

THE COST AND RELATION OF FARM DEBTS
TO ASSETS AND INCOME

by

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INTRODUCTION

Agriculture in Kansas is becoming more and more specialized as new labor saving devices are put on the market. By this, it is meant that farmers are becoming more dependent upon others for a larger share of their working capital than was the case prior to 1914. For example, today many farmers use mechanical power to draw farm equipment which in turn requires fuel and oil processed by people working in other industries. Previously this equipment was drawn by horse power produced on the farm or in the community with little actual cash outlay. These same horses were fed from the store of feed raised on the farm. Labor saving devices have changed greatly the relationship of each of the factors of production; namely, land, labor, and capital. This change has been toward increasing the importance of capital and decreasing the importance of labor, until today, capital is the limiting factor on many Kansas farms. One man with adequate capital can do many times more work in a given time today than was possible prior to 1914.

This change as well as many others has brought about a decided increase in the importance of the financial management of the farm business. With more money being spent in operating the farm, it is logical to conclude that more money must be earned from farm operations if the net result is to be favorable and provide a satisfactory standard of living for the farmer and his family. The question of how far one should go in expanding the use of his credit to increase his income by

having a more economical unit and at the same time operate on a sufficiently safe margin to be able to withstand periods of adverse weather and price conditions is a pertinent one to present day agriculture. The tool known as credit is used more on most farms today than any other tool used in the production process.

Although a great deal of literature is available showing the total indebtedness of farms, there is very little showing the type of debt and the relation of that debt to assets and income for a period of several years covering the same farms. L. J. Morton, Joseph Ackersan, and C. R. Sayre (3) summarized a survey made in 1935 of 1,055 Illinois farms. The debt-to-property ratio and cash income was calculated for each operator as a basis for studying comparisons including different tenure groups, analysis of 1935 capacity to pay, adjusting financial plans to capacity to pay, and land ownership to capacity to pay. Their conclusions were "the capacity of farmers to pay their debts from farm earnings varies greatly even among farmers having assets of about the same value. It increases with income but decreases with debts." Recommendations were also made in regard to the type of loans that should be made to different classes of farmers based on their ability to repay their debts.

Pine of Kansas (4) concluded that if the debt exceeds three times the gross income, the debtor is approaching an unsound financial condition from the standpoint of ability to pay the debt. He also stated that the average farm can carry a debt load of 2.1 times the income at a five per cent interest rate.

The purpose of this study is to make an inquiry into the amount and kinds of credit used, the costs of credit used, the relationship of total credit and costs of credit to total business assets, and the relationship of the amount and costs of credit used to gross and net farm income in order to determine what has actually existed on Kansas farms over a period of years. It is hoped that this study will provide information that will aid in establishing a guide as to the wise use one can make of available credit in determining the proper balance of credit and assets.

What per cent of my total assets should be represented by debt? What is a reasonable rate of interest to pay? What should be the relationship of short-time loans to net farm income? What type of credit is best from the standpoint of cost? These questions and many others are being asked by farmers every day. No attempt is made in this study to answer these and many other questions specifically, but an effort will be made to show what has actually happened over a period of years on a group of Kansas farms and in that way point to possible answers to the above questions.

METHODS AND PROCEDURE

Source of Information

Information for this study was obtained from records kept by farmers under the supervision of the fieldman for the farm management association located in north central Kansas. This association is known as

Farm Management Association No. 1 and hereafter will be referred to as such. Figure 1 shows the eight counties included in this study together with the other counties served by farm management associations. Morris and Pottawatomie Counties of Association No. 1 were not included in this study because there were no records running five consecutive years in those counties.

Farm management service is available to farmers in 45 Kansas counties located in central and northeast Kansas. During 1938, 691 Kansas farmers received service from these associations. The purpose of these associations is to give assistance and instruction to members in better farm practices and proper farm organization. Emphasis is placed on the proper balance between crops to maintain soil fertility, between the different classes of livestock, and between livestock and crops in line with the financial resources of that farm and the long-time outlook for commodities produced. This service is built around complete farm records of the farm business kept in a uniform manner in farm account books furnished by each association and kept by each member with the assistance of the fieldman. These records are sufficiently complete and accurate for summary and analysis purposes. Two of the four associations have been organized since 1930 and have records from 1931 to 1938, inclusive. Records from 1932 to 1937 were used for this study.

Upon close examination of records kept by members in Farm Management Association No. 1, it was found that although these records were complete enough for studies of the farm business, they were not detailed

enough to provide all the information needed in this study. Many records lacked information on the interest rate agreed to be paid on each obligation and the type of each obligation. This information is extremely difficult to obtain, since it deals with the financial aspects of the farm business which is considered by many farmers to be of a strictly personal nature and not to be divulged to anyone or made public in any way.

It was necessary to devise a plan whereby detailed information concerning the credit structure of the business could be obtained in usable form. This information had to be of such nature that it could be used with figures concerning total assets and farm income as was obtained from the records kept over the period of years (see form 2 in appendix). A list was made of all members having kept records five or more years out of the seven. In so far as possible, a complete list by years, of all debts by type and interest costs was made from the records turned in for summary and analysis. After listing this data, a survey was made of those members' records of five or more years for the additional information necessary to make the material for the study complete. This additional information consisted of getting the interest rate agreed upon for each item of debt, the particular type of debt owed, and a check to make sure that each item of debt was listed by years. A letter of inquiry was prepared and sent out to several of the members. The failure to return these letters of inquiry required the survey to be made. After an explanation of the purpose of securing the information and the

use to which it was to be put, together with assurance that the information concerning the individual would not be made public, 100 per cent cooperation was secured. A total of 31 farms with records for five years or more was obtained for 1931; 40 for 1932; 51 for 1933; 52 for each of 1934 and 1935; 49 for 1936; and 46 for 1937.

Information on each farm as of January 1 was used. The debts owed as of January 1 were taken as the debts owed by that member. This did not give a picture of the average or total indebtedness for the year, but it did show the debt structure in relation to the assets supporting that debt which was also taken as of January 1. Total interest paid was computed from the interest rates assigned to each item of debt, rather than the total amount of interest paid as shown in the expense section of the records. This gave the total interest contracted on the basis of each debt running the entire year whether the interest was paid that particular year or not. Each individual's debt was considered as a separate item. When debt was compared to assets and farm income, the individual's debt and his equity in the farm business assets and share of the total farm income was considered on the basis of what he owed and the amount of assets and farm income he had to carry that debt, and meet principal and interest payments. Interest costs figured on the basis of debts owed at the first of the year multiplied by the interest rate showed little relationship to total interest paid as was shown in the expense section of the records kept during the years. This condition does not indicate that inaccurate records were kept or that interest

costs as were figured for this study were misleading. The length of time each debt ran if less than 12 months influenced interest costs. The amount of debt contracted and paid during a record year, therefore not appearing in the inventories influenced interest costs and per cent interest paid when compared to debt owed at the beginning of the year. From the results of this survey, it is evident that the total interest paid during the year could not be compared to debts owed January 1 of any given year in computing average per cent of interest paid.

Changes in the kind of credit used, as well as changes in the cost of that credit, were prepared showing the trend over a period of years. Debt and the cost of that debt were compared to total assets and farm income showing the changes as they occurred over the years. In all cases weighted averages were used in making comparisons.

Description of the Farms

The farms included in this study were general farms having, for the most part, a well-balanced livestock program. The livestock program varied among the farms both in type of livestock kept and the proportion of the business represented by livestock. Since the sample was small, no distinction was made on the basis of type of agriculture followed on each farm. In studying these farms over a period of years, it was found that many would shift from one type of agriculture to another, due to price relationships rather than any actual changes made in the farm organization. This condition increased the problem when an attempt was

made to study the farm on a type-of-farm basis.

The farms included in this study are for the most part good average farms. Only a few could be classed as low type farms, and many could be classed as the highest type of farm from the standpoint of the ability of the operator and the productivity of the land. These farms run above average for the territory on net farm income, dollars invested, and standard of living for the family.

Normality of Period Covered

The period covered by this study is somewhat abnormal since it includes the years, 1932 to 1937, inclusive. The year, 1935, was the most favorable year from the standpoint of farm income. A part of this farm income is reflected in an increase in inventory value of salable farm commodities. The poorest financial year was 1932 when the interest costs required practically all net farm income, exclusive of interest costs, leaving a small amount with which to purchase the necessary items for personal living and pay principal payments due on the debts owed. The accounting principles followed in keeping association farm records keep changes in inventory value to a minimum in that productive working capital which is represented by work stock, beef cow herds, or dairy herds is inventoried at a conservative price and is kept within a narrow range of that price as long as the average quality is maintained over a period of years. By following this policy, any material change that takes place in inventory value is based on a change in the quantity or

value of market produce rather than any change in the value of productive working capital. Market produce referred to here includes farm property such as grain, feed, or market classes of livestock that will be marketed in one form or another before any cash returns can be obtained. By following this policy in making an inventory of farm property, it was deemed advisable to include inventory changes in the income studies. In this way, the farm was given credit for the market products produced during the calendar year whether sold that year or not.

Definition of Terms

Association refers to Farm Management Association No. 1.

Member refers to a member of Farm Management Association No. 1.

Total assets is the total farm property owned by the member being studied including land, buildings, machinery, grain, feeds, and supplies, livestock, and accounts receivable.

Net farm income is the difference between total cash farm receipts plus any increase in inventory value of livestock or crops and total farm expenses plus any decrease in inventory value of livestock and crops.

Gross farm income is the total cash income of the business including any change in inventory of livestock and crops.

Mortgage debt is referred to as that portion of the total debt secured by real estate mortgage.

Commercial banks are referred to as state or national banks located

in the towns over the territory that furnish depository service for the community.

Insurance company is referred to as life insurance companies and trust or mortgage companies set up to handle loans and real estate for life insurance companies.

