Economic aspects of the family farm unit

George M. Beal
Iowa State College

Follow this and additional works at: https://lib.dr.iastate.edu/rtd

Part of the Agricultural and Resource Economics Commons, Agricultural Economics Commons, and the Economics Commons

Recommended Citation
Beal, George M., "Economic aspects of the family farm unit" (1947). Retrospective Theses and Dissertations. 16456.
https://lib.dr.iastate.edu/rtd/16456

This Thesis is brought to you for free and open access by the Iowa State University Capstones, Theses and Dissertations at Iowa State University Digital Repository. It has been accepted for inclusion in Retrospective Theses and Dissertations by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.
ECONOMIC ASPECTS OF THE FAMILY FARM UNIT

by

George M. Seal

A Thesis Submitted to the Graduate Faculty for the Degree of
MASTER OF SCIENCE
Major Subject: Agricultural Economics

Iowa State College
1947

Signatures have been redacted for privacy
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>REVIEW OF LITERATURE</td>
<td>5</td>
</tr>
<tr>
<td>THE &quot;FAMILY TYPE FARM&quot; DEFINED</td>
<td>14</td>
</tr>
<tr>
<td>A Theoretical Definition</td>
<td>14</td>
</tr>
<tr>
<td>Developing a Practical Definition</td>
<td>18</td>
</tr>
<tr>
<td>A Practical Definition</td>
<td>32</td>
</tr>
<tr>
<td>THE STATIC THEORY OF THE FIRM</td>
<td>37</td>
</tr>
<tr>
<td>ECONOMIC EVALUATION OF THE FAMILY TYPE AND LARGE SCALE FARMS</td>
<td></td>
</tr>
<tr>
<td>Large Scale Farms Defined</td>
<td>43</td>
</tr>
<tr>
<td>Basis of Economic Evaluation</td>
<td>45</td>
</tr>
<tr>
<td>Entrepreneurship</td>
<td>45</td>
</tr>
<tr>
<td>Labor</td>
<td>56</td>
</tr>
<tr>
<td>Importance of labor as a factor of production</td>
<td>56</td>
</tr>
<tr>
<td>Labor efficiencies</td>
<td>57</td>
</tr>
<tr>
<td>Effects of organized labor</td>
<td>62</td>
</tr>
<tr>
<td>Labor force adjustment to change</td>
<td>66</td>
</tr>
<tr>
<td>Capital</td>
<td>68</td>
</tr>
<tr>
<td>Importance of capital as a factor of production</td>
<td>68</td>
</tr>
<tr>
<td>Risk, a limiting factor on size</td>
<td>73</td>
</tr>
<tr>
<td>Capital rationing</td>
<td>77</td>
</tr>
<tr>
<td>Capital drain from agriculture</td>
<td>83</td>
</tr>
<tr>
<td>Conservation</td>
<td>86</td>
</tr>
<tr>
<td>Returns to Scale</td>
<td>91</td>
</tr>
<tr>
<td>Research studies relating to efficiencies of scale, R.D. Jennings</td>
<td>91</td>
</tr>
<tr>
<td>F.E. Johnson and H.C.M. Case</td>
<td>93</td>
</tr>
<tr>
<td>D. Curtis Minford, Jr.</td>
<td>96</td>
</tr>
<tr>
<td>John A. Hopkins, Jr.</td>
<td>97</td>
</tr>
<tr>
<td>Louis J. Ducoff and Margaret Jarman Higood</td>
<td>98</td>
</tr>
<tr>
<td>Earl O. Heady</td>
<td>98</td>
</tr>
<tr>
<td>J. Karl Lee</td>
<td>101</td>
</tr>
<tr>
<td>Indivisibilities and scale of operation</td>
<td>103</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Page</td>
</tr>
<tr>
<td>-------------</td>
<td>------</td>
</tr>
<tr>
<td>Coordinating ability and adjustment to change</td>
<td>107</td>
</tr>
<tr>
<td>The theory of the flexibility of the firm</td>
<td>109</td>
</tr>
<tr>
<td>Flexibilities and &quot;fixed&quot; costs</td>
<td>113</td>
</tr>
<tr>
<td>The steadiness of agricultural production</td>
<td>117</td>
</tr>
<tr>
<td>Adjustment to change</td>
<td>119</td>
</tr>
<tr>
<td><strong>COnFLICT--ECONOMIC, SOCIAL AND POLITICAL</strong></td>
<td>121</td>
</tr>
<tr>
<td>Social and Political Characteristics of the Family</td>
<td>124</td>
</tr>
<tr>
<td>Farm</td>
<td>124</td>
</tr>
<tr>
<td>Immediate Research Needs</td>
<td>129</td>
</tr>
<tr>
<td><strong>SUMMARY</strong></td>
<td>130</td>
</tr>
<tr>
<td><strong>ACKNOWLEDGEMENT</strong></td>
<td>134</td>
</tr>
<tr>
<td><strong>LITERATURE CITED</strong></td>
<td>135</td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table 1. Labor productivity of different size farm enterprises ........................................... 27

Table 2. Adapted from family-sized farm, No. Ill, South Central Dairy-Hog, Cornbelt Region, Minnesota. 29

Table 3. Family and/or hired labor working on farms the equivalent of 2 or more days during the weeks of March 24-30 and September 24-30, 1939 .... 35

Table 4. Family labor working on farms the equivalent of 2 or more days during the weeks of March 24-30 and September 24-30, 1939 .................... 36

Table 5. Estimated relative share of gross income in agriculture imputed to land, labor and capital and management ........................................ 56

Table 6. Distribution of total value of agricultural products by type of product, for value groups of farms, United States, 1939 ....................... 63

Table 7. Estimated capital employed in production and distribution, 1935 .......................... 70

Table 8. Capital utilization and returns by regions ... 71

Table 9. Net returns by value of product classes, 1939. 80

Table 10. Per cent distribution of farms in each value group by tenure of operator ................ 84

Table 11. Corn, grain and hay acreages by size of farm. 87

Table 12. Ranch and farm participation in conservation programs .............................. 88

Table 13. Use of commercial fertilizer and liming materials by size of farms ..................... 90
Table 14. Variations due to difference in size of farm, average for Illinois accounting farms, 1926-1935. Per cent earned on investment .................................. 94

Table 15. Variations due to difference in size of farm, average for Illinois accounting farms, 1926-1935. Labor and management wage (labor income) ............ 95

Table 16. Addition to net farm income due to lower costs alone and to greater volume alone ..................... 100

Table 17. Farmer operators reporting business with or through cooperatives, 1939 ................................. 105

Table 18. Industrial and agricultural production and prices received and paid by farmers 1928-1944 (1935-1939 = 100) ......................................................... 120

Table 19. Characteristics of two communities in the Central Valley of California ................................. 126
LIST OF FIGURES

Figure 1. Long-run cost curve .......................... 41
Figure 2. Entrepreneurial Function, real and apparent ............................. 49
Figure 3. Returns of capital managed on combined hog and general type farms in East Central Iowa .......................... 52
Figure 4. Effects of organized farm labor on cost curves of family type and large scale farms .......................... 65
Figure 5. Optimum investment without risk ............... 75
Figure 6. Optimum investment with risk ............... 77
Figure 7. Cost curves of flexible and inflexible plants .......................... 115
INTRODUCTION

This study deals with the "family" concept of farming unit. The concept is not new. Down through the years the terms family type, family size, family owned, and family operated farms have been used for many and varied reasons. Very few people have attempted to formulate a definition of the "family" concept of which they were speaking. The economic, social and political aspects of the "family farm" have been set up as an ideal, as a goal toward which American agriculture should strive. By some, the "family farm" is pointed out as a panacea for the ills of American agriculture, in fact, the ills of the nation as a whole. Large-scale commercial farms are likewise blamed for many of those same ills.

Since the early thirties the "family" concept of farming unit has received increased emphasis in government planning programs. More frequent mention is made of this concept by farm organizations, government action agencies and policy makers. Indeed, it would seem the "family" concept has come of age. But still there is no general agreement as to just what constitutes a "family" farm.

In 1941 Secretary of Agriculture Wickard appointed a special committee, representing all federal agencies concerned, to study the problem of farm size. Singled out for special study were the problems of farm family displacement and changes in policy which would help
maintain family size farms. In part, this committee recommended a policy as follows:

The U.S. Department of Agriculture believes that the welfare of agriculture and of the Nation will be promoted by an agricultural land tenure pattern characterized by efficient family-size owner-operated farms, and one of the continuing major objectives of the Department will be the establishment and maintenance of such farms as the predominating operating farm unit in the United States. Policies within the Department on credit, other action programs, land acquisition, and research will be designed and administered so as to achieve this objective as rapidly as available funds, authorizations, and existing legislation will permit. The Department will attempt to prevent large farms from becoming as large as to drive out family farming, and it will, at the same time, do what it can to help make small farms large enough to provide each farm family with a reasonably adequate minimum level of living. This objective is obviously inconsistent with a possible alternative objective of maintaining opportunity in agriculture for the maximum possible number of farm families. The department of Agriculture believes that only as many farm families should be permanently engaged in agriculture as can be afforded an opportunity to maintain a reasonably adequate level of living.

This government committee report indicates the increased emphasis given to the "family" concept of farm. With this increased emphasis in mind, the author presents this thesis to focus attention on some of the factors affecting the family farm in its economic setting.

Often writings about family farms have taken the emotional approach. The political, social, and economic aspects of the family farm have been considered as one inseparable unit. The usual approach seems to state,

---

or imply, that the political and social virtues of the family farm outweigh its economic disadvantages. Therefore, the family farm should be maintained and fostered. Without defining the family farm or attempting to separate its functions, conflict is assumed among its social, political, and economic functions. Does the large scale farm possess clearcut economic advantages over the family farm? If these two farm types were compared on the basis of efficient utilization of entrepreneurial ability, labor, capital and land, would there be a clearcut advantage for the large scale farm? Do large scale farms possess over-all economies of scale? Which type of farm can best adapt itself to changing conditions? Why do not farms become infinitely large? What are the factors that limit size of farm?

With these questions forming a framework, the purpose of this thesis becomes three-fold:

1. To formulate a definition of the “family” concept of farming unit (the family type farm) that describes the distinctive characteristics of that type farm, that describes a real segment of American agriculture, and that retains within the definition qualities that are measurable by census and/or other tabulation.

2. To compare the family type farm with the large scale farm on the basis of certain selected economic criteria and attempt to determine some of the relative merits of each type of farming unit.

3. To examine the factors that affect size of farm firm.

It is recognized at the outset that original research and the gathering of primary data would not be possible on all phases of a study
that encompasses such a wide scope. For the most part, secondary data will be used. When applicable, completed studies will be evaluated, referred to and presented as evidence. The author thinks that a contribution can be made by bringing together these data, theoretical and empirical, and examining them in an attempt to determine some of the relative merits of the family type and the large scale farm.

It is also recognized that the identity of the "family" cannot be completely isolated into its function individually as an economic, social and political unit. The family plays an important role in each of these three phases of every day life. Each function is very important in any consideration of the family as an integral part of a farming unit. However, within the scope of this paper the family concept is used mainly as it relates to its economic role in the firm. Where social and political considerations directly influence the economic activity of the family they too are considered.
REVIEW OF LITERATURE

As pointed out, the "family" concept of farming unit has long been used by various groups in describing past, present and potential segments of American agriculture. In many cases neither public discussion, congressional debate, nor research workers in the field have stopped to attempt to formulate a clear precise definition—even for their own varying purposes. However, in some cases the concept has been defined. What are the characteristics that are most frequently included in a definition of the "family farm"?

It appears that from the very beginning the family farm has been thought of as a farm on which the family furnished the main portion of the labor needed. As early as 1914 the family farm was called the typical American farm. It was a size of farm where the family did most of the farm work, with some hired help. ¹

Many references were made to the family farm down through the ensuing years. However, real emphasis toward defining the family concept becomes evident in the late thirties. John D. Black and others wrote of the "middle sized farm". They defined this farm as one including, "...the number of acres that could be worked by an average-sized farm family using whatever labor saving equipment that is economical for the particular system at the time". ² This definition (of farm size in terms

of acres) introduced the conditions of labor saving equipment and efficient use of labor into the concept of the family farm.

In the spring of 1934 the Federal Government supported its first rural rehabilitation program for the nation. An attempt was being made to perform the emergency functions of resuming people from relief and restoring them to self-support. The Federal Government has remained in the field of rural rehabilitation and it seems apparent that it will continue to do so. In succession, three administrative agencies dealt with this rehabilitation problem: State rural rehabilitation corporations of the Federal Emergency Relief Administration, the Resettlement Administration, and the Farm Security Administration. In these nation wide programs the family-farm was again given important consideration.

Under the provisions of the Tenant Act the Farm Security Administration limits loans to family-sized farms which are defined as being farms of a size which will have the "capacity to yield an income which shall maintain the borrower according to acceptable living standards, pay annual operating expenses, pay for and maintain necessary livestock and farm and home equipment, and pay off the purchase loan." The farm should also "not be larger than the borrower and his family can operate successfully without employing outside labor, except during brief peak load periods at planting or harvest time."  

---

1 Workers in the field indicated that living levels were a measure of the commodities and services actually consumed by a family plus intangibles such as participation in community activities. The family's present level in relation to what it wants to attain, or its standards, is affected by cash income, size of household, type of family, age of operator, health of family members, social and educational status, the initiative and thriftiness of the household members, prevailing cultural habits and attitudes, and similar factors. "Accepted living standards" within any area, therefore, represent a range of expenditures affected by many individual and local peculiarities and cultural traditions. Sitter, H. G. and Jehlick, F. J. Farm resources and farming systems needed to meet living needs of farm families, Part IV. Albuquerque. U.S. Bur. Ag. Econ. preliminary.

On the basis of past farm management studies, using normal inputs and yields, assuming average operating efficiency, and long-time average price relationships organization plans were drawn up for family size farms of different types in different areas.

A committee of the American Farm Economic Association published a list of Farm Management definitions in 1940. According to this committee, "A family farm is one which is operated largely or entirely with the labor of the operator and his family."  

S.F. Johnson and O.R. Rush used much the same definition when they classified farms by scale of operations:

The family size, owned farm—operated by the family with only occasional hired labor (tenant purchase size). Income expected to cover: family living; operating expenses; maintenance of farm plant; interest on debt; amortization. Family size, tenant farm—same as above except that a rent item is substituted for interest on, and maintenance of real estate. Residual income, if any, probably accumulated for a future down payment on a farm.

In a paper read before the Western Farm Economics Association in 1943 R.L. Adams formulated a wide and inclusive definition of the "family-sized or family type" farm. Such a farm was:

...a farm with sufficient earning power, year in and year out, to maintain a farm family, finance the farm business, and create modest savings. This implies a

1Farm Economic Association, Committee on Definition of Terms in Farm Management. Menasha, Wisconsin. 1940. p. 5


reasonable standard of living, economical farm operations, freedom from over capitalization and a debt load the terms of which are not burdensome. It implies a farm of adequate size or volume of business, properly planned as to kind, extent and dovetailing of enterprises; with proper facilities for marketing all commodities produced for sale. It includes whatever is needed in the form of managerial ability.

Adams also included in his concept many specialty family farms that pay wages for peak labor loads during certain seasons. Special reference to the California and Pacific northwest fruit and vegetable farms was probably implied. Adams included new criteria in his definition that qualify the family farm economically and socially. A farm possessing all the mentioned qualifications might be thought by some to approach the ideal type farm. From a practical point of view, a farm thus defined would be very difficult to isolate. The definition is somewhat nebulous since many of the qualifying characteristics are matters of relative degree and would be unwieldy from a tabular point of view.

About this same time O.R. Johnson¹ posed the questions: Is the Corn Belt family farm unit becoming obsolete, is it worth preserving? According to Johnson the family farm possessed two major identifying characteristics:

First, unlike the subsistence farm, it provides for the family a satisfactory living and in addition a chance to accumulate savings for old age; and second, unlike the highly commercialized farm, the family farm depends very largely on the labor and management of the farm family with some exchange help from neighbors to carry on its productive activities. Family farm operation does not depend on hired labor.

Johnson had injected more than labor, management, size and efficiency into his definition. Like Adams, he included accumulation of savings and satisfactory standard of living as characteristics of the family farm.

Many popular books and articles in leading periodicals were written extolling the goodness of a little plot of ground, of self-sufficiency, of roots in the soil and of being close to the earth. Typical of this type of writing is the work of P. Alston Waring and Walter Magness Teller who wrote that:

When we think about a small, or family-size, farm we mean a farm which provides a large part of the family's actual requirements for living. These are food, shelter, and fuel. (it is not practical to attempt to provide clothing from the farm) And we also mean a farm where the operator and his family devote a considerable part of their effort to satisfying these requirements on a generous rather than a subsistence level.

Emphasis here seemed to be on self-sufficiency and the live-at-home pattern of farm life. Little emphasis was placed on commercial farm production. Small and family-size were synonymous, a connotation that is often found in this type of writing.

Louis Schmidt noted the wide variation in emphasis on the importance of certain characteristics attributed to the family farm by different authors. He concluded that recognized authorities "...conceived of the family farm as a territorial unit of land operated by the farm family as an economic and social unit of society". After so broadly defining

---


the basic farming unit Schmidt went on to observe that:

The desirable characteristics of the family farm unit are private ownership and operation by the farm family; an investment of capital, particularly in implements, machinery and other equipment, a substantial income and a comparatively high standard of living. Thus defined, the family farm, like democracy, is an ideal deeply rooted in American history.

Schmidt made a valuable contribution in that he has separated the basic family farming unit from the many and varied characteristics that have been suggested as being desirable attributes of the family farm. As Schmidt has indicated, a family farm described on the basis of desirable characteristics becomes an "ideal". However, like democracy itself, this ideal type farm would probably never be found in its pure form.

Theodore W. Schultz\(^1\) and ten associates formulated a definition based upon the family as a sociological entity and on the farm as an economic unit both in production and consumption. In their definition the family farm unit contained the following characteristics:

1. The entrepreneurial functions vested in the farm family.

2. The human effort required to operate the farm provided by the farm family with the addition of such supplementary labor as may be necessary, either for seasonal peak loads or during developmental and transitional stages in the family itself. (The amount of such regular outside labor should not provide a total labor force in excess of that to be found in family of "normal" size in the community).

3. A farm large enough (in terms of land, capital, modern technology, and other resources) to employ the labor resources of the family farm efficiently.\(^2\)

---


\(^2\)The labor resources of the family farm are deemed to be employed efficiently when the reward for their efforts are equal to rewards
Schultz et al. included entrepreneurial functions, labor limitation on size of farm and efficient use of labor resources in their definition. They compared the family farm with large scale and smaller farms and concluded that "...the family farm as a going concern has been demonstrated to have significant advantages over other types of farm organization in each of three spheres—the economic, social and political."¹

The committee on Postwar Agricultural Policy of the Association of Land Grant Colleges and Universities made postwar agricultural policy recommendations in October of 1944. They stated² that:

...the family-type farm should remain the basis on which American agriculture typically is organized. Although there is no reason to standardize all farms, because of differences in agricultural requirements and in the managerial abilities of farmers, the best interest of the country will be served when a majority of farms are of a type on which the operator, with the help of his family and perhaps a moderate amount of outside labor, can make satisfactory living and maintain the farm's productivity and assets.

In the same year Murray Benedict et al.³ pointed out a definite need for a new classification of farms in the then forthcoming 1945 census. One of five farm classification groups recommended was "family-

(Footnote continued)

for comparable human efforts in other occupations in the economy. Rewards in this context are in "real" terms in contrast to monetary rewards and include the values that members of the farm family place on leisure, working close to nature, "independence" and other non-monetary values ascribed by them to farming. ibid., p. 6.

¹Ibid., p. 25.

²Association of Land-Grant Colleges and Universities, Committee on Postwar Agricultural Policy. Postwar agricultural policy. 1944. (Sec. of Committee, L.A. Salter, Jr., Univ. Wisc.)

commercial farms’. This family-commercial farm was to have a value of products equivalent, at 1939 prices, to at least $600.00 and less than $10,000.00. Farm labor wage paid out would have to be less than ten men for three months, or roughly, less than 750 days of wage labor.

The lower limit of the family commercial farm would be set by a total value of product of $600.00. However, the upper limit of this type farm would be set only by amount of labor used. A farm could be a family-commercial farm and have a value of product of over $10,000.00, providing the labor limitation (ten men for three months) was not exceeded.

This was an attempt to define family farm (family commercial farm) in measurable terms that would afford valuable analytical data. The size indicators used are value of product and amount of labor, family and non-family.

During the past year at least two other contributions have been made toward defining the Family Farm. One of these¹ uses Benedict et al. as a basis for its recommendations. The Columbia University Seminar on Rural Life in broad terms stated:

...a family farm is one on which the operator and his family make their home; supply more than half the required labor, produce a marketable surplus, and control and perform the managerial function. Any work off the farm must be to supplement, not to attain, a minimum level of living. The farm should produce a gross income of at least $750.00.² The family should maintain and improve the soil and equipment, be assured of tenure, and contribute to and benefit from rural social organizations.


²At what price level is not stated in this definition.
This seminar would have family farms tabulated into two groups. In the first group, gross income would be between $750.00 and $1499.00. Non-farm income would have to be less than farm income and family labor input would exceed non-family labor input. The second group would have a gross income of $1500.00 or more. This group’s upper limit would be set at a point where non-family labor input exceeded family labor input.

