ERS 167

Technical Appraisal of the 1960 Sample Survey Estimates of Farm Debt

FARM PRODUCTION ECONOMICS DIVISION • ECONOMIC RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

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TECHNICAL APPRAISAL OF THE 1960 SAMPLE SURVEY ESTIMATES OF FARM DEBT

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In the late fall and winter of 1960-61, the Bureau of the Census made a survey of farm debt as part of its 1960 Sample Survey of Agriculture. This was the first national survey of virtually all types of farm debt ever made in the United States (Alaska and Hawaii were not included). 2/ It produced a wealth of information never before available on the distribution of farm debt among the operators and landlords of the various sizes, types, and economic classes of farms. It disclosed the relationships between farm debts of operators and landlords, the farm incomes they received, and the value of the land they owned.

Five reports on the results of this survey have been published and several more reports are planned. 3/ In this report we attempt to appraise

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1/ Others who have reviewed and contributed to this appraisal are Ray Hurley, Bureau of the Census; Martin Planting, Farm Credit Administration; and Emanuel O. Melichar, Board of Governors of the Federal Reserve System.

2/ The survey covered all farm debts except price-support loans of the Commodity Credit Corporation and debts to merchants and dealers for home appliances and family living expenses. Although the Bureau of the Census conducted this survey, a technical committee composed of representatives of other interested agencies--including the U. S. Department of Agriculture, the Farm Credit Administration, and the Federal Reserve System--helped in framing the questions on farm debt and in preparing instructions for respondents and enumerators.

3/ The five published reports are:

Bureau of the Census. The 1960 Sample Survey of Agriculture. Vol. V: Part 5, Special Reports, 1962. (This report covers other phases of agriculture as well as farm debts.)

Atkinson, J. H. A New Look at the Farm Debt Picture. Fed. Reserve Bul. Dec. 1962.

Doll, Raymond J. Farm Debt as Related to Value of Sales. Fed. Reserve Bul. Feb. 1963.

Hesser, Leon F. Bank and PCA Lending to Farmers. Fed. Reserve Bul. Sept. 1963.

Federal Reserve Bank of Cleveland. Dairy Farmers Indebtedness. Monthly Business Rev. Aug. 1963.

(An additional article, "Agriculture in Our Capitalistic Economy," in the Monthly Review of the Federal Reserve Bank of Kansas City, September-October 1963, contains some data from the survey.)

the data on farm debts obtained in the survey. An appraisal is needed to serve as a basis for improving future debt survey techniques. Moreover, it may be useful to those who are preparing, or to those who are reading reports on the survey.

Our appraisal indicates that estimates of the farm debt based solely on the survey data result in understatements of the farm debt. Therefore, we include in this report estimates of the farm debt which we have made on the basis of all information available, including the survey data.

Method of Appraisal

In this appraisal we shall not examine in detail the procedures used in conducting the survey. These procedures have been described adequately in the Census report on the 1960 Sample Survey of Agriculture and in an article which appeared in the Review of International Statistical Institute. 4/

Instead, by comparing the data in this survey with data from other sources, we shall attempt to determine how completely the survey accounted for the amount of farm debt and how accurately it distributed the debt among the various sources of farm credit.

Two other sources of data on substantial parts of the farm debt are available. One is the periodic reports of the major lending institutions which make farm loans. The other is a survey of farm mortgage debt and farm taxes made at about the same time as the 1960 sample survey. 5/

For practical purposes the data from all three sources can be said to apply to the same date, January 1, 1961. The lending institution reports are available for December 31, 1960. The farm mortgage debt and tax survey obtained information as of January 1, 1961. Data from farm operators in the 1960 sample survey were obtained mainly in November and December 1960. Landlords who were canvassed later were asked to report their farm debts as of January 1, 1961.

Comparative Data

Data from the three sources are compared in table 1. Data from the two Census surveys agree fairly well as to the amount of farm real estate debt owed to each of the reporting lending institutions. Moreover, the survey data

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4/ Jabine, Thomas B., Hurley, Ray, and Horwitz, William N. Sample Design and Estimation Procedure for the 1960 Sample Survey of Agriculture in the USA. Rev. Internatl. Statis. Inst., Jan. 1962.
(Operators and landlords of about 11,000 farms reported in the survey.)

