Evaluation of the production and subsistence loan program in Iowa

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EVALUATION OF THE PRODUCTION AND SUBSISTENCE 
LOAN PROGRAM IN IOWA

by

J. Robert Tompkin

A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of
The Requirements for the Degree of
DOCTOR OF PHILOSOPHY

Major Subject: Agricultural Economics

Approved:

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1950
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1.

INTRODUCTION

During the past two decades a change has taken place with respect to the role of the Federal Government in the economy. Prior to 1930 the prevailing philosophy leaned toward little government intervention in, or competition with, business. The United States was a capitalistic nation which was still advocating rugged individualism and glorying in the doctrine of private enterprise. Every man, so it was felt, could take advantage of the "equal opportunity" existing in America, and if he did not succeed there must have been something the matter with him. Society was not responsible for one who failed in such a wealth of opportunity.

The great depression jolted considerably this independence. Millions of unemployed, millions on relief, and millions of people in the bread lines testified to the fact that disaster could strike our economic system. The thought became widespread that the Federal Government should do something about the prevailing conditions. Realization that low income could result from causes other than the faults of the individual began to make "individualism" less sacred. A sense of social consciousness sprang up which dictated aid to those whose financial misfortune stemmed from the chaotic economic conditions of the national economy.

The Federal Government began increased action in the early thirties. Additional legislation was enacted providing aid for the needy. At first this aid was in the form of direct relief, but from the research and
analyses called forth by the depression, there arose a type of help designed to preserve man's human resources and his dignity in himself. The Works Progress Administration projects were examples of this.

This philosophy extended to agriculture, which was one of the sections of the economy in which income dropped most during the depression. After the direct relief authorized by the Federal Emergency Relief Act, the concept was introduced to help farm people to help themselves by providing the resources needed to supplement the human factors. Capital was the limiting resource in the case of practically every farm family. To help them help themselves capital was needed.

Capital was available only from the federal government. Commercial agencies did not wish to advance funds to such a high risk group. Many agencies did not have funds to lend until "unfreezing" took place, or until the obligations to depositors were satisfied. The new philosophy justified government credit.

With this new type of credit, based as it was on human qualities rather than physical security, arose a new theory of credit. This was the principle of credit with supervision combined with moral integrity and ability as security. The social objectives of this credit were an increased level of living and rehabilitation in place.

The period during and since the depression developed a consciousness of income-distribution problems within agriculture. From this developed a new type of agricultural research, designed to study agricultural questions in terms of income classes rather than all farmers collectively. Studies
were made of the low-income farmers in agriculture. The knowledge obtained from these studies, combined with added government participation in agricultural credit, made possible a more effective type of rehabilitation program. From this overall program sprung such agencies as the Rural Rehabilitation Corporation, the Resettlement Administration, the Farm Security Administration and its successor in 1946 the Farmers Home Administration.

Much research has been done on the socio-economic aspects of the rehabilitation movement. Much of it was motivated by the need for information necessary to establish and administer the programs.

Purpose of the Study

The purpose of the present study is to examine the agricultural rehabilitation programs in their effect on Iowa clients. Comparison with the few studies made in other states would not be entirely valid in view of the different types of farming carried on in different areas. The investigations of the rehabilitation loans previously made in Iowa have been confined to single counties and are thus too local in nature to be representative of the state.

Over ten per cent of the farmers in the state have had, or do now have, operating loans of this type. These farmers controlled between 2,500,000 and 3,000,000 acres of land valued at approximately $170,000,000 in terms of 1940 land values. Thus, in terms of the resources controlled, this group of farmers is important.
The objectives of this project can be divided into four broad categories:

1. To investigate the economic and sociological accomplishments of the FHA-operating-loan program in Iowa, in terms of increased income, social adjustment, and level of living.

2. To determine what proportion of the former borrowers have shifted to other locations and to other occupations.

3. To examine the purposes and the results of the loans to determine whether or not a more optimum use of resources has resulted on the farms where the loans have been made.

4. To provide information which will be of assistance to both borrowers and lenders in improving farm-lending policies and practices.
REVIEW OF LITERATURE

A wealth of literature has been written about the FSA and its predecessor, the Resettlement Administration. Less work has been done relative to the FHA because of its more recent origin. Most of the writings dealing with the sociological and economic aspects of the program at the national and regional level are not pertinent to the present study. A few representative works which touch on some aspects of this investigation will be briefly summarized.

The 16th Census of Agriculture (32) contributed some interesting statistics relative to low-income farms in Iowa. The 1940 figures show approximately 13,000 farms in 1939 with a total value of products less than $250, 7700 farms between $250 and $399, and 10,000 farms within the $400 to $599 range. The ages of the operators for the west north central area (including North and South Dakota, Nebraska, Kansas, Missouri, Minnesota, and Iowa) were shown by age classifications as 3.3%, 16.5%, 22.8%, 25.0%, 19.3%, and 12.9% for age groups under twenty-five, 25-34, 35-44, 45-54, 55-64, and over 65 years, respectively.

The USDA publication "Farm Security Administration" (33) released in May, 1941, attributed agricultural poverty to growing population, soil loss, decline of foreign markets, and the advent of labor-saving machinery. It states further that the small farmer is hardest hit because he is unable to afford technical improvement, his tenure system is poor, and he does not have access to proper credit.
In 1936, the pamphlet continues, there were approximately 1,700,000 farm families in the United States with average annual incomes below $500. This includes that farm-raised produce consumed in the household. More than two million farm families have been on the relief roles, at one time or another, since 1932. By 1941 the FSA had aided nearly one million of these farm families. The publication concludes with a history of the development of a national rehabilitation program, the procedure for obtaining aid, and the purposes and objectives of the program.

A series of eighteen research reports of areas over the United States was sponsored by the FSA and the BAE cooperatively. These were designed to supply to administrators information concerning problems and conditions relative to the rehabilitation program. The writer reviewed five of these research monographs and decided they were sufficiently similar in objectives to disregard the others in the series. Beck and Forster in "Six Rural Problem Areas, Relief, Resources and Rehabilitation" (4) deal analytically with the factors influencing the low-income problem in six major low-income areas of the country. "Standard Farm Plan Cases in Resettlement Region II" (14, Ch. 4) was published in 1935 and included 11,600 rehabilitation families in Michigan, Wisconsin and Minnesota. The purpose was to investigate various characteristics of the families and the uses of the loans. It was found that purchases of livestock and workstock were the chief purposes of the loans, with refinancing next. The total assets of the clients averaged $2,450.

"Standard Farm Plan Cases in Resettlement Region X" (14, Ch. 5) was published in 1936 and included 4600 clients in Colorado, Wyoming, and Montana. This study revealed that the farms of FSA clients were smaller.
than the average farms in the area, and that need existed for more live-
stock on the borrowers' farms.

The other research monographs contained descriptive material relative
to the national and regional problems of resource allocation hazards, part-
time farming, migration, and landlord-tenant relationships.

The Rehabilitation Division of the Resettlement Administration made
another study in 1936 called "Standard Farm Plan Clients in Selected Type
of Farming Areas" (14, Ch. 6). This work was to determine some of the
characteristics of clients at the time they received loans. Eight sample
groups of clients were chosen, with each group representing a certain
type of farming area in the United States. The study points out that
rehabilitation is much more difficult in the south than in the north or
west.

The reports of the administrator (34, 35) are largely factual and
statistical. Not only are they lacking in pertinence to the more local
nature of the present study, but much of the material is duplicated elsewhere.

Some of the representative private contributions pertaining to rehabili-
tation methods include Forster's Journal of Farm Economics article "Orienta-
tion of Farm Management Research to Low Income Farms" (9) in which he says
"The problem of low income in agriculture is largely a pathological case
to which the farm management worker has little to contribute."

Ray C. Smith (26) in "Public Assistance to Low Income Farmers in the
North" suggests revising the present method of analysis to arrive at a
satisfactory solution of the problem.

One of the most recent and most comprehensive works covering the program at the national level was "Rural Rehabilitation—Theory and Practice" (15) by Olaf F. Larson. This article, written in 1946, is a condensed abstract of a BAE study, the purposes of which were:

(1) to trace the development of program policies and of rehabilitation tools and techniques associated with the standard rural rehabilitation loan program
(2) to draw some generalizations with respect to the rehabilitation process and the use of rehabilitation tools and techniques, and
(3) to attempt to set forth some of the major issues involved in rural rehabilitation from the standpoint of public policy.

Data was obtained from a special survey of 39,235 standard borrowers who entered the program between March 1936 and February 1939. On pages 231-232 Larson stated that the average size of initial loans had tended to move upward from $240 in 1936 to $1007 in 1944 while supplemental loans increased from $67 to $316 during the same period. By the end of 1945 the number of standard-loan borrowers had reached 770,000, or about one for every eight farm operators reported by the United States Census.

Larson also discusses the development of the rehabilitation program, its coverage, the selection policies and the characteristics of the borrowers. He classifies the program as an instrument of social change. He takes some time in a treatment of the results, pointing out that the practices have changed old patterns of buying, selling, and lending, and that better practices of clients have been imitated by other farmers. He concludes the discussion by stating that the FSA program is a "social invention" which can be used as an instrument to improve rural level of living.
The research at the state level, not including the work done in Iowa, is exemplified by three publications. E.L. Kirkpatrick discussed the "Disadvantaged Farm Families in Alabama" (14, Ch. 2) in 1934. He studied some 30,000 families with respect to the possibility of their becoming self-sufficient after initial aid. This was intended as a guide for rehabilitation planning. It was found that about 11 per cent of the families were considered incapable of being properly rehabilitated, 35 per cent would need supervision, and the balance appeared able to manage rehabilitation loan funds.

Wilson and Metzler (40) studied FSA rehabilitation clients in Arkansas with the idea of comparing these clients with the farmers of the state as a whole. Approximately 19,000 approved clients and 3,000 disapproved applicants were studied during 1934 and 1935. The results revealed that the FSA clients were below state average with respect to size of farm, crop yields, and quality of land.

The third study selected to summarize was the "Rural Rehabilitation Progress in Starns County, Minnesota" (3) carried on by W.R. Bailey and published in 1940. This investigation included seventy-two families who had become FSA clients between December 1935 and July 1936. It was found that the loans averaged about $986, of which 58 per cent was used for purchasing livestock and equipment, and about 34 per cent was used for refinancing. It was further found that while the financial status of the clients improved considerably, their production fell short of FSA expectations. This was explained partly by the 1936 drought and partly by excessive expectations by FSA.
The foregoing literature has been summarized in order to acquaint the reader with the type of research generally carried on with respect to the rehabilitation program outside Iowa, and also to present a general setting into which can be placed the present study.

Several investigations pertaining to the FSA rehabilitation loan program have been made in Iowa. Some of these overlap the present work and can profitably be summarized for comparative purposes and for background material.

The 1943 Iowa Yearbook of Agriculture (42) contains a special report by the Iowa State FSA Director. He points out that 16,256 rural families in the state had received loans and 6,890 had repaid in full by December 31, 1943. He brought out that 8,845 families had increased their 1943 production of war foods over 1942 as follows: milk 18%, eggs 23%, poultry 22%, pork 39%, beef 36%, and soybeans 36%. He added that 1943 reports showed a per person average of 86.5 quarts of canned fruit and vegetables, 4.5 bushels of potatoes and 3.1 bushels of other fruits and vegetables stored. The average value of farm-produced food and fuel consumed by FSA families in Iowa in 1943 was $467.

Beck and Jensen (5) discussed the production-increase response of FSA borrowers in Illinois, Iowa, Indiana, Missouri, and Ohio to USDA production goals. The increase achieved by the FSA families in these states expressed as a per cent of the USDA goal increases was: milk 14%, pork 5.5%, eggs 10.4%, beef 6.9%, chicken 6.2 and soybeans 6.1. These figures would indicate that greater increases were made by FSA clients than by other farmers.
A study made by D. R. Kaldor (13) on low income in Iowa Agriculture in 1939 and 1941 was designed to compare the lower one-third of the 203 farms drawn with the middle one-third and upper one-third as to income, products used in the household, size of family, age of operator, capital accumulation, household conveniences, education, resource allocation, and tenure. He concluded that the lower one-third were characterized by larger families, less AAA payments, less home-consumed farm products per adult equivalent, less money spent for medical and dental care, less money spent for capital inputs, smaller net worth, less farming experience, less planning on crops and livestock, less farm account record-keeping, less efficient use of their labor, and less proportion of farm ownership than the other two groups. The lowest income group did, however, compare favorably with the other two groups in formal education and in power per unit farmed.

Witt's (41) 1939 study of 740 randomly drawn Iowa farms disclosed a larger proportion of low-income farmers in the Southern Pasture area than in the other four type-of-farming areas. There were more owners than tenants in the low-income group, with generally older operators and smaller households than other farmers. Witt also found that low-income farmers, when compared to other farmers, had smaller farms, had greater proportion of land in rotated pasture, had lower crop yields, had more labor relative to other resources, and had poorer quality farms. He concludes that a smaller proportion of low-income farmers follow approved farming practices. The group had virtually no contact with County Extension Directors.

Wilcox (39) wrote a Ph.D. thesis on the Tenant Purchase loan program
in Iowa. This work, while treating a different aspect of the FSA program than the present study, contained an excellent chapter on the legislation creating the FSA and FHA and the objectives of their programs.

In 1941 DeGraff (7) made a study of 106 FSA clients in Dallas County, Iowa, who had received loans between 1936 and 1940. The purpose was to determine income, financial status, farm organizations, purposes of the loan, factors influencing size of loan, and the repayment conditions of the clients. DeGraff concluded that the 106 clients were, collectively, poor financial risks for commercial credit agencies. He also found that the FSA clients were located on smaller farms with a lower value per acre than was the average farmer in the county. It was found that the mean loan between 1936 and 1940 was $773 with supplementary loans averaging $292. Seventy-one per cent of the total amount of the loans had been paid at maturity.

White (39) conducted a study of 132 FSA families in Union County in 1940 on the sociological factors affecting the economic outcome of families after a year's supervision. The criteria of "success" were management return and efficiency of home management although each of these included numerous economic and sociological factors and attitudes. The study included investigations regarding the effect on "success" of such factors as age, size of family, education, mobility of family, occupational history, attitude toward children's future, and organization membership. The conclusions were as follows: management return was an effective measure of the economic ideal of the tenant, the "more efficient" operator had more education and intelligence than the "less efficient" operator, and also
moved more often. White found shame and resentment in the lower class of families. These traits were not present in the current study.

Anderson and White (1) followed up White's work with an article in the Iowa Farm Economist summarizing the rating scale used in the earlier work for predicting the "success" of the FSA clients. A high correlation was found between "success" and willingness to cooperate, hopefulness, sharing in community social life, self-restraint in spending money and other related points.

The research most pertinent to the present study was that done by Stillman (30) in 1941. He attempted to uncover the differences between FSA rehabilitation clients and other farmers in Iowa, with respect to income, tenure, age, family characteristics, education, mobility, geographical distribution, farm size, capital available, labor supply, quality of farm, and managerial ability.

Information on the FSA borrowers was obtained from the 1045 most complete Farm and Home records for 1939 submitted in response to a request to the county FSA supervisors to send in records from their counties. This was not a random sample and undoubtedly contained two types of bias: (1) the selection of records by the county supervisors who knew what the records were to be used for and who were presumably loyal to the agency by which they were employed, and (2) the selection of the most complete records from those submitted.

The "all farmers" group was a sample taken from the 1939 Iowa Sample Census Survey and included 740 schedules. To supplement these schedules,
questions as to age of operator and family size were inserted in the April
1941 Farm Employment Survey questionnaire obtained from 4314 farms from
all counties in Iowa. Further supplementation included the use of Witt's
(41) data on low-income families.

Stillman found that generally FSA clients have been chosen from among
the lowest one-third of the income range of Iowa farmers. He states that
the FSA clients include a greater proportion of young operators than does
the low-income group as a whole. He implies that the FSA has tended to
ignore the needs of the older farmers. He adds that the FSA has deterred
the flow of many rural people from rural to urban employment. He says
that the loans are distributed too liberally in the southern and western
sections of the state relative to the other parts of Iowa.

Stillman agrees with Witt that the FSA family farms are larger than
the other low-income farms and are more efficiently operated. Capital was
found to be a more limiting factor on the borrowers' incomes than for the
low-income group in general.

He concludes that the FSA has succeeded in rehabilitating intensively
but thinks that too many young and inexperienced operators have been included
for proper rehabilitation on the extensive level.
Economic theory deals with the principles pertaining to man's actions in satisfying wants. Economic activity, then, includes all efforts which man expends toward want satisfaction. This fulfillment of desires may be accomplished by economic goods or free goods. The former requires economic activity in production whereas the latter are available without man's effort and are sufficiently plentiful that they can be had in any amount desired, subject to certain place limitations.

Some people prefer greater amounts of free goods than do other people, and choose their occupations accordingly. This explains why some farmers, for example, stay in agriculture, even at less income, rather than work in non-agricultural pursuits. To them rural life offers certain intangible values which outweigh the greater amount of economic goods available to them through urban employment.

It is much more difficult to evaluate the utility derived from these various intangibles than to measure the satisfaction supplied by an economic good. The money a person will give in exchange is a good yardstick of the latter, but we lack specific figures in calculating the former. It is also quite likely that a high correlation exists between amount of economic goods possessed and amount of satisfaction obtained from intangibles, inasmuch as a large quantity of the former often tends to make possible greater access to the latter. For these reasons most economic studies are concerned with man's efforts to obtain economic goods to satisfy his wants. The
present study is no exception to this general pattern.

Basic Factors of Production

All economic goods are produced from resources which are classified into three basic categories: namely, capital, labor, and management. Capital is comprised of the physical components used in the production of a good; labor is the human effort expended in the production; and management is the technical "know-how" upon which production decisions are based.

In agricultural studies, however, land is such a large part of capital, that it is usually treated as a fourth factor of production. In the present work the writer uses the approach of four, rather than three, basic resources.

Resource Allocation

In any economy, in any industry, and in any firm there exists at any specific time, a certain amount of each of the production factors. There is one optimum amount of product which can be produced from these resources.  

*In the physical sense "optimum" means "maximum", but from the economic standpoint it means that amount corresponding to society's desires so that the last unit of output is produced at a cost equal to the price for which it will sell. Thus the "optimum" output, in fulfilling this condition, will be produced at the least cost in resources for which that particular output can be realised. The accompanying graph assumes perfect competition (approximating agricultural firms) and indicates that OR is the optimum production where marginal cost (MC) and price (AR) are as shown. Production at OL results in a loss of revenue equal to TCD whereas output OK means excess of
If the factors are combined in the proper proportion this optimum production will be realized. No other combination will lead to this output. For this reason maximum want satisfaction is contingent upon proper combination, or allocation of these resources.

**Diminishing Returns**

If production factors are not allocated in exactly the right proportion, then obviously one or more is being used too sparingly or too plentifully with respect to the others and optimum output is not obtained. Where this is true resources are being wasted. This phenomenon of input-output relationship is explained by two economic concepts. The first of these is commonly referred to as the principle of diminishing returns* and states that "if

*This expression "diminishing returns" is somewhat ambiguous, but because it has such general recognition we shall use the term. It is also known as the "Law of variable proportion" and "Law of non-proportional output". Boulding (6, p. 502) refers to it as "the law of eventually diminishing marginal physical productivity" and hastens to explain that it is very improbable that "average physical productivity" would fail to decrease if marginal physical productivity were declining.
the quantity of one productive service is increased by equal increments, the quantities of the other productive services remaining fixed, the resulting increments of product will decrease after a certain point\(^7\) (29, p. 116). This definition deals with the behavior of marginal product as one input factor is varied. The principle applies equally well when considering the total or the average quantities. The following graph illustrates the operation of the principle.

![Graph](image)

**Figure 1. Principle of diminishing returns**

Line OA is a 45\(^0\) line superimposed on the graph for reference. Segment RQ indicates that output is increasing at an increasing rate as input A is added. This is the area of increasing returns. Segment QP shows output still increasing but at a decreasing rate. This is the area of decreasing returns. Addition of input A beyond point X actually results in a decline in total product. Under conditions indicated by this graph, the firm would produce somewhere in segment QP, depending on the input-output cost-price relationship.
Returns to Scale

The second economic concept dealing with input-output relationship is that of returns to scale. This deals with the effect on output when the quantities of all the input factors are varied. Scale problems may be of three types: constant returns, increasing returns, or decreasing returns. Where the input factors are all increased in the same proportion and the output increases in the same proportion, constant returns to scale obtains. In the event output increases by a greater proportion than the increase in inputs, increasing returns to scale is present, and when the product increases in a lesser ratio we have decreasing returns to scale.

It can be seen that under conditions of constant returns to scale, size of the firm has no bearing on resource efficiency. The average costs of a small firm and a large firm will be the same. This is not true, however, under conditions of increasing or decreasing returns to scale. A firm operating under increasing returns should expand its operations until resource limitation such as capital rationing, unavailability of labor, or too heavy strain on management ability, result in decreasing returns. More will be said about evidence of increasing, constant, or decreasing returns to scale after we have examined iso-product curves.

Elasticity

The concept of elasticity (of demand or of supply) of a product (or a resource) assumes some importance in production decisions. Elasticity (of demand or supply) is the percentage change in Q per one per cent change
in $P$, where $Q$ is quantity (demanded or supplied) and $P$ is the price of the commodity.

Elasticity may be either "arc" or "point". Arc elasticity is an average elasticity for a segment of a demand (or supply) curve, whereas point elasticity refers to but a point on the curve. Obviously, however, a point is nothing more than an infinitely small arc. The following formulas are applicable to the derivation of elasticity:

\[
\text{Arc } E = \frac{\frac{q_1 - q_2}{q_1 + q_2}}{\frac{P_1 - P_2}{P_1 + P_2}}
\]

\[
\text{Point } E = \frac{d_q}{d_p} \cdot \frac{p}{q}
\]

Where $q$ is quantity, $p$ is price, $d_q$ is the infinitesimal change in quantity and $d_p$ is the infinitesimal change in price.

In demand curves where quantity increases are usually associated with price decreases, the elasticity is negative. In supply curves the reverse is true. Where elasticity is 1 (for supply) or -1 (for demand) it is called unit elasticity or unity. Elasticity greater than unity is called elastic demand (or supply), and in cases where the elasticity is less than unity the demand (or supply) is said to be inelastic. In the following Figure 2 if demand curve segment $D_1$ and supply curve segment $S_1$ each have arc elasticity of unity, then $D_2$ and $S_2$ represent elastic segments and $D_2$ and $S_2$ are inelastic. The same price and quantity scale is used for all the demand curves and supply curves shown in Figure 2.
Another economic principle pertinent to the present study is that of substitution. Stated simply, it is merely the substitution of one product (resource) (or production element) for another product (resource) (or production element) in the production process. In factor for factor substitution the exchange is carried to the point where the same physical product is produced at the least cost of the inputs. In product for product substitution the exchange continues until the most profitable combination of both is obtained from the given amount of factor. Thus it can be seen that the proper rate of substitution varies as the changing ratio of costs of the inputs. The following graphs illustrate three important aspects of product substitution.
Figures 3, 4, and 5. Illustrations of substitution principle

In Figures 3, 4, and 5 we assume a given amount of a factor (or total cost of factors) which can be used in producing both product A and B.

Figure 3 illustrates a constant rate of substitution in which so many units of product B must be given up as units of the factor (or factors) are diverted to the production of so many units of product A. Thus A and B substitute for each other at a constant rate.

In Figure 4 products A and B are also competitive, but substitute for each other in a diminishing or non-constant rate. If all of the factor (or factors) available were used in the production of product B, then O'S' of B could be produced along with none of product A. If a small amount of A should be produced it can be seen that the increment of A would be considerably greater than the decrement of B. As more and more A is produced
the decrement of B becomes larger and larger as compared to the increment of A. This graph illustrates a diminishing rate of substitution.

Figure 5 shows a complementary relationship existing between products A and B up to point F, followed by a competitive relationship after Point F. It is obvious that any amount of product A less than $O'C$ would result in less of both products as compared with production $O'C$. Successive increments of A after $O'C$ are accompanied by increasingly larger decrements of B. In the agricultural industry most complementary relationships eventually lead to a diminishing rate if the substitution is carried far enough.

**Marginal Productivity**

Another concept which is of great importance in the analysis of the present investigation is that of marginal productivity. For the purpose of this study the marginal productivities will apply to the factors of production. The marginal productivity of capital, for example, means the monetary return from the last dollar of capital added to the firm or to a certain enterprise within the firm.

Where resources are not limited, inputs of each factor should be made in each enterprise within the firm until the last dollar's worth of each factor added brings a return of one dollar. When this is done for all enterprises in the firm, optimum resource allocation has been achieved. This is true in the static sense. Under the dynamic conditions prevailing within practically all firms, it is necessary to continually adjust the inputs according to the cost-price relationships existing between factors and products.
In the event that factors are limited to the firm as in cases of capital rationing, management limitation, labor scarcity, etc., the optimum allocation cannot be that point where marginal cost is equated with marginal revenue. For the entrepreneur to most advantageously distribute his resources among the existing enterprises, the principle of equating the marginal productivities of his factors among the various enterprises should be his guide. Under these conditions the last unit of each factor applied would receive the same return in each enterprise.* The last dollar's worth of each factor in each enterprise would thus receive a return somewhat in excess of one dollar.

Iso-Product and Iso-Factor Curves

Another group of curves essential to the present analysis includes
(1) Iso-product curve, (2) Iso-factor curve and (3) outlay curve.

An iso-product curve (also called "product contours" and "iso-quant") is one which depicts the various combinations of inputs that result in the same amount of output. Boulding (6, p. 680) speaks of iso-product curves as lines connecting all points which yield the same product, where each point represents a combination of input quantities which will produce the same output as the input combinations indicated by the other points on the

---

*The entrepreneur may wish to eliminate one or more enterprises if initial application of resources in the particular enterprise resulted in earlier marginal productivities so low that the entire investment realized no profit unless carried beyond that point where limited resources curtailed additional inputs. Adherence to the principle of opportunity cost throughout would eliminate this danger. Opportunity cost is the return given up when the second best investment alternative is sacrificed in favor of the most profitable investment alternative.
iso-product curve.

Iso-factor curves (also called iso-cost curves) are lines connecting all points of product combination derived from the same amount of resources or combination of resources.

Outlay curves are really the same thing as iso-factor curves but are generally thought of as being straight line curves, whereas iso-factor curves are generally shown as concave to the origin in the agricultural firm. This concavity is produced through rising marginal cost. If marginal cost were falling, the curves would become convex to the origin. Thus the straight line outlay curves assume constant marginal cost, a very unrealistic assumption in agricultural firms. Difficulty in determining a continuous cost curve, however, often makes the assumption of constant marginal cost necessary in agricultural research. The two curves will be used interchangeably in this study.

Optimum Resource Combination

The determination of the optimum combination of resources within the firm can now be accomplished by the use of some of the foregoing concepts. We have explained that the slope of a transformation curve reveals the rate of substitution existing between the competing elements. Where the slope is identical between two transformation functions the rate of substitution must be the same. This identical slope occurs at the point of tangency as the two curves are moved toward each other. In Figure 6 this point of tangency occurs at Point P as iso-factor curve AB meets iso-product curve CD.
In Figure 6 let us assume that the firm produces products X and Y and that curve CD represents the various combinations of these products which equal the same money value produced from different combinations of two (for simplicity) resources. Curve AB is the line connecting points of equal factor cost for various combinations of products X and Y produced. It should be noted that AB cuts the X and Y axis at distances from 0 as dictated by the amount of product that could be produced were all the resources to be diverted to the production of only product X or only product Y.

Tangency at point P indicates that optimum resource allocation would
be achieved with CE of Y and OF of product X, subject, of course, to change as either factor prices or product prices change. Movement along curve CD either above or below point P would mean a factor substitution different from the true transformation rate as shown by the slope of AB. From this we can see that the marginal productivities of all the existing factors combined are at the optimum at point P.

We see that when the rate of substitution between the product contour and the outlay contour is equal, we have the formula:

\[
\frac{MP_A}{MP_B} = \frac{P_A}{P_B}
\]

where MP_A and MP_B are the marginal productivities of factor A and B respectively, and P_A and P_B are the prices of factor A and factor B. As the factor prices change so will the slope of AB and the location of the point of tangency. Assuming a rise in the price of factor B and a drop in the price of A, the following changes would take place in the amounts of X and Y produced:

Figure 7. Results from changes in factor prices
A'B' would be the new outlay curve, P' would be the new point of tangency, and OE' of product Y with OF' of product X the amounts produced for best use of resources.

Returns to Scale Illustrated

A series of iso-product curves from differing amounts of total resources are helpful in determining scale problems. In Figure 8 a series of product contours (iso-product curves) CD ——— C₄D₄ have been constructed so that each interval between two adjacent contour lines represents an equal increase in product, i.e. CD represents $1000 income, C₁D₁ is $2000, C₂D₂ is $3000, C₃D₃ is $4000 and C₄D₄ is $5000. Iso-factor curves (AB, A₁B₁ ——— A₄B₄) are then added. For simplicity let us assume that the ratio of costs between factor A and factor B remains unchanged regardless of the amounts of each used by the firm.

![Figure 8. Decreasing returns to scale](image-url)
Line HW is drawn parallel to the Y axis intersecting the product contour lines at S, T, U, V, and W. Line LW, parallel to the X axis, cuts the iso-product curves at S', T', U', V', and W. It will be noted that to advance from contour C_2D_2 to C_3D_3 requires U'V' additional factor B and UV more factor A. To add the same increment of product by expanding to output C_4D_4 requires V'W increment of factor B and W' addition of factor A. Thus Figure 8 shows that a larger amount of both A and B was required to obtain the last $1000 product increase than was necessary for the next-to-last $1000 product increment, i.e. V'W > U'V' and W > UV. The fact that proportional increases in both factors did not give a product increase of the same proportion indicates a loss of efficiency in one or both factors. 

If we accept the definition of decreasing returns to scale as offered earlier in the chapter, that a proportional increase in all the production factors results in less than the same proportional increase in product, we can conclude that the firm shown in Figure 8 is operating under decreasing returns to scale. It should be pointed out, however, that the condition of widening contour levels prevails throughout Figure 8, starting with the origin. No valid conclusions can be drawn as to returns to scale where the contour lines draw closer together in some regions of the figure and draw farther apart in other regions. Where the iso-product curves all draw closer together from the origin, increasing returns to scale would be indicated. This, however, is very unlikely and unrealistic in the agricultural firm.
Regression Analysis

When two or more variables are so related that changes in one or more of them produces corresponding change in the others, a functional relation exists between them.* The method of analysis used in this study is that of multiple regression. The methodology of the standard regression technique is given in practically all statistical textbooks so no effort will be made to amplify it here. The writer has, however, used some applications not always contained in straight multiple regression procedure. In the present work the relationships appeared to be curvilinear rather than straight line.** The values of the variables were converted into their logarithms, thus permitting the use of linear regression methods. The antilogs of the resulting regression equation then restored the curvilinearity.

Heady (12, p. 991) has pointed out some other advantages of the Cobb-Douglas production function which are pertinent to this analysis. He says:

(1) The regression coefficients immediately give the elasticities as they indicate the percentage change in output which will, on the average, result from a one per cent increase in the input of various factors and the elasticities are independent of the unit of measurement; (2) it permits the phenomena of diminishing marginal returns without using too many degrees of freedom; (3) assuming that the errors are small and normally distributed, such a logarithmic transformation of the variables will presume to a substantial degree normality in the distribution of errors in the data.

*Careful analysis should be undertaken, however, to ascertain that the functional relationship is real. In many cases of apparent functionality the changes in the variables may be caused either by chance errors of sampling or by the action of some outside factor which affects the variables in the same manner.

**It was felt that the Cobb-Douglas function for industry approximated the relationships found in this investigation. The regression equation for this function is of the type \( Y = AX_1 X_2 \ldots X_n \).
Marginal Productivity Formula

The marginal productivities of the production factors can be obtained by using the formula

\[
\frac{dE}{dF} \cdot \frac{F}{P} = \frac{dP}{dF} = E \cdot \frac{F}{P} \]

where \(E\) is the elasticity of the factor involved, \(F\) and \(P\) represent the means of the product and factor respectively, and \(dP\) and \(dF\) are changes in the product and in the factor.
DEVELOPMENT OF THE PRODUCTION AND SUBSISTENCE LOAN

The evolution of the FHA standard Operating Loan has been orderly and logical. It started with the old seed loan in 1918 and has advanced from stage to stage, hastened by the depression of the early thirties, to the present FHA standard loan.

Seed Loans

To describe this development is the purpose of this chapter. The seed loan, the establishment of the Rural Rehabilitation Corporations and the Resettlement Administration, and the activities of the Farm Security Administration and Farmers Home Administration will be explained.

In 1918 the Federal Government began to grant emergency seed loans to farmers. This move was probably prompted by the desire to maintain production in line with demands of World War I. These loans were advanced primarily to three types of farmers (21, p. 351); (1) those who couldn't get credit elsewhere because of destruction of the previous crop by disaster or natural hazards, (2) those in areas where credit was not available, and (3) operators with insufficient resources to warrant credit from commercial agencies.

Funds for the seed loans were appropriated annually until 1937 when congress removed the necessity for yearly authorization. By 1929 these loans had become more or less permanent.
The seed loans were for one year terms and were small in amount. Murray (21, p. 315) points out that they averaged about $220 per farmer. After the first few years, however, the plan of administering the loans changed to that of loaning the money in installments as needed. The loans also became a means, in some cases, to persuade more backward operators to adopt more approved practices.

From 1921 through 1932 the seed loans were administered through the USDA. From 1933 until November 1, 1946 the loans were handled by the Farm Credit Administration as Emergency Crop and Feed Loans. After November 1, 1946 they were merged with the FSA Rehabilitation Loans to form the present FHA Production and Subsistence Loans.

The Seed Loan program was truly an emergency type of financing as evidenced by the rapid expansion in number of loans after 1931. Murray (21, p. 332) shows that prior to 1931 not more than 50,000 loans nor more than $6,000,000 in funds were distributed in any one year, whereas from 1931 to 1946 there were never less than 80,000 loans or less than $15,000,000 loaned in any one year.

**Rural Rehabilitation Corporations**

In 1933 the Federal Emergency Relief Act was passed to administer relief to both rural and urban needy families. There were, at this time, approximately one million farm families on relief. In the same year some of the state governments initiated action to help farm families on relief to become self-supporting again by loaning them necessary tools and workstock. This state action set the pattern for later Federal assistance designed to re-
habilitate in place.

In April 1934 the FERA set up the Rural Rehabilitation division. This program was organized on a state basis, with state Rural Rehabilitation Corporations administering the loans, the financing of which was accomplished through an appropriation of some $70,000,000 of federal funds. Originally the corporations were established in forty-five states, the District of Columbia, Alaska, Hawaii, and Puerto Rico. The program never functioned, however, in Maryland, Massachusetts, Hawaii, and the District of Columbia.

The RR loans were for livestock, equipment, feed, operating expenses and refinancing and were designed to rehabilitate in place instead of continuing on direct relief. They were both financial and advisory in nature with each borrower working out a Farm and Home Plan with the RR supervisor. The RR loan borrowers were expected to raise a large part of their food and to use improved farming practices. Repayment could be in cash, in kind, or by work by the operator on some community project.

The RR program lasted until June 30, 1935 and during its existence approximately 397,000 families received about $49,000,000 in loans (15, p. 226). The primary prerequisite to obtaining a loan seemed to have been eligibility for relief.

Resettlement Administration

On July 1, 1935, the Resettlement Administration took over most of the functions of the Rural Rehabilitation Corporations. In addition to the state corporations, the RA absorbed the FERA resettlement projects, the subsistence homestead projects, the submarginal land program, and the
activities for aiding transient workers.

The objectives of the RA were similar to those of the RR with respect to the rehabilitation loans except that loans to groups of low income farmers were inaugurated for the purpose of purchasing cooperatively those larger items of equipment which one operator could not afford to own singly. The RA was placed in the USDA at the end of 1936.

Farm Security Administration

On September 1, 1937 the Farm Security Administration began operating as the successor to the Resettlement Administration. The national headquarters of FSA was in Washington D.C., with twelve regional offices throughout the United States. Each state was headed by a state office and was subdivided into districts which were, in turn, broken down into several county offices.

The purpose of the FSA was to help low-income farm families to become self-supporting. This was to be accomplished through three different programs; rural rehabilitation in place, by rural homesteads, and by purchases of farms by tenants with repayment terms of forty years and three per cent interest.

To be eligible for FSA help the applicant had to show a definite need for help, must possess the ability to rehabilitate himself with the loan, and must be unable to obtain adequate credit at normal terms elsewhere in the community.

The FSA also continued to make the non-standard type of loans which
had been made previously. These loans were an emergency type for $300 or less and required no farm and home plan. From July 1935 to June 1944 these non-standard loans were made to some 340,000 borrowers (15, p. 224).

The FSA also gave grants in cases of disaster or to tide a family over until a standard rehabilitation loan could be made. By July 1, 1944 some 623,000 of these grants had been distributed (15, p. 224). By the end of 1945, 770,000 standard loans had been made.

In 1944 Congress passed Public Law 518 giving "the Secretary of Agriculture authority to compromise, adjust or cancel loans made to farmers under federal programs" (21, p. 333) providing that the debt is five years or more overdue, that the borrower can't pay and doesn't appear likely to be able to, that the debtor has acted in good faith, and that the debt is not over $1000. By June 30, 1946, 39,550 loans to 70,222 borrowers had been compromised, adjusted or cancelled under this law, involving about $11,000,000 of loans of which about half had been repaid (21, p. 333).

Farmers Home Administration

The Farmers Home Administration was created by Public Law 731, 79th Congress, second session, and approved August 14, 1945. On November 1, 1946 the FHA succeeded the FSA, taking over practically all the functions of the agency. The FSA rehabilitation loans and the Emergency Crop and Feed loans of the FCA were combined into the Production and Subsistence loans and administered by the FHA. The new agency was also authorized to insure loans made by other credit agencies to low-income farmers for the purpose of buying farms, provided the FHA approved the purchase. The twelve
regional offices set up by FSA were eliminated by the 1946 act, but the state organization remained unchanged. The funds for the new agency continued to be derived from annual appropriations.

The eligibility rules for applicants remained about the same as under the FSA. Each applicant must possess control of a farm sufficient in size to assure the family an adequate living. The operator must spend most of his labor on the farm and receive most of his income from the farm. He must be a citizen of the United States.

The purposes of the standard loan changed little from those of the FSA loans. Emphasis was placed on the loan being able to raise the income and the standard of living of the client.

The standard Production and Subsistence loan is limited to $3500 with a maximum outstanding indebtedness of $5000 at any one time. The loan carries an interest rate of 5 per cent on the unpaid balance and is repayable in one to five years, depending on the purpose and the family's ability to repay. The security of the loan is centered in the moral integrity and ability of the client although a chattel mortgage is usually taken on the property of the borrower.

The clients are required to draw up a Farm and Home Plan with the county FHA supervisor and are expected to carry on approved farm and soil conservation practices. Account keeping by borrowers is emphasized. The county supervisor visits the farm periodically as needed and is ready and willing to act in an advisory capacity concerning the farm problems the clients may have. The FHA exerts considerable effort to obtain for the
tenant clients assurance from the landlord of sufficient length of tenure to permit the borrower to make progress. Longer leases are stressed by the county supervisors.

The applications are passed upon by the county committee which is composed of three prominent residents of the county. At least two of these three must be farmers. This committee determines the applicant's eligibility, certifies the value of the farm to be bought, and reviews the borrower's progress (8, p. 322).

In 1949 legislation was passed authorizing the FHA, for a four year period, to make loans to farm owners for building or repairing farm buildings and farm dwellings (8, p. 326). Eligibility is based on inability to obtain a loan elsewhere, and evidence of being able to repay the loan. Preference is given to veterans.
SAMPLING PROCEDURE

The local unit of the Farmers Home Administration in Iowa is the county office. There are thirty of these offices scattered throughout the state, each with a county supervisor who handles the loan applications, loan processing, counseling, management supervision, and loan repayments under his jurisdiction. The number of counties assigned to each supervisor varies from one to nine, depending upon the normal number of loans in the counties.

Type of Loan Studied

The county supervisors in Iowa were requested to submit, by counties, the number of paid-up standard operating loans. Non-standard loans such as Emergency Crop and Feed Loans, Seed Loans, Food for Victory Loans, grants, various disaster loans, and loans made in other states which were classified as "collection only" were excluded. The number of standard loans reported, by counties, is shown in Figure 9.

Size of Sample

A 1½ random sample was considered sufficiently large to adequately measure the FHA paid-up loan population. Another forty cases were added to offset anticipated refusals, incomplete knowledge for suitable record, and clients who could not be found. This brought the sample size to 280 from the population of 23,638 paid up loans.
Sampling Method

Iowa was then divided into fourteen strata with each stratum containing as many complete counties as necessary to bring the number of loans in the stratum to approximately 1/14 of the total paid up loans in the state. All counties within a stratum were chosen, as nearly as possible, from the same type of farming area, and were grouped as compactly as practicable. Division into the fourteen strata is shown in Figure 10.

Two counties were randomly drawn, with replacement, from each stratum. The method employed was that of cumulative county totals of number of loans, within each stratum. Random numbers were then drawn between zero and the number representing the total number of loans in the stratum under consideration. That county was selected in which the cumulative loan totals included the randomly drawn number. An example from the actual drawing may clarify the method. Stratum IX included Marion, Warren, Madison, Adair, and Union counties. The arrangement of these for drawing purposes was as follows:

<table>
<thead>
<tr>
<th>Stratum IX</th>
<th>No. loans</th>
<th>Accumulated no. loans</th>
<th>Total loans per stratum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marion</td>
<td>435</td>
<td>435</td>
<td></td>
</tr>
<tr>
<td>Warren</td>
<td>334</td>
<td>319</td>
<td></td>
</tr>
<tr>
<td>Madison</td>
<td>407</td>
<td>1226</td>
<td></td>
</tr>
<tr>
<td>Adair</td>
<td>299</td>
<td>1525</td>
<td></td>
</tr>
<tr>
<td>Union</td>
<td>225</td>
<td>1750</td>
<td>1750</td>
</tr>
</tbody>
</table>

Number 1226 was then drawn randomly and compared with the column of accumulated number of loans. Inasmuch as the number drawn fell between 1226 and 1525, Adair was chosen as one of the two counties to be taken from
Stratum IX. The procedure was repeated with another random number to select the second county. All fourteen strata were treated in this manner.

The drawing was done with replacement. After Adair county had been selected on the first draw, it was not removed from the list but was eligible to be drawn again on the second random number. In two strata the same county was drawn twice (Woodbury County in stratum IV and Guthrie in stratum X). The counties drawn in the sample are shown in Figure 11. Comparison of figures 9 and 11 reveals the heaviest concentration of sample counties in western and southern Iowa which are also the areas of greatest loan concentration. This, of course, is desirable and indicates the sample gave a proper distribution of counties.

It had been decided to draw an equal number of former clients from each county selected in the sample, and to adjust the bias due to unequal numbers of cases between counties and between strata, by weighting. The number of sample loans per county had been set at ten, totaling 280 in twenty-eight counties. Random numbers were again used to determine which borrowers were to be included in the sample. An actual example is Mitchell County with a total of 104 paid up loans. Dividing 104 loans by ten gave a within-county sampling rate of 10.4. A random number between 0 and 10.4 was drawn, 3.8 in the case of Mitchell. Thus, former borrower number four (3.1 + 4.0) in Mitchell County would be included in the sample. The second borrower was determined by adding 3.8 + 10.4 = 14.2 or ex-client 15. The third farm was 14.2 + 10.4 = 24.6 or farm 25, and so on until the ten farms were selected. This method was used for all twenty-eight counties in the sample.
To determine the name and location of each of the numbers drawn within a county, necessitated a visit to the county FHA office servicing the county under consideration. Each local office had lists of paid up borrowers, usually arranged alphabetically, by counties, according to the year in which the borrowers' records had been destroyed.* These lists were arranged in order of age with the loans repaid earlier on top and the list of those most recently repaid placed on the bottom. Then each loan was numbered consecutively from the top of the oldest list to the bottom of the most recent list. The numbers which had been drawn for the county were then paired with the same numbers on the lists. The names of the ten borrowers were then known.

The advantage of the method used in the county offices lies in the distribution of the sample loans over time. Arrangement of the loans in order of date paid gave greater probability of drawing approximately equal numbers of old loans, more recent loans, and those in the middle group.

In some county offices the writer discovered that the total number of repaid loans as shown by the destruction lists and the lists of those loans paid up but not yet destroyed, did not coincide with the number of paid-up cases previously submitted by the county supervisor. The previous county total was accordingly changed, as was the within-county sampling rate, to agree with the lists. The change in the sampling rate then led to new farm numbers.

*The FHA is required by law to destroy a borrower's records three years after the loan is repaid.
The records for the sample borrowers who had paid within the last three years were available in the county office. All FHA supervisors contacted kindly permitted the use of these records to obtain information needed in the study.

Collection of Data

The sample clients were then visited during the late summer and fall of 1949, and the necessary data collected and recorded on the prepared questionnaire.* For those clients who had repaid their FHA indebtedness far enough in the past that their records were not available in the county office, it was necessary to obtain the information relative to the year before, and at the time of the loan, by relying on the memory of the farmer and his wife or by whatever records the farmer happened to keep.

The FHA had insisted that each borrower keep a complete set of records during the period of his indebtedness. Most of the clients had these old books stored away in the attic or storeroom, and willingly produced them for the interviewer. It was encouraging to note that the practice of record keeping started by the FHA was retained by so large a number of the farmers visited. Many of them had a complete set of records from the time of the loan until 1949.

For those who had not kept their old records, the information relating back to the time of the loan was obtained from the memory of the farmer and his wife. It is felt that the memory bias was not as great in these cases

*A reproduction of the questionnaire used is shown in Appendix B.
as might be expected at first thought. The period immediately before, and 
at the time of, the loan was one of great financial stress for these people. 
They were unable to obtain adequate credit from any source. The usual case 
was inability to obtain any credit at all except from the FHA, the FSA, or 
RA where the loan was very old. Because of their critical position the con-
ditions tended to be impressed on their memory much more than would have 
been true had the period been normal and uneventful. The great majority of 
those interviewed seemed to remember the crucial period very well, even to 
quite minor details. There is, undoubtedly, some memory bias in the in-
formation, but much of it should be compensatory when a large group of farms 
is used.

Adjustment of Population Size

Despite the endeavor to draw the farms from a population of only standard 
Operating Loan borrowers, thirty-six non-standard loans were found in the 
sample. This reduced the percentage of the sample to less than 1 per cent 
of the 23,633 total previously thought to be correct. However, if the 
sample were representative of the population the thirty-six non-standard 
loans should indicate the proportion of the 23,633 which are also emergency 
loans. The population was then decreased by 3039, leaving 20,594 as the 
estimated number of paid-up standard Operating Loan borrowers in Iowa. To 
fulfill the requirement of a 1 per cent sample, only 206 borrowers need be 
drawn. Information was actually obtained relative to 110 clients still 
farming in 1946, seventy-two clients who had ceased farming, and seventeen 
clients who were deceased. Thus the sample obtained falls only seven
cases short of the desired 1 per cent.

In addition to the thirty-six non-standard loans, there were six refusals, seventeen former borrowers the interviewer was unable to locate, and twenty-two cases where the location of the client was known but he could not be visited. Most of this latter category had moved out of the state.

Means Used

A system of weighting the data based on the probability of each county and each client being chosen, was discarded when it was discovered that very little difference existed between the weighted means and the arithmetic means. Consequently the arithmetic mean is used throughout the study.

To eliminate increases due to fluctuations in the price level, and to bring all borrowers to a comparable time period, all values have been adjusted to a 1940 base. This was accomplished by using the most appropriate of the indexes of prices paid by farmers, prices received by farmers, and the Bureau of Labor Statistics cost of living index.
SOCIOLOGICAL ANALYSIS

One of the objectives of the present study was to determine whether or not the level of living had raised since the FHA clients received their loans. It is reasonable to assume that as income increased, the necessities such as food, clothing, and medical attention would also increase over previous levels.* This was considered sufficiently logical that consumption of absolute necessities was ignored and attention was focused on the increase in farm and home conveniences, educational pattern, membership in organizations, and contacts with various organization personnel.

Farm and Home Conveniences Indexes

Information was obtained from 110 clients, still farming, relative to twenty-two items of convenience. Each client was asked if he had these conveniences at the time of the interview and if he had had them at the time he received the FHA loan. Index A contains only the six conveniences considered most basic, or standard, whereas index B contains the other sixteen items. Table 1 shows the answers received for index A.

*It is extremely unlikely that the marginal propensity to consume should be zero for the sample group considering that the propensity to consume for the U.S. economy stays quite close to 0.65. This figure is taken from Tarshis (31), Elements of Economics.
Table 1. Number of clients possessing listed conveniences at present (now) and at time of loan (then)

<table>
<thead>
<tr>
<th>Electricity Standard in house</th>
<th>Electricity Standard bathroom</th>
<th>Automobile</th>
<th>Telephone</th>
<th>Radio</th>
<th>Tractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Now</td>
<td>Then</td>
<td>Now</td>
<td>Then</td>
<td>Now</td>
<td>Then</td>
</tr>
<tr>
<td>No. 93</td>
<td>16</td>
<td>19</td>
<td>4</td>
<td>109</td>
<td>101</td>
</tr>
<tr>
<td>% 4.5</td>
<td>14.5</td>
<td>17.3</td>
<td>3.6</td>
<td>99.1</td>
<td>91.8</td>
</tr>
<tr>
<td>* 108</td>
<td>85</td>
<td>88</td>
<td>56</td>
<td>87.5</td>
<td>77.3</td>
</tr>
<tr>
<td>% 98</td>
<td>31</td>
<td>88.2</td>
<td>77.3</td>
<td>69.1</td>
<td>28.2</td>
</tr>
</tbody>
</table>

For index A the number of "thens" for each item was added and the total divided by the number of clients asked (293 : 110 = 2.66). The same procedure was employed for the "nows", resulting in a score of 4.71 (518 : 110 = 4.71), an increase of 77.1%.

The answers to the supplemental index of conveniences (index B) are shown in Table 2. These results were incorporated with the answers to index A to show the over-all increase for all 22 items. The combined score for the "thens" was 631 : 110 = 5.74 whereas for the "nows" 1527 : 110 = 13.88. The per cent increase in the use of all these conveniences was found to be 141.8 per cent.

These results are not intended to infer that this great difference between 1949 and the year the client obtained the loan, is due entirely to having received a loan. They are merely to point out the change in living level between the two points in time, acknowledging cause due to the increased income accompanying the higher price level, the favorable prices received—prices paid ratio existing during and after World War II, the greater availability of many of the items in recent years, and various other reasons. This study has, however, found that the FHA operating loan permitted a continuation of farming in many cases where such continuation would have been otherwise impossible, thus enabling
many farmers to take advantage of the prosperous period for agriculture.

Education

Several questions were asked relative to the education of the parents and the children in the client families. An absolute comparison cannot be made between parents and all children because seventy-three families have 171 children still attending school. It is assumed, however, that the pattern for those children now in school will be better, or at least no worse, than that of those who have now gotten all the education they will receive. A comparison has, therefore, been made between the education of the parents and that of the children who are no longer attending school. Table 3 shows the percentage of parents and of children not attending school by "grade completed" categories.

Table 2. Number of clients possessing listed conveniences at present (now) and at time of loan (then)

<table>
<thead>
<tr>
<th>Convenience</th>
<th>Now</th>
<th>Then</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity in other buildings</td>
<td>83</td>
<td>12</td>
</tr>
<tr>
<td>Running water in house</td>
<td>33</td>
<td>13</td>
</tr>
<tr>
<td>Kitchen sink with drain</td>
<td>70</td>
<td>31</td>
</tr>
<tr>
<td>Hot water in house</td>
<td>18</td>
<td>3</td>
</tr>
<tr>
<td>Weekly newspaper</td>
<td>68</td>
<td>48</td>
</tr>
<tr>
<td>Daily newspaper</td>
<td>98</td>
<td>78</td>
</tr>
<tr>
<td>Farm magazine</td>
<td>105</td>
<td>79</td>
</tr>
<tr>
<td>Electric or gas cook stove</td>
<td>65</td>
<td>3</td>
</tr>
<tr>
<td>Electric sewing machine</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Electric washer</td>
<td>90</td>
<td>13</td>
</tr>
<tr>
<td>Electric iron</td>
<td>92</td>
<td>15</td>
</tr>
<tr>
<td>Electric refrigerator</td>
<td>73</td>
<td>3</td>
</tr>
<tr>
<td>Deep freeze</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Use of locker</td>
<td>89</td>
<td>7</td>
</tr>
<tr>
<td>Furnace</td>
<td>26</td>
<td>14</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1009</td>
<td>338</td>
</tr>
</tbody>
</table>
Table 3. Education of parents and of children no longer in school

<table>
<thead>
<tr>
<th>Grade completed</th>
<th>0-7</th>
<th>8</th>
<th>9-10</th>
<th>11-12</th>
<th>13-14</th>
<th>15-16</th>
<th>Over 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Husbands</td>
<td>24.8%</td>
<td>38.6%</td>
<td>10.1</td>
<td>24.8</td>
<td>1.8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Wives</td>
<td>4.6</td>
<td>42.6</td>
<td>14.8</td>
<td>33.4</td>
<td>4.6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Husbands and wives</td>
<td>14.8</td>
<td>40.5</td>
<td>12.5</td>
<td>29.0</td>
<td>3.2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Children</td>
<td>4.1</td>
<td>30.4</td>
<td>14.2</td>
<td>46.8</td>
<td>4.7</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

From this table it can be noted that the wives appear to be better educated than their husbands, and the children have received a substantially greater amount of high school training than their parents. This, of course, is the same trend as exists generally in Iowa agricultural population.

Organization Membership

Membership in various organizations and contacts with organization personnel was considered as indicative of the degree of socialization, or mixing, with other people. The client families were questioned as to membership in several groups both at the present time and when the loan was received. Table 4 is a condensation of the answers received.

From Table 4 it can be seen that organization membership has increased materially since the clients received their operating loan. The column of "Number holding offices" shows a marked increase in the activity of the clients within each group, with the exception of the church wherein little change is noted. There is little reason to believe that much change would take place in the religious activity of the group.
Table 4. Summary of clients with membership in various organizations

<table>
<thead>
<tr>
<th>Organization</th>
<th>% clients holding membership</th>
<th>% clients holding office</th>
<th>Clients holding membership in more than one organization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>At time of loan 1949</td>
<td>At time of loan 1949</td>
<td>At time of loan 1949</td>
</tr>
<tr>
<td>Farm organizations*</td>
<td>42.7</td>
<td>7.5</td>
<td>3 0 0</td>
</tr>
<tr>
<td>Cooperatives</td>
<td>30.9</td>
<td>6.4</td>
<td>2 0 14</td>
</tr>
<tr>
<td>Church</td>
<td>71.6</td>
<td>64.5</td>
<td>6 5 0</td>
</tr>
<tr>
<td>Home Bureau study</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>group</td>
<td>7.3</td>
<td>1.8</td>
<td>2 1 0</td>
</tr>
<tr>
<td>Others**</td>
<td>16.4</td>
<td>9.1</td>
<td>4 1 0</td>
</tr>
<tr>
<td>No. of persons ever</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>belonging to 4-H</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>or FFA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Farm organizations include 46 clients professing membership in Farm Bureau Federation and one client as a member of the Grange.

**"Others" include school board, AAA committee man, and township or county office.

Organization Personnel Contacts

Another approach used in testing the degree of community participation was that of organization personnel contact by the clients. Each operator was asked if he, or his wife, had talked to the school teacher (if the family had children in school), the minister of their church, the County Extension Director, the County Home Economist, the Farm Bureau Representative, and the AAA Committeeman during the past twelve months. The answers received are tabulated in Table 5.
Table 5. Per cent of clients reporting contact with organization personnel during past 12 months

<table>
<thead>
<tr>
<th>School teacher</th>
<th>Minister</th>
<th>County Extension Director</th>
<th>County Home Economist</th>
<th>Farm Bureau representative</th>
<th>AAA committee man</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>62</td>
<td>63</td>
<td>46</td>
<td>16</td>
<td>64</td>
</tr>
<tr>
<td>%</td>
<td>84.9</td>
<td>75.4</td>
<td>41.8</td>
<td>14.5</td>
<td>58.2</td>
</tr>
</tbody>
</table>

The high percentages shown under "minister" and "AAA Committeeman" are expected in light of the large church membership among the clients and the extensive coverage of the Farm Program. A large percentage of the contacts with the school teacher were reported as arising through country school gatherings. Contacts with extension personnel appear to be considerably lower than would appear desirable but much higher than Witt (41) found in his study.

Attitude Toward Community and Occupation

Three miscellaneous questions were asked in an attempt to determine how the clients were fitting into the community and their attitude toward rural life. When asked if they felt at home in their community 96 answered yes and 11 replied in the negative. Only four families felt that having had an FHA loan had hindered their community life whereas 105 operators had noticed no adverse social effects. In response to whether they preferred their children, when grown, to remain on the farm or move to town, seventy-two parents wanted the children to stay on the farm, two hoped the children would migrate to an urban setting, and thirty-six preferred to let the children make that decision themselves.
ECONOMIC DESCRIPTION OF THE POPULATION

The simple analysis of the collected data has divulged many interesting bits of information about the farmers interviewed. Inasmuch as the sample was randomly drawn from a population believed to be normally distributed, the descriptive material from the sample is assumed to be representative of the entire group of former standard operating loan borrowers in Iowa. The information should be of some value in setting forth the conditions surrounding the group of borrowers, not only prior to receiving the loan, but also the year after, and again in 1949 after the loan had been repaid.

