

A STUDY OF FARM LAND INVENTORY VALUES FOR ACCOUNTING
PURPOSES IN GARFIELD COUNTY, OKLAHOMA
1929-1950

By

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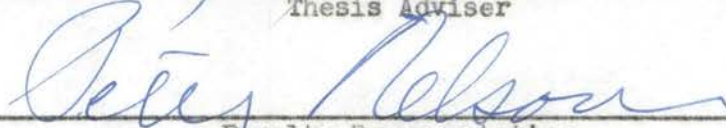
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CHAPTER I

INTRODUCTION

The effects of the procedures used for farm accounting can well determine the difference between good or poor farm management decisions. This fact is sometimes overlooked by both farmers and farm management research workers in making use of farm accounts and records. Perhaps some of the weakness results from lack of a complete comprehension of the real meaning of successful farm management. Dr. George A. Ford has given a very good review of the definition as follows:

.....farm management as a subject of research, teaching, or practice deals with the economic organization and operation of individual farm units. It represents the private entrepreneurial aspect of the economic problems of agriculture as distinguished from the social or group aspects covered in other fields of agricultural economics. It deals with the problems of the individual farmer in his efforts to maximize his earnings under the economic conditions which confront him. It does not deal with the efforts of farmers as a group, or of the planning and policy-making activities of public agencies assigned to alter these conditions. Those activities fall within the general field of agricultural economics.

The reports of the Committee on Definitions of Terms in Farm Management of the American Farm Economic Association show an almost unanimous acceptance, in their poll of farm management workers in federal, state, and private agencies, of the old accepted concept of the field of farm management. Such dissent as was brought out represented largely a quibbling over the exact form of expression. The definition finally presented in the committee report contains an addition which is new and was not expressed or implied in the previously approved definitions. It reads as follows:

"Farm management is the science of the organization and operation of farms. It considers the effectiveness of different sizes of operating units and of expenditures or productive resources, enterprises, and practices for the operating units; programs of adjustment for agricultural areas; and the impact of public policies and programs on economic activities on farms."

The last two clauses seem to broaden the concept of farm management to include the group of social economic aspects previously assumed to be in the broader field of agricultural economics.¹

With a knowledge of the principles and objectives of farm management, one is better able to establish a successful farm business. One of the most useful tools in successful farm management work is the farm record or account. If it is to aid the farmer in making decisions that will obtain greater profits from his operations, it must be completed and maintained with a reasonable degree of accuracy. High returns and efficient management depend largely on the use of a good set of records. Properly kept and used, they will supply him with facts to aid in improving efficiency of production. They should tell him where he stands financially at a given time as well as permit him to determine his progress from year to year. They can be used to point out weak spots in the farm organization and management so steps can be taken to improve or correct them; otherwise, serious inefficiencies may not be detected and remedied before great losses have occurred. No doubt one of the greatest functions is to aid in making decisions from year to year concerning the organization and operation of the farm business. There are many alternatives to which a farmer can devote his time and money. Records of past and present performance aid in choosing between these alternatives.

The annual inventory is of considerable importance. It can be used to compare succeeding years to get an idea of farming progress; a comparison of inventories will show the growth of capital among the

¹George A. Pond, "Objectives of Research in the Farm Management Field." Papers Presented at Farm Management Statistical Clinic, University of Illinois, September, 1941. Mimeographed Report: AE-1837, March, 1942. Agricultural Experiment Station, Department of Agricultural Economics, University of Illinois, Urbana, Illinois, p. 45.

various types of property; it will show how much of the capital is in the various factors of production; and it is important in fixing or determining yearly cost to the factors of production in arriving at labor and management income or the per cent rate of return on capital.

The farm operator is normally interested in the farm operation from the standpoint of making a living and receiving the maximum return for his labor and management; therefore, it is essential that he first meet the costs of the various factors of production. In the business of farming many of the costs which the farmer must meet are determined by the nature of the operation regardless of what the farm income is. It is after these costs of production are met that the farm operator has income left from the farm as the residual value for his year's earnings as a farm laborer and manager. It is generally conceded that there must be a normal return to the factors of production to hold them in the business. What these normal returns are to be is fairly well determined by the competitive costs of the region, and they must be calculated with a reasonable degree of accuracy if a farmer is to know whether his management is really paying.

The problem that presents itself in this study is to determine the method of arriving at the normal return for land from the operator's point of view. Since land is one of the largest single factors that make up the capital investment of most farm businesses, the amount of return to land resulting from the accounting procedure can well make the difference between successful and unsuccessful farm management. An error showing too high a return to land will tend to influence the farm manager to over-capitalize in land with a resulting under-employment of labor, whereas too low a return will tend toward the

opposite. Therefore, successful farm management may well rest upon the accounting procedure used in determining the return to land.

Whenever a farmer begins a new year of farming operations, he has a conceived cost of what he is to pay for the factors of production, and by weighing the results of uncertainties he attempts to organize his business operations to meet these costs and still leave a residual from the gross farm income for his labor and management.

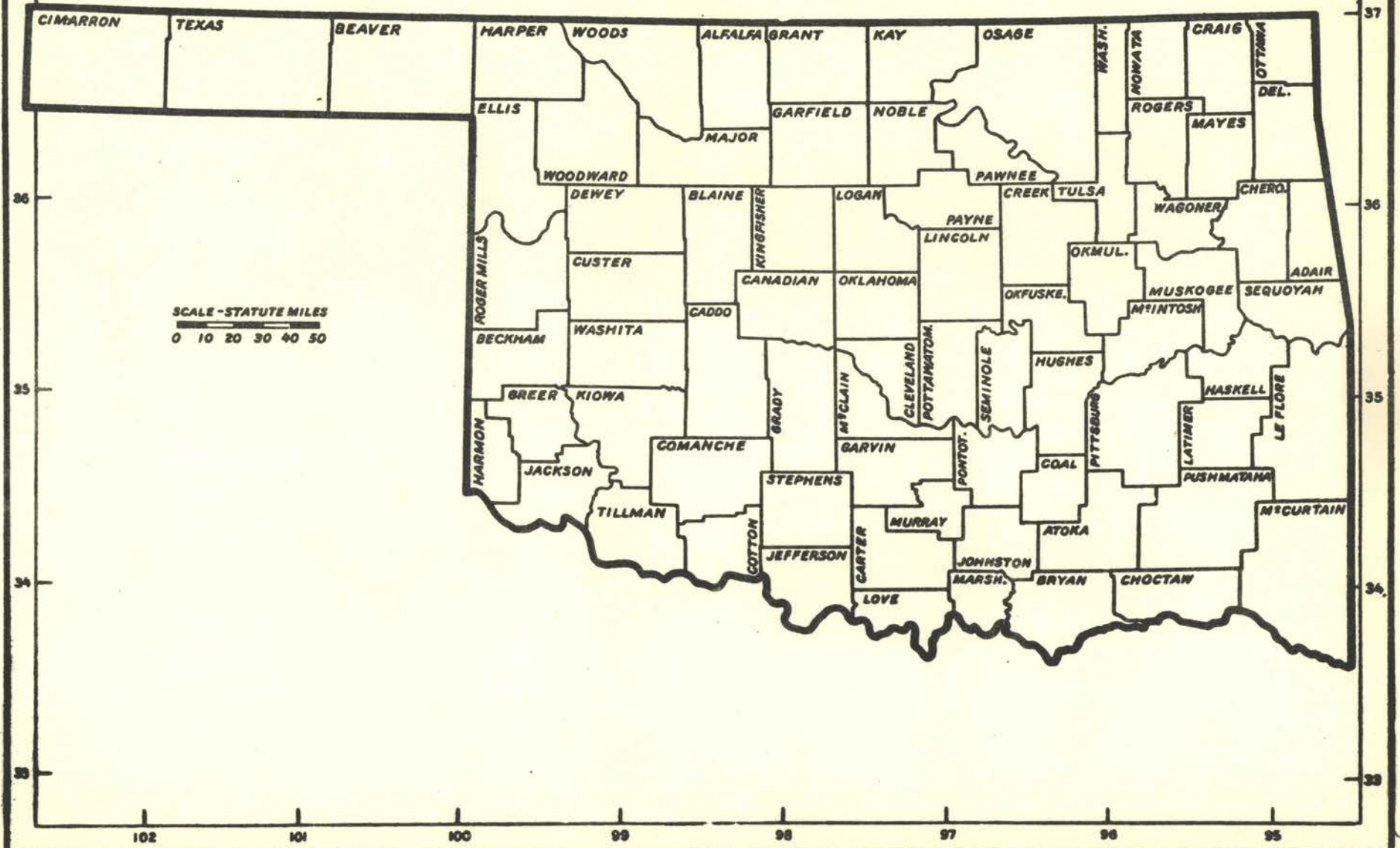
Because of the controversial methods outlined by different farm management workers for evaluating land for accounting purposes and determining returns as a basis for management decisions, this study was conducted to analyze the effect of land inventory values on land costs and net returns of a group of accounting farms.

The data for this analysis were provided by 162 different Garfield county farms with a total of 912 completed yearly farm account records through the period 1929-50. These data have been gathered yearly through this period by the Department of Agricultural Economics of the Oklahoma Agricultural Experiment Station. Data from individual farm account books have been summarized and kept on file for study and research as needs arise.

Garfield county (Figure I) is located in the north central portion of Oklahoma.

The labor and management income left after meeting all other farming costs is used as one of the indicators of management success. However, one must bear in mind that the major objective of farm management is to secure the greatest continuous profit. In order to measure farm management success it is essential that the land resources remain as productive at the end of the year as at the beginning. With this in mind the purpose set forth in the following chapters is to demonstrate

Figure I. Map of Oklahoma



a suggested procedure for determining land cost in farm accounting as an intermediate step in arriving at labor and management income. No attempt was made by the writer to analyze labor and management income except for the purposes of discussion to support the contention of this thesis.

CHAPTER II

REVIEW OF LITERATURE

Purpose of the Inventory and Farm Accounts

Every farmer should know within reasonably close limits the amount of profit his efforts are yielding. He should also know with some degree of accuracy the amount of capital which he is employing in his farming business, how it is represented by net assets, and whether or not his profit result constitutes a proper return from the use of that capital. Farming, like any other business enterprise, must be efficient if it is to be successful, and this is only possible where the farmer knows with some degree of accuracy the elements of strength or weakness in the management of his farm.¹ This is made possible by keeping farm records or accounts. These are simply another farm tool which should be maintained, completed, and used for the same purpose that any other item of farm equipment is used on the farm; to aid the farmer in obtaining greater profits or making larger savings in the operation of his business. A farm record which does not serve this purpose is of little value.²

The first step in beginning to keep records is to go over the business thoroughly and prepare an inventory, which is a list of all that a farmer owns and all that he owes, established at a specific

¹F. Sewell Gray and C. V. Dawe, Farm Accounts (Oxford, 1948), p. 1.

²J. Norman Efferson, Farm Records and Accounts (New York, 1949), p. 1.

given time, showing the value of each item.³ It is the complete financial statement of the farmer, and the first fact any farmer needs to know is his financial status at the beginning and ending of each year.⁴

A very important object of taking an inventory is to discover the worth of each particular type of resource or asset which is essential for successful farm record analysis. An asset may be defined as anything of value possessed by the business or any claim to values in the possession of others.⁵

The converse of an asset is a liability, which may be defined as a claim which some person outside the business has against it or the operator. The net worth, or capital of the business, may be found by subtracting total liabilities from the total resources or assets. It expresses the farmer's equity or ownership in the business, and its growth is a direct measure of the growth of his investment.⁶

The net worth figure also indicates the solvency of the business. When the total liabilities are not covered by the total assets or resources, the business is said to be insolvent or bankrupt. The size of the net worth figure thus affords, in a way, a measure of the distance from insolvency.⁷ In the analysis of the farm records it is wise to make a comparison of the total assets with the operator's equity in the business, or the net worth. The net worth of the farmer in the business should be large enough in comparison to the total resources so that sudden price declines will not destroy his ownership of the business.⁸

³John A. Hopkins and Earl O. Heady, Farm Records (Ames, Iowa, 1951), p. v-vi.

⁴Efferson, Farm Records and Accounts. p. 36.

⁵Hopkins and Heady, Farm Records. p. 55.

⁶Ibid., p. 55.

⁷Ibid., p. 55.

⁸Efferson, Farm Records and Accounts. p. 58-59.

A farmer may also wish to make comparative financial statements, which are statements showing the resources, liabilities, and net worth of a business for two or more years. By means of such statements, the farm operator can observe the trends taken by each classification of assets and liabilities. If certain trends are in an unfavorable direction, positive action can often be taken before investment relationships get too far out of line. If a farmer knows what these relationships should be for his size and type of farm, he is thus enabled to work more effectively than he otherwise could for a well balanced farm investment.⁹

There are several stages to which one may go in keeping farm records. The simplest form of records is the inventory taken once a year, usually on corresponding dates.¹⁰ The farm inventory is the cornerstone for all other farm records. For the time spent, the inventory is perhaps the most valuable record for use in planning and managing the farm business, even though many others, more detailed and complex are kept. It is a record that should be assembled and used on every farm. It is the basis for all other accounting work and must be kept and summarized before any other kind of record can be made useful.¹¹

Some of the functions of the farm inventory can be briefly summarized as follows:

1. To establish a basis for determining net worth at recurrent periods, thus reflecting increases or decreases in net worth.
2. To determine the distribution of capital, that is, the amount of money tied up in each type of asset.

⁹Ibid., p. 110.

¹⁰Hopkins and Heady, Farm Records. p. 6.

¹¹Efferson, Farm Records and Accounts. p. 36.