5/ Bureau of the Census (in cooperation with the U. S. Department of Agriculture). Farm Mortgage Debt and Farm Taxes. Final Report. Vol. V: Part 4, Special Reports, 1962.
(This survey used a sample of about 129,000 farms.)

Table 1.--Farm debts owed to reporting lending institutions: Census estimates and amounts reported by lending institutions, January 1, 1961

Type of debt and source of credit	Census survey estimates based on--		Reports of lending institutions	1960 Census survey estimates as percentage of lending institutions reports
	1960 survey of all farm debt on sample farms	1961 farm mortgage debt survey		
	Million dollars	Million dollars	Million dollars	Percent
Farm real estate debt:				
Federal land banks	2,565	2,568	2,538	101
Insurance companies	2,584	2,592	2,975	87
Commercial and savings banks	2,348	2,187	1/ 1,686	139
Farmers Home Administration	712	735	2/ 685	104
Production credit associations	532	3/	4/ 340	156
Total	8,741	5/ 8,082	6/ 8,184	107
Farm non-real-estate debt:				
Commercial and savings banks	2,567	7/	4,984	52
Farmers Home Administration	159	7/	418	38
Production credit associations	613	7/	4/ 1,140	54
Total	3,339	7/	6,542	51
Total farm debt:				
Federal land banks	2,565	7/	2,538	101
Life insurance companies	8/ 2,584	7/	2,975	87
Commercial and savings banks	4,915	7/	1/ 6,670	74
Farmers Home Administration	871	7/	1,103	79
Production credit associations	1,145	7/	1,480	77
Total	12,080	7/	6/ 14,726	82

1/ Includes an estimated $40 million of insured loans of Farmers Home Administration held by banks and reported as real estate loans secured by farmland.
2/ Includes $203 million of loans insured by FHA, most of which were held by, but not reported by other lenders.
3/ In this survey, no estimate was made of the real-estate-secured loans held by production credit associations.
4/ Estimate based on reports in 1956 and 1962 of the security for loans made by production credit associations.
5/ Excludes real-estate-secured loans held by production credit associations.
6/ Excludes $40 million of insured loans of FHA which were included in amount reported by both banks and by FHA.
7/ No estimate made.
8/ Excludes $176 million of non-real-estate loans presumably secured by insurance policies.

on farm real estate debt to the Federal land banks and the Farmers Home Administration agree quite closely with data reported by these agencies on their outstanding real estate loans. But both surveys indicate much more real-estate-secured debt to banks, and substantially less to insurance companies, than these lenders report. The 1960 sample survey indicates more real estate debt to production credit associations than is estimated for the associations. 6/

Data on non-real-estate farm debts were obtained only in the 1960 sample survey. It indicates about half as much debt of this type to institutions shown in the table as was reported by (or estimated for) these institutions.

With respect to total farm debt, the survey data on debt owed to the Federal land banks approximated the amount reported by these agencies; on the other hand, survey data on loans of the other types of institutions were less than the amounts reported by these institutions.

Since allowance must be made for sampling errors in the 1960 sample survey, we show in table 2 the range of amounts within which amounts obtained by a complete census of farm debts probably would have fallen. From these data it is clear that sampling errors can account for only a small part of the differences between the survey debt estimates and the amounts reported by some of the lending institutions. The probable reasons for these differences are:

1. Differences between the Bureau of the Census and the lending institutions in defining a farm and a farm debt.

2. Lack of reports on farm loans held in the trust department of commercial and savings banks.

3. Methods of classifying creditors by survey respondents.

4. Inclusion by some respondents of debts on chattel mortgages with debts secured by real estate.

5. Underreporting of debts by survey respondents.

Definition of Farm and Farm Debt

It is impossible to determine the extent to which lending institutions and the Bureau of the Census differed in their concepts of a farm and a farm

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6/ Amounts of production credit association loans secured by real estate were estimated from data obtained by Farm Credit Administration on the security for loans made in 1956 and 1962.

