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**PATTERNS OF  
FARM FINANCIAL STRUCTURE  
A CROSS-SECTION VIEW OF ECONOMIC  
AND PHYSICAL DETERMINANTS**



## INTRODUCTION

BY R. J. SAULNIER

THIS study was undertaken as one of the set of investigations which constitute the National Bureau's Agricultural Finance Project. A recently published study by Lawrence A. Jones and David Durand on *Mortgage Lending Experience in Agriculture* and my own earlier investigation of *Costs and Returns on Farm Mortgage Lending by Life Insurance Companies, 1945-1947* are parts of the same project, as is Howard G. Diesslin's recent monograph on *Agricultural Equipment Financing*. It is perhaps evident without elaboration how these studies and the one in hand can be used in building the Project's capstone volume, now in progress at the National Bureau under the tentative title of "Agricultural Credit Facilities in the United States." Dr. Horton's book is basic to the capstone study: working as close as possible to the level of what the economist calls "real" phenomena, he attempts to show how the physical and economic features of farms are related to the way in which farms are financed. In doing this he contributes much to our general understanding of the agricultural financing process; more specifically, he shows how particular sources of capital and credit are drawn on to meet the needs of particular types of farms, and thereby gives substance to the familiar concept of a "system" of interrelated farm financing facilities.

The author's object does not imply, of course, that the forces shaping agriculture's financial arrangements are to be found exclusively in the physical and economic features of farms. Much less does it imply that there is necessarily any causal connection running from the nonfinancial to the financial features of farms. Yet one can be unduly timid about making inferences of this type, for there is assuredly more reason for believing that financial arrangements accommodate themselves to the nature of the productive process and the conditions under which it is carried forward—no less in agriculture than in industry and trade—than that such connections run in the opposite direction, or that they are absent altogether. As the reader will see, the author speculates on the causal connections between the economic and physical characteristics of farms and farm financial patterns where he feels it is justified, though he is careful not to infer too much from his material. The reader, of course, will not necessarily be subject to equal constraints.

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The ideal factual basis for a study of this kind would consist of cross-section and time series data on individual farms, but unfortunately such materials are largely unavailable. Bodies of information may be found that give for individual farms many of the characteristics—financial and nonfinancial—pertinent to the present study, but they are fragmentary at best and spotty in their representation of the leading types of farming. The only available data adequate for the author's purposes, and which he was under necessity to employ, are averages for groups of farms, more specifically, averages of the characteristics of all the farms within given counties as of 1939-1940.

The use of county averages in the present analysis obviously involves serious statistical hazards. Perhaps the most important is that the averages for some of the counties may mask appreciable differences in the characteristics of the farms which they encompass, and may not be representative, really, of any significant number of the farms in the county. Another difficulty is that although the essence of the study is to reveal differences in financial patterns systematically associated with economic and physical differences among farms, the portrayal of these differences—which would be a relatively simple matter if one could deal with individual farm units—may be difficult or impossible on a basis of countywide averages. In view of the seriousness of these hazards it may be useful to comment briefly on Dr. Horton's solution of his informational problem.

His procedure was to select, from among 250 counties on which usable information was available, 108 that appeared to be relatively homogeneous internally as regards the physical and economic characteristics of their component farms and that, as a group, gave the widest possible representation of different kinds of agriculture. The test of internal homogeneity was made primarily on the basis of the author's knowledge of the agriculture of different parts of the United States, but certain bodies of descriptive information were available which helped in that connection. While we may be sure that interfarm differences are present beneath the countywide averages, it is believed that neither in kind nor in quantity are they such as to disqualify the data for the analytical purposes to which they are put.

As for the second difficulty, the 108-county sample seems to serve relatively well in representing differences among types of farms. Apart from the internal make-up of the county units, emphasis was placed, as the author puts it, "on diversity of repre-

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sentation rather than on homogeneity." Careful consideration was given to the need for obtaining proper balance within the sample as between different areas of the country and different kinds of agriculture. It cannot be claimed that all varieties of farming are represented, or that the differences among types of farms are in all cases shown in their proper degree. Indeed, the author suggests that the differences among types of farms that are revealed by his data are perhaps an exaggeration of those that exist in reality, but since the purpose of the study is to detect patterns of relationship rather than to weigh any element absolutely, this magnification effect may be regarded as a virtue. Furthermore, there are grounds for believing, as the author specifically demonstrates, that the representation of agriculture as a whole by the sample is remarkably good.