3. To serve as a basis for calculating depreciation and interest charges on the investment.¹²

At the end of the year or accounting period, the financial information needed to complete the basic records is the ending inventory. So after closing the farming year, the operator must again turn his attention to the business of valuation. The ending inventory will be done in the same way as was the beginning inventory.¹³ The same care and attention should be given the ending inventory as to the beginning one, making sure the values are in line and no omissions have been made.¹⁴

A succession of inventories over a period of years will show a farmer whether his net worth is increasing or decreasing, but they will not tell him what his farming returns have been. Such questions, which are vital to management, must be answered by a more complete accounting system. If we are to accept as an objective of farm accounting the securing of sufficient data to measure the success of the farm operator through a net income figure, and to demonstrate to management the strength and weakness of present methods, the inventory record alone is not adequate.¹⁵ Financial records taken in conjunction with inventories can be combined with the inventories in developing operating ratios or efficiency factors, and on the basis of these records, the general budget or plan of operation will be modified to increase returns in the coming year.¹⁶ This analysis should serve as a means of determining the strong and weak points of the farm business and indicate ways of improving the weak points in order to obtain higher net earnings in the

¹²Donald R. Mitchell, Farm Accounting (New York, 1941), p. 12.

¹³Bray and Dawe, Farm Accounts. p. 28.

¹⁴Hefferson, Farm Records and Accounts. p. 256-257.

¹⁵Mitchell, Farm Accounting, p. 12.

¹⁶Hopkins and Heady, Farm Records. p. 8.

future.¹⁷ A well-developed farm plan, or budget, combined with complete and accurate farm records and used with good judgment, will aid the farmer in adjusting his farm business more accurately and rapidly to meet changing economic conditions, and it will assist in the more efficient management of the farming enterprise. A farm budget or plan, making use of the best information obtainable, will help to prevent many mistakes before they occur and will aid in bringing about the maximum income possible with the given resources of the farm.¹⁸

Methods of Valuation of Farm Land

Accurate valuations are not always easy, but are necessary if one is to determine financial progress and calculate charges to the factors of production. In establishing values for most types of farm property, absolute accuracy is practically impossible, and it may be useless to attempt to achieve it in the farm inventory, but this is no excuse for careless work. To determine a reasonable degree of accuracy in a farm inventory requires great care to come within the limits of accuracy necessary for farm accounting purposes.¹⁹

The major reasons for establishing values are for accounting purposes, basis for obtaining loans, taxation purposes, the adjustment and settling of estates, and for condemnation proceedings. For the farm inventory the object is to establish all values as to give the most accurate picture of the true values of each item at that particular time. If the object of the farm inventory is to show the true net worth of the business and the changes in net worth from year to year,

¹⁷Efferson, Farm Records and Accounts. p. 112.

¹⁸Ibid., p. 144-145.

¹⁹Ibid., p. 46.

an inaccurate valuation in the inventory at either the beginning or the end of the year will distort the picture and result in misleading conclusions.²⁰

It is likely that the value for different types of property may be arrived at by different methods. In the following discussion are listed some of the most common methods used for establishing land values with some advantages and disadvantages of each method as pointed out by different workers in farm accounting.

1. Valuation at cost. Farm values often are placed according to the original cost of the article. This means entering in the inventory the amount that was invested in the asset when it was acquired. Under this method the inventories will show the total of sums actually put into the business.²¹ The application of this principle of valuation makes the farm accounts essentially a record of historical costs. This is justified on the belief that the individual farm operator is interested in the costs actually incurred and the relationship between such costs and the incomes realized from his farm operations.²²

An objection to this is that information on original investment ceases to be useful or significant after the business has been in operation for some time. The information in the records should be useful as far as possible in current management, and the facts of original investment afford no guide to business decisions after conditions have changed. The records should show the true net worth of the business at the present time. If original cost is used as a basis of valuation, the figures will seldom conform to the true net worth. If a farmer bought a farm thirty

²⁰Ibid., p. 46.

²¹Hopkins and Heady, Farm Records, p. 69.

²²Mitchell, Farm Accounting, p. 14.

years ago at a price of \$20 per acre, and surrounding farms of comparable value are now selling for \$125 per acre, the original cost becomes absurd as a basis of present net worth.²³

2. Valuation at cost or market price, whichever is lower. Many business concerns inventory their resources at cost or market price, whichever is lower. For this method can be claimed the virtue of conservatism, and it is perhaps the most conservative of all approaches to the inventory values, but often serves to understate many values and gives a distorted picture of the true value of resources.²⁴ If an asset were purchased under inflated prices, cost will not represent present worth. To find true net worth it would be necessary to write down the valuation from cost to what could actually be obtained if the asset were offered for sale. This would be represented by market price at the present time. On the other hand, market price sometimes represents too optimistic a valuation. If it exceeds the original cost, the latter figure is used to avoid the danger of overstating the net worth.²⁵

Further objection to this method is that values can be understated as well as overstated. In the case of the farm mentioned above, valuation at the original cost would be unreasonable as a basis for present net worth, although the original cost would be the lower of current market price or original cost. The lower of market value or original cost is, after all, a purely arbitrary method. It contributes to a degree of financial safety, but at the expense of distorting the facts in many cases. The degree of conservatism differs inversely with the need for it. When prices are rising, there is least need for conservatism, but

²³Hopkins and Heady, Farm Records. p. 69.

²⁴Efferson, Farm Records and Accounts. p. 47.

²⁵Hopkins and Heady, Farm Records. p. 70.

when prices are falling, market price may be the lower of the two. Here an even greater degree of conservatism may be needed.²⁶

In preparing an inventory that will be of the most value to the farmer, there appears to be little justification for this method in establishing values for any type of farm property.²⁷

3. Valuation based on capitalized earnings. This means establishing values according to capitalized earnings of the farm over a period of time.²⁸ This is based on the theory that the purchase of an asset is in reality the purchase of future income. A farmer purchases an asset because he expects to realize a certain income from it over its useful life. Its value to him is contingent upon the probable amount of future income.²⁹ Some people refer to this method as the "true" value or "real" value of land, meaning some value based on its "true earning power". This means a value based on the assumption that a particular net income is the true net income. This may mean a net income at the time, or instead the net incomes of some past period conceived as normal. It should be apparent that ordinarily there is little merit in assuming the current earning power or any past earning power to be the true earning power. Even if one chooses some period as normal and bases his valuations upon it, series of years of unusually high or low earnings would develop from time to time. Even though these are only temporary, they do affect the current value of the land.³⁰

How sound are values placed on assets by the capitalization method? Does this method when applied to resources of variable and

²⁶Ibid., p. 70.

²⁷Efferson, Farm Records and Accounts. p. 47-48.

²⁸Ibid., p. 48.

²⁹Mitchell, Farm Accounting. p. 15.

³⁰John D. Black, et al., Farm Management (New York, 1947), p. 738-739.

uncertain income as land provide a dependable and objective valuation, or does it merely provide a means of rationalizing the market price and perhaps testing the closeness of fit of present market prices to present net income and present interest rates?³¹ The values obtained by this method depend on the rate of interest selected and the amount of the average earnings, both of which are unknown. It would be practically impossible to determine the future contribution to net income of particular assets. Even if done, what assurance would there be that the income so determined would remain a constant throughout the life of the asset? Such assurance would presuppose a knowledge of future costs and prices that we do not have. Finally, what assurance have we that the interest rate chosen would remain constant?³²

The fact that land, long term bonds, industrial stocks, and so on, do sell for fairly definite prices at any given time indicates that farmers and other business men do form fairly consistent judgments about future incomes and future interest rates. But the fact that prices of such income series vary widely from time to time should cause farmers to take such judgments with a great deal of reserve.³³ Because of the difficulty in obtaining reliable average earnings on the farms and because of the fluctuations in interest rates from year to year, in general this method is not desirable for establishing values for farm inventory purposes. Small errors in the estimated income or the interest rate will result in large errors in the established land value. As a result, this method is satisfactory as a

³¹Hopkins and Heady, Farm Records. p. 74.

³²Mitchell, Farm Accounting. p. 15.

³³Hopkins and Heady, Farm Records. p. 74.

check on some other established value but not as an original method to determine the absolute price.³⁴

4. Valuation according to market price. A fourth possible basis for valuation of land is the available market price. This is the price that could be obtained for the land if marketed, less the cost of marketing. This value has the merit of conforming most closely to the present worth, and permits the use of judgment in valuation much more than either of the methods just described.³⁵ A fair market price implies that there was a willing buyer and a willing seller.³⁶

The value of inventories may change during the accounting period due to fluctuations in the price level and land values. Price changes give rise to many complexities in the evaluation of inventories, but changes in certain items must be considered if accounts are to be of use in analyzing management efficiency.³⁷

This method has been criticized by some writers in that it would involve a succession of reappraisals with changing prices. This would result in gains and losses due to reappraisals affecting income. Inasmuch as such gains or losses are not due to production management, and may in fact hide the results of good or poor management, this method of valuation will tend to destroy the purpose of the record itself.³⁸ As logical as this may seem it does not present an insurmountable problem as will be noted in a later discussion.

The valuation of an individual farm is a problem involving a certain amount of judgment as well as all known facts, because land

³⁴ Efferson, Farm Records and Accounts. p. 48.

³⁵ Hopkins and Heady, Farm Records. p. 70.

³⁶ Efferson, Farm Records and Accounts. p. 47.

³⁷ Hopkins and Heady, Farm Records. p. 57.

³⁸ Mitchell, Farm Accounting. p. 14-15.

appraisal is not an exact science.³⁹ But there is only one value, and that is the market value. The price at which the farm would sell if it were placed on the market and sold under ordinary conditions is the value which the census enumerator undertakes to obtain when he visits each farm in the United States every five years; it is the value wanted when an estate is settled, or by an insurance company when it is selling farms acquired through foreclosure; or that a farmer wants when he is preparing an inventory.⁴⁰

Given this purpose, the objective is to find out what farms just like this one are selling for at the time in the area. The usual procedure for this is to rely upon the judgment of those who are most closely in touch with the farm real-estate market — the bankers, the real-estate brokers, and the like. The reasoning which these persons follow is simple and much like the following: Fred Wagner's farm sold for \$110 per acre last fall, George Ward's for \$130 per acre. Your farm has better cropland and a bit more than the Wagner's farm, but it is not quite as good as the Ward farm. Its value therefore ought to be around \$125 per acre.⁴¹

This method has been referred to as the "experienced guess".⁴² A well attended farm auction is a good place to observe the current prices for farm land. Other sources of information on market values include the daily papers, and state and U.S.D.A. publications.⁴³

The "experienced guess" on market value can be further refined by collecting data on selling prices and on the major facts about a

³⁹Efferson, Farm Records and Accounts. p. 49.

⁴⁰Black, et al, Farm Management. p. 744.

⁴¹Ibid., p. 744.

⁴²Ibid., p. 744.

⁴³Efferson, Farm Records and Accounts. p. 47.

considerable number of farms sold in the area within the past few years. These data may show the differences in yields of the farms sold, in the percentage of land which is tillable, in the value of buildings per acre, in the type of road upon which the farms are located, in the distance of the farms from town, and other factors that may be important. These factors need to be considered in establishing the value of the farm. Individual farmers are unable to engage in this type of analysis, but agricultural experiment stations may do so.⁴⁴

Even this careful procedure may not establish the true market value of the farm,⁴⁵ but it approaches the best value available for current accounting purposes if true net worth is of the essence.

Farm real-estate values are not based upon the expectations of any one person, but instead on the expectations of all those who have enough interest in the subject that they can be said to be in the real-estate market. The expectations of these different persons are ordinarily spread over a wide range, and those who are potential buyers have a range of expectations that fits into a schedule much like the demand schedule for commodities. Those who are potential sellers have a range or schedule much like the conventional supply schedule for commodities. At the point where these two schedules intersect, the prevailing level of land values is established. This market value of farm land represents a certain level of expectations. This level fluctuates greatly in periods such as those through which we have been passing in the last two or three decades. It does reflect the earnings of the land, but only because these earnings affect expectations.⁴⁶

⁴⁴Black, et al, Farm Management. p. 744-745.

⁴⁵Ibid., p. 745.

⁴⁶Ibid., p. 743.

Current and expected incomes from land do not wholly account for land prices in all cases. Particular pieces of land may have values to certain persons because of sentimental or other reasons. A man might pay more for the farm on which he was reared than would a purely disinterested person. Sometimes a rapid rise occurs in prices of farm products. When people realize what effect these changed prices may have on rents, we are likely to have a land boom. Prospective buyers bid up the land prices in attempting to obtain some of the profits from the higher rents. Consequently, land sometimes has an element of speculative value.⁴⁷

The value placed upon farm land depends largely upon the purpose of the valuation or the use which it is to serve. Different from market value in many instances are loan value, assessed value, and insured value. This may differ because the laws of the country determine the basis on which loan values or assessed values are determined; or regulations of credit agencies; or of tax or insurance authorities; or the established practice or custom. One frequently hears reference to values for farm land as if there can be but one value and this can be determined. If there is any such value, it must be the market value, or the price at which the farm land would sell if placed upon the market.⁴⁸

An error in the valuation of an inventory may make the accounting results quite misleading, therefore valuation of the assets is one of the most important and perplexing problems with which the accountant has to deal. An effort has been made to point out what seems to be sound and satisfactory principles with some advantages and disadvantages. As can be seen, there are various methods and theories of

⁴⁷Hopkins and Heady, Farm Records. p. 79-80.

⁴⁸Black, et al, Farm Management. p. 736.

valuation, but considering the nature of the problem, the best we can do here is to present a brief description of relatively simple procedures which can generally be depended on to yield results which are satisfactory for practical purposes. This means that the valuations must be as accurate and basically sound as the nature of the case permits, and that they must not result in misinformation which could lead to unsound business decisions.⁴⁹

Views of Different Writers as Related to Land Inventories

The type of information presented in the preceding section is of a very general nature, and the writers quoted presented essentially similar views on the subjects discussed. There is considerable disagreement, however, as to the proper value at which to inventory farm land. It is not uncommon for an author to state in one section of his book "that an accurate inventory value is essential to establish a true net worth of the business", as presented in the preceding sections, but when it comes to the valuation of land suggest a different value which may greatly distort the net worth figure. It is well to review the method of land inventory valuation as suggested by different writers, and appraise the method most likely to create a true net worth figure on which the farmer can base his calculations of management efficiency.