Table 2.--Farm debts owed to reporting lending institutions: Estimates based on 1960 sample survey and range of estimates within probable sampling error compared with amounts reported by lending institutions 1/

Type of debt and source of credit	1960 sample survey estimates		Amounts reported by lending institutions 3/
	Amounts	Range of amounts within probable sampling error of estimates 2/	
	Million dollars	Million dollars	Million dollars
Farm real estate debt:			
Federal land banks	2,565	2,300-2,825	2,538
Insurance companies	2,584	2,250-2,900	*2,975
Commercial and savings banks	2,348	2,100-2,600	*1,686
Farmers Home Administration	712	575- 850	685
Production credit associations	532	425- 625	*340
Farm non-real-estate debt:			
Commercial and savings banks	2,567	2,325-2,800	*4,984
Farmers Home Administration	159	100- 200	*418
Production credit associations	613	500- 725	*1,140
Total farm debt:			
Federal land banks	2,565	2,300-2,825	2,538
Life insurance companies	2,584	2,250-2,900	*2,975
Commercial and savings banks	4,915	4,575-5,250	*6,670
Farmers Home Administration	871	725-1,025	*1,103
Production credit associations	1,145	975-1,300	*1,480

1/ See footnotes in table 1 relating to amounts shown for various agencies.

2/ Chances are 19 out of 20 that these limits include the amount that would have been obtained by a complete census of farm debt. Amounts are rounded to nearest $25 million.

3/ Amounts marked with asterisk fall outside range of sampling error.

debt. But at several points, it seems clear that different concepts were used.

For example, the Census intentionally omitted from the farms it sampled approximately 140,000 "places" included in "whole farm" contracts of the Conservation Reserve. Lending institutions would have included loans on these properties among those they reported as farm loans. A post-Census check revealed that an estimated 79,000 additional places (mostly small, noncommercial operations) also were omitted from the farms sampled by the Census. Lenders may have had loans on some of these places. Farms omitted were equal to about 7 per cent of the total number of farms sampled. 7/ Because many were small or not actively operated, however, they could not have accounted for an equal proportion of farm debt. Certainly they do not explain why Census estimates of farm real estate debt held by banks and production credit associations were so far above the amounts reported by, or estimated for, these institutions.

Large timber tracts also were treated differently by Census and by lending institutions. The Census included only the debt on farmed, pastured, or grazed land in these tracts. But some larger life insurance companies included loans on large tracts of timber as farm real estate loans. From data furnished by these companies, it is estimated that they included as much as $80 to $90 million of loans on large tracts of timber in the farm real estate loans they reported at the end of 1960. This would account for nearly a fourth of the $400 million difference between the Census estimate and the lending institution report of farm real estate loans held by insurance companies. 8/

Loans in Bank Trust Departments

In their call reports, banks regularly report farm loans they hold for their own account. Farm real estate loans held for their own account are reported as loans secured by farm real estate, except a few that some banks report as "other loans to farmers" when real estate mortgages are supplemental rather than principal security. In addition to the loans held for their own account, the banks hold a sizable volume of farm real estate loans in their trust departments. These loans are not included in the call reports as the banks hold them only as trustee for others.

7/ Even if all of these places had been included, the farms sampled by the Census would have been about 9 percent below the total number of farms as estimated by the Statistical Reporting Service, USDA.

8/ The Federal land banks also had about $15 million of loans on large timber tracts, but adjustment for that amount still leaves the Census estimate of their loans within the range of probable sampling error.

From a survey of a sample of banks made by the American Bankers Association, it is estimated that at the beginning of 1961 banks held in their trust departments nearly $120 million of farm real estate loans. Of the loans held in their banking departments, about $40 million of loans secured by farm land were not so reported but were reported as "other loans to farmers." Thus it is estimated that the banks held nearly $160 million of farm real estate loans in addition to the $1,686 million shown in the tables. 9/ This would explain about one-fourth of the difference between the survey estimate and the lending institution report on bank-held farm real estate debt.