Having selected a sample of counties, the author's next major informational problem was to compile reliable data for each of them on those farm characteristics—financial and nonfinancial—that on a priori grounds seem most significantly related to his problem. Here, also, he was often compelled to improvise solutions to his requirements. Data were assembled from a number of different sources on the essentials: the average amount of physical assets per farm, which serves as a measure of farm size; the composition of farm assets, which is broadly suggestive of the character of farm capital requirements; and the distribution of farm income according to type of product, which is also indicative of the kind of farming involved and accordingly of the type of farm financing problem which is presented. Among the indicators of farm financial patterns are the interests of operators, landlords, and creditors in the physical assets involved, the frequency and extent of use of mortgage credit and of non-real-estate credit, and the relative importance of the various sources—commercial banks, life insurance companies, federal emergency lending agencies, etc.—from which real estate credit and production credit are drawn. As the author indicates, many of these materials are estimated, yet their consistency within the sample of counties, and their prima-facie reasonableness, strongly suggest that they give a faithful reflection of the financial and nonfinancial profiles of a wide variety of farms.

Another informational difficulty confronted by the author, one that is common to all analyses employing balance sheet data in the study of financial problems, should be commented on. Balance sheet data necessarily reflect the net cumulative effect of forces

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operating on an enterprise from its beginning. In most respects the balance sheet reflects deliberate choice on the part of the farm owner; in other respects, however, it reflects forces which have left their mark on specific balance sheet items quite beyond the farmer's power to interfere. Inflation is an outstanding example of such a force: it expands some elements in a balance sheet while having no effect on others, thereby producing changes in financial proportions that must be clearly separated, at least conceptually, from those that occur as a result of deliberate management decisions. Conversely, deflation and operating losses, even without a general decline in values, tend to reduce certain items and automatically to give greater prominence, as reflected in conventional balance sheet ratios, to others. Thus, equity is eroded by asset deflation, whereas the hard rock of indebtedness may be unaffected. At least in the financial structure of surviving concerns, debt stands out more sharply at the end of a deflationary period than at the beginning. The opposite is observed where balance sheets, as is commonly the case in agriculture, are permitted to reflect inflationary increases in asset values. This effect could be ignored in a cross-section analysis if all farms were equally affected, but not if there is reason to believe that the effect has been felt in different degrees by different farms. The problem is formidable, and inevitable: no year could have been selected which would have avoided it. Accordingly, a technique for correcting this distortion in the data was required. The method devised was to classify the 108 counties into subgroups so that comparisons might be drawn between combinations of counties which are roughly similar in the extent of asset deflation which they experienced in the decade leading up to the year of report, but differ with respect to the specific economic and physical characteristics being studied. For all practical purposes, this procedure made it possible to study the relationships between the financial and nonfinancial aspects of farms free of the distortions produced by differential financial experience.

Only on the information gathered in the decennial Censuses of Agriculture can studies such as Dr. Horton's be built, and when the present one was undertaken, the latest available census was that of 1940. His investigation is based largely, therefore, on data for that year. It would have been interesting to add a similar analysis for 1950, but this was not possible within the resources accessible to the author; however, the census materials are availa-

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the same in 1930 as in 1940. In 1930, farm operators had a 42 per cent interest in farm real estate, compared with 43 per cent in 1940. Landlords held interests of 38 per cent in both 1930 and 1940, and the interests of creditors in farm real estate were 20 per cent in both years. As would be expected, this relationship was more stable for the country as a whole than for its parts. Moreover, when account is taken of non-real-estate credit—so far as incomplete data permit—creditor interests in total farm assets appear to have declined between 1930 and 1940.

In 1950 the distribution of interests in farm real estate among farm operators, landlords, and creditors was quite different from both 1930 and 1940. Farm operator interests increased to 53 per cent from 42 in 1930 and 43 per cent in 1940; landlord interests rose somewhat to 39 per cent, while creditor interests declined from 20 per cent to 7 per cent. The value of farm real estate rose sharply from 1940 to 1950, reflecting the inflation of this decade, while farm real estate debt declined by \$1 billion. The result was that operator equities rose, and creditor interests—both in dollar amount and as a percentage of total assets—were reduced.

A mild counteraction set in during the following years. Between 1950 and 1955, creditor interests in farm real estate increased from 7 to 9 per cent; while the value of farm real estate increased, by 21 per cent, farm real estate debt rose more steeply, by 47 per cent. In the future, as farms change hands on the basis of post-World War II values, the rise of mortgage debt relative to real estate values will tend to continue. Accordingly, the creditor interest in farm real estate was probably lower in 1950, and the interest of operators higher, than will be the case in the future. In other words, there will be a tendency for the situation in future years—barring such events as marked the forties—for the pattern of farm financial relationships to move toward, rather than further away from, the 1940 status.

