outflows, 38 class-types of farms have increases in equity capital (unadjusted) and 2 class-types have decreases in equity capital (unadjusted) during the 11 year period analyzed. The absolute decreases in unadjusted equity capital are $5,425 for class II poultry farms and $576 for class V other field crop farms. The increases in unadjusted equity capital range from a low of $1,714 for class V cotton farms to a high of $229,124 for class I cotton farms. The annual rates of increase range from a low of .41 percent for class V cotton farms to a high of 7.80 percent for class I dairy farms.

When equity capital is adjusted for the price appreciation in land and buildings, all class-types of representative farms are projected to

have increases in equity capital (adjusted) from 1969 to 1980. The increases in adjusted equity capital requirements range from a low of $8,101 (from $23,783 in 1969 to $31,884 in 1980) for representative class II poultry farms to a high of $392,942 (from $393,725 in 1969 to $786,667 in 1980) for class I cotton farms. The annual rates of increase range from a low of 1.01 percent for class V poultry farms to a high of 9.07 percent for class I cotton farms.

Under the assumption that any positive difference between the total capital required and the sum of initial equity plus the accumulated surplus of cash inflows over cash outflows must be provided by non-equity or debt sources, 31 class-types of farms have increasing non-equity capital requirements and 5 class-types eliminate the need for non-equity capital and accumulate surplus equity capital during the 11 year period. When price appreciation of land and buildings is assigned to accumulated equity capital, only 3 class-types of farms have estimated increases in non-equity capital (adjusted) between 1969 and 1980. Under the same assumption, 18 class-types of farms are projected to decrease their adjusted non-equity capital requirements during this period. The remaining class-types of farms (19) eliminate the need for adjusted non-equity capital and accumulate surplus equity during the period analyzed.

Non-Historical Trends in Government Program Payments

When government farm program payments are held constant at the 1969 level, substantially less equity capital (unadjusted and adjusted) is accumulated on crop farms in particular. For example, representative

class I cotton farms accumulate 13 percent less unadjusted equity capital by 1980, while class I cash grain farms accumulate 8 percent less adjusted equity capital. In contrast, the adjusted equity capital accumulation of representative class V livestock ranches is reduced only 1 percent when government program payments are not allowed to increase after 1969.

The effect of no growth in government program payments on non-equity capital requirements (unadjusted and adjusted) is to substantially increase the requirement for the upper classes of cotton, cash grain and general farms. The projections of equity and non-equity capital when the rate of increase in government program payments is limited to half the historical rate of growth differ only in magnitude from the "no change" projections.

Non-Historical Trends in Supplementary Income

Two alternative projections were made which included non-historical trends in supplementary income, (1) no-change in supplementary income after 1969 and (2) 1.5 times the historical rate of increase in supplementary income. With the exception of representative class I and class II livestock ranches and class II poultry farms, the equity and non-equity capital requirements of higher sales classes of farms are not significantly affected by the alternative rates of change in supplementary income. The lower sales classes, however, particularly the class IV and class V farms, are greatly affected by changes in the level of supplementary income. For example, representative class V livestock farms accumulate 16 percent less unadjusted equity capital by 1980 when

supplementary income does not increase after 1969. When supplementary income increases at 1.5 times the historical rate of growth, these same farms are able to accumulate 8 percent more unadjusted equity capital than in the base projections. As would be expected, more non-equity capital is required for class IV and V farms when supplementary income is not allowed to increase to the historical rate.

Non-Historical Trends in Price Appreciation of Land and Buildings

Alternative projections were also made assuming no price appreciation in land and buildings after 1969 and twice the historical census rate of appreciation in land and buildings. These alternative projections have significant effects on the total capital, equity capital (adjusted) and non-equity capital of all economic classes and enterprise types of representative Oklahoma farms. For example, when there is no price appreciation in land and buildings after 1969, representative class I cash grain farms require 22.5 percent less total capital in 1980 than in the base projections. When land appreciates at twice the historical census rate of growth, these same farms require 18.5 percent more total capital than in the base projections. The total capital requirements of land intensive enterprise types such as crop farms and livestock ranches are affected to a greater degree by different price appreciation assumptions compared to the livestock and dairy farms.

With no price appreciation in land and buildings after 1969, the adjusted equity capital accumulation of all class-types of

representative farms (except class I poultry) is reduced.[1] Price appreciation of land and buildings at twice the historical census rate leads to increased adjusted equity capital accumulation by all class-types of representative farms.

The non-equity capital (unadjusted and adjusted) requirements of all representative farms are substantially reduced or the accumulation of surplus equity capital is increased when land is not allowed to appreciate after 1969. In contrast, when land and buildings appreciate at twice the historical census rate, the non-equity capital (unadjusted and adjusted) requirements of all representative farms increase or the accumulation of surplus equity capital declines.

Aggregate Capital and Credit Requirements

Economic Classes and Enterprise Types

The farm number projections indicate a 9 percent increase in Oklahoma farms of economic classes I through V from 1969 to 1980. Farm numbers increase for 18 class-types of representative farms, but decline for 22 class-types. The number of farms in each of economic classes I, II and III are projected to increase from 1969 to 1980, whereas the numbers in economic classes IV and V are expected to decline. The farms in the dairy, cotton and cash grain enterprise types are projected to decline in number while farm numbers in the other enterprise types are expected to increase during this period.

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[1]The unadjusted equity capital requirements under this assumption are identical to the base projections. This is due to the definition of unadjusted equity capital.

The greatest absolute increase in aggregate total capital from 1969 to 1980 is projected to occur for class I livestock farms. Total capital required by all class I livestock farms in 1980 ($3,987.9 million) is projected to be 21.45 percent of the aggregate total capital required by all Oklahoma farms. In contrast, aggregate total capital required by all class II dairy farms is projected to decrease from 1969 to 1980 and will be less than one percent of the aggregate capital required by all Oklahoma farms in 1980.

Although 16 class-types of farms are expected to have a decrease in the aggregate total capital requirement, every enterprise type except cotton and every economic class is projected to have an increase in aggregate total capital between 1969 and 1980. For the economic classes the relative size of the aggregate 1980 capital requirements corresponds to their gross sales rankings. Among the enterprise types, all livestock farms are expected to require the largest amount of aggregate total capital in 1980 ($6,017.9 million), and all cotton farms are expected to require the least amount of total capital ($35.5 million). It is interesting to note that all livestock farms are projected to account for 43.28 percent of the aggregate total capital required by all Oklahoma farms in 1980.

Aggregate unadjusted non-equity capital requirements are expected to increase to 25 class-types of farms, decrease for 10 class-types of farms, and be eliminated for 5 class-types from 1969 to 1980. Each of the five economic classes are expected to have increases in aggregate unadjusted non-equity capital requirements during the period. When land price appreciation is allowed to contribute to equity accumulation, only 4 class-types are expected to have increases in aggregate

non-equity capital (adjusted) requirements between 1969 and 1980. Seventeen class-types of farms decrease their aggregate non-equity requirements and 19 class-types eliminate completely the need for non-equity capital and accumulate surplus equity. Only economic class I farms are expected to have increasing aggregate adjusted non-equity capital requirements during the period studied. Of the eight enterprise types of farms, only livestock farms will have increasing aggregate adjusted non-equity capital requirements between 1969 and 1980.

State Totals

In 1969 there were 50,977 farms in the five economic classes and eight enterprise types of farms analyzed in this study. It is estimated that the total capital requirements of these farms were $6,796.2 million. The number of farms within the five classes and eight types is projected to increase to 55,606 farms by 1980. The projections indicate that the total capital requirements of these farms will be $13,904.3 million. This is an increase in total capital required of 104 percent during the eleven year period.

The unadjusted equity capital accumulation for all Oklahoma farms analyzed is estimated to be $10,453.5 million by 1980. This is a projected increase of 83 percent ($5,743.3 million) from the estimated $5,710.1 million of equity capital for Oklahoma farms in 1969. When land price appreciation is included in farmers' equity, the aggregate equity capital (adjusted) is projected to be $13,351.9 million in 1980, an increase of 134 percent from 1969.

The unadjusted non-equity capital requirements of the Oklahoma farms accounted for in this study were estimated to be $1,034.2 million

in 1969. These requirements are projected to increase 233 percent to $3,451.9 million by 1980. When land price appreciation is assumed to add to the farmers' equity, non-equity capital (adjusted) is expected to decrease from $1,034.2 million in 1969 to $763.6 million in 1980. This is a decrease of 26 percent during the eleven year period.

Under the assumption of no change in government program payments after 1969, the estimates of state aggregate unadjusted and adjusted equity capital are 2 percent and 1.5 percent less, respectively, than the base projections for 1980. The state aggregate non-equity capital requirements are from 6 percent (unadjusted) to 18 percent (adjusted) greater than the base projections in 1980 under this assumption.

When there is no change in supplementary income after 1969, the state aggregate accumulation of unadjusted equity capital is 8 percent lower and the adjusted non-equity capital is 31 percent greater than the base projections in 1980. Alternatively, under the assumption of 1.5 times the historical rate of growth in supplementary income, the state aggregate unadjusted equity capital accumulation is 2 percent greater and the adjusted non-equity capital requirement is 9 percent less than the base projections in 1980.

No price appreciation in land and buildings after 1969 reduces the 1980 aggregate capital requirement 21 percent below the base projection. This alternative assumption also results in an 18 percent lower accumulation of state aggregate adjusted equity capital and a 31 percent lower state aggregate adjusted non-equity capital requirement. When land price appreciation occurs at twice the historical census rate, the state aggregate total capital requirement is 17 percent greater than the base projection in 1980. Under this alternative assumption, state aggregate

adjusted equity capital accumulation is 15 percent greater, and the state aggregate adjusted non-equity capital requirement is 29 percent greater than the base projections for 1980.

Conclusions and Implications

Farm Firms

The most apparent conclusion that can be drawn from this study is that capital requirements of Oklahoma farm firms will increase rather significantly between the present and 1980. This is evident in the base projections and is magnified in alternative projections with greater than the historical census rate of price appreciation for land and buildings. If the increases in total capital per farm firm projected in this study materialize, some farmers may have difficulty in obtaining the quantities of capital necessary for the maintenance of a viable farm production unit. Farmers will also be faced with the problem of successfully managing the larger quantities of capital. Those farmers who succeed in obtaining and managing the necessary capital will eventually have serious problems of efficiently liquidating the farm business or transferring it to the succeeding generation.

The projections of future growth in equity capital indicate that several class-types of farms will accumulate surplus equity capital by 1980. This result suggests that some farms may be in a position to expand at rates which exceed the historical rates of farm growth. Alternatively, farmers may have the capital or funds that are necessary to initiate forward or backward integration into farm related activities. One possible example of this phenomena in Oklahoma would be an increase

in the numbers of farmer financed cattle in commercial feedlots.

Conclusions with respect to future non-equity capital requirements are more difficult to formulate. The projections of unadjusted non-equity capital, which might apply to those who are entering farming, to those who are expanding rapidly, or to those who rent or lease most of their land, indicate significant increases in the non-equity capital requirements of 94.5 percent of the farms analyzed. The implications of increased non-equity capital requirements are that farmers will have to develop capital management skills and record-keeping techniques that will enable them to convince lending institutions of their ability to make profits with the credit they receive.

The projections of adjusted non-equity capital, which apply to full-owner farmers who are not expanding rapidly, indicate decreases in or elimination of the non-equity capital requirements of 91.5 percent of the farms analyzed. However, the percentage of Oklahoma farmers who are full-owner, non-expanding operators is relatively low. Also, with the average age of Oklahoma farmers over 65 years old increasing, land transfers to young entrants with limited equity result in increased non-equity capital needs. Therefore, it is probable that the projected unadjusted non-equity capital requirements more nearly depict the future non-equity capital requirements of Oklahoma farmers.

The alternative projections indicate that different levels of government program payments and supplementary income have a significant impact on the equity and non-equity requirements of selected representative farms, but little impact on the aggregate capital requirements. The equity and non-equity needs of crop and higher sales class farms are more sensitive to reductions in government payments than are other

class-types of farms. Alternative rates of change in supplementary income tend to have a more pronounced effect on the equity and non-equity requirements of the lower sales classes. Different rates of price appreciation in land and buildings also influence the capital and credit needs. When land appreciates at twice the historical census rate, both the equity and non-equity requirements of all representative farms increase. Not only is this rate of price appreciation consistent with current trends, the capital and credit estimates based on this assumption also seem to be quite consistent with recent projections of U. S. capital and credit needs.[2] Thus, it is apparent that the capital and credit requirements in Oklahoma agriculture will be significantly affected by trends and policies in the nonfarm sector.

The projections of future farm numbers indicate an increase in commercial farms of economic classes I to V from 1969 to 1980. However, the future growth in commercial farm numbers will not keep pace with the rate of increase of past years. Consequently, the total number of viable farming opportunities for young entrants may be more limited in the future.

Lending Institutions

The projected per farm increases in total and unadjusted non-equity capital indicate that local suppliers of agricultural credit must

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[2] Brake, "Impact of Structural Changes on Capital and Credit Needs," pp. 1536-1545; Melichar, "Farm Capital and Credit Projections to 1980," pp. 1172-1177; Melichar, "Financing Agriculture: Demand for and Supply of Farm Capital and Credit," paper presented at the joint session of the American Agricultural Economics Association and the American Finance Association, Toronto, Canada, December 1972.

evaluate their ability to finance Oklahoma agriculture in the future. The representative class I livestock farmer who is expected to require $240,014 of non-equity (unadjusted) capital in 1980 will place a substantial burden on the lending limits of most local financial institutions. Local suppliers of agricultural credit must become aware of the expected future needs of their customers and begin analyzing methods of meeting the future demand for agricultural credit. In addition, it appears that some class-types of farms, such as class I dairy farms, may not need as much non-equity capital as other class-types. Thus, lending institutions may do an increased volume of business with livestock ranches and farms compared to dairy farms in the future. This trend has implications for the training of loan officers as well as the emphasis of advertising and promotion programs.

Those who are in a position to formulate credit policy should evaluate the effect on the present agricultural credit system of a possible increase in the aggregate demand for agricultural capital of the magnitude projected in this study. The estimated 104 percent increase in total capital requirements (base projections) between 1969 and 1980 should encourage credit policy makers to formulate adjustments in credit arrangements to better serve farmers during these years of rapid changes.

Methodological Problems and Further Research

Data and Conceptual Problems

The most serious difficulty with this study are the data requirements. Much of the needed data was simply not available. Off-farm investments, as mentioned previously, were eliminated from the analysis

because of the lack of data. It was necessary to estimate nonfarm income of farm operators and their families because this information is not directly reported for Oklahoma farms by economic class and enterprise type. Incomplete data on the value of transfers of real estate to farm and nonfarm heirs also presented problems. Future research into and analysis of the capital and credit requirements of Oklahoma and United States farms would be greatly aided if these data series were made available.

Every attempt was made to utilize available published or unpublished data. The published data used for income and expense items are highly dependent upon the input and product price levels and relationships that existed during the observation years. In particular, the data used for cash inflows and farm operating expenses have a great influence on the results of the study. If the farm operating expenses taken from the census are lower than actual expenses or if cash inflows reported in the census are higher than actual inflows, the projections of equity capital accumulation will be biased upward. The same variations in inflows and expenses will lead to underestimation of future non-equity capital requirements. Another potential data problem that could greatly affect the future equity and non-equity capital projections is the level of initial equity employed in the study. If the initial equity base is in reality lower than the estimates used in the analysis, then future non-equity capital requirements would be expected to exceed the projections of this study.