Hofferson in his book "Farm Records and Accounts" has recommended:

For accounting purposes, it is preferable to establish an original long-time value for the farm real estate and carry it at the same value from year to year in order to eliminate the accidental effect of changing real estate values on net worth and cost and returns from year to year. A farm is ordinarily a lifetime investment, and any paper profits or losses from temporary shifts in land values should not

⁴⁹Hopkins and Heady, Farm Records. p. 69.

confuse the record of that being earned or lost on the farm as an operating unit each year.⁵⁰

One may ask what is meant by establishing an original long time value. Would it be a value when the land was first purchased, or some other value? It is possible that this value may be absurd. Much of the land in this area was purchased for the price of three cents per acre when we made the Louisiana Purchase. That was an original long time value. Economists frequently maintain that land, unlike many types of farm property, was not produced by man and has no original cost of production, so we may need to look for something other than original cost to explain its value.⁵¹

If the inventory is to be used in showing the true net worth of the business at a given time, all assets and liabilities should be based on market price or value. Efferson has defended his view with the argument that changes in the value of the land inventory between the beginning and end of the year serve as a credit or receipt. True, the results of financial accounting will depend upon the manner in which inventories are valued and applied especially when prices are fluctuating.

Business profits may arise from two sources. They may arise from operating the business in the production process, or simply by holding fixed capital such as land while the market prices are swinging upward. Most farmers operate their farms in order to realize profits of the first sort.⁵² In farm accounting an attempt is made to keep receipts of the latter type out of the records insofar as possible. The reason is that receipts of this kind do not properly reflect efficiencies in

⁵⁰Farm Records and Accounts. p. 49.

⁵¹Hopkins and Heady, Farm Records. p. 79.

⁵²Ibid., p. 81.

production management, and may, in some instances, hide gross inefficiencies, thus defeating one of the fundamental purposes of the record itself.⁵³

If the value of fixed or working capital is varied upward with the price level between the beginning and closing inventory, part of the net income computed at the end of the accounting year may be purely a paper profit. This is true where the farmer has no expectations of selling his farm. The increase in inventory value of land within the year will act the same as a sale or credit if net income is computed on the inventory or accrual method. Net income will increase by a corresponding amount. Yet this profit is not available for withdrawal by the operator and may be offset by a decline in inventory values at a later time. In order to avoid this discrepancy, land values should be held constant between the beginning and closing inventories.⁵⁴

If the value of land is to be increased to correspond to the market value in order to arrive at the true net worth of the business, the change might well be made between the closing inventory of one year and the beginning inventory of the following year. The increase in inventory value can then be considered as a capital gain rather than as a credit attributable to the production process and normal operation of the business.⁵⁵

Other writers also follow somewhat the same general line of thinking as stated by Efferson. Two English writers, Dray and Dawe, on entering land values in the inventory section are quoted as:

.....asset values are matters which play a prominent part in the measurement of farming profits... The entries which are made in books

⁵³ Mitchell, Farm Accounting. p. 96.

⁵⁴ Hopkins and Heady, Farm Records. p. 81.

⁵⁵ Ibid., p. 82.

of accounts are mainly based on price in terms of cash or its equivalent at the time the transaction is entered into -- historical cost as it is sometimes called in the more technical language of accountants. As a result of this, accounting or book values such as those which find their way into the Private Ledger accounts, are generally restricted to the statement of items at cost or at modifications of cost. Accountants feel that if they record items at cost then there is less chance of elements of uncertainty in the form of mere opinion creeping into the statement of accounts. When it comes to attempting a reasonable measurement of profit we shall see that a great deal depends upon the consistency with which opening and closing farm valuations are kept on a "like" basis....

The first entries to be made in the Private Ledger must be related to a statement of the farmer's Net Worth -- that is, his proprietorship capital -- on the date he starts keeping more complete accounts, and this date should ordinarily coincide with the beginning of a farm accounting year. This means that the farmer must set about making an inventory of all his assets and liabilities at the beginning of his accounting year. It must include all his farming assets and all the liabilities which are related to his farming operations.

In compiling a statement of this type the first question which presents itself is concerned with the method to be adopted in arriving at the book values of the farm assets, bearing in mind the fact that accounting technique generally adopts "cost" as the starting-off point. Well, if the farmer is a freehold owner of his land it should not be too difficult to ascertain what he paid for it, treating the conveying costs as part of the purchase price. If by any chance the farmer has taken a long-term lease of the farm, the figure to bring in to the statement of Net Worth is the amount paid for the lease, multiplied by a fraction which may be conveniently represented in the form --

$$\frac{\text{unexpired portion of lease.}^{56}}{\text{original term of lease}}$$

Bray and Dawe are placing more emphasis upon historical costs of the factors of production than upon the need for computing costs and management efficiency factors as they exist under current conditions. It does not seem that the accounting system should warrant operating a modern farm with extremely high amounts of capital tied up in its operation under outmoded inventory costs which are unsatisfactory for placing operating cost, and furthermore give a distorted net worth value. Yet they recognize in the opening statement that asset values are matters which play a prominent part in the measurement of farming profits.

⁵⁶Farm Accounts. p. 9-12.

Mitchell has presented a modified version of land value inventories as to the original or historical costs as follows:

There are three basis for valuing land: (a) original cost, (b) present sales value, and (c) capitalized rent or income.

The original cost is the preferred base..... In some cases, where this value is badly out of line with present and probably future values of similar land, an adjustment should be made. Although such action would be a departure from the recording of historical costs, it seems justified on the basis that permanent appreciation or depreciation of long-lived assets should be recognized on the books. For example, land purchased prior to 1920 and entered on the books at cost would have to have its value adjusted downward in view of both present and probable future land prices.

In cases where the original cost is not known, or is not now a satisfactory figure, it may be possible to value land on the basis of the present sales value of similar land in the vicinity. This may be satisfactory, provided (1) that the basis for such an estimate is wide enough and (2) that the present value of land appears likely to bear a reasonable relationship to probable future values of land.

Undoubtedly, if we could but see into the future, the most accurate method of appraising land would be to capitalize the rent or income from it. This is because all value, in the last analysis, is based on earning power, actual or potential. Unfortunately, as has been discussed previously, the determination of such earning power depends on future costs and prices, information concerning which we do not have.

We are forced to the conclusion that none of these three possible basis of value is entirely satisfactory. Maybe in individual cases some weight should be given to each. It is suggested (1) that the value figure used be a conservative one and (2) that, when once entered on the books, it remain unchanged unless for a very good reason, such as a decided and apparently more or less permanent change in land values such as has occurred since 1920.⁵⁷

It is very likely that if Mitchell were writing his book in 1953 instead of in 1941, he may have taken a somewhat different view on the land value situation for inventory purposes. He has approached the idea of adopting current value for land inventories, but has left the door open for confusion. He has taken in a great range for land inventory values that may find their way into farm accounting books, depending largely upon the whims of the reader. He has been inconsistent as to

⁵⁷ Farm Accounting. p. 15-16.

which value to use. If a farmer is to follow this practice of land valuation, it is very doubtful whether his records will indicate his true net worth for any one year.

In Hopkins and Heady's recent book "Farm Records" a still further view of inventorying land values has been presented, and perhaps the most satisfactory one yet discussed in that it takes into account conditions of progress and gives a better basis for determining cost factors and management efficiency.

One function of the records is to show the true net worth of the business. If this is to be done, the land must be inventoried at a price at which it could be sold. There is always a danger in placing a price on anticipated changes in values. Sometimes the anticipated changes do not occur. If such valuations lead to overborrowing, they may have serious consequences. On the other hand, a policy of conservatism in valuation could hardly be of injury to the business. As a general policy, conservative market price should be used in arriving at the net worth figure.

A second function of the records is to show changes in the net worth. To do this the valuations of assets must be adjusted from time to time. This may at first seem to conflict with the last paragraph. There is no use in changing the valuations with every little flurry in the market, since much of the short-time variation is purely temporary. Practically, they could not be realized on anyhow.

The better policy, again, will be to adjust the valuations gradually, following somewhat behind the market where there is any uncertainty, so as to record only those changes which seem rather likely to remain. The general accounting policy is to err, if at all, on the side of conservatism. This policy is justified because it promotes business safety.⁵⁸

From this discussion the conflicts are quite evident among the various farm accounting writers as to which inventory value of land to use for farm accounting purposes. If the records are to be of any value under current conditions it is necessary to list assets at their true net worth. Hopkins and Heady have recognized the need for keeping land values corresponding to market conditions so they can be used by farm

⁵⁸ Farm Records. p. 80.

managers in evaluating present farm conditions as they exist today and not some period in the past. It is apparent that they are recognizing the fact that the farm manager is more than a farm accountant, but an economist as well who has to make decisions as to present alternatives.

The farm manager needs to realize the effects that a changing price level can have on his decisions based on farm accounts. If we were not faced with a changing price level there would be little need to quibble with accounting statements.⁵⁹

The accountant has a different problem from the economist. The economist studies the basic principles of value, and is interested in the forces which cause commodities to exchange for each other in the ratios that they do. Many of these forces, which are known to exist are not susceptible to measurement. The accountant, on the other hand, must place definite and specific valuations on the assets with which he works. He, like the economist, is unable to measure some of the basic forces. He has available only the practical facts and must use methods which are arbitrary in many respects. It is not surprising that not all accountants agree on the best methods of valuation, nor that these methods are frequently criticized by the economist.⁶⁰

A proper balance in the capital structure of the farm business is just as important as the aggregate amounts of capital used. To have too much invested in farm land and too little invested in other types of production factors might prove fatal from the standpoint of farming income, even though the total amount of capital might be well in line

⁵⁹ Gray and Dawe, Farm Accounts. p. 98.

⁶⁰ Hopkins and Heady, Farm Records. p. 69.

with the usual for the given size and type of farm.⁶¹ To determine the proper balance of the farming structure it is essential to know the true value of the different factors of production.

Land Cost in Calculating Labor and Management Efficiency

Farming is a very complicated business in which the usual operator acts as investor, manager, and laborer. Under such circumstances, statistical measures to determine the financial success or failure of a farm business are difficult to ascertain. To be considered a financial success a farm business must meet the following requirements: (a) It must pay all farm expenses incurred. (b) It must pay the prevailing interest rate on the capital invested, this is necessary as the funds invested in some other manner would very likely return the prevailing interest rate. (c) It must pay fair wages to the farmer for his labor and management because as a laborer he could earn wages in other occupations. (d) It must leave the farm as productive at the close of the year as it was at the beginning.⁶²

Because the farm business is very complicated, including a varying combination of land, labor, capital and management, it may be difficult to determine the best measure of returns from the farming operation. Some of the most commonly used measures of farming returns are as follows:

1. Farm income. Farm income is computed by subtracting the total farm expenses from the total farm receipts. It represents the pay which a farmer receives for his labor and management and for the use of the total capital invested in the farm business, in addition to the use of

⁶¹Mitchell, Farm Accounting. p. 184.

⁶²Liferson, Farm Records and Accounts. p. 19-20.

a house and all farm products consumed, after paying all business expense. Since it measures the combined return to the farmer for his capital, labor, and management, it is of little value as a final measure of farm earnings but is very useful as an intermediate step in the computation of other, more important measures of farm return.⁶³

2. Labor income. Labor income is the pay which a farmer receives for his labor and management in addition to the use of a house and products furnished by the farm after paying all farm expenses and after deducting a charge for the use of capital invested. It is the income to the operator for his labor and management, or farm income minus an interest charge on the average investment at the prevailing interest rate.⁶⁴

3. Per cent return on capital. The farmer's return to capital represents the income earned on the capital investment. The per cent return on capital indicates the rate of earnings produced by the capital invested in the farm business. This measure of farm return is directly comparable to the measure of earnings most commonly used by other kinds of business operations, the per cent return on the investment.⁶⁵

The per cent return on capital is computed by first determining the farm income, which is the combined return to the farmer for the use of his labor and capital. The value of the operator's labor is subtracted from the farm income to obtain the return to capital, and the total return to capital finally is divided by the average capital investment for the year to obtain the per cent return to capital.⁶⁶

⁶³Ibid., p. 20.

⁶⁴Ibid., p. 20.

⁶⁵Ibid., p. 22.

⁶⁶Ibid., p. 23.

4. Management returns. To determine this figure it is necessary to deduct from farm income the going rate of return on each resource except management.⁶⁷

The residue, management return, is attributed to the grade of management. It should be remembered that the accuracy and significance of this figure depends on whether the deductions for operator's and family labor, interest, and rent, have been made at the proper rates. If one of these is computed at a rate higher or lower than the market, then the management return will be too low or too high just to that extent.⁶⁸

In studying the farm as a business unit the first step is to obtain a satisfactory measure of business success. Labor income was originally devised as a measure of the comparative financial returns of farm operators. It was used in order to determine the more successful farmers in a region so that the causes of their success might be analyzed. For the purpose for which it was intended, labor income seemed to serve very well. As farm business analysis studies were carried on in various parts of the United States, difficulties were encountered in adapting labor income to peculiar local conditions. Because of the scarcity of other statistical data relating to farmer's incomes and expenditures, labor income came to be used for various purposes other than that for which it was intended. As a result of these difficulties there arose among farm management workers a demand for a more satisfactory measure of financial success in farming.⁶⁹

For successful farming, much importance needs to be attached to an adequate arrangement of balance of costs to secure the most economical

⁶⁷Hopkins and Heady, Farm Records. p. 181.

⁶⁸Ibid., p. 181-183.

⁶⁹W. I. Myers, "Farm Business Analysis," Journal of Farm Economics, VIII (January, 1926), p. 76-77.

outputs. Economic accounting normally seeks to apply its tests of efficiency in terms of output per unit of land, per unit of labor, and per unit of capital. We must find so far as is reasonably possible the equilibrium position for inputs. For this purpose each has to be valued and measured in money. It is not difficult to see the influence which accounting technique can have on farm management.⁷⁰

Some disagreement has been presented by different writers as to the manner by which we are to arrive at accounting statements and in applying these to terms of management efficiency. Earl O. Heady, in his book "Economics of Agricultural Production and Resource Use", has recommended an application of economic theory to farm management as follows:

.....The residual imputations of agricultural economics assume that no residual can remain and that each factor can be imputed its exact reward. This assumption is implicit in the procedure; otherwise the appraiser would have no reason to impute the residual to land rather than labor, seed corn, or other capital item, while the efficiency analyst would have no reason to impute the residual to labor rather than capital or land. Early economic theories did premise that one or more residual shares of the total product exist; profit to management and rent to land were taken to be such residuals.

In contrast to the early residual theories, more recent production principles state that each resource may receive its marginal product as reward and therefore, that no factor need receive a residual reward. This condition applies to the long-run situation in a competitive market. One question which may arise in the reader's mind is this: if each factor receives its marginal product as a reward, will the total product be just exhausted or will it be smaller or larger than the sum of the shares to the individual factors? The answer is given in an econometric principle known as Euler's theorem. In contrast to the early residual theories, this principle states that if each factor is imputed its marginal product, the total product will, under specified conditions, be exactly exhausted. Under the residual imputational system, factor shares in correspondence with marginal products would not be consistent with "exhaustion of the total product". Euler's theorem has come to be considered as a central tenet of production economics. The theorem need not be looked upon as proof that every factor in the economy receives its marginal product as a return. (Actually it is the discounted value of marginal products which must be imputed to factors.) Rather it can be used as simple proof that a total physical or value product can be distributed to the factors by

⁷⁰ Bray and Dawe, Farm Accounts. p. 92.

which it is produced in a manner to exhaust the total amount or the total value of output. We thus proceed to illustrate 2 principles which are important for the imputational problems of production economics: (1) each factor can receive the marginal product as a reward, and (2) the total product can be equal to the sum of the shares to the individual resources..... The Euler principle applies to producing units of any magnitude, whether they be an acre of land, a farm, or the agricultural industry. It has been grossly neglected in agricultural economics.⁷¹

Under economic reasoning perhaps we should impute no residual to any one factor of production, but can this assumption be applied in farm accounting? In Heady's discussion of the use of residual imputation in his production economics text, however true, he did not carry his reasoning to the presentation of a workable schema by which to apply the Euler theorem to farm management and farm accounting techniques. In a statement taken from an earlier book bearing Heady's name, "Farm Records" by Hopkins and Heady, he has tended to consider farm management apart from agricultural economics as presented in the above quotation.

The records should be so planned as to permit an appraisal of the methods of operation. The requirements of data needed for practical use are more exacting than for the more abstract and general concepts used in classroom discussions of principles. In the classroom the elementary concepts of land, labor, fixed or circulating capital are satisfactory. In practice the farmer seldom deals with economically "pure" elements of production. Some forms of capital and of land are often inextricably mingled. Some of the most important questions regarding organization may be concerned, not with whether sufficient capital is being combined with the land and labor, but with the specific form which the capital takes..... For practically successful operation the records must yield information of this type rather than the theoretically simple but practically impossible measures of "pure" land, labor and capital.⁷²

In this earlier reference, the joint authors of the accounting text got closer to practicable farm management and farm accounting. They appear to have recognized the practical necessity of deviating

⁷¹Economics of Agricultural Production and Resource Use (New York, 1952), p. 407-408.

⁷²Farm Records, p. v-vi.

from "pure" economic terms and principles for purposes of expressing concepts in terms of definite figures for accounting techniques.

George J. Stigler, in his book "Production and Distribution Theories", tends to differ somewhat from Heady by presenting a further view in that:

Once uncertainty is introduced, the theory of distribution is altered greatly. Anticipations rule economic activity, and many of the anticipations must be erroneous because of the very fact of uncertainty. The entrepreneur becomes a residual claimant, and the exhaustion-of-product problem disappears. Anticipated marginal productivity becomes the basis for remunerating all productive services except entrepreneurship.⁷³

This view not only gives validity to the accounting procedure of imputation of land charges and certain other costs at figures currently available, because of the uncertainty of accurately estimating other figures, but also indicates that a measure of return to the operator is a valid criterion of the financial result of the venture. The operator is entitled to claim what is left over, after meeting other production costs, because he battles the uncertainties of outcome.

Of the factors of production or resources the farmer uses in producing his income, in taking an inventory, we find it impossible to place a money value on labor and management because they do not exist physically as things which may be transferred from person to person. This leaves only land and capital goods to be entered in our inventory.⁷⁴ It is common in farm management work to see computations as a per cent return to capital. This measure has a disadvantage in that it involves an estimate of the operator's labor and management which may be quite inaccurate since farmers have little basis for making such an estimate.⁷⁵

⁷³ Production and Distribution Theories (New York, 1941), p. 386.

⁷⁴ John A. Hopkins, Elements of Farm Management (New York, 1947), p. 98-99.

⁷⁵ Efferson, Farm Records and Accounts. p. 23.

Farm management workers should have clearly in mind the object of their studies in order to agree upon a measure or measures of farm income that is most satisfactory for their purposes. Under the definition of farm management, a farmer strives to maximize his profits, but it falls short of being completely satisfactory because it does not state from what point of view the profits should be considered. Whose profits? The landlord's? The farm operator's? Or returns on the farm investment? A lack of agreement on this point has been responsible for a large part of the conflict of opinion in farm management research.⁷⁶

The primary object of farm management should be to show how farm operators can organize their business operations so as to yield the greatest profits. If this principle is accepted, the selection of a satisfactory measure of farming returns is greatly simplified. If the object of farm management studies is to determine the business principles affecting the financial returns of the farm operator, the best measure of financial success will be the income accruing to the farm operator after deducting all other expenses. This is what is generally known as labor income.⁷⁷

The rate of return on the investment is the common measure of corporate profits, but since all labor and management are hired, the residuum after paying the cost of doing business is appropriately expressed as a return on the investment of the owners. On most farms, the farm operator is laborer, manager, and capitalist or investor, and any allocation of returns to any one or more of these factors involves estimates. Farmers differ in their ability as laborers as well as in their capacity

⁷⁶Myers, "Farm Business Analysis," Journal of Farm Economics, (January, 1926), p. 78.

⁷⁷Ibid., p. 78-79.

as managers, and it would be difficult to assign a value to management as distinct from labor. Farmers do not usually make such a distinction, and for the purpose of finding out how to operate farms successfully, attempts to isolate the returns for operator's management from returns for his labor are gratuitous as well as being difficult or practically impossible. The managerial ability of the farmer expresses itself in the organization and operation of his farm business. The best measure of managerial ability is the financial success of the business. Even the total value of the operator's services is more difficult to estimate correctly than is the proper interest charge on his capital. From the standpoint of accuracy, labor and management income is likely to be a better measure of financial return than interest on his investment. Furthermore, a farmer is usually more interested in the returns to labor and management than in interest on his investment.⁷⁸

As usually computed in farm management studies, return on investment of an owner-operated farm is a mixture of returns on capital and returns for the managerial ability of the operator. In computing returns on investment, the value of the operator's time is usually deducted as the mere cost to hire the labor he performs, thus any pay for managerial ability is included with legitimate returns on the farm investment.⁷⁹

The determination of the land charge to use in computing labor income has given rise to some discussion among farm management workers. The most accurate method seems to be to use the interest figure calculated at the current rate, plus the charge for land taxes. If taxes have been deducted as an expense paid, only the interest must be imputed.

⁷⁸Ibid., p. 79.

⁷⁹Ibid., p. 80.

There can be little doubt about the computation of the labor income of cash renters. Their land charge will be the cash rent actually paid. If on owner-operated farms, a net cash rent be deducted as the land charge, the resulting labor income will not be the labor income of a farm operator, but will be the labor income that he would have if he were a cash renter on his farm.⁸⁰

There is some advantage in computing the labor income of the owner-operator in both ways. A comparison of the two results may be helpful to a tenant in deciding whether to continue renting or to buy a farm, or to a farm owner in deciding whether to continue operating as an owner or to sell and become a renter.⁸¹

This may also present the question as to whether a farmer should invest in agriculture at all. Both landlords and mortgage-holders have the alternative of investing their funds in other enterprises. Farmers can operate as tenants and put their surplus earnings in non-agricultural enterprises.⁸² These are decisions which the farmer has to make, and with accurate farm accounts and good judgment he is better able to decide upon the alternatives available.

A sound permanent agriculture should return fair interest on the farm investment and going wages to the farm operator. The value of the labor income concept as a return to the operator above interest and taxes is worthy of consideration. A better understanding of farm management may be helpful in discouraging the building up of farm values by farmers to prices that do not permit a going rate of return for the investment and a going wage for the operator's labor and management.⁸³

⁸⁰Ibid., p. 81.

⁸¹Ibid., p. 82.

⁸²Black, et al, Farm Management, p. 731.

⁸³Myers, "Farm Business Analysis," Journal of Farm Economics, (January, 1926), p. 82-83.

In summary: For the purpose of studying farm organization for management decisions to obtain the greatest maximum profits, labor income above interest and taxes on the investment seems to afford the best measure of farming success. In arriving at the labor income appropriate deductions must be made for the cost of the other factors of production. In the case of land inventories, in arriving at the true net worth figure we are bound to use the current value; in calculating land cost, we must, in addition, use current interest rate plus tax charge. However, an incorrect land inventory value will distort not only the labor income figure, but in cases in which the rate of return on capital appears to be the more appropriate measure of financial success, an incorrect valuation will also throw this measure out of line with the facts of the current situation.

CHAPTER III

LAND INVENTORY VALUES IN THE GARFIELD COUNTY FARM ACCOUNTING PROJECT

In view of the need for accurate land inventory values to arrive at the current net worth and income of the farm business as a better basis for making farm management decisions, it is appropriate to weigh some of the effects of inaccurate values.

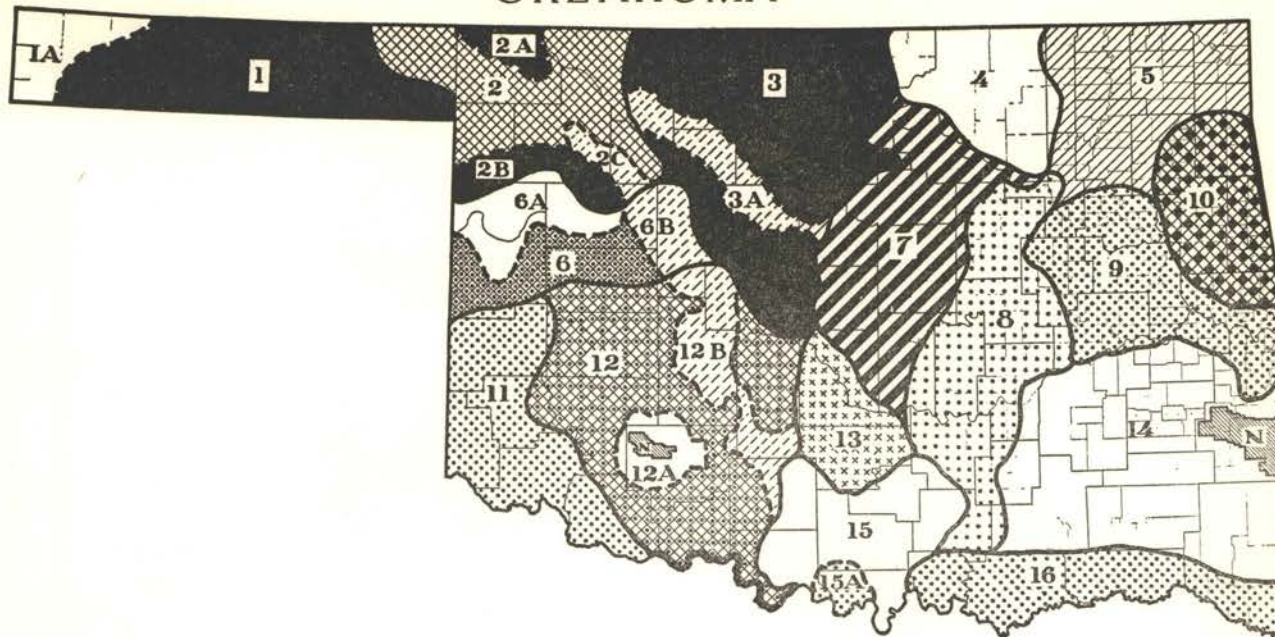
The material for the analysis made in this study has been supplied by the Department of Agricultural Economics, Oklahoma A. & M. College. The data were extracted from a farm account project in Garfield county, Oklahoma, extending through 24 consecutive years beginning in 1929. The project originated from a farm management survey taken for the year 1928, when the farm account project was initiated for the following year. Garfield county is located in the north central part of Oklahoma, mainly in type-of-farming area 3 (Figure I and II). The agriculture is described as cash-grain and general farming. The southwest corner of the county lies within area 3A, which is described as a wooded area of sandy soil and general farming. Wheat is the main source of income.

The number of account keepers varied from 21 to 72 each year. The books were turned in to the experiment station for summary and use in farm management research. Each individual record book was summarized and returned to the farmer, a copy being kept on filing forms for a permanent record by the department of agricultural economics.