Orlin Scoville has divided definitions of the family farm into two classes, functional and purposive. According to Scoville, the functional concepts are intended to describe the fundamental ways in which farming on a family farm differs from other kinds of farming. The purposive concepts are meant to describe the kind of farm that will advance certain desired ends, such as adequate income, continuity of tenure, or employment of family labor. To describe the entire array of family farms (functional) Scoville said, "A family farm is one on which the farm operator makes most of the managerial decisions, participates regularly in farm work, and on which his role as employer of labor is minor relative to his other functions."¹ It is Scoville’s stated opinion that there are many other special kinds (purposive) of family farms that may be referred to. He lists two. A family size farm is one which, operated by a family of average size and managerial ability, will permit reasonably efficient use of labor-saving equipment and of the family labor force over

the life cycle of the family. The socially desirable family-sized farm for the family of average managerial ability, would be a farm that would permit the reasonably efficient use of labor saving equipment and of the family labor force over the life cycle of the family and provide with average management a labor and management return adequate to maintain a socially acceptable level of living. Scoville mentions the "life cycle of the family". Families with pre-school children could probably not operate as large a farm as they could with boys of working age. This dynamic function is considered in Scoville's definition. Scoville has followed Schmidt in separating the basic farming unit with its distinctive family farm characteristics away from more general purposive characteristics that may or may not be desirable or attributable to family farms.

Thus it is evident that the connotations attached to the family farm have been many and varied. The next step in this thesis will be to attempt to formulate a basic, usable, meaningful definition of the family type farm.
THE "FAMILY TYPE FARM" DEFINED

A Theoretical Definition

The over six million farms in the 1940 Census represent many different type-of-farming units. There are subsistence and part-time farms, rural homes, estates, cropper units, plantations, corn and livestock farms of the midwest, ranches of the west and the highly intensified fruit and truck farms. With such a wide diversity among these farms there is little significance in farm averages. Yet data are used and policy is formulated on the assumptions that all farms have similar characteristics. In reality, problems, conditions, and policy needs differ widely among the segments of our farming economy. Farms must be segregated into a few simple, distinct, and yet recognizable groups with distinct differences in characteristics, problems, and needs. Attention will be given here to only one segregated group, the family type farm.

It is recognized that such segregation will have to be made in an arbitrary fashion in some cases. This paper's definition is not posed as the definition of the family type farm. Classification of farms is significant only as it relates to some purpose for which it is to be used. No single simple classification can serve all purposes. The purposes vary from broad general terms to ones more specific. In this paper emphasis is on a broad general definition. Within the framework of this definition sub-classifications would have to be set up for specific
information or policy. As nearly as possible, logical points of differentiation will be used in an attempt to present a clearcut division between this group and other groups of farming units. However, a complete spelling out of individual cases and detailed description or delineation of border cases will not be attempted. The definition given here is primarily for comparative purposes within this study. However, the approach has merits for a detailed classification.

In the opinion of the author, the family type farm should not be set up as an end in itself. The mere fact that a farm is classified as a family type farm should not necessarily guarantee it anything in terms of income, tenure, or social participation. If all farms became family type farms, as here defined, the change would not necessarily cure any of the ills of agriculture. The mere defining of a family type farm does not attach any stigma to part-time or large-scale farming. However, this does not preclude the possibility of using the farms so classified as a group toward which or through which certain policies may be directed after those policies have been accepted as feasible. Such policies as farm ownership, conservation of soil, or participation in community activities might be decided upon by policy makers, as being attributes the family type farm group should possess. Then nothing in the definition should stop these attributes from becoming a reality. However, these attributes would not become a part of the definition itself.

In setting out to define a family type farm certain basic criteria should be met if the definition is to have real meaning and use. A definition of the family type farm should,
1. Be descriptive of a real segment of the American farm economy.
2. Describe certain characteristics peculiar to that type of farming.
3. Have within its framework certain measurable qualities and/or quantities, the use of which would enable the separation of the family type from other farm groups.
4. Have within its framework upper and lower limits within which the family type farm should fall.
5. Be applicable, as much as possible, to past available census data.
6. Be dynamic.

The review of literature presented in this study has shown the many characteristics that have been attributed to the family farm as it has been variously defined. In summary form, here are a few of those ascribed characteristics. The family farm should create a modest saving, provide a reasonable standard of living and a non-burdensome debt load. There should be proper dovetailing of enterprises and proper marketing facilities on the family farm. The family farm should maintain and improve the soil and equipment, be assured of tenure and contribute to and benefit from rural social organizations. Farm productivity and assets should be maintained. The family farm should provide a large part of the family's actual requirements for living. There should be private ownership of the family farm. This type of farm should depend largely upon the family labor force. The managerial function should be
controlled and supplied by the farm family. There should be proper utilization of the farm family labor force.

A re-examination of most of these characteristics gives little indication of distinctive characteristics of a family type farm. Indeed, many of the characteristics mentioned may imply very worth while goals toward which not only family type farms, but subsistence farms, part-time farms, and large scale farms alike should strive. Certainly many of these characteristics are not distinctive characteristics that set the family type farm apart from other farming units. What are the criteria that separate this type of farm unit from other types?

There appear to be two fundamental distinctions and one qualifying condition that may set the family farm apart from the other farm types. These differences, logically enough, revolve around the farm family and the role of that family in providing management and labor for the farm. The typing of these farms as "family" farms certainly must bear within it certain basic functions that the family should perform in that farming unit. If it is to be a "family" farm it would seem that the managerial function should be vested with the family. The family should be able to make basic decisions and formulate plans for the operation of the farming unit they operate. It should be a farming family—farming should be the family's main enterprise. If it is to be a family farm it would seem that the members of the family should contribute a large share of the labor needed on that type of farm. Then the two fundamental distinctions of a family type farm appear to be: the family should provide and control the managerial function of the farm and the farm should
depend largely upon family labor.

However, these two criteria are not enough. A family of six, with a mother, father and four boys of working age, on a three acre plot of wheat could qualify as a family type farming unit under the two fundamental distinctions listed above. If the distinction between family type farms and other farming units is to be real, some qualifications must be set up. Not only should the family furnish a large share of labor required by the farm unit, but that family labor force should have at its disposal a physical plant that is large enough to assimilate its labor with reasonable efficiency.

Using these three identifying characteristics of the family type farm a preliminary theoretical definition may be formulated.¹

1. The entrepreneurial function is vested in and performed by the farm family with farming being the main enterprise of the family.

2. The human effort required to operate the farm should be proved by the farm family.

3. The farming unit should be of such size to employ the labor resources of the farm family efficiently. The labor resources of a farm family are deemed to be employed efficiently when the real rewards² for their efforts on the farm are equal to real rewards for comparable quantities and qualities of resources in other occupations of the economy.

¹On the basis of logically arriving at a definition of the family type farm from the approach used here, the Schultz et al. definition comes closest to being acceptable. The definition given here follows the Schultz et al. definition in general but not in its entirety.

²For explanation of real rewards see p. 9.
Developing a Practical Definition

There must be some type of measurement used if farms are to be divided into different groups. One element of measurement may deal with size. Broadly, size relating to the farm may be measured in three ways. First, the fixed plant may be measured. In the case of the family farm this would refer to land, to acres. This measurement is often used. This type measurement may be useful to show long range broad trends in shift of "sizes". Or, it may have real significance as a means of comparing homogeneous farms within limited areas. Second, size may be measured in terms of inputs. There may be a certain number of laborers employed on a farm, so many days of labor utilized. Size may be measured by the amounts of capital, both fixed and variable, used over a period of time. The amounts of seed, fertilizer, and feed used may also be a measure of size. Third, size may be measured by output. In this category volume of sales, gross income, total value of product and units produced may measure size. Recently the total value of product measured in dollars has been used extensively and is available in census data. However, it may be well to recognize, as G.F. Warren put it "...no size of farm is large enough to insure a profit".

The question remains, are there measurable quantities within the formulated theoretical definition? In part one of the theoretical

---

1In the final definition there are at least two measures of size, that are used: labor input and value of product output.

2Warren, op. cit., p. 244.
definition, it could be definitely determined (measured) whether or not the managerial function was vested in and performed by the farm family. In census or other tabulation a very brief set of questions could determine whether or not this is fact. It could also be determined whether at least half of the gross family income was obtained from the family farming enterprise. If it were so obtained farming would be considered the main enterprise of the farm family.

Point two of the theoretical definition states that the human effort used to operate the farm should be provided by the farm family. A possible interpretation of this could be that no labor other than family labor could be used on the farm. This is not a realistic approach to a labor force concept of the family type farm. Many farms hire custom work done for a day, a week, or several weeks during the year. There may occur peak labor load periods, lasting for a short time, when the average farm family labor force could not handle the farm enterprise.

Census data show that some hired farm labor is used by almost all

---

1 In actual practice it would have to be established just where the entrepreneurial authority lies on each farm. This point arises immediately in considering rented farms or on farms where farm management services are retained. Rented farms, for instance, often have complete entrepreneurial authority vested with the renter if there is a cash lease. However, nearing the other extreme, the stock share lease, the landlord makes most of the entrepreneurial decisions and the tenant furnishes his resource of labor and perhaps some equipment. Between these two extremes entrepreneurial authority rests with varying degrees with the tenant and landlord. A decision would have to be made as to what portion of this authority would have to rest with the farm operator and still the farm be classified as a family type farm.

classifications of farms. Examination of farms classified by value of products in 1939 shows 12 per cent of the $1,00 to $99.00 value of product group had expended some money on hired labor. Twenty-seven per cent of those with total value of product of between $400.00 and $599.00 had expended money for hired labor. Apparently the qualification of no hired labor is not very realistic. Of necessity, picking any point at which a farm shall or shall not be classified as a family type farm, on the basis of labor used, becomes rather arbitrary. It might be reasoned that if the family (average size) retains its basic relation of being mainly a labor force, not an employer of labor, then it is still a family farm. Although the employer-employee relationship may exist on the family type farm it certainly is not a characteristic of this type farm. On the basis of this reasoning and with a degree of arbitrariness a labor force size dividing point can be established. That point exists where the amount of hired labor used on a family type farm exceeds the amount provided by the average farm family labor force.

The dividing point where more than half of the workers on the farm were other than family workers comes at a value of product of approximately $6,000.00.  

It may be noted that the "average size" labor force of the family type farm has been introduced at this point. It does not seem feasible to treat each farm's labor force as a separate labor unit. The basic

---

1 Value of product sold, traded, or used by farm households.

2 See Table 2, p. 35, for family and hired labor data compiled on the basis of employment at 2 or more days for related weeks.
reasons for this are the many and varied sizes of farm families and the life cycle of the farm family. This life cycle might be typified by: a single man on a farm, then a young married couple, the couple with young children, children of workable age, grown children of 18 or 20, part of the children moving off the farm, the parents becoming old and farming less intensively and then perhaps selling or renting part of their farm. To attempt to measure the labor force of each individual farm as it changes each year through these various periods would be very difficult. As a matter of long range policy, it seems that it would be more realistic to measure family labor forces in averages for given areas. If the definition is going to serve as a basis of comparison over a period of time and have lasting value as a framework through which policy is to be put into action, it must deal with something that changes less than characteristics of individual families.

For example, farms could be considered family type farms as long as half of the laboring force was made up of family members—no average size of farm family laboring force concept being used. Then a farmer having two boys ages 18 and 20 would have a total family labor force of three. Under the assumption made above three men could also be hired and it would still be a family type farm (one-half of total labor furnished by the farm family labor force). However, assume the work could be done with the use of one hired laborer making a total working force for the farm of four. Further, assume the two farm family sons moved off the home farm to manage farms of their own. The home farm family labor force
is then cut to one and under the assumed definition of family labor force only one hired man could be employed if the farm is to continue as a family type unit. In reality there would be need for three hired men, the one usually hired and two to replace the sons who have left the farm. If three men were hired the farm would move out of the classification of the family type farm without any real change being made in the basic farm unit itself. If the concept of average family labor force were used and that average were say, two, in this case, this farm could remain within the limits of the defined family type farm before and after the sons left the farm. The total labor force never is more than four, and at least half of the labor could be furnished by a farm family of average size. This average concept of labor force would allow the farm family to hire more labor when children were too young to work, and when children moved away from the farm after becoming older.

To give the definition real policy value it would seem that the type of fluctuation brought about by actual individual family labor force fluctuations would have to be eliminated. To make a definition workable the concept of "average size" of farm family labor force\(^1\) could be introduced. This average might well be varied with regions or states. For instance, farms with value of product $2,000.00 to $2,499.00 varied in family labor reported in September of 1939 from 2.23 in the South Atlantic

\(^1\)In reality a more detailed study of family labor used and an evaluation of the women and child labor should be made if this average concept of farm family labor force is to be accurately used.
Region to 1.57 in the Mountain Region.\footnote{U.S. Bur. of Census and U.S. Bur. of Ag. Econ., \textit{op. cit.}, p. 104.} The average could be made on the basis of "all farm operators"\footnote{This concept will be altered slightly, see p. 34.} in the state or region.\footnote{Inclusion of all farm families would enlarge the size of family labor force. Owners, tenants and farm laborers have progressively larger families.} Census data provides total expenditures for hired labor. Local and/or regional labor wage rates could be used in determining amount of labor hired by farms.

There might perhaps be one exception to the rule of the family labor force providing at least half of the total farm labor requirements. Certain types of farming such as fruit and truck garden enterprises, while typical family type farms through most of the year, employ peak labor loads for relatively short periods. To have a farming unit that utilizes the farm labor force to any degree of efficiency during 11 months of the year a large peak labor force must be hired during harvest season. Certain exceptions might be made for these farming units. The limiting factors could be length of time hired and the amount of labor that is hired. Crop and regional distinction would probably have to be set up.

As has been stated, a definition of the family type farm should have within its framework upper and lower limits. An upper limit has been set in the above discussion by limiting the amount of labor that may be hired on a family type farm. Thus far no lower limit has been set in readily measurable terms. All farms that qualify under the entrepreneurial and labor qualification are family type farms. The larger proportions of
part-time, subsistence and low income farms would fall into the category of family type farms. In this sense the definition of the family type farm would lose much of its significance. However, there was an attempt made in part three of the theoretical definition to impose a lower limit. The farming unit was to be large enough (in terms of land, capital, modern technology) to employ the labor resources of the farm family efficiently. Efficiency was measured, by definition, in terms of real rewards in agriculture being equal to real rewards in other occupations for comparable human effort and comparable quantities and qualities of resources. In this form the concept does not lend itself readily to measurement. On a very elementary level, much difficulty has been experienced in attempting to determine the net income from a given farm. Net income is difficult to measure when such factors are included as rent, products used on the farm, setting prices for products used on the farm, labor return for family members and evaluation of the farm plant. When real income is included in this concept the problem becomes even more involved and necessitates arbitrary individual computations for each farm.

How then can the lower limit of farm size be defined? What is the minimum scale of operation necessary for the efficient employment of family labor? It is impractical to apply a detailed measure of efficient employment to each and every farm even if a measure could be determined. However, it does seem logical that an arbitrary size of farming unit could be found below which inefficient use of labor is practically a certainty. Probably the best single index of size available for this measure of efficiency is the total value of product produced. This measure of size includes within it a rough measurement of the effectiveness
with which the various resources of land, machinery, livestock, capital and labor have been combined in the farming operation. The use of this measure also has its shortcomings. In some cases value of product will be low but expenses also will be very low and give a large net income. In another case, value of product may be very high with expenses very high. The net income of the two mentioned cases may be nearly the same. This possibility is recognized but the measure of size by value of product is found to be the best one available for this measurement purpose.

Fixing an actual limiting point where value of product does or does not represent efficient utilization of the labor force becomes an arbitrary decision. Louis Ducoff and Margaret Hagood examined 1940 census data to determine labor productivity as it related to different size of farm enterprise.

Examination of Table 1 shows the increase in both total value product per man equivalent worker and net return to labor and management as size of enterprise increases. When the interval between value of product classes is noted closely (column 1) it becomes evident that the greatest increase in value of product per worker (column 4) occurs in the smaller classes of farms, below $1,000.00. This great increase for small farms is also true for net return to labor and management per man equivalent worker (column 6). These data substantiate Ducoff's and Hagood's statement that:

The increase in efficiency of labor utilization with increase in size of farm enterprise, as measured by net returns to labor and management per worker, are most marked in the groups
Table 1. Labor productivity of different size farm enterprises*

<table>
<thead>
<tr>
<th>Value of product classified</th>
<th>Total value</th>
<th>Difference</th>
<th>Net return to labor &amp; management</th>
<th>Equivalent worker in column 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
</tr>
<tr>
<td>100-249</td>
<td>150</td>
<td>200</td>
<td>115</td>
<td>-3</td>
</tr>
<tr>
<td>250-399</td>
<td>150</td>
<td>315</td>
<td>109</td>
<td>103</td>
</tr>
<tr>
<td>400-599</td>
<td>200</td>
<td>424</td>
<td>101</td>
<td>177</td>
</tr>
<tr>
<td>600-749</td>
<td>150</td>
<td>525</td>
<td>116</td>
<td>233</td>
</tr>
<tr>
<td>750-999</td>
<td>250</td>
<td>641</td>
<td>196</td>
<td>269</td>
</tr>
<tr>
<td>1000-1499</td>
<td>500</td>
<td>837</td>
<td>325</td>
<td>56</td>
</tr>
<tr>
<td>1500-1999</td>
<td>500</td>
<td>1087</td>
<td>402</td>
<td>77</td>
</tr>
<tr>
<td>2000-2499</td>
<td>500</td>
<td>1298</td>
<td>477</td>
<td>75</td>
</tr>
<tr>
<td>2500-3999</td>
<td>1500</td>
<td>1599</td>
<td>327</td>
<td>600</td>
</tr>
<tr>
<td>4000-6999</td>
<td>2000</td>
<td>1926</td>
<td>702</td>
<td>123</td>
</tr>
<tr>
<td>6000-9999</td>
<td>3000</td>
<td>2312</td>
<td>881</td>
<td></td>
</tr>
</tbody>
</table>


**Total value of product sold, traded or consumed at home. Man equivalent is an approximation to the labor time input, work capacity and skills of the average farm operator who is under 65 years of age and does not work off the farm in excess of 100 days per year.

**Net returns are gross value of production less operating expenses, taxes, maintenance, or depreciation and return on capital investment and/or rent.
of farms which had a total value of production of less than $1,000.00 in 1939. It is in this range that the relatively
greatest increments in net returns per worker are possible
from moderate increases in resource factors other than labor.
It is this range that agriculture in the United States fell
farthest below any reasonable standards of affording adequate
returns or productive employment to its workers during 1939.1

In the present census classification, value of product groups are
broken at $750.00, $1,000.00 and $1,500.00. In view of the under utiliza-
ization of labor in the lower farm value groups, especially below
$1,000.00, the evidence at hand indicates choosing a lower size limit
for family type farms of $1,000.00, at 1939 price levels.

How near will a farm enterprise producing total value of product of
$1,000.00 come to utilizing a labor force on the family type farm? To
got insight into this problem a hypothetical small midwest dairy and hog
farm has been set up and labor requirements for it have been computed,2
Table 2.

The value of product on this hypothetical farm approximates $1,000.00,
actually $1034.00. Column 4 of Table 2 indicates the approximate labor
requirement in hours that would be needed for this type of farm in 1939.

1 Ibid., p. 9.

2 This farm plan was adapted from Family-sized Farm Plan Number III for
South Central Dairy-Hog type farming in Minnesota, on the North Iowa
border. These farm plans were developed by the RA F at the request of
the Farm Security Administration. Plans were to specifically indicate
the size and type of farm organization necessary to permit paying for
a farm, to maintain the farm plant and to provide a family with a
satisfactory level of living. Emphasis should be given to the fact
that the farm plan presented here is adapted from the RA F plan and
this farm is smaller than those of the RA F. As the farm enterprise
is presented here it will not meet the above criteria. This
presentation is merely to give indication of labor utilization.
Table 2. Adapted from family-sized farm, No. Ill, South Central Dairy-Hog, Cornbelt Region, Minnesota

<table>
<thead>
<tr>
<th>Farm plan</th>
<th>Hours labor: Total labor: Estimated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) : (2) : (3) : (4) : (5)</td>
</tr>
<tr>
<td></td>
<td>acres : per head® : hours : income 1936-40 : prices$</td>
</tr>
<tr>
<td>Cattle</td>
<td></td>
</tr>
<tr>
<td>Cows</td>
<td></td>
</tr>
<tr>
<td>Butterfat</td>
<td>4 : 121 : 484 :</td>
</tr>
<tr>
<td>Cull cow</td>
<td>125.00</td>
</tr>
<tr>
<td>Heifers</td>
<td>2.00</td>
</tr>
<tr>
<td>Yearling</td>
<td>1.40</td>
</tr>
<tr>
<td>Calves</td>
<td>2.50</td>
</tr>
<tr>
<td>Bull</td>
<td>1.00</td>
</tr>
<tr>
<td>Hogs</td>
<td></td>
</tr>
<tr>
<td>Sows</td>
<td>2.00</td>
</tr>
<tr>
<td>Pigs, spring</td>
<td>12 : 26 : 312 : 154.00</td>
</tr>
<tr>
<td>Pigs, fall</td>
<td>5.00</td>
</tr>
<tr>
<td>Boar</td>
<td>1.00</td>
</tr>
<tr>
<td>Chickens</td>
<td></td>
</tr>
<tr>
<td>Hens</td>
<td>60 : 134 per 100 : 80 : 19.00</td>
</tr>
<tr>
<td>Broilers</td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td></td>
</tr>
<tr>
<td>Pullets to laying age</td>
<td>52 per 100 : 16 : 30.00</td>
</tr>
<tr>
<td>Chickens to 4 months</td>
<td></td>
</tr>
<tr>
<td>Small grains</td>
<td></td>
</tr>
<tr>
<td>Oats</td>
<td>4.00</td>
</tr>
<tr>
<td>Barley</td>
<td>2.00</td>
</tr>
<tr>
<td>Wheat</td>
<td>2.00</td>
</tr>
<tr>
<td>Oats and barley</td>
<td>5.00</td>
</tr>
<tr>
<td>Corn</td>
<td></td>
</tr>
<tr>
<td>Grain</td>
<td>8.00</td>
</tr>
<tr>
<td>Silage</td>
<td>2.50</td>
</tr>
<tr>
<td>Alfalfa</td>
<td>4.50</td>
</tr>
<tr>
<td>Garden</td>
<td>1.00</td>
</tr>
<tr>
<td>Rotation pasture</td>
<td>6.00</td>
</tr>
<tr>
<td>Total acres, crop</td>
<td>36.00</td>
</tr>
<tr>
<td>Total labor required</td>
<td>$1054.00</td>
</tr>
</tbody>
</table>

Table 2. (footnotes continued)

b Estimated 5 per cent higher labor requirements 1936-40 than 1942-46.

c Estimated family living from farm, Family-sized Farm No. 111.

d Total value of product.

e Normal inputs and yields, average, or slightly below, operating efficiency, a family labor force of 1.5 man equivalent, and long-time average prices and price relationship (1936-40).
The total number of hours required is 1832. The Bureau of Agricultural Economics assumed that there would be 1.5 man equivalent workers on this dairy-hog farm. On the basis of 1.5 man equivalent workers the average hours required per worker is 1226 (1832/1.5). This figure, of 1226, can be compared with hours worked by workers in all manufacturing industries to gain insight into relative amounts of time worked by farmers on this size farm. Census estimates for 1939 place the total number of hours worked by workers in all manufacturing industries at 1880.1 A comparison of hours worked on the hypothetical farm with the average for all manufacturing industries shows that this farm labor would be used at a capacity of approximately 65 per cent. Farm labor was probably utilized at higher efficiency. Nearly 24 per cent of the farm operators in value of product group $1,000.00 to $1,499.00 reported they were employed off the farm during part of the year. Of these nearly 24 per cent, 4.1 per cent worked off the farm 250 days or more. On the hypothetical farm at no time during the year do peak labor requirements exceed the labor force available on the farm, 1.5 man equivalents. On the basis of these data it appears that the labor force would be utilized to such an extent as to be acceptable for a lower limit of family type farm.