Methods of Classifying Creditors by Respondents

An additional part of the difference between the survey estimate and the lending institution report on bank-held farm real estate debt may be explained by the fact that many banks service farm real estate loans owned by other lenders. Loans owned by insurance companies often originate from applications taken by banks, and after the loans are made the banks service them for the companies. Also, banks sometimes sell farm mortgage loans which they initially made with their own funds and then service these loans for the buyers. Since virtually all the borrowing farmers' contacts are with the banks, it is probable that many of them consider banks the institutions to which they owe money.

An instruction to enumerators in the survey probably encouraged this method of reporting: 10/

> "Usually, a debt is owed to the institution or person from whom the farm operator obtained a loan or made a purchase 'on time.' Sometimes, however, loans or sales contracts, and even charge accounts, are sold by the person or institution that originally made them to some other person or institution. In such case, report the debt owed to the institution or person to whom the farm operator makes payments."

From the survey of sample banks by the American Bankers Association referred to earlier, it is estimated that on January 1, 1961, banks were servicing for others at least $155 million of farm real estate loans. Respondents probably reported that they owed most if not all of these loans to banks

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9/ Results of this American Bankers Association survey have not been published.

10/ Here and several places later in the report, the authors cite parts of the survey questionnaire and of the related instructions which, they believe, contributed to inaccurate or incomplete reporting of debts by respondents. They can do this with good grace as both served as members of the technical committee that helped to frame the survey questions on farm debt and the related instructions to enumerators and respondents.

because they thought banks were the sources of these loans, or because they followed the above instruction.

The following tabulation summarizes the estimated effects of these reporting practices on the data for banks. This tabulation starts with the amount of farm real estate loans the banks reported and ends with our best estimate of the amount of farm real estate debt farmers may have thought they should report as bank loans. All adjustments have been explained except the $40 million of insured loans of the Farmers Home Administration which the banks owned and reported as bank loans. These loans had been made and were serviced by FHA. Under the above instruction, respondents should have reported that they owed these loans to FHA.

		Million dollars
Farm real estate loans reported by banks		1,686
Add:		
Farm real estate mortgages held by banks as supplemental security for loans which banks reported as "other loans to farmers"		1/ 40
Farm real estate mortgage loans which banks held in trust departments but did not report in their call reports		1/ 118
Estimated amount of farm real-estate-secured loans held by banks as owners or trustees		1/ 1,844
Add:		
Farm real estate loans owned by others, serviced by banks. Farmers probably thought they should report these as bank loans.	1/ 155	
Deduct:		
FHA insured loans included in amount reported by banks. Farmers probably thought they should report these as FHA loans.	2/ 40	
	115	115
Estimated amount of farm real-estate-secured loans that farmers probably thought they should report as bank loans		1,959

1/ Estimates based on survey data obtained from a sample of banks by American Bankers Association.

2/ Estimate based partly on data of Farmers Home Administration and partly on survey data of American Bankers Association.

Of the $155 million of loans serviced by banks, we estimate that $125 million were owned by insurance companies. This would explain an additional part of the discrepancy between the Census estimate of amounts farmers owed life insurance companies and the amounts of farm loans these companies reported.

In the following tabulation the data reported by life insurance companies and banks--after adjustment for factors described above--are compared with the Census estimate based on the 1960 sample survey. The adjusted figure for life insurance companies is within the range of probable error of estimate for the sample survey. The adjusted figure for banks is still far below the amount of the Census estimate and outside the range of probable sampling error. There is little question that respondents in the survey over-reported the amounts of farm real estate loans they owed banks, even after adjustment for bank-serviced loans that respondents may have considered bank loans.

	Insurance companies	Banks
	Million dollars	Million dollars
Census 1960 sample survey:		
Estimated amount of farm real estate debt owed	2,584	2,348
Range within probable error of estimate	2,250-2,900	2,100-2,600
Adjusted amounts of farm real estate loans reported by lending institutions	1/ 2,760	2/ 1,959

1/ Excludes loans on large tracts of timber, estimated at $90 million, and loans serviced by banks, estimated at $125 million.
2/ From preceding tabulation.