Land Inventory Practices of Account Keepers

Individual account keepers used some form of original or historical

PRELIMINARY TYPE-OF-FARMING MAP OF OKLAHOMA



Area Description of Counties by Type-of-Farming

Areas in Oklahoma

<p>Area 1: Beaver Cimarron Texas</p> <p>Area 2: Ellis Harper Woods Woodward</p> <p>Area 3: Alfalfa Canadian Garfield Grant Kay Kingfisher Major Noble</p> <p>Area 4: Osage</p> <p>Area 5: Craig Mayes Nowata Ottawa Rogers Tulsa Washington</p>	<p>1. Cash grain and Livestock. 1A.—Largely range livestock.</p> <p>2. Somewhat broken topography—some small grains, feed crops, livestock. 2A.—Cash wheat primarily. 2B.—Cash wheat primarily. 2C.—Sandy area, general farming.</p> <p>3. Cash grain, general farming. 3A.—A wooded area of sandy soil, general farming, some cotton produced on this strip.</p> <p>4. Range livestock—some general farming.</p> <p>5. General farming, livestock, dairy, poultry and self-sufficing.</p>	<p>Area 6: Blaine Custer Dewey Roger Mills</p> <p>Area 7: Cleveland Lincoln Logan Oklahoma Pawnee Payne Pottawatomie</p> <p>Area 8: Creek Hughes Okfuskee Pontotoc Seminole</p> <p>Area 9: Haskell LeFlore McIntosh Muskogee Okmulgee Sequoyah Wagoner</p> <p>Area 10: Adair Cherokee Delaware</p>	<p>6. Cash grain, general farming, cotton, livestock. 6A.—Rough, sandy area, scarcely any farming, some range livestock. 6B.—Wooded area, general farming, and cotton.</p> <p>7. General farming, cotton, livestock, dairy, and poultry.</p> <p>8. Cotton, general farming, self-sufficing, dairy, (An area of generally poor soil, except on small bottoms).</p> <p>9. Cotton, some dairy, potatoes, commercial vegetables, self-sufficing.</p> <p>10. Some fruit, general farming, dairy and poultry, self-sufficing (rough wooded land).</p>	<p>Area 11: Beckham Greer Harmon Jackson Tillman</p> <p>Area 12: Caddo Comanche Cotton Grady Kiowa Stephens Washita</p> <p>Area 13: Garvin McClain</p> <p>Area 14: Atoka Coal Latimer Pittsburg Pushmataha</p> <p>Area 15: Carter Jefferson Johnston Love Murray</p> <p>Area 16: Bryan Choctaw Marshall McCurtain</p> <p>N—National Forest.</p>	<p>11. Cotton, supplemented with cash grain, livestock, dairy, and poultry.</p> <p>12. Cotton, cash grain, livestock, some dairy and poultry. 12A.—Range livestock. 12B.—Sandy, wooded section, cotton, general farming.</p> <p>13. Cotton, livestock, general farming, broomcorn.</p> <p>14. Cotton, self-sufficing, livestock (rough, mountain and wooded area).</p> <p>15. Rang livestock, general farming, self-sufficing. 15A.—Cotton.</p> <p>16. Cotton, general farming.</p>
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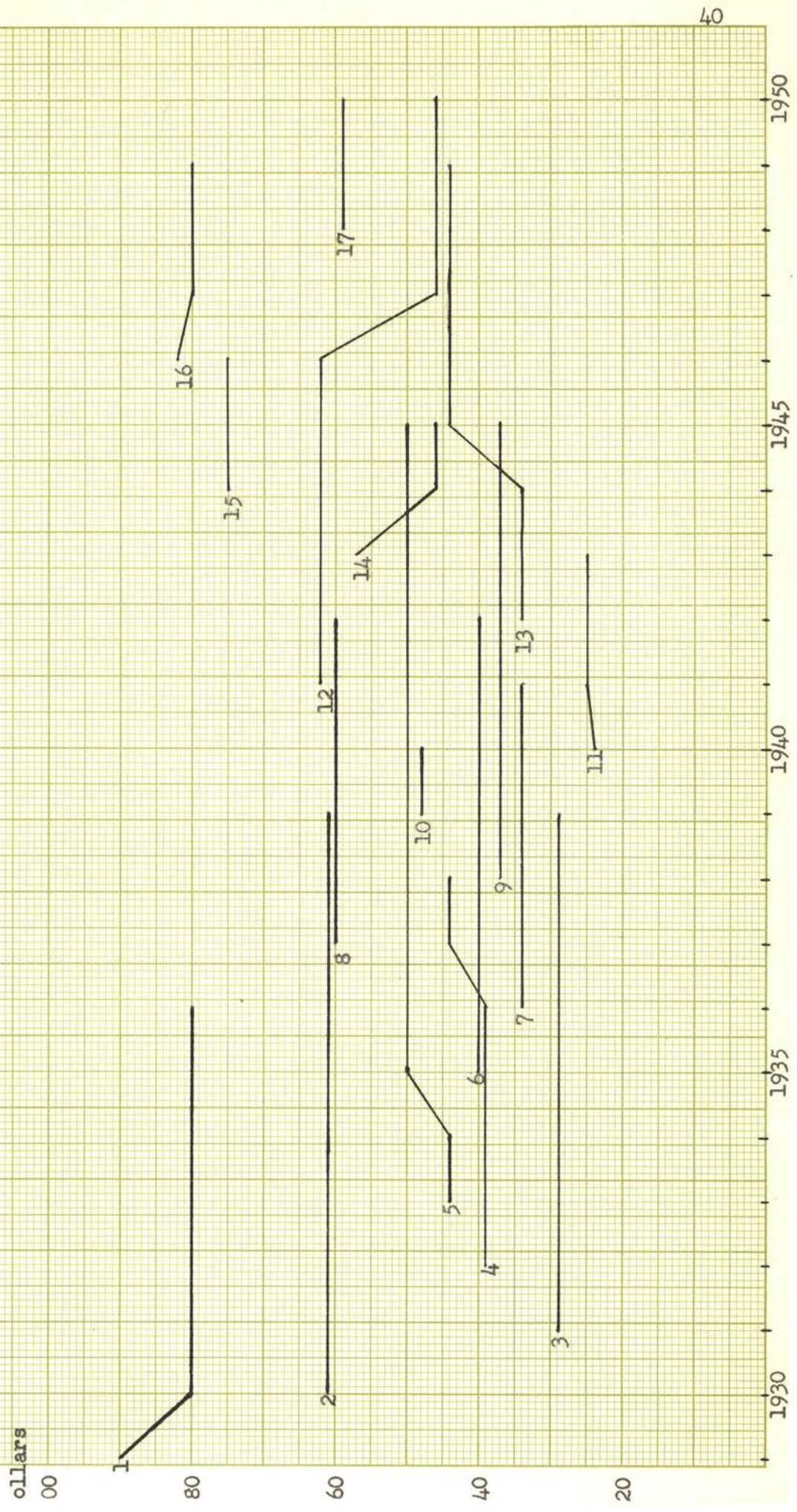
cost basis for land inventory valuation of annual land cost.

Among 17 continuous record keepers who entered the project at different dates in the 22-year period used in this study, one for each year in which such new cooperators were enrolled, a strong tendency was exhibited for holding the land value constant throughout the years at the figure entered in the first year's record (Figure III). These particular farms were selected as examples of farmers that retained the same piece of land in their continuous records for the longest span of time. They well illustrate the general method used in inventorying land values. Once a tract of land was inventoried, subsequent records usually retained this value except for an occasional deviation in price either up or down, again followed by a series of stable inventory values. Changing land prices in the area probably influenced the farmer away from the original value or historical cost basis. Such occasional changes in land inventory values by various farmers tend to defeat the purpose of original cost, and result in summarizing and calculating land cost and efficiency measures on some basis other than either original cost or market price (alternative price).

Of these 17 farms, among those who joined the project in the period 1930 to 1950, 10 held their values constant as long as they kept records varying from 2 to 10 years; 2 changed their price contrary to the direction in which regional land prices moved (Figures III and IV); and only 4 changed in the same direction as the land price index. In all cases the land value was held constant before and after the change.

From the information available it was impossible to determine the basis for the original entry of land values. Many factors influence each farmer's opening value as: a conceived long time normal agricultural value; the purchase price; the level of land prices when he

Figure III. Land Inventory Values per Acre for 17 Continuous Record Keepers Starting in Different Years.



entered the project; the date when he purchased the land; how he became possessor of the land; the land rental; and perhaps many more. These factors were not pointed out in the records.

Comparison of Fluctuations in Values for Oklahoma,
Garfield County Census, and Account Keepers.

For comparative purposes in this study of the land cost under an alternative land valuation of market price instead of the original cost or other basis used for the initial entry, the problem arises of adjusting the record values to the market price. Several ways are possible in arriving at an adjusted market value, yet none may be entirely accurate or satisfactory, partly because of incomplete data on each farm.

Since the market value of farm land is affected by many factors including location, type of community, topography, elevation, soil fertility, climate, water supply, condition of improvements on the land, size and type of farm, mineral rights, roads, utilities, available markets, and others,¹ these factors must be considered in establishing the value of farm land.

Mr. Parcher has made a study of land prices in Oklahoma as affected by various factors mentioned above, which may well point out the weight applied to each:

Good roads and nearness to town are associated with higher farm land prices. These are conclusions resulting from a study of more than 2600 land sales involving 330,000 acres in seven counties of the state for the period 1941-1945. In view of the fact that the counties studied are fairly well distributed over the state, it is believed that the results will be useful to farmers, tax assessors, appraisers and others in all parts of the state who may be interested in the influence of location on the market value of a farm.

¹ J. Norman Efferson, Farm Records and Accounts (New York, 1949), p. 48.

Farms on pavement, on the average, sold for 50 per cent more than farms located on improved dirt roads. Farms on unimproved dirt roads sold for about 43 per cent less than farms on all-weather roads. Farms within a half mile of an all-weather road sold for roughly 50 per cent more than those two to four miles from such a road. Farms within a mile of a market sold for about one-third more on the average than those three to five miles away. Farms within five miles of a principal city sold for about 30 per cent more than farms 10 to 15 miles away.²

This type of data may be very helpful in calculating a reasonably accurate valuation. Although some of the data for all of the factors mentioned above may not be obtainable, most of it can be made available through further research.

A very good index of soil fertility may be obtained from a study of the yield index of the various farms. This may be taken into account along with the relative proportions of crop and pasture land in arriving at an appropriate valuation for inventory purposes.

The above considerations are essential in the correct appraisal of the value of an individual farm. For the purposes of illustration in this study, however, it was felt that accuracy in the original computation of land values for individual farms was not essential. The main objective was to determine the effect of changing land market values upon net worth, measures of income, and annual charges for the use of land for farming in comparison to the procedure employed in the accounting project. For this purpose a somewhat simple procedure was used.

The adjustments were based on the Oklahoma farm real estate price index prepared by the federal Bureau of Agricultural Economics and upon the census values of farm land enumerated for Garfield County every five years. These series include farm buildings, whereas the accounting figures represent land only. This was necessary because values of farm

²L. A. Parcher, Tentative Title: Influence of Location on Land Prices in Oklahoma, Manuscript Number: 285, August 1952, Oklahoma A. & M. College, Stillwater. Manuscript edited for publication.

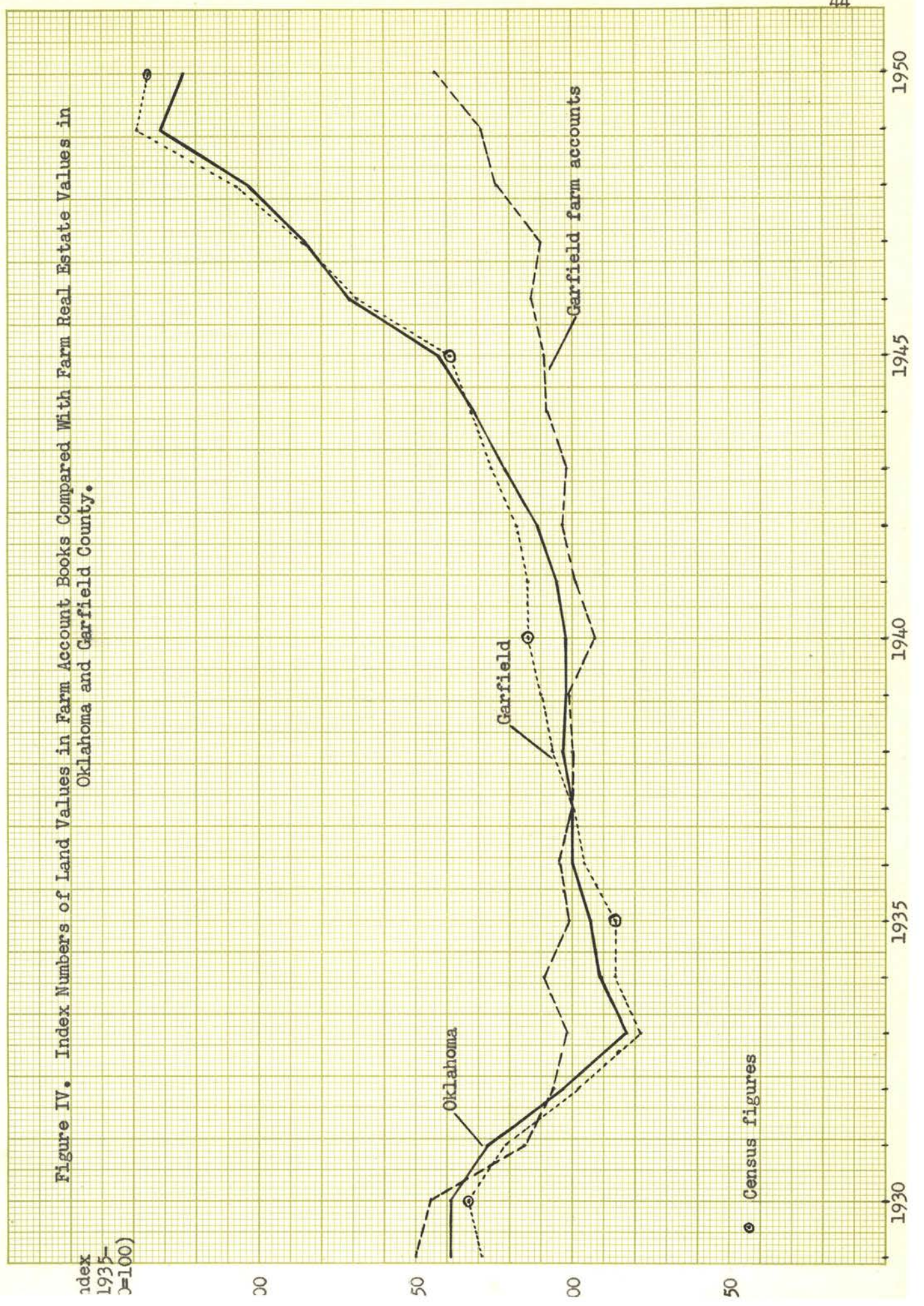
dwellings were omitted from the accounts.

The Oklahoma index was adjusted to a base of 1935-40 = 100. Likewise the average of the Garfield County real-estate values per acre for the two census years 1935 and 1940 was taken as a base of 100 per cent. (Table I, Appendix). This provided an index for Garfield County every five years; the remaining years were interpolated according to the fluctuations in the Oklahoma index. From the Garfield County index it was possible to calculate the Garfield real-estate value per acre for the years not given by the Agricultural Census, and also the Garfield index as a per cent of the preceeding year (with 1929 = 100) which was useful in the process of adjusting land inventory values for the account keeping farms.