The definition of the family type farm as it is being formulated provides for the dynamic aspects of agriculture in at least two ways. As technology advances, the same amount of labor force will be able to operate

---

1This figure was computed from average hours per week worked by workers in all manufacturing industries, 37.5, assuming 50 weeks employment per worker during the year. U.S. Statistical Abstract of the United States: 1941. Gov't Print. Off. 1942. p. 268.
a larger unit. New and improved strains may bring about greater yields from crops, improved breeds and production practices may bring greater production from livestock. New and improved machinery may allow larger acreages to be farmed with the same labor force. All of these factors point to a larger size farming unit that can still be handled by the same size family labor force. It would be unrealistic to not allow for such expansion of size of farm within the framework of the definition given. In the future the average size farm labor force may well be able to handle larger farming units. The family type farm will probably grow larger. However, the historical decrease in size of family may tend to counteract part of this type of expansion.

The use of the "average" concept in computing the size of family labor force allows for different amount of the labor force being provided by the family as it progresses through the family cycle.

The family type of farm has been defined in terms that meet the basic criteria laid down for a definition at the beginning of this section. Certain distinctive characteristics of the family type farm have been noted. The definition describes a segment of American agriculture. Upper and lower limits have been provided to set the family type farm apart from other segments of agriculture. Measurable qualities have been included and it is a dynamic definition that allows for change.
A Practical Definition

As defined in this paper the family type farm has the following characteristics:

1. The entrepreneurial function is vested in and performed by the farm family with the farming enterprise contributing 50 per cent or more of the gross family income.

2. At least one-half of the human effort required to operate the farm should be provided by a farm family of average size. Certain exceptions may be made for highly seasonable labor loads of certain crops.

3. The farming unit should be of such size in terms of land capital and modern technology to employ the labor resources of the average farm family relatively efficiently. If the total value of product is less than $1,000.00 (1939 price levels), it is assumed that labor resources of the farm are not being employed on a sufficiently large unit (in the above terms) for it to be classified as a family type farm.

By making assumptions and examining census data, the farms that fall within this definition can be delineated. It is assumed that the entrepreneurial decisions of all farms with value of product of over $1,000.00 rests with the farm family. It is assumed that at least one-half of gross income of all farms over $1,000.00 comes from the farm enterprises. It is assumed that the averages of the amount of labor reported by value of product groups represent each individual farm within the group.
The lower limit has been set by definition at $1,000.00 value of product. The upper limit will be set by examining the average size family laboring force. For farms larger than $1,000.00 value of product the average size farm family labor force as indicated by census data (Table 4) is 1.7 workers. This would allow for a total labor force of 3.4 workers. Using the broad census classifications, family and hired workers totaling 3.4 appear between value of product groups $4,000.00 to $5,999.00 and the $6,000.00 to $9,999.00 (Table 4). The indications are then that the family type farms fall largely in the value of product groups $1,000.00 to $5,999.00. If this be true the family type farm makes up 31.6 per cent of all farms. The family type farm produces 53 per cent of all farm products measured in terms of value of product sold, traded, or used by farm households. This group possesses 56.3 per cent of the crop land in all farms. Only 2.5 per cent of the farms are larger than the family type farms. However, these 2.5 per cent of farms larger than $5,999.00 value of product produce 25.7 per cent of farm products.
Table 3. Family and/or hired labor working on farms the equivalent of 2 or more days during the weeks of March 24-30 and September 24-30, 1939.*

<table>
<thead>
<tr>
<th>Value of product group</th>
<th>Farms reporting</th>
<th>Persons working</th>
<th>: Per cent of : Average per</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Number</td>
<td>total</td>
</tr>
<tr>
<td>1- 99</td>
<td>241,705</td>
<td>233,444</td>
<td>4.5</td>
</tr>
<tr>
<td>100- 249</td>
<td>659,034</td>
<td>639,235</td>
<td>12.4</td>
</tr>
<tr>
<td>250- 399</td>
<td>706,126</td>
<td>688,964</td>
<td>13.3</td>
</tr>
<tr>
<td>400- 599</td>
<td>772,237</td>
<td>756,687</td>
<td>14.5</td>
</tr>
<tr>
<td>600- 749</td>
<td>435,448</td>
<td>424,162</td>
<td>8.1</td>
</tr>
<tr>
<td>750- 999</td>
<td>519,299</td>
<td>509,913</td>
<td>9.8</td>
</tr>
<tr>
<td>1000-1499</td>
<td>647,526</td>
<td>637,680</td>
<td>12.2</td>
</tr>
<tr>
<td>1500-1999</td>
<td>382,971</td>
<td>375,423</td>
<td>7.2</td>
</tr>
<tr>
<td>2000-2499</td>
<td>243,306</td>
<td>238,828</td>
<td>4.6</td>
</tr>
<tr>
<td>2500-3999</td>
<td>349,323</td>
<td>345,101</td>
<td>6.6</td>
</tr>
<tr>
<td>4000-5999</td>
<td>155,207</td>
<td>153,808</td>
<td>2.9</td>
</tr>
<tr>
<td>6000-9999</td>
<td>86,940</td>
<td>82,560</td>
<td>1.6</td>
</tr>
<tr>
<td>10,000 &amp; over</td>
<td>53,894</td>
<td>52,524</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Table 4. Family labor working on farms the equivalent of 2 or more days during the weeks of March 24-30 and September 24-30, 1939*

<table>
<thead>
<tr>
<th>Value of product group</th>
<th>Number of farms reporting</th>
<th>Number of persons working</th>
<th>Average per farm reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>All groups</td>
<td>45,081,648</td>
<td>4,905,305</td>
<td>1.56</td>
</tr>
<tr>
<td></td>
<td>5,305,989</td>
<td>6,054,305</td>
<td>1.31</td>
</tr>
<tr>
<td></td>
<td>194,913</td>
<td>1,456</td>
<td>1.30</td>
</tr>
<tr>
<td></td>
<td>666,382</td>
<td>666,360</td>
<td>1.42</td>
</tr>
<tr>
<td></td>
<td>728,386</td>
<td>1,54</td>
<td>1.44</td>
</tr>
<tr>
<td></td>
<td>606,494</td>
<td>1,60</td>
<td>1.40</td>
</tr>
<tr>
<td></td>
<td>49,944</td>
<td>1,70</td>
<td>1.54</td>
</tr>
<tr>
<td></td>
<td>4,48,083</td>
<td>1,75</td>
<td>1.57</td>
</tr>
<tr>
<td></td>
<td>6,00,467</td>
<td>1,70</td>
<td>1.58</td>
</tr>
<tr>
<td></td>
<td>649,752</td>
<td>1,70</td>
<td>1.57</td>
</tr>
<tr>
<td></td>
<td>221,051</td>
<td>1,70</td>
<td>1.58</td>
</tr>
<tr>
<td></td>
<td>318,539</td>
<td>1,70</td>
<td>1.57</td>
</tr>
<tr>
<td></td>
<td>134,434</td>
<td>1,76</td>
<td>1.58</td>
</tr>
<tr>
<td></td>
<td>60,269</td>
<td>1,74</td>
<td>1.58</td>
</tr>
<tr>
<td></td>
<td>39,621</td>
<td>1,69</td>
<td>1.59</td>
</tr>
</tbody>
</table>

*Adapted from U.S. Dept. of Com., Bureau of Census and U.S. Dept. of Ag., Bureau of Ag. Econ. Analysis of specific farm characteristics for farms classified to total value of product. Gov't Print. Off. 1945. Chapt. VIII, Table 1, p. 102.
THE STATIC THEORY OF THE FIRM

The term "firm" as used here refers largely to the decision-making unit in our economy. It may or may not be identified with the physical unit of production such as a plant or a farm. However, in agriculture the firm and the physical production plant are usually identical—the firm and the farm are the same. Though this is not true in all cases, it is consistently enough true for the purpose of this paper to use the two terms, firm and farm interchangeably.

The remainder of this thesis will be devoted to a comparison of the family type farm with large scale farms on the basis of certain selected criteria. An attempt will be made to determine some of the relative merits of the two types of farms. While most of the analysis will be on the basis of the examination of empirical evidence, some theoretical analysis will be made. The theoretical analysis deals largely with the dynamic aspects that affect the size of a firm. Since so much of the comparison between the two types of farms is related to size, it seems appropriate to briefly analyze, from a theoretical approach, some of the factors that affect size of firm (farm).

The dynamic aspects affecting size of firm follow logically from...
a basic framework of the long-run static\(^1\) theory of the firm. In this brief section the development of long run static theory of the firm is undertaken. This theory, as presented here, will be used as a base from which to develop some of the dynamic aspects of the firm as they relate to the size of the firm in the following sections of this thesis.

The theory of the firm under static conditions and perfect competition is usually formulated on certain assumptions. It is assumed that the firm has unlimited supplies of resources at a constant known price available to it. The firm is trying to maximize profit. Perfect competition implies four conditions; each firm is so small relative to all the firms in the market that the actions of one firm in buying or selling will not influence the market price; there are no restrictions on prices nor mobility of resources; all economic units possess complete knowledge of the industry; and, there must be free entry or exodus of the firms into or out of the industry. In addition, to simplify the analysis, it is usually assumed that the firm produces only a single product. Size is expressed in terms of output of that product over a given period of time.

A time concept is introduced into the theory of the firm by speaking of the size of the firm in the short run or in the long run. The "short run" is usually thought of as a period of time during which only variable

---

\(^1\)Static economic theory usually deals with a particular problem on the assumption that the data for that problem do not change. Dynamic economic theory usually concerns itself with the possibility of change through time.
factors of input can be changed. The input of fixed factors remains the same. In the long run all factors tend to become variable—the inputs of all factors may be altered. Thus, in the short run the only change in "size" of firm that may occur is a varying amount of output from a fixed plant. This could be accomplished by expansion or contraction of the number or proportion of variable factors going into the fixed plant. This output would be in terms of the single product that is being considered in the analysis. However, in the long-run the physical size of the plant could be expanded or contracted by changing fixed factors of production. Usually the optimum size firm is associated with long run analysis. However, because the long run analysis is based on and proceeds logically from short run analysis the short run analysis will be briefly stated.

The theory of the size of firm is based largely upon the cost curves, and demand curves facing the firm and the law of diminishing returns. As implied above, costs may be divided into two parts: fixed costs are associated with the fixed factor and would accrue even if no output were produced and thus do not vary with volume of production. Variable costs are associated with the variable factors and do vary with the volume of output.

In the short run, with fixed and variable costs determined, the traditional diagram relating average costs, average variable costs, average total costs and marginal costs can be constructed. With any given selling price it can then be determined by equating marginal cost and marginal
revenue, what the size of that firm will be, measured in units produced. If the selling price is below the minimum average total cost but above the minimum average variable cost the firm can minimize losses by equating marginal cost and marginal revenue. If selling price is below the minimum point on the average variable cost curve the firm can keep losses at a minimum by not producing.

More realistic to the present analysis is the size of firm in the long-run. There, in reality, the distinction between fixed and variable factors tends to disappear. An entrepreneur will not stay in business in a particular field in the long run unless he can at least cover his long run average costs. Long run average costs may be defined as the lowest possible average costs of producing any output when the entrepreneur has adequate time to make all desired adjustments. This long range average cost curve (LAC) may be drawn as the amount of fixed factors varies with output. The curve will be U shaped as shown in Figure 1. The downward slope in the early range of output is due to economies of large scale. As output expands more and more indivis-

---

1 Marginal revenue equals selling price under purely competitive conditions.

2 Assumed to be included in average costs is normal profit. Normal profit is usually thought of as being equal to what the capitalist could get with his capital if it were used in some other way. Boulding, in the main, uses this concept. Boulding, Kenneth E. Economic analysis. New York, Harper Bros. 1941. pp. 415-416.

3 This statement as well as the general approach here is taken from Stigler, George J. The theory of price. New York, Macmillan. 1946. pp. 139-143.

4 These economies may be external or internal and be classified as technological and pecuniary.
ibilities are overcome. Larger machines that are cheaper relative to their output may be used. Fixed costs may be distributed over a larger total output. Division and specialization of labor may result. Raw materials may be bought at cheaper prices because of larger volume purchased. However, a point must be reached where all the economies of scale are realized. Further expansion would move into an upward sloping curve, to the right, largely due to large scale diseconomies. Large scale diseconomies relate largely to the coordinating and decision-making faculties of management which become subject to diminishing returns after a given point. It must be realized that this LATC (Figure 1) is the cost curve that faces the entrepreneur and allows him to adjust size of firm to the optimum in the long run. It is an

![Figure 1. Long-run cost curve.](image-url)
envelope of the family of short-run average cost curves which in reality lose their identity when long-run adjustments are made. The curve atc₁ is the average total cost curve for a certain amount of fixed factors in the short-run (these of course are variable in the long-run). The curve atc₂ represents a larger amount of fixed factors. In this hypothetical case the output atc₂ has brought with it increasing economies of scale. An expansion of fixed factors from atc₂ to atc₃ involves decreasing returns to scale of plant—average total costs have risen.

In reality, there are an infinite number of short run average cost curves, each representing the ideal combination of resources for that amount of fixed factors (scale of plant). Thus, the long range total average cost curve (LATC) is a smooth curve. As can be noted in Figure 1, a given output may be produced by plants of varying size but not at the same cost. It follows then that there is an optimum-sized plant for any given output. Under conditions of pure competition, a firm must be of optimum size to survive. If prices were high enough to make it profitable for firm atc₁ to produce, possibly at P₂ then firm atc₂ and firm atc₃ would be getting pure profits. Other firms would enter the field, increase the supply and force a lowering of the price. New firms will continue to enter until no pure profits remain. This is possible only at point S on curve atc₂. Long run equilibrium is established at a market price P₁ and with a firm the size atc₂.

Thus the long-run static theory of the firm has been briefly presented.
ECONOMIC EVALUATION OF THE FAMILY TYPE AND LARGE SCALE FARMS

Large Scale Farms Defined

It has been true in the past that, "The tendency to romanticize about the virtues of family farms has been stronger than the willingness to wrestle with their economic problems."¹ This section will attempt to strip the family type farm of its emotional trappings and examine some of its merits and shortcomings on the basis of selected economic criteria. As far as data are available, the family type farm will be examined on the basis of the definition formulated in this study. It is recognized that in most cases data will not be available for the family type farm so defined.

If comparisons are to be made between the family type farm and large scale farms, some sort of measure of size for the large scale farms must be developed. Most of the studies made have taken into account such things as wide divergence of type of farming, soil and climate. As far as possible, these elements have been separated and data made comparable. If data relating to family type and large scale farms are used it is doubtful if any fine line can be drawn between the outer limits of the two types of farms. Rather, an arbitrary division must be

made. Many studies made have been within narrow limits of size and make it impossible to separate family type and large scale farms. For the purpose of this study, border areas between the two types of farms may be eliminated. In fact, for a comparison of family type and large scale farms multiples of from three to five times might be used and the results still be accurate for the purpose of this paper. For instance, a typical family type Iowa cattle feeding farm might be 160 acres large, or employ three men, or have a value of product of $2,500.00. Then a farm three times that large would not be a family type farm but a large scale farm. In this paper's definition of family type farm the amount of hired labor is the main limiting factor. If the average size of family labor force is 1.5 men, then that same amount of hired labor might be employed by the family type farm for a total labor supply of three men. If 4.5 or 7.5 men were hired by the farm operator, it would not be a family type farm. In the intermediate area, between the family type and the large scale farm, both types of farms may be found. Depending upon the amount of land, labor and capital and the managerial ability, these intermediate size farms may be either large scale or family type farms. However, if an arbitrary division is set up in the multiples suggested, there should be a clearcut division. Farms are either family type or large scale farms. As far as possible this type of division will be made between size of farms in the following discussion.
Basis of Economic Evaluation

Fundamentally, the main factors that affect farming as a going concern may be classified as entrepreneurship, land, capital and labor. These categories in some cases are too broad and inclusive to have real meaning. In the main, these factors and subdivisions within them will be examined to attempt to determine the efficient use of resources by large scale and family type farm operations. These two types of farms will be examined as to relative efficiency of management, efficient use of labor and the use of capital. Which of the two types is the more flexible in response to economic stimuli? Can each type farm meet research needs equally well? Will they both respond to conservation and new technology practices so as to get the most efficient allocation of resources in the long run? Do large farms have economies of marketing in which smaller farms can't share? Are there real economies of scale evident when large scale farms are compared with family type farms? Large scale farms and family type farms will be examined on the basis of these criteria to attempt to determine some of their relative merits from an economic point of view.

Entrepreneurship

"Differences in managerial ability seem to cause a wider variation in farm returns than any other individual factor."1

---

At the outset, it must be admitted that entrepreneurial ability cannot be measured empirically, but can be discussed only in general terms. This discussion will follow two approaches: the theoretical, and a discussion of relative efficiencies that are apparent from empirical studies. Emphasis will be placed on entrepreneurship as a factor that limits the optimum size of firm.

The theoretical approach will be presented first. The static theory of the firm, as presented in a previous section, will serve as an analytical tool. Using the basic framework of the static theory of the firm Nicholas Kaldor has contributed a long stride toward making the theory of the firm dynamic. In so doing he has segregated out the management factor as a factor that limits the size of the firm. Kaldor reasons that indivisibilities which cause rising costs over certain ranges of the long-run total average cost curve, do not explain the limitation upon the size of firm so long as all factors are freely variable and all prices are constant. External diseconomies, by definition, affect all firms equally. Therefore, they do not explain why the output of the individual firm remains relatively small. Nor, will knowledge of the prices of the factors and the production function of the commodity allow one to determine the optimum size of firm. It will only enable a person to determine the optimum proportions within the firm. However, Kaldor reasons that there must be one factor of production that is fixed. That factor limits the "optimum size" of firm because of the law of non-

---

1Kaldor, op. cit., p. 66.
proportional (diminishing) returns. It is necessary that the factor whose supply is fixed for the firm should at the same time have a flexible supply for the industry. If this were not the case, the industry would consist of one firm or at least a fixed number of firms. The fixity of supply does not arise from the fact that there is a natural limitation of the amount available. The fixity of supply arises from a special peculiarity of the firm's production, "...the firm cannot have 'two' units--just because only one unit can do the job."\(^1\)

Such a factor is entrepreneurship. Entrepreneurship possesses, according to Kaldor, two distinct characteristics: one uncertainty-bearing, two, management. Management is divided into two parts: supervision and coordination. Of these two characteristics of entrepreneurship uncertainty-bearing is not deemed to have a fixed supply for any one firm. People react differently to uncertainty-bearing, and formulate different expectations. The spreading of uncertainty-bearing over a great number of people by joint stock companies is pointed out as evidence against its supply being fixed.

Supervision may take unique skills and be a factor that is indivisible but it certainly is not a fixed factor. However, coordination is a factor that is fixed. Kaldor points out that it is the essence of coordination that every single decision should be made on a comparison with all the other decisions already made or likely to be made. It must, therefore, go through a single brain. The fact that there are boards of

\(^1\)Ibid., p. 67.
directors does not alter the situation. All alternatives have to be weighed by each member of the board. There can be no division of labor in the actual coordinating process. Coordinating ability of the individual firm is fixed and through the law of diminishing returns the optimum size of any one firm is fixed by the coordinating ability of its entrepreneur.