Conceptually, defining non-equity capital as the residual between the capital stock and the equity flows of a representative farm leads to interpretation difficulties in the case where the representative

farm is considered to be wholly owned and non-expanding. In this case a large portion of the increase in capital stock is due to appreciation in land and buildings and must be assigned to the equity. This, in turn, results in a smaller residual and reduced non-equity capital requirement. In reality the actual non-equity capital requirements would be expected to lie within the bounds of the adjusted and unadjusted estimates of this study. However, as indicated earlier, the unadjusted estimates probably predict the direction of future non-equity capital requirements more nearly than do the adjusted estimates.

Another conceptual and data problem in this study relates to the real world phenomenon of farm firm growth that leads to movement from lower to higher sales classes. The increased capital requirements that are needed for a farm to move from a class II to a class I farm during a census period are not evident in the census data used for the projections of this study. Thus, these projections must be interpreted as estimates of the future average capital and credit needs of representative firms that have not changed class size during the projection period. In reality, growing firms move from smaller to larger sales classes over time. Estimates of the capital and credit that are required to duplicate this real world phenomena must be obtained by interpolating between the projections given here for the size classifications of interest.

Further Research

The findings of this study suggest several areas in which further research in needed.

(1) Needs of beginning farmers: The projected increases in per farm capital needs during the next eight to ten years present a

potential barrier to young men who desire to enter farming. Research is needed to determine and examine the financing needs of beginning farmers.

(2) Problems of large units: Research and experimentation is needed to formulate practices which will enable the farmer who is hampered by loan limits to obtain credit. Loan limits which have restricted the size of loans in the past will continue to be a problem as capital and credit needs increase over time.

(3) Farm transfer problems: As farm operations become more capital intensive, the stresses and strains on the intra-family, intergeneration transfer of viable farms will increase. Research and education are needed in this area to enable farm families to plan and provide for the efficient transfer of the farm unit.

(4) Importance of nonfarm income: As nonfarm income of the farm family increases, it becomes more important as a source of capital for the farm enterprise and as a means of repaying farm debt. Research is needed to determine the effect of nonfarm income on the survival and expansion of the farm firm.

(5) Importance of government program payments: Historically, government farm program payments have been an important source of funds for many Oklahoma farms. As society becomes more urban and less farm oriented it is likely that the per farm amount of government program payments will decrease. Additional research is needed to determine the impact of decreasing government farm program payments on per farm and aggregate credit needs.

(6) Problems of lending institutions: In the past, most agricultural lending institutions have furnished only a portion of the total

capital needs of any one farm operator. Research is needed that will help lending institutions evaluate the feasibility of providing a "credit package" that will fulfill all the financial requirements of the individual farm production unit.

In conclusion, the capital and credit requirements of the Oklahoma farm sector are expected to increase beyond the levels of the recent past. Changes in all aspects of agricultural production will accompany these increases. However, the magnitude of these accompanying changes will depend in part on how credit institutions adapt to meet increasing capital needs and on how farm operators develop skills for managing the future levels of capital and credit. Additional well-planned research is needed to guide individuals and credit institutions as they adjust to the everchanging challenges of Oklahoma and American agriculture.

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APPENDIXES

APPENDIX A

DERIVATION OF GOVERNMENT FARM PROGRAM PAYMENTS AND SUPPLEMENTARY INCOME FOR REPRESENTATIVE FARMS

The 1959 census does not report dollar estimates of nonfarm income. In addition, the 1969 census reports only "Farm Related Income" which is composed of (a) customwork and other agricultural services, (b) recreational services, and (c) government farm program payments. The problem, therefore, is to derive estimates of nonfarm income, the sum of farm program payments plus supplementary income for representative economic class and enterprise type Oklahoma farms for 1959 and 1969. These estimates can then be used in the projections of future capital and credit needs.

The nonfarm income (NFI_{ijt}) estimates for 1959 and 1969 are based on the data reported in the 1964 census as "Income of all persons in farm operator's household from sources other than farm operated."[1] This data is presented in Table XXIX. The 1964 census includes the following income sources in this category: (a) wages and salaries, (b) nonfarm business or profession, (c) Social Security, pensions, veteran and welfare payments, (d) rent from farm and nonfarm property,

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[1] U. S. Census of Agriculture for Oklahoma, 1964, p. A-11.

interest, dividends, etc. The latter source was to include Soil Bank payments and feed grain program payments. It was determined that this source includes all government program payments.

TABLE XXIX

NONFARM INCOME FOR OKLAHOMA FARMS BY ECONOMIC CLASS AND ENTERPRISE TYPE, 1964

Enterprise Type	Economic Class				
	I	II	III	IV	V
Cash Grain	$ 3,981	$3,673	$2,591	$2,894	$3,566
Cotton	3,342	2,731	1,838	1,744	2,160
Other Field Crop	3,082	1,937	1,077	1,492	1,755
Poultry	3,141	1,717	2,948	1,718	3,495
Dairy	3,252	1,562	1,922	2,180	2,090
Livestock	4,439	4,175	3,670	3,788	3,866
Livestock Ranches	15,952	4,326	5,056	4,163	3,976
General	4,782	3,439	3,035	2,619	2,879

Source: U. S. Bureau of the Census, U. S. Census of Agriculture for Oklahoma, 1964 (Washington, D. C., 1967), I, Part 36, pp. 168-239.

In the derivation of the desired data for 1959 and 1969, the following assumptions are adhered to: (1) the relationships that existed in 1964 between Oklahoma state averages by economic class and U. S. averages by economic class were the same in 1959 and in 1969; and (2) the relationships that existed in 1964 between state averages for Oklahoma by economic class and state averages by economic class and enterprise type were the same in 1959 and in 1969.

Estimation of 1959 Nonfarm Income Values

U. S. average supplementary income (reported as off-farm income) by economic class for 1959 and U. S. average direct government payments by economic class for 1959 are available in the Farm Income Situation.[2] These figures are presented in Table XXX. Table XXX also includes the sum of supplementary income and government payments which is an estimate of the U. S. average nonfarm income value for 1959. To obtain Oklahoma class by type values of nonfarm income for 1959, the 1959 U. S. nonfarm income figure is multiplied by the ratio of the 1964 Oklahoma nonfarm income by economic class value to the 1964 U. S. nonfarm income by economic class value. The resulting figure is then multiplied by the percentage that the 1964 Oklahoma class-type observation is of the 1964 Oklahoma average by economic class. Nonfarm income

TABLE XXX

U. S. AVERAGE PER FARM SUPPLEMENTARY INCOME DIRECT GOVERNMENT PAYMENTS AND NONFARM INCOME BY ECONOMIC CLASS FOR 1959

Type of Income	Economic Class I	II	III	IV	V
Supplementary Income	$2,264	$1,744	$1,322	$1,545	$1,806
Government Payments	920	479	313	214	127
Nonfarm Income	$3,184	$2,223	$1,635	$1,759	$1,933

Source: U. S. Department of Agriculture, ERS, Farm Income Situation, FIS-218 (1971, pp. 72-73; FIS-199 (1965), p. 76.

[2] U. S. Department of Agriculture, Farm Income Situation (Washington, D. C., 1965) ERS, FIS-199, p. 76.

estimates by class and type for representative Oklahoma farms in 1959 are presented in Table XXXI.

TABLE XXXI

ESTIMATES OF NONFARM INCOME FOR OKLAHOMA FARMS BY ECONOMIC CLASS AND ENTERPRISE TYPE, 1959

Enterprise Type	Economic Class I	II	III	IV	V
Cash Grain	$1,927	$2,114	$1,310	$1,445	$1,987
Cotton	1,618	1,572	929	886	1,203
Other Field Crop	1,492	1,115	544	745	978
Poultry	1,521	988	1,490	858	1,947
Dairy	1,574	899	972	1,088	1,164
Livestock	2,149	2,403	1,855	1,891	2,154
Livestock Ranches	7,724	2,490	2,556	2,078	2,215
General	2,316	1,979	1,534	1,307	1,604

Source: Author's estimates.

The 1959 nonfarm income estimates by class and type can be divided into government payment and supplementary income portions. The 1959 government payment is obtained by first obtaining the ratio of the derived 1964 Oklahoma government payment for each class to the U. S. class average government payment. The resulting percentage is then multiplied times the 1959 U. S. class average government payment. The 1959 supplementary income for each class is calculated by subtracting the derived 1959 class-type government payment figures from the 1959 class-type nonfarm income estimates. The estimates of 1959 government

payments and supplementary income cross-classified by economic class and enterprise type are presented in Table XXXII and Table XXXIII, respectively.

TABLE XXXII

ESTIMATES OF GOVERNMENT FARM PROGRAM PAYMENTS FOR OKLAHOMA FARMS BY ECONOMIC CLASS AND ENTERPRISE TYPE, 1959

Enterprise Type	Economic Class				
	I	II	III	IV	V
Cash Grain	$ 704	$845	$498	$367	$195
Cotton	704	530	401	509	224
Other Field Crop	531	202	145	62	55
Poultry	38	34	26	22	31
Dairy	245	132	73	53	26
Livestock	948	480	246	150	57
Livestock Ranches	179	93	62	45	31
General	1,423	796	425	272	140

Source: Author's estimates.

Estimation of 1969 Nonfarm Income Values

The 1964 Oklahoma census data on nonfarm income by class and type and the 1969 Oklahoma census data on government payments by class and type are used to derive 1969 class-type estimates of nonfarm income. The general procedure followed is: (1) derive the 1964 Oklahoma government payments (GP_{ijt}) by class and type; (2) subtract the derived government payments from 1964 census class-type nonfarm income data to

obtain 1964 Oklahoma supplementary income (SI_{ijt}) by class and type; (3) add to the derived 1964 Oklahoma supplementary income figures the change in Oklahoma supplementary income from 1964 to 1969 to obtain Oklahoma supplementary income figures by class and type for 1969; (4) add the derived 1969 Oklahoma supplementary income figures to the 1969 census government payment data to obtain estimates of 1969 Oklahoma nonfarm income by class and type.

TABLE XXXIII

ESTIMATES OF SUPPLEMENTARY INCOME FOR OKLAHOMA FARMS BY ECONOMIC CLASS AND ENTERPRISE TYPE, 1959

Enterprise Type	I	II	III	IV	V
Cash Grain	$1,223	$ 631	$ 812	$1,078	$1,792
Cotton	909	1,042	528	377	979
Other Field Crop	961	913	399	683	923
Poultry	1,483	954	1,464	836	1,916
Dairy	1,329	767	899	1,035	1,138
Livestock	1,201	1,923	1,609	1,741	2,097
Livestock Ranches	7,545	2,397	2,494	2,033	2,184
General	893	1,183	1,109	1,035	1,464

Source: Author's estimates.

The average U. S. government payment in 1969 was approximately 61 percent larger or 1.61 times the average U. S. government payment.[3]

[3]The figure 1.61 is derived from data presented in U. S. Department of Agriculture, Farm Income Situation (Washington, D. C., 1971), ERS, FIS-218, p. 73.

The exact changes over the period varied somewhat from class to class as illustrated in Table XXXIV. Using this information, the U. S. class increases in government program payments as a percent of the U. S. average increase could be calculated. These figures are also presented in Table XXXIV.

TABLE XXXIV

CHANGES IN U. S. AND OKLAHOMA GOVERNMENT FARM PROGRAM PAYMENTS BY ECONOMIC CLASS 1964-1969

	Economic Class				
	I	II	III	IV	V
Change in U. S. Government Payments[a]	1.99	1.68	1.51	1.35	1.50
Change in U. S. Government Payments as a Percent of U. S. Average Change	1.24	1.04	.94	.84	.93
Derived Changes in Oklahoma Government Payments	2.10	1.77	1.59	1.43	1.58

[a]Derived from data presented in Farm Income Situation, 1964 = 1.0.

The increase in total Oklahoma government payments from 1964 to 1969 was approximately 69 percent (1.69 times).[4] If it is assumed that the Oklahoma classes have the same relationship to the change in the

[4]Derived from data presented in U. S. Department of Agriculture, Farm Income Situation Supplement (Washington, D. C., 1971), ERS, FIS-218 p. 29.

state average as the U. S. classes have to the change in the U. S. average, then the numbers previously derived (in Table XXXIV) can be multiplied by the Oklahoma state average change in government payments to obtain Oklahoma government payments changes by class from 1964 to 1969. These changes for the five economic classes are given in Table XXXIV.

The 1969 Oklahoma census values for government payments by class and type are presented in Table XXXV. These figures are now divided by the appropriate class figures from Table XXXIV to obtain 1964 government payments for Oklahoma by class and type. These estimates of 1964 cross-classified Oklahoma government payments are also presented in Table XXXV.

The derived 1964 Oklahoma government payments (GP_{ijt}) figures are now subtracted from the 1964 Oklahoma census values of nonfarm income to obtain estimates of 1964 Oklahoma supplementary income (SI_{ijt}) by class and type. The 1964 supplementary income estimates appear in Table XXXVI.

If it is assumed that the change in Oklahoma supplementary income by class from 1964 to 1969 corresponds to the change in U. S. supplementary income (SI_{ijt}) estimates can be derived. The desired figures are obtained by multiplying the 1964 class-type estimates of Oklahoma supplementary income by the corresponding U. S. economic class changes from 1964 to 1969. The changes in U. S. supplementary income for all classes and the estimates of cross-classified 1969 supplementary income for Oklahoma are presented in Table XXXVII.

TABLE XXXV

GOVERNMENT FARM PROGRAM PAYMENTS FOR OKLAHOMA FARMS BY ECONOMIC CLASS AND ENTERPRISE TYPE, 1964[a] AND 1969[b]

Enterprise Type	Economic Class I	II	III	IV	V
Cash Grain					
1964	$ 2,003	$2,734	$1,865	$1,193	$ 622
1969	8,537	4,840	2,965	1,704	982
Cotton					
1964	2,003	1,715	1,500	1,656	714
1969	24,293	9,455	4,886	2,366	1,127
Other Field Crop					
1964	1,511	654	543	202	174
1969	3,179	1,158	863	288	274
Poultry					
1964	108	109	97	71	100
1969	228	194	154	102	158
Dairy					
1964	696	427	272	172	82
1969	1,465	755	433	246	130
Livestock					
1964	2,695	1,552	923	487	182
1969	5,670	2,748	1,468	696	287
Livestock Ranches					
1964	510	301	232	148	98
1969	1,073	532	396	212	154
General					
1964	4,045	2,574	1,592	885	446
1969	8,058	4,557	2,531	1,265	704

[a]Author's estimates.

[b]U. S. Bureau of the Census, Census of Agriculture for Oklahoma, 1969 (Washington, D. C., 1971), I, Part 36, Section 1, pp. 154-249.

TABLE XXXVI

ESTIMATES OF SUPPLEMENTARY INCOME FOR OKLAHOMA FARMS BY ECONOMIC CLASS AND ENTERPRISE TYPE, 1964

Enterprise Type	Economic Class				
	I	II	III	IV	V
Cash Grain	1,978	939	674	1,701	2,944
Cotton	1,339	1,016	338	118	1,446
Other Field Crop	1,571	1,283	482	1,290	1,581
Poultry	3,033	1,608	2,799	1,647	3,395
Dairy	2,556	1,135	1,598	2,008	2,008
Livestock	1,744	2,623	2,695	3,301	3,684
Livestock Ranches	15,442	4,025	4,772	4,015	3,878
General	737	865	1,391	2,734	2,433

Source: Author's estimates.

TABLE XXXVII

CHANGE IN U. S. SUPPLEMENTARY INCOME[a] AND SUPPLEMENTARY INCOME FOR OKLAHOMA FARMS[b] (1969) BY ECONOMIC CLASS

	Economic Class				
	I	II	III	IV	V
Change in U. S. 1964-1969	1.32	1.37	1.50	1.59	1.60
Enterprise Type					
Cash Grain	$ 2,616	$1,286	$1,092	$2,696	$4,708
Cotton	1,771	1,391	508	187	2,312
Other Field Crop	2,078	1,757	803	2,045	2,528
Poultry	4,011	2,202	4,289	2,611	5,429
Dairy	3,380	1,554	2,482	3,183	3,211
Livestock	2,037	3,591	4,132	5,232	5,892
Livestock Ranches	20,423	5,511	7,257	6,364	6,202
General	975	1,184	2,395	4,334	3,891

[a]Derived from data presented in Farm Income Situation, 1964 = 1.0.

[b]Author's estimates.

Finally, the derived 1969 Oklahoma supplementary income figures are added to the 1969 Oklahoma census government payment figures to obtain 1969 Oklahoma nonfarm income values by class and type. The cross-classified estimates of 1969 Oklahoma nonfarm income are presented in Table XXXVIII.

TABLE XXXVIII

ESTIMATES OF NONFARM INCOME FOR OKLAHOMA FARMS BY ECONOMIC CLASS AND ENTERPRISE TYPE, 1969

Enterprise Type	Economic Class				
	I	II	III	IV	V
Cash Grain	$10,883	$ 6,126	$3,872	$4,115	$5,982
Cotton	25,881	10,005	5,341	2,533	3,583
Other Field Crop	5,042	2,915	1,511	2,116	2,959
Poultry	3,825	2,396	3,920	2,436	5,924
Dairy	4,496	2,309	2,583	3,092	3,540
Livestock	7,738	6,339	5,094	5,375	6,544
Livestock Ranches	19,386	6,043	6,789	5,903	6,740
General	9,382	5,741	4,402	5,140	4,836

Source: Author's estimates.

APPENDIX B

DERIVATION OF TRANSITION PROBABILITY MATRIX FOR THE MARKOV CHAIN ANALYSIS OF FARM NUMBERS

A Markov chain analysis procedure is used to project future numbers of representative farms for Oklahoma by size-type classification. Census data on the class-type distribution of farm numbers for 1959, 1964 and 1969 are used to derive the transition tables for the Markov chain analysis. The 1959 and 1964 census figures become the row totals and the column totals, respectively, for the first transition table and are the first figures entered in this table (Table XXXIX). From these figures the S_{00} row and column entries are derived. The numbers in the S_{00} column indicate that the total number of farms decreased in these class-type states between 1959 and 1964. The numbers in the S_{00} row represent the increase in farm numbers from 1959 to 1964 in the various class-type states. This initial data and the following procedure are then used to obtain the proper movement of farms between the various class-type states from 1959 to 1964.[1]

1. Begin with class I of a particular enterprise type. If class I has a deficit, the S_{00} row will have a non-zero entry. Go to class II

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[1]Exceptions to this procedure are the poultry, dairy and livestock ranch enterprise types. For these types, all deficits are filled by moving farms up from the lower classes.

TABLE XXXIX

TRANSITION TABLE, 1959-64

Size in 1959	S_{00}	S_{15}	S_{14}	S_{13}	S_{12}	S_{11}	S_{25}	S_{24}	S_{23}	S_{22}	S_{21}	S_{35}	S_{34}	S_{33}	S_{32}	S_{31}	S_{45}	S_{44}	S_{43}	S_{42}	S_{41}
S_{00}	7,974				(8)	(1)						30 (81)	(87)	(90)	(80)	(35)	52		(14)	(17)	(90)
S_{15}	369 (409)	3,043										31									
S_{14}	701 (751)		4,257									31									
S_{13}				3,481	9								36	31	18						
S_{12}					1,276 (1,277)	1															
S_{11}						195															
S_{25}	763 (814)						707					31									
S_{24}	677 (764)							903				31	37								
S_{23}	164 (412)								615				36	31	20						
S_{22}	(81)									252					3	7					
S_{21}											89										
S_{35}												265 (338)	73								
S_{34}													270 (345)	85							
S_{33}														205 (272)	60	7					
S_{32}															106 (127)	21					
S_{31}																16					
S_{45}	(76)																57 (109)	125	3		
S_{44}	(47)																	0 (123)	136	16	
S_{43}																			0 (145)	145	
S_{42}																				12 (102)	90
S_{41}																					35
S_{55}	(56)																				
S_{54}	390 (630)																				
S_{53}	(243)																				
S_{52}																					
S_{51}																					
S_{65}	1,350																				
S_{64}	822 (841)																				
S_{63}	7 (167)																				
S_{62}	(142)																				
S_{61}																					
S_{75}	446																				
S_{74}	101																				
S_{73}	83																				
S_{72}	57																				
S_{71}	69																				
S_{85}	(2)																				
S_{84}																					
S_{83}																					
S_{82}																					
S_{81}																					
Totals for 1964		3,043	4,257	3,481	1,285	196	707	903	615	252	89	419	452	362	207	51	109	125	159	173	125

TABLE XXXIX (Continued)

Size in 1959	S_{55}	S_{54}	S_{53}	S_{52}	S_{51}	S_{65}	S_{64}	S_{63}	S_{62}	S_{61}	S_{75}	S_{74}	S_{73}	S_{72}	S_{71}	S_{85}	S_{84}	S_{83}	S_{82}	S_{81}	Totals for 1959
S_{00}				(362)	(102)					(39)						(96)	(24)	(400)	(195)	(102)	8,056
S_{15}																19					3,443
S_{14}																	49	77			5,008
S_{13}																					4,064
S_{12}																					1,277
S_{11}																					195
S_{25}																20					1,521
S_{24}																19					1,667
S_{23}																	49	111	1		1,027
S_{22}																			51	20	333
S_{21}																				2	91
S_{35}																					338
S_{34}																					365
S_{33}																					272
S_{32}																					127
S_{31}																					16
S_{45}																					185
S_{44}																					172
S_{43}																					145
S_{42}																					102
S_{41}																					35
S_{55}	447																				1,014
S_{54}		704	221																		1,334
S_{53}			884 (1,105)	464												19					1,348
S_{52}				303 (405)	102																405
S_{51}					89																89
S_{65}						3,729															5,079
S_{64}							2,644									19					1,485
S_{63}								1,656									49	111			1,823
S_{62}									838	39								33	51	19	980
S_{61}										493											493
S_{75}											2,796										3,242
S_{74}												1,543									1,643
S_{73}													685								768
S_{72}														361							418
S_{71}															283						352
S_{85}																1,735 (1,831)	98				1,833
S_{84}																	1,815 (2,036)	221			2,036
S_{83}																		948 (1,101)	153		1,101
S_{82}																			323 (384)	61	384
S_{81}																				66	66
Totals for 1964	447	704	1,105	767	191	3,729	2,644	1,656	838	532	2,796	1,542	685	361	283	1,831	2,060	1,501	579	168	

*Numbers in parentheses in this table indicate that this number of farms have been moved out of this cell into other cells during the process of deriving the table.

of the same type and see if class II has any surplus from the previous period as indicated by a non-zero entry in the S_{00} column. If class II has a surplus, take as much of the class I deficit as possible from the class II surplus.

2. If class II does not have enough surplus to fill the class I deficit, take up to 40 percent of the original class I deficit from the upward diagonal entry for class II of the same enterprise type and move this number of farms to class I.

3. If the class I deficit is still not filled, check the other class I enterprise types for surpluses from the previous time period. If any surplus is found use it to fill the class I deficit. However, do not take more than 20 percent of the original class I deficit from any one enterprise type. Check the other types for surpluses in the following order: general, cotton, livestock farm (skip livestock farm if class I is other field crop), dairy (skip dairy if class I is other field crop), cash grain and other field crop.

4. If class I still has a deficit take additional numbers, not to exceed 20 percent of the original deficit, from class II of the same enterprise type.

5. If a deficit still remains in class I, check class II of all other enterprise types for any surplus from the previous time period. Again, do not take more than 20 percent of the original class I deficit from any one type. Check the other types in the following order: general, cotton, livestock farm (skip livestock farm if class I is other field crop), dairy (skip dairy if class I is other field crop), cash grain and other field crop.

6. If, after completing steps 1 through 5, class I still has a deficit, take the remainder of the deficit from class III of the same enterprise type.

This procedure is completed for class I general, cotton, livestock farm, cash grain, and other field crop enterprise types, respectively. The steps are then repeated for class II, class III, class IV and class V farms. However for classes II through V, the following intermediary adjustment is made between steps 1 and 2 above: If a class deficit still remains, check the next largest size class (as measured by gross income) of the other enterprise types for surpluses from the previous period. Check the other types in the following order: general, cotton, livestock farm (skip livestock farm if the deficit base is other field crop), dairy (skip dairy if the deficit class is other field crop), cash grain and other field crop. Do not take more than 20 percent of the original deficit from any one type.

When the farm movements from 1959 to 1964 have been derived for all classes and types, Table XXXIX is completed by entering zeroes into all the empty cells.[2] The non-zero components in the transition table are then divided by the row totals and entered into another matrix. This becomes the transition probability matrix for the 1959 to 1964 interval. The transition probability matrix for this period is presented in Table XL.

To obtain the transition probability matrix for the 1964 to 1969 period, the same procedure is used. Then to determine the transition

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[2]Zeroes are not actually entered in Table XXXIX. This is done to facilitate reading the transition numbers.

TABLE XL

TRANSITION PROBABILITY MATRIX, 1959-64

Size in 1959	S_{00}	S_{15}	S_{14}	S_{13}	S_{12}	S_{11}	S_{25}	S_{24}	S_{23}	S_{22}	S_{21}	S_{35}	S_{34}	S_{33}	S_{32}	S_{31}	S_{45}	S_{44}	S_{43}	S_{42}	S_{41}
S_{00}	.989821											.003724					.006455				
S_{15}	.107174	.883822										.009004									
S_{14}	.139976		.850040									.006190									
S_{13}	.089321			.856545	.002215								.008858	.007628	.004429						
S_{12}					.999217	.000783															
S_{11}						1															
S_{25}	.501644						.464826					.020381									
S_{24}	.406119							.541692				.018596	.022196								
S_{23}	.159688								.598832				.035054	.030185	.019474						
S_{22}										.756757					.009009	.021021					
S_{21}											.978022										
S_{35}												.784024	.215976								
S_{34}													.739726	.260274							
S_{33}														.753676	.220588	.025735					
S_{32}															.834646	.165354					
S_{31}																1					
S_{45}																	.308108	.675676	.016216		
S_{44}																			.906977	.093023	
S_{43}																				1	
S_{42}																				.117697	.882353
S_{41}																					1
S_{55}	.559172																				
S_{54}	.292354																				
S_{53}																					
S_{52}																					
S_{51}																					
S_{65}																					
S_{64}	.265800																				
S_{63}	.235868																				
S_{62}	.003840																				
S_{61}																					
S_{75}	.137569																				
S_{74}	.061473																				
S_{73}	.108073																				
S_{72}	.136364																				
S_{71}	.196023																				
S_{85}																					
S_{84}																					
S_{83}																					
S_{82}																					
S_{81}																					

TABLE XL (Continued)

Size in 1959	S_{55}	S_{54}	S_{53}	S_{52}	S_{51}	S_{65}	S_{64}	S_{63}	S_{62}	S_{61}	S_{75}	S_{74}	S_{73}	S_{72}	S_{71}	S_{85}	S_{84}	S_{83}	S_{82}	S_{81}
S_{00}						1														
S_{15}																				
S_{14}																.003794				
S_{13}																	.012057	.018947		
S_{12}																				
S_{11}																				
S_{25}																.013149				
S_{24}																.011398				
S_{23}																	.047712	.108082	.000974	
S_{22}																			.153153	.060060
S_{21}																				.021978
S_{35}																				
S_{34}																				
S_{33}																				
S_{32}																				
S_{31}																				
S_{45}																				
S_{44}																				
S_{43}																				
S_{42}																				
S_{41}																				
S_{55}	.440828																			
S_{54}		.527736	.165667													.014243				
S_{53}			.655786	.344214																
S_{52}				.748148	.251852															
S_{51}					1															
S_{65}						.734200														
S_{64}							.758680									.005452				
S_{63}								.908393									.028879	.060889		
S_{62}									.855102	.039796								.033673	.052041	.019388
S_{61}										1										
S_{75}											.862431									
S_{74}												.938527								
S_{73}													.891927							
S_{72}														.863636						
S_{71}															.803977					
S_{85}																.946536	.053464			
S_{84}																	.891454	.108546		
S_{83}																		.861035	.138965	
S_{82}																			.841146	.158854
S_{81}																				1

probability matrix [P] for the entire 1959 to 1969 period, the probabilities in corresponding cells for each time interval (1959 to 1968 and 1964 to 1969) are totaled and averaged. The [P] matrix is presented in Table XLI.

Projections of future farm numbers for consecutive five-year time intervals are obtained by post multiplying the initial vector of farm class-type distributions by the [P] matrix. The base year used as the initial vector in this study is 1969. For the second five year interval, the resultant vector of farm numbers is post multiplied by [P]. This process is continued for the desired number of time periods. The estimated farm numbers for different time periods are presented in Chapter IV.

Past studies by Krenz[3] and Sobering,[4] in which the Markov chain process was used to project farm numbers, employ rules governing transitions from a state S_i to a state S_j that appear to differ from the rules used in this study. The assumptions made in this study attempt to accommodate increasing and decreasing chains or number series. In addition, they recognize that farms do not move up only one class or state at a time and do not necessarily move out of farming rather than decrease in size. This line of reasoning follows somewhat from the 40-40-20 matrix approach in Daly's[5] work. In the final analysis, the assumptions made in this study regarding transitions in the Markov

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[3]Krenz, p. 78.

[4]Sobering, p. 109.

[5]Rex F. Daly, J. A. Dempsey, and C. W. Colb, "Farm Numbers and Sizes in the Future," in A. Gordon Ball and Earl O. Heady (ed.) Size, Structure and Future of Farms (Ames, 1972), p. 317.

TABLE XLI

TRANSITION PROBABILITY MATRIX, 1959-64-69

Size in 1959	S_{00}	S_{15}	S_{14}	S_{13}	S_{12}	S_{11}	S_{25}	S_{24}	S_{23}	S_{22}	S_{21}	S_{35}	S_{34}	S_{33}	S_{32}	S_{31}	S_{45}	S_{44}	S_{43}	S_{42}	S_{41}
S_{00}	.502279											.001862					.003227				
S_{15}	.053587	.871257										.004502									
S_{14}	.069988		.783723									.003095									
S_{13}	.044660			.811352	.021360	.007900							.004429	.003814	.006523						
S_{12}					.967701	.032298															
S_{11}						1.00															
S_{25}	.230822						.583190					.010190									
S_{24}	.203059							.422908				.009298	.011098								
S_{23}	.079844								.457139				.017527	.015092	.009737						
S_{22}										.540918					.004304	.0.0510					
S_{21}											.640696										
S_{35}												.6922727	.139014								
S_{34}													.672960	.29A960	.032079						
S_{33}														.708329	.233222	.058447					
S_{32}															.796550	.203449					
S_{31}																1.00					
S_{45}																	.319191	.337836	.008108		
S_{44}																		.164000	.461488	.046511	
S_{43}																			.238993	.761006	
S_{42}																				.255355	.744644
S_{41}																					1.00
S_{55}	.279586																				
S_{54}	.146177																				
S_{53}																					
S_{52}																					
S_{51}																					
S_{65}	.132900																				
S_{64}	.117934																				
S_{63}	.001920																				
S_{62}																					
S_{61}																					
S_{75}	.068784																				
S_{74}	.030736																				
S_{73}	.059036																				
S_{72}	.068182																				
S_{71}	.098011																				
S_{85}																					
S_{84}																					
S_{83}																					
S_{81}																					

TABLE XLI (Continued)

Size in 1959	S_{55}	S_{54}	S_{53}	S_{52}	S_{51}	S_{65}	S_{64}	S_{63}	S_{62}	S_{61}	S_{75}	S_{74}	S_{73}	S_{72}	S_{71}	S_{85}	S_{84}	S_{83}	S_{82}	S_{81}
S_{00}						.218845					.239225	.034559								
S_{15}						.070653														
S_{14}						.026192	.115104									.001897				
S_{13}								.033323	.052571								.066028	.009473		
S_{12}																				
S_{11}																				
S_{25}						.149222										.006574				
S_{24}								.348837								.005699				
S_{23}									.342276								.023856	.054041	.000487	
S_{22}										.283730									.076576	.063760
S_{21}										.258426										.100876
S_{35}						.168257														
S_{34}																				
S_{33}																				
S_{32}																				
S_{31}																				
S_{45}																				
S_{44}																				
S_{43}																				
S_{42}																				
S_{41}																				
S_{55}	.365827					.354586														
S_{54}		.495402	.082833				.230113	.038352								.007121				
S_{53}			.567259	.398803					.033936											
S_{52}				.642000	.357999															
S_{51}					1.00															
S_{65}						.472892	.394207													
S_{64}							.467274	.412065								.002726				
S_{63}								.501298	.390398	.062500							.013439	.030444		
S_{62}									.573133	.374313								.016836	.026020	.009694
S_{61}										1.00										
S_{75}											.431215	.463876	.036123							
S_{74}												.469263	.469195	.030804						
S_{73}													.445963	.500000						
S_{72}														.453978	.477839					
S_{71}															.901988					
S_{85}						.013380	.179137									.780750	.026732			
S_{84}								.130339									.803251	.066408		
S_{83}																		.876220	.123779	
S_{82}																			.878258	.121741
S_{81}																				1.00

process actually do not differ substantially from the assumptions made in other studies. Furthermore, several different sets of assumptions were initially used to make the Markov chain projections, and the end results indicated only slight variations in future farm numbers.

APPENDIX C

CENSUS DATA FOR OKLAHOMA FARMS BY ECONOMIC CLASS AND ENTERPRISE TYPE, 1969

TABLE XLII

TOTAL CAPITAL FOR REPRESENTATIVE OKLAHOMA FARMS, 1969

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	LB[a]	416,603	233,203	144,677	88,994	54,679
	ME[b]	42,661	24,250	15,258	9,495	5,791
	CC[c]	22,675	12,178	7,381	4,069	2,000
	TC[d]	481,939	269,631	167,317	102,558	62,470
Cotton	LB	386,153	192,664	101,556	57,150	35,818
	ME	41,480	21,225	12,681	7,215	4,362
	CC	22,411	9,358	5,590	2,763	1,104
	TC	450,044	223,247	119,827	67,128	41,284
Other Field Crop	LB	238,881	108,134	68,119	39,611	49,785
	ME	37,194	17,368	11,078	6,679	4,574
	CC	19,504	9,853	6,939	4,646	2,610
	TC	294,579	135,355	86,136	50,936	56,969
Poultry	LB	59,876	37,478	32,235	24,813	18,707
	ME	17,392	4,842	5,334	3,461	1,797
	CC	8,146	5,213	4,045	1,798	2,378
	TC	85,414	47,533	41,614	30,072	22,882
Dairy	LB	165,241	90,724	59,977	35,960	30,069
	ME	22,476	11,157	7,751	5,310	4,780
	CC	28,602	14,434	8,555	5,318	3,715
	TC	216,319	116,315	76,283	46,588	38,564
Livestock	LB	338,272	176,311	101,700	59,644	38,606
	ME	28,803	16,572	10,317	6,499	4,546
	CC	74,949	24,171	15,253	9,414	6,109
	TC	442,024	217,054	127,270	75,557	49,261
Livestock Ranches	LB	548,818	207,413	117,907	78,108	51,971
	ME	17,385	8,987	7,132	4,908	3,946
	CC	115,331	35,946	21,090	12,448	7,886
	TC	681,534	252,346	146,129	95,464	63,803
General	LB	374,592	190,472	115,199	72,175	48,609
	ME	36,053	19,993	12,927	8,107	5,482
	CC	29,171	16,083	9,763	5,768	3,293
	TC	439,816	226,548	137,889	86,050	57,384

[a]Value of land and buildings from 1969 Census of Agriculture for Oklahoma.

[b]Value of machinery and equipment from author's estimates.

[c]Value of cattle and calves from author's estimates.

[d]Total capital from sum of LB, ME and CC. The values of other livestock are used in the projection model but are not presented because they are only a small proportion of total capital.

TABLE XLIII

GROSS FARM INCOME FOR REPRESENTATIVE OKLAHOMA FARMS, 1969

Enterprise Type	Economic Class				
	I	II	III	IV	V
Cash Grain	$ 62,062	$26,923	$14,054	$7,249	$3,563
Cotton	76,574	27,058	14,060	7,315	2,805
Other Field Crop	61,771	27,951	14,618	7,336	3,642
Poultry	97,387	28,950	14,392	7,514	3,630
Dairy	65,921	29,047	15,095	7,308	3,875
Livestock	150,275	27,824	14,061	7,063	3,522
Livestock Ranches	146,553	27,284	13,820	6,960	3,459
General	65,053	27,515	14,261	7,256	3,574

TABLE XLIV

FARM OPERATING EXPENSES FOR REPRESENTATIVE OKLAHOMA FARMS, 1969

Enterprise Type	Economic Class				
	I	II	III	IV	V
Cash Grain	$ 45,345	$20,190	$10,633	$5,864	$3,840
Cotton	68,295	21,249	12,385	5,349	3,017
Other Field Crop	42,168	18,167	9,957	5,138	3,428
Poultry	86,159	27,884	13,788	8,209	4,832
Livestock	46,641	20,450	9,991	5,241	4,024
Livestock Ranches	132,245	23,880	12,320	6,151	4,297
General	48,395	20,959	10,982	5,994	4,047

TABLE XLV

NUMBER OF OKLAHOMA FARMS, 1969

Enterprise Type	Economic Class				
	I	II	III	IV	V
Cash Grain	333	1,344	2,667	3,054	2,613
Cotton	27	92	194	273	496
Other Field Crop	134	305	389	300	252
Poultry	230	151	78	41	36
Dairy	547	912	529	326	130
Livestock	1,522	2,399	3,788	5,365	6,466
Livestock Ranches	628	796	1,649	3,274	4,707
General	250	693	1,388	1,473	1,126

APPENDIX D

ALTERNATIVE PROJECTIONS FOR OKLAHOMA FARMS

TABLE XLVI

CASH INFLOWS FOR REPRESENTATIVE FARMS WITH NO CHANGE IN GOVERNMENT PROGRAM PAYMENTS AFTER 1969

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	72,134	33,140	18,087	11,648	9,180
	1980	84,520	35,747	18,901	13,419	12,194
	Δ	12,386	2,607	814	1,771	3,014
	% Δ	17.17	7.87	4.50	15.20	32.83
Cotton	1969	98,234	37,041	19,015	9,920	6,327
	1980	117,176	38,471	19,532	9,788	6,811
	Δ	18,942	1,430	517	-132	484
	% Δ	19.28	3.86	2.719	-1.33	7.65
Other Field Crop	1969	86,783	31,009	16,221	9,653	6,426
	1980	79,004	36,003	17,464	11,435	8,263
	Δ	12,221	4,994	1,243	1,782	1,837
	% Δ	18.30	16.10	7.66	18.46	28.59
Poultry	1969	102,791	31,209	18,830	10,176	9,089
	1980	123,658	33,200	20,062	12,156	12,752
	Δ	20,867	1,991	1,232	1,980	3,663
	% Δ	20.30	6.38	6.54	19.46	40.30
Dairy	1969	70,249	31,054	18,028	10,709	7,124
	1980	84,494	34,629	21,086	12,700	9,566
	Δ	14,245	3,575	3,058	1,991	2,442
	% Δ	20.28	11.51	16.96	18.59	34.28
Livestock	1969	162,938	34,054	19,588	12,942	9,614
	1980	237,001	35,814	22,415	16,814	13,728
	Δ	74,063	1,760	2,827	3,872	4,114
	% Δ	45.45	5.17	14.43	29.92	42.79
Livestock Ranches	1969	165,622	33,318	21,444	13,466	9,700
	1980	232,161	36,607	26,955	18,317	14,056
	Δ	66,539	3,289	5,511	4,851	4,114
	% Δ	40.17	9.87	25.70	36.02	44.91
General	1969	73,430	33,113	19,144	12,895	8,087
	1980	79,271	34,862	21,399	16,602	10,518
	Δ	5,841	1,749	2,255	3,707	2,431
	% Δ	7.95	5.28	11.78	28.75	30.06

TABLE XLVII

UNADJUSTED EQUITY CAPITAL FOR REPRESENTATIVE FARMS WITH NO CHANGE IN GOVERNMENT PROGRAM PAYMENTS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	435,956	234,358	146,486	87,029	56,674
	1980	568,619	275,811	165,185	99,250	68,856
	Δ	132,663	41,453	18,700	12,221	12,182
	% Δ	30.43	17.69	12.77	14.04	21.49
Cotton	1969	393,725	186,680	103,082	56.756	37,595
	1980	541,488	247,276	114,981	61,655	37,568
	Δ	147,763	60,596	11,899	4,899	-27
	% Δ	37.53	32.46	11.54	8.63	-.07
Other Field Crop	1969	271,843	115,712	74,054	41,748	47,216
	1980	382,657	167,524	90,005	49,138	46,294
	Δ	110,814	51,812	15,951	7,390	-922
	% Δ	40.76	44.78	21.54	17.70	-1.95
Poultry	1969	71,453	40,226	34,100	23,783	20,372
	1980	130,791	33,872	47,772	25,846	36,139
	Δ	59,338	6,354	13,672	2,063	15,767
	% Δ	83.04	15.80	40.09	8.67	77.40
Dairy	1969	200,262	106,169	65,395	38,990	34,654
	1980	367,778	144,888	90,416	53,387	39,133
	Δ	167,516	38,719	25,021	14,397	4,479
	% Δ	83.65	36.47	38.26	36.92	12.92
Livestock	1969	366,066	189,859	112,952	67,477	45,767
	1980	411,882	221,195	137,045	90,627	61,422
	Δ	45,816	31,336	24,093	23,150	15,655
	% Δ	12.52	16.50	21.33	34.31	34.21
Livestock Ranches	1969	582,451	233,036	142,189	85,902	58,620
	1980	764,483	265,637	182,403	113,212	72,911
	Δ	182,032	32,601	40,214	27,310	14,291
	% Δ	31.25	13.99	28.28	31.79	24.38
General	1969	391,150	197,974	120,633	72,521	51,230
	1980	549,744	243.898	146,703	95,573	55,811
	Δ	158,594	45,924	26,070	23,052	4,581
	% Δ	40.55	23.20	21.61	31.79	8.94

TABLE XLVIII

ADJUSTED EQUITY CAPITAL FOR REPRESENTATIVE FARMS WITH NO CHANGE IN GOVERNMENT PROGRAM PAYMENTS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	435,956	234,358	146,486	87,029	56,674
	1980	732,484	368,870	226,509	137,395	91,515
	Δ	296,528	134,512	80,023	50,366	34,841
	% Δ	68.02	57.40	54.63	57.87	61.48
Cotton	1969	393,725	186,680	103,082	56,756	37,595
	1980	705,306	328,546	163,590	86,177	53,327
	Δ	311,581	141,866	60,508	29,421	15,732
	% Δ	79.14	75.99	58.70	51.84	41.85
Other Field Crop	1969	271,843	115,712	74,054	41,748	47,216
	1980	514,891	214,384	113,194	65,010	82,547
	Δ	243,048	98,672	39,140	23,262	35,331
	% Δ	89.41	85.27	52.85	55.72	74.83
Poultry	1969	71,453	40,226	34,100	23,783	20,372
	1980	120,865	51,597	51,837	31,707	42,568
	Δ	49,412	11,371	17,737	7,924	22,196
	% Δ	69.15	28.27	52.01	33.3	108.95
Dairy	1969	200,262	106,169	65,395	38,990	34,654
	1980	386,051	160,439	105,730	62,765	52,330
	Δ	185,789	54,270	40,335	23,775	17,676
	% Δ	92.77	51.12	61.68	60.98	51.01
Livestock	1969	366,066	189,859	112,952	67,477	45,767
	1980	547,774	292,389	173,479	113,655	75,431
	Δ	181,708	102,530	60,527	46,178	29,664
	% Δ	49.64	54.00	53.59	68.44	64.82
Livestock Ranches	1969	582,451	233,036	142,189	85,902	58,620
	1980	943,948	338,069	225,132	147,820	99,617
	Δ	360,597	105,033	82,943	61,918	40,997
	% Δ	61.91	45.07	58.33	72.08	69.94
General	1969	391,150	197,974	120,633	72,521	51,230
	1980	652,569	315,942	195,123	128,405	82,516
	Δ	261,419	117,968	74,490	55,884	31,286
	% Δ	66.83	59.59	61.75	77.06	61.07

TABLE XLIX

UNADJUSTED NON-EQUITY CAPITAL FOR REPRESENTATIVE FARMS WITH NO CHANGE IN GOVERNMENT PROGRAM PAYMENTS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	59,256	40,417	24,930	18,773	7,827
	1980	155,323	128,148	88,049	54,940	22,601
	Δ	96,067	87,731	63,119	36,167	14,774
	% Δ	162.12	217.06	253.18	192.65	188.76
Cotton	1969	46,088	29,296	16,981	12,359	5,739
	1980	133,003	80,713	69,091	37,072	22,495
	Δ	86,915	51,417	52,110	24,713	16,756
	% Δ	188.58	175.51	306.87	199.96	291.97
Other Field Crop	1969	32,909	16,884	12,020	8,968	7,494
	1980	115,562	34,712	30,477	22,449	51,006
	Δ	82,653	17,828	18,457	13,481	43,512
	% Δ	251.16	105.59	153.55	150.32	580.62
Poultry	1969	8,590	7,625	5,455	5,761	2,985
	1980	-44,720	38,213	226	11,178	-4,131
	Δ	-53,310	30,588	-5,229	5,417	-7,116
	% Δ	-620.61	401.15	-95.86	94.03	-238.39
Dairy	1969	21,650	16,744	10,225	8,074	5,239
	1980	-111,414	1,768	4,498	4,027	16,767
	Δ	-133,064	-18,512	-5,727	-4,047	11,528
	% Δ	-614.61	-110.56	-56.01	-50.12	220.04
Livestock	1969	86,442	33,404	18,717	13,794	6,082
	1980	254,928	100,221	43,841	19,399	7,411
	Δ	168,486	66,817	25,124	5,605	1,329
	% Δ	194.91	200.03	134.23	40.63	21.85
Livestock Ranches	1969	132,862	42,692	23,697	18,076	8,316
	1980	191,796	100,819	36,514	34,018	27,388
	Δ	58,934	58,127	12,817	15,942	19,072
	% Δ	44.36	136.15	54.09	88.19	229.34
General	1969	51,190	33,394	19,792	14,834	7,573
	1980	39,416	85,524	58,809	32,368	34,378
	Δ	11,774	52,130	39,017	17,534	26,805
	% Δ	23.00	156.11	197.14	118.20	353.95

TABLE L

ADJUSTED NON-EQUITY CAPITAL FOR REPRESENTATIVE FARMS WITH NO CHANGE IN GOVERNMENT PROGRAM PAYMENTS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	59,256	40,417	24,930	18,773	7,827
	1980	-8,542	35,089	26,725	16,795	-58
	Δ	-67,798	-5,328	1,795	-1,978	-7,885
	% Δ	-114.42	-13.18	7.20	-10.54	-110.56
Cotton	1969	46,088	29,296	16,981	12,359	5,739
	1980	-30,815	-557	20,482	12,550	6,736
	Δ	-76,903	-29,853	3,501	191	997
	% Δ	-166.86	-101.90	20.62	1.55	17.37
Other Field Crop	1969	32,909	16,884	12,020	8,968	7,494
	1980	-16,672	-12,148	7,288	6,577	14,753
	Δ	-49,581	-29,032	-4,732	-2,391	7,259
	% Δ	-166.86	-101.90	-39.3	-26.6	96.8
Poultry	1969	8,590	7,625	5,455	5,761	2,985
	1980	-34,794	20,488	-3,839	5,317	-10,560
	Δ	-43,384	12,863	-9,294	-444	-13,545
	% Δ	-505.05	168.6	-170.38	-7.7	-453.77
Dairy	1969	21,650	16,744	10,225	8,074	5,239
	1980	-129,687	-17,319	-10,817	-5,351	3,570
	Δ	-151,337	-34,063	-21,042	-13,425	-1,669
	% Δ	-699.02	-203.43	-205.79	-166.27	-31.8
Livestock	1969	86,442	33,404	18,717	13,794	6,082
	1980	119,036	29,027	7,407	-3,629	-6,599
	Δ	32,594	-4,377	-11,310	-17,423	-12,681
	% Δ	37.7	-13.1	-60.4	-480.10	-208.50
Livestock Ranches	1969	132,862	42,692	23,697	18,076	8,316
	1980	13,231	28,387	-6,215	-591	682
	Δ	-119,631	-14,305	-29,912	-18,667	-7,634
	% Δ	-90.0	-33.5	-126.23	-103.27	-91.7
General	1969	51,190	33,394	19,792	14,834	7,573
	1980	-63,409	13,480	10,389	-464	7,673
	Δ	-114,599	-19,914	-9,403	-15,298	100
	% Δ	-223.87	-59.6	-47.5	-103.13	1.3

TABLE LI

AGGREGATE UNADJUSTED EQUITY CAPITAL WITH NO CHANGE IN GOVERNMENT PROGRAM PAYMENTS

Enterprise Type		Economic Class I	II	III	IV	V	Enterprise Type Totals
Cash Grain	1969	143,914,700	312,157,900	387,187,700	263,318,800	146,802,900	1,253,382,000
	1980	263,337,700	368,512,500	274,077,400	174,970,900	130,996,900	1,211,895,400
	Δ	119,423,000	56,354,600	-113,110,300	-88,347,900	-15,806,000	-41,486,600
	% Δ	82.98	18.05	-29.21	-33.55	-10.77	-3.31
Cotton	1969	10,539,940	17,022,840	19,820,090	15,350,460	18,483,080	81,216,410
	1980	5,337,314	6,331,098	4,063,091	2,602,360	5,716,039	24,049,902
	Δ	-5,202,626	-10,691,742	-15,756,999	-12,748,100	-12,767,041	-57,166,508
	% Δ	-49.36	-62.81	-79.50	-83.05	-69.07	-70.39
Other Field Crop	1969	36,115,200	34,983,320	28,551,520	12,408,250	11,793,280	123,851,570
	1980	127,024,300	66,740,000	30,662,350	10,097,740	8,492,830	243,017,220
	Δ	90,909,200	31,756,680	2,110,830	-2,210,510	-3,300,450	119,165,649
	% Δ	251.72	90.78	7.39	17.81	-27.99	96.22
Poultry	1969	16,293,750	6,018,985	2,636,270	965,853	726,964	26,641,822
	1980	551,165,400	1,652,160	802,745	482,978	1,538,162	59,641,445
	Δ	38,871,650	-4,366,825	-1,833,525	-482,875	811,198	32,999,623
	% Δ	238.57	-72.55	-69.55	-49.99	111.59	123.86
Dairy	1969	108,616,700	95,970,940	34,288,410	12,593,790	4,465,477	255,935,317
	1980	439,619,000	87,664,060	16,346,370	3,796,345	577,352	548,003,127
	Δ	331,002,300	-8,306,880	-17,942,040	-8,797,445	-3,888,125	292,067,810
	% Δ	304.74	-8.66	-52.33	-69.86	-87.07	114.12
Livestock	1969	551,895,200	451,384,300	424,056,300	358,687,700	293,370,600	2,079,394,100
	1980	1,811,279,000	819,100,600	660,787,900	482,639,800	299,147,700	4,072,955,000
	Δ	1,259,383,800	367,716,300	236,731,600	123,952,100	5,777,100	1,993,560,900
	% Δ	228.19	81.46	55.83	34.56	1.97	95.87
Livestock Ranches	1969	359,465,200	183,821,300	232,382,100	278,643,900	273,518,500	1,327,831,000
	1980	1,224,412,000	540,622,300	592,001,000	493,914,300	289,613,300	3,140,562,900
	Δ	864,946,800	356,801,000	359,618,900	215,270,400	16,094,800	1,812,731,900
	% Δ	240.62	194.10	154.75	77.26	5.88	136.52
General	1969	96,943,520	135,972,500	165,950,600	105,841,600	57,179,390	561,887,610
	1980	291,574,000	252,594,800	236,571,900	104,170,500	38,560,410	923,471,610
	Δ	194,630,480	116,622,300	70,621,300	-1,671,100	-18,618,980	361,584,000
	% Δ	200.77	85.77	42.56	-1.58	-32.56	64.35
Economic Class Totals	1969	1,323,784,210	1,237,332,085	1,294,872,990	1,047,810,353	806,340,191	5,710,139,829
	1980	4,217,748,714	2,143,217,518	1,815,312,756	1,272,674,923	774,642,693	10,223,596,604
	Δ	2,893,964,504	905,885,433	520,439,766	224,864,570	-31,697,498	4,513,456,775
	% Δ	218.61	73.21	40.19	21.46	-3.93	79.04

TABLE LII

AGGREGATE UNADJUSTED NON-EQUITY CAPITAL WITH NO CHANGE IN GOVERNMENT PROGRAM PAYMENTS

Enterprise Type		Economic Class I	II	III	IV	V	Enterprise Type Totals
Cash Grain	1969	143,914,700	312,137,900	387,187,700	263,318,800	146,802,900	1,253,382,000
	1980	340,354,000	494,979,800	377,654,000	243,440,200	174,775,600	1,631,203,600
	Δ	196,439,300	182,821,900	-9,533,700	-19,878,600	27,972,700	377,821,600
	% Δ	136.50	58.57	-2.46	-7.55	19.05	30.14
Cotton	1969	10,539,540	17,022,840	19,820,090	15,350,460	18,483,080	81,216,410
	1980	6,975,489	8,444,132	5,813,024	3,636,806	8,138,652	33,048,103
	Δ	-3,564,451	-8,578,708	-14,007,066	-11,693,654	-10,324,428	-48,168,307
	% Δ	-33.82	-50.40	-70.67	-76.18	-55.86	-59.31
Other Field Crop	1969	36,115,200	34,983,320	28,351,520	12,408,250	11,793,280	123,851,570
	1980	171,587,200	85,671,560	38,685,790	13,415,030	15,308,520	324,668,100
	Δ	135,472,000	50,688,240	10,134,270	1,006,780	3,515,240	200,816,530
	% Δ	375.11	144.89	35.49	8.11	29.81	162.14
Poultry	1969	16,293,750	6,018,985	2,636,270	965,853	726,964	26,641,822
	1980	50,946,800	2,538,414	871,849	594,338	1,814,579	56,765,980
	Δ	34,653,050	-3,480,571	-1,764,421	-371,515	1,087,615	30,124,158
	% Δ	212.68	-57.83	-66.93	-38.46	149.61	113.07
Dairy	1969	108,616,700	95,970,940	34,288,410	12,593,790	4,465,477	255,935,317
	1980	461,638,300	97,181,120	19,148,890	4,471,543	775,306	583,215,159
	Δ	353,021,600	1,210,180	-15,139,520	-8,122,247	-3,690,171	327,279,842
	% Δ	325.02	1.26	-44.15	-64.49	-82.64	127.88
Livestock	1969	551,895,200	431,384,300	424,056,300	358,687,700	293,370,600	2,079,394,100
	1980	2,420,211,000	1,087,215,000	839,165,400	607,016,400	368,272,600	5,321,880,400
	Δ	1,868,315,800	655,830,700	415,109,100	248,328,700	74,902,000	3,242,486,300
	% Δ	338.53	140.86	97.89	69.23	25.53	155.93
Livestock Ranches	1969	359,465,200	183,821,300	232,382,100	278,643,900	273,518,500	1,327,831,000
	1980	1,514,580,000	690,411,200	732,623,100	647,197,100	397,398,000	3,982,209,400
	Δ	1,155,114,800	506,589,900	500,241,000	368,553,200	123,879,500	2,654,378,400
	% Δ	321.34	275.59	215.27	132.27	45.29	199.90
General	1969	96,943,520	135,972,500	165,950,600	105,841,600	57,179,390	561,887,610
	1980	346,790,900	328,384,500	315,932,100	140,515,100	57,361,260	1,188,983,860
	Δ	249,847,380	192,412,000	149,981,500	34,673,500	57,179,390	561,887,610
	% Δ	257.72	141.51	90.38	32.76	0.32	111.61
Economic Class Totals	1969	1,323,784,210	1,237,332,085	1,294,872,990	1,047,810,353	806,340,191	5,710,139,829
	1980	5,313,083,689	2,794,825,726	2,329,894,153	1,660,306,517	1,023,864,517	13,121,974,602
	Δ	3,989,299,479	1,557,493,641	1,035,021,163	612,496,164	217,524,326	7,411,834,773
	% Δ	301.36	125.88	79.93	58.45	26.98	129.80

TABLE LIII

AGGREGATE ADJUSTED NON-EQUITY CAPITAL WITH NO CHANGE IN GOVERNMENT PROGRAM PAYMENTS

Enterprise Type		Economic Class I	II	III	IV	V	Enterprise Type Totals
Cash Grain	1969	19,732,190	54,320,800	66,488,970	57,331,200	20,451,800	218,324,760
	1980	73,001,880	174,153,700	148,715,300	98,816,940	43,865,720	538,153,530
	Δ	53,269,660	119,832,100	82,226,330	41,285,780	23,213,920	319,828,770
	% Δ	269.96	220.60	123.67	72.01	113.51	146.49
Cotton	1969	1,244,372	2,695,286	3,294,338	3,373,923	2,846,518	134,544,417
	1980	1,330,025	2,098,541	2,487,289	1,594,073	3,486,657	10,996,587
	Δ	85,653	-596,725	-807,049	-1,779,848	640,139	-2,457,830
	% Δ	6.88	-22.14	-24.50	-52.73	22.49	-18.27
Other Field Crop	1969	4,409,729	3,149,467	4,675,682	2,690,423	1,888,406	18,813,719
	1980	38,944,440	14,023,870	10,544,930	4,691,880	9,589,188	77,794,108
	Δ	34,934,701	8,874,203	5,869,248	2,001,433	7,700,782	58,980,389
	% Δ	783.13	172.33	125.53	74.39	407.79	313.50
Poultry	1969	1,875,628	1,151,368	425,471	236,206	107,470	3,896,143
	1980	-19,003,930	1,910,833	3,837	212,388	-177,647	2,126,860
	Δ	-20,981,338	759,267	-421,634	-23,818	-285,117	-1,769,283
	% Δ	-1,062.02	65.94	-99.10	-10.08	-265.30	-45.41
Dairy	1969	11,842,660	15,270,120	5,409,221	2,631,967	681,030	35,835,018
	1980	-134,253,400	-1,081,977	823,123	289,921	231,305	1,364,549
	Δ	-146,096,080	-16,352,097	-4,586,098	-2,342,046	-429,525	-34,470,469
	% Δ	-1,233.64	-107.09	-84.78	-88.98	-63.07	-96.19
Livestock	1969	131,365,100	80,135,440	70,898,800	74,003,120	39,325,520	395,927,980
	1980	1,142,332,000	377,430,700	214,644,300	104,776,000	36,567,720	1,875,750,720
	Δ	1,010,766,900	297,295,260	143,745,500	30,772,880	-2,757,800	1,479,822,740
	% Δ	768.26	370.99	202.75	41.58	-7.01	373.76
Livestock Ranches	1969	82,773,290	33,982,970	39,076,030	59,181,230	39,143,840	254,157,360
	1980	311,668,700	208,492,900	120,168,800	130,667,300	110,537,400	901,535,100
	Δ	228,895,410	174,509,930	81,092,770	91,486,070	71,393,560	647,377,740
	% Δ	276.53	513.52	207.53	154.59	182.39	254.72
General	1969	12,797,430	23,141,720	27,471,630	21,850,190	8,527,404	93,788,394
	1980	21,168,110	89,971,560	96,388,350	33,831,230	24,202,360	267,559,610
	Δ	8,368,680	66,829,840	68,916,720	13,981,040	15,674,956	173,771,216
	% Δ	65.39	288.79	250.87	63.99	183.83	185.28
Economic Class Totals	1969	288,340,449	215,848,951	217,740,142	221,298,261	112,971,988	1,034,197,791
	1980	1,588,443,125	888,081,705	593,775,949	396,879,734	229,300,550	3,675,218,064
	Δ	1,322,102,676	672,234,755	376,035,807	175,581,473	116,328,562	2,641,083,273
	% Δ	496.40	302.17	172.70	79.25	102.09	255.38

TABLE LIV

CASH INFLOWS FOR REPRESENTATIVE FARMS WITH ONE AND ONE-HALF TIMES THE HISTORICAL TREND IN SUPPLEMENTARY INCOME

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	72,134	33,140	18,087	11,648	9,180
	1980	93,898	40,510	21,772	15,784	14,669
	Δ	21,764	7,370	3,685	4,136	5,489
	% Δ	30.17	22.24	20.37	35.51	59.79
Cotton	1969	98,234	34,041	19,015	9,920	6,327
	1980	143,598	48,487	24,460	11,730	8,533
	Δ	45,364	11,446	5,445	1,810	2,206
	% Δ	46.18	30.90	28.64	18.25	34.87
Other Field Crop	1969	66,783	31,009	16,221	9,653	6,426
	1980	82,535	37,521	18,476	12,436	9,391
	Δ	15,752	6,512	2,255	2,783	2,965
	% Δ	23.59	21.00	13.90	28.83	46.14
Poultry	1969	102,791	31,209	18,830	10,176	9,089
	1980	125,259	34,064	21,762	13,223	14,826
	Δ	22,468	2,855	2,932	3,047	5,737
	% Δ	21.86	9.15	15.57	29.94	63.12
Dairy	1969	70,249	31,054	18,028	10,709	7,124
	1980	86,964	35,746	22,351	14,092	10,815
	Δ	16,715	4,692	4,323	3,383	3,691
	% Δ	23.79	15.11	23.98	31.59	51.81
Livestock	1969	162,938	34,054	19,588	12,942	9,614
	1980	242,655	39,230	25,143	19,339	16,071
	Δ	79,717	5,176	5,555	6,397	6,457
	% Δ	48.92	15.20	28.36	49.43	67.16
Livestock Ranches	1969	165,622	33,318	21,444	13,466	9,700
	1980	240,224	38,802	29,914	20,886	16,399
	Δ	74,602	5,484	8,470	7,420	6,699
	% Δ	45.04	16.46	39.50	55.10	69.06
General	1969	73,430	33,113	19,144	12,895	8,087
	1980	86,619	39,004	24,430	19,506	12,471
	Δ	13,189	5,891	5,286	6,611	4,384
	% Δ	17.96	17.79	27.61	51.27	54.21

TABLE LV

UNADJUSTED EQUITY CAPITAL FOR REPRESENTATIVE FARMS WITH ONE AND ONE-HALF TIMES THE HISTORICAL TREND IN SUPPLEMENTARY INCOME

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	435,956	234,358	146,486	87,029	56,674
	1980	597,649	287,061	170,757	104,446	74,922
	Δ	161,693	52,703	24,271	17,417	18,248
	% Δ	37.09	22.49	16.57	20.01	32.20
Cotton	1969	393,725	186,680	103,082	56,756	37,595
	1980	624,329	276,787	125,789	65,292	40,732
	Δ	230,604	90,107	22,707	8,536	3,137
	% Δ	58.57	48.27	22.03	15.04	8.34
Other Field Crop	1969	271,843	115,712	74,074	41,748	47,216
	1980	393,203	171,768	92,241	51,266	48,060
	Δ	121,360	56,056	18,187	9,518	844
	% Δ	44.64	48.44	24.56	22.80	1.79
Poultry	1969	71,453	40,226	34,100	23,783	20,372
	1980	135,440	38,082	52,011	28,075	41,714
	Δ	63.987	-2,144	17,911	4,292	21,342
	% Δ	89.55	-5.33	52.52	18.05	104.76
Dairy	1969	200,262	106,169	65,395	38,990	34,654
	1980	375,517	147,995	93,797	56,849	41,763
	Δ	175,255	41,826	28,402	17,859	7,109
	% Δ	87.51	39.40	43.43	45.80	20.51
Livestock	1969	366,066	189,859	112,952	67,477	45,767
	1980	427,925	229,720	144,120	97,444	67,525
	Δ	61,859	39,861	31,168	29,967	21,758
	% Δ	16.90	21.00	27.59	44.41	47.54
Livestock Ranches	1969	582,451	233,036	142,189	85,902	58,620
	1980	789,636	271,717	191,029	120,396	78,946
	Δ	207,185	38,681	48,840	34,494	20,326
	% Δ	35.57	16.60	34.35	40.16	34.67
General	1969	391,150	197,974	120,633	72,521	51,230
	1980	572,906	255,240	154,343	103,305	59,196
	Δ	181,756	57,266	33,710	30,784	8,686
	% Δ	46.47	28.93	27.94	42.45	16.95

TABLE LVI

UNADJUSTED NON-EQUITY CAPITAL FOR REPRESENTATIVE FARMS WITH ONE AND ONE-HALF TIMES THE HISTORICAL TREND IN SUPPLEMENTARY INCOME

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	59,256	40,417	24,930	18,773	7,827
	1980	126,293	116,898	82,477	49,744	16,535
	Δ	67,037	76,481	57,547	30,971	8,708
	% Δ	113.13	189.23	230.83	164.98	111.26
Cotton	1969	46,088	29,296	16,981	12,359	5,739
	1980	50,162	51,202	58,283	33,435	19,331
	Δ	4,074	21,906	41,302	21,076	13,592
	% Δ	8.84	74.77	243.22	170.53	236.84
Other Field Crop	1969	32,909	16,884	12,020	8,968	7,494
	1980	105,016	30,468	28,241	20,321	49,240
	Δ	72,017	13,584	16,221	11,353	41,746
	% Δ	219.11	80.45	134.95	126.59	557.06
Poultry	1969	8,590	7,625	-5,455	5,761	2,985
	1980	-49,369	34,003	-4,013	8,949	-9,706
	Δ	-57,959	26,378	-9,468	3,188	-12,691
	% Δ	-674.73	345.94	-173.57	55.34	-425.16
Dairy	1969	21,650	16,744	10,225	8,074	5,239
	1980	-119,153	-4,875	1,117	565	14,137
	Δ	-140,803	-21,619	-9,108	-7,509	8,898
	% Δ	-650.36	-139.11	-89.08	-93.00	169.84
Livestock	1969	86,442	33,404	18,717	13,794	6,082
	1980	238,885	91,696	36,766	12,582	1,308
	Δ	152,443	58,292	18,049	-1,212	-4,774
	% Δ	176.35	174.51	96.43	-8.79	-78.49
Livestock Ranches	1969	132,862	42,692	23,697	18,076	8,316
	1980	166,643	94,739	27,888	26,834	21,353
	Δ	33,781	52,047	4,191	8,758	13,037
	% Δ	25.43	121.91	17.69	48.45	156.77
General	1969	51,190	33,394	19,792	14,834	7,503
	1980	16,254	74,182	51,169	24,636	30,273
	Δ	-34,936	40,788	31,377	9,802	22,700
	% Δ	-68.25	122.14	158.53	66.08	299.75

TABLE LVII

ADJUSTED NON-EQUITY CAPITAL FOR REPRESENTATIVE FARMS WITH ONE AND ONE-HALF TIMES THE HISTORICAL TREND IN SUPPLEMENTARY INCOME

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	59,256	40,417	24,930	18,773	7,827
	1980	-37,572	23,839	21,153	11,600	-6,125
	Δ	-96,828	-16,578	3,777	7,173	-13,952
	% Δ	-163.41	-41.02	-15.15	-38.21	-178.25
Cotton	1969	46,088	29,296	16,981	12,359	5,739
	1980	-113,655	-30,069	9,673	8,913	3,572
	Δ	-159,743	-59,365	-7,308	-3,446	-2,167
	% Δ	-346.60	-202.64	-43.04	-27.88	-37.76
Other Field Crop	1969	32,909	16,884	12,020	8,968	7,494
	1980	-27,218	-16,393	5,052	4,449	12,986
	Δ	-60,127	-33,277	-6,968	-4,519	5,492
	% Δ	-182.71	-197.09	-57.97	-50.39	73.29
Poultry	1969	8,590	7,625	5,455	5,761	2,985
	1980	-39,443	16,277	-8,078	3,087	-16,135
	Δ	-48,033	8,652	-13,533	-2,674	-19,120
	% Δ	-559.17	113.47	-248.08	-46.42	-640.54
Dairy	1969	21,650	16,744	10,255	8,074	5,239
	1980	-137,426	-20,426	-14,197	-8,813	940
	Δ	-159,076	-37,170	-24,452	-16,887	-4.299
	% Δ	-734.76	-221.99	-238.44	-209.15	-82.06
Livestock	1969	86,442	33,404	18,717	13,794	6,082
	1980	102,993	20,503	333	-10,446	-12,702
	Δ	16,551	-12,901	-18,384	-24,240	-18,784
	% Δ	19.15	-38.62	-98.22	-175.73	-308.85
Livestock Ranches	1969	132,862	42,692	23,697	18,076	8,316
	1980	-11,922	22,307	-14,841	-7,775	-5,353
	Δ	-144,784	-20,385	-38,538	-25,851	-13,669
	% Δ	-108.97	-47.75	-162.63	143.01	-164.37
General	1969	51,190	33,394	19,792	14,834	7,573
	1980	-86,570	2,138	2,749	-8,196	3,567
	Δ	-137,760	-31,256	-17,043	-23,030	-4,006
	% Δ	-269.12	-93.60	-86.11	-155.25	-52.90

TABLE LVIII

AGGREGATE UNADJUSTED EQUITY CAPITAL WITH ONE AND ONE-HALF TIMES THE HISTORICAL TREND IN SUPPLEMENTARY INCOME

Enterprise Type		Economic Class I	II	III	IV	V	Enterprise Type Totals
Cash Grain	1969	143,914,700	312,157,900	387,187,700	263,318,800	146,802,900	1,253,382,000
	1980	276,981,700	383,802,300	283,488,700	184,297,300	142,716,800	1,271,286,800
	Δ	133,067,000	71,644,400	-103,699,000	-79,021,500	-4,086,100	17,904,800
	% Δ	92.46	22.95	-26.78	-30.01	-2.78	1.43
Cotton	1969	10,539,940	17,022,840	19,820,090	15,350,460	18,483,080	81,216,410
	1980	6,165,718	7,098,398	4,452,204	2,758,741	6,206,426	26,681,487
	Δ	-4,374,222	-9,924,442	-15,367,886	-12,591,719	-12,276,654	-54,534,923
	% Δ	-41.50	-58.30	-77.54	-82.03	-66.42	-67.15
Other Field Crop	1969	36,115,200	34,983,320	28,551,520	12,408,250	11,793,280	123,851,570
	1980	130,578,400	68,454,700	31,435,820	10,542,450	8,824,986	249,836,356
	Δ	94,463,200	33,471,380	2,884,000	-1,865,800	-2,968,294	125,984,786
	% Δ	261.56	95.68	10.10	-15.04	-25.17	101.72
Poultry	1969	16,293,750	6,018,985	2,636,270	965,853	726,964	26,641,822
	1980	57,141,230	1,862,672	874,806	525,344	1,777,882	62,181,934
	Δ	40,847,480	-4,156,313	-1,761,464	-440,509	1,050,918	35,540,112
	% Δ	250.69	-69.05	-66.82	-45.61	144.56	133.40
Dairy	1969	108,616,700	95,970,940	34,288,410	12,593,790	4,465,477	255,935,317
	1980	448,944,600	89,565,690	16,965,050	4,045,592	616,800	560,137,732
	Δ	340,327,900	-6,405,250	-17,323,360	-8,548,198	-3,848,677	304,202,415
	% Δ	313.33	-6.67	-50.52	-67.88	-86.19	118.86
Livestock	1969	551,895,200	451,384,300	424,056,300	368,687,700	293,370,600	2,079,394,100
	1980	1,883,167,000	851,203,300	695,426,300	519,459,800	329,260,000	4,278,516,400
	Δ	1,331,271,800	399,891,000	271,370,000	160,772,100	35,889,400	2,199,122,300
	% Δ	241.22	88.58	63.99	44.82	12.23	105.76
Livestock Ranches	1969	359,465,200	183,821,300	232,382,100	278,643,900	273,518,500	1,327,831,000
	1980	1,265,287,000	553,195,200	620,389,600	525,732,300	313,969,600	3,278,573,700
	Δ	905,821,800	369,373,900	388,007,500	247,088,400	40,451,100	1,950,742,700
	% Δ	251.99	200.94	166.97	88.68	14.79	146.91
General	1969	96,943,520	135,972,500	165,950,600	105,841,600	57,179,390	561,887,610
	1980	304,011,500	264,527,000	249,094,100	112,730,000	41,450,600	971,813,200
	Δ	207,067,980	128,554,500	83,143,500	6,888,400	-15,728,790	409,925,590
	% Δ	213.60	94.54	50.10	6.51	-27.51	72.96
Economic Class Totals	1969	1,323,784,210	1,237,332,085	1,294,872,990	1,047,810,353	806,340,191	5,710,139,829
	1980	4,372,277,148	2,219,709,260	1,902,126,580	1,360,091,527	844,823,094	10,699,027,609
	Δ	3,048,492,938	982,377,175	607,253,590	312,281,174	38,482,903	4,988,887,780
	% Δ	230.29	79.39	46.90	29.80	4.77	87.34

TABLE LIX

AGGREGATE UNADJUSTED NON-EQUITY CAPITAL WITH ONE AND ONE-HALF TIMES THE HISTORICAL TREND IN SUPPLEMENTARY INCOME

Enterprise Type		Economic Class I	II	III	IV	V	Enterprise Type Totals
Cash Grain	1969	19,732,190	54,320,600	66,488,970	57,331,200	20,451,800	218,324,760
	1980	59,357,550	15,886,400	139,304,200	89,290,700	31,945,960	335,784,810
	Δ	-13,794,640	-38,434,200	72,815,230	31,959,500	11,494,160	171,460,050
	% Δ	-69.91	-70.75	109.51	55.75	56.20	53.80
Cotton	1969	1,244,372	2,695,266	3,294,338	3,373,923	2,846,518	13,454,417
	1980	501,621	1,331,242	2,098,179	1,437,696	2,996,271	8,365,009
	Δ	-742,751	-4,364,024	-1,196,159	-1,936,227	149,753	-5,089,408
	% Δ	-59.69	-76.63	-36.31	-57.39	5.26	-37.83
Other Field Crop	1969	4,409,739	5,149,467	4,675,682	2,690,425	1,888,406	18,813,719
	1980	35,390,440	12,308,990	9,771,494	4,247,164	9,257,043	70,975,131
	Δ	30,980,701	7,159,532	5,095,812	1,556,739	7,368,637	52,161,412
	% Δ	702.55	139.03	108.99	57.86	390.20	277.25
Poultry	1969	1,975,628	1,151,368	425,471	236,206	107,470	3,896,143
	1980	-20,981,760	1,700,126	-68,224	170,022	-417,368	1,870,148
	Δ	-22,957,388	548,758	-493,695	-219,184	-524,838	-2,025,995
	% Δ	-1,162.03	47.66	-116.04	-92.79	-488.36	-52.00
Dairy	1969	11,842,680	15,270,120	5,409,221	2,631,967	681,030	35,835,018
	1980	-143,578,800	-2,983,576	204,434	40,674	212,057	457,165
	Δ	-155,421,480	-18,253,696	-5,204,787	-2,591,293	-468,973	-335,377,853
	% Δ	-1,312.38	-119.54	-96.22	-98.45	-68.86	-99.86
Livestock	1969	131,565,100	80,135,440	70,898,800	74,003,120	39,325,520	395,927,980
	1980	1,070,445,000	345,328,100	180,006,300	67,956,380	6,455,830	1,670,191,610
	Δ	938,879,900	265,193,660	109,107,500	-6,046,740	-332,869,690	1,274,263,630
	% Δ	713.62	330.03	153.89	-8.17	-98.10	321.84
Livestock Ranches	1969	82,773,290	33,982,970	39,076,030	59,181,230	39,143,840	254,157,360
	1980	270,794,200	195,919,900	91,780,430	118,849,700	86,181,200	763,525,430
	Δ	188,020,910	161,936,930	52,704,400	-47,296,260	47,037,360	409,368,070
	% Δ	227.15	476.52	134.88	-79.92	120.17	200.41
General	1969	12,797,450	23,141,720	27,471,630	21,850,190	8,527,404	93,788,394
	1980	8,728,632	78,039,390	83,866,280	27,271,840	21,312,220	219,218,362
	Δ	-4,068,818	54,897,670	56,394,650	5,421,650	12,784,816	125,429,968
	% Δ	-31.79	237.22	205.28	24.81	149.93	133.74
Economic Class Totals	1969	266,340,449	215,846,951	217,740,142	221,298,261	112,971,988	1,034,197,791
	1980	1,445,217,443	650,514,148	507,031,317	308,264,176	158,360,581	3,070,387,665
	Δ	1,178,876,994	434,667,197	289,291,175	87,965,915	45,388,593	2,036,189,874
	% Δ	442.62	201.38	132.86	39.75	40.18	196.89

TABLE LX

AGGREGATE ADJUSTED NON-EQUITY CAPITAL WITH ONE AND ONE-HALF TIMES THE HISTORICAL TREND IN SUPPLEMENTARY INCOME

Enterprise Type		Economic Class I	II	III	IV	V	Enterprise Type Totals
Cash Grain	1969	19,732,190	54,320,600	66,488,970	47,331,200	20,451,800	218,324,760
	1980	-17,658,970	32,396,840	35,727,720	20,821,420	-11,832,770	88,945,980
	Δ	-37,391,160	-21,923,760	-30,761,250	-36,509,780	-32,284,570	-129,378,780
	% Δ	-189.49	-40.36	-46.27	-63.68	-157.86	-59.26
Cotton	1969	1,744,372	2,695,266	3,294,338	3,373,923	2,846,518	13,454,417
	1980	-1,136,554	-786,797	348,244	383,248	553,658	1,285,150
	Δ	-2,380,926	-3,477,063	-2,946,094	-2,990,675	-2,292,860	-12,169,267
	% Δ	-191.84	-129.01	-89.43	-88.64	-80.55	-90.45
Other Field Crop	1969	4,409,739	5,149,467	4,675,682	2,690,425	1,888,406	18,813,719
	1980	-9,172,360	-6,622,595	1,748,056	929,880	2,441,344	5,119,280
	Δ	-1,358,099	-11,772,062	-2,927,626	-1,760,545	552,938	-13,694,439
	% Δ	-308.00	-228.61	-62.61	-65.44	29.28	-72.79
Poultry	1969	1,975,628	1,151,368	425,471	236,206	107,470	3,896,143
	1980	-16,763,160	813,872	-137,328	58,661	-693,785	872,533
	Δ	-18,738,788	-337,496	-562,799	-177,545	-801,255	-3,023,610
	% Δ	-948.50	-29.31	-132.28	-75.17	-745.56	-77.61
Dairy	1969	11,842,680	15,270,120	5,409,221	2,631,967	681,030	35,835,018
	1980	-165,598,200	-12,500,670	-2,598,108	-634,523	14,103	14,103
	Δ	-177,440,880	-27,770,790	-8,007,329	-3,266,490	-666,927	-35,820,915
	% Δ	-1,498.32	-181.86	-148.03	-124.11	-97.93	-99.96
Livestock	1969	131,565,100	80,135,440	70,898,800	74,003,120	39,325,520	395,927,980
	1980	461,512,700	77,213,820	1,628,532	-56,420,520	-62,669,200	540,355,052
	Δ	329,947,600	-2,921,620	-69,270,268	-130,423,640	-101,994,720	144,427,072
	% Δ	250.79	-3.65	-97.70	-176.24	-259.36	-36.48
Livestock Ranches	1969	82,773,290	33,982,970	39,076,030	59,181,230	39,143,840	254,157,360
	1980	-19,373,740	46,130,990	-48,841,520	-34,433,240	-21,603,690	46,130,990
	Δ	-102,147,030	12,148,020	-87,917,550	-93,614,470	-60,747,530	-208,026,370
	% Δ	-123.41	-35.75	-224.99	-158.18	-155.19	-81.85
General	1969	12,797,450	23,141,720	27,471,630	21,850,190	8,527,404	93,788,394
	1980	-46,488,140	2,248,978	4,505,611	-9,072,764	2,511,344	9,265,933
	Δ	-59,285,590	-20,892,742	-22,966,019	-30,922,954	-6,016,060	-84,522,461
	% Δ	-463.26	-90.28	-83.60	-141.52	-70.55	-90.12
Economic Class Totals	1969	266,340,449	216,345,951	217,740,142	221,298,261	112,971,988	1,034,197,791
	1980	461,512,700	158,804,500	43,958,163	22,193,209	5,520,449	691,989,021
	Δ	195,172,251	-57,042,451	-173,781,979	-199,105,052	-107,451,539	-342,208,770
	% Δ	73.28	-26.43	-79.81	-89.97	-95.11	-33.09

TABLE LXI

TOTAL CAPITAL FOR REPRESENTATIVE FARMS WITH TWICE THE HISTORICAL CENSUS APPRECIATION IN LAND AND BUILDINGS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	495,212	274,775	171,416	105,801	64,501
	1980	887,807	497,018	314,558	192,334	114,117
	Δ	392,595	222,243	143,142	86,533	49,616
	% Δ	79.28	80.88	83.51	81.79	76.92
Cotton	1969	439,813	215,976	120,063	69,115	43,334
	1980	838,309	409,260	232,681	123,249	75,822
	Δ	398,496	193,284	112,618	54,134	32,488
	% Δ	90.61	89.49	93.80	78.32	74.97
Other Field Crop	1969	304,751	132,595	86,074	50,716	54,710
	1980	630,453	249,096	143,671	87,459	133,554
	Δ	325,702	116,501	57,597	36,743	78,844
	% Δ	106.87	87,86	66.92	72.45	144.11
Poultry	1969	80,043	47,851	39,555	29,544	23,357
	1980	76,145	89,810	52,063	42,884	38,436
	Δ	-3,898	41,959	12,508	13,341	15,079
	% Δ	-4.87	87.69	31.62	45.16	64.56
Dairy	1969	221,912	122,913	75,620	47,064	39,893
	1980	274,637	158,671	110,229	66,792	69,097
	Δ	52,725	35,758	34,609	19,728	29,204
	% Δ	23.76	29.09	45.77	41.92	73.21
Livestock	1969	452,508	223,263	131,669	81,271	51,849
	1980	802,703	392,609	217,319	133,054	82,843
	Δ	350,195	169,346	85,650	51,783	30,994
	% Δ	77.39	75.85	65.05	63.72	59.78
Livestock Ranches	1969	715,313	275,728	165,886	103,978	66,936
	1980	1,134,844	438,888	261,646	181,839	127,005
	Δ	419,531	163,160	95,760	77,861	60,069
	% Δ	58.65	59.17	57.73	74.88	89.74
General	1969	442,340	231,368	140,425	87,355	58,803
	1980	691,985	401,466	253,932	160,773	116,895
	Δ	249,645	170,098	113,507	73,418	58,092
	% Δ	56.44	73.52	80.83	84.05	98.79

TABLE LXII

ADJUSTED EQUITY CAPITAL FOR REPRESENTATIVE FARMS
WITH TWICE THE HISTORICAL APPRECIATION
IN LAND AND BUILDINGS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	435,956	234,358	146,486	87,029	56,674
	1980	899,928	459,161	284,444	173,326	113,065
	Δ	463,972	224,803	137,958	86,297	56,391
	% Δ	106.43	95.92	94.18	99.16	99.50
Cotton	1969	393,725	186,680	103,082	56,756	37,595
	1980	927,452	427,317	216,199	111,105	68,611
	Δ	533,727	240,637	113,117	54,349	31,016
	% Δ	135.56	128.90	109.74	95.76	82.50
Other Field Crop	1969	271,843	115,712	74,054	41,748	47,216
	1980	637,231	257,600	134,863	79,174	114,050
	Δ	365,388	141,888	60,809	36,426	66,834
	% Δ	134.41	122.62	82.11	87.25	141.55
Poultry	1969	71,453	40,226	34,100	23,783	20,372
	1980	112,939	67,759	55,678	36,921	48,470
	Δ	41,486	27,533	21,578	13,138	28,098
	% Δ	58.06	68.45	63.28	55.24	137.92
Dairy	1969	200,262	106,169	65,395	38,990	34,654
	1980	405,964	175,698	119,939	71,334	63,893
	Δ	205,702	69,529	54,544	32,344	29,239
	% Δ	102.72	65.49	83.41	82.95	84.37
Livestock	1969	366,066	189,859	112,952	67,477	45,767
	1980	679,475	359,713	208,199	135,044	88,111
	Δ	313,409	169,854	95,247	67,567	42,344
	% Δ	85.62	89.46	84.33	100.13	92.52
Livestock Ranches	1969	582,451	233,036	142,189	85,902	58,620
	1980	1,099,579	401,638	262,833	178,077	122,897
	Δ	517,128	168,602	120,644	92,175	64,277
	% Δ	88.78	72.35	84.85	107.30	109.65
General	1969	391,150	197,974	120,633	72,521	51,230
	1980	763,959	389,184	242,522	159,454	106,698
	Δ	372,803	191,210	121,889	86,933	55,468
	% Δ	95.31	96.58	101.04	119,87	108.27

TABLE LXIII

UNADJUSTED NON-EQUITY CAPITAL FOR REPRESENTATIVE FARMS WITH TWICE THE HISTORICAL APPRECIATION IN LAND AND BUILDINGS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	59,256	40,417	24,930	18,773	7,827
	1980	292,570	210,891	144,140	89,934	43,186
	Δ	233,314	170,474	119,210	71,161	35,359
	% Δ	393.74	421.79	478.18	379.06	451.76
Cotton	1969	46,088	29,296	16,981	12,359	5,739
	1980	215,460	133,058	106,866	57,740	36,512
	Δ	169,372	103,762	89,885	45,381	30,773
	% Δ	367.50	354.18	529.33	367.19	536.21
Other Field Crop	1969	32,909	16,884	12,020	8,968	7,494
	1980	239,098	78,629	51,926	37,798	86,914
	Δ	206,189	61,745	39,906	28,830	79,420
	% Δ	626.54	365.70	332.00	321.48	1,059.78
Poultry	1969	8,590	7,625	5,455	5,761	2,985
	1980	-55,251	55,009	3,943	16,862	1,919
	Δ	-63,841	47,384	-1,512	11,101	-1,066
	% Δ	-743.20	621.43	-27.72	192.69	-35.71
Dairy	1969	21,650	16,744	10,225	8,074	5,239
	1980	-97,349	11,888	18,766	12,895	29,742
	Δ	-118,999	-4,856	8,541	4,821	24,503
	% Δ	-549.65	-29.00	83.53	59.71	467.70
Livestock	1969	86,442	33,404	18,717	13,794	6,082
	1980	375,906	165,274	76,865	40,829	20,782
	Δ	289,464	131,870	58,148	27,035	14,700
	% Δ	334.86	394.77	310.67	195.99	241.70
Livestock Ranches	1969	132,862	42,692	23,697	18,076	8,316
	1980	367,289	171,930	78,264	68,113	53,765
	Δ	234,427	129,238	54,567	50,037	45,449
	% Δ	176.44	302.72	230.27	276.81	546.52
General	1969	51,190	33,394	19,792	14,834	7,573
	1980	119,218	146,242	101,443	62,365	59,853
	Δ	68,028	112,848	81,651	47,531	52,280
	% Δ	132.89	337,93	412.55	320.42	690.35

TABLE LXIV

ADJUSTED NON-EQUITY CAPITAL FOR REPRESENTATIVE FARMS
WITH TWICE THE HISTORICAL APPRECIATION
IN LAND AND BUILDINGS

Enterprise Type		Economic Class I	II	III	IV	V
Cash Grain	1969	59,256	40,417	24,930	18,773	7,827
	1980	-12,121	37,857	30,114	19,009	1,052
	Δ	-71,377	-2,560	5,184	236	-6,775
	% Δ	-120.46	-6.33	20.79	1.26	-86.56
Cotton	1969	46,088	29,296	16,981	12,359	5,739
	1980	-89,143	-18,057	16,482	12,144	7,211
	Δ	-135,231	-47,353	-499	-215	1,472
	% Δ	-293.42	-161.64	-2.94	-1.74	25.65
Other Field Crop	1969	32,909	16,884	12,020	8,968	7,494
	1980	-6,778	-8,504	8,808	8,286	19,504
	Δ	-39,687	-25,388	-3,212	-682	12,010
	% Δ	-120.60	-150.37	-26.72	-7.60	160.26
Poultry	1969	8,590	7,625	5,455	5,761	2,985
	1980	-36,794	22,051	-3,615	5,964	-10,034
	Δ	-45,384	14,426	-9,070	203	-13,019
	% Δ	-528.34	189.19	-160.27	3.52	-436.15
Dairy	1969	21,650	16,744	10,225	8,074	5,239
	1980	-131,326	-17,027	- 9,710	- 4,542	5,204
	Δ	-152,976	-33,771	-19,935	-12,616	35
	% Δ	-706.59	-201.69	-194.96	-156.25	.67
Livestock	1969	86,442	33,404	18,717	13,794	6,082
	1980	123,228	32,897	9,121	-1,990	-5,268
	Δ	36,786	-507	-9,596	-15,784	-11,350
	% Δ	42.56	-1.52	-51.27	-114.43	-186.62
Livestock Ranches	1969	132,862	42,692	23,697	18,076	8,316
	1980	35,265	37,250	-1,187	3,761	4,108
	Δ	-97,597	-5,442	-24,884	-14,315	-4,208
	% Δ	-73.46	-12.75	-105.01	-79.19	-50.60
General	1969	51,190	33,394	19,792	14,834	7,573
	1980	-71,974	12,283	11,411	1,318	10,197
	Δ	-123,164	-21,111	-8,381	-13,516	2,624
	% Δ	-240.60	-63.22	-42.35	-91.12	34.65