Misclassification of Chattel Mortgages

So far, we have considered only the loans secured by real estate. Commercial banks and FHA reported outstanding amounts of their non-real-estate loans to farmers as of December 31, 1960. Moreover, as noted earlier, an estimate has been made of non-real-estate loans to farmers held by production credit associations. For each of these lenders, the reported (or estimated) amounts of their outstanding non-real-estate loans to farmers far exceed the estimates from the 1960 sample survey. Total farm loans reported by these institutions also exceed total farm debts to these agencies estimated in the sample survey.

These underestimates, combined with survey overestimates of real-estate-secured debt to banks and production credit associations, led us to believe that some survey respondents confused debt secured by chattel mortgages with debt secured by farm real estate. The instruction for reporting real-estate-secured debts read: "If any part (or all) of this amount is secured by mortgages, deeds of trust, or land purchase contracts on this place, enter the amount so secured." This could have been misinterpreted by respondents to include chattel mortgages; we believe many respondents made such a misinterpretation. As shown in the Appendix, we estimate that about $1,045 million of the survey estimate of farm real estate debt were debts on chattel mortgages.

Reclassification of Survey Data

Even before the estimates of misclassified chattel mortgages were made, the original survey data were reclassified in an attempt to make them reflect more realistically the relationship between debts arising from long-term uses of credit and those arising from short-term uses of credit. Specifically, the reclassification was intended to shift from the real estate to the non-real-estate category: (1) debts secured by chattel mortgages that had been reported incorrectly as secured by real estate; and (2) debts correctly reported as secured by real estate but for which real estate was supplemental rather than primary security.

The reclassified data were used in the articles already published in the Federal Reserve bulletins. They probably will be used also for most of the analyses yet to be done.

The reclassifications were made on an individual case basis so that the reclassified data could be tabulated for any desired groupings of farm borrowers. However, to avoid detailed analysis of each case (which might have been no more satisfactory) a mechanical method of reclassification was used. It was as follows:

1. New categories called "major real estate debt" and "non-real-estate and related debt" were established.

2. Major real estate debt was defined as: (a) All the real-estate-secured debt reported by respondents as owed to Federal land banks, to insurance companies, and to individuals from whom part or all of the farm was purchased; and (b) the largest real-estate-secured debt reported by a respondent as owed to the FHA, banks, other financial institutions (except production credit associations), or individuals other than those from whom the respondent purchased the farm--provided such debt was equal to, or larger than, real-estate-secured debts reported as owed to the creditors listed under (a) above.

3. Non-real-estate and related debt was taken to include all debts reported as owed to production credit associations and merchants and dealers, and all debts to other lenders not classified as major real estate debts.

These classifications were adopted in the belief that they would give a clearer picture of the longer-term (major real estate) and the shorter-term (non-real-estate and related) debt situations of various groups of farm operators and landlords discussed in the special reports. Federal land banks and insurance companies make real-estate-secured loans only (except policy loans of insurance companies), and individuals selling farms on contract or mortgage ordinarily have only the farm as security.

Most of the credits extended by these lenders were long-term. Therefore, all real-estate-secured debts reported as owed to these creditors were classified as major real estate debts. At the other extreme, production credit associations and merchants and dealers seldom take real estate as security except as a supplement to other security. Most of the credits they extend are short-term. Hence, all debts reported as owed to these creditors were classified as non-real-estate and related debt.

Banks and the FHA regularly make short-term non-real-estate farm loans as well as long-term loans secured primarily by farm real estate. Similarly, "other" institutions and individuals make both types of loans. It was less clear how real estate loans owed to these creditors should be classified, but it was decided to classify them as major real estate loans only if they were as large or larger than any other real-estate-secured loans reported by borrowers. 11/ This decision was based on the belief that real estate mortgages in most other situations were supplemental security for relatively short-term loans and did not reflect the use of long-term credit. (Table 3 shows the reclassified estimates.)