In determining the statistics of this chapter the sample was weighted by county and by stratum according to the probability of being drawn for each county within the stratum and for each client within the county. The weighted results for the first few means were compared with the straight arithmetic means. The variation between them was less than 3 per cent or probably statistically non-significant. It was felt that the slight difference between weighted and arithmetic means did not justify the additional work required in weighting, so arithmetic means will be used throughout the discussion contained in this chapter.

Adjustment of Data to 1940 Values

All money values used in this chapter have been adjusted to a 1940
base by using the Iowa prices-received index*, the Iowa prices-paid index*, and the Bureau of Labor Statistics cost of living index. A custom rates index was derived by combining the indexes of prices received by Iowa farmers for motor vehicles, automobile supplies, farm machinery other than motor vehicles, and daily wages without board.** This was done to show physical increases rather than increases attributable to fluctuations in the price level.

The information has been divided into two parts: that pertaining to former borrowers who were still farming at the time of the interview, and that group who had ceased farming to enter some other occupation. The two categories will be called "farmers" and "non-farmers", respectively.

Number and Age of Sample Operators

When visited during the summer and fall of 1949 there were 110 former clients still farming and seventy-two who had ceased farming and were engaged in other occupations. Of the 110 farmers, fifty-eight had been operating a farm prior to receiving their loan whereas the other fifty-two had been able to start with FHA assistance. The average age of the "farmers" at the time they received the loan was thirty-five years; that of the clients who left the farm was 37.6 years. The age distribution at time of loan is given for both groups in Figure 12. It will be noted that

*The source of these two indexes is the Iowa Crop and Livestock Reporting Service.

**This index was derived from data compiled by B. French and W. Chryst, Iowa State College, from records of the Iowa Crop and Livestock Reporting Service in Des Moines, Iowa.
Figure 12 -- Age Distribution of Operators by Percent
a slightly bi-modal tendency exists for both groups. A rather large percentage of those who left the farm had received their loans at a more advanced age than was generally true of those still farming.

Size of Family

The average family size in the sample was 5.36. This includes parents and children in those families still engaged in agriculture inasmuch as no data was obtained for the "non-farmer" group. All other persons living in the household, other than parents and children, were excluded in determining family size.

Resources Controlled Prior to Loan

The fifty-eight operators farming the year before receiving financial assistance possessed an average of $1047 of capital. This includes the value of household goods as well as that of the goods used in the operation of the firm. This capital was combined with 133 acres of land, of which 98, or 73.7 per cent, acres were tillable, worth $7783, or $59 per acre. To this was added 17.2 man months of family labor, including operator, .33 man months of hired labor, and the management ability of the operator. The result was a gross income of $963. This figure includes $100 per farm earned by off-farm work. Actually only twenty-one operators caused this $100 increase per farm for the group.

Resources Controlled Immediately After Loan

Data relative to the resources controlled by the 182 clients of both
groups immediately after receiving the loan show that the mean farm size was 133.3 acres of which only 95.2 or 71.4 per cent was tillable. The mean farm value was $8118, or $60 per acre. The clients who were to continue farming averaged 136.4 acres with 101, or 74.0 per cent, crop acres valued at $8305 per farm, or $61 per acre in terms of 1940 land values. Those clients who eventually left the farm averaged 123.6 total acres, including 86.4, or 67.2 per cent, crop acres. Their farms had a mean value of $7835, or $61 per acre.* The apparent paradox of farms with lesser percentage of crop land bearing the same value per acre can be explained by pointing out that the value of buildings makes up a larger share of total value in the case of smaller farms than on larger places. It appears quite likely that a significant difference exists in the percentage of crop land between the two groups. The quality of the farm may be to some degree responsible for the exodus of many of this group from agriculture. Table 5 shows the breakdown of acreage and value according to tenure. Data on tenure is not available for the "non-farmer" group.

*The valuation of all the farms in the sample was accomplished by means of deviation of soil type, slope, erosion present, crop yields, and condition of buildings from what was considered the "average farm" in the township. The value of the average farm in the township was obtained from computations of value of land and buildings by civil townships in Iowa, based on 1940 U.S. Census data, by Dr. Wm. G. Murray, Iowa State College, Ames, Iowa. The author believes that whatever errors in valuation may result for individual farms due to omission of detailed appraisal technique, will be compensatory when the farms are considered as a large group.
The assessor’s annual farm census contained in the 1946 Iowa Yearbook of Agriculture (2, p. 575) shows the average farm size in the state during the period 1935-1944 to be 165.9 acres, of which 76.3 per cent is cropland. Thus we see that the average FSA operator at the time of the loan controlled about thirty acres less per farm and about 5 per cent less cropland than did the average Iowa operator.

Immediately after the receipt of the loan those clients still farming in 1940 had 15.8 man months of family labor available, including operator’s labor, and .33 man months of hired labor. Only six farms hired any labor.
and five of these hired only seasonally. Comparison of the family labor available at this time with that for the group farming prior to the loan would indicate that those starting up with FHA help were a younger group with smaller children. Table 7 shows the family labor distribution at the time the loan was received, at the time of the loan, and for 1949. Comparable data was not collected for those clients who subsequently quit farming.

The capital per client at the time of the loan, but not including the loan itself, was $1703. The "farmer" group averaged $1703 whereas the "non-farmers" had but $879 per operator. The two groups combined were loaned an average of $945 per operator during the first crop year following the granting of the first loan. The initial loan was, therefore, somewhat smaller than $945, but inasmuch as the subsequent amounts served as usable capital during the crop year, they were combined with the first amount loaned. Supplemental loans after the first crop year were disregarded. The mean amount loaned those who have continued farming was $896, and the amount to the other group averaged $761, some $135 less per farm.

A recapitulation of the resources controlled by the two groups shows that those clients who left agriculture possessed a lesser amount of land with a smaller percentage of crop land, less capital, and received smaller loans than did those borrowers who managed to continue farming. Lack of data makes it impossible to compare the labor resources. It is assumed that the same amount of managerial supervision was afforded both groups by the county FHA supervisor.
Table 7. Clients still farming. Man-months family labor available year before loan, year after loan, and in 1949 by farms

<table>
<thead>
<tr>
<th>Time</th>
<th>Total no. farms</th>
<th>0-12</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19-22</th>
<th>23-26</th>
<th>27-30</th>
<th>30-36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year before loan</td>
<td>57</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>12</td>
<td>9</td>
<td>3</td>
<td>2</td>
<td>8</td>
<td>2</td>
<td>7</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Year after loan</td>
<td>108</td>
<td>2</td>
<td>13</td>
<td>12</td>
<td>27</td>
<td>18</td>
<td>8</td>
<td>4</td>
<td>10</td>
<td>3</td>
<td>7</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>In 1949</td>
<td>108</td>
<td>1</td>
<td>15</td>
<td>14</td>
<td>14</td>
<td>11</td>
<td>13</td>
<td>7</td>
<td>10</td>
<td>9</td>
<td>6</td>
<td>7</td>
<td>1</td>
</tr>
</tbody>
</table>
Gross Income in Year Following Loan

No data were available by which to determine the gross income during the first year after the loan for the "non-farmers". The group remaining on the farm, however, earned a gross income of $1259 in that period. The distribution of this income is shown in Figure 13.

Uses of Loan Funds

Investigation of the purposes of the loan revealed a slightly different use pattern employed by one group as compared to that of the other. Table 8 shows the uses each group made of the funds.

Several facts emerge from Table 8. The "farmer" group obviously made greater use of the acquired funds to supply power for the farm business than did the "non-farmers". It is also apparent that more modernization of power was desired as indicated by the larger percentage of capital expended for tractors. This becomes even more significant in light of the fact that the

Table 8. Percentage of loan funds spent for various uses, by two major client groups

<table>
<thead>
<tr>
<th>Purpose for which spent</th>
<th>% spent by &quot;farmers&quot;</th>
<th>% spent by &quot;non-farmers&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horses</td>
<td>10.6</td>
<td>9.2</td>
</tr>
<tr>
<td>Tractor</td>
<td>11.6</td>
<td>2.8</td>
</tr>
<tr>
<td>Machinery</td>
<td>11.1</td>
<td>10.8</td>
</tr>
<tr>
<td>Livestock</td>
<td>39.9</td>
<td>46.7</td>
</tr>
<tr>
<td>Feed</td>
<td>10.2</td>
<td>15.4</td>
</tr>
<tr>
<td>Farm operation</td>
<td>5.4</td>
<td>4.0</td>
</tr>
<tr>
<td>Refinancing</td>
<td>10.1</td>
<td>12.4</td>
</tr>
<tr>
<td>Household use</td>
<td>1.1</td>
<td>.7</td>
</tr>
</tbody>
</table>
Figure 13 -- Distribution of Gross Income, by Percent, of Clients Still Farming
arithmetic mean of the loan dates for the "non-farmers" is almost three years later than for the "farmers." One possible answer of unavailability of tractors because of diversion of material for war use is at least partially discounted because the ratio of post-1943 borrowers between the two groups is much less than the ratio of percentage of funds spent for tractors for the two groups. Then too, the proportion spent for machinery is practically the same for both groups.

The operators still farming seem to have spread the funds out more uniformly among the various alternatives, perhaps striving for a more rounded or better balanced system of enterprises. The "non-farmers" group appears to have needed more funds for refinancing, suggesting, possibly, a slightly higher debt load prior to the loan.

Resources Controlled in 1949

The 110 operators still farming when interviewed were asked their resources as of January 1, 1949. The average farm contained 182.7 acres of land of which 140, or 76.8 per cent, acres were tillable. The per-farm value was computed at $11,335, or $65 per acre. These values are still in terms of 1940 as the base. Thus the quality as well as the size of the client farms appear to have improved over time. The breakdown by tenure is shown in Table 6.

The available family labor for 1949 was 16.6 man months but the hired labor had increased to 1.14 man-months per farm. This is logical inasmuch as the acreage increased approximately forty acres per farm.
Capital resources showed the largest increase during the period since the loan. The available capital, still including household goods, was $4009 per operator, or more than 200 per cent of the amount used during the first crop year following the initial loan. All farmers interviewed had retired their indebtedness to the FHA prior to 1949.

**Gross Income in 1949**

The combination of these resources with the factor of management yielded a gross income of $2309 per farm. This was nearly double the gross income earned during the first year after credit had been extended. Table 9 shows the amounts of resources needed to obtain $1000 gross product before the loan was granted, the year following the loan, and in 1949.

**Table 9. Value of resources used per $1000 gross product (1940 values)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Land</th>
<th>Labor</th>
<th>Capital</th>
<th>Gross production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year before loan</td>
<td>$8040</td>
<td>18.1 mo.</td>
<td>$1082</td>
<td>$1000</td>
</tr>
<tr>
<td>Year after loan</td>
<td>6595</td>
<td>12.8 mo.</td>
<td>1353</td>
<td>1000</td>
</tr>
<tr>
<td>1949</td>
<td>5125</td>
<td>7.7 mo.</td>
<td>1736</td>
<td>1000</td>
</tr>
</tbody>
</table>

Table 9 shows $271 additional capital saved 5.3 man-months of labor and $1446 worth of land in the production of $1000 gross income. During the second period $383 more capital saved 5.1 man-months of labor and $1469 of land. At 5 per cent return on the land and with labor valued at $100 per month, nearly $600 has been saved in these two resources by the application of the additional capital. It is apparent from the table that
diminishing returns have set in, but further capital can profitably be added until the saving in other resources is equal to the last increment of capital. The table illustrates the savings resulting from proper resource combination.

In 1949 forty-four of the 110 farmers received more than $8300 for off-farm work. Most of this was for custom work. This was an average of $189 for each off-farm worker, or $77 each if distributed over the entire group. While approximately the same proportion of operators received off-farm income in 1949 as during the year before receipt of the loan, the amount per worker was only about 75 per cent as much as formerly. This could be due to better farm balance, or a greater utilization of the operator's time than was true before.

Tenure

There are four standard types of leasing arrangement in Iowa, as well as several modifications of the standard types. Each of the main types are designed to fit the capital and risk-bearing condition of the tenant. The cash rent lease is adapted to the farmer who possesses more capital and can afford to stand greater risk. This form also tends to attract better managers. The crop share plan usually requires less capital from the operator and divides the risk between landlord and tenant. The livestock share type is more attractive to the farmer who wishes to utilize particular livestock management ability but who is somewhat limited in capital and cannot afford the complete risk. The labor share plan is for the operator who has very little capital, thus practically no risk bearing ability.
Customarily this operator furnishes little other than labor and part of the management. Here the greatest share of the risk and uncertainty has been shifted to the landlord. This plan is most frequently used in father-son partnerships at the time the son is first taken into the firm.

Questions as to tenure were asked the farmers interviewed. The purpose was to determine whether or not a significant change toward ownership and toward a greater risk-bearing tenure had taken place as the operator's capital accumulation had become larger. The breakdown, by per cent, for the 110 farmers is given in Table 10. This data refers to the tenure at the time the loan was granted and also in 1949.

Table 10. Per cent operators by tenure groups in 1949 and at time of loan

<table>
<thead>
<tr>
<th>% owners</th>
<th>% cash rent</th>
<th>% crop share</th>
<th>% livestock share</th>
<th>% labor share</th>
</tr>
</thead>
<tbody>
<tr>
<td>At time of loan</td>
<td>13.9</td>
<td>15.7</td>
<td>35.8</td>
<td>4.6</td>
</tr>
<tr>
<td>1949</td>
<td>35.2</td>
<td>9.2</td>
<td>49.1</td>
<td>6.5</td>
</tr>
</tbody>
</table>

The most significant change between the two points of time in the table is the increase in farm ownership. The period 1940-1949 was an extremely favorable one in which to pay for a purchased farm. The index of the ratio between prices received by farmers and prices paid by farmers was very high, and farmers realized net returns well above that necessary for living expenses. The gain in number of owners was apparently made at the expense of the cash renters and crop share renters.

Several of the operators shown in Table 10 had divided tenures, that is,
they farmed some land under one rental agreement and another tract under some other plan. A few were part owners. Where divided tenure occurred the farmer was placed in that category which applied to the larger tract of land farmed, unless that tract were only used for pasture.