Not only will the same type farms have different optimum sizes as entrepreneurial abilities differ, but different type farms will probably be different sizes. All factors or agents of production are consumers of management and each consumes management at a different rate. Work in agriculture calls for much attention to details. Black et al. states

"....the capacity of any agent for management, determines how many units of the agent will be associated with an operator and, hence, becomes a factor in determining the size of the business." ¹

The effect of law of diminishing returns on this fixed factor of coordinating ability does not necessarily affect the entrepreneur of the large scale farm any more than it does the entrepreneur of the family type farm. Each entrepreneur may possess different entrepreneurial abilities. There may be many optimum size firms according to the entrepreneurial abilities of the various managers concerned. This gives an indication of what is known to be true in practice. There are many different sizes of firms ranging from very small to very large and many of them may be optimum size firms for the entrepreneurial ability

possessed by that firm. Farmers with a high degree of entrepreneurial ability are not necessarily associated with large farms. It is conceivable that some individual small-scale operators might be less efficient and realize less income if they attempted to manage a larger firm. Some large firm operators might have a higher net income if they were operating smaller units. There are many efficient operators on small farms who might operate a large farm just as efficiently and receive a greater net income. On the other hand, they might not possess the coordinating or supervisory abilities to move up to a larger firm.

Figure 2. Entrepreneurial Function, real and apparent.
Graphically it may be shown how entrepreneurs of different abilities received different amounts of net profit as the size of firm expands.

This is shown in Figure 2. The three curves, large farmer, medium farmer, and small farmer represent entrepreneurs with different entrepreneurial skills. The curves represent profits as a function of size. They show that net profits of all entrepreneurs will not be the same for the same size farm, nor will equal increases in size of firm bring about equal increases in profits. Each curve has a maximum point, shown as C, E, and B, that represents a firm of optimum size for entrepreneurs with the three degrees of entrepreneurial skills. A mistake often made in standard farm management studies is to imply that net profits will always increase as size of firm increases or that all entrepreneurs can reach a maximum profit, HB, by increasing size of enterprise. For instance, a farmer with entrepreneurial ability of a small farmer is receiving a profit OA' and producing at point A. It is implied that, if this small farmer increases the size of his enterprise to point A, then he will move up the apparent function curve from A to B and receive profit HB. In reality, with an increase in size of firm the amount of profits will move along the small farmer curve, OAGM, and not up the apparent function on curve AB. A maximum profit in this case will be reached at point C. Any expansion in size beyond that point will find profits decreasing because of lack of entrepreneurial ability to manage the larger firm.

As previously stated, and indicated in Figure 2, the large farm entrepreneur would not necessarily receive high profits on all farm sizes.
Certain large farm entrepreneurs may possess the entrepreneurial curve indicated by dotted line ONFB. On portion of the curve from 0 to N this large farm entrepreneur would make less profit than the small farm operator. Over the length of the curve from 0 to P the large farm makes less profit than the medium farm. It is only on the portion of the curve FB that the large farm entrepreneur makes more profit than the medium farm entrepreneur.

As long as there are entrepreneurs with different abilities there will be farms of different optimum size. To attempt to standardize size of farm would be inefficient. The example in Figure 2 also emphasizes that merely increasing the size of the farming unit does not necessarily mean that the net income of individual farmers will be increased.

These facts are pointed up when farms of a particular area and type are examined. Record Association farms are usually accepted as better than average farms from the point of view of resources, including entrepreneurial ability, and the combination of those resources. Even in these farms wide divergence in abilities are found. Data for farms of the Hog-General type were taken from the three Record Associations of East and Central Iowa for a two-year period. Management return for these 30 farms is measured on the horizontal axis, Figure 3, while the size of farm business, measured in terms of capital managed, is measured on the vertical axis. If these Association farmers ranked near the same in efficiency little scatter would be expected on Figure 3. However, an examination of the diagram shows two groups, 1 and 2, that
Figure 3. Returns of capital managed on combined hog and general type farms in East Central Iowa.
deviate greatly from the line A-B. It appears that farmers in group 1 are not operating their enterprises in a fashion to get the returns expected of them considering the amount of capital managed at their disposal. They appear to be inefficient in the operation of their farms. The farmers in group 2 have a relatively small amount of capital to manage but are getting much better than average management returns from their capital. The dispersion on the diagram may indicate farmers of different capacity and farmers of different efficiency. Apparently the farmers in group 2 are very efficient. They may have the capacity for a larger farm plant. If they could continue efficient operation of the larger size plant more profit would be made by them. In contrast, perhaps the maximum capacity of group 1 has been exceeded. If these farmers had a smaller farm plant they might fall on the line with other farmers at average capacity and efficiency. Until methods are found to separate and measure capacity and efficiency, it is not possible to determine causes of the dispersion on the diagram.

Some studies suggest that the large scale farms offer the greatest possibility for the use of greater managerial capacity. However, it is also pointed out that this greater capacity is not always associated with large farms; when it is not, management becomes relatively expensive compared with the smaller farms where the operator combines management with labor.¹ There is a tendency for large farms to have wider range in management return, both higher and lower.

Edwin Nourse noted in 1929 that two-thirds\(^1\) of the "...workers engaged in farming are in direct control of the business in which they are employed.\(^2\) To him, "It would seem a self-evident proposition that in no field of human endeavor could it be expected that leaving managerial decisions to two-thirds of all workers could result in anything but inefficiency almost medieval in character." He believed there was a real economic demand for large scale organization and specialized management in agriculture. It might be reasoned too, that more than the proportionate share of inefficient managers stay in managerial posts on the smaller farms (including the family type farm). There, many entrepreneurial inefficiencies can be partially absorbed by the family labor force taking low labor returns.

On the family type farm, by definition, the entrepreneur, the foreman, and the labor force are largely made up from the farm family. The decision-making body is in direct contact with most of the details that accompany the management of a farm. There is a definite and continuous interest in and association with, not only the major decisions that are made, but most of the minor decisions as well. The decision-making body has intimate, first hand, factual data on the farm and the farm enterprise upon which to base its decision. Nowadays, with the available county extension workers, crop, livestock and technical outlook material, the family type entrepreneur has the opportunity to keep abreast of the latest developments and make his decisions accordingly.

\(^1\)Though this proportion seems high, the principle still applies.

On the large scale farm, the entrepreneurial ability may be used to a fuller capacity. If the entrepreneur does not conduct the farming enterprise in the most economical way, he is more apt to be forced from his managerial position due to competition. Because so many of large scale farm costs are represented by out-of-pocket costs, the large scale entrepreneur will not be able to stay in operation for long if returns do not cover costs. Costs resulting from poor entrepreneurial decisions cannot be absorbed by taking low labor returns. Those labor costs have already been paid out.

The entrepreneur on the large farm is relieved from a great number of incidental and menial tasks that take up so much of the time and physical effort of the entrepreneur on the family type farm. The large scale entrepreneur can spend more time formulating his managerial decisions. Proper keeping and analysis of farm records, selection of enterprises, picking specialized labor, investigating market and supply conditions and sources, keeping abreast of new techniques, and studying the economics of farming may aid him in doing a more efficient management job. In other words, full time may be devoted to the actual managerial job.

The higher cost of the entrepreneur, of the foreman, of the bookkeepers and overhead administration may be a burdensome cost on large scale farms, even when distributed over a large volume of production.

As stated at the opening of this section, actual empirical measurement of relative abilities of entrepreneurs on different size farms is not as yet possible. Entrepreneurship as it plays its part in general returns such as gross return, value of product, or labor and management returns will be examined in later sections of this thesis.
However, certain points are apparent from the discussion presented. Optimum size of firm will vary according to coordinating abilities of different entrepreneurs. Large scale farms offer possibilities for the use of greater managerial capacity. However, a high degree of coordinating ability is not necessarily associated with the larger farm entrepreneurs. Expansion of size of farm is no guarantee of improving the income position of farmers. Smaller farms offer more possibility for absorption of entrepreneurial inefficiencies than do large scale farms.

**Labor**

*Importance of labor as a factor of production*

By definition, the family type farm is largely dependent upon the labor furnished by the farm family. In most cases, a small amount of outside labor is hired and it works on a personal and friendly basis with the family labor. Large scale farms hire a high per cent of their labor force, and there the impersonal employer-employee relationship tends to exist.

With the advent of modern technology, labor has become a less important factor of production. Earl Heady sees the factors, land and labor, both becoming less important (Table 5). Labor requirements for

<table>
<thead>
<tr>
<th>Table 5. Estimated relative share of gross income in agriculture imputed to land, labor and capital and management*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period</td>
</tr>
<tr>
<td>1919-14</td>
</tr>
<tr>
<td>1924-28</td>
</tr>
<tr>
<td>1933-40</td>
</tr>
</tbody>
</table>

almost every crop and livestock enterprise have been reduced. Never-
theless, it is important to note that labor requirements have not been
reduced equally for all types of enterprise. This gives even more
evidence pointing to the fact that there will be different size of farm
for different types of farming. It is pointed out\footnote{Johnson, op. cit., p. 535.} that while corn belt
crop labor requirements have been reduced about 50 per cent, livestock
requirements have been reduced only 5 to 10 per cent.

All of this does not necessarily detract from the place that family
type farms may play in American agriculture. The same size family labor
force may now take care of a larger farm enterprise. However, this new
"largeness" may be accomplished either by extending the farm enterprises
to a larger unit (more land), farming the present enterprise more in-
tensively or diversifying more on the present farm unit.

\textbf{Labor efficiencies}

What are some of the advantages of efficient labor use that are
apparent in comparing the large scale and family type farm? The large
scale farms may provide for a greater division of labor and the use of
skilled labor. Because of the amount of labor needed for certain jobs,
it may be practical to train certain laborers. Labor efficiencies may
be gained in this manner. On the family type farms the individual worker
may have to be more adept at doing many different jobs. There is very
little chance for labor specialization or a single skilled laborer.
The family type farm is usually thought of as a more diversified farm than the larger farms. Not only are skills needed for each diversified segment of the farm enterprise, but a greater amount of coordinating ability is needed to coordinate these diversified segments into an efficient overall farm enterprise. Thus, there may be need for even more different skills on family type farms than on the larger farms. These skills will have to be available in a relatively small labor force. The family type farm has advantages too. In many cases it has not been impossible to incorporate into farm machines the number of automatic processes that industrial machines possess. Nor can there be instilled in hired labor the personal judgment, actual and constant concern, interest, and responsibility that seemingly are needed in the farm worker's every day tasks. The family type farm with its close tie between firm, family, and labor force would appear to have the greater concern and interest in each individual everyday task that is done on the farm.

There appears to be a certain minimum size of work force needed for efficient labor utilization. Many farm processes are in terms of work crews of men. Modern technological development has lowered the size of those crews. There are still many machines that require a two or three man crew to operate them. Many incidental jobs, lifting, building and repairing require at least two men crews. If the labor force depends on one person, farm operations may have to be curtailed or stopped because of illness or injury or the one man labor force being called away on business. John D. Black, et al. speak of farms in terms
of size as "one-man, two-man, etc." size of farm depending on type and size of farm.

The tractor units now used in the Corn Belt and in an increasing number of other sections of the country require a two-man crew to utilize them effectively. As a result, a strong movement is under way toward two-man farms in this section.¹

Certainly there is allowed within the framework of the family-type farm, as defined in this thesis, a labor force large enough to allow a high degree of efficiency in the farming enterprise. Restriction on amount of labor within this definition will not be a main deterrent to efficient operation of the farm as far as minimum size work crews are concerned.

The farm enterprises of the family type farm are often planned with the end in view of maximizing the use of the family labor force on a year round basis. An indication of this fact may be gained by examination of census data. The family type farm (value product group $1,000.00-$5,999.00 as examined in a previous section) reports a larger family labor force than do either the large farms, $10,000.00 and over, or the smaller farms, less than $1,000.00. This may be an indication of more male laborers being held on the family type farm. It may also be an indication that a fuller use is made of the farm labor force that is on the farm. Census labor statistics deal only with children over 14 years of age. Using modern technological methods, and with proper supervision, much work is accomplished on many family type farms by members of the

family younger than 14. Also, many women take care of the poultry enterprise or have other duties on the farm that contribute to the farm labor force. These portions of the labor force, women and children, are a labor supply that would probably not be used if they were not on the family type farm. If they were used on the large scale farm they would not be such a large proportion of total labor as is true for the family farm. An "extra" contribution is being made to total physical product. Properly supervised, this labor can be used without any exploitation taking place.

Certain practices may be found in family farm enterprises, that apparently do not make efficient use of labor as a factor of production. The family type farm need not necessarily be condemned for this. In many cases the labor is being substituted for other factors of production for the simple reason that labor, in a sense, is a free agent at that particular time of year. Some contribution to total physical product is being made by this "free agent" labor. It may be quickly pointed out that this labor might be more productively employed in a sector of the economy where there is full year round employment. It must be remembered that agriculture is a segment of our economy that takes peak season loads of labor.

For United States Agriculture as a whole, the greater part of the requirement for seasonal labor is met by the employment of local seasonal workers for pay and by unpaid work of farm family members. Employment of migratory workers is primarily a feature of the pattern of production of that segment of the agriculture of our country which is characterized by relatively large-scale specialized production often referred to as industrialized farms.1

---

The alternative to family labor partially underemployed at certain times of the year may be large peak employment loads that are characteristic of many large scale farms. After the peak, labor is then turned back to society to support the remainder of the year. For instance, Bureau of Agricultural Economics studies reveal that slightly more than 74 per cent of the 550,000 hired farm workers employed on three or more farms during the year 1945, worked less than 75 days during the entire year. In fact, the country as a whole may be subsidizing large scale producers by providing them with peak labor loads. Then the country assumes the responsibility for those laborers during off seasons by maintaining them on relief or by other government support. The family type farm comes much closer than does the large scale farm to meeting its peak labor needs with its own labor force or a cooperative labor force with neighbors.

Closer cooperation in labor utilization between farm operators has been suggested as a possible solution to migrant seasonal labor. Evidence points to the fact that the family type farm would provide a firm base socially for such an arrangement. Farmers on this size farm

---


2 Roy Smith quotes a North Dakota study that estimates that 25 to 30 thousand itinerant laborers from outside the state could be eliminated if labor living on farms plus local city and village labor available for hire could be distributed 50 per cent effectively. Smith, Roy J. Fuller annual employment of farm labor. Jour. Farm Econ. Vol. 26, No. 8, 1944. p. 514.
seem to be more prone to cooperate among themselves than do farmers on larger units. Family type farms do have a larger\(^1\) family labor force than the large scale or small farms. Then, on this type farm there is a larger physical labor force upon which to build a cooperative labor arrangement.

Examination of the type of enterprise in which farms of different size (measured in total value of product) are engaged gives some insight into type and amount of labor used on different size farms. Comparing the family type and large scale farm one would expect to find that the family type farm would be engaged in enterprises that would allow for full utilization of family labor. It may be noted that this is true in dairying. It is true in the poultry enterprise, but to a much less degree than might be expected. The large farms engage rather heavily in the production of fruit and nuts and horticultural specialties, all requiring large amounts of hired seasonal labor. Truck gardening, as represented by vegetables, also has high labor requirements of the hired seasonal type and large scale farms are engaged heavily in this type of farming.

**Effects of organized labor**

The operator of the family type farm often does not think of receiving a net income as such. He merely takes the difference between total income and total expenses and considers that as the family labor

\(^1\) See p. 36.
Table 6. Distribution of total value of agricultural products by type of product, for value groups of farms, United States, 1939*

<table>
<thead>
<tr>
<th>Value groups</th>
<th>Livestock</th>
<th>Dairy</th>
<th>Poultry</th>
<th>Horti-</th>
<th>Farm products</th>
</tr>
</thead>
<tbody>
<tr>
<td>All classified farms</td>
<td>22.6</td>
<td>14.3</td>
<td>7.1</td>
<td>1.4</td>
<td>31.6</td>
</tr>
<tr>
<td>1- 399</td>
<td>6.4</td>
<td>4.4</td>
<td>6.2</td>
<td>.5</td>
<td>25.5</td>
</tr>
<tr>
<td>400- 599</td>
<td>9.3</td>
<td>7.3</td>
<td>6.8</td>
<td>.6</td>
<td>33.2</td>
</tr>
<tr>
<td>600- 999</td>
<td>13.2</td>
<td>11.2</td>
<td>7.5</td>
<td>.8</td>
<td>34.9</td>
</tr>
<tr>
<td>1000-1499</td>
<td>17.4</td>
<td>15.9</td>
<td>8.0</td>
<td>1.0</td>
<td>33.7</td>
</tr>
<tr>
<td>1500-1999</td>
<td>20.1</td>
<td>18.6</td>
<td>8.0</td>
<td>1.0</td>
<td>32.8</td>
</tr>
<tr>
<td>2000-2499</td>
<td>21.6</td>
<td>19.1</td>
<td>7.8</td>
<td>1.0</td>
<td>35.5</td>
</tr>
<tr>
<td>2500-3999</td>
<td>23.1</td>
<td>16.4</td>
<td>7.5</td>
<td>1.1</td>
<td>35.1</td>
</tr>
<tr>
<td>4000-5999</td>
<td>25.4</td>
<td>16.6</td>
<td>7.0</td>
<td>1.2</td>
<td>36.1</td>
</tr>
<tr>
<td>6000-9999</td>
<td>29.3</td>
<td>15.0</td>
<td>6.7</td>
<td>1.5</td>
<td>33.1</td>
</tr>
<tr>
<td>10,000-19,999</td>
<td>34.8</td>
<td>13.0</td>
<td>6.2</td>
<td>2.6</td>
<td>25.4</td>
</tr>
<tr>
<td>20,000-49,999</td>
<td>39.4</td>
<td>10.7</td>
<td>6.6</td>
<td>2.4</td>
<td>21.2</td>
</tr>
<tr>
<td>50,000 and over</td>
<td>39.9</td>
<td>7.9</td>
<td>6.6</td>
<td>3.0</td>
<td>16.9</td>
</tr>
</tbody>
</table>


Forest products, less than 1 per cent in all cases, make up the remaining per cent.
force wage for the year. This is even more evident when inadequate capital is used in production and the farmer is largely selling the family labor when the product is sold. This is not to say that the family farm operator does not have variable and fixed costs and does not take into account depreciation. But in the end, the residue between total income and total expense is thought of not as profit but as a wage for the farm family labor force. This provides a point of departure to discuss labor's wage as it relates to the family labor supply on the family farm and hired labor on the large scale farm.

Because of the pressure to organize farm labor the relative positions of family type and large scale farms might well be examined. The large scale operator hires the larger proportion of outside labor. If farm labor were organized, farmers would probably have to pay higher labor wages. This might affect the family type farm too, but not to such a great extent as large scale farms. If higher wages were demanded by organized farm labor it would raise the cost of production for the large scale farms much more than it would for the family type farms. The effect of substitution of other factors of production would probably be small. Thus the larger firms would be forced to a new cost curve and would either sell at higher prices (not possible under perfect competition) or take less margin (See Figure 4).

In terms of Figure 4, the initial production would be OQ. The selling price would be QB with a profit of AB. However, if labor were organized it would change curve AC to AC' for the large scale farms.
Curve \( AC \) would be left virtually unchanged for the family type farms. For the large scale farms \( MC \) would move to \( MC' \). Under perfect competition the price would remain the same. Therefore, large scale farms would sell quantity \( Q' \) at price \( Q'B' \). Profit then would amount to only \( A'B' \), which is less than the original profit \( AB \).

As it is today, many family type farmers may be said to be selling their labor, in the form of products, on the market in competition with low paid unorganized farm labor which produces a large portion of large
scale farm products. If farm labor organization occurred family type farms would be relatively better off. Their average cost curve (See Figure 4) might move up slightly due to the increase brought about by organized labor. However, their cost curves would not shift up as far as would those of the large scale farms. The family labor force return would be higher because of labor organization. The AC curve may not be the same for both the large scale and family type farms. Even if this be true, the family type farms would be benefited and they would be relatively better off than before labor was organized.  

1Labor force adjustment to change

Over a two or three year period, labor supplies would probably adjust themselves to changing need more rapidly on large scale farms. The supply of labor on large scale units is not an integral part of the firm as is partially true on the family farm. On the family farm a larger portion of the labor force tends to be a fixed supply.  

This will depend upon the size of farm family and amount of labor hired within the limits of the family type farm. However, it should be noted that labor costs are out-of-pocket costs and are paid out mostly during the growing season before the product is ready for market. Wage rates usually lag behind general price declines. In the case of the large

---

1Part of this increased return might possibly be imputed back into land value and thus the farm family would receive only part of the benefit.

2See section on Flexibility for more discussion on this point.
scale operator these high wages may have already been paid out before price declines. The large operator may have no opportunity to "hedge" on his farm operations when lower product prices come. The high labor expenditure has already been made. However, the wage will fall faster for the farmer who is receiving his wage as a residual of receipts over costs. It is true, in fact, that his wage will drop immediately because his wage automatically drops as the residual between costs and receipts narrows.

Family type farms are able to survive unfavorable price relationships that often bankrupt the large scale farm depending on hired labor. 1 Low farm prices, in the main, move with low prices for the economy as a whole. During these "poor" times there are few chances for labor to shift to non-farm employment. This holds for both farm family labor and hired labor. Though labor returns are not high on family farms during these periods, family labor is still employed and a physical product results to flow to the economy as a whole.

It is true of the family type farm that the living coming from the farm usually makes up a greater proportion of total income than on large scale farms. The living obtained directly from the farm tends to be 2 nearly constant as the size of farm increases. Here, then, is a segment of the enterprise of the individual family farm that does not suffer from adverse relationships as much as do large scale farms.

---

1 Additional discussion on this point will be found in section on Flexibilities.

2 See Table 6.
In conclusion, it is apparent that labor is becoming a less important factor of production. Large scale farms give opportunity for greater labor specialization and development of skills. Greater out-of-pocket costs for labor incurred by large scale farms leave them more open to reverses in case of adverse price-cost relationships. Organization of farm labor would make the family farms relatively better off. Migrant laborers are more closely associated with large scale farms.

Capital

Importance of capital as a factor of production

The lack of adequate capital in agriculture has long been pointed out as one of the main factors that has led to inefficient operation of many farms. Private and government credit agencies have made great strides in improving the availability and use of credit. It has been pointed out that the returns on invested capital in agriculture are higher than for the average investment. These returns are much higher than the going interest rates.¹ But the flow of additional capital into agriculture is many times restricted by the excess supply of labor resources already in agriculture. The cheap available factor

¹D. Gale Johnson found that on an output of $800,000 the marginal productivities were 12 per cent for capital in Middle Atlantic, East North Central, South Atlantic, and East South Central regions. Johnson, D. Gale. Contribution of price policy to the income and resource problems in agriculture. Jour. Farm Econ. Vol. 26. No. 4. 1944. p. 631.
of labor is often substituted for the less cheap factor, capital. As pointed out by Earl Heady \(^1\) "...low returns are increasingly the result of these families who are unable to acquire proper amounts of capital and who must accordingly sell commodities which embody mainly labor."

Additional capital investment in agriculture evolves largely into the substitution of capital for labor in the production function. Because of the immobility of most labor this substitution often results in the shifting of under-employed agricultural labor into the pool of unemployed industrial workers which gains the economy nothing.

The substitution of labor for capital in the capital-poor areas of the nation has reached the point where it takes a large amount of labor to replace a small increment of capital. In fact, large deductions from the labor force could be made without materially reducing output even with capital investment remaining constant.

An indication of the importance of the agricultural sector of the economy as a possessor of capital may be gained from the data presented in Table 7. "Rough estimates" of the U.S. National Resources Committee place the total net worth of the United States in 1935 at 363 billion dollars. It was estimated that 161 billion dollars represented capital that was employed in production and distribution. Nearly one-fourth of that capital, 39 billions, was in agriculture. Nearly two-thirds of

\(^1\) Heady, op. cit., p. 447.
Table 7. Estimated capital employed in production and distribution, 1933*

<table>
<thead>
<tr>
<th></th>
<th>Capital value in billions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total owned</td>
</tr>
<tr>
<td>Utilities, including auto and bus transportation</td>
<td>51</td>
</tr>
<tr>
<td>Agriculture, land, buildings, machines and livestock</td>
<td>39</td>
</tr>
<tr>
<td>Manufacturing, inventory and fixed capital</td>
<td>31</td>
</tr>
<tr>
<td>Trade, inventories and fixed capital</td>
<td>13</td>
</tr>
<tr>
<td>Service to consumers</td>
<td>20</td>
</tr>
<tr>
<td>Mining, inventories and fixed capital</td>
<td>6</td>
</tr>
<tr>
<td>Construction, inventories and capital assets</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>161</strong></td>
</tr>
</tbody>
</table>


aLess than 1 billion.

The privately owned capital is invested in agriculture. Agriculture and services to consumers are the two areas where capital owned by individuals remains important.

Census compilation by Ducoff and Hagood present informative data.
that relates to use of capital within agriculture (Table 8). Capital investment per farm worker is listed for each of nine geographical divisions. This investment varies from $7,211.00 for the Pacific region to lows of below $2,000.00 in the South Atlantic and East South Central regions. Column 2 shows the value in dollars added by the agricultural

Table 8. Capital utilization and returns by regions* 

<table>
<thead>
<tr>
<th></th>
<th>Value in $</th>
<th>Value added by production per unit of capital in</th>
<th>Value added by agricultural process per worker</th>
<th>Value added per $100 capital investment per farm worker</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>4,222</td>
<td>807</td>
<td>942</td>
<td></td>
</tr>
<tr>
<td>New England</td>
<td>6,451</td>
<td>6</td>
<td>250</td>
<td>6 1,244</td>
</tr>
<tr>
<td>Middle Atlantic</td>
<td>5,225</td>
<td>5</td>
<td>952</td>
<td>5 1,129</td>
</tr>
<tr>
<td>East North Central</td>
<td>6,055</td>
<td>4</td>
<td>1,112</td>
<td>4 1,197</td>
</tr>
<tr>
<td>West North Central</td>
<td>6,702</td>
<td>2</td>
<td>1,135</td>
<td>2 1,238</td>
</tr>
<tr>
<td>South Atlantic</td>
<td>1,253</td>
<td>3</td>
<td>533</td>
<td>3 608</td>
</tr>
<tr>
<td>East South Central</td>
<td>1,887</td>
<td>9</td>
<td>493</td>
<td>9 486</td>
</tr>
<tr>
<td>West South Central</td>
<td>3,379</td>
<td>7</td>
<td>716</td>
<td>7 700</td>
</tr>
<tr>
<td>Mountain</td>
<td>6,243</td>
<td>3</td>
<td>1,204</td>
<td>3 1,423</td>
</tr>
<tr>
<td>Pacific</td>
<td>7,211</td>
<td>1</td>
<td>1,409</td>
<td>1 1,558</td>
</tr>
</tbody>
</table>

*Adapted from Ducoff and Haggard, op. cit., p. 20.

a Total value of land and buildings (less estimated value of dwelling) plus value of livestock and machinery.

b Total value of agricultural production (adjusted to EAR level and to include government payments) less the following operating expenses: Feed purchased, livestock purchased, fertiliser and lime, cost of operating motor vehicles, and a group of miscellaneous expenses, seed, insecticides, twine, hardware supplies, etc.

c All "farm worker" units are in man-equivalent terms.
production process per worker. It should be noted that the value of
dollars added ranks the same by regions as did the amount of capital
invested per worker. When total value of product produced per worker
is computed (column 3) it does not follow columns 1 and 2 exactly.
However, in only one case do the rankings differ by more than one. As
would be expected, the value added by the agricultural process per
$100.00 in fixed capital investment (column 4) was greatest where
capital investment was least; in the South Atlantic region. Other
regions group themselves roughly into inverse rank of column 1. The
investment of capital in areas that now have low capital investments
apparently bring high returns, as would be expected. Capital has not
been invested to a point where its marginal cost equals marginal returns.

The actual amount of capital any individual possesses in a farming
enterprise may, however, be a poor indication of efficiency of use.
Under existing institutional conditions a farmer is able to rent a much
larger volume of capital than he is allowed to borrow. If an operator
buys, the most he can usually borrow through first and second mortgages
is 75 per cent of the value of his farm. He may also be able to borrow
50 per cent on his machinery by chattel mortgage. This leaves a cash
capital need of 25 per cent of the value of the land and 50 per cent
of the machinery. The renter will usually need only the 50 per cent
to cover the chattel mortgage on machinery, a much smaller capital
requirement. A great many farm families prefer to remain tenants
even after they accumulate capital savings. They prefer to use their
capital as operating capital and get higher returns investing it in
in livestock and machinery rather than land. Ownership of land is often bought at the expense of operating efficiency due to smaller farming units and low operating capital. This may lead to lower returns and lower standard of living to the farmer and his family. Family type farms are often emphasized in the light of operator-ownership which many times results in high capital investment in land and low operating capital and efficiency. This may be particularly true of the very small family type farm. Large scale farms are subject to the same situation. However, as a rule, they do possess a larger proportion of operating capital than do smaller farms and are thus in an advantageous position on this score.

Risk, a limiting factor on size

It was noted previously that uncertainty bearing is one of the characteristics of entrepreneurship. It may also be noted that this uncertainty bearing, as it relates to capital investment, may be a limiting factor in the size of the farm firm. Robert Rudd and David MacFarlane have combined the work of N. Kaldor, Michael Kalecki and John Maynard Keynes and have adapted it to point out at least two factors dealing with capital utilization that may limit size of firm. They draw upon the Keynes concept of marginal efficiency of capital. According to Keynes, when a man buys an investment he purchases the

---


right to the series of prospective returns. The relation between the prospective yield of one more unit of capital investment in any line and its supply price or replacement costs is called the marginal efficiency of capital of that type. If there is increased investment in any given type of capital during any period of time, the marginal efficiency of that type of capital will diminish as the investment in it is increased. This is partly due to the fact that, as a rule, pressure on the facilities for producing that type of capital will cause its supply price to increase. It is also partially due to the fact that prospective yield will fall as the supply of that type of capital is increased. Within a given unit of enterprise the marginal efficiency of capital may decrease unless all factors of production can be increased in relative proportions or are perfectly substitutable.

Rudd and MacFarlen believe that empirical observations support the adoption of the theory of a downward sloping marginal efficiency investment curve for agriculture. In Figure 5, R is the prospective rate of return on investment, in most cases a fixed interest charge. Curve AB represents marginal efficiency of the investment with decreasing returns. According to this analysis, investment will be made to an optimum point of equating prospective rate of returns on investment with marginal efficiency of investment, both relating to the last unit of investment applied. Optimum investment would be at quantity Q.

Michel Kalecki¹ has dealt with the concept that marginal risk increases

with the amount invested. Kalecki pointed out, the greater the investment the greater is the reduction of the entrepreneur's income from his own capital when the average rate of profit falls short of the rate of interest. In addition, the greater the proportion of the investment that is borrowed, the greater would be the probability of the operator losing complete equity in the business as earnings fall short of the rate of interest.

Risk may also increase with scale in that large farms have more direct cash costs involved in operation and are more vulnerable to changing price conditions than are smaller farms. With a higher investment the liquidity position of the large-scale farmer may be less
favorable. He would be less able to meet contingencies requiring sudden large expenditures. The rate of interest on borrowed capital is sometimes related to the liquidity position of the entrepreneur. In most cases the family type farm operator is an individual owner and does not distribute risks by combining ownership with others. Many large scale farms are also owned and operated by individuals. However, the large scale farms that have corporate ownership are able to distribute risk among many individuals and different types of share issues.

Agriculture has within its framework problems that lead to much uncertainty. There is the great dispersion of future price expectations. There are uncertainties of production, especially due to weather, disease, and inability to speed up or slow down production due to static length of growing and breeding periods that cannot be appreciably altered. Not only the opinions of the entrepreneur respecting future expectations (uncertainty) but the willingness of the entrepreneur to bear risk is important. The family type farmers may have family, home, generations of ownership and tradition bound up in his entrepreneurial decisions. For these reasons family type farmers may discount future returns to a greater extent than will the large scale farmer and thus apply a smaller amount of capital.

These risk and uncertainty factors that affect future expectations

---

1 Failure to realize expected prices, costs and technological production rates for which no appropriate risk premiums can be paid. Rudd and MacFarlane, op. cit., p. 424.
have been shown above to increase with scale. The effect of these factors is presented graphically in Figure 6.

![Graph showing marginal efficiency of investment vs. risk factor with points Q, Q', and M.]

**Figure 6.** Optimum investment with risk.

Here, according to this analysis, optimum investment will be at point M, quantity Q'. At point M the marginal efficiency of the last unit added will be equated with the risk and uncertainty involved in adding that unit. As long as the return from the last unit added is greater than the risk and uncertainty involved, any place to the left of point M, it will pay to apply additional units of investment. Although optimum investment was at Q without uncertainty, it is at M when future returns are discounted by the factor of risk and uncertainty.

**Capital rationing**

Large scale farms are usually more efficient employers of capital to its optimum point than are family type farms. The larger farms have
more completely separated the functions of the management of the business from the family and family resources than have the family type farms. The family as an integral part of the family type farm may influence certain economic decisions. J.M. Brewster and H.L. Parsons\(^1\) have pointed out that the resources of land, labor, and capital are often already controlled by the farm (family type farm) and they do not have to be bargained for on the open market.\(^2\) A unit of capital may be more productive and its market price cheaper than a unit of labor. However, the unit of capital could be employed only by displacing a unit of labor that is an integral part of the family. It is reasoned, therefore, that on family type farms capital is many times not substituted for labor to a point where its marginal return is equal to its marginal cost.

This close tie-up between family and business unit many times brings about forced savings. Capital investment cut of income can be made only at the expense of present or future standards of living of the farm family. For instance, at the lower limit of family type farms, value of product of $1000.00, much of that amount is used for living expense. Studies have shown that the minimum cash living expense for an average farm family is nearly $500.00. Value of agricultural product used by the household is approximately $250.00. This leaves


\(^2\)For more detailed discussion see section on Flexibility, p. 117.

\(^3\)Sitler and Jehlick, op. cit., p. 19.
$250.00 to be used for all farm expenses and capital investment. It can be easily seen that there would be little or nothing left for capital investment on the lower limit family type farms.

The proportion that cost of living is of total income becomes smaller as income increases. The per cent that farm products used by the farm household are of total value of product produced is indicative of proportional cost of living data. This per cent varies from 53.1 per cent on value of product farms below $400.00 to .5 per cent from the largest group of farms.¹

Most years there are more net returns available on large scale farms than smaller farms for capital investment. Such a year was 1939.

Net returns for labor and management increased as size of farm increased (Table 9). On the basis of man-equivalent workers each successive size of farm had a greater amount of net returns available to use at the entrepreneur's discretion. The ratio that net returns were to value of product (column 3 to column 1) decreased as farms became larger. Nevertheless, there was still more net returns available for such expenditures as "capital" investment as farms became larger.

High profits of the war years enabled many family type farms to accumulate liquid and working capital. This has reduced the importance of forced capital rationing. In many cases wartime expansion has been on the basis of renting more land and retaining a large part of accumulated capital as working capital.

¹See Table 6, p. 83.
Table 9. Net returns by value of product classes, 1939*

<table>
<thead>
<tr>
<th>Value groups</th>
<th>Net returns to labor, management, and capital</th>
<th>Per man-equiv.</th>
<th>Per man-equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td></td>
<td>Per farm talent worker</td>
<td>Per worker</td>
<td></td>
</tr>
<tr>
<td>$5 1-99</td>
<td>-71</td>
<td>-102</td>
<td>-164</td>
</tr>
<tr>
<td>100-249</td>
<td>35</td>
<td>41</td>
<td>5</td>
</tr>
<tr>
<td>250-399</td>
<td>153</td>
<td>150</td>
<td>103</td>
</tr>
<tr>
<td>400-599</td>
<td>266</td>
<td>230</td>
<td>177</td>
</tr>
<tr>
<td>600-749</td>
<td>378</td>
<td>295</td>
<td>233</td>
</tr>
<tr>
<td>750-999</td>
<td>466</td>
<td>345</td>
<td>269</td>
</tr>
<tr>
<td>1000-1499</td>
<td>612</td>
<td>423</td>
<td>325</td>
</tr>
<tr>
<td>1500-1999</td>
<td>843</td>
<td>534</td>
<td>402</td>
</tr>
<tr>
<td>2000-2499</td>
<td>1077</td>
<td>627</td>
<td>477</td>
</tr>
<tr>
<td>2500-3999</td>
<td>1512</td>
<td>777</td>
<td>600</td>
</tr>
<tr>
<td>4000-5999</td>
<td>2239</td>
<td>909</td>
<td>702</td>
</tr>
<tr>
<td>6000-9999</td>
<td>3550</td>
<td>1125</td>
<td>831</td>
</tr>
<tr>
<td>10,000 &amp; over</td>
<td>12945</td>
<td>1605</td>
<td>1311</td>
</tr>
</tbody>
</table>

*Duerr and Haag, op. cit., p. 22.
Walter Wilcox points out an important consideration when he states that, "...analysis of a capital formation and maintenance as a simple problem in balancing expected returns from alternative resource allocation for the farm as an independent firm misses a large share of the important consideration which influence the use of capital in agriculture.\(^1\)

People attach a social stigma to being in debt. Debt is looked upon as something to avoid if at all possible. The prestige of being known as a debt free family means more to many people than increased income that might be gained by capital investment with its attached stigma of being in debt. Often the distinction is not made, in the minds of people, between credit for production with resulting returns and profits and credit used for consumption—buying something that will not return interest on investment. Donald Kaldor's findings substantiated these points. Low income (lower one-third of random sample of farms studied) Iowa farms were associated with small farms both in acreage and in capital investment. Most of these were near or below the lower limit of family type farms set in this study. In Kaldor's study\(^2\) eighty per cent of these low-income farmers felt lack of capital limited their increasing the size of their business. However, only 24 per cent of the high income group thought capital limited them in expansion.


The low income farmers stated that if they had more capital they would first pay their present debts, even at the expense of future income. The concept of using additional capital to invest in feed, buy livestock, fertilizer, or enlarge their business was secondary in their minds. The use of capital in terms of future returns was secondary to paying current obligations. Family farm operators, especially the operators of smaller farms, apparently are more prone to have this attitude than are large farm operators.

The tenure status of farm families has been recognized as a limiting factor in the use of capital. This may be especially true in soil building practices and conservation. Some modern leasing arrangements compensate the tenant, if he should move off the farm, for unused portions of soil building and conservation practices he has followed. In that tenants are more largely associated with family type farms than with larger farms, this type of leasing arrangement may aid capital investment on the part of the family type farm.

A fact that cannot be overlooked is that the tenure of the family type farm is at best a lifetime tenure. In many cases there is no carryover of accumulated capital from one generation to the next. Or if there is, it is often divided among so many heirs that it is of small consequence to any one heir. The life cycle of the average farm family may be closely paralleled by its use of capital. The young man starting to farm often has very little capital. Then, if he is successful, he builds up a working and investment capital by middle age. By this time, or with increasing age, he may not want to employ his

---

1See Table 10, p. 84.
factors of production, including capital, so extensively and the accumulated capital will not be used to its marginal efficiency. An important consideration is that this accumulated capital is often not passed on to the next person who runs the farm. This next operator may have to go through the same cycle of capital accumulation.

Corporation farms may be able to avoid these periods of insufficient capital. The corporation may maintain its available capital over a long period of time, over the life span of many managers. The individual and his life span loses its importance, in fact identity, within the corporation. However, it should be pointed out that by far the greater number of large scale farms are privately owned. They are subject to the same shortcomings in use of capital as it relates to the life cycle of the farm operator. It is recognized that managers are not associated totally with corporate farms. Often individual owners will hire managers. However, the percentage of managers may be used as an indication of the number of farms that may be corporate. It can be seen (Table 10) that while managers are increasingly important as farms get larger, they make up less than 5 per cent of all size of farms below $10,000.00. Managers operate only 11 per cent of all farms above $10,000.00 value of product.

Capital drain from agriculture

There is also a large drain on the capital that does come to the farming sector of the economy. One factor that affects this drain is the migration of the farm youth from the farm. It is estimated that
Table 10. Per cent distribution of farms in each value group by tenure of operators.

<table>
<thead>
<tr>
<th>Value of product</th>
<th>All farms</th>
<th>Owners and managers</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. operators</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classified farms, total</td>
<td>100.0</td>
<td>61.4</td>
<td>50.6</td>
</tr>
<tr>
<td>$ 1-99</td>
<td>100.0</td>
<td>67.2</td>
<td>64.3</td>
</tr>
<tr>
<td>100-249</td>
<td>100.0</td>
<td>61.8</td>
<td>57.4</td>
</tr>
<tr>
<td>250-399</td>
<td>100.0</td>
<td>58.1</td>
<td>51.9</td>
</tr>
<tr>
<td>400-599</td>
<td>100.0</td>
<td>56.0</td>
<td>49.8</td>
</tr>
<tr>
<td>600-749</td>
<td>100.0</td>
<td>57.1</td>
<td>47.8</td>
</tr>
<tr>
<td>750-999</td>
<td>100.0</td>
<td>59.3</td>
<td>49.0</td>
</tr>
<tr>
<td>1000-1499</td>
<td>100.0</td>
<td>63.1</td>
<td>49.9</td>
</tr>
<tr>
<td>1500-1999</td>
<td>100.0</td>
<td>66.1</td>
<td>49.6</td>
</tr>
<tr>
<td>2000-2499</td>
<td>100.0</td>
<td>65.4</td>
<td>47.6</td>
</tr>
<tr>
<td>2500-3999</td>
<td>100.0</td>
<td>65.1</td>
<td>44.6</td>
</tr>
<tr>
<td>4000-5999</td>
<td>100.0</td>
<td>68.4</td>
<td>41.3</td>
</tr>
<tr>
<td>6000-9999</td>
<td>100.0</td>
<td>69.9</td>
<td>38.7</td>
</tr>
<tr>
<td>10,000 &amp; over</td>
<td>100.0</td>
<td>80.2</td>
<td>37.6</td>
</tr>
</tbody>
</table>

under normal conditions in Iowa the loss of farm young people from 
migration can hardly fall short of 50 per cent in a generation. In a 
study of 191 Iowa consolidated school districts made in 1940 and 1941 
it was found that "...farm people in these 191 districts were paying 
3.24 times as much per child for education as were their town neighbors 
in the same districts." The cost to the farm people of feeding, clothing, 
and educating the migrating farm youth could not have been less 
than $2,000.00 per person. In addition to this initial investment 
in the youth and its being drained out of the farm sector by migration, 
other drains of capital off the farms may be pointed out. These youth, 
now out of the farm sector of the economy, may later inherit land and 
sell it, receive rent from a tenant, interest on the mortgage given by 
the purchaser or share in the settlement of an estate. All of these 
phenomena drain money out of the farming sector. This all tends to 
lead to inadequate capital in agriculture. The family type farm, because 
of smaller capital accumulation, probably suffers to a greater extent 
than do large scale farms.

There may also be more local institutions associated with family 
type farms than with large scale farming areas. It is such drains on

---

1Lancelot, W.H. and Morgan, Barton. Iowa's vanishing farm youth and 

2Ibid., p. 52.