The method described above of reclassifying data reported by survey respondents resulted in shifting $1,372 million of debt from the real estate to the non-real-estate and related debt category. The tabulation (page 13) shows how the amounts shifted for various lenders compare with our estimates of the amounts of chattel mortgage loans that respondents incorrectly reported to be secured by farm real estate. (Also, see Appendix.) In the aggregate, the amounts shifted exceed our estimates of misclassified chattel mortgages. This was to be expected because all debts to production credit associations and merchants and dealers were reclassified as non-real-estate and related loans.

For some lenders--banks, other lending institutions, and other individuals--the amounts shifted were below our estimates of misclassified mortgage loans. Despite these differences, the reclassified data on major real estate debt and non-real-estate and related debt provide a more realistic picture of the debts arising from longer- and shorter-term uses of credit than do the original survey data.

11/ Except real-estate-secured debts to merchants and dealers and production credit associations.

Table 3.--Original Census debt estimates compared with reclassified estimates used in special reports

Type and holder of debt	Original Census estimates of debt	Reclassified estimates used in special reports 1/	Difference 2/
	Million dollars	Million dollars	Million dollars
Real-estate-secured debt held by--			
Federal land banks	2,565	2,563	-2
Insurance companies	2,584	2,583	-1
Commercial and savings banks	2,348	1,972	-376
Farmers Home Administration	712	653	-59
Production credit associations	532	0	-532
Other lending institutions	636	557	-79
Merchants and dealers	250	0	-250
Individuals:			
Seller of farm:			
On mortgage	1,904	1,903	-1
On sales contract	1,828	1,828	0
Other individuals	509	429	-80
Total real-estate-secured debt	13,868	12,488	-1,380
Non-real-estate farm debt held by--			
Commercial and savings banks	2,567	2,942	+375
Production credit associations	613	1,144	+531
Farmers Home Administration	159	217	+58
Other lending institutions 3/	490	568	+78
Merchants and dealers	1,342	1,592	+250
Individuals	723	805	+82
Miscellaneous 4/	135	134	-1
Total non-real-estate debt	6,029	7,402	+1,373
Total farm debt	19,897	19,890	-7

1/ Types of debt are designated "major real estate debt" and "non-real-estate and related debt."

2/ In the tabulations for the special reports, estimates for several agencies differed slightly from the original Census estimates even when no loans were reclassified. The estimate of total farm debt was $7 million short of the amount shown by the original Census estimates.

3/ Including insurance companies.

4/ Debts not included above, such as unpaid bills for veterinary services, utilities, past-due taxes, insurance premiums, and other purposes (excluding family living expenses).

Creditor	Amounts shifted	Estimates of misclassified chattel mortgage loans
	Million dollars	Million dollars
Banks	375	434
FHA	58	44
Production credit associations	531	200
Other lending institutions	78	134
Merchants and dealers	250	125
Other individuals	80	108
Total	1,372	1,045

Adequacy of Estimates Used in Special Reports

To obtain a point of reference for appraising the reclassified survey estimates used in the special reports, we made estimates of the farm debt held by various institutional and noninstitutional lenders. (See Part I of Appendix.) In making these estimates, we accepted the reports of regularly reporting lending institutions (adjusted for factors described previously) as measures of the part of the farm debt they held. Differences between the adjusted farm loans reported by these institutions and the survey estimates were then used to estimate from the survey data the farm debt held by non-reporting lenders.

All debt to production credit associations and to merchants and dealers was treated as "non-real-estate and related debt" in the data prepared for the special reports. To make our estimates of debt as comparable as possible, we have classified all debts to these creditors as non-real-estate debt even though some of them are secured by real estate (table 4). Even with these changes the concepts underlying the two sets of figures are not identical. For example, in our estimates bank loans with real estate mortgages as supplemental security were classed as farm real-estate-secured debt, while in the data used in the special reports at least some of these were shifted to "non-real-estate and related debt."