Supplemental Loans

Heretofore the supplemental loans have been disregarded in the analysis. This type of loan, as considered in this study, is one granted the client subsequent to the initial loan. The definition used here is not strictly in accord with that promulgated by the Farmers Home Administration. That agency does not always classify loans subsequent to the initial loan as supplementary.

Those clients still farming in 1949 were granted a total of $33,685 in supplemental loans. This amount was granted forty-five operators, or an average amount of $748 per operator. Dividing this between the 110 borrowers the mean is $306 per farm. The "non-farmers" received $17,858 granted to seventeen borrowers. This represents a sum of $1050 for each of the seventeen and an average of $248 apiece when distributing it among the seventy-two clients in the group. This would indicate that the majority of those who left agriculture received less secondary financial help than was true in the "farmer" group. It also appears that the FHA exerted considerable effort in the form of financial aid to help seventeen operators make a go of their business.
Length of Loan

Comparison of the two groups with respect to length of time required to pay off the indebtedness shows that the clients in the "farmer" group retired their loans in 4.55 years. Those clients who ceased farming needed an average of 5.13 years to repay the funds borrowed. These averages include repayment of all loans, initial and supplemental. The distribution of borrowers by length of loan is shown for both groups in Figure 14.

Only twenty-six clients retired their loan prior to leaving the farm. Another twenty-two repaid at the time they stopped farming, seven more cleared up their FHA indebtedness within one year, and 3,0,1, 4,1,3,2,1,0,0,1, and 1 paid off in 2,3,4,5,6,7,8,9,10,11,12, and 13 years respectively after leaving the farm. The repayment history of this group suggests that it became more difficult for them to pay after moving to town than was true of those operators who remained in agriculture.

Mobility

From the information received from the "non-farmers" it was possible to compute the distribution of clients leaving the farm in terms of number of years after receiving initial loan. Figure 15 shows the number of farmers quitting the farm each year after receiving the operating loan. Two of the seventy-two clients left during the same year they received aid.

The thought has often been expressed that FHA operating loan borrowers change farms more frequently than does the average tenant farmer in Iowa. This seems illogical in light of the efforts of county FHA supervisors to
Figure 14 -- Total Length of Loan
Figure 15 — No. Farmers Leaving Farm, by Years After Loan.
secure leases in excess of one year for their borrowers. Each tenant farmer was asked by the interviewer how many times he had changed farms since the loan was received. The answers from the ninety-three farmers asked showed a total of 203 moves, an average of 2.2 moves per family during an average period of eight years. Figure 16 depicts the average number of years per move from date of loan.

Group Discontinued Farming

What became of the group that discontinued farming? To answer this question the "non-farmers" were asked why they left the farm, in what occupation they were presently engaged, their present annual income, and their present net worth. They were also questioned as to size and location of the last farm they operated.

Size of last farm

The average size of their last farm was 140.8 acres or 12.2 acres larger than the farm on which they were living at the time of the loan. The percentage of crop land, however, had fallen from 67.2 per cent to 66.3 per cent and the value from $61 per acre to $57 per acre. Instead of bettering themselves with the passing of time, it seemed that these clients seemed to gravitate to poorer farms.

Present occupations

These people were working at a wide variety of jobs in the summer and fall of 1949. In an attempt to shorten the list, the occupations were
Figure 16 — No. Clients Still Farming by Average No. Years per Move from Date of Loan *

* Ten clients have not moved since the loan. They average 8.3 years on the same farm.
condensed into sixteen categories. Fewer classes, it was felt, would be too general to show the heterogeneity which prevailed. The following categories resulted:

- General labor (unskilled) 11
- Agricultural labor 3
- General trucking 7
- General labor (semi-skilled) 6
- Retired 6
- Proprietor of small business 5
- Carpenter 5
- Salesman 4
- Mechanics 4
- Manager of small business 3
- Factory work (skilled) 3
- Construction work (semi-skilled) 3
- Technical 2
- Painter 1
- Postmaster 1
- Unemployed 1

70

**Annual income**

The average annual income from the job each held at the time of the interview was $1640 in terms of 1940 values. The Bureau of Labor statistics cost of living index was used to adjust to a 1940 base. Unadjusted annual income was $2781. The net worth at the time of the visit was given as $2230 (1940 values) against $2042 at the time they gave up farming. The financial progress of this group has been definitely slower than that made by the borrowers who remained on the farm.

**Reasons quit farming**

The reasons given as to why they had decided to give up farming are
listed below:

<table>
<thead>
<tr>
<th>Reason</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slow financial progress</td>
<td>26</td>
</tr>
<tr>
<td>Inability to obtain a farm</td>
<td>12</td>
</tr>
<tr>
<td>Domestic reasons*</td>
<td>12</td>
</tr>
<tr>
<td>Preference for another occupation</td>
<td>11</td>
</tr>
<tr>
<td>Retired</td>
<td>3</td>
</tr>
<tr>
<td>To enter armed forces</td>
<td>2</td>
</tr>
<tr>
<td>Inability to obtain labor</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>68</strong></td>
</tr>
</tbody>
</table>

Conversation with those interviewed revealed that in several cases slow financial progress was a dominant force in the decision despite the fact that another reason was offered. In many instances two or more reasons were given, but in such cases the individual was asked to rank them according to the amount of influence each had on the change of occupation.

The intent of this chapter has been to draw a verbal picture of the resources and financial progress of these people. This should lead to a better understanding of the economic conditions surrounding them at the time when they needed financial help and also after they had retired their indebtedness to the Farmers Home Administration.

*Under this heading the interviewer received such explanations as poor health, divorce, refusal of wife to live on a farm, and death of spouse.*
ANALYSIS OF RESOURCE ALLOCATION

One of the major purposes of the Production and Subsistence loans was to rehabilitate the client so that he could continue farming successfully without FHA assistance. Increased efficiency in the combination of, and use of, resources on the client's farm was necessary to raise the income of the operator. The purpose of this section of the study is to determine if, and how much, the addition of FHA capital improved the resource combination of the client.

Analysis Technique

Income is dependent upon many variables. In addition to the four basic resources, such factors as weather, price fluctuations, and acts beyond man's control affect income. Because of the difficulty of measuring these other influences and because we are interested only in the part played by land, labor, capital, and management in income determination, only those four factors were included as independent variables. The dependent variate is gross income. The multiple correlation coefficients show that the four independent variables explain 53.5 per cent of the variation in gross income during the year prior to the loan, 54.4 per cent during the year following the loan, and 77.0 per cent in 1949.

The variables of land, capital, and gross income were measured in terms of dollar values. Capital items were valued according to prevailing
auction sale values. All values for these three variables were adjusted to a 1940 base.

Labor was measured in terms of man-months. The management factor on each farm was indexed as a number between zero and 100, the number being determined both subjectively and objectively from a series of questions, management practices used, and the observations of the interviewer. The questions related to sound farming principles and each question carried a variable value according to the familiarity of the operator with the principle.

A large number of management practices were included in the index and the client was scored on these according to the degree of use of each practice. The proper degree of use of each practice, in view of the conditions on the particular farm, was determined by the judgment of the interviewer. In each case where the practice used did not coincide with that considered most desirable by the interviewer, the operator was asked his reason for using the method used, and why he did not adopt the "preferred" practice. If the answers indicated that the operator was aware of the "better" method but could not adopt it because of some reason beyond his control, he was not penalized in the rating.

The observations of the schedule-taker relative to the overall management ability of the client in his labor, feeding, machinery and power efficiency, supplemented the principles and practices-used questions. This was obtained from general conversation and a tour of the farmstead.

It should be emphasized that this index rating of the management factor is valid only as the weighting and judgment of the evaluator is valid.
Rating by another interviewer might well result in quite different scores for each operator. However, uniformity of scoring prevails throughout the sample inasmuch as all clients were visited and rated by the writer.

Standard regression analyses were run for three different periods of time, namely, the year prior to the loan, the year after the loan, and in 1949. Because of the feeling that the regression line would be curvilinear, the values of the variables were converted into their logarithms, which permitted the regression procedure to follow that of linear multiple regression. The statistical computations necessary to determine the simple correlation coefficients \( r \) of the variables are shown in Appendix A.

Derivation of the partial regression coefficients (Betas, \( B \)), the multiple correlation coefficients (\( R \)), the overall variance (\( V \)), the variances of the different factors (\( V_1, V_2, V_3, V_4 \)), the standard deviations of the factors (\( S_1, S_2, S_3, S_4 \)), and the regression equations, was then completed in the usual manner. The values of these statistics are shown in Appendix A.

Significance of Regression Coefficients

The partial regression coefficients were tested for significance with the following results: both in the year before the loan and in the year after the loan, land was significant at the 5% level, capital was significant at the 1% level, and labor and management were non-significant. In 1949 land, capital, and management were highly significant with labor testing significant. The t values for each factor in each time period are shown in Appendix A.
The regression equations in this study take the form $AX^bX^cX^dX^e$ when taken out of the logarithms. The regression coefficients (b,c,d,e) show the percentage change in gross income for each 1% of factor change. Thus we have a measure of relative importance of the different factor categories. Referring to Table 11, it can be seen that before the loan land and labor changes produced the larger income changes. The year following the loan management and capital were more important, although the management factor may have been of less importance than the regression coefficient indicates in view of the non-significance of its Beta. The fiducial limits of this regression coefficient are .370 to .770. The fiducial limits for the various regression coefficients are shown in Table 12.

In 1949 with all variables testing significant, the elasticities for management and capital were greatest. The elasticity for management was -.171 before the loan to .57 the year after the loan to 1.002 in 1949. Capital elasticity increased from .287 to .434 to .383, indicating a greater relative productivity for capital in 1949 than in the year before the loan, but less than in the year following the loan.

Marginal Productivities

Computation of the marginal productivities of the various factors at each of the three points in time should serve as additional information.
on the resource combination. Using the formula: \( MP = \frac{(E)(F)}{F} \) where \( MP \) is marginal productivity, \( E \) is elasticity, \( F \) is the mean product, and \( F \) is the mean of the factor, the marginal productivities of the factors are derived. They are shown in Table 13.

Table 11. Regression coefficients (elasticities)

<table>
<thead>
<tr>
<th>Time</th>
<th>Labor</th>
<th>Land</th>
<th>Capital</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year before loan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-.155</td>
<td>.300*</td>
<td>.237**</td>
<td>-.171</td>
</tr>
<tr>
<td>Year after loan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-.372</td>
<td>.290*</td>
<td>.454**</td>
<td>.570</td>
</tr>
<tr>
<td>1949</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.363*</td>
<td>.273**</td>
<td>.563**</td>
<td>1.002**</td>
</tr>
</tbody>
</table>

*Significant at the 5% level.
**Significant at the 1% level.

Table 12. Fiducial limits of regression coefficients at 5% level

<table>
<thead>
<tr>
<th>Time</th>
<th>Labor</th>
<th>Land</th>
<th>Capital</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year before loan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reg. coefficient</td>
<td>-.155</td>
<td>.300</td>
<td>.237</td>
<td>-.171</td>
</tr>
<tr>
<td>Upper limit</td>
<td>.093</td>
<td>.556</td>
<td>.543</td>
<td>.077</td>
</tr>
<tr>
<td>Lower limit</td>
<td>-.403</td>
<td>.044</td>
<td>.031</td>
<td>-.419</td>
</tr>
<tr>
<td>Year after loan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reg. coefficient</td>
<td>-.372</td>
<td>.290</td>
<td>.434</td>
<td>.570</td>
</tr>
<tr>
<td>Upper limit</td>
<td>-.165</td>
<td>.493</td>
<td>.551</td>
<td>.770</td>
</tr>
<tr>
<td>Lower limit</td>
<td>-.879</td>
<td>.084</td>
<td>.217</td>
<td>.370</td>
</tr>
<tr>
<td>1949</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reg. coefficient</td>
<td>.363</td>
<td>.273</td>
<td>.363</td>
<td>1.002</td>
</tr>
<tr>
<td>Upper limit</td>
<td>.498</td>
<td>.449</td>
<td>.565</td>
<td>1.140</td>
</tr>
<tr>
<td>Lower limit</td>
<td>.222</td>
<td>.097</td>
<td>.201</td>
<td>.864</td>
</tr>
</tbody>
</table>
Table 13. Marginal productivities of the four basic resources for three points in time

<table>
<thead>
<tr>
<th>Time</th>
<th>Labor</th>
<th>Land</th>
<th>Capital</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year before loan</td>
<td>8.080</td>
<td>.039</td>
<td>.236</td>
<td>-2.229</td>
</tr>
<tr>
<td>Year after loan</td>
<td>-29.920</td>
<td>.466</td>
<td>.313</td>
<td>10.387</td>
</tr>
<tr>
<td>1949</td>
<td>42.34</td>
<td>.053</td>
<td>.233</td>
<td>29.786</td>
</tr>
</tbody>
</table>

The marginal productivities in Table 13 show the absolute return in dollars of gross income for each unit change in the factor. In the table the unit of labor is the man-month, land and capital are in dollar units, and the management units are in terms of the index, or rating, numbers. Inasmuch as these numbers are based on 100 as the maximum, they really are in terms of percentage. It should also be pointed out that these productivities are at the geometric means only, and at no other point.

Comparison through time of the productivities of the labor factor can be by general trend only because of the non-significance of the factor immediately before and after the loan. We can, however, be reasonably certain that the productivity of labor was much higher in 1949 than for the two other periods, indicating a much better resource combination than formerly. The amount of labor was much higher relative to the amounts of the other resources controlled in the earlier periods. In 1949 the average month of the last addition of labor increased gross income by more than $42. Where the market price for one man-month of labor exceeds $42, a loss is being incurred. While more points in time are needed to establish
the trend, it appears that the productivity of the labor factor is still increasing.

The marginal productivity of land is apparently decreasing after a substantial initial increase. Addition of more land relative to other factors certainly does not appear desirable.

Capital productivity increased somewhat but has either been carried too far or not far enough. Additional points in time are necessary to draw more accurate inferences. In 1949 the last dollar of capital added returned twenty-three cents. In view of the rise in importance of the regression coefficient for capital, it is likely that additional capital could be added under conditions of increasing returns.

The increase in management productivity is apparent. In 1949 the last unit of management added increased gross income by nearly $30. Prior to the loan the negative return to increase in managerial ability tests non-significant, so the validity of the productivity is doubtful.

