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Volume Author/Editor: Donald C. Horton

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Chapter Author: Donald C. Horton

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### SOURCES OF DATA AND METHODS OF ESTIMATING INDICATORS OF THE ECONOMIC AND FINANCIAL CHARACTERISTICS OF AGRICULTURE

THIS appendix reviews briefly the sources from which the basic data were drawn and indicates, in as detailed a manner as space allows, the procedures that were followed in adapting them for use in the study. In most instances these adaptations were extensive. For this reason it would be well for the reader to regard the results as merely estimates descriptive of the characteristics of agriculture, and to bear in mind that they should be employed in other connections only with a full appreciation of their unavoidable shortcomings.

#### *Indicators of Asset and Product Characteristics*

##### TOTAL PHYSICAL ASSETS

For each county the reported value of land, buildings, livestock, and implements and machinery was taken directly from the 1940 Census of Agriculture; to this were added estimates of crops, feed, fertilizer, and other miscellaneous supplies on hand at the beginning of the year. Estimates for the latter items were derived from a number of sources, principally agricultural experiment station bulletins reporting local studies based on farm records. Since the data are for the beginning of the year, the actual value of growing crops was excluded except in areas where such crops were likely to be maturing at that time. No comprehensive body of data on which to base these estimates of the value of growing crops was available; we therefore made allowance for them by increasing moderately the percentage of total assets represented by non-real-estate assets in those counties where this item was thought to be significant. In general, the amount of non-real-estate assets other than livestock and implements and machinery is so small relative to total assets that even a fairly large error in estimating crop value would result in only a moderate error in the estimate of total physical assets.

Household equipment and other personal effects of the farm family were excluded from total physical assets, although from many viewpoints they may properly be regarded as assets of the

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combined firm-farm home. The omission of these categories for which data are unavailable causes an understatement of the total, but this is not serious where, as in this study, measures based on total asset size of farm are employed only to indicate intercounty differences.

### AVERAGE PHYSICAL ASSETS PER FARM

The average of physical assets per farm for each county is affected, of course, by the estimates of both total physical assets and number of farms, the latter being considered identical with the number of farm operators, exclusive of croppers. The exclusion of croppers helps to make the average farm size of the southern counties comparable to the averages for other areas, but it is at best a rough adjustment and the results must be interpreted with this fact in mind. However, since the sample was chosen to show extremes in kinds of agriculture, the per farm data serve reasonably well to indicate intercounty differences in average assets per farm even where they do not accurately measure *the amount* of this difference.

### COMPOSITION OF PHYSICAL ASSETS

While the division of real estate value between land and buildings is somewhat artificial as a measure of asset composition for a particular farm, it is usable as a means of comparing all farms in one county with those in another. For example, the farms in counties in which census figures show land to equal 75 per cent of the value of all real estate assets are clearly different from the farms in counties in which land is shown to be only 50 per cent of such assets.

In computations of *the percentage of total acreage in cropland*, cropland acreage includes cropland harvested, acreage in land involving crop failure, and idle or fallow cropland. Plowable pasture is excluded. The *value of farmers' dwellings* is taken directly from the 1930 Census of Agriculture.

### PRODUCT CHARACTERISTICS OF FARMS

Data on the distribution of the value of farm product sales by type of product were taken directly from the 1940 Census of Agriculture, with sales of crops and livestock combined, since crops are frequently marketed via sales of livestock. For most purposes, the relative importance of crops, as compared with livestock raised on pasture, can be better evaluated by reference

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to the percentage of acreage in cropland than by direct comparisons of the respective product sales. Dairy product sales are self-explanatory. The third category includes sales of poultry and poultry products as well as a wide range of miscellaneous products. *Value of products consumed by the farm household* provides an indirect clue to the extent to which commercial farming is practiced; and *off-farm work per farm operator* is useful as a measure of the extent to which nonfarm occupations are combined with the operation of the farm.