From the Garfield farm account average value of land per acre (Table I, Appendix), an index was computed using years 1935-40 as the base (Figure IV).

The trend taken in Garfield land values through this period was approximately the same as that for the state, while the trend in the Garfield farm account values differed greatly from that for the county. This further indicates the reluctance of the farm account keepers to vary their land values with the price level of land. Although they decreased their values somewhat during the early 1930's they did not decrease them in proportion to the decrease in the county level. When land prices soared to an almost all time high in the late 1940's the account keepers adjusted their values upward only slightly. Thus, the entire group of accounts followed the somewhat inflexible pattern of stable inventory values as shown in Figure III for a selected group of records. The changing composition of the group may have been the major factor for change in the average value, rather than conscious efforts on the part of individuals to reflect the market changes.

Figure IV. Index Numbers of Land Values in Farm Account Books Compared With Farm Real Estate Values in Oklahoma and Garfield County.



● Census figures

Oklahoma

Garfield

Garfield farm accounts

Adjustment of Account-Book Land Values

With the use of the calculated Garfield County index as a per cent of the preceeding year, adjustments were made for each individual inventory value following the original entry in the farm account books. These adjustments were made on the assumption that the original entry represented the farmer's best estimate of proper land value for his accounting purposes, since later inventory values were largely set by the first entry.

That the first value entered in the books may not always have been an accurate reflection of soil productivity or other factors affecting farm land value is indicated by a somewhat weak and inconsistent relationship of harvested wheat yields and proportion of total farm in cropland to the average value per acre of total farm (Table I). For this analysis, wheat yields were expressed as per cents of county averages for the year in question so that the different years could be combined. While increased wheat yields and increased proportions of cropland among these farms were generally associated with increased land values, the relationship for one of these factors within restricted range of the other was not in every case consistent.

It might be suggested that since different years were combined in this analysis, the trend in general land prices was responsible for differences in average land values between the groups. This would tend to strengthen the argument that first-entry land values failed to reflect differences in productivity. However, relatively few of the 162 farms entered the project after 1938, and average account-keeper land values showed little tendency toward a marked rise before that time. Furthermore, analyses with respect to individual years in which all or most of the categories were represented failed to reveal any closer or

Table I. Inventory Values of Farm Land as Related to Per Cent of Total Farm Occupied by Cropland and to Per Cent of County Average Wheat Yield Per Acre Harvested. First Year of Record, 162 Garfield County Farm Accounts.

Per Cent of Total Farm in Cropland	Per Cent of County Average Wheat Yield : All Farms			
	Less Than 95	95 to 124	125 or More	
	Number of Farms			
Less than 66	21	18	13	52
66 to 79	24	19	19	62
80 or more	<u>13</u>	<u>15</u>	<u>20</u>	<u>48</u>
All Farms	58	52	52	162
	Land Value Per Acre			
Less than 66	\$55	\$43	\$48	\$49
66 to 79	46	59	61	55
80 or more	48	57	69	58
Average	49	53	59	54

more consistent patterns of relationship than did the general summary of the entire group. Notwithstanding the apparent need for better appraisal of individual properties at the beginning, it was necessary to use first-entry figures as the best available starting point for adjustment to current land market price fluctuations.

A weakness may creep into this method of adjustment whenever a continuous account keeper changes farms. It was not known to what extent his previous inventory values may have influenced the inventory value recorded for the new farm.

For consistency in calculations it has been assumed in the case of the full renter that whenever a farmer changed farms the new inventory value was tied to the value shown for the previous farm. If the value per acre differed it was assumed that the land was proportionately better or poorer.

For those that purchased land during the time that they were in the project it was assumed that the purchase price was entered, although this may not always have been the case. The value at which a part owner carried his rented land was assumed to be tied closely to the value at which he carried his owned land. Whenever he changed rented land the adjustment was made proportionate to the book value of owned land as adjusted. The results of adjusting account book land values to conform to changes in land prices are given in Figure V for the group of continuous record keepers as a whole.

In all cases the adjusted values approximated those for the county. The amount of adjustment necessary between 1932 and 1936 was much less than that required after 1940. This probably resulted from the fact that the majority of the record keepers through the 1940's had entered the project before 1938. The changing composition of the

Figure V. Garfield County Land Values Compared With Account Book Values Unadjusted and as Adjusted to Market Price Fluctuations in the County.

Average
Value
Per Acre
(Dollars)

120

100

80

60

40

----- Excludes one farm of 1145 acres valued at \$23.01 per acre that was in the accounting project for 1947 only.

Adjusted

Unadjusted

Garfield county

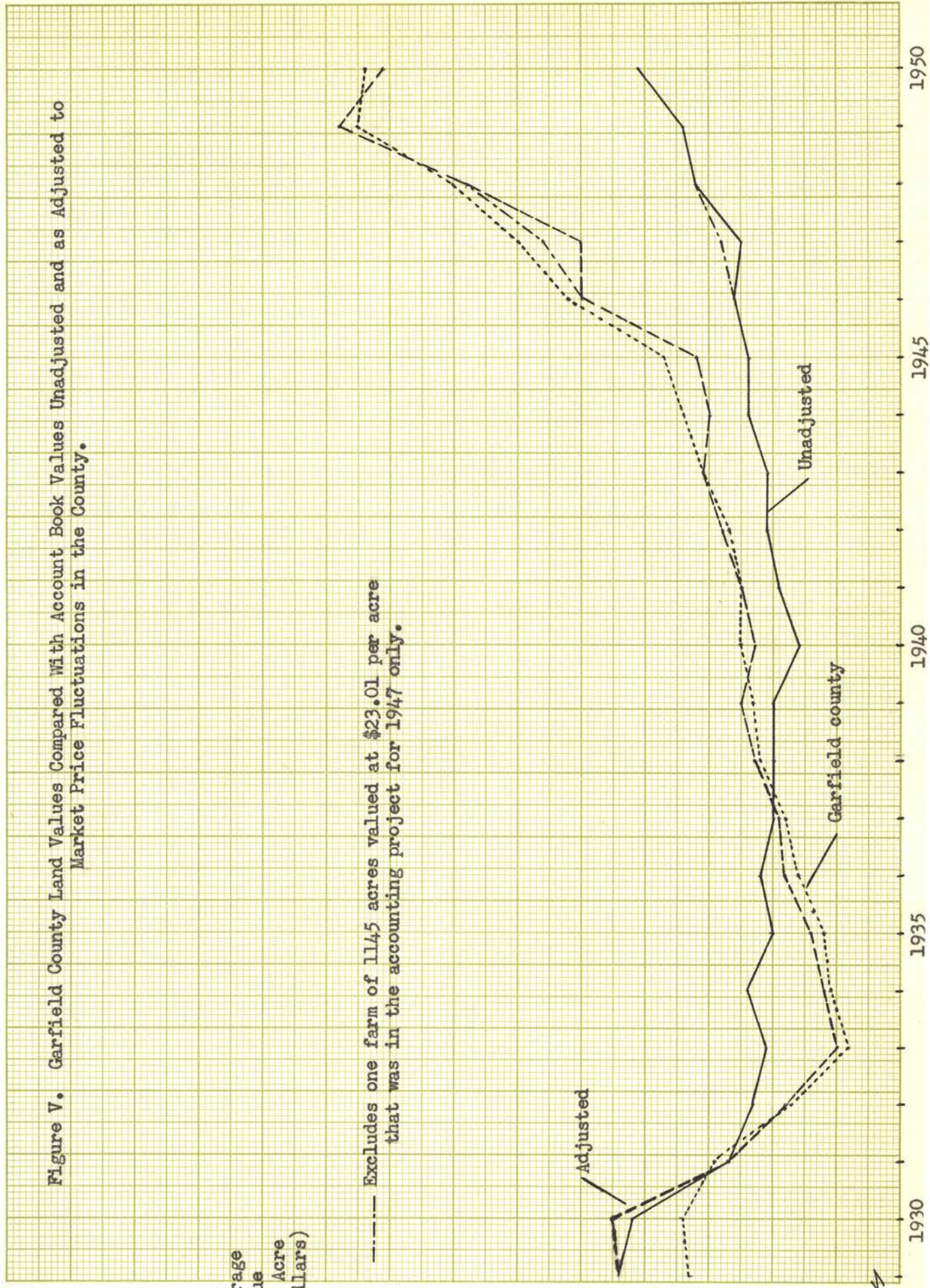
1930

1935

1940

1945

1950



group of record keepers in the project tended to influence the average value closer to the county level through the earlier years.

Following 1945 an extremely large amount of adjustment was necessary to bring the record values to the county level.

The question of why the adjusted value shown in Figure V was above the county value in 1929 and 1930, whereas in following years it closely approximated the county value may indicate a weakness of this procedure of adjustments in view of the likelihood that account keeping farms may be above average. Bias of this nature was pointed out by Karl T. Wright with reference to farms in central Michigan:

Now much difference is there between the farms where the farmers are keeping financial records in an extension project, and average farms? In central Michigan, where general farming practices are followed, the "farm account" farms usually average about 175 acres in size compared with 125 acres for average farms; some are 50 acres, or 40 percent larger. The percentage of the tillable land of the "farm account" farms devoted to corn, oats, barley, wheat, beans, and hay was within 1 or 2 percent of average in the case of each crop. The yields of the crops on the "farm account" farms during the ten years 1929-38 averaged 10 percent above the average of all farms in this region. The amount of livestock carried for each acre of tillable land was only slightly higher than average in the "farm account" farms, but the production of that livestock was some 22 percent above average.³

These differences in size of farm and productivity may likely result, as mentioned earlier, in higher farm land values. Should this be the case, the adjusted values might well have remained above the county level throughout the 22 years from 1929-1950.

This is not necessarily the most accurate method of adjustment possible. A better method may be worked out through further research and study of these land values for this period. This may be desirable if more accurate research for land values is of the essence.

³Karl T. Wright, "Use and Limitations of the Mixed Sample Supplied by Farm Financial Records". Mimeographed copy of Papers Presented at Farm Management Statistical Clinic, University of Illinois, September, 1941. p. 11.

For the years 1931-37, adjusted values per acre (Table II, Appendix) and per farm (Table III, Appendix) were less than those used in the account books, the greatest difference occurring in 1933 during the depths of the depression. Although the account keepers had reduced their land inventory valuations markedly in the period 1929 to 1933 and many of the new cooperators who entered the project inventoried their land at lower prices than those formerly prevailing, these revisions were insufficient to reflect adequately the changes that had occurred in the land market.

After 1933, farm land values in the area rose somewhat gradually to the period 1939-1941 (Figure IV, and Table I, Appendix), but the values from the account books failed to reflect any such tendency (Tables II and III, Appendix, and Figure IV). Following 1941, regional land values continued upward at an accelerating rate to 1949 but only a meager tendency in this direction was reflected in the account books. Owing to the pronounced tendency on the part of account keepers to hold inventory values constant (Figure III), the greatest opportunity for market changes to be incorporated into the average account-book value occurred from the entry of new cooperators into the project. As these were less numerous during this period (except for 1938, which included 20 new men, 8 of whom kept records more than one year) than in the earlier years, little change was to be expected. The fact that entrance of new cooperators into the project failed to influence the average values upward may reflect the policy of the project leaders to avoid "inflated" values in the account book land inventories, although it could have been possible that land of much lower grades was operated by the newcomers. The belated rise that occurred after 1947 was insufficient to keep pace with the trend of the land market.

Interest Rates

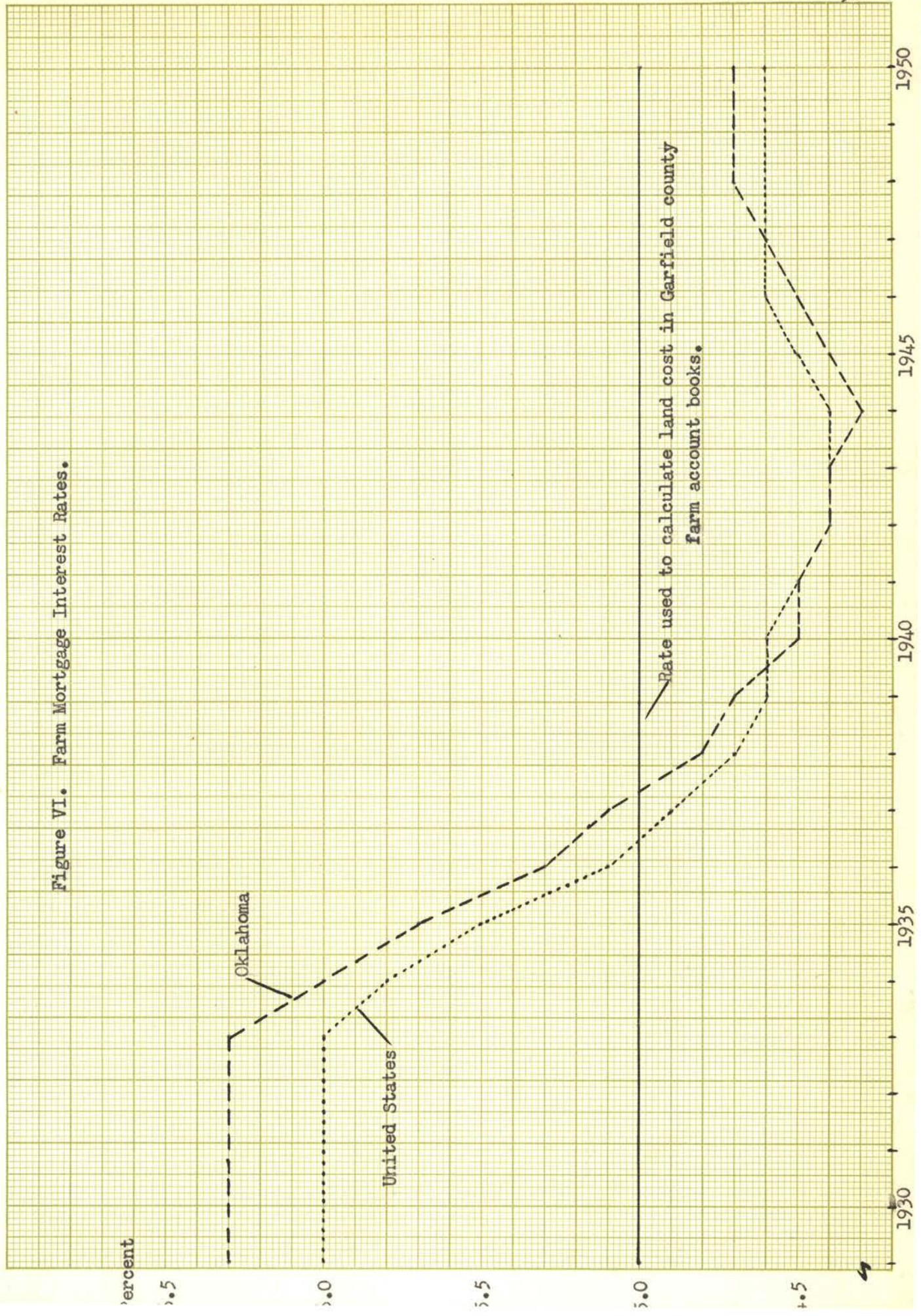
In order to observe the effect of differences in land valuations upon the computation of measures of net farm income, the account book land values were compared with values adjusted to conform with fluctuations in the county average land price index, and an annual land cost per farm was calculated for each set of values (Appendix, Table III).