Second, it is known that both the percentage of farms under mortgage and the ratio of mortgage debt to the value of mortgaged, full-owner farms fell sharply from 1940 to 1950, further reflecting the farm prosperity of that decade. Similarly, the percentage of land in tenant-operated farms fell sharply—from 29.4 per cent in 1940 to 18.3 per cent in 1950—but this decline was offset by a sharp rise in the rented land in farms operated by part-owner operators. As a result, landlord interests in total farm real estate were about the same in 1950 as in 1940.

These comparisons suggest how the pattern of farm financial

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ble now and perhaps will at some time be studied by comparable methods.

Even though we lack a comparison as thoroughgoing as the work in hand, the question may still be asked whether the results for 1940 are reasonably descriptive of conditions in 1950 and earlier, and if not, what differences exist. As would be expected, the picture one gets of differences between the farm financial position in 1940 and in earlier and later years is dramatically different depending on whether one looks at the value of farm capital in current or in constant dollars. By the former measure, farm capital was at a very low ebb in 1940, substantially below 1920 and 1950 and almost as low as in 1935. Measured in constant dollars, on the other hand, 1940 is a roughly representative year. These facts are set forth in Alvin Tostlebe's Occasional Paper 44, *The Growth of Physical Capital in Agriculture, 1870-1950* (National Bureau of Economic Research, 1954, p. 40).

But in financial studies there is no escape from dealing with value in "current dollars"; indeed, it is the fluctuations in capital values eliminated by corrections for price changes that comprise much of the substance of financial studies. We must still ask, therefore, whether the relationships revealed in Dr. Horton's study obtained earlier and are likely still to have characterized agriculture in 1950.

Several of the relationships which the author discusses, including the relative use of outside funds and credit, and the sources of credit used, have been examined for 1930 and 1950 and are shown in the following tabulation alongside the 1940 data. Comparison shows, first, that the amount of outside funds employed by agriculture, as a per cent of total assets, was practically

*Selected Indicators of Farm Financial Structure,  
United States, 1930, 1940, 1950*

	1930	1940	1950
Interest in farm real estate of:			
Operators <sup>a</sup>	42.0%	42.8%	53.3%
Landlords <sup>a</sup>	37.9	37.6	39.3
Creditors <sup>a</sup>	20.1	19.6	7.4
Per cent of farms under mortgage <sup>b</sup>	40.1	38.8	27.5
Rates of mortgage debt to value of mortgaged full-owner farms <sup>b</sup>	39.6	42.5	27.6
Per cent of land in tenant-operated farms <sup>b</sup>	31.1	29.4	18.3

<sup>a</sup> Estimates based on data published by the Bureau of the Census and the Department of Agriculture.

<sup>b</sup> Bureau of the Census.

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organization has been affected by changing economic conditions. Additionally, there is evidence that underlying economic forces are at work tending to alter the financial structure of farms in different kinds of agriculture, quite apart from the impact of depression and wartime inflation. Nevertheless, the evidence strongly suggests—though it is not conclusive on this point—that the relationships characteristic of 1940 have considerable stability over time and provide useful suggestions as to the relationships prevailing around 1950 as well as around 1930.

A further examination of the stability of farm financial relationships was made on the basis of data for individual states. The forty-eight states were arrayed from high to low on the basis of the combined interests of landlords and creditors (outside interests) in farm real estate in 1940. Of the twelve states that ranked highest in this respect in 1940, eleven had been in the top twelve in 1930 and eight remained so in 1950. Of the four states in the 1940 array that did not fall within the top twelve in 1950, three were within the top one half in that year. Similarly, there was a tendency for states that ranked high in 1940 with respect to operator interest in farm real estate to rank high in 1930 and 1950. Maine, West Virginia, and New Hampshire occupied first, second, and third place, respectively, in all three years.

Creditor interests in farm assets in different areas in any given year tend to reflect the immediately preceding economic circumstances. Eight of the twelve states that ranked highest as to creditor interest in 1940 had been among the twelve highest in 1930, but only five of the twelve highest states in 1940 remained among the twelve highest in 1950. As regards the proportion of farms mortgaged, there was considerable duplication of states in the upper one fourth of the array in both 1930 and 1950. None of the twelve highest states in 1940 had ranked lower than eighteenth in 1930, and none ranked lower than nineteenth in 1950.