The data on product composition are deficient in that they exclude certain products of the farm firm, such as housing, but intercounty differences in the importance of this service can be inferred from the ratio of the value of the farmers' dwellings to the value of total real estate. Likewise, the income derived from off-farm work is, in a sense, income derived from the farm, but differences in its importance among farms can only be inferred from the number of days of off-farm work performed yearly per farm operator. Although these two items cannot be included directly in the percentage distribution of farm product value, measures of them can be used to supplement the product data and thus to give a reasonably complete coverage of farm product throw-off.

### *Indicators of Financial Characteristics*

Data on the financial characteristics of farms are less plentiful than data on the asset and product characteristics reviewed above, and those available are deficient in many respects. The basic objective is to indicate differences among counties in the capital structure of agriculture, but since most farms are organized on an individual proprietorship basis, a description of capital structure comparable to that available for corporate business is not feasible.

#### OPERATOR INTEREST IN TOTAL PHYSICAL ASSETS

The dollar value of this interest includes the interest of both owner operators and tenants; in order to measure the extent to which agriculture draws its capital from active farmers, it also includes the equity interest that farm operators may have in farms other than those they operate. However, operator interest excludes whatever creditor interest operators may have in other farms, since we had no way of estimating this amount.

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Separate estimates have been made of the interests of operators in real estate assets and non-real-estate assets. Census data provide a basis for estimating the interest of operators in farm real estate, and survey data obtained by the Department of Agriculture in a mailed questionnaire make it possible to estimate the value of the operator's equity interest in farm real estate other than that of the farm he operates.

Estimates of operator interest in non-real-estate assets were made as follows: From an estimate of total value of non-real-estate assets were deducted the reported non-real-estate loans of banks, Production Credit Associations, the Farm Security Administration, and the Emergency Crop and Feed Loan Division of the Farm Credit Administration, and an additional amount estimated to represent obligations to other sources of non-real-estate credit. In most counties this additional amount was estimated at about 40 per cent of total non-real-estate debt.

The estimate was then reduced to take account of the probable landlord interest in non-real-estate assets by shifting to landlords the entire equity in non-real-estate assets for cropper farms and a partial equity in the case of farms operated by share tenants. This procedure is far from precise, but it does take account of those situations in which the landlord interest in non-real-estate assets is relatively high. Moreover, it gives a measure which, when combined with the measure of operator interest in real estate, produces a reasonably accurate indicator of intercounty differences in operator interest in total physical assets.

The principal deficiency to be noted in this estimate is the adjustment that was necessary to take account of the non-real-estate loans made by individuals and miscellaneous lenders. The estimate is used, therefore, only in combination with the estimate of operator interest in real estate assets, which reduces appreciably the possible percentage error. Furthermore, the selection of extreme counties for the 108-county sample gives reasonable assurance that the indicated differences among counties with respect to operator interests in non-real-estate assets are real, even though the precise extent of the differences may not be represented reliably.

### CREDITOR INTEREST IN PHYSICAL ASSETS

The measure of creditor interest in physical assets is based on three sources: estimates of total mortgage debt for owner-operated farms, constructed from the 1940 Census of Agricul-

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ture; survey data for tenant- and manager-operated farms obtained from a mailed inquiry sent to farm owners; and the estimate of total non-real-estate debt used in obtaining a measure of operator interest in physical assets. As pointed out earlier, credit interests of farm operators and landlords are included in the category of creditor interest rather than in that of operator or landlord interest. Since debt relates to a somewhat larger universe than assets, the percentage creditor interest is overstated, but this is not serious insofar as the measures are used only to indicate intercounty differences.

### LANDLORD INTEREST IN PHYSICAL ASSETS

Estimates of landlord interest are residuals, after deduction from total assets of the estimated interests of farm operators and creditors. The two major items in this computation are the value of farm real estate in tenant- and manager-operated farms and the estimated mortgage debt on these farms; the estimated landlord interest in non-real-estate assets is but a small percentage of the total landlord interest in most counties.