TABLE LXV

AGGREGATE ADJUSTED TOTAL CAPITAL WITH TWICE THE HISTORICAL APPRECIATION IN LAND AND BUILDINGS

Enterprise Type		Economic Class I	II	III	IV	V	Enterprise Type Totals
Cash Grain	1969	164,905,500	369,297,400	457,166,300	323,116,000	168,541,100	1,483,026,300
	1980	417,269,200	675,447,500	531,288,500	345,240,000	220,473,400	2,189,718,600
	Δ	252,363,700	306,150,100	74,122,200	22,124,000	51,932,300	706,692,300
	% Δ	153.04	82.90	16.21	6.85	30.81	47.65
Cotton	1969	11,874,950	19,869,790	23,292,200	18,868,380	21,493,660	95,398,980
	1980	8,383,088	10,640,750	8,376,527	5,299,707	11,752,370	44,452,442
	Δ	-3,491,862	-9,229,040	-14,915,673	-13,568,673	-9,741,290	-50,946,538
	% Δ	-29.41	-46.45	-64.04	-71.91	-45.32	-53.40
Other Field Crop	1969	40,836,620	40,441,470	33,482,780	15,214,800	13,786,920	143,762,590
	1980	212,462,600	100,634,900	49,710,200	18,278,970	25,108,080	406,194,750
	Δ	171,625.980	60,193,430	16,227,420	3,064,170	11,321,160	262,432,160
	% Δ	420.27	148.84	48.46	20.14	82.12	182.55
Poultry	1969	18,409,880	7,225,501	3,085,290	1,211,304	840,852	30,772,827
	1980	32,361,590	4,490,503	885,070	814,817	1,652,761	40,204,731
	Δ	13,951,700	-2,734,998	-2,200,220	-406,497	811,090	9,431,904
	% Δ	75.79	-37.85	-71.31	-33.56	96.56	30.65
Dairy	1969	121,385,800	112,096,600	40,002,970	15,342,860	5,186,090	294,014,320
	1980	330,937,800	97,106,520	20,171,800	4,809,006	1,036,454	454,061,580
	Δ	209,552,000	-14,990,080	-19,831,170	-10,533,854	-4,149,636	160,047,260
	% Δ	172.63	-13.37	-49.57	-68.66	-80.01	54.44
Livestock	1969	688,717,000	535,607,800	498,761,900	436,018,600	335,255,500	2,494,360,800
	1980	3,596,909,000	1,478,566,000	1,063,995,000	718,626,500	408,746,400	7,266,842,900
	Δ	2,908,192,000	942,958,200	565,233,100	282,607,900	73,490,900	4,772,482,100
	% Δ	422.26	176.05	113.33	64.82	21.92	191.33
Livestock Ranches	1969	445,639,900	219,479,400	273,545,900	340,423,900	315,067,600	1,594,156,700
	1980	1,844,121,000	907,620,000	861,077,700	805,363,900	512,591,100	4,930,773,700
	Δ	1,398,481,100	688,140,600	587,531,800	464,940,000	197,523,500	3,336,617,000
	% Δ	313.81	313.53	214.78	136.58	62.69	209.30
General	1969	110,584,900	160,338,000	194,909,800	128,673,900	66,212,170	660,718,770
	1980	37,584,900	422,342,300	416,194,800	177,975,200	82,293,900	1,470,401,700
	Δ	261,010,600	262,004,300	221,285,000	49,301,300	16,081,730	809,682,930
	% Δ	236.03	163.41	113.53	38.31	24.29	122.55
Economic Class Totals	1969	1,602,354,500	1,464,355,961	1,524,247,140	1,278,869,744	926,383,892	6,796,211,287
	1980	6,814,039,768	3,696,848,473	2,951,699,597	2,076,408,100	1,263,654,465	16,802,650,403
	Δ	5,211,785,218	2,232,492,512	1,427,452,457	797,638,356	337,270,573	10,006,439,116
	% Δ	325.25	152.46	93.65	62.36	36.41	147.24

TABLE LXVI

AGGREGATE ADJUSTED EQUITY CAPITAL WITH TWICE THE HISTORICAL APPRECIATION IN LAND AND BUILDINGS

Enterprise Type		Economic Class I	II	III	IV	V	Enterprise Type Totals
Cash Grain	1969	143,914,700	312,157,900	398,187,700	263,318,800	146,802,900	1,253,382,000
	1980	418,166,700	616,231,400	474,315,500	307,148,500	215,905,000	2,031,767,100
	Δ	274,252,000	304,073,500	87,127,800	43,829,700	69,102,100	778,385,100
	% Δ	190.57	97.41	22.50	16.65	47.07	62.10
Cotton	1969	10,639,940	17,022,840	19,820,090	15,350,460	18,483,080	81,216,410
	1980	9,178,106	10,987,870	7,686,834	4,716,568	10,499,570	43,068,948
	Δ	-1,361,834	-6,034,970	-12,133,256	-10,633,892	-7,983,510	-38,147,462
	% Δ	-12.92	-35.45	-61.22	-43.19	-43.19	-46.97
Other Field Crop	1969	36,155,200	34,983,320	28,551,520	12,408,250	11,793,280	123,851,570
	1980	212,303,300	102,913,000	46,090,940	16,337,090	21,152,570	398,796,900
	Δ	176,188,100	67,929,680	17,539,420	3,928,840	9,359,290	274,945,330
	% Δ	487.85	194.18	61.43	31.66	79.36	222.00
Poultry	1969	16,293,750	6,018,985	2,636,270	965,853	726,964	26,641,822
	1980	47,626,810	3,336,325	936,353	692,129	2,065,198	54,656,815
	Δ	31,333,060	-2,682,660	-1,699,917	-273,724	1,338,234	28,014,993
	% Δ	192.30	-44.57	-64.48	-28.34	184.09	105.15
Dairy	1969	108,616,700	95,970,940	34,288,410	12,593,790	4,465,477	255,935,317
	1980	485,379,800	106,410,200	21,716,780	5,080,737	946,480	619,533,997
	Δ	376,763,100	10,439,260	-12,571,630	-7,513,053	-3,518,995	363,598,680
	% Δ	346.87	10.88	-36.66	-59.66	-78.80	142.07
Livestock	1969	551,895,200	451,384,300	424,056,300	358,687,700	293,370,600	2,079,394,100
	1980	3,003,369,000	1,337,674,000	1,007,104,000	721,109,200	430,039,800	6,499,286.000
	Δ	2,451,463,800	886,289,700	583,047,700	362,421,500	136,669,200	4,419,891,900
	% Δ	444.19	196.35	137.49	101.04	46.59	212.56
Livestock Ranches	1969	359,465,200	183,821,300	232,382,100	278,643,900	273,518,500	1,327,831,000
	1980	1,765,607,000	820,148,400	855,079,900	779,442,100	490,116,800	4,710,394,200
	Δ	1,406,141,800	636,327,100	622,697,800	500,798,200	216,598,300	3,382,563,200
	% Δ	391.18	346.17	267.96	179.73	79.19	254.74
General	1969	96,943,520	135,972,500	165,950,600	105,841,600	57,179,390	561,887,610
	1980	405,971,900	404,563,400	392,706,000	174,468,900	74,169,080	1,451,879,280
	Δ	309,028,380	268,590,900	226,744,500	68,627,300	16,989,690	889,991,670
	% Δ	318.77	197.53	136.64	64.84	29.71	158.39
Economic Class Totals	1969	1,323,784,210	1,237,332,085	1,294,872,990	1,047,810,353	806,340,191	5,710,139,829
	1980	6,347,592,616	3,402,264,595	2,805,636,307	2,008,995,224	1,244,894,498	15,809,383,240
	Δ	5,023,808,406	2,164,932,510	1,510,763,317	916,184,871	438,554,307	10,099,243,411
	% Δ	379.50	174.97	116.67	91.73	54.39	176.87

TABLE LXVII

AGGREGATE UNADJUSTED EQUITY CAPITAL WITH TWICE THE HISTORICAL APPRECIATION IN LAND AND BUILDINGS

Enterprise Type		Economic Class I	II	III	IV	V	Enterprise Type Totals
Cash Grain	1969	19,732,190	54,320,600	66,488,970	57,331,200	20,451,800	218,324,760
	1980	137,507,900	286,601,200	243,472,700	161,432,300	8,343,730	837,337,830
	Δ	117,775,710	232,280,600	176,963,730	104,101,100	-12,108,070	619,013,070
	% Δ	596.87	427.61	266.16	181.58	-59.20	283.53
Cotton	1969	1,244,372	2,695,266	3,294,338	3,373,923	2,846,518	13,454,417
	1980	2,154,598	3,459,495	3,847,189	2,482,828	5,659,426	17,603,536
	Δ	910,226	764,229	552,851	-891,095	2,812,908	4,149,119
	% Δ	73.15	28.35	16.78	-26.41	98.82	30.84
Other Field Crop	1969	4,409,739	5,149,467	4,675,682	2,690,425	1,888,406	18,813,719
	1980	80,576,060	31,766,930	17,966,350	7,899,853	16,339,840	154,548,033
	Δ	76,166,321	26,616,463	13,290,668	5,209,428	14,451,434	135,734,314
	% Δ	1,727.23	516.88	284.25	193.63	765.27	721.46
Poultry	1969	1,975,628	1,151,368	425,471	236,206	107,470	3,896,143
	1980	-23,481,450	2,750,432	67,031	320,382	82,523	3,220,368
	Δ	-25,457,078	1,599,064	-358,440	84,176	-24,947	-675,775
	% Δ	-1,288.56	138.88	-84.25	35.64	-23.21	-17.34
Dairy	1969	11,842,680	15,270,120	5,409,221	2,631,967	681,030	35,835,018
	1980	-117,305,300	7,275,570	3,434,086	928,425	446,130	12,084,211
	Δ	-129,147,900	-7,994,550	-1,975,135	-1,703,542	-234,900	-23,750,807
	% Δ	-1,090.54	-52.35	-36.51	-64.73	-34.49	-66.28
Livestock	1969	131,565,100	80,135,440	70,898,800	74,003,120	39,325,520	395,927,980
	1980	1,684,435,000	622,420,200	376,329,400	220,518,000	102,536,100	3,006,238,700
	Δ	1,552,869,900	542,284,760	305,430,600	146,415,880	63,210,580	2,610,310,720
	% Δ	1,180.31	676.71	430.80	197.98	160.74	659.29
Livestock Ranches	1969	82,773,290	33,982,970	39,076,030	59,181,230	39,143,840	254,157,360
	1980	596,843,700	355,550,700	257,567,200	301,672,400	216,993,700	1,728,627,700
	Δ	514,070,410	321,567,730	218,491,170	242,491,170	177,849,860	1,474,470,340
	% Δ	621.06	946.26	559.14	409.74	454.35	580.14
General	1969	12,797,450	23,141,720	27,471,630	21,850,190	8,527,404	93,788,394
	1980	64,019,880	153,846,100	166,265,400	69,038,520	42,136,680	495,306,580
	Δ	51,222,430	130,704,380	138,793,770	47,188,330	33,609,276	401,518,186
	% Δ	400.25	564.80	505.23	215.96	394.13	428.11
Economic Class Totals	1969	266,340,449	215,846,951	217,740,142	221,298,261	112,971,988	1,034,197,791
	1980	2,565,537,139	1,463,669,627	1,068,929,356	764,292,708	392,538,129	6,254,966,958
	Δ	2,299,196,689	1,247,822,676	851,189,214	542,994,447	279,566,141	5,220,769,167
	% Δ	863.25	578.11	390.92	245.37	247.46	504.81

TABLE LXVIII

AGGREGATE ADJUSTED NON-EQUITY CAPITAL WITH TWICE THE HISTORICAL APPRECIATION IN LAND AND BUILDINGS

Enterprise Type		Economic Class I	II	III	IV	V	Enterprise Type Totals
Cash Grain	1969	19,732,190	54,320,600	66,488,970	57,331,200	20,451,800	218,324,760
	1980	-5,696,664	51,448,080	50,862,750	34,120,700	2,032,826	139,464,356
	Δ	-25,428,854	-2,872,520	-15,626,220	286,789,500	-18,418,974	-79,860,404
	% Δ	-128.87	-5.29	-23.50	500.23	-90.06	-36.58
Cotton	1969	1,244,372	2,695,266	3,294,338	3,373,923	2,846,518	13,454,417
	1980	-891,429	-469,492	593,359	522,189	1,117,637	2,233,185
	Δ	-2,135,801	-3,164,758	-2,700,979	-2,851,734	-1,728,881	-11,221,232
	% Δ	-171.64	-117.42	-81.99	-84.52	-60.74	-83.40
Other Field Crop	1969	4,409,739	5,149,467	4,675,682	2,690,425	1,888,406	18,813,719
	1980	-2,284,059	-3,435,439	3,047,568	1,731,669	3,666,740	8,445,977
	Δ	-6,693,798	-8,584,906	-1,628,114	-958,756	1,778,334	-10,367,742
	% Δ	-151.80	-166.71	-34.82	-35.64	94.17	-55.11
Poultry	1969	1,975,628	1,151,368	425,471	236,206	102,470	3,896,143
	1980	-15,637,420	1,102,534	-61,462	113,317	-431,477	1,215,851
	Δ	-17,613,048	-48,834	-486,933	-122,889	-538,917	-2,680,292
	% Δ	-891.52	-4.24	-114.45	-52.03	-501.46	-68.79
Dairy	1969	11,842,680	15,270,120	5,409,221	2,631,967	681,030	35,835,018
	1980	-158,248,100	-10,420,480	-1,776,975	-327,038	78,055	78,055
	Δ	-170,090,700	-25,690,600	-7,186,196	-2,959,005	-602,975	-35,756,963
	% Δ	-1,436.26	-168.24	-132.85	-112.43	-88.54	-99.78
Livestock	1969	131,565,440	80,135,440	70,898,800	74,003,120	39,325,520	395,927,980
	1980	552,184,300	123,888,400	44,654,270	-10,747,310	-25,994,460	720,726,970
	Δ	420,619,200	43,752,960	-26,244,530	-84,750,430	-65,319,980	324,798,990
	% Δ	319.70	54.60	-37.02	-114.52	-166.10	82.03
Livestock Ranches	1969	82,773,290	33,982,970	39,076,030	59,181,230	39,143,840	254,157,360
	1980	57,305,610	77,032,990	-3,905,182	16,659,400	16,579,130	167,577,130
	Δ	-25,467,680	43,050,020	-42,981,212	-42,521,830	-22,564,710	-86,580,230
	% Δ	-30.77	126.68	-109.99	-71.85	-57.65	-34.07
General	1969	12,797,450	23,141,720	27,471,630	21,850,190	8,527,404	93,788,394
	1980	-38,650,120	12,921,450	18,702,110	1,459,510	7,178,380	40,261,450
	Δ	-51,447,570	-10,220,270	-8,769,520	-20,390,680	-1,349,024	-53,526,944
	% Δ	-402.01	-44.16	-31.92	-93.32	-15.82	-57.07
Economic Class Totals	1969	266,340,449	215,846,951	217,740,142	221,298,261	112,971,988	1,034,197,791
	1980	609,489,910	266,393,454	117,860,057	54,606,785	30,652,768	1,079,002,974
	Δ	343,149,461	50,546,503	-99,880,085	-166,691,476	-82,319,220	44,805,183
	% Δ	128.84	23.42	-45.87	-75.32	-72,87	4.33

VITA

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