The differential effects of the depression of the thirties and the inflation of the forties on creditor interests in farm real estate reflect mainly divergent movements of debt and real estate values. This is suggested by a comparative ranking of states in the three decennial years by the ratio of the mortgage debt outstanding to the value of full-owner farms. The states ranking highest in 1940 include several Grain Belt states that were among those that suffered most during the depression of the 1930's. On the other hand, debt-to-value ratios for 1950 reflect the impact of wartime inflation and high farm incomes.

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In sharp contrast is the relative stability of state rankings made on the basis of landlord equities in farm real estate. In this respect, Illinois ranked first in 1930 and 1940 and second in 1950. All but two of the twelve states ranking highest in 1940 had been among the twelve highest in 1930, and nine of the twelve remained within the highest twelve in 1950. Landlord equity rankings were far less changeable between dates than debt-to-value ratios. A tendency for landlord equities to bulk large has persisted in certain states, even though they are among the group that suffered most in the 1930's and benefited most from the war-time inflation.

Finally, it may be inquired whether 1940 was an atypical year as regards the distribution of farm mortgage real estate debt among major institutional lender groups. The fact is that the distribution in 1950 was more nearly similar to the distribution in 1930 than to that characteristic of 1940. Between 1940 and 1950, commercial banks, savings banks, and life insurance companies became more important as sources of farm mortgage credit, while federally sponsored agencies became less important. This occurred as the private lenders renewed their farm financing activities after the heavy refinancing operations of the federal land banks and the Federal Farm Mortgage Corporation during the 1930's. Yet the area specialization of life insurance companies changed less over both decades than might have been expected. From 1940 to 1950, life insurance companies came to hold higher percentages of total farm mortgage loans in the Southwest and in other range livestock states, and smaller percentages in the East North Central and southeastern states. But the hard core of life insurance loans in 1950 was still in the midwestern grain states and in the West South Central region.

So much for the central object of the study, the method of analysis, and changes which preceded and followed the base year of the study—1940. What does Dr. Horton's analysis tell us about the influence on agricultural financing arrangements of the economic and physical features of farms? The study reveals many such relationships, primarily between certain patterns of financing and certain combinations of nonfinancial farm characteristics. In other words, there exist both a high intercorrelation of the economic and physical characteristics of farms, such that we can identify a number of fairly distinctive nonfinancial profiles for farms, and certain affinities among sources of capital

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and credit, such that we can isolate certain fairly distinctive patterns of farm finance.

There are two ways in which the connections between these nonfinancial profiles and financial patterns can be elucidated: one method is to trace the relationship between a particular physical or economic characteristic of farms, or a stated combination of such characteristics, and the financial pattern of the farm; the other is to take a particular financial characteristic, such as heavy reliance on landlord investment, or some combination of such characteristics, and show what types of farms, described in terms of their physical and economic features, are generally financed on this pattern.

Certain fairly consistent relationships are revealed by the first method. For example, the relatively large farms given over primarily to the production of crops and livestock, and on which land is ordinarily a major and buildings a minor component of assets, characteristically make relatively heavy use of external funds, usually drawing on landlords for equity and on such mortgage lenders as life insurance companies for long-term credit. Also, farms of this type ordinarily rely rather heavily on production credit, which they tend to draw from local sources, predominantly from commercial banks and production credit associations.

The rationale of this financial pattern is fairly obvious. The fact that farms are almost invariably owned by individuals means that on those of relatively large size recourse must be had to outside funds. Insofar as equity funds must be obtained from the outside, these must be drawn from landlords, since our financial system provides no other alternative to operator-ownership. To the extent that long-term credit is required, the chances are that this will be drawn from life insurance companies or from the federal land banks, since the farms that conform to the physical and economic specifications set forth in the last paragraph are suited to the investment preferences of these lenders. The investor operating from some distance, whether as owner or creditor, usually prefers, even at some sacrifice of return, to invest fairly large amounts at a time, to make these commitments for relatively long periods, and to rely on the security provided by a lien on land, or more or less indestructible asset, rather than on the potentially transient protection of sound management. In brief, crop and livestock farms of relatively large size both demand external funds and are naturally congenial to their investment on a long-term, absentee basis.

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Contrasting sharply with the large-scale crop and livestock farms are the large farms in which dairy production predominates. The largest of the farms in this group are still not as large as the largest crop and livestock farms, however, and they make substantially less use of external funds, especially of funds drawn from absentee sources. The equity in them is more likely to be provided by the operator than by a landlord, and there is a somewhat greater tendency to depend on local sources for such long-term credit as is used, rather than on lenders operating from some distance.

These facts, too, are easily rationalized. The fact that dairy farms typically are somewhat smaller than large crop and livestock farms in many cases makes it feasible for the operator to supply the needed ownership funds; and the strategic role of management in the farm's operations, combined with the specialized nature of the assets which it employs, discourages investment by individuals or institutions not in a position to keep the farm's operations under more or less intimate and continuing observation. The fact that dairy farms characteristically make relatively little use of short-term production credit may mean that their working capital needs are minor, in consequence of their more or less regular and constant income, or that their needs for medium-term financing are met mainly by mortgage loans secured by real estate assets.

Finally, fairly consistent financial patterns are displayed by the common types of small farms. One such type is the relatively small farm on which land is a modest component of total assets and on which buildings, consisting predominantly of the farm residence, represent the major form of wealth. It is a further characteristic of such farms that much of the operator's work is done off the farm, and that a high proportion of the farm's product is consumed at home. At most these are part-time farming operations and may, perhaps, be fairly described as being on the borderline between the agricultural and the industrial communities. Farms that fit this description usually make relatively little use of outside funds, except for the financing of the farm residence, a fact which does no violence to their characterization as part-time farming units.

A second fairly conventional type of small farm is that on which dairy, poultry, or miscellaneous products are ordinarily the major source of income. Land is usually a minor, and buildings a major, component of the assets of such farms, but they

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are more obviously geared to the agricultural process than are the small farms in the first group. On the financial side, they tend to make somewhat greater use of external funds, drawn primarily from local sources and from federal emergency credit agencies. They depend but little on landlord investment and show no noticeable tendency to attract funds from absentee lenders. This pattern of financing clearly reflects the relatively unfavorable income position of these farms, the kinds of assets which they possess, the relatively small amount of funds which they require, and the problems of investment supervision which they present to the potential outside investor.

It must be apparent from what has been said that there is a distinct tendency for the various suppliers of funds for farm enterprises to focus their activities on certain types of farms, in other words, for there to be what Dr. Horton calls a functional specialization of financing facilities. Thus, insurance companies tend to lend where loans of relatively large size can be made, where the security for the loan is an asset relatively indestructible at least in its physical aspect, and, as a corollary of the latter, where it is not necessary to "bank," as the saying goes, on day-to-day management. This combination of asset preferences reflects the nature of the insurance company, and the conditions under which it operates. Being a national agency, in no position carefully to watch the daily operations of management and using funds that can be appropriately invested for long periods, it naturally falls into this functional groove. Its more or less natural companion as a supplier of ownership funds is the landlord, and for reasons that are perhaps obvious.

The commercial banks and production credit associations, on the other hand, are ideally situated, as local institutions, to know and to cope with the problems of farm management, and are predisposed, because of the laws under which they operate and the type of funds which they have to invest, to seek out relatively short-term investments. It is readily understandable, also, that commercial banks and production credit associations, both having relatively severe credit standards, occupy a markedly different functional niche from the federal emergency credit agencies that were set up, and have been administered, to aid farmers in hard-pressed circumstances.

The outstanding fact revealed by Dr. Horton's study concerning federal farm mortgage credit facilities, notably the federal land banks and the Federal Farm Mortgage Corporation,

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is their apparent lack of functional specialization. In contrast to the private agencies, which seem to have some more or less distinct fields of activity, the federal agencies appear to serve a cross-section of all types of farms. There are a number of reasons for this. First, their facilities are nationwide, and because of their organization they are necessarily under some pressure to lend funds in all areas. Unlike the insurance companies, they are in no position to withdraw from a particular section on the ground that it presents credit risks higher than can be sustained at the rates of interest which they are permitted, or desire, to charge.

Second, the broad participation of the federal land banks in mortgage lending as of 1940 reflects certain historical circumstances. In the early twenties and again in 1929 and 1930 foreclosures eliminated life insurance companies as lenders in certain areas and caused them to concentrate their new lending in relatively limited regions. This created a credit gap which only the subsidized and specially protected federal agencies could fill. Especially in the early thirties, the refinancing on a broad scale by these agencies of farm mortgage loans made originally by private lenders left them with creditor interests in a wide variety of types of farms, many of which credits were still extant in 1940, contributing to the more nearly universal and less specialized nature of the agencies' lending operations.

It is along these lines that the author seeks to show how the pattern of farm financing facilities reflects the nonfinancial characteristics of farm enterprises. The study of agricultural credit institutions will extend the analysis by showing how the organizational characteristics of various farm financing agencies and the types of funds which they employ influence their asset preferences. In this way it is sought to build a fuller understanding of the institutional framework within which the farm financing process takes place, and to win the practical benefits that such an understanding will bring within reach.