3Baker, C.C. The effects of recent public policies on the future 

4Table 19 p. 126 gives indication that there are local institutions 
connected with family type farming areas. This in itself is, of

capital from the farming sector of the economy that makes it difficult to accumulate the amount of capital that would lead to application of capital on a more complete marginal efficiency approach.

More capital is usually available on the large scale farm than on the family type farm. The large scale farm with its greater segregation of firm and family probably applies capital more completely on a marginal approach. Self-imposed capital rationing is greater on family type farms, especially lower limit farms, than on large scale farms. Decreasing marginal efficiency, and risk as it relates to capital appear to be an increasing function of scale. These two factors along with uncertainty limit size of firm.

Conservation

Soil conservation and the family type farm are not incompatible. However, in many cases, the capital to invest in soil conservation is not available. In "poor" times small operators are sometimes forced to continue or increase production, even at the expense of their soil, to maintain family income. During the war period many farmers have accumulated more operating capital and may be in a better position to now, and in the future, adopt soil conservation measures. In most cases the information and facilities to conduct such a program are equally available

(Footnote continued)

course, not bad. From a purely economic point of view it does create a drain on incomes and result in capital rationing for the family type farm in some cases, depending on the methods of supporting these institutions.
to the large and small operator. The use of family labor in slack seasons may facilitate some low cost conservation practices on family type farms.

Many family type farms are passed on from generation to generation within the family. Consequently, there may be deeper interest in building or maintaining the soil and its fertility. The meager data at hand indicate that family type farms follow cropping practices and cooperate in soil conservation work equally with the larger farms.

A study made of 3400 farms in southern Wisconsin in 1942 indicated that large farms have a somewhat higher percentage of their farms in corn, a lower percentage in small grains and a smaller amount in hay (Table 11).

Table 11. Corn, grain and hay acreages by size of farm*

<table>
<thead>
<tr>
<th>Crop acres per farm</th>
<th>Per cent of cropland in:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Corn</td>
</tr>
<tr>
<td>20-39a</td>
<td>24</td>
</tr>
<tr>
<td>40-59a</td>
<td>25</td>
</tr>
<tr>
<td>100 &amp; over</td>
<td>30</td>
</tr>
</tbody>
</table>


Most of these are family type farms under this paper's definition.

This data does not necessarily reflect soil building or fertility practices and levels on these farms. Commercial fertilizer, lime, etc. could be applied to maintain the fertility level on the large scale
farms equal to that of small farms. Nevertheless this data does indicate the per cent of soil erosive crops that are raised on these different size farms.

An Iowa State College study\(^1\) of 15,000 farms representative of three different degrees of soil productivity throughout the state showed "practically no difference between the average percentage of cropland in corn and hay on farms of the various sizes."\(^2\)

On the basis of participation by farms and ranches in government soil conservation programs, the 380-499 acre farms appear to be the most cooperative (See Table 12). Actually there is not a great difference in participation among any of the size groups over 180 acres. Though

Table 12. Ranch and farm participation in conservation programs

<table>
<thead>
<tr>
<th>Acreage</th>
<th>Percentage distribution</th>
<th>Percentage distribution</th>
<th>Ratio of plans as of 6-30-44: Census distribution(^a): column 1 to column 2 by farm size(^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-29</td>
<td>3.0</td>
<td>24.9</td>
<td>0.650-1</td>
</tr>
<tr>
<td>30-49</td>
<td>8.2</td>
<td>12.6</td>
<td>0.929-1</td>
</tr>
<tr>
<td>50-99</td>
<td>19.7</td>
<td>21.2</td>
<td>0.929-1</td>
</tr>
<tr>
<td>100-179</td>
<td>23.7</td>
<td>21.5</td>
<td>1.033-1</td>
</tr>
<tr>
<td>180-259</td>
<td>18.6</td>
<td>8.0</td>
<td>1.935-1</td>
</tr>
<tr>
<td>260-379</td>
<td>10.7</td>
<td>5.3</td>
<td>2.019-1</td>
</tr>
<tr>
<td>380-499</td>
<td>4.9</td>
<td>2.2</td>
<td>2.227-1</td>
</tr>
<tr>
<td>500-999</td>
<td>5.2</td>
<td>2.7</td>
<td>1.938-1</td>
</tr>
<tr>
<td>1000 &amp; over</td>
<td>3.1</td>
<td>1.6</td>
<td>1.938-1</td>
</tr>
</tbody>
</table>

\(^a\)U.S. Soil Conservation Service. Percentage distribution. Farm and ranch conservation plans, 6-30-44. Washington, Soil Conservation Service. 1944.


\(^2\)Largest size farms were 250 acres and over.
acres may not be the best measure of size, these figures do give
indication that the medium large farms do participate in equal or
greater proportions than do the larger farms. Using value of product
and labor used on farms as a measure of size the $4,000.00 to $5,999.00
value group was found to represent the approximate upper limit of family
type farms. This value of product bracket of farms averaged 442.5
acres in size. Farms of that size would fall within the acreage
group that participated most in conservation programs according to
Table 12.

Using broad census data of farms that reported the use of com-
mmercial fertilizer and liming materials for the United States as a whole
some tentative observations may be made.1 Of the almost 6 million
classified farms over 2,300,000 reported the use of commercial ferti-
lizer. Using acres in crop land as a measure of size, data presented
in column 7 of Table 13 indicate that the larger farms used more
fertilizer per acre. In fact, the value of product groups in which most
of the family type farms fall used the lowest amount of fertilizer per
acre of any size groups. However, family type farms ($1,000.00-
$5,999.00 value of product) showed the largest percentage of farm using
commercial fertilizer (column 4).

However, the data indicate a different pattern for those farms
using liming materials. Only 471,607 farms reported use of liming materi-
als. On the average the family type farm used more liming materials

1This data would have more significance if it were compiled on a
smaller area basis. However, most of the data by regions has a
coefficient of variation of approximately 10 per cent or more and
may be subject to sampling errors greatly in excess of that amount.
Table 13. Use of commercial fertilizer and liming materials by size of farms

<table>
<thead>
<tr>
<th>Value of product</th>
<th>Percentage of farms</th>
<th>Acres</th>
<th>Average</th>
<th>1% of all farms</th>
<th>Tons</th>
<th>Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Of all</td>
<td>Of 50.5%</td>
<td>Of all</td>
<td>per farm</td>
<td>in tons</td>
<td>use of</td>
<td>per acre</td>
</tr>
<tr>
<td>classification</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farms</td>
<td>Reporting ex-</td>
<td>All</td>
<td>Classified</td>
<td>in tons</td>
<td>Materials</td>
<td>Farm</td>
</tr>
<tr>
<td>Classified expenditure for farms</td>
<td>Farms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertilized</td>
<td>Commercial</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertilizer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
<th>(10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- 99</td>
<td>5.4</td>
<td>2.1</td>
<td>14.5</td>
<td>9.9</td>
<td>.78</td>
<td>.0788</td>
<td>1.6</td>
<td>8.36</td>
<td>.34</td>
</tr>
<tr>
<td>100- 249</td>
<td>13.3</td>
<td>10.5</td>
<td>30.2</td>
<td>14.9</td>
<td>.95</td>
<td>.0637</td>
<td>2.6</td>
<td>7.08</td>
<td>.47</td>
</tr>
<tr>
<td>250- 599</td>
<td>13.5</td>
<td>14.5</td>
<td>41.3</td>
<td>31.4</td>
<td>1.32</td>
<td>.0612</td>
<td>4.0</td>
<td>7.39</td>
<td>.34</td>
</tr>
<tr>
<td>600- 999</td>
<td>14.3</td>
<td>17.1</td>
<td>45.7</td>
<td>30.2</td>
<td>1.70</td>
<td>.0604</td>
<td>5.6</td>
<td>9.38</td>
<td>.33</td>
</tr>
<tr>
<td>750- 999</td>
<td>7.9</td>
<td>9.6</td>
<td>46.9</td>
<td>39.7</td>
<td>2.13</td>
<td>.0556</td>
<td>6.9</td>
<td>11.39</td>
<td>.30</td>
</tr>
<tr>
<td>1000-1499</td>
<td>9.4</td>
<td>11.1</td>
<td>45.3</td>
<td>30.2</td>
<td>2.54</td>
<td>.0505</td>
<td>8.1</td>
<td>13.67</td>
<td>.27</td>
</tr>
<tr>
<td>1500-1999</td>
<td>11.6</td>
<td>12.6</td>
<td>41.6</td>
<td>37.0</td>
<td>3.15</td>
<td>.0466</td>
<td>10.6</td>
<td>15.51</td>
<td>.23</td>
</tr>
<tr>
<td>2000-2499</td>
<td>6.8</td>
<td>7.0</td>
<td>39.3</td>
<td>26.5</td>
<td>3.55</td>
<td>.0446</td>
<td>13.4</td>
<td>17.41</td>
<td>.20</td>
</tr>
<tr>
<td>2500-3999</td>
<td>4.3</td>
<td>4.3</td>
<td>37.9</td>
<td>27.6</td>
<td>4.23</td>
<td>.0416</td>
<td>14.1</td>
<td>20.13</td>
<td>.197</td>
</tr>
<tr>
<td>4000-5999</td>
<td>6.2</td>
<td>5.9</td>
<td>36.6</td>
<td>12.0</td>
<td>5.42</td>
<td>.0331</td>
<td>16.0</td>
<td>23.58</td>
<td>.187</td>
</tr>
<tr>
<td>6000-9999</td>
<td>2.7</td>
<td>2.6</td>
<td>37.3</td>
<td>162.0</td>
<td>7.36</td>
<td>.0492</td>
<td>18.9</td>
<td>31.19</td>
<td>.192</td>
</tr>
<tr>
<td>10,000 &amp; over</td>
<td>1.5</td>
<td>1.4</td>
<td>36.7</td>
<td>21.9</td>
<td>13.10</td>
<td>.0631</td>
<td>17.9</td>
<td>35.83</td>
<td>.184</td>
</tr>
</tbody>
</table>

per acre than did large scale farms. The proportion of farms using liming materials was greater for large scale farms than for the family type farms, (column 8).

Returns to Scale

Research studies relating to efficiencies of scale

"The relation between efficiency and size of firms is one of the most serious problems of theory, being, in contrast with the relation for a plant, largely a matter of personality and historical accident rather than of intelligible general principles."¹ This observation of Professor Frank Knight probably applies more appropriately to the farm firm than to other firms. Farm size is many times conditioned by size at time of settlement, inheritance of farm, indivisibility of farms when sold and failure to use available credit facilities.

Previous discussion has attempted to show relative advantages of the family type farm and the large scale farms as they relate to certain economic criteria. The criteria considered were factors of production, labor, entrepreneur, capital and, in a minor sense, land. An attempt to combine these factors of production into one analysis may be made by the examination of resource combination as it relates to returns to scale.

In static theory, the optimum size of the firm is found at the low

¹Knight, Frank H. Risk uncertainty and profit. New York, Houghton Mifflin & Co. 1933. preface, p. XXX.
point on the average cost curve. In practice optimum size of individual firm varies with individual abilities, discount of future returns, equity position of the owner and amount and rapidity of change that is taking place. However, when farms are grouped in general categories are there average overall economies of scale that result from increased size? Many farm management studies have been directed toward studying efficient operation and different types of returns as they relate to size. Most of these studies, however, deal with different size of farm within narrow ranges. Large scale farms and family type farms, as they are defined in this thesis, are not often separated into distinct classifications. Most studies relate to examination of efficiency within the limits of the family type farm. "Large scale" farms are too often categorized as "340 acres and over". Included in this group may be the very large family farms and large scale farms ranging in size from 400 to 2000 acres. Distributions of sizes within these limits are not given. Therefore, interpretations cannot be made about the results obtained. Realizing these and other shortcomings of studies used here an attempt will be made to apply the best studies to the problem of returns to scale.

R.D. Jennings

R.D. Jennings ¹ made a study in 1929 and classified large scale farms as those with a value of product that amounted to $30,000.00 or more.

This represented multiples of from 9 to 31 times larger than average type farms of the ten different types studied. After making this study Jennings concluded:

Under conditions existing in 1929 large-scale farms appeared to be more efficient than the average farms as far as the use of land, labor and capital were concerned. This does not mean, however, that large-scale farms are more efficient under all conditions than the average farm or than the family farm of optimum size for the greatest economic efficiency under the same conditions. (Underlining inserted by present author)

P.E. Johnson and H.C.M. Case

In 1942 P.E. Johnson and H.C.M. Case of the University of Illinois, reviewed twelve years of farm record accounts in Illinois. These records covered the years 1926 to 1937 inclusive. Though it is not contended that these record farms are typical farms, these farms do give interesting basis for comparison. The state of Illinois was divided into nine major farming type areas to remove much of the difference in soils, climate, topography, markets and types of farming. It is interesting to note that this study covered the years of high income as well as low income, although it must be emphasized that the lower income years are in predominance.

If comparison of size of farm is made on the basis of per cent earned on investment (Table 14) most of the type-of-farming areas had the greatest return on the 220 to 299 acre size farm. Only in one case,

---

Table 14. Variations due to difference in size of farm, average for Illinois accounting farms, 1926-1935*

<table>
<thead>
<tr>
<th>Per cent earned on investment</th>
<th>Acres per farm</th>
<th>0-99</th>
<th>100-139</th>
<th>140-179</th>
<th>180-219</th>
<th>220-259</th>
<th>260-299</th>
<th>300-339</th>
<th>340 &amp; over</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy and truck</td>
<td></td>
<td>.93</td>
<td>4.18</td>
<td>4.22</td>
<td>4.13</td>
<td>3.80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed livestock</td>
<td></td>
<td>2.68</td>
<td>2.93</td>
<td>3.91</td>
<td>3.41</td>
<td>3.86</td>
<td>4.23</td>
<td>3.39</td>
<td>3.35</td>
</tr>
<tr>
<td>Livestock &amp; grain</td>
<td></td>
<td>1.62</td>
<td>2.72</td>
<td>3.17</td>
<td>3.45</td>
<td>3.12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash grain</td>
<td></td>
<td>.53</td>
<td>1.61</td>
<td>2.47</td>
<td>2.71</td>
<td>3.06</td>
<td>3.33</td>
<td>3.30</td>
<td>3.13</td>
</tr>
<tr>
<td>General farming</td>
<td></td>
<td>.46</td>
<td>2.28</td>
<td>2.39</td>
<td>2.20</td>
<td>2.63</td>
<td>3.33</td>
<td>3.52</td>
<td>3.38</td>
</tr>
<tr>
<td>Wheat, dairy &amp; poultry farms</td>
<td></td>
<td>2.98</td>
<td>2.97</td>
<td>2.97</td>
<td>2.93</td>
<td>3.69</td>
<td>3.22</td>
<td>3.40</td>
<td></td>
</tr>
<tr>
<td>Mixed farming</td>
<td></td>
<td>.23</td>
<td>1.54</td>
<td>.99</td>
<td>2.50</td>
<td>2.55</td>
<td>3.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grain &amp; livestock</td>
<td></td>
<td>1.50</td>
<td>2.70</td>
<td>.88</td>
<td>3.68</td>
<td>2.79</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Adapted from Ibid., p. 227.
Table 14. Variations due to difference in size of farm, average for Illinois accounting farms, 1926-1935*

<table>
<thead>
<tr>
<th>Labor and management wage (labor income)(^a)</th>
<th>0-99</th>
<th>100-139</th>
<th>140-179</th>
<th>180-219</th>
<th>220-259</th>
<th>260-299</th>
<th>300-339</th>
<th>340 &amp; over</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy and truck</td>
<td>134</td>
<td>298</td>
<td>262</td>
<td>164</td>
<td>-94</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed livestock</td>
<td>142</td>
<td>32</td>
<td>203</td>
<td>-27</td>
<td>62</td>
<td>164</td>
<td>-132</td>
<td>-516</td>
</tr>
<tr>
<td>Livestock &amp; grain</td>
<td>79</td>
<td>-33</td>
<td>-92</td>
<td>-55</td>
<td>-380</td>
<td>-144</td>
<td>-493</td>
<td>-679</td>
</tr>
<tr>
<td>Cash grain</td>
<td>-322</td>
<td>-553</td>
<td>-361</td>
<td>-419</td>
<td>-433</td>
<td>-419</td>
<td>-558</td>
<td>-1004</td>
</tr>
<tr>
<td>General farming</td>
<td>-70</td>
<td>47</td>
<td>-74</td>
<td>-213</td>
<td>-263</td>
<td>83</td>
<td>-78</td>
<td>-53</td>
</tr>
<tr>
<td>Wheat, dairy &amp; poultry</td>
<td>173</td>
<td>126</td>
<td>88</td>
<td>322</td>
<td>122</td>
<td>5</td>
<td>-45</td>
<td></td>
</tr>
<tr>
<td>Mixed farming</td>
<td>33</td>
<td>125</td>
<td>-398</td>
<td>-12</td>
<td>-32</td>
<td>86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grain &amp; livestock</td>
<td>102</td>
<td>111</td>
<td>139</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


\(^a\)A portion of the variation as it relates labor income to size of business is a product of method of calculating labor income. An assumed return to capital, 5 per cent, is set up and in years of low rates earned, say, 4 per cent, there is a negative margin between rate returned and rate deducted for the use of capital.
general farming, was the amount earned greatest on the largest size farm. That earning was only .05 of one per cent greater than for size of farm 220 to 299 acres. Net receipts per acre were highest on the same size farm, 260 to 299 acres. Labor and management wage was greater for the smaller farms (Table 15). The 340 acre farm may not be a large scale farm. But, even on this size farm there is indication that the largest farms are not necessarily the most efficient when measured in the terms used in this study. Labor expense per crop acre was lowest on large farms, but machinery expense per crop acre was, with the exception of cash grain farming, lower on farms of 260 to 299 acres and smaller.

It is quite conceivable that the family type farm as defined in this thesis, would include within its limits the 260 to 299 acre size farms in all type of farms except dairy.

D. Curtis Mumford

D. Curtis Mumford¹ published a study relating to large scale farming during 1930. He classified farms as small, medium and large and used a combination-size index to relegate farms into their specific categories. Farms were divided into ten general classes.² Mumford’s study was focused on large scale farms. It may be pointed out, however, that it is quite possible for larger family farms, as defined in this

²Truck, fruit, cotton, cash-grain, other crops, general mixed dairy, cattle and sheep ranches, poultry, and other livestock.
study, to be included within the lower limits of his medium size farm. For instance, a farm of 200 acres, with a total labor force of 3 men and a capital investment of $25,000.00 would be at the lower limit of medium farms. A lower limit large scale farm in Munford's terms might be 500 acres in size, employ 10 men and have a capital investment of over $100,000.00. This was a nation-wide study and was conducted by questionnaire. Most of the analysis of data is merely tabulation and does not represent a penetrating statistical approach. Munford's conclusions were, "...that on the average a larger proportion of the medium sized farms were more successful than was true of either the small or the large scale farms." This relationship did not always hold true when related to individual types of farming. The smaller farms were more successful in truck and poultry enterprises. The large scale farms were most successful only for the cash-grain type of farming.

John A. Hopkins, Jr.

Using efficiency factors in analyzing 1929 and 1930 Iowa farm records Hopkins related net income to size of farm, measured in acres. Farms were grouped as to type of farming and cross relationships with the other factors were removed. The net income increased with total acreage up to about 400 acres. After that point net income decreased as farmer's managerial ability is (generally) spread over an area greater than he can handle effectively with present equipment and

---

1This was true of net income computed both before and after payment for interest was made.
under present forms of farm organization.\(^1\)

**Louis J. Ducoff and Margaret Jarman Hagood**

Ducoff and Hagood used value of agricultural products sold, traded or used by the farm household as an index of size of farm. They found that both gross and net productivity (gross value of production less operating expenses, taxes, maintenance or depreciation and return on capital investment and/or rent) of farm workers increase over the total range of returns curves using 1939 data. "The curves for both gross and net productivity of farm workers rise rapidly with increasing size of enterprise in the value-of-product classes of less than $2,500.00. Both continue to rise, though at a slower rate, up to the highest value group.\(^2\)

**Earl O. Heady**

Net farm income might conceivably increase with scale of operations in two different ways: (1) it might result from lower costs as production factors are combined more economically and as fixed costs are spread over a greater output, and (2) it might result from greater volume alone.

---

\(^1\) Hopkins also related the number of spring litters of pigs to net income on average farms. In 1929 and earlier years net income rose until there were about 35 litters, 20 to 25 above average. After that point net income tended to decline as the larger number of pigs received less efficient care. "On farms where the most modern methods and equipment are used and where, at the same time, the management is more than ordinarily efficient, it seems likely that the point of diminishing returns occur with a large number of litters." Hopkins, Jr., *op. cit.*, pp. 136, 138, 141.

\(^2\) Ducoff and Hagood, *op. cit.*, p. 9.
even though costs were to remain constant or if output were pushed beyond the low cost combination and as long as the addition to cost was less than the addition to income.¹

Earl Heady examined data collected from a 1939 random sample of Iowa farms and found evidence substantiating the theory that net income still increases, on large farms, in spite of higher unit cost that these farms have. Heady compared the increased returns due to lower costs with those due to volume alone. In every case, the increase in net income due to volume alone was much greater than that due to lower costs alone (Table 16). The application of these findings to this study again raises difficulties. The lower limit of the largest farming units is still within the possible realm of large family type farms. A total labor force of three men would have to be employed only 200 days each to operate the 600 unit farm. It would be pertinent to know whether increasing cost, apparent in Heady's study, would cancel increased net income due to efficiencies of volume production as the analysis was carried into truly large scale farms.