The annual charge for the use of land included a share of the total farm taxes apportioned on the basis of the capital investment as represented by the value of land compared to other items, and an interest charge on the value of the land. The rate of interest that had been used for this calculation in summarizing the farm account books was held constant at 5 per cent for all farms and years.

For sound farm management decisions and for research purposes it may be of value to use the current rate of interest rather than the straight line 5 per cent rate. A false land charge may lead to unwise management decisions, therefore it is well to consider the effect of the interest rate upon the land charge.

The current interest rates used (Table IV, Appendix, and Figure VI) were those reported by the United States Department of Agriculture, Bureau of Agricultural Economics for Oklahoma. They were the average interest rates charged by all agencies making farm mortgage loans for those years. These average interest rates were based on a percentage of the total loans in the state, and may be somewhat misleading. Many lending agencies such as commercial banks and private individuals make short term loans with farm mortgages as security. These loans often bear a short-term rate of interest which is higher than that for normal farm mortgage loans. Since these loans are not actual farm mortgage loans in the strict sense of long-term mortgages for the use of land or

Figure VI. Farm Mortgage Interest Rates.



Rate used to calculate land cost in Garfield county farm account books.

land purchase, it may be questioned whether they should be included in the average. If they are, there is little question that they raise the average rate. However, no better series for this purpose is known to be available.

Effect of Interest Rates and Land Values Upon
Computed Yearly Cost of Land Use

Interest charges and total annual land costs including interest and taxes were calculated by both the 5 per cent and current rates for original book values and adjusted land values (Appendix, Table V and Figure VII). The difference in land cost using either 5 per cent or the current rate was usually of small consequence as compared to the difference between unadjusted and adjusted land values, except for the earlier years of the study.

From the beginning of the accounting project through the year 1937, the annual cost of the use of land per farm was significantly higher when calculated at current interest rates than when the 5 per cent rate was used (Table II). After 1937, the reverse was true (see also Figure VI and Table V, Appendix). The averages of the entire period 1929-1950 differed by only \$18 per farm on the unadjusted values and only \$2 per farm on adjusted values. Although the average results for the 22 years were about the same either way, the last cost for any one year was sometimes greatly affected by using the alternative rate of interest.

In view of the fact that the interest rates for farm mortgages have taken a downward trend in recent years and may possibly remain somewhat below 5 per cent for a while, are we justified in using a straight 5 per cent rate for either yearly cost or long time averages? Since farm management is interested in current conditions to a great extent, a distorted land cost may result in unwise management decisions

Figure VII. Estimated Farm Land Charges, Including Taxes.

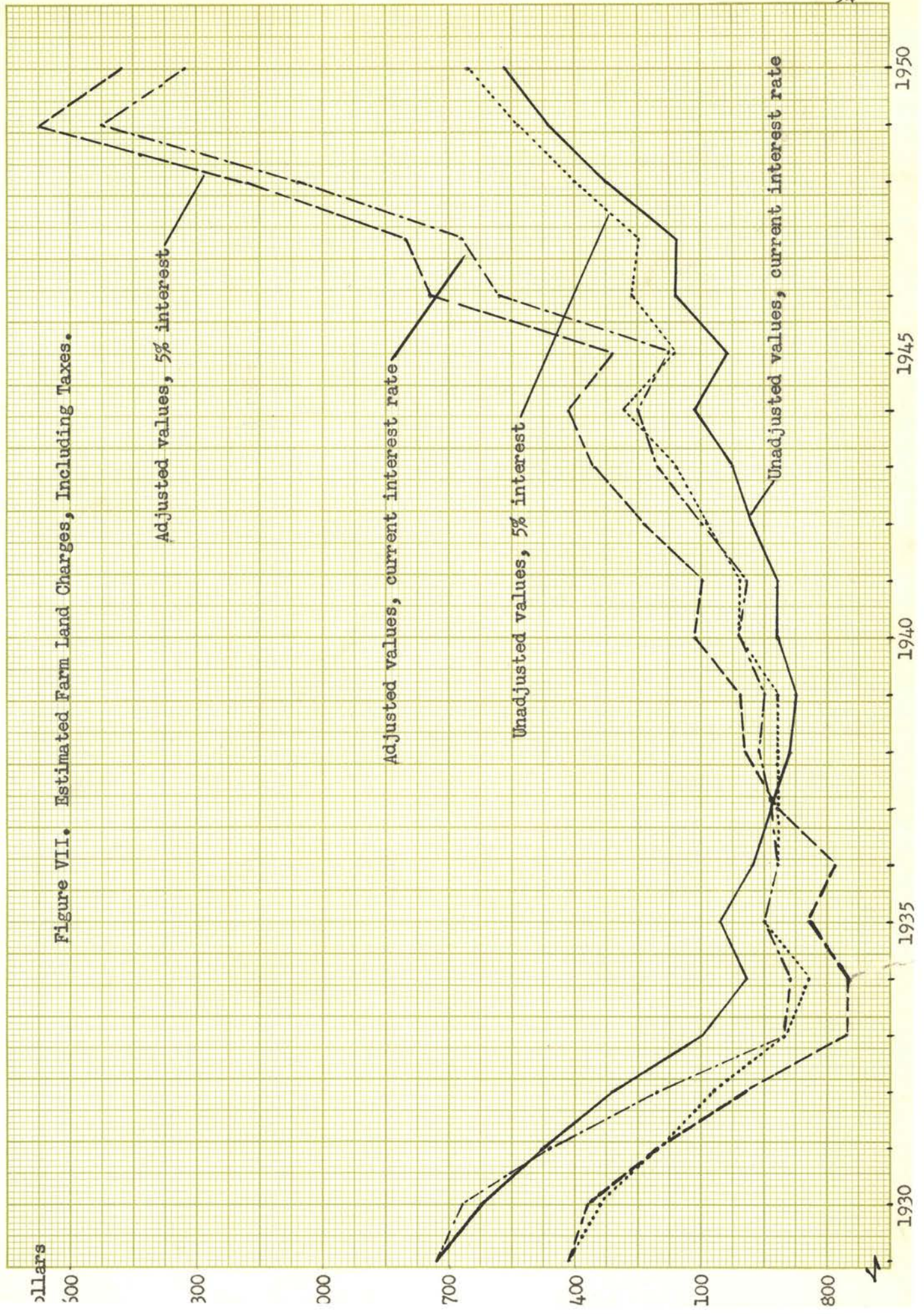


Table II. Difference in Land Cost Per Farm Using Both Unadjusted and Adjusted Land Value with Both the Standard 5% and Current Rate of Interest Charge. Unadjusted Value at 5% Interest Charge is Used as a Base.

Year	Unadjusted Value		Adjusted Value	
	Interest at 5%	Interest at Current Rate	Interest at 5%	Interest at Current Rate
1929	0	\$ 312	\$ 0	\$ 312
1930	0	291	38	339
1931	0	259	-7	251
1932	0	229	-78	129
1933	0	106	-153	4
1934	0	155	-93	43
1935	0	119	-101	4
1936	0	50	-137	-2
1937	0	17	-11	6
1938	0	-34	74	37
1939	0	-51	79	23
1940	0	-91	103	2
1941	0	-90	96	-4
1942	0	-119	142	6
1943	0	-125	198	50
1944	0	-160	139	-40
1945	0	-128	151	5
1946	0	-115	478	316
1947	0	-88	563	429
1948	0	-74	778	658
1949	0	-79	1133	986
1950	0	-88	819	682
Total	0	\$ 386	\$ 4211	\$ 4236
Average	0	\$ 18	\$ 191	\$ 193

for the current year. A land cost calculated on a too high interest rate may encourage an operator to undercapitalize his farm and overemploy labor resulting in poor management.

Considerable difference occurred between the annual land charge calculated on the basis of the unadjusted or "historical" land value and that calculated from the adjusted or "market" value of the land.

A difference in land cost of a yearly average of \$191 or \$193 may sometimes be a sizeable proportion of the farm income, not to mention some yearly differences ranging upward to \$1000 or more. In practically all years the charge to land using the market value was above that used by the account keepers. There can be little question of the fact that these large differences in land cost can affect the management decisions.

If the purpose of the farm inventory is to establish the true net worth of the business for accurate farm management decisions, are we justified in using a misleading land value and land interest charge? The farm operator is compelled to make management decisions under alternative cost conditions. Why, then should he not prefer to use current land values and interest rates in arriving at estimates of current operating costs? The failure to make sufficient deductions from farm income for land cost resulted in average labor and management earnings that were inflated unrealistically. This tends to make the farmer think he was making more money than he really was, and to lead him into unwise decisions, deluded by the misuse of the very tool that was designed to keep him informed and to augment his wisdom.

When an individual's farm accounts show a good return to capital or land he is inclined to bring more of that factor into his production schedule. A farmer may overcapitalize if he is using a distorted land value and cost that is far too low, resulting in an unbalance of labor

input and poor management.

Proper land inventory values are necessary both for determining true net worth of the business and for calculating either the aggregate net income or the rate of return on the investment.

CHAPTER IV

SUMMARY AND CONCLUSIONS

The usefulness of accurate farm accounts is unquestioned as an aid to successful farm management. Much emphasis has been placed on the necessity of accurate farm inventory values to arrive at the true net worth of the farm business, and in calculating various costs and returns. Absolute accuracy in inventory values is very difficult if not practically impossible for some factors of production, but this is no excuse for careless work.

Conflicting views in the literature on the subject of farm accounting methods and techniques indicate possible weaknesses in the procedure employed, for obviously not all views can be equally correct. Perhaps the greatest conflict, and possibly the greatest resulting weakness, lies in the realm of land inventory values. Most authors apparently prefer an "original cost" or historical value without any close agreement as to how far back into history it is necessary to go to find "original cost", either as a general principle or in specific cases. A few authors have recognized the need for more modern valuations owing to long time changes in agricultural land values, but even the majority of these appear reluctant to permit changes for fear capital gains or losses will confuse the operating statement and obscure the financial results of operating efficiency.

In order to avoid paper profits and losses in the accounting statements resulting from a changing land inventory value, it has been suggested that these adjustments be made between the ending inventory of

one year and the beginning of the next. A change in inventory values will then be considered a capital gain or loss to the operator outside of his farm operations, and will give the basis for calculating capital cost in the operation of the business under current conditions.

Whatever weaknesses exist, they can be remedied sufficiently as not to invalidate farm accounting as a useful procedure by which to measure farming returns and to serve as a basis for management decisions. We must make use of these tools, the best available, until a superior technique has been presented, tested, and proved that can readily be applied by the individual farmer.

For all practical purposes, the market price of land with current interest rate will reflect the most satisfactory land cost under present conditions, with the possible exception of renters. A measure of the extent to which inaccurate land inventory values may be reflected in misleading costs and farming returns has been demonstrated. On 162 farms in Garfield County, Oklahoma, on which accounts were summarized through the years 1929-1950, the difference between land cost calculated on the basis of current land values and that based on the original inventory values entered in the books amounted to \$191 per farm as a yearly average for the 22-year period. In some years the difference exceeded \$1000 per farm. Since this was the average for a group of farms for the year, some individual farms showed even greater discrepancies. If a farm operator accepts such results at face value, they may easily lead him into errors in management decisions. In any event, the resulting income computations fail to reflect accurately the proper current allocation to the various production factors.

To a lesser extent, an inaccurate interest rate may be reflected in misleading accounting statements. While the average difference for

the 22 years was reasonably small by using either 5 per cent or the current rate of interest, the land costs for some years were considerably distorted because current mortgage interest rates at times differed from the 5 per cent rate by more than one-fifth.

In farm accounting and farm business analysis, several measures of financial success are used, most of which are affected by differences in land values. Two common measures are labor income (labor and management wage) and per cent return on capital. In computing labor income, interest on all capital, including land, is deducted. More clearly the result is influenced by both the land value and the interest rate used. In computing the rate of return on capital, the "net farm income" is divided by the total investment, including the value assigned to land, and the divisor influences the resulting percentage of return. In either case, misleading income measures result from using a land value that has little or no relation to the current situation.

There appears to be much merit in using the current interest rate and market price of land in calculating land cost and arriving at other farming returns. Even though a farm business is normally considered a life-time investment, a farmer must make farm management decisions as to present alternatives, so there seems to be little justification for the use of out-of-date land inventory values, unless the intent is clearly to show the present yield of an ancient investment. Such a revelation would be of limited value in making current decisions, because it merely shows what should have been invested at some time in the past to achieve a given return now. The return on present worth furnishes a far better guide for present planning. This is particularly significant when real properties have experienced marked changes in value so that the operator is undecided whether to retain his investment in farming or withdraw it for other uses.