### PERCENTAGE OF FARMS UNDER MORTGAGE

County estimates of the total number of mortgaged farms of full-owner and part-owner operators were made on the basis of data from the 1940 Census of Agriculture. The number of mortgaged farms operated by tenants and managers, on the other hand, was estimated from Department of Agriculture survey data. For the estimate of the number of mortgaged tenant- and manager-operated farms, cropper farms were deducted from tenant-operated farms before the survey data on the percentages of farms under mortgage were applied. The total number of farms, excluding cropper farms, was used also as the basis for the estimate of the percentage of all farms under mortgage. The resulting percentages are somewhat higher than would be obtained if cropper farms were included, but this fact probably improves their quality for purposes of comparison among counties.

### RATIO OF MORTGAGE DEBT TO THE VALUE OF MORTGAGED FARMS

Total farm mortgage debt was estimated in the manner described above, and the value of mortgaged full-owner and part-owner farms was derived from 1940 census data. Two bases were used to approximate the value of mortgaged farms operated by

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tenants and managers, namely the 1940 survey data and the relationship between the average values per farm of mortgaged and debt-free farms of full-owner operators. The estimate obtained on the latter basis was checked against independent estimates based on the 1940 survey data, and where substantial differences were found the data were further analyzed to produce a final estimate.

### PERCENTAGE OF FARM MORTGAGE DEBT HELD BY PRINCIPAL LENDER GROUPS

Estimated total farm mortgage debt by counties is the starting point for apportioning farm loans among the several lenders. Survey data and complete tabulations are available for federal land banks, the Federal Farm Mortgage Corporation, and commercial banks. County data for the first two are based on the original amount of loans outstanding in 1940; independent estimates were prepared on the basis of survey questionnaire data for groups of counties falling in major type-of-farming regions. County estimates based on original loan amount were then adjusted downward to bring them into line with the county group estimates based on *unpaid balance* data.

There is probably some upward bias in the loan estimates, since the responses to mailed questionnaires from farm owners whose mortgages are held by the indicated lenders are usually relatively high, in contrast to replies of farmers borrowing from other sources. It seems unlikely, however, that there would be any appreciable difference in this bias among the several counties.

Estimates of bank holdings of farm mortgage debt are based on the same types of data as those described above, but the method of adjustment was different. Farm real estate loans reported by banks located in the respective counties provided the starting point for these estimates; the second basis was the replies of farm owners to mailed questionnaires. Where the two bases disagreed markedly, data for the counties were further analyzed to produce a compromise estimate. Although the possible error in individual county estimates was reduced by the use of these independent bases, a substantial element of judgment necessarily entered into the estimates for a few of the counties.

The estimates for insurance companies, mortgage investment companies, and the residual group of miscellaneous and individual lenders represent a segment of farm mortgage debt not accounted for by land banks, the Federal Farm Mortgage Cor-

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poration, or commercial banks on the basis of survey data obtained from farm owners. Since no independent check on the survey data could be made for these two major groups, the possibility of error in evaluating their loan percentages for individual counties is greater than that for the other two lender groups. However, the importance of insurance and mortgage investment company loans varies widely among counties, so that substantial differences in the estimated percentages of total mortgage debt held by the residual group may well represent nearly equal real differences.

### NON-REAL-ESTATE LOANS OF THE PRINCIPAL INSTITUTIONAL LENDERS

Data for PCA loans, FSA loans, and Emergency Crop and Feed loans are directly available for individual counties, but in a number of the drought-stricken counties the latter two classes of loans represented in 1940 an accumulation of past-due relief loans as well as current production loans. It is unlikely that the stratification of the sample for asset change in the 1930's fully offsets the distorting influence of these accumulated loans, but no basis was found on which to declare specific portions of the loans "dead debt" and to eliminate them from the total, especially since many of the debts incurred during the 1930's were repaid during the 1940's.

Data on non-real-estate loans of banks pertain to banks located in the county. Each county was separately considered from the viewpoint of the appropriateness of such data as a measure of current non-real-estate debt. Loan data of this type for counties in the range livestock area are particularly deficient; accordingly, after the counties were grouped, weight was given both to the ratio of loans to non-real-estate assets for the group and to the individual-county data in the estimates for individual counties. It is probable, however, that the result for this group of counties still underestimates the non-real-estate loans of banks in some of the counties, particularly where such loans are obtained from larger financial centers located outside the county.