Some studies have been made of production functions that have related to scale of operation. While this is a relatively new approach and is subject to certain shortcomings, it does hold possibilities if done properly. Earl Heady² studied data from a random sample of Iowa


<table>
<thead>
<tr>
<th>Size interval</th>
<th>Costs per 100 gross</th>
<th>Gross income</th>
<th>Net farm income</th>
<th>Total increase in net farm income</th>
<th>Increase due to lower costs</th>
<th>Increase due to greater volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 149</td>
<td>225</td>
<td>55.05</td>
<td>325</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150 to 299</td>
<td>1044</td>
<td>57.41</td>
<td>865</td>
<td>529</td>
<td>165</td>
<td>364</td>
</tr>
<tr>
<td>300 to 449</td>
<td>3094</td>
<td>47.42</td>
<td>1712</td>
<td>847</td>
<td>236</td>
<td>551</td>
</tr>
<tr>
<td>450 to 599</td>
<td>4330</td>
<td>46.60</td>
<td>3513</td>
<td>608</td>
<td>58</td>
<td>770</td>
</tr>
<tr>
<td>600 &amp; over</td>
<td>6454</td>
<td>46.34</td>
<td>3469</td>
<td>951</td>
<td>-125</td>
<td>951</td>
</tr>
</tbody>
</table>

*Adapted from Haddy, production functions from a random sample of farms, p. 174.*

Work unit is considered as the amount of work performed by an average man in a ten hour day.

*Net farm income is the difference between total farm credits and total farm debits.*

*Increase for each size group over average of next smaller group.*

*Computed by multiplying the units of $100 gross income for the size group by the decrease in costs per $100 gross over the next smaller size group. For example, the increase due to lower costs for the 150-229 group is equal to $(66.05 - 57.11) \times 15.44 = \$165.00$.*

*Increase in net farm income minus increase due to lower costs: For the 150-229 group this is equal to $529 - 165 = \$364.00$. Actually this method of computation attributes less to volume alone than would be true if costs were held constant as scale is expanded. This is true since the method employed allows a reduction in costs for both the original output and the additional output.*
farms in 1939 and classified resources as real estate, labor machinery and equipment, livestock and cash operating expenses. Marginal productivity (return for dollar added investment) for each type of resource except cash operating expenses showed larger return on the larger farms. Ready states this is consistent with the belief that in general the techniques employed on large farms are more productive than those employed on small farms. Diminishing returns to scale was found for both "large" and "small" farms. However, the larger farms had a higher return, .9605, against .8051 for small farms.¹ This exploratory study into production functions and scale has suggested that the larger farm is a more efficient unit in combining the selected factors of production.

J. Karl Lee

A recent study made by J. Karl Lee,² of the BAE, relates scale of operation to economic efficiency. This study was made of four types of farms in the San Joaquin valley of California. The four types include specialized fruit, major fruit, summer-field crop and dairy. The farms are classified as to size largely on the basis of acreage, varying with type of farming, into three classifications; medium, medium-large and large. The family type farm, with the use of some seasonal labor would best fit the classification of medium large. Using the farm budget approach Lee evaluated these three sizes of farms. A combined index

¹Constant returns to scale would be indicated by 1.00; an increase in input of all resources by 1 per cent would result in increase in total product by 1 per cent.

²Lee, op.cit.
of farm returns, based upon the rate earned on investment and the per
hour returns to all workers, indicated that the large and medium-large
farms were of about equal efficiency. The large farms were 2 per cent
more efficient. However, in three of the four cases the large scale
were the most efficient measured on this basis.

Lee's study brings forth one point that is interesting to note in
the light of an observation of Nicholas Kaldor in his study of the
dynamic firm. The downward slope of the average total cost curve in
its early stages is noted—increasing returns to scale. Kaldor then
points out that with a given state of knowledge a point must be reached
where all technical economies are realized and costs of production
therefore reaches a minimum. Beyond this point, costs may rise over
a certain range, but (if in accordance with his assumptions, factors
continue to be obtainable at constant prices) afterwards they must
again fall until they once more reach their minimum at the same level
as before. The optimum point can then only be reached for certain
outputs. However, there is no reason why successive optimum points
should not be at the same level of average costs. The transfer from
theory to reality may be made by suggesting that perhaps the low cost
point on the average total cost curve may be reached at different size
farms. Firms of the size 320, 480, and 640 acres may be just multiples
of the 160 acre farms and in reality no efficiencies have occurred by
these larger farms being in operation. The 160 acre and the 640 acre
farms may be equally efficient.

\[1\] Kaldor, Nicholas, *op. cit.*, p. 65.
Lee notes in the type of farms that he studied, "...that all the economies to be gained in the investment in machinery are attained at 100 acres." However, the machinery investment per acre tended to go down slowly to about 400 acres, but beyond that the reduction was practically negligible. Then for the most part the investment in machinery on larger farming units than 100 acre tracts is for duplication of machinery used on the 100 acre tract. If this be true of other factors of production or the entire farm organization then large scale units may be said to be replications of smaller efficient units and not any more efficient than the basic smaller unit. Though evidence to establish this has not as yet been presented, it should be borne in mind as a possibility.

Indivisibilities and scale of operation

It has been suggested in the past that the size of machinery units would force the adoption of larger farming units in agriculture. It was reasoned that machine indivisibilities would bring about a larger size farm. How many of the machinery units with their power take-offs and attachments have been adapted for efficient operation on the family type farm. The advent of custom work or cooperative ownership of large equipment units has helped bridge the gap of some of these indivisibilities to favor more the family type farm.

---

1Lee, op. cit., p. 37.
It might seem at the outset that the larger scale farms would have the advantage over the family type farm as far as buying and marketing is concerned. The larger operator may be able to take the time and spend the money to investigate and develop various marketing possibilities. Special packaging, channels of sale, brand names and advertisement may be economical for the larger producer that would not return benefits for the small amount that the family type farm would produce. It can be noted that cooperatives have come to play an increasingly important part in helping the smaller farms extend their functions into buying and marketing. They now have many of the same advantages as do larger operators. There have been examples of commodity cooperatives through which nearly all of a crop is processed and/or sold. This is another indication that indivisibilities (buying and selling efficiently) can be broken down in practice so that the family type farm and smaller farms may participate in some of the same savings, as do the larger farms.

Indicative of the importance that cooperatives have come to have to farm operators are the data presented in Table 17. Using value of product as an indicator of size over 50 per cent of the family type farms, by our definition, did business with or through cooperatives. This percentage increases as size of farm grows larger up to $6,000.00 value product. Beyond the $6,000.00 size fewer farm operators made use of the cooperatives.
Table 17. Farmer operators reporting business with or through cooperatives, 1932*

<table>
<thead>
<tr>
<th>Value of product</th>
<th>Per cent of all operators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>United States:</td>
</tr>
<tr>
<td>All groups</td>
<td>22.4</td>
</tr>
<tr>
<td>1- 99</td>
<td>6.0</td>
</tr>
<tr>
<td>99- 249</td>
<td>7.8</td>
</tr>
<tr>
<td>250- 399</td>
<td>9.9</td>
</tr>
<tr>
<td>400- 599</td>
<td>14.0</td>
</tr>
<tr>
<td>600- 749</td>
<td>18.7</td>
</tr>
<tr>
<td>750- 999</td>
<td>23.2</td>
</tr>
<tr>
<td>1000-1499</td>
<td>32.1</td>
</tr>
<tr>
<td>1500-1999</td>
<td>39.9</td>
</tr>
<tr>
<td>2000-2499</td>
<td>43.3</td>
</tr>
<tr>
<td>2500-3999</td>
<td>43.9</td>
</tr>
<tr>
<td>4000-5999</td>
<td>50.5</td>
</tr>
<tr>
<td>6000-9999</td>
<td>50.3</td>
</tr>
<tr>
<td>10,000 &amp; over</td>
<td>48.8</td>
</tr>
</tbody>
</table>


Indivisibilities may become important as they relate to the supply of land as a factor of production. The supply of land is actually discontinuous. Small increments are, as a rule, not available for application as a factor of production. Additional increments of land are usually only available as other farms are liquidated. In some cases the holding will be broken up for sale to several operators. Seldom are they broken up into more than two units. More often farms are transferred as a total unit. Leo Hoover\(^1\) studied farm consolidation in Iowa where the average size farm, measured in acres, is approximately 160 acres. Out of 56 farm consolidations studied Hoover found only one farm absorbed that was less

---

than 40 acres in size. Over 75 per cent of the absorbed farms were between 30 and 160 acres in size. This indicates that in reality increments of land added to production are relatively large. Small increments are not available for application to the firm. This should not be construed to mean that lack of availability of land is the main limiting factor in increase in size of farms. Also, many farms that become truly large scale do not always remain so, but are often broken up.

For instance, in Iowa in the years 1935 to 1939 the total number of farms over 1000 acres increased from 151 to 201, or a net increase of 50. However, during that same period there were at least 32 farms, of over 1000 acres in size in 1935 that were broken up by 1940 and classified as smaller sized farms.

The few studies, of many, that have been presented here have indicated that there is no clearcut proof of economic efficiency for either the large scale or family type farm. This is especially true when a long range of high and low prices are taken into account. These studies have demonstrated that mere large size of firm is no guarantee of more efficient operation in the long run. On the pure basis of efficiencies connected with scale of operation there has been proven no clearcut advantage for large scale farms. This statement holds true especially when large scale farms are compared with the larger family type farms. These studies indicate that the smaller family type farms would be more efficient if their size were increased to approach the upper limit of family type farms.

There is a definite need for farm management studies that will compare relative efficiencies of large scale and family type farms. Too often in the studies cited large scale farms were not specific categories but just all farms larger than a specific upper limit of what might well be a family type farm. Most studies of efficiency have been made within the limits or twilight borders of family type farms.

Some studies show decreasing returns near or just beyond the probable upper limit of size of the family type farm. However, it is not clear if the farms concerned are just over-sized family farms or truly representative of large scale farms. Other studies show increasing returns above the family type farms but give no indication of how far the curve extends, even within limits of an average large scale farm. On the basis of data examined here, a conclusion cannot be reached that large scale farms have a definite overall economic advantage over the large family type farm. This is not to say that economic efficiencies of large scale farms may not be proved. But, to the author's knowledge, they haven't been conclusively proved to date.

Flexibility

Over a period of years with price fluctuations, changes in demand, recurrence of business cycles, which of the two, family type or large scale farm, is the more adaptive to a changing condition?

Flexibility as it relates to farming may be divided into two categories. First, there is the adjustment that is made by the firm to the conditions of the business cycle as it progresses through its var-
ious phases. Second, there are the adjustments that are made from year to year as expectations change on individual products. This latter adjustment may be made independently of the general trend of the longer cyclical adjustments. For instance, well founded expectations for high corn prices for the coming season may be formulated despite an expected decline of aggregate agricultural and business prices. With these two categories in mind an examination of flexibility and adjustment to change will be made.

It has been said\(^1\) that good times and large scale farming go hand in hand—that a truly distinctive characteristic of the family size farm is its proficiency at "belt tightening" in the face of unfavorable circumstances. Studies that have been made and farm records that have been kept, tend to point to this conclusion. As long as prices are high and the margin large, then the large scale farms flourish successfully. When depressions come the small family type farm makes more, or loses less, money. Is this an indication that large scale farms can't adapt themselves to change as rapidly as can family type farms? Much of the evidence substantiating the relation of large scale farming to good times revolves around the method used to compute income and losses in farm management studies. In computing net returns it is often assumed that market rates of interest on different types of farm capital reflect actual productivity of that capital. However, it can be pointed out that there is certain evidence to support the relation of "boom" and large farms going hand in hand.

\(^1\)Rudd and MacFarlane, _op. cit._, p. 433.
As noted before, the family type farm depends largely upon the family labor force. Their wages are computed largely from residue of income over expenses. There is very little out-of-pocket costs for labor (and other factors for which labor is substituted) on the family type farms. On the other hand, the large scale operator must employ and pay for labor as his crop or livestock is being produced. In many cases labor expense makes up a sizeable portion of his out-of-pocket costs. Labor must be paid before the product is ready to sell.

If conditions of price become unfavorable, there is no way for the large scale farm manager to hedge, for the expense has already been incurred. Labor and other variable costs that come with fuller employment of capital in machinery and buildings are usually associated with large scale farms. They cannot be absorbed as readily by large scale operators as they can be by smaller farmers because they make up a large proportion of total costs on large scale farms. The family type farmer may substitute his or his family's labor for other factors of production that demand out-of-pocket costs. This cannot be done to any great extent by the larger producer.

Coordinating ability and adjustment to change

For a theoretical approach to the size of the firm and its relation to changing conditions, such as "boom" and "bust", a return is made to N. Kaldor. It was pointed out in a previous section that one of the

\[ \text{Kaldor, Nicholas, } \text{op. cit.}, \text{ p. 67-70.} \]
limiting factors on the size of the firm was the fixity of the factor
of coordinating ability. Kaldor points out that the ability to adjust,
to coordinate, is essentially a dynamic function; it is only required
as long as adjustments are required. If conditions are static, there
is no change, or if changes occur at a given rate, then there would
be no problem of coordination, but merely a task of supervision. Then
the size of the optimum firm becomes infinite (or indeterminate). It
is only the dynamic situation that limits the size of the firm. As a
firm becomes larger there is need for more coordinating to be done,
which limits the size of firm. In periods when great uncertainty
enters into the planning and the decision making of the farm firm,
then the dynamic condition in which the farm finds itself will limit
its optimum size. In times of lower prices, closer margins, more and
more efficient coordinating decisions must be made, which may not be
compatible with the larger scale farms.¹ Albert Mighell² found that
prosperity favors the large farms and depression the small farms. He
attributed his findings partially to the relative inflexibility which
characterizes the large scale farms.

It may be true that entrepreneurial abilities are not so often
used to full capacity during "good times" on family type and smaller

¹When prices are moderately good and fairly stable, when crop yields
are high and when costs do not change greatly, the advantage of a
large farm is increased considerably.
Iowa Farm Business Association, Annual Report, F.M. 653. 1a. State
College, 1939. p. D.

²Mighell, Albert. Why prosperity favors the large farms and
depression favors the small farm. Iowa State College.
(Mimeographed). 1933.
farms as are the abilities of operators on large scale farms. With
good prices, stable costs, and good yields, fewer coordinating decisions
have to be made and, as indicated above, the advantage seems to lie
with the large scale farm. It is possible that coordinating ability is
being used to, or near, its capacity by large scale farm operators
during the prosperity phase of the business cycle. However, in times
of lower and changing prices, closer margins, and wider dispersion of
expectations a greater number of efficient coordinating decisions must
be made. This "extra" demand on coordinating ability cannot be met by
large scale entrepreneurs who are already using their coordinating
ability at or near its full capacity. It is also possible that entre-
preneurial abilities of the family type farm operator were not being
used to their fullest capacity during "good times". Then during "bad
times" the latent ability of these family farm operators may be called
forth to deal with rapid change and the demand for more coordinating
ability. A more efficient job of coordination may be done by family
type farms at this stage of the business cycle. However, this thesis
has stated that entrepreneurial abilities differ greatly with different
operators. In that case the "unused" portion of coordinating ability
may be available in either the large scale or family farm operator.
However, if it be true that large scale operators do make relatively
fuller use of their entrepreneurial abilities than do family farm oper-
ators then this point remains one of importance.

It may be interesting to point out that the smaller farms are
thought of as usually being more diversified while the larger farms are specialized.\footnote{For instance, Jenning's study of 1930 census data points out the specialization of large scale farms. Of all the large scale farms (those farms with value of product of over \$30,000.00 in 1929) 30 per cent were stock ranches, 20 per cent were fruit and 20 per cent were truck farms. General farms (no enterprise providing as much as 40 per cent of the total income) made up less than 2 per cent of the large scale farms. Of the 785 large scale truck farms, 506 raised only one vegetable, and 165 farms raised only 2 vegetables. Only 12 per cent of large scale fruit farms had more than one product. Over two-thirds of the dairy farms had no other important products raised on the farm. Sheep and cattle farms were likewise found to be specialized. Jenning, \textit{op. cit.}, pp. 21, 25, 49.} It is conceivable that the reason small farms are small is because they are diversified farms. The diversity of enterprises may bring with it a greater demand on the coordinating ability of the entrepreneur. Not only are there coordinating demands within enterprises, but between enterprises on the farm. An optimum size as it relates to coordinating ability, is reached on a small sized farm. The large more specialized farms may require no more coordinating decisions than do the smaller diversified farms.

Against this theoretical background it may be well to indicate that actions to remove risk and uncertainty from agriculture may call for less coordinating ability on the part of the entrepreneur and farms may expand in size. Government actions such as crop insurance, the ever normal granary and forward prices are aimed at lessening the uncertainties in farmer planning and expectations. In parity both the uncertainty of prices and of costs are attacked on a common footing in an attempt to remove some of the uncertainty from the farming enterprise.
Judgment is not passed on whether these policies are good or bad. However, it may be pointed out that as uncertainties are removed, as less coordinating ability need be used, the size of the optimum firm may well become larger and larger. In terms of Figure 6, p. 77, risk and uncertainty are reduced and the risk and uncertainty curve is shifted to the right. This would allow for a larger investment, a larger size firm.

The theory of the flexibility of the firm

With changing price and cost levels, both real and anticipated, there arises the need for flexibility in operation if the firm is to be moderately efficient at all probable levels of production. In fact, on a marginal basis, flexibility will be added until its accumulated marginal cost is equal to the discounted marginal returns from savings due to that additional flexibility. Flexibility and adaptability of the firm should not be confused. Stigler makes the distinction between the two.

If a fixed plant of quantity X can be combined with from a to b units of a variable service, within this range there is complete adaptability if for any combination of the two services, it is possible to use the best known technology that utilises the two productive services in these quantities. But the best technology for combining X with (say) Z units of variable service, with a product of Y units, need not be, and for non-optimum outputs generally will not be, the same as the technology which (given the prices of the productive services) would minimize the cost of production of Y. This latter

---

technology will almost certainly require a different quantity of the fixed services. Flexibility permits this best technology for producing \( y \), and other non-optimum outputs, to be approximated, but at the cost of not being able to use the best-known technology for output.\(^1\)

A plant that is certain of producing \( W \) units of output each week will surely have lower costs at \( W \) output than will a plant designed to be passably efficient in producing from one half \( W \) to twice \( W \) units of output each week.

The difference between the cost curves of an indivisible and relatively inflexible plant and those of a relatively divisible plant is illustrated by Figure 7. The cost curves of the former type are drawn as solid lines; the latter case is represented by dotted lines. At optimum output \( OF \), the indivisible and unadaptable plant has lower average and marginal costs; the flexible firm's costs are larger by \( GJ \) times \( OF \). When output is \( OA \), however, the flexible plant has much smaller losses (\( OA \) times \( CD \)), and the inflexible firm would even have to close down if it were in a competitive market. Similarly, if output \( OK \), the profits of the flexible firm are larger by \( OK \) times \( LN \), and the inflexible firm would require a prohibitive price to cover marginal costs at this output. If output were anticipated to fluctuate only between \( W \) and \( z \), clearly a less flexible plant would be desirable.\(^2\)

Extension or enlargement of a plant is in general much simpler than contraction. The plant cannot usually be depreciated out of existence within a moderate time period.

\(^1\)Ibid., pp. 314-15.

\(^2\)Ibid., pp. 316-17.
Figure 7. Cost curves of flexible and inflexible plants.
Two main methods are important in securing flexibility of operations. The first is based on divisibility of a fixed plant, which will reduce variable costs of sub-optimum output. The second method is to reduce fixed plant relative to variable services, i.e., to transform fixed into variable costs.  

Theory may be related to practice. Large scale farms are more specialized. The large scale farm's equipment, the management, and its labor may be trained to do one specific job the best way possible. Machinery is bought or made especially for one certain job or crop. Labor is trained to do one or a few jobs well. On the diversified family type farm a machine may be bought not to do a single job the best, but to do two or three jobs acceptably well. This perhaps leads to more efficient operation by large scale farms when both firms operate according to expectations. In adverse or changing times the large scale farm is specialized and can well pursue only one type enterprise because of large and specialized fixed costs involved. The family type farm may be able to adapt its factors of production, already diversified, all into one enterprise already in operation or into alternate enterprises. This may be done still using the same or near the same factors of production without great loss of efficiency.

1 Ibid., p. 317.
2 In that large scale farms use their equipment more intensively it may wear out more quickly. Thus the large scale farm may stay more closely abreast of new and improved machinery or may be able to shift into other lines of agriculture more rapidly as equipment wears out in shorter time and alternative actions are open to the large scale operator.
Flexibilities and "fixed" costs

The above approach implies that the large scale operator may have more fixed costs tied up in his single enterprise type farm. This may well be true. J.M. Brewster and H.L. Parsons\(^1\) use the fixed costs analysis approach in comparing the family type and the large scale farm and their relation to flexibility and adjustment to change. The family type farm has attributed to it an "occupational unity of functions" that does not separate the three personal functions of firm, labor, technological management, and business. According to this analysis the primary function of the business element of the firm is to bargain for legal control over factors of production. It is then contended that, in the case of the family type farm, with its occupational unity of function, such factors of production as family labor, working capital and land are available without the business part of the firm bargaining for them. "A farm characterized by a complete unity of functions is equivalent to a firm in which all costs for a given year are fixed."

This is contrasted with the large scale farm where factors of production are bargained for and employed more on the marginal basis. However, it can be empirically proved that farmers of the family type farm do, in many cases, bargain for factors of production and employ them on a marginal efficiency basis. Feeding hogs to different weights under different price conditions, production responses to subsidy payment, and

\(^1\)Brewster and Parsons, *op.cit.*, p. 339.
farm practices such as reducing number of cultivations on corn all may be mentioned. However, the points made by Brewster and Parsons are pertinent. In a sense the family type farm does have many fixed costs and has available to it factors of production for which it does not have to bargain. The family farm may continue to use those factors only because it does not have to bargain for them. However, it should be pointed out that this bundle of "fixed costs" are fixed for the farming enterprise as a whole. There may be a wide range of alternative uses, for these "fixed" factors of production within the farming unit. Family farms are diversified and the principle of opportunity costs may be used in shifting greater proportions of these "fixed" factors into other enterprises. These factors may be shifted into enterprises already in operation on the farm or into entirely new enterprises using nearly the same "fixed" factors. Thus as relative prices within agriculture change, regardless of broad general trends, shifts in the use of resources may be made quickly and effectively on family type farms.

As far as actual shift of all fixed factors out of agriculture is concerned and the farmer going to another occupation, it appears that the family type farm will be less apt to make the shift than will large scale farms. In adverse times labor may be substituted for other factors of production and out of pocket costs are minimized on the family type farms. In these adverse times there is usually no alternative employment for labor. Unemployment is high. The labor on the family type farm is being employed and is returning a physical product to society as well as furnishing itself with certain minimums of living in the way of food and shelter. But, as a rule the labor resource will not
be shifted out of agriculture.

The steadiness of agricultural production

It has been shown that agriculture does not respond to cyclical price rise and fall in the typical industrial fashion. There is not great expansion or contraction of production in limited time in response to price expectations. Table 18 illustrates the small degree of fluctuation in agricultural production when compared with industrial production. Agricultural production varied from a 1935 low of 91 to a 1944 high of 133. Production in industry fluctuated from a 1932 low of 58 to an index of 259 in 1935. The prices received by farmers fluctuated over a much wider range than did prices paid by farmers.

There is some fluctuation in farm production. Large scale farms are more apt to increase or decrease production as prices rise and fall because of greater use of the marginal approach to employment of factors of production. The factors of production are not residual within the large scale firm, they must be bargained for on the market. What if all farms were large scale farms and reacted to economic stimuli as do industrial firms? What if these large farms would "close down" during a depression as business firms do? It is obvious that people need nearly the same amount of food and fiber in "good" times as in "poor" times. Schultz states that "... it is obvious that the steady performance of agriculture is a major national asset, while the erratic rate of production in industry is a serious liability."¹

---

¹Ibid., p. 15.
Table 16. Industrial and agricultural production and prices received and paid by farmers 1928-1944
(1935-1939 = 100)

<table>
<thead>
<tr>
<th>Year</th>
<th>Industrial production</th>
<th>Agricultural production</th>
<th>Prices received by farmers</th>
<th>Prices paid by farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1928</td>
<td>99</td>
<td>102</td>
<td>141</td>
<td>120</td>
</tr>
<tr>
<td>1929</td>
<td>110</td>
<td>99</td>
<td>139</td>
<td>119</td>
</tr>
<tr>
<td>1930</td>
<td>92</td>
<td>98</td>
<td>120</td>
<td>116</td>
</tr>
<tr>
<td>1931</td>
<td>75</td>
<td>102</td>
<td>84</td>
<td>103</td>
</tr>
<tr>
<td>1932</td>
<td>58</td>
<td>94</td>
<td>64</td>
<td>92</td>
</tr>
<tr>
<td>1933</td>
<td>69</td>
<td>87</td>
<td>67</td>
<td>91</td>
</tr>
<tr>
<td>1934</td>
<td>75</td>
<td>93</td>
<td>84</td>
<td>100</td>
</tr>
<tr>
<td>1935</td>
<td>87</td>
<td>94</td>
<td>102</td>
<td>98</td>
</tr>
<tr>
<td>1936</td>
<td>103</td>
<td>94</td>
<td>107</td>
<td>98</td>
</tr>
<tr>
<td>1937</td>
<td>113</td>
<td>106</td>
<td>114</td>
<td>102</td>
</tr>
<tr>
<td>1938</td>
<td>99</td>
<td>103</td>
<td>91</td>
<td>102</td>
</tr>
<tr>
<td>1939</td>
<td>109</td>
<td>106</td>
<td>89</td>
<td>100</td>
</tr>
<tr>
<td>1940</td>
<td>119</td>
<td>110</td>
<td>93</td>
<td>100</td>
</tr>
<tr>
<td>1941</td>
<td>182</td>
<td>113</td>
<td>116</td>
<td>106</td>
</tr>
<tr>
<td>1942</td>
<td>159</td>
<td>124</td>
<td>149</td>
<td>122</td>
</tr>
<tr>
<td>1943</td>
<td>259</td>
<td>129</td>
<td>180</td>
<td>129</td>
</tr>
<tr>
<td>1944</td>
<td>235</td>
<td>135</td>
<td>182</td>
<td>136</td>
</tr>
</tbody>
</table>

The fact that agriculture continues to produce so that the nation can be fed and clothed, even in low income years, is not necessarily inherent in agriculture as a whole. To a large degree continuous production may be the result of the type-of-farming unit that makes up a large portion of commercial agriculture, the family type farm. Large scale farms curtail their production for the reasons already mentioned. Farms smaller than family type farms contribute a very small percentage of agricultural production that goes to commercial channels. By and large it is the family type farm that continues commercial production in spite of adverse price relationships.

Adjustment to change

The field of fundamental and applied research in agriculture has long depended mainly upon federal and state agencies. It is not conceivable that this arrangement will change appreciably for either the family type farm or large scale farm in the near future. There are very few farming units in the United States that could afford to conduct their own research on a very elaborate scale. With competition in agriculture approaching the "perfect" stage it would be very difficult for individual farming units to benefit greatly by introducing or withholding new techniques or products from the market. The policy of government research has probably distinctly benefitted the family type farmer who could not afford or would not have the ability to conduct his own research extensively.
A quarter of a century ago there were apparently well founded predictions that farming, like industry, was going to turn quickly to large scale production. The development of new techniques was supposed to hasten the evolution. History has shown that this was not necessarily true. Many of the present day technological improvements can be used on the small and the family type farm equally as well as they can on the large scale farms. Hybrid corn, new varieties of crops, soil improvement, crop rotation, improved cropping, livestock breeding and feeding, improved techniques and many other improvements are just as applicable to the small units as to the large.

Of course, just because new practices and improvements were equally available to different type farms does not necessarily mean that the smaller farms adopt them as rapidly as the larger farms. The adequacy of extension service, farm management data, and outlook information coupled with the family's ability, judgment, and working capital will greatly determine the speed of adopting new techniques on the family type farm. Some studies\(^1\) show that the larger farms (in acres and in income) tend to use more new approved farm practices and techniques and adopt them sooner than do the smaller farms. In neither case, however, were the "large" farms of greater size than the large family type farm in the areas studied. Nevertheless, these studies do show that lower limit


family type farms as defined by this thesis, are slower to adopt improved practices. Education and capital accumulation were thought to be more important than size as a determining factor of time of adoption of new practices and techniques. Larger farms would probably more often have capital available to experiment or to fully employ new or improved techniques of farming. Many times the greatest advantage in increased returns are received by those who first employ new techniques. If the above two points be true, then large scale farm operators would enjoy the windfall benefits of improved techniques.

Changing technology usually brings in its wake new economic uncertainties. In many cases new technology, such as machines, may tend to require reorganization of the entire farm enterprise. This may throw increased pressure on the entrepreneurial ability of the farm managers. Change with its accompanying uncertainties has been pointed out as one of the limiting factors in size of firm. Technological change as well as uncertainty of future expectations plays its part. The rate at which future returns are discounted as risk increases with change is an increasing function of size and will limit size of farm.
CONFLICT: ECONOMIC, SOCIAL AND POLITICAL

Emphasis in this thesis has been primarily on the economic side of the family type farm. Within this economic framework efficiency in the use of resources has been emphasized. No clear-cut verdict for or against the family type farm was found. Even within the scope of economic agricultural planning, study must go farther than the pure economics of scale of operation. This is emphasized by Ducoff and Hagood who make this statement:

The fundamental variables which enter into the equation of post-war agricultural planning are the amount of agricultural production desired, the number of farm workers which would represent a balanced distribution between agriculture and other occupations, and the levels of living to be achieved by persons engaged in agriculture.¹

The first two points mentioned above group themselves into the central thought of efficient use of resources both in agriculture alone, and in the economy as a whole of which agriculture is an integral part. The last point of Ducoff and Hagood is related to farm income and wealth distribution, including actual size of farm plant holdings.

Social and Political Characteristics of the Family Farm

On the pure basis of economic efficiency the optimum size farm has not been fixed. Discussion in this thesis has emphasized the economic side of the family farm unit. However, it should be pointed out that

¹Ducoff and Hagood, op. cit., p. 1.
the political and social sides of the family farm are also very important. Literature and research studies show overwhelmingly the acceptance of the family farm over large scale and subsistence farms when judged on a political and social basis.

Detailed examination of the relative social and political merits of the two types, family and large scale, farms cannot be made in this thesis. However, an example is given that points out some of the characteristics that are usually attributed to the two type-of-farming areas. A study was made in the Arvin and Dinuba communities in the Central Valley of California. For the type of farming concerned, the two communities were thought typical of large-scale and small-scale family farms respectively. Both communities possessed fairly good soil and they both produced fruit and field crops, though in somewhat different proportions. Neither community was on a main highway or railway route. Neither community was surrounded by any industrial activity of sufficient magnitude to establish the tone and character of social life. Examination of Table 19 indicates some of the social and political differences between the two communities. It was recognized that certain characteristics such as history, character of people, type of crops grown, and the size of operation all had influence in explaining the difference between the two communities. However, it was the opinion of the author Goldschmidt that, "....the basic cause, the one all-important cause, is the last, size of farm operations."

---

Table 19. Characteristics of two communities in the Central Valley of California*

<table>
<thead>
<tr>
<th></th>
<th>Arvin</th>
<th>Dimona</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acreage, average</td>
<td>285</td>
<td>89</td>
</tr>
<tr>
<td>Population</td>
<td>6,300</td>
<td>7,600</td>
</tr>
<tr>
<td>Tributary trade area</td>
<td>70,000 acres</td>
<td>77,000 acres</td>
</tr>
<tr>
<td>(approx.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross dollar volume of</td>
<td>$2,460,000</td>
<td>$2,540,000</td>
</tr>
<tr>
<td>farm products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banks</td>
<td>None</td>
<td>Two</td>
</tr>
<tr>
<td>Newspapers</td>
<td>One</td>
<td>Two (one a vigorous,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>real force in the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>community)</td>
</tr>
<tr>
<td>All business establishments</td>
<td>60</td>
<td>156</td>
</tr>
<tr>
<td>Schools</td>
<td>One grammar school</td>
<td>Four grammar schools</td>
</tr>
<tr>
<td></td>
<td>No high school</td>
<td>One high school</td>
</tr>
<tr>
<td>Local government</td>
<td>County only</td>
<td>Incorporated, elect own</td>
</tr>
<tr>
<td></td>
<td></td>
<td>local officials</td>
</tr>
<tr>
<td>Service and commercial</td>
<td>Two</td>
<td>Five</td>
</tr>
<tr>
<td>clubs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fraternal &amp; women's clubs</td>
<td>None</td>
<td>Seven</td>
</tr>
<tr>
<td>Veterans' associations</td>
<td>None</td>
<td>Two</td>
</tr>
<tr>
<td>Churches</td>
<td>Six (only three are</td>
<td>Fourteen (mostly</td>
</tr>
<tr>
<td></td>
<td>adequately housed)</td>
<td>substantial, in good</td>
</tr>
<tr>
<td>Housing</td>
<td>Very poor; houses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>badly crowded on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>small lots, very few</td>
<td></td>
</tr>
<tr>
<td></td>
<td>brick or other</td>
<td></td>
</tr>
<tr>
<td></td>
<td>permanent buildings</td>
<td></td>
</tr>
</tbody>
</table>
<pre><code>                      |                         |                         |
</code></pre>

*Adapted from Goldschmidt, op. cit., p. 4, and McWilliams, op. cit., p. 5.
Here then, can be seen the type of conflict that could develop. If future studies show conclusively that large scale farms are more efficient in agricultural production, then this efficiency would have to be weighed against political and social benefits associated with family type farms. In the case of the family type farm, as defined in this paper, it is evident that the larger family type farms are much more efficient than are those at the lower limit. If family farms are increased in size to the upper limit, fewer people will be able to be fully employed in agriculture. This, according to the agricultural fundamentalists would not be desirable. It is their belief that a large proportion of the population should be kept in agriculture because of the political and social benefits associated with the agricultural way of life.

However, it should be pointed out that alternative means may be used to resolve social, political and economic ends without conflict becoming a reality. For instance, the most efficient size economic agricultural plant could be set up to produce the food and fiber for

<table>
<thead>
<tr>
<th></th>
<th>Arvin</th>
<th>Dimba</th>
</tr>
</thead>
<tbody>
<tr>
<td>Youth and juvenile</td>
<td>Fairly serious, few</td>
<td>Almost non-existent,</td>
</tr>
<tr>
<td>delinquency</td>
<td>recreational opportunities</td>
<td>Numerous recreational</td>
</tr>
<tr>
<td></td>
<td></td>
<td>facilities</td>
</tr>
<tr>
<td>Working for wages</td>
<td>4/5 of those gainfully</td>
<td>1/2 of those gainfully</td>
</tr>
<tr>
<td></td>
<td>employed</td>
<td>employed</td>
</tr>
<tr>
<td>Independently employed</td>
<td>1/5 of those gainfully</td>
<td>1/2 of those gainfully</td>
</tr>
<tr>
<td></td>
<td>employed</td>
<td>employed</td>
</tr>
</tbody>
</table>

Table 19. (continued)
our nation. Assume that this economic unit was a relatively large farm, the upper limit of the family type farm. Those farmers dispossessed by increasing size of farming unit to an "optimum size" might be deployed about the country on small acreages. Emphasis for these small acreages would be placed on producing food and fiber for family use. Because of greater efficiencies realized from the larger farm units it might be possible to tax them and distribute a portion of the revenue to the displaced farmers. The total product for all the farmers concerned might be greater than under the present system of agriculture. Or, it is quite possible that the social and political benefits attributed to farm life could be accomplished or approached by planned small acreage communities near larger centers. The farm way of life along with industrial employment, could be maintained in these small acreage communities. There could still be economic commercial agricultural production on larger optimum size farms. These are merely pointed out as possible approaches that might limit apparent conflict.

It is recognized that policy decisions rest with the people. The people of this nation through their government can mold future agricultural policy. Steps can be taken within the framework of democracy to advance or stop concentration of land into larger holdings. Larger concentrations of land can be forbidden, graduated land taxes can be imposed, greater inheritance taxes, forbidding of absentee ownership and allowing for no profit on land from increase in land value while in the hands of the owner—all of these would have their effect on the size of future agricultural units.
Immediate Research Needs

It is not for the student of economics to put forth goals that should be attained. However, he can point out alternative means of reaching a given goal, with the possible direct and indirect effects of those means. He can point out that given goals or means are in conflict with each other. He can point out probable effects on the economy of attaining certain goals or alternative goals. The policy decision, the selection of the goal, remains with the people of the nation. To aid these people in more intelligently making their decisions much more study must be made on and about the family type farm. There are many problems that need examination. However, there appear to be at least two main and immediate steps that need be made. First, on the economic side of the farming unit, the economic efficiency of a definitely defined family type farm should be compared with other size farming units ranging from very small to very large. In this manner a range of the most efficient size of farming units should be determined. Second, the desirable and non-desirable social and political characteristics associated with "agriculture as a way of life" should be more specifically delineated. An attempt should be made to show how they can or cannot be associated with farming units of different sizes. Then people should be better able to recognize conflicts if they exist. If conflict exists, it can be resolved and goals chosen that are thought the best. Only then will the family concept of farming unit take on true significance, or be cast aside because of its shortcomings, as a meaningful descriptive term in American agriculture.
SUMMARY

The "family" concept of farming unit has long been used to describe widely varying segments of American agriculture. In recent years it has come to have increasing importance as a concept representative of a segment of agriculture important in action policy programs. With this increased importance of the family concept in mind, this thesis is directed toward three problems relating to the economics of the family type farm. First, a definition of the family type farm has been formulated. Second, the family type and large-scale farm have been compared on the basis of certain economic criteria. Third, factors that limit size of firm (farm) have been examined.

There have been many characteristics attributed to the family type farm. However, there appear to be only two real and one qualifying characteristic that are distinctive of the family farm. These characteristics revolve around the function of the family in the farming unit. Using these distinctive characteristics, a definition was formulated in terms of: the entrepreneurial function being furnished by and vested in the farm family with farming being the main enterprise of that family, at least one-half of the labor force being furnished by an average size farm family, and a farm plant large enough to utilize the farm family labor supply with reasonable efficiency.

To better understand the farm in its economic setting a brief review of the short and long run static theory of the firm was presented.
A large scale farm was defined in multiples of two to five times the size of the family type farm. Large scale and family type farms were compared on the basis of selected economic criteria. Coordinating ability of individual entrepreneurs was found to be a factor limiting size of farm and efficient operation of different size farms. Large farms offer greater possibilities for the use of greater entrepreneurial capacities. However, a high degree of coordinating ability is not necessarily associated with the large farm entrepreneurs. Smaller farms offer more possibility for absorption of entrepreneurial inefficiencies. Expansion of size of farm, without considering capabilities of entrepreneurs, is no guarantee of improving the income position of farmers.

The factor of labor is becoming less important as a factor of production. Large scale farms give opportunity for greater labor specialization and development of single skills. However, greater out-of-pocket cost for labor incurred by large scale farms leaves them more open to reverses in case of adverse price-cost relationship. Migrant laborers and resulting problems are more closely attributable to large scale farms. Family type farms would be relatively better off if farm labor were organized.

The production factor of capital is usually more available on large farms than on family type farms. The large scale farm, with its greater segregation of firm and family, applies capital more completely on a marginal approach. Self-imposed capital rationing is greater on family type farms, especially lower limit family farms. Risk and the decreasing marginal efficiency of increments of added capital are factors limiting size of firm. Discount of future returns due to economic uncertainty also limit size of firm.
In an attempt to determine economic efficiency data relating to scale of operations was examined. Some studies show decreasing returns near or just beyond the probable upper size limit of family type farms. Other studies show increasing returns to scale through and above the family type farm size. However, in most cases the data are inadequate and the studies incomplete in actually comparing economic efficiencies of family type and large scale farms. As yet, there has been established no clearcut economic advantage of large scale over family type farms. The importance of certain indivisibilities such as machine units, marketing and purchasing, can be lessened by cooperative actions.

Data presented indicate that family type farms raise no larger per cent of land erosive crops than do large scale farms. Family type farms cooperate equally well in government soil conservation programs.

The family type farm seems better able to weather rapidly changing economic conditions than do large scale farms, because of ability to substitute the factor of labor for other factors of production and the ability to absorb unfavorable cost-price relationships in low labor returns, family type farms continue to produce even under adverse price relationships. Continued production is an advantage to the nation in that food and fiber are needed in almost the same amounts in "good" or "bad" times. In "good" times when cost-price relationships vary little or change a known rate little coordinating ability is needed and conditions tend to be static. Then farms may become very large. It is when static conditions are replaced by dynamic conditions, changing price
relationships, etc., that coordinating ability is really needed. This limits size of farm (farm) and apparently favors the smaller size farm. Government programs aimed at reducing risk and uncertainty tend to increase size of farm.

Economic efficiency alone may not be the goal for which the nation strives. The "best" size farm unit measured by political and social criteria may not be the same size as the most efficient economic unit. If there be conflict, it will have to be resolved. However, before conflict is assumed two major steps should be taken; first, an attempt should be made to find the most efficient economic size of farming unit; second, a more definite attempt should be made to delineate favorable and non-favorable political and social attributes of agriculture "as a way of life" and show how they can or cannot be associated with farming units of different size. Only then will we know if conflict really exists. Only then will the people of the nation be able to logically choose their policy goal as it relates to size of farming unit.
ACKNOWLEDGEMENT

The author is deeply indebted to Dr. Earl O. Heady for his guidance and helpful suggestions in the planning and completion of this study. The constructive suggestions of Dr. John A. Nordin and Dr. Geoffrey S. Shepherd are also gratefully acknowledged.
LITERATURE CITED


Association of Land-Grant Colleges and Universities, Committee on Post-war Agricultural Policy. Postwar Agricultural Policy. 1944. (Sec. of Committee, L.A. Salter, Jr., Univ. Wis.)


* and Hagood, Margaret Jarman. Differentials in productivity and in farm income of agricultural workers by size of enterprise and regions. U.S. Bur. Ag. Econ. 1944.

Farm Economic Association, Committee on Definitions of Terms in Farm Management. Menasha, Wisconsin, 1940.

Goldschmidt, Walter R. Large farm or small: the social side. Paper prepared for Western Farm Econ. Assoc. 1944. (Mimeographed copy secured from the author at Berkeley, Univ. Cal.)


McWilliams, Carey W. Small farm and big farm. Public Affairs Pamphlet No. 100. New York, Public Affairs Committee, Inc. 1944.

Mighell, Albert. Why prosperity favors the large farms and depression favors the small farm. Iowa State College. (Mimeoographed) 1933.


Schultz, Theodore W. et al. The place of the family farm in our land tenure system. Report of Committee I. (Hectograph copy secured from T.W. Schultz, Univ. Chicago.)

Sitler, H.G. and Jehlick, P.J. Farm resources and farming systems needed to meet living needs of farm families. U.S. Bur. Ag. Econ. 1941.


U.S. Bur. of Ag. Econ. Farm resources and farming systems needed to meet living needs of farm families. U.S. Bur. Ag. Econ. 1941.


---


---