THE AMOUNT AND KINDS OF CREDIT USED

A detailed record of all credit by kind and amount was obtained on 44 farms for a five-year period, 1933 to 1937, inclusive. These farms were located in the counties as follows: Riley fifteen, Cloud seven, Washington five, Clay five, Geary two, Ottawa three, Dickinson three, and Marshall four. These farms represent all types of tenure including owner-operator, part owner-operator, and tenant. Since the type of farm did not remain the same on a high per cent of the farms over the five-year period, no attempt was made to make studies based on type of farm. The debt structure was divided into the following classes: Debt secured by real estate mortgage; short-time commercial bank, insurance company, and building and loan debts; and other interest-bearing and non interest-bearing debt (Table 1).

There were from 40 to 42 farms out of the 44 studied listing some kind of debt for each of the five years leaving from two to four farms not owing any debt January 1. On this basis, 91 to 95 per cent of all farms studied were carrying some debt load.

Mortgage Debt Secured by Real Estate

Of the 44 farms, there were never less than 26 nor more than 28 of these farms having mortgage debt secured by real estate. Real estate mortgage debt was divided among three types of lending agencies (Table 2). Those agencies were (1) federal land bank (2) private individuals and (3) insurance companies. In one instance in 1933, there was a small mortgage on real estate held by a commercial bank which was included with insurance companies.

Table 2. The amount of mortgage debt secured by real estate by major lending agencies, 1933 to 1937.

Type of Agency	1933	1934	1935	1936	1937	Average
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Federal Land Bank and Land Bank Commissioner	113,822	106,256	144,960	140,813	142,332	129,637
Individual	58,700	64,000	41,300	38,050	31,700	46,750
Insurance Company and Commercial Bank	10,000	9,500	9,500	9,500	9,500	9,600
Total	182,522	179,756	195,760	188,363	183,532	185,987

Table 3 shows the shift in type of mortgage credit used by farmers whose records are included in this study. The number and amount of real estate mortgage loans held by insurance companies were too small to be

of importance (Table 2). The major change in the type of lending agency holding the real estate mortgage as security for loans occurred between the federal land bank and land bank commissioner and private individuals (Table 3). From 1934 to 1937, the number of loans held by the federal land bank increased 38 per cent, while the number of loans held by private individuals decreased 41 per cent during the same time.

Table 3. The per cent of the number of farms having different types of loans secured by mortgage, 1933 to 1937.

Type of Loan	1933	1934	1935	1936	1937
	Per cent	Per cent	Per cent	Per cent	Per cent
Federal Land Bank and Land Bank Commissioner	50	50	62	61	69
Individual	42	46	34	35	27
Insurance Company and Commercial Bank	8	4	4	4	4
Total	100	100	100	100	100

The per cent of the total amount loaned in dollars (Table 4) by different lending agencies shows even a greater increase over the five-year period in federal land bank and land bank commissioner loans than when the increase was based on the number of individuals obtaining mortgage credit, as is shown in Table 3. This indicates that the federal land bank and land bank commissioner loans were large in proportion to

other types of mortgage loans. It also indicates that the amount loaned by the federal land bank and land bank commissioner increased more per farm over the five-year period than did other types of mortgage loans.

The change in the total mortgage debt shows a substantial decrease during 1936 and 1937, but is still above the total of 1933 as is shown in Table 1. The per cent of change from January 1, 1933, to January 1, 1937 (Table 5), is comparable to a decrease of 2.3 from January 1, 1935, to January 1, 1936, and 3.7 from January 1, 1936, to January 1, 1937, as shown in Agricultural Finance Review (1) which totals the same for these two years. This indicates that, from the standpoint of per cent change, the relationship of the farms included in this study is comparable to the average farm having mortgage debt in Kansas.

Table 4. Per cent of total real estate mortgage in dollars held by major lending agencies, 1933 to 1937.

Type of Agency	1933	1934	1935	1936	1937	Average
	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
Federal Land Bank and Land Bank Commissioner	62	59	74	75	78	70
Individual	32	36	21	20	17	25
Insurance Company and Commercial Bank	6	5	5	5	5	5
Total	100	100	100	100	100	100

Short-term Credit

Farms having short-time loans from commercial, state, and national banks doing business for the most part in the community where the member was operating, insurance company policy loans, and building and loan associations ranged from 24 to 30 of the 44 farms during the five years, 1933 to 1937. This grouping was made in order to include all short-time loans that could be obtained by anyone having sufficient security. In other words this class of debt includes all commercial short-term credit used by these particular samples.

Table 5. Change in total mortgage debt in per cent from January, 1933, to January, 1937.

Year	Per cent Change
January 1, 1933, to: January 1, 1934	-1.5
January 1, 1934, to: January 1, 1935	+9.0
January 1, 1935, to: January 1, 1936	-3.5
January 1, 1936, to: January 1, 1937	-2.5

The largest amount of this type of credit outstanding any one year was \$46,992 in 1934. This figure was followed by the smallest amount outstanding in 1935 of \$28,846 and 1937 of \$28,958, a decrease of 38 per

cent (Table 1). This type of credit fluctuated more in total amount than any other type used. This can be accounted for in two ways. In the first place, this type of credit is, for the most part, written for a short term, that is from three to nine months; and second, the cost of this type of credit was considerably higher than other general short-term types used (Figure 3).

Farms having other short-term interest-bearing debt, including personal loans, store credit where interest rates were charged, installment credit, taxes due and unpaid, and any other noncommercial credit were included as one group. The use of this type of credit exceeded the use of commercial short-time credit by an average total of \$3,750. This particular fact leads one to believe that, from the standpoint of short-time credit, the farms included in this study have on an average more noncommercial credit available than most farms in Kansas. This grouping of short-term credit was made to include all credit that might be obtained without security or from a source that is not available to the public. This type of credit was, for the most part, made up of private individual loans made by either relatives or friends.

The five-year average shows that mortgage credit secured by real estate represents 70 per cent of all credit used with a shift to long-time credit as shown in Table 6.

Norton, Ackerman, and Sayre (3) found that 82.6 per cent of the credit in Illinois in 1935 was represented by long-term loans.

Non-interest bearing credit used, represented for the most part

unpaid accounts at the close of the year, remained fairly constant over the five-year period and constituted from two to four per cent of credit used. This type of credit is high in per cent of total because two of the samples studied accounted for almost 20 per cent of the total non interest-bearing credit reported.

Table 6. Per cent of total debt represented by different classes of credit used, 1933 to 1937.

Year	(Per cent)	Commercial Short-time Bank and In- surance Com- pany Policy Debt	(Per cent)	Other Interest Bearing Debt	(Per cent)	Non Interest- Bearing Debt	(Per cent)
1933	69	12	16	3			
1934	62	17	17	4			
1935	72	11	13	4			
1936	72	13	12	3			
1937	73	11	14	2			
5-Yr. Ave.	70	13	14	3			

COSTS OF CREDIT USED

The same 44 farms included in studying the amounts and kinds of credit used were considered in studying the costs of credit used (Table 8).

Cost of Long-term Credit

Table 3 indicates a decided shift in the number of loans made by the federal land bank and land bank commissioner as a source of long-term credit from 1933 to 1937. Table 7 and figure 2 indicate possible reasons for such a shift. The cost of land bank and land bank commissioner credit which was based on the amount actually paid (and not necessarily the amount called for in the notes, due to a regulation passed by recent Congresses reducing temporarily the interest rates called for on most federal land bank notes) shows a steady decrease from five per cent in 1933 to 3.7 per cent in 1936. The increase of one-tenth of one per cent in 1937 was due chiefly to new loans secured by contract of purchase calling for a specified rate of interest until the contract was complied with and the land deeded to the purchaser. This interest rate was favorable to the borrower in 1937 compared to the fairly constant interest rates of 5.7 and 5.6 charged by other long-term lending agencies. The reduction in federal land bank and land bank commissioner interest rates (Table 7) afforded the borrowers a saving in interest of \$1,438 in 1937 on land bank and land bank commissioner indebtedness compared to the amount that would have been paid had the 1933 interest rate been charged. This is a saving of 24 per cent in total interest costs of federal land bank and land bank commissioner credit.

Interest rates charged by lending agencies other than federal land bank has been reduced materially since January 1, 1937, on sound real

estate mortgage loans according to information obtained from knowledge of a few such loans. This reduction brings all long-time mortgage interest rates more nearly in line with each other than Table 7 might indicate. This brings the lowest interest rate ever known in history to farmers for long-term real estate mortgage credit. Federal land bank loans are being written today for four per cent per annum. This will be the rate at which present day borrowers will pay if and when Congress ceases to grant additional reduction or extension of present interest reductions.

Table 7. Rates of interest paid on long-term mortgage loans by type of lending agency for 1933 to 1937.

Type of Loan	1933	1934	1935	1936	1937	Average
	Per cent Interest	Per cent Interest	Per cent Interest	Per cent Interest	Per cent Interest	Per cent Interest
Federal Land Bank and Land Bank Commissioners	5.0	4.4	3.7	3.7	3.8	4.0
Individual	5.7	5.7	5.5	5.5	6.0	5.7
Insurance Company and Commercial Bank	5.6	5.6	5.6	5.6	5.6	5.6

Cost of Short-term Credit

Interest costs on short-term loans varied little during the five

years studied. Bank loans averaged 7.42 per cent for the five years while insurance company policy, and building and loan loans averaged 6.3 per cent. Individual loans averaged 5.7 per cent and the average interest rate charged on store credit and installment debt was 7.8 per cent. This cost of store and installment credit does not represent a true cost in many instances because no information was obtained as to the cash saving one might have made in the form of a cash discount which should be added to interest costs when the installment plan of buying is used. This is particularly true since cash payment usually is accompanied by a discount. In a few cases where the actual cost of this type of credit was obtained, the rates ran much higher. In figuring the average interest rates, the actual rates contracted were totaled and divided by the number of samples for the period. This type of credit compares with the type of credit used in a study made by A. H. Moore and J. T. Sanders (2) where it was found that store credit cost farm owners 18.4 per cent and farm tenants 38.5 per cent in 1925 and 1926. Installment credit cost a great deal more in 1925 and 1926 than it does today according to the results of these studies.

With commercial bank and insurance company policy loans costing an average of 7.2 per cent, the decline of six per cent in total loans from that source of credit from 1934 to 1937 can be accounted for. This represents a decline from \$46,992 in 1934 to \$28,958 in 1937, a reduction of 38.0%. This reduction in commercial credit represents 38 per cent of that source of credit from the high in 1934 to 1937. The

reduction in other noncommercial short-term interest-bearing debt was not as great being from \$47,238 in 1934 to \$34,550 in 1937, a reduction of \$12,688. This represents a reduction of 26 per cent of that type of credit. The average cost of this type of credit was 5.6 per cent.

With the reduction in long-term mortgage credit interest rates and particularly federal land bank and land bank commissioner interest rates compared to short-term interest rates, a substantial saving was made in interest costs alone. With the possibilities of substantial savings in interest costs, it is well to consider carefully the costs of credit used before borrowing additional capital. Unless additional capital is needed for a short period and is to be paid on the due date without renewals, serious consideration should be given to possible long-term mortgage loans if loans of this type can be secured. On the basis of this study, long-term federal land bank and land bank commissioner loans are costing 3.7 per cent interest with land bank loan contracts calling for four per cent which will be paid if and when the United States government discontinues the practice of absorbing part of the present interest rates. Assuming the full interest rate was paid according to present contract agreements, the cost of long-term credit at four per cent would be little over one-half the present cost of commercial bank credit which cost 7.4 per cent (Table 8). This means that almost twice the amount of mortgage credit could be secured at the same interest cost when compared to short-term commercial credit.

Possibly the high interest charge for commercial bank credit

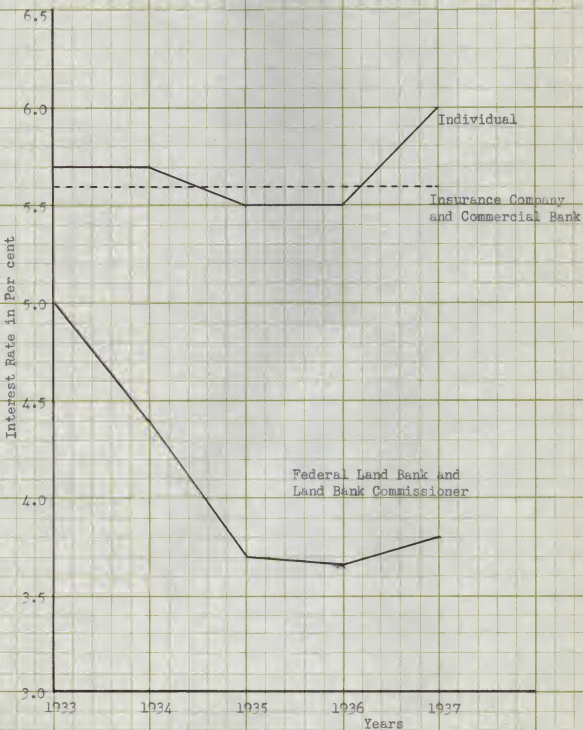


Fig. 2. Average interest cost of long-term credit by major lending agency, 1933 to 1937.

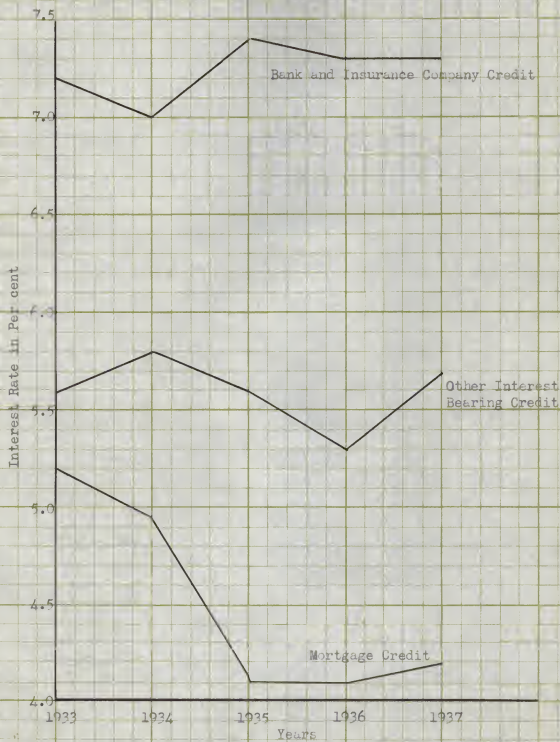


Fig. 3. Interest rate by type of credit, 1933 to 1937.

accounts for the wide fluctuations in amounts borrowed over the five-year period. This charge exceeded all other interest charges except installment credit which was used very little by those members included in this study as has been previously mentioned (Table 2). The variation of interest costs for different types of credit based on this study indicates that in many instances overhead expenses can be materially reduced by using the proper type of credit best suited to the business needs. Possible savings in interest costs should not be reflected in increased prices for those items purchased by the use of credit. If this saving is reflected in increased prices, there will be no particular advantage in having reduced interest rates.

RELATIONSHIP OF TOTAL CREDIT AND COSTS OF CREDIT TO ASSETS AND INCOME

Studies showing the relationship of credit and costs of credit to farm business assets and incomes are based on 27 farms for a five-year period, 1932 to 1936, inclusive. The sample was reduced to this size because it was felt that a study covering a period of years should include the same farms if the study from year to year was to be comparable. The five years, 1932 to 1936, were used because by selecting that particular period, more farms having five-year records could be obtained than for any other five-year period. This five-year period provides 135 farm years' records while had any other combination been used, the total years' records would have been reduced. This sample is smaller than the one used in debt studies alone because, in several instances, a complete

debt record was obtained when the survey was made. It was not possible to get an accurate report of the farm assets and income figures on all these farms since the figures regarding farm assets and income were taken from records kept currently each year. Unless the records had been kept currently during the years, no effort was made to get that information since it would be a guess on the part of most members.

These farms were located in the following counties: Riley with ten farms included; Cloud, five; Washington, four; Clay, three; Geary, two; Dickinson, two; and Ottawa, one. These farms represented all types of tenure, owner-operator, part owner-operator, and tenant operated. No attempt was made to study the samples on a type-of-farm basis due to the small number of samples. All studies based on averages are shown as weighted averages.

Debt and Interest Costs to Total Farm Business Assets

Table 9 shows that the weighted yearly average dollar of assets per dollar of debt ranged from \$3.52 in 1933 to \$3.87 in 1936 or a difference of 35 cents from the two extremes. When compared to the average, 1933 is 12 cents below and 1936 is 23 cents above the average. The total debt ranged from 29 per cent in 1933 and 1934 to 26 per cent in 1936 of the total assets which is a spread of 3 per cent from the high to the low.

The tendency during the five-year period was to increase the dollars of assets per dollar of debt. With the exception of 1932, there

was a gradual increase in dollars of assets per dollar of debt. This was brought about by an increase in total assets from \$548,989 in 1933 to \$590,496 in 1936 or a \$41,507 increase. At the same time there was a reduction of total indebtedness from \$155,957 in 1933 to \$152,172 in 1936 or a reduction of \$3,785.

With the exception of 1932, there was a constant decrease in the amount of interest paid per \$100 of assets. This decrease ranged from \$1.54 in 1933 to \$1.13 in 1936. There were three factors affecting the trend from 1932 to 1936 as follows: An increase in total assets, a decrease in total debt, and a reduction of interest rates from 1932 to 1936. The interest rate charged is important from the standpoint of interest costs to dollars of assets. Had interest rates remained constant over the five-year period, the spread from 1933 to 1936 of interest paid per \$100 of assets would have been 13 cents instead of 41 cents which was actually the case.

The relationship of debt and interest costs to total assets indicates that the farms included in this study increased the soundness of their financial positions from the standpoint of having more property as security for their debts and also having more property for the production of increased income.

Debt and Interest Paid Compared to Gross Income

The gross income represented by all cash farm income plus or minus any change in the inventory value of crops and livestock showed an

Table 9. Debt and interest paid compared to total assets by years, 1932 to 1936.

Year :	Total : Debt : (Dollars) :	Total : Interest : Paid : (Dollars) :	Interest : Paid : (Per cent) :	Total : Assets : (Dollars) :	Dollars of : Assets per : Dollar of : Debt :	Dollars : of Interest : Paid per : \$100 : Assets : (Per cent) :	Total : Assets : Represented : by Debt :
1932 :	159,962 :	8,741 :	5.5 :	586,398 :	3.69 :	1.43 :	27 :
1933 :	155,957 :	8,452 :	5.4 :	548,989 :	3.52 :	1.54 :	29 :
1934 :	155,797 :	8,944 :	5.1 :	559,830 :	3.53 :	1.46 :	29 :
1935 :	151,019 :	7,124 :	4.7 :	546,018 :	3.61 :	1.30 :	28 :
1936 :	152,172 :	6,671 :	4.4 :	590,498 :	3.87 :	1.13 :	26 :
5-Yr. Total :	773,987 :	50,032 :	25.1 :	2,822,733 :	18.22 :	6.92 :	139 :
5-Yr. Ave. :	154,797 :	7,806 :	5.0 :	564,547 :	3.64 :	1.28 :	28 :

increase from \$67,820 in 1932 to \$142,272 in 1935 and a drop to \$132,262 in 1936 (Table 10). From this income, all farm operating expense, including interest on indebtedness and personal living expense, and payment of principal on outstanding debts had to be paid.

Table 10 shows that the relationship between total debt and gross farm income is not constant over a period of years in that the change from 1932 of \$2.33 debt for each dollar of income to \$1.05 debt for each dollar of income in 1935 represents a decrease of \$1.28 from 1932 to 1935. The fewer the dollars of debt per dollar of gross income, the better is the financial position of the business. From the figures obtained in this study, it would seem that the dollars of gross income any one year would not be an indication of how much debt the farm could carry over a period of years. The change in relationship of debt to gross income over the years was more than 100 per cent while the change in the relationship of debt to total assets varied but three per cent.

The dollars of gross income increased from \$7.76 in 1932 to \$20.11 in 1935 for each dollar of interest paid. Although the gross income per dollar of interest paid in 1936 showed a decline from 1935, the amount was small compared to changes occurring in previous years. Again the financial position of the farms showed improvement from 1932 to 1936. Here again a decided change had taken place in the relationship of gross income to interest paid. Part of this change was due to a change in interest rate; but for the most part, the change was caused by an increase in gross farm income from the extreme lows of the low price period of

Table 10. Debt and interest paid compared to gross income, 1932 to 1936.

Year	Total Debt :(Dollars):	Average Debt per Farm :(Dollars):	Total Interest Paid :(Dollars):	Average Interest Paid :(Dollars):	Total Gross Farm Income :(Dollars):	Average Gross Farm Income :(Dollars):	Dollars of Debt per Dollar of Gross Income	Per cent Gross Income to Total Debt	Dollars Gross Income per Dollar of Interest Paid
1932	159,082	5,892	8,741	324	67,823	2,512	2.23	42	7.76
1933	155,957	5,776	8,452	313	91,528	3,390	1.71	51	10.82
1934	155,757	5,769	8,044	298	103,914	3,849	1.50	67	12.91
1935	151,019	5,593	7,124	264	142,272	5,269	1.05	94	20.11
1936	152,172	5,636	6,671	247	132,262	4,899	1.14	87	19.82
5-Yr. Total	773,987	28,666	39,032	1,446	537,796	19,919	7.73	341	71.42
5-Yr. Ave.	154,797	5,733	7,806	289	107,559	3,984	1.54	68	14.28

1932 to 1934. It is desirable to have a high gross income per dollar of interest paid. As desirable as this condition is, it is difficult to make recommendations as to the year to year financial policy of a given farm on the basis of this relationship since it does not remain sufficiently constant over a period of years, according to this study, for one to be able to draw definite conclusions.

Debt and Interest Paid Compared to Net Farm Income

When this same study was applied to net farm income, an even wider range occurred during the five-year period. Table 11 shows the net farm income exclusive of any interest payments and the amount of interest contracted on the basis of the amount of debt owed January 1 of each year and the rate of interest charged for each item of debt. In other words, the net farm income as indicated here is that part of the gross income left after all other farm expenses except interest costs have been deducted. This amount was left to take care of interest charges and personal living expenses. In 1932 interest costs required 87 per cent of the net farm income exclusive of interest costs which indicates that only 13 per cent of this income could be used for personal living expenses and payment on principal. The range ran from 24 per cent to 11 per cent during the other four years with the best year occurring in 1935. This was also the best year for high farm incomes in that the income this year was \$16,000 greater than any of the other years studied.

Here again there is no consistency one year with another in the

Table 11. Net income exclusive of interest costs and total interest paid for years, 1932 to 1936.

Year	Net Income Exclusive of Interest Paid (Dollars)	Net Income Exclusive of Interest Paid (Dollars)	Amount of Interest Cost per Farm (Dollars)	Net Farm Income (Dollars)	Net Income (Dollars)	Dollar of Net Farm Income per Dollar of Net Income Exclusive of Interest Paid (Dollars)	Int. Pay-ment in Per cent of Net Income
1932	13,067	373	324	1,326	49	.15	87
1933	45,131	1,672	213	36,679	1,358	4.40	19
1934	33,635	1,246	298	25,591	948	3.18	24
1935	66,608	2,467	260	59,584	2,207	8.50	11
1936	50,504	1,871	247	43,833	1,623	6.55	13
5-Yr. Total	205,945	7,629	1,442	167,013	6,185	22.78	154
5-Yr. Ave.	41,189	1,526	288	33,403	1,237	4.56	21

relationship of debt and interest costs to net farm income. A study of any one year's results or a series of years' results without regard to changes from year to year would not show this variation. The important reason for these wide fluctuations in debt to net farm income exclusive of interest payments is due to the relatively stable debt structure and the unstable net farm income from year to year. A study based on a number of years' results with no regard to any particular year might give a picture of the debt carrying capacity of a farm based on the net farm income one might expect over a long period of years. If, however, the price cycle was on a long-time down trend, one may be forced to liquidate in order to meet obligations before conditions would become favorable for payment of debt contracted on the basis of higher prices and larger incomes. In other words, the debt carrying capacity based on net farm income studies, will fluctuate from the average a great deal from year to year according to results based on this study.

SUMMARY

This study indicates that a decided shift to long-term credit had taken place during the five years, 1933 to 1937. There was a reduction in total debt from 1933 to 1937 with long-term mortgage debt showing but a small part of that decrease. Long-term debt was made up of federal land bank and land bank commissioner, individual, and insurance company and commercial bank loans. Land bank and land bank commissioner loans made up from 62 to 78 per cent, from 1933 to 1937, of the total long-term indebtedness.

The per cent of interest paid on total debt decreased from 5.4 per cent in 1933 to 4.8 per cent in 1937. This decrease in interest rate represented a saving of \$1,500 annually from what the total interest costs would have been had there been no reduction in interest rate. Most of this saving was made by the reduced interest rates on federal land bank and land bank commissioner loans. Since the per cent of the total long-term mortgage debt represented by federal land bank and land bank commissioner loans increased during the five-year period, the reduction in total interest costs was greater than it would have been otherwise. Since there were never less than 43 of the 44 farms studied carrying some debt load, credit institutions are in a position to aid materially in working with farmers in regard to their credit and financial problems. If low interest rates are to be helpful to agriculture in general, this reduction in interest rates must not be reflected in an

increase in prices paid for property purchased with credit secured. If prices are increased, the total interest load will remain the same while the debt load will be increased. This would prove to be an added burden rather than a benefit to anyone securing credit.

The relationship of debt to total assets varied less over the years than any other comparison made. Total debt represented a spread of from 26 to 29 per cent of the total assets during the five years, which is a maximum spread of three per cent. Had tenants and part owner-operators been excluded from the study, the relationship might have been somewhat different with even less fluctuation in per cent of assets represented by debt. From the standpoint of determining the proper relationship between debts to a known figure such as assets or income, the comparison to assets was the most consistent over the five-year period.

Yearly studies, of the same farms based on gross and net farm income, over the five-year period indicated a wide variation in relationship of debt to gross and net farm income from one year to another. This variation would not have been apparent had all years been combined into one study with no attention given to each individual year. Comparisons of this kind can best be used in making recommendations for long-time goals. Year to year performance cannot be forecast on the basis of single year comparisons due to the relatively stable nature of the debt structure and the unstable nature of gross and net farm income. This relationship fluctuated over 100 per cent compared to a fluctuation of three per cent when debt was compared to total assets. Although the

comparison to gross and net farm income is desirable, it is questionable if a comparison varying as much as 100 per cent can be used in determining year to year operations or for periods of short-duration, debt carrying capacity of a group of farms.

CONCLUSIONS

From the standpoint of costs of credit, long-term financing proved to be the most economical during the last two years (1935 and 1936) included in this study. Mortgage debt interest rates dropped materially during the five years included in this study to a rate far below the cost of short-term commercial credit.

Total farm business assets give the best indication of the amount of debt one can carry and remain on a sound financial basis. Although the farms included in this study were, for the most part, above average and in sound financial positions, an average of 28 per cent of their total assets were represented by debt. One should not exceed this per cent more than 75 to 100 per cent, that is a total of from 49 to 56 per cent of total assets, if a sound financial position is to be maintained. Some farmers can justify over 30 per cent of their assets to be encumbered with debt while others who are operating on a small margin of profit should not have as much as 30 per cent of their assets represented by debt. Economic conditions will influence the financial position of each farm.

Studies based on the yearly relationship of debt and interest costs to gross and net farm income showed wide variations from one year to the next with a maximum variation in relationship of over 100 per cent from 1932 to 1935.

A material improvement was made from 1932 to 1937 in the financial

position of the farms studied on the basis of the relationship of debt, its cost, and relationship to assets and farm income.

The results of this study are affected materially by the size of the sample, types of farms having the necessary data and the period of years included; however, the variation in cost of different kinds of credit available and the total asset debt relationship should aid in establishing a sound financial plan at the lowest cost to the farmer.

ACKNOWLEDGMENTS

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LITERATURE CITED

- (1) Agricultural Finance Review, U.S.D.A., E.A.E. 1(2):18. November, 1938.
- (2) Moore, A. N. and Sanders, J. T.
Credit Problems of Oklahoma Cotton Farmers. Okla. Agric. Exper. Sta. Bul. 198. 61 p. October, 1939.
- (3) Horton, L. J., Ackerman, Joseph and Sayre, C. R.
Capacity to Pay and Farm Financing. University of Illinois, Agric. Exper. Sta. Bul. 449. 50 p. 1938.
- (4) Pine, Wilfred Harold
The Debt Carrying Capacity in Relation to Cash Income of North Central Kansas Farms. Unpublished thesis, Kans. State Col. Agric. and Appl. Sci. 120 p. 1938.

APPENDIX

Form 2. Debt survey sheet.

1938

County _____

Form No. _____

	1931	1932	1933	1934	1935	1936	1937
Type of:	Amount:	Amount:	Amount:	Amount:	Amount:	Amount:	Amount:
Owed Int.:	Owed Int.:	Owed Int.:	Owed Int.:	Owed Int.:	Owed Int.:	Owed Int.:	Owed Int.:
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