BIBLIOGRAPHY

Books and Periodicals

- Black, John D., Marion Clawson, Charles R. Sayre, and Walter W. Wilcox. Farm Management. New York: Macmillan Company, 1947.
- Bray, F. Sowell, and C. V. Dawe. Farm Accounts. London: Oxford University Press, 1948.
- Efferson, J. Norman. Farm Records and Accounts. New York: Prentice-Hall, 1947.
- Heady, Earl O. Economics of Agricultural Production and Resource Use. New York: Prentice-Hall, 1952.
- Hopkins, John A. Elements of Farm Management. New York: Prentice-Hall, 1947.
- Hopkins, John A., and Earl O. Heady. Farm Records. Ames: Iowa State College Press, 1949.
- Mitchell, Donald H. Farm Accounting. New York: McGraw-Hill Book Company, 1941.
- Nyers, W. I. "Farm Business Analysis." Journal of Farm Economics. Volume VIII, Number 1 (January, 1926), 75-85.
- Stigler, George J. Production and Distribution Theories. New York: Macmillan Company, 1941.

Publications

- . Agricultural Finance Review. United States Department of Agriculture, Bureau of Agricultural Economics. Washington, D. C. Volume 15, November, 1952.
- . Census of Agriculture, 1935. United States Department of Commerce, Bureau of the Census. Washington, D. C.: United States Government Printing Office, Volume 1, 1936.
- . Current Developments in the Farm Real Estate Market. United States Department of Agriculture, Bureau of Agricultural Economics. Washington, D. C. April, 1947.
- . Farm Real Estate Values. United States Department of Agriculture, Bureau of Agricultural Economics co-operating Oklahoma State Board of Agriculture, Office of Agricultural Statistician, 318 Federal Building, Oklahoma City, Oklahoma. June, 1952.

- . Fifteenth Census of the United States, 1930. United States Department of Commerce, Bureau of the Census. Washington, D. C.: United States Government Printing Office. Volume II, Part 2. 1932.
- Johnson, A. R. The Farm Real Estate Situation, 1946-47. United States Department of Agriculture, Circular 780. Washington, D. C.: United States Government Printing Office. March, 1948.
- Parcher, L. A. Tentative Title: Influence of Location on Land Prices in Oklahoma. Manuscript Number 285. Date of Manuscript: August, 1952. Oklahoma Agricultural Experiment Station, Stillwater.
- Fond, George A. "Objectives of Research in the Farm Management Field", Papers Presented at Farm Management Statistical Clinic, University of Illinois, September, 1941. Mimeographed Report: AE-1837, March, 1942. Agricultural Experiment Station, Department of Agricultural Economics, University of Illinois, Urbana, Illinois. 44-48.
- . Sixteenth Census of the United States, 1940. United States Department of Commerce, Bureau of the Census. Washington, D. C.: United States Government Printing Office. Volume 1, Part 5. 1942.
- Umstott, Haven D., and Sarah L. Yarnall. Revised Annual Estimates of Interest Charges and Interest Rates on Farm Mortgage Debts, 1930-43. United States Department of Agriculture, Bureau of Agricultural Economics. Washington, D. C. October, 1944.
- . United States Census of Agriculture, 1925. United States Department of Commerce, Bureau of the Census. Washington, D. C.: United States Government Printing Office. Part II. 1927.
- . United States Census of Agriculture, 1945. United States Department of Commerce, Bureau of the Census. Washington, D. C.: United States Government Printing Office. Volume I, Part 25. 1946.
- . United States Census of Agriculture, 1950. United States Department of Commerce, Bureau of the Census. Washington, D. C.: United States Government Printing Office. Volume I, Part 25. 1952.
- Wright, Karl T. "Use and Limitations of the Biased Sample Supplied by Farm Financial Records." Papers Presented at Farm Management Statistical Clinic, University of Illinois, September, 1941. Mimeographed Report: AE-1837, March, 1942. Agricultural Experiment Station, Department of Agricultural Economics, University of Illinois, Urbana, Illinois. 11-17.
- Yarnall, Sarah L. Farm Mortgage Interest Charges and Interest Rates, 1940-48. United States Department of Agriculture Circular No. 821. Washington, D. C.: United States Government Printing Office. October, 1949.

Table I. Selected Series of Farm Real Estate Values and Index Numbers: State of Oklahoma, Garfield County Average, and Garfield County Farm Accounts, 1929-1950.

Year:	Oklahoma:	Garfield County:	Farm Accounts	Difference:	Per Cent of			
:	Farm	Land and	Land per Acre	Between	Preceding Year			
:	Real	Buildings, Per	Value	Oklahoma	Okla-: Garfield			
:	Estate	Acre	(Dollars):	And Gar-	home : County			
:	Index	Value	Index	field	: : Average			
:	(1935-	(Dol-	(1935	:40=	: : :			
:	40=100)	lars)	and 40:	:100)	:(Points)			
:	1/	2/	=100)	:	:			
1925	143	55.37	115.0					
1929	139	62.63	129.2	74.45	149.7	-28.0	100.00	100.00
1930	139	64.47*	133.0*	72.25	145.3	-6.0	100.00	102.94
1931	127	58.70	121.1	57.32	115.2		91.37	91.05
1932	103	47.41	97.8	52.72	106.0		81.10	80.76
1933	83	38.00	78.4	50.57	101.7		60.58	80.16
1934	91	41.49	85.6	54.27	109.1		109.64	109.18
1935	94	41.62*	86.0*	50.27	101.1	-8.0	103.30	100.47
1936	100	46.22	95.5	51.70	103.9		106.38	111.05
1937	100	48.16	99.5	50.00	100.5		100.00	104.19
1938	103	51.55	106.5	49.91	100.3		103.00	107.04
1939	102	53.00	109.5	50.22	101.0		99.03	102.82
1940	102	54.97*	114.0*	56.34	93.2	+12.0	100.00	104.11
1941	105	55.07	114.2	49.34	99.2		102.94	100.18
1942	111	56.66	117.5	51.09	102.7		105.71	102.89
1943	122	60.71	125.9	50.85	102.2		109.91	107.15
1944	131	63.65	132.0	53.84	106.2		107.38	104.85
1945	143	67.07*	139.0*	54.00	108.6	-4.0	109.16	105.30
1946	171	81.64	169.2	56.08	112.7		119.58	121.73
1947	185	89.80	186.1	54.89	110.7		108.19	109.99
1948	203	99.98	207.2	61.71	124.1		109.73	111.34
1949	231	115.23	238.3	64.17	129.0		113.79	115.25
1950	224	113.55*	235.0*	71.36	143.5	+11.0	96.97	98.41

1/ 1925 and 1929-47: A. H. Johnson. The Farm Real Estate Situation, 1946-47. United States Department of Agriculture, Circular 780. Washington, D. C.: United States Government Printing Office. March, 1948. p. 4-5.

1948-50: Farm Real Estate Values. United States Department of Agriculture, Bureau of Agricultural Economics co-operating Oklahoma State Board of Agriculture, Office of Agricultural Statistician, Oklahoma City, Oklahoma. June, 1952. All land with improvements.

2/ 1925, 1930, 1935, 1940, 1945, and 1950: United States Census of Agriculture. United States Department of Commerce, Bureau of the Census. Washington, D. C.: United States Government Printing Office. All land with improvements. Other years calculated in relationship to Oklahoma index.

* These figures are used as a base to calculate other figures in those columns which are computed in relationship of Garfield county census figures to the Oklahoma index.

Table II. Acreage and Values of Land in Accounting Farms, Garfield County, Oklahoma, 1929-1950.

Year	Total Acres	Total Value of Land		Values Per Acre	
		Unadjusted	Adjusted to County Price Index	Unadjusted	Adjusted to County Price Index
1929	7410.0	551640	551640	74.45	74.45
1930	6510.0	470360	486248	72.25	74.69
1931	21231.0	1217060	1209761	57.32	56.98
1932	16663.0	873390	791905	52.72	47.52
1933	15245.0	770902	615349	50.57	40.36
1934	12843.0	697040	542573	54.27	42.25
1935	16855.0	847265	746324	50.27	44.28
1936	18083.0	934825	870167	51.70	48.12
1937	18540.0	926964	915745	50.00	49.39
1938	25170.5	1256188	1323747	49.91	52.59
1939	16831.0	845910	925013	50.22	54.79
1940	17354.0	827522	953458	46.34	53.40
1941	16423.0	810281	896852	49.34	54.61
1942	15656.5	791674	905281	51.09	57.82
1943	18043.0	917400	1091822	50.85	60.51
1944	18668.5	1005027	1125134	53.84	60.27
1945	12355.0	667157	762913	54.00	61.75
1946	15039.0	846117	1200115	56.08	79.54
1947	11475.5	629853	917631	54.89*	79.96*
1948	9169.0	565321	900200	61.71	98.18
1949	10001.0	641791	1176045	64.17	117.59
1950	8597.0	613512	957351	71.36	111.36

* This value seems to be somewhat out of line, largely on account of one farm of 1145 acres valued at the rate of \$23.01 per acre that was in the project for only this one year, otherwise the unadjusted value would have been \$58.42 and the adjusted value \$86.28 per acre.

Table III. Average Acres and Unadjusted and Adjusted Per Farm Land Values by Years Calculated from Garfield County Farm Account Records.

Year	Acres Per Farm	Land Values Per Farm (Dollars)		Difference Adjusted - Unadjusted
		Unadjusted	Adjusted	
1929	326.5	23984	23984	000
1930	310.0	22398	23154	756
1931	348.0	19952	19829	-123
1932	336.5	17568	15990	-1578
1933	298.9	15115	12064	-3051
1934	321.1	15426	13566	-1860
1935	337.1	16945	14927	-2018
1936	328.8	16815	15822	-993
1937	337.1	16854	16649	-205
1938	349.6	16891	18358	1467
1939	337.6	16918	18497	1561
1940	379.9	18220	20287	2067
1941	363.9	17963	19873	1910
1942	391.4	19791	22631	2840
1943	410.0	20850	24809	3959
1944	424.7	22824	25597	2773
1945	393.2	21253	24280	3027
1946	407.8	22870	32436	9566
1947	416.1	22029	33271	11242
1948	409.1	24601	40165	15564
1949	416.7	26348	49000	22652
1950	409.4	29215	45591	16376

Table IV. Farm Mortgage Interest Rates by Years from 1929-1950 for Oklahoma and the United States.

Year	Oklahoma Per Cent <u>1/</u>	United States Per Cent <u>1/</u>
1929	6.3	6.0
1930	6.3	6.0
1931	6.3	6.0
1932	6.3	6.0
1933	6.3	6.0
1934	6.0	5.8
1935	5.7	5.5
1936	5.3	5.1
1937	5.1	4.9
1938	4.8	4.7
1939	4.7	4.6
1940	4.5	4.6
1941	4.5	4.5
1942	4.4	4.4
1943	4.4	4.4
1944	4.3	4.4
1945	4.4	4.5
1946	4.5	4.6
1947	4.6	4.6
1948	4.7	4.6
1949	4.7*	4.6
1950	4.7*	4.6

1/ 1929-39: Haven D. Umstott, and Sarah L. Yarnall. Revised Annual Estimates of Interest Charges and Interest Rates on Farm Mortgage Debts, 1930-43. United States Department of Agriculture, Bureau of Agricultural Economics. Washington, D. C. October, 1944. p. 30.

1940-48: Sarah L. Yarnall. Farm Mortgage Interest Charges and Interest Rates, 1940-48. United States Department of Agriculture, Circular No. 821. Washington, D. C: United States Government Printing Office. October, 1949. p. 29-30.

1949-50: Agricultural Finance Review. United States Department of Agriculture, Bureau of Agricultural Economics. Washington, D. C., Volume 15, November, 1952. p. 97.

*Estimated in relation to the United States figures.

Table V. Four Possible Ways of Calculating Land Cost or Charge to Land From Garfield County Farm Accounts: Using the Straight Line 5% Method and the Current Rate of Interest as Applied to Both Unadjusted and Adjusted Farm Land Values.

Year :	Interest Charge on Land				Average :	Land Cost (Interest / Taxes)			
	Unadjusted Value		Adjusted Value			Land	Unadjusted Value		Adjusted Value
:	:	:	:	:	:	:	:	:	:
:	Interest	Interest	Interest	Interest	Per	Interest	Interest	Interest	Interest
:	at 5%	at	at 5%	at	Farm	at 5%	at	at 5%	at
:	<u>1/</u>	Current		Current	<u>2/</u>	<u>1/</u>	Current		Current
:	:	Rate	:	Rate	:	:	Rate	:	Rate
:	:	:	:	:	:	:	:	:	:
1929	1199	1511	1199	1511	219	1418	1730	1418	1730
1930	1120	1411	1158	1459	218	1338	1629	1376	1677
1931	998	1257	991	1249	213	1211	1470	1204	1462
1932	878	1107	800	1007	199	1077	1306	999	1206
1933	756	952	603	760	146	902	1098	749	906
1934	771	926	678	814	71	812	997	749	885
1935	847	966	746	851	96	943	1062	842	947
1936	841	891	791	839	87	928	978	791	926
1937	843	860	832	849	82	925	942	914	931
1938	845	811	919	882	79	924	890	998	961
1939	846	795	925	859	78	924	873	1003	947
1940	911	820	1014	913	96	1007	916	1110	1009
1941	898	808	994	894	106	1004	914	1100	1000
1942	990	871	1132	996	102	1092	973	1234	1098
1943	1042	917	1240	1072	113	1155	1030	1353	1205
1944	1141	981	1280	1101	135	1276	1116	1415	1236
1945	1063	935	1071	1068	103	1166	1038	1317	1171
1946	1144	1029	1622	1460	125	1269	1154	1747	1585
1947	1101	1013	1664	1530	147	1248	1160	1611	1677
1948	1230	1156	2008	1888	170	1400	1326	2178	2058
1949	1317	1238	2450	2303	224	1541	1462	2674	2527
1950	1461	1373	2280	2143	193	1654	1566	2473	2336

1/ Land charges used by Garfield county farm account keepers.

2/ Land taxes are calculated from the total taxes in the same ratio as land is to the total investment.

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