Elasticities

The regression coefficients show the average percentage change in gross income for each 1% change in a factor. Thus the regression coefficients are the elasticities for the individual production factors. Re-examination of the regression coefficients reveals that for the three periods of time all factors show elasticities less than 1, with the exception of the management factor in 1949. All factors but management in 1949, then, indicate diminishing marginal returns. In those cases immediately before or after the loan, where negative elasticities appear,
the tests of reliability show non-significance, indicating that those
elasticities could have occurred by chance more than 5% of the time
even if the population elasticities were actually zero.

Returns to Scale

If the sum of the elasticities of the independent variables is
considered during any one year, some information is given as to returns
to scale. If the elasticities total 1.0 during any one year constant
returns to scale is indicated. Where the sum exceeds 1.0, increasing
returns to scale seem evident, and where less than 1.0 is obtained,
decreasing returns exist.

In the year before the loan the presence of two negative elasticities
reduces the positive sum to .261, indicating decreasing returns. The
validity is doubtful, however, because of the improbability that increases
in these two factors should decrease total product.

The year following the loan shows a total elasticity of .922,
notwithstanding an elasticity of -.372 for the labor factor. The indica-
tion is, therefore, that the returns to scale are rather close to constant.

In 1949 the sum of the individual elasticities is 2.021. Increasing
returns to scale is plainly evidenced. Removing the elasticity of manage-
ment leaves 1.019 total for the other three factors. Under the conditions
in 1949 expansion of the firm would seem advisable for the average and
above average operator in the group. This expansion should, in the absence
of more specific knowledge of the individual factors, follow the form of
proportional increases in each production factor until constant returns to scale is reached.

In a previous study by Heady (12) in which a sample of all farms was used, substantially the same results were obtained relative to the returns to scale of the farms studied, as was found in the two earlier periods of this study. He found decreasing returns to scale to be prevalent in his investigations. Heady's study differed somewhat in that he did not include management as a variable. In 1949 management comprised nearly half of the total elasticity of the factors in the present study, thus bringing the 1949 results closer to the results found by Heady.

Significance of Regression Equations

The question now remains as to whether or not any real progress was made by the addition of more capital. Could the data from the period immediately after the loan have come from the same population as the 1949 data? To answer this question the differences between the two regression equations were tested for significance.

This procedure involved standard regression analysis using the differences between the logarithms of the values of each variable at each of the two different times. The partial regression coefficients were then tested for significance. The resource of capital tested significant well beyond the 1% level. Land tested significant at approximately the 20% level. There appeared to be no difference between labor in 1949 and
at the time of the loan. Management does not lend itself properly to this type of test for two reasons. In the first place much of the decision making in the period immediately following the loan was influenced by the FHA supervisor. Secondly, the information on management differences was so inadequate that no attempt was made to test them.

The tests of significance of the partial regression coefficients of the differences between 1949 and the year before the loan are shown in Table 20. The tests were run on seventy-eight paired cases, i.e., each difference related to the same farmer for two periods of time.

Table 14. Tests of significance of factor differences between 1949 and year after loan

\[
V = \frac{1 - R^2}{N - M} = \frac{1 - .2478}{74} = .010165
\]

<table>
<thead>
<tr>
<th>Factor</th>
<th>V</th>
<th>s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor</td>
<td>.01237</td>
<td>.1122</td>
</tr>
<tr>
<td>Land</td>
<td>.01200</td>
<td>.10954</td>
</tr>
<tr>
<td>Capital</td>
<td>.01278</td>
<td>.11505</td>
</tr>
</tbody>
</table>

(labor) \( t_1 = .3023 \)
(land) \( t_2 = 1.3401 \) (significant at approximately 20% level)
(capital) \( t_3 = 5.8673^{**} \) (significant at 1% level)

From Table 14 it can be seen that a "t" value as large as 3.8673 for capital would happen by chance less than one time in a hundred trials in a population where there was zero difference between 1949 and the year following the loan. Thus it is almost certain, from the evidence at hand, that a substantial change has taken place, over time, from the standpoint of both absolute capital accumulation and in the relative position of
capital with respect to the other resources.

The evidence is not sufficiently conclusive to say that the position of the land factor has also changed during the period since the loan was received. Significance at the 20% level indicates a possibility, but the results could well have happened by chance.

Apparently no substantial change has occurred with respect to labor supply. The marginal productivity has increased, more land has been added to each farm, and a greater amount of hired labor has been added. If the test of significance had included only the unpaid family labor (including operator's labor), there is strong reason to believe the results would have been significant.

Conclusion

The results of the regression analyses indicate that real progress has been made in improving the resource allocation on the client farms as evidenced by the higher marginal productivities of the production factors in 1949. The marginal productivities of the various factors have risen as a result of better combination. The absolute amounts of land and capital have increased, together with over a 200 per cent rise in gross income. The results also show that the group has shifted from a position of decreasing returns to scale to one of constant, or slightly increasing, returns.
SUMMARY

1. During the two decades following 1930 popular feeling changed to a philosophy embracing government assistance for low-income families. The result was government credit combined with supervision for those farm families unable to obtain adequate credit elsewhere. The objectives of the program were increased level of living and rehabilitation in place.

2. Prior to 1934 financial assistance to farmers by the federal government was in the form of disaster loans. In 1934 the State Rural Rehabilitation Corporations were established under the Federal Emergency Relief Act. On July 1, 1935 the Resettlement Administration succeeded the RR Corporations and in September, 1937, the Farm Security Administration succeeded the RA. Public Law 731 established the Farmers Home Administration in 1946, and this agency assumed the functions of the FSA in November of that year. The purpose of these post-1933 agencies included rehabilitation of low-income farm families by means of supervised production loans.

3. A 1% sample was selected from the some 20,000 paid-up operating loan borrowers in Iowa. Sampling procedure included division of the state into fourteen strata of approximately the same number of paid-up loans. Two counties were chosen at random from each stratum and ten paid-up borrowers were randomly selected from each county. Thus 280 farms
were included in the sample, allowing for refusals, unsuitable records, and clients who could not be located. Each operator in the sample who could be located, was interviewed.

4. All values used in the study were adjusted to a 1940 base. This was done by using the Iowa indexes of prices paid by farmers, prices received by farmers, and the Bureau of Labor Statistics Cost of Living index. This method was employed to eliminate the effects of fluctuations in the general price level.

5. The survey disclosed 110 clients still farming in 1949, seventy-two clients who had ceased farming, and seventeen who were deceased. The balance of the farms in the sample either refused to cooperate, could not give sufficient information to be included in the analysis, or could not be located by the interviewer.

6. Indexes of twenty-two farm and home conveniences indicated the FHA families had enjoyed a 141.8 per cent increase in conveniences between the time of the loan and 1949.

7. The wives of FHA families appear to be better educated than their husbands, and the children are receiving substantially more high school training than either parent had.

8. Nearly 43 per cent of the sample operators belonged to farm organizations and 31 per cent were members of cooperatives, in 1949. At the time they received the loan the percentages were 7.3 and 6.4 respectively. Slightly less than 42 per cent reported contact with the County Extension Director in 1949.
9. The group no longer farming averaged 2.6 years older at the
time of the loan than those clients still farming. The "non-farming"
category contained a larger percentage of borrowers who had received
aid at a more advanced age than was generally true of those still farming.

10. The mean amount loaned those who have continued farming was
$896 and the amount to those who quit farming averaged $761. Supple­
mental loans after the first crop year averaged $306 for the first group
and $248 for the second group.

11. Those clients farming the year before receiving the loan combined
average resources of 135 acres of land, of which ninety-eight acres were
tillable, with 17.6 man-months of labor and $1047 of capital, including
household goods, to earn a gross income of $968.

12. The year following the loan, as reported by those clients still
farming in 1949, 136.4 acres, with 101 tillable acres, were used with
16.1 man-months of labor and $1103 of capital, not including the loan,
to earn a gross income of $1259.

13. During 1949 the paid-up borrowers used 132.7 acres on the average,
of which 140 acres were tillable, with 17.7 man months of labor and $4009
capital to produce $2309 gross income per farm.

14. A recapitulation shows that the resources needed to produce
$1000 gross income before the loan were $8040 of land, 19.1 man months
of labor and $1082 of capital. The year following the loan required
$6695 of land, 12.8 months of labor and $1353 of capital to earn $1000
gross income. In 1949 the same gross income was obtained with $5125 worth
of land, 7.7 months of labor and $1736 of capital. Diminishing returns
have set in but addition of even more capital appears to be profitable.

15. The group of clients who subsequently left the farm received,
on the average, smaller loans, less supplemental aid, and had smaller
farms of poorer quality than those operators who were still farming in
1949.

16. Nearly half the funds received were spent for livestock. The
group who continued farming spent a substantially larger share of the
loan for power and less for refinancing than did the other group.

17. At the time they received the loan only 13.9 per cent of the
borrowers owned their farms. When interviewed in the fall of 1949, 35.2
per cent reported ownership.

18. The operators still on the farm in 1949 needed an average of
4.55 years to repay their FHA indebtedness. The group that discontinued
farming required 5.13 years to pay up in full. A study of the repayment
history suggests that it became more difficult for the latter group to
repay after moving to town than for the operators who remained in agri-
culture.

19. The borrowers who discontinued farming were on poorer farms when
they quit farming than when they received FHA help.

20. The clients who left the farm were employed in a wide variety
of occupations when interviewed in 1949. Their average annual income,
in terms of 1940, was $1640, and their net worth was reported as $2230.
Nearly 40 per cent of this group gave slow financial progress as the reason
for leaving the farm. The financial progress of this group has been
definitely slower than that made by the borrowers who remained on the farm.

21. Regression analyses were run with labor, land, capital, and management as the independent variables and gross income as the dependent variable. Land, capital, and income were measured in terms of dollars, labor in terms of man-months and management as rating units as a per cent of 100. This rating was both objective and subjective in nature, and was applied to the operator by the writer.

22. In the year before the loan and in the year after the loan the regression coefficients for land tested significant at the 5% level, capital was significant at the 1% level, and labor and management were non-significant. In 1949 land, capital, and management showed highly significant (1% level) and labor tested significant (5% level). These regression coefficients show the percentage change in gross income for each 1% factor change.

23. The marginal productivities of the factors, showing the absolute return in dollars of gross income for each unit change in the factor, indicate greater returns for the last unit of labor and management in 1949 than in the year immediately before or after the loan. Land and capital productivities raised the year following the loan and have dipped downward again in 1949.

24. Examination of the regression coefficients, as measures of elasticity of the factors, reveals that the sum of the individual elasticities during each of the three periods studied, indicate decreasing returns to scale for the group during the year before the loan, nearly constant
returns in the year after the loan, and slightly increasing returns in 1949.

25. To find out whether or not any real change had taken place between the first year after the loan and 1949, a regression analysis was run using the differences in the factors as they existed in the two time periods. This regression included seventy-eight paired cases. The difference in capital tested significant at the 1% level and land at about the 20% level. Labor showed non-significant. Management was not tested. Thus we can conclude that a real difference exists between 1949 and the year after the loan with respect to absolute capital accumulation and in the relative position of capital with respect to the other resources.
CONCLUSIONS

To the extent that our present findings are true, the principle of rehabilitation in place has had some success where the client remained on the farm. Whether the progress registered by the group studied has been due to FHA help or to a succession of prosperous years for agriculture, is beyond the scope of the present study. Undoubtedly both factors were of major importance in that the loans placed many operators in a position where they could profit from the favorable cost-price relationships that existed during the 1940's.

From the standpoint of community action and organization membership, the FHA clients have shown considerable progress as compared to the pre-loan level. The level of living has been materially raised, as measured by increase in farm and home conveniences. The educational pattern is improving for the younger generation in FHA family homes.

Higher incomes and greater production characterize the families included in the study, when contrasted to the pre-loan era. A more balanced combination of resources and greater efficiency per resource has resulted from the capital additions and accumulations.

From the result of the investigation and from conversation and observation among the farmer borrowers interviewed, a few suggestions for improving the program have been noted.

Most of the group who ceased farming gave as reasons, slow financial
progress. Their net worths at the time they left the farm also suggest slow progress. This group received smaller loans, on the average, and less supplemental aid than those clients who were able to continue farming. Further study may be required but it appears that a tendency exists to make loans that are too small. This may be caused by fund limitation which means adequate loans for a few or inadequate loans for a greater number.

This study revealed a tendency to make loans to two more or less distinct groups; a younger group in the twenties, and an elderly group past forty. The loans to the younger group are generally to help the client get started farming. Some attention should perhaps be directed toward those farmers between the ages of thirty and forty who are already farming but who need aid.

As the case load per county diminishes, each supervisor will be able to give more time per family. Many of the clients expressed the opinion that more frequent visits by the supervisor would have been helpful. Closer supervision as to physical amounts and prices per purchased item, was also recommended by most of the former clients. This latter item would, of course, involve much added expense.

Another suggestion might be the establishment of an operating fund. The loans studied were for specified purposes with a minimum of flexibility. The existence of a fund, controlled by the county supervisor, to aid a client in obtaining quick, but necessary, small amounts of cash for unexpected needs, would help in balancing a farm operation. Many transactions
which would increase the income of the client never materialize because
the opportunity is gone before the funds can be obtained through regular
channels. This observation is made upon the premise that increasing the
income of the clients is a major purpose of the program.

In a large number of the loans over half the funds were used for the
purchase of additional livestock. In many cases this is desirable, but in
other instances better resource allocation can be achieved by alternate
fund use. It will be noted that the group still farming in 1949 used about
7 per cent less of their loans for livestock than did the group who left
agriculture. Greater attention to proper balance and to factor productivity
is urged in the distribution of the loan among the various farm enterprises.
It is assumed that the risk-bearing ability of all the clients is somewhat
similar.

Analysis revealed that the smaller, poorer quality farms, and the
excess of available labor which characterized the client families at the
time of the loan, did not provide as economic a unit nor as good a resource
combination as existed in 1949 after the families had enlarged their land
resources. It is suggested that the FHA investigate the possibility of
larger units for clients at the time the loan is granted.

The author feels that a more comprehensive understanding of the re-
habilitation principle can be obtained by further investigations. Breaking
the present study down into smaller, more specific, aspects would lead to
valuable conclusions. With less information to obtain from each operator,
a greater number of frequencies could be used, thus contributing to the
increased validity of the information. Each phase of this study would receive more intensive consideration if in the form of separate, yet coordinated, efforts.
BIBLIOGRAPHY


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ACKNOWLEDGMENTS

I wish to express my gratitude to the members of the Economics and Sociology Department for their valuable criticisms and advice. I am particularly indebted to Drs. W.G. Murray, E.C. Heady, and J.A. Nordin, without whose help and guidance this thesis could not have been written.

Mr. B.E. Lodwick, FHA State Director, and the various FHA County Supervisors gave willingly their time and the records which were so basic to this study. I want to thank the FHA for the financial assistance which made this project possible.

Dr. R.E. Wakeley spent many hours helping the author work out numerous sociological problems. Dan Horvitz rendered invaluable aid in planning the sampling technique and the weighting procedure. Mr. R.D. Tompkin gave freely of his time in proofing of the final draft and in attention to the many details that arose during my absence. I take this opportunity to sincerely thank all three of them.

Last, but by far not the least, I want to express my appreciation to my wife, not only for her constant cheerful encouragement but also for the scores of hours of clerical work which she contributed to this study.
APPENDIX
### Multiple regression analysis for year before loan

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<th>Gross Income</th>
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Multiple regression analysis for year after loan

\[ N = 78 \quad \bar{X}_1 = 1.18465 \quad \bar{X}_2 = 3.08358 \quad \bar{X}_3 = 3.23142 \quad \bar{X}_4 = 1.32994 \quad \bar{Y} = 3.08014 \]

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<th>Gross income</th>
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Multiple regression analysis for 1949

\[ N = 108 \quad \bar{X}_1 = 1.23335 \quad \bar{X}_2 = 4.00611 \quad \bar{X}_3 = 3.51535 \quad \bar{X}_4 = 1.32754 \quad \bar{Y} = 3.29986 \]

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Regression procedure from simple correlation coefficients to regression equations for year before loan

\[
\begin{array}{ccccccc}
K_1 & .1992K_2 & .0916K_3 & -.0312K_4 & 1 & 0 & 0 & 0 \\
.1992K_2 & .2352K_3 & -.0575K_4 & 0 & 1 & 0 & 0 \\
.0916K_3 & .2352K_2 & .1612K_4 & 0 & 0 & 1 & 0 \\
-.0312K_4 & -.0575K_2 & .1612K_3 & 0 & 0 & 0 & 1 \\
\end{array}
\]

This leads to:

\[
\begin{align*}
K_1 & = 1.0406 - .1815 - .0577 + .0313 \\
K_2 & = - .1815 + 1.1002 - .2563 + .0992 \\
K_3 & = - .0577 - .2563 + 1.0974 - .1935 \\
K_4 & = .0313 - .0993 - .1935 + 1.0379 \\
\end{align*}
\]

\[
\begin{align*}
B_{y1.234} & = -.07187 & R^2 & = .26620 \\
B_{y2.134} & = .26577 & R & = .53498 \\
B_{y3.124} & = .41705 & V & = \frac{1 - R^2}{N - M} = .01467 \\
B_{y4.123} & = -.06085 & V_1 & = VK_{11} = .01547 \\
V_2 & = VK_{22} = .01537 \\
V_3 & = VK_{33} = .01632 \\
V_4 & = VK_{44} = .01543 \\
\end{align*}
\]

\[
\begin{align*}
s_1 & = .12438 & t_1 & = -.57822 \\
s_2 & = .12795 & t_2 & = 2.07714* \text{ (significant at 5\% level)} \\
s_3 & = .12775 & t_3 & = 3.26458** \text{ (significant at 1\% level)} \\
s_4 & = .12422 & t_4 & = -.40935 \\
\end{align*}
\]

\[
E = 1.41834 - .155X_1 + .300X_2 + .287X_3 + .171X_4
\]

\[
Y = 26.202X_1 + .5X_2 + .297X_3 + .171X_4
\]
Regression procedure from simple correlation coefficients to regression equations for year after loan

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<tr>
<th></th>
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</table>

\[
K_1 = 1.11404, \quad K_2 = 0.03917, \quad K_3 = -0.36515, \quad K_4 = 1.06366
\]

\[
E = -0.04076 - 0.3713X_1 + 0.28984X_2 + 0.4359X_3 + 0.5703X_4
\]

\[
Y = 0.9104X_1 + 0.29X_2 + 0.454X_3 + 0.57X_4
\]
Regression procedure from simple correlation coefficients
to regression equations for 1949

\[
\begin{align*}
K_1 &= .35659K_2 + .25591K_3 + .00647K_4 \\
K_2 &= .36559K_1 + .66581K_3 + .15547K_4 \\
K_3 &= .25591K_1 + .66581K_2 + .38356K_4 \\
K_4 &= .00647K_1 + .15547K_2 + .38356K_3
\end{align*}
\]

\[
K_1 = 1.15188 \quad K_2 = -1.37075 \quad K_3 = -0.7892 \quad K_4 = -0.8046
\]

\[
R^2 = 0.59326 \quad R = 0.77023
\]

\[
\begin{align*}
E &= .36328X_1 + .27305X_2 + .38289X_3 + 1.002X_4 - 1.42013 \\
Y &= .038X_1 + X_2 + X_3 + X_4
\end{align*}
\]
### APPENDIX B SCHEDULE I

**Former Clients in Other Occupations**

<p>| | |</p>
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<tbody>
<tr>
<td><strong>1. Name</strong></td>
<td><strong>Address</strong></td>
</tr>
<tr>
<td><strong>2. Present occupation</strong></td>
<td><strong>Date you quit farming</strong></td>
</tr>
<tr>
<td><strong>3. Other occupations since you quit farming are:</strong></td>
<td></td>
</tr>
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<tr>
<td><strong>4. Why did you quit farming?</strong></td>
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</tr>
<tr>
<td><strong>5. First FSA loan received</strong></td>
<td><strong>Amount $</strong></td>
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<tr>
<td><strong>6. What was the loan used for?</strong></td>
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<tr>
<td><strong>7. Total net worth when you applied for the loan? $</strong></td>
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</tr>
<tr>
<td><strong>8. Date you paid off your FSA loan</strong></td>
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<tr>
<td><strong>9. Size of farm at time of loan (Total acres) (Crop acres)</strong></td>
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</tr>
<tr>
<td><strong>10. Location of this farm</strong></td>
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</tr>
<tr>
<td><strong>11. If you were on a different farm at the time you quit farming</strong></td>
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</tr>
<tr>
<td><strong>12. What is your annual income from your present occupation? $</strong></td>
<td></td>
</tr>
<tr>
<td><strong>13. What is your present net worth (all you own minus all you owe) $</strong></td>
<td></td>
</tr>
<tr>
<td><strong>14. What was your net worth at the time you quit farming? $</strong></td>
<td></td>
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</tbody>
</table>
SCHEDULE II
Family Living Factors

1. Name __________________________ Enumerator __________________________
2. Present address: Post Office __________________ County __________________
3. Loan: Amount ______, Year granted ______, Year repaid ______
4. Number of moves since loan was made ______
5. Present residence (Check one) Farm: Q.C. Non-Farm: Town/City __________________
6. Farm: Present size ______ Quality ______ Size at time of loan ______
7. Previous occupation (other than farming) __________________
8. Family roster: Members of family and household

<table>
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<tr>
<th>Line</th>
<th>First Name</th>
<th>Head</th>
<th>Sex</th>
<th>Age in school</th>
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9. Farm and home conveniences (Check) NOW OF LOAN NOW LOAN
   Electricity in house ______ ______ Tractor ______
   Electricity in other buildings ______ ______ Automobile ______
   Running water in the house ______ ______ Telephone ______
   Kitchen sink with drain ______ ______ Radio ______
   Piped hot and cold water in house ______ ______ Elec. Washer ______
   Bath room with standard fixtures ______ ______ Elec. Iron ______
   Home on all weather surfaced road ______ ______ Elec. Refrig. ______
   Weekly newspaper (Name) ______ ______ Deep freeze ______
   Daily newspaper (Name) ______ ______ Use of Locker ______
   Farm magazine (Name) ______ ______ Pressure Cooker ______
   Kind of stove (kind) ______ ______ Vacuum cleaner ______
   Sewing machine (kind) ______ ______ Furnace ______

10. Membership of parents in organizations:

   Farm Organization (Name) ______ NOW ______ AT TIME OF LOAN ______
   Cooperative (Name) ______
   Church ______
   Home Bureau study group ______
   Other (Local offices held, e.g. School, AAA) ______

11. List family members ever belonging to 4H Club (Question 8, Line No.) ______
12. Contacts with Organization personnel:

<table>
<thead>
<tr>
<th>Person</th>
<th>Visited During the Past Year</th>
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<tr>
<td></td>
<td>In Our Home</td>
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<tr>
<td>School Teacher</td>
<td></td>
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<tr>
<td>Minister</td>
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<tr>
<td>Co. Ext. Director</td>
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<tr>
<td>Co. Home Econ.</td>
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<tr>
<td>Farm Bureau Rep.</td>
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<tr>
<td>AAA Committeeman</td>
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</table>

13. Have you received any I.S.C. bulletins during the past 12 months. Specify.
   For the Farm
   For the Home

14. What is your favorite radio program (and station):
   Farm information
   Home information
   Entertainment

15. Do you feel at home in this community?

16. What is the best community resource?

17. What is the greatest community need?

18. Has your FSA loan helped or hindered your community life? Explain.

19. To whom are you most likely to go for advice?
   On Farming
   On Home Making
   Children's Problems
   Community Affairs

20. Would you prefer to have your children stay in farming or move to town?

21. Do you consider this an adequate home in terms of
   1. Housing
   2. Care of home and premises
   3. Family relationships
111.

SCHEDULE III
Former Clients Still Farming

1. Name __________________________ Address __________________________

2. Legal description of present farm __________________________

3. Years farming experience ______ As operator __________________________

4. Total acres in present farm ____ Crop acres in farm ___________
   Of these you own ______ How many crop acres ___________
   (Acres)
   When did you buy the land ______ Price paid per acre $ ______
   Kind of soil on farm __________________________
   Slope and erosion on farm __________________________

5. If you have moved since you first applied for an FSA operating loan:
   Legal description of original farm __________________________
   How many total acres was it ____ How many crop acres ______
   Was it a better or worse farm than the one you are now on ______
   Explain __________________________

6. Rental agreement at time loan was granted __________________________

7. What rental agreement now __________________________

8. Months of labor per year:
   During last year before loan: Family labor (Mos.) ______
   Mos. hired labor ______ When ______
   Amount of labor during 1948: Family labor (Mos.) ______
   Mos. hired labor ______ When ______

9. Off-farm work last year before loan Off-farm Work in 1948
   (Kind of Work) $ (Income) (Kind of Work) $ (Income)
   __________________________ __________________________
   __________________________ __________________________
   __________________________ __________________________

10. Amount of FSA operating loan $ ______ Date you received it ______

11. What was the original FSA loan used for:
   Use ___________________________________ Amount $ ______
   __________________________
   __________________________
   __________________________
SCHEDULE III (Continued)

12. Did you receive any supplemental loans?

(Date) $(Amount) (Uses)

---

13. When did you pay off your FSA loan

Were you refinanced by another agency _____ Which one ______

How much FSA loan was refinanced

---

14. At the time the FSA loan was applied for:

What was the value of everything you owned $_____

How much did you owe $_____ This was adjusted to $_____

15. What was your net worth when you retired your FSA loan $_____

16. Your present net worth:

The value of everything you own $____ less what you owe $_____

equals your present net worth of $_____

If land is included in above, what have you valued the land at?

$_____

17. Were you satisfied with the FSA program as it applied to you ______

18. What suggestions do you have for improving the FSA operating loan program in Iowa

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SCHEDULE IV
Management Practices

1. Are pigs raised on pasture. Yes ___ No ___ Kind of pasture ____________

2. How many years since hogs were on this pasture __________________________

3. Do young pigs have access to old lots. Yes ___ No ___

4. Do you feed your hogs a balanced ration. Yes ___ No ___
   What is the ration __________________________
   How many pounds protein per pig is this __________________________

5. On the ration you use how much corn and other grain does it take to produce a hog weighing 225 pounds.
   How much between 75 and 150 lbs. __________________________
   How much between 150 and 225 lbs. __________________________

6. At present costs, how much does it cost you to produce a 225 lb. hog?

7. As an average over time, in what months of the year do you think the price of market hogs is lowest _________ Highest _________

8. How many sows did you spring farrow in 1948 _________ in 1949 _________

9. What ration do you feed your sows the month before farrowing _________

10. How many spring pigs did you wean in 1948 _________ in 1949 _________

11. What crop rotation do you use _________ Before loan _________
    Reasons for using this rotation rather than another _________

12. Are the following custom machines easily available in your community:
    Combine _____, Baler _____, Chopper _____, Corn picker _____

13. Do you use pure bred sires _________ Why not _________

14. Do you use artificial insemination on cows _________ Why not _________

15. Size of buildings:
    Barn _________ (Dimensions) _________ Hog house _________ (Dimensions)
    Crib _________ _________ Silo (tons) _________ Hen house _________ _________
    (Dimensions) _________ Cattle shed _________ _________

16. Check the following practices which you use on your farm. If you do not use a practice listed below please indicate why you do not.
    Grass waterways _________ (Reason for not using)
    Contour farming _________ __________________________
    Strip cropping _________ __________________________
    Terracing _________ __________________________
    Gully control _________ __________________________
    Legumes with all small grain _________ __________________________
    Fertilizer _________ __________________________
    Lime _________ __________________________
    Green manure _________ __________________________
    Plant across slope _________ __________________________
    Listing corn _________ __________________________
### SCHEDULE V

**Gross Income and Capital Information**

During 1948 how much of the following did you:

<table>
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<tr>
<th>Have on hand Jan. 1</th>
<th>Sell</th>
<th>Use</th>
<th>Feed</th>
<th>HH</th>
<th>Use</th>
<th>Have on hand Dec. 31</th>
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<td>Cattle</td>
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<td>Hogs</td>
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<td>Oats (1948 acres)</td>
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<td>Hay (1948 acres)</td>
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<td>Wheat (1948 acres)</td>
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<td>Rye (1948 acres)</td>
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<td>Other</td>
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**Have on hand Dec. 31 (Size, make, year new, cond.) Buy or Sell**

Tractor

General Mach.

Corn machinery

Small grain mach.

Hay machinery

Transportation mach.

Misc. Equipment, Value $ ___________

Av. # cows milked in 1948 _____ breed _____ Lbs. cream sold _____ Used/HH
Av. # cows milked before loan _____ breed _____ Lbs. cream sold _____ Used/HH
Av. # laying hens in 1948 _____ Daz. eggs sold _____ Used in household
Av. # laying hens before loan _____ Daz. eggs sold _____ Used in House
Value garden & orchard prod. used in HH-1948 _____ Yr. before loan
Value products sold during year before loan (crops) (cattle) (hogs) (other)
Value products used in Household during year before loan