The estimates used in special reports account for 98 percent of our estimate of real-estate-secured farm debt, 62 percent of our estimate of non-real-estate farm debt, and 81 percent of our estimate of all farm debt on January 1, 1961. Both the survey data and our estimates of farm debt exclude price support loans made by the Commodity Credit Corporation and debts to merchants and dealers for home appliances and family living expenses.

Table 4.--Farm debt: Reclassified Census debt estimates compared with our estimates of debt, by source of credit, January 1, 1961

Type and holder of debt	Our estimates of debt 1/	Reclassified estimates used in special reports 2/	Estimates used in special reports as percentage of our estimates
	Million dollars	Million dollars	Percent
Real-estate-secured farm debt held by--			
Federal land banks	3/ 2,523	2,563	102
Insurance companies	3/ 2,885	2,583	90
Commercial and savings banks	4/ 1,804	1,972	109
Farmers Home Administration	5/ 685	653	95
Subtotal	7,897	7,771	98
Other lending institutions	515	557	108
Individuals			
Seller of farm:			
On mortgage	1,953	1,903	97
On sales contract	1,875	1,828	97
Other individuals	442	429	97
Subtotal	4,785	4,717	99
Total real-estate-secured debt	12,682	12,488	98
Non-real-estate farm debt held by--			
Commercial and savings banks	4,944	2,942	60
Production credit associations	1,480	1,144	77
Farmers Home Administration	418	217	52
Subtotal	6,842	4,303	63
Other lending institutions	1,010	568	56
Merchants and dealers	2,502	1,592	64
Individuals	1,345	805	60
Miscellaneous 6/	218	134	61
Subtotal	5,075	3,099	61
Total non-real-estate debt	11,917	7,402	62
Total farm debt	24,599	19,890	81

1/ Our estimates are based on data from reporting lenders as well as Census survey data. To improve the comparability of our estimates with the estimates used in the special reports, all debt to production credit associations and to merchants and dealers has been treated as non-real-estate debt.

2/ In this column, types of debt are designated "major real estate debt" and "non-real-estate and related debt."

3/ Omits loans on large tracts of timber. An estimated $125 million of the difference in amounts for insurance companies was the result of loans serviced by banks, which survey respondents reported as held by banks rather than by insurance companies.

4/ Includes real estate mortgages held in trust departments, but excludes loans insured by FHA and loans serviced by others. An estimated $155 million of the difference in amounts for banks was the result of loans serviced by banks for insurance companies and others, which survey respondents reported as held by banks rather than by insurance companies and others.

5/ Includes loans insured by the agency. Most insured loans are held by other creditors who cannot be identified.

6/ Debts not included above, such as unpaid bills for veterinary service, utilities, past-due taxes, insurance premiums, and other purposes (excluding family living expenses).

The differences between our estimates and reclassified survey estimates arise from a combination of factors. An important factor was underreporting of debts by respondents. However, the reports of lending institutions, used as a base for our estimates, included some types of loans that would not have been included in the survey. The exclusion of some soil-bank and other farms from the survey has been mentioned. Also, many of the non-real-estate loans held "for collection only" by FHA and included in its reported loan totals were owed by persons who no longer were farming at the time of the survey. Most important was the probability that the survey did not pick up all loans to integrated farm and nonfarm operations (such as broiler or livestock feeding and fruit and vegetable growing) and to corporate owners of farms operated by managers that were included as agricultural loans in reports of lending institutions. 12/

On the other hand, the survey coverage may have been broader in some respects than that of the lending agencies. For example, some farm loans held by banks probably were classified as installment loans rather than farm loans. On balance, however, we believe the lending agency coverage was considerably broader, and that underreporting of debts by survey respondents was responsible for only part of the differences between survey estimates and our estimates of farm debt.

To the extent that underreporting by respondents occurred, it affected chiefly the survey estimates of non-real-estate debts. As these debts usually are smaller and more volatile than debts secured by real estate--farmers often owe such debts to several creditors--respondents may have overlooked some of them. Part of the underreporting may have resulted from instructions in the survey questionnaire. One instruction was to omit debts to merchants and dealers for home appliances and family living expenses; another was to omit "miscellaneous debts" for family living purposes. 13/ The instructions may have caused some respondents to omit all debts for farm family purposes, regardless of the creditors to whom debts were owed. Another instruction directed respondents to report all debts relating to "this place " defined as the "land and buildings you operate." The purpose of this instruction was to keep farmers from reporting debts arising from other farms or nonfarm businesses they might own; but it may have been misinterpreted by some respondents to mean only those debts relating to land and buildings, to the exclusion of debts for operating purposes.

Despite the ambiguities in the survey questionnaires and the other possible reasons for underreporting, respondents appear to have reported most debts that represented important financial commitments arising from

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12/ The Census did not obtain farm debt data from larger-than-family-size corporations that owned farms operated by managers.

13/ To get as complete reporting as possible of debts to merchants and dealers for purposes other than family living, the questionnaire listed six major groups of purposes for which such debts are most commonly owed and asked about debts owed in each group.

operating and owning their farms. The reclassified survey estimate of major farm real estate debt used in the special reports comes close to accounting for all farm real-estate-secured debt. Although the survey estimate of non-real-estate and related debt is considerably below our estimate of all farm non-real-estate debt, it probably includes most larger debts of individual farmers and landlords for operating, stocking, and equipping farms.

Accordingly, it is believed that the survey estimates used in the special reports provide a valid basis for comparing major debt commitments of unincorporated operators and landlords of the various types, sizes, and economic classes of farms. This comparison can be made satisfactorily both in absolute terms and in terms of the relationship between these debts and survey estimates of other items (such as the value of farmland and buildings operated or owned and farm and nonfarm incomes received). Probably more farmers and landlords had debts of one sort or another than the survey estimates indicate, but, for groups of operators and landlords, the debts not accounted for represent only a small part of their total farm debt and probably did not affect their financial condition significantly.

Appendix

In preparing our estimates of total farm debt, we have used the loans reported by regularly reporting financial institutions (adjusted for factors described earlier) as measures of the part of the farm debt they held at the end of 1960. Also, we have assumed that if there are differences between the survey estimates of debt held by these institutions and the adjusted amounts of farm loans reported by these institutions, differences of at least equal magnitude would be found between the survey estimates for nonreporting creditors and the amounts of farm debt these other creditors held.

Part I: Procedure for Estimating Total Farm Debt

1. The first step was to bring the Census survey estimates of debt to reporting lending institutions as closely as possible into agreement with the basis on which these agencies themselves would report. This has been done by shifting from banks the real estate loans which they merely serviced to insurance companies and others that actually own them. (See table 5.) Insured FHA loans also might have been shifted, but the only financial institutions that report their holdings of such loans are banks and they report only a small percentage of the FHA insured loans. For this reason, the survey estimates of FHA loans were not changed.

2. The second step, shown by table 6, was to bring the agency reports on farm debt as closely as possible into agreement with the basis on which respondents in the survey are believed to have reported, excluding the adjustments made in table 5. Large timber loans of the Federal land banks and insurance companies were deducted from the agency totals because these loans were not included in the survey estimates. Since the FHA insured loans were left in table 5 as reported by survey respondents, they were added to the totals for FHA; the small part included in the bank reports was deducted from the bank totals. On the other hand, farm real estate loans held in their trust departments but not reported by banks, and real estate mortgages held as supplemental security for loans, reported by banks as non-real-estate loans, were added or shifted to the real estate loans reported by banks.

3. The third step, shown in table 7, was to make further adjustments in the survey estimates to correct the misclassification of chattel mortgages as real estate mortgages. The procedure used in making these corrections is explained in Part II of this Appendix.

4. Next, the adjusted survey estimates for debt <u>to reporting lenders</u> after adjustments for misclassified chattel mortgages were compared with the amounts reported by these lenders as adjusted in table 6. The adjusted survey estimate of real

Table 5.--Adjustment of sample survey debt estimates to more correctly identify creditors

Type of debt and creditor	Debt reported	Adjustments +	Adjustments -	Adjusted debt reported
	Million dollