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Volume Title: Costs and Returns on Farm Mortgage Lending by Life Insurance Companies, 1945-1947

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Volume Publisher: UMI

Volume ISBN: 0-87014-345-X

Volume URL: <http://www.nber.org/books/saul49-1>

Publication Date: 1949

Chapter Title: Concepts And Methods In Measuring Lending Costs

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Chapter URL: <http://www.nber.org/chapters/c2129>

Chapter pages in book: (p. 5 - 14)

## Concepts and Methods in Measuring Lending Costs

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The primary obstacle to a better understanding of the level of net returns on mortgage investments has been the use of dissimilar accounting methods in cost analyses. As a result, comparisons of individual studies, and the rough checks on accuracy which such comparisons provide, have been almost impossible. Since widely varying results can be achieved from different accounting procedures and types of analyses, it is essential, when interpreting cost figures, to have clearly in mind the nature of the analytical approach used. Differences can exist not only in the basic character of the accounting method but also in the range of costs included in the analysis and in the details of cost allocation procedures. Other difficulties arise when concepts employed in cost analyses are ambiguously, or otherwise inadequately, defined. It is important, therefore, to review briefly the principal alternative accounting approaches to a study of lending costs, and to describe the method and concepts selected for this investigation.

### ALTERNATIVE ACCOUNTING APPROACHES IN MEASURING LENDING COSTS

The chief difference among lending cost studies is generally found in the type of yield measurement used. Some studies attempt to measure the *present yield*, after costs of loan administration, on a portfolio of farm mortgages; others aim to measure the *expected yield* on "new business," that is, on an additional investment of a given amount in mortgage loans made at a given rate of interest. Studies of the first-mentioned type use what may be termed a "present portfolio yield" approach and the second an "expected yield" approach.

In measuring present portfolio yields, income and costs may be treated by the *accrual* or by the *cash* methods of accounting. The following illustration will clarify the essential differences between these two methods and show how each affects the final estimates of costs and yield. Let us assume that we are dealing with a portfolio of mortgages on which loan correspondents were paid fees, at the time the loans were closed, of 1.50 percent of the original amount of the loan in return for their activities in loan-origination, and servicing fees, disbursed at intervals over the life of the loan, for making collections on the mortgage, for periodically inspecting the property, and for performing any other agreed-upon servicing functions. The degree of dependence on correspondents or other outside agents for the acquisition and servicing of loans varies considerably from one company to another. In the farm loan business, however, a smaller proportion of new loan volume is acquired in this way than in lending on urban properties.

Handling these mortgages involves still other costs for the insurance company. A department for coordinating lending policy and for general administration of the mortgage portfolio must be maintained at the home office. Branch offices as well are operated by the great majority of companies making farm mortgage loans. If a mortgage goes into default and property is acquired, expenditures will be incurred in managing the foreclosed real estate, and either a profit or loss will be registered for the whole transaction when it is finally sold or exchanged. Each of these expenditures raises certain accounting problems, but to illustrate the differences between the cash and the accrual methods only the problem of handling originating fees paid to correspondents will be considered.

If the fees paid for loan origination are treated on an accrual basis, they are spread over the projected lives of the loans according to some assumption as to how long these loans will stay on the books.<sup>2</sup> The loan portfolio income of a given year is charged, there-

<sup>2</sup> Customarily mortgage lending institutions amortize the fee by annually charging against income a proportion of the fee equal to the reciprocal of the number of years the loan is expected to be an active balance. If the loan is paid off before the anticipated extinguishment date, the unamortized portion of the fee is charged against the income of the final year of the loan's life, with no attempt to recompute the income of previous years. This method is correct in the case of unamortized mortgages, but on an amortized mortgage the practice of charging the fee at a constant amount against loan income, the absolute amount of which decreases proportionately with

fore, with a proportion of the fees disbursed for that year and with portions of the still not fully amortized acquisition fees disbursed in earlier years.<sup>3</sup> On the other hand, if the cash principle of accounting is followed, the full amount of the fee is charged against the loan portfolio income of the year in which the fee was actually disbursed. In the same way, all other expenditures, whether for acquisition or servicing, are charged in full against the loan portfolio income of the year in which they were disbursed.<sup>4</sup>

The accrual and cash methods will give the same results in measuring yield after loan administration costs when the amount of loan balances outstanding, the rate at which new loans are being made, and the level of fees paid are constant. However, if the volume of new loans is increasing, whether outstandings are rising or not, discrepancies appear between the two measures of cost. As long as new loan volume rises, the accrual, or amortizing, method will give lower loan administration costs than the cash, or current charging, method. The opposite is true when the volume of new loans is falling.<sup>5</sup>

The other general type of yield measure — expected yield — requires a quite different accounting approach from the one just described. In this case there is the question: What will be the future yield of new business contracted today on given conditions of inter-

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the loan balance, means that the fee bears more and more heavily on loan income as the balance falls. To distribute the fee "fairly" in such cases it is necessary to charge against income in each period an amount proportional to the unpaid balance of that period. This can be done by finding the factor  $F$  which, multiplied by the unpaid balances of the several periods ( $P_1, P_2, P_3 \dots P_r$ ), will equal the total fee ( $C$ ) to be charged against income. That is, we must find the value of  $F$  where  $F(P_1 + P_2 + P_3 + \dots P_r) = C$ .

<sup>3</sup> Any other acquisition expense incurred for an individual loan, such as that portion of home office costs attributable to loan acquisition, should also be treated in this way. However, it is difficult to allocate home office or branch office costs to the separate functions of loan acquisition, loan servicing and real estate management, and companies do not attempt to spread any part of these costs, despite the logic of the case. Even if the process were not practically impossible, the costs involved are so small that the refinement would hardly be justified.

<sup>4</sup> Expenditures for office equipment and other capital items would be amortized, of course, in either case.

<sup>5</sup> It must be emphasized, as a final observation on these two methods, that consistency is essential no matter which one is followed. Income and expense, and every type of each, must be handled on the same basis. Ordinarily the treatment of interest income presents no difficulties (except for interest delinquencies), but serious problems arise in handling income from owned real estate as well as profit or loss on the whole transaction.

est rate and costs? In most respects, this problem is simpler than measuring present portfolio yields. Suppose that mortgages are made with the expectation that they will be repaid in ten years. From the gross interest received, it will be necessary merely to subtract annually a portion of the originating fee paid at the time the loan was closed and two other amounts, one representing a service fee paid periodically to the correspondent and the other an estimate of what should be charged continuously against the loan balance to cover costs of operating the home office mortgage loan department and to meet general administrative expenses.

Thus, a calculation of the expected yield on new loans acquired and serviced through correspondents can be made easily if one can (a) estimate the life of new loans with reasonable accuracy and (b) apply a reasonably accurate factor to cover home office costs. All other factors — originating cost and servicing fee — are given in the conditions of the problem. This is not the case, however, if a company acquires and services its loans without correspondents, or even if it acquires loans from correspondents but does its own servicing. In other words, the simplicity of the expected yield approach vanishes when a lending business not fully operated through correspondents or other outside agents is considered.

So much for the two principal ways of measuring lending costs. In this study the present portfolio yield approach, utilizing a "cash" or "current" accounting procedure, has been followed. It was not a difficult choice after all conditions had been examined. Calculation of the expected yield is, in a sense, a by-product of the measurement of present portfolio yield. Put more strongly, it is impossible to calculate expected yield without having measures of home office and branch office costs, and these can be developed only in the present portfolio yield type of study. Further, the expected yield calculation is feasible only when correspondents are widely used in servicing as well as in acquiring loans, and when home office and branch office costs — which present the most difficult problems in cost allocation — are at a minimum. And in the final analysis, the cash method of accounting was the only practical basis on which to ask individual companies to prepare their cost reports. The accrual method, used consistently for a large number of companies, would,

in fact, have required a recalculation of income on thousands of loans.

## CONCEPTS AND ANALYTICAL METHODS

In addition to accounting difficulties, the measuring and analysis of lending costs involve certain other concepts and problems which it will be useful to discuss at this point.

### THE UNIT OF OUTPUT

A principal object of cost studies is to determine the relationship between unit cost and the amount of business done, that is, the relationship between cost and output. Then the question arises: What should be used as the unit of output? In studies of agricultural and manufacturing costs a "physical" or "value" unit is ordinarily used, while in trade industries the choice is between a value unit (e.g., dollar volume of sales) and an "activity" unit (e.g., number of sales transactions completed).<sup>6</sup> In finance, the problem is more akin to trade than to agriculture or manufacturing. The lending institution's object is to keep its funds in use and, accordingly, cost studies must determine whether (a) the cost of keeping money at work varies significantly with the amount at work or with how it has been lent out (in large or small amounts; on different types of security; for different periods of time, etc.) and (b) the costs of handling an additional investment of funds, and the additional income expected therefrom, warrant making the investment.

In both cases the unit of output is an amount of money at work, or to be at work,<sup>7</sup> but other investigations may require a different unit, for example, an activity unit, such as the number of loans closed in a given period or the number outstanding at a given time. In a cost study in the personal loan field<sup>8</sup> the number of active

<sup>6</sup> See Joel Dean, "Statistical Determination of Costs, with Special Reference to Marginal Costs," *The Journal of Business of the University of Chicago*, Vol. 9, No. 4, Part 2, October 1936, pp. 25-28, for a discussion of units of measurement for output and costs; see also *Cost Behavior and Price Policy* (National Bureau of Economic Research, 1943) pp. 85-87.

<sup>7</sup> Accordingly, it is appropriate to use the expression "cost-investment relation" in place of the familiar term "cost-output relation."

<sup>8</sup> W. A. Peterson, *Factors Influencing the Cost of the Small Loan Business* (University of Chicago M.A. thesis, 1934).

accounts was used as the output variable, but this would be unworkable in mortgage studies where the average size of new loans (or of outstanding balances) varies greatly from company to company, and where costs vary greatly for different types of loans.

In the present study it has been practical to take a dollar of outstanding loan balances as the unit of output and to use the dollar amount of the mortgage portfolio as the independent variable. This is not to say that the number of loans made or outstanding, or some combination thereof, would not be a useful variable; indeed, the amount of loans made has been used occasionally in this investigation. In general, however, there is greater interest in the amount of outstanding loan balances.

#### THE UNIT OF COST

There is no problem in studies of the present type as to the unit of cost to be used as a dependent variable — it must be a dollar of expenditures. Nevertheless, the relationship between the number of employees and the number of accounts outstanding is of interest in other financial fields. In general, studies of this nature would be appropriate for the small loan business or, in the mortgage field, for investment activities involving nothing but insured loans on single family dwellings. In both cases mortgage handling practices are sufficiently standardized to assure that the relationship arrived at would be broadly indicative of the economy of labor-use at different levels of portfolio size.

#### TIME-PERIOD VERSUS CROSS-SECTION STUDIES OF COST-INVESTMENT RELATIONSHIPS

A more important problem in planning studies of lending costs is whether to seek (a) cost-investment relationships over a number of years for one or a small number of companies or (b) cost-investment relationships for a single year for a large number of lenders having portfolios of different sizes. The former may be called the "time-period" and the latter the "cross-section" type of cost analysis.

Both analyses would be useful, but only the last-named was made in the present investigation owing to certain difficulties relating to the collection and adjustment of data. It was possible to obtain data readily for 1945 (and later for 1946 and 1947) from a large

number of companies, whereas it would have been almost impossible to obtain adequate cost data for a longer period of years for any single company: But disregarding this practical matter, the technical difficulties of adjusting time-period data to eliminate all cost-influencing factors and conditions, other than the ones to be examined, are sufficient reason for avoiding the time-period type of analysis.<sup>9</sup>

Data adjustments are always troublesome but particularly so in this instance because mortgage financing has undergone marked institutional changes in recent years. Many companies have shifted from "correspondent" to branch office operations (particularly in farm mortgage lending), and since the late thirties the proportion of owned real estate to total loan and real estate investment has fallen abruptly. Both of these developments have greatly influenced costs, and there is no method of adjusting data to eliminate their effects. The only way to meet these problems (and the similar problem of change in type of loan) is to find a lender who has operated within a fairly stable framework over the whole period. Where such an opportunity is available it should be grasped; unfortunately the option was not open in the present investigation.<sup>10</sup>

Finally, if a time-period analysis is used it is necessary to disentangle the influence of loan delinquency from the joint effect of all elements affecting the cost-investment relation.<sup>11</sup> It is not unusual to find instances where the percentage of delinquent loans to the total amount of loans outstanding has changed since the late twenties from less than 5 percent to over 50 percent and back to less than 1 percent. This is only a forerunner of the larger problem presented

<sup>9</sup> See Joel Dean, *The Relation of Cost to Output for a Leather Belt Shop* (National Bureau of Economic Research, Technical Paper No. 2, December 1941) pp. 12-18, for a discussion of data adjustments of this type.

<sup>10</sup> It is necessary to adjust time-period data for changes in prices of labor and materials, which raises a very difficult problem in mortgage financing. Since the mid-thirties lenders have absorbed two costs — originating fees and compensation to outside agents for loan servicing — formerly borne by the mortgagor.

Not all problems of data adjustment are avoided in the cross-section approach. Companies vary, even at one point in time, in lending practices and in types of loans handled, but this difficulty can be met by selecting broadly similar cases and grouping companies for separate analyses. As will be noted, cases were grouped in the present study into "branch" and "nonbranch" companies; in some instances the separation was made arbitrarily since there is no clear dividing line between the two groups.

<sup>11</sup> W. A. Peterson, *op. cit.*, uses an ingenious means of correcting for changes in delinquency ratios. His data are of the cross-section type and cover a number of offices operated by a large personal finance company, which were located in different

by changes in the proportion of owned real estate to total loan and real estate investment, yet it presents somewhat more formidable difficulties since real estate management costs are separable from loan portfolio costs, whereas the costs of handling loan delinquencies are inseparable from other loan department expenses.

Loan delinquency would not influence costs if loans expired quietly into the charge-off category.<sup>12</sup> However, this seldom happens; in fact, a loan may end a long and troublesome life without ever having been charged off. An investigator wishing to pursue the time-period approach can do little but devise a scheme for "adjusting" his data, or look for a company without a variable delinquency ratio.

#### NATURE AND CLASSIFICATION OF LENDING COSTS

A few general comments on the nature of lending costs and the categories of costs that can be used effectively in analytical studies should be made at this point. First, in finance as in manufacturing there is a time lag, perhaps substantial, between the incurrence of an expense (e.g., the payment of an originating fee) and the receipt of the income resulting in whole, or in part, from this expenditure. This is significant for cost and yield analyses because it is impossible, by taking observations over a single time period (except from the very beginning of lending operations to the very end), to compare inputs of resources at given costs with outputs of income produced thereby. The only real solution to this problem is to reallocate expenditures, or receipts, so as to match inputs and outputs, but this is virtually impossible as an accounting procedure. Obviously, the seriousness of the problem increases with the maturity of loans

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communities and experienced different delinquency conditions. Briefly, his theory is that those cost differentials among offices which cannot be explained by differences in the number of active accounts held and in the population size of the territory served are attributable to differences in delinquency ratios. This seems reasonable for the small loan business but there are many more cost-influencing factors at work in mortgage lending (at least where different types of mortgage security are taken) and they are, unfortunately, not all measurable in terms that permit analytical treatment. Peterson's lead might be followed, perhaps, in studies of cost-investment relations in savings and loan associations since these agencies provide the closest counterpart in mortgage lending to the conditions of his experiment.

<sup>12</sup> Since charge-offs and reductions in valuation allowances and their opposites—recoveries and increases in valuation allowances—are separable accounting entries, their adjustment can be handled without special difficulty, provided the reporting is convenient.

made. It would be relatively easy to cope with if loan life averaged less than one year, but in mortgage lending loans run for a much longer time.

Second, the full costs of any given increment of loan investment are not incurred except over a substantial period of time, and cannot be precisely forecast before the first "instalment" of total expenditure is made.<sup>13</sup> As a result, only an approximate judgment is possible as to whether a given investment will be profitable. For example, one can estimate only very roughly the percentage of loans that will become delinquent and the extent of the losses that will be sustained on foreclosed loans. Accordingly, expected cost-investment relations based on portfolios showing little or no delinquency can be upset in a very short time.

Third, interesting and important questions are involved in selecting the categories of expenditures that can be used most effectively in studies of lending costs. Perhaps the most commonly used classification is that in which expenditures are grouped according to the identity of the goods or services purchased (e.g., labor, office supplies, heat, light, taxes, telephone, etc.). Such subclassifications are useful to management, but have only limited value from the economic viewpoint. In this investigation costs are classified according to whether they were incurred in the operation of branch offices or in the home office loan department and each of these groups is further classified into costs arising out of the functions of loan acquisition, loan servicing, and real estate management. This procedure was adopted because it provides direct answers to the main problems of the investigation; fortunately it was also the most convenient form of reporting for respondents.

There is little resemblance between this grouping of costs and those most frequently used in nonempirical studies. It is interesting to inquire, therefore, into the usefulness and adaptability for lending cost analyses of the conventional grouping of costs into those that are "fixed" in the short period and those that are "variable." The fact of primary importance in considering the usefulness of this

<sup>13</sup> The investigator should not be pressed too hard to define what is meant by the "first" expenditure. I have had the originating fee of a particular loan in mind (to take a relatively simple case) but there is no "first" expenditure short of the initial disbursement made by the company at its very beginning, if we have in mind the maintenance of a whole investment portfolio.

classification of costs is that there is no single variable in relation to which mortgage lending costs can be said to be either fixed or variable. Some costs vary with the number or dollar amount of loans outstanding; others vary with the number or dollar amount of loans made. Furthermore, some costs are fixed for substantial ranges of portfolio size and some for shorter ranges; others vary with the slightest change in portfolio size; and there are no clear lines separating one group from the next. While costs cannot be studied along these conventional lines the same questions can be explored by other methods. Costs can be aggregated and, without regard to the variability of the different elements of total cost, an "average incremental cost" can be calculated by dividing the difference between total costs at successive, fairly widely separated levels of outstandings by the amount of the difference in outstandings.<sup>14</sup> From the movement of a curve of average incremental cost computed on this basis, it is possible, of course, to indicate the behavior of marginal cost. As will be seen in the following section, the total unit cost of lending funds on farm mortgage security is roughly constant, at least for the range of portfolio amounts above \$20 million. Since fixed costs are small relative to variable costs at present levels of lending activity, it may be inferred that average variable costs and marginal costs are also constant, or nearly so.

<sup>14</sup> This procedure was followed by W. A. Peterson, *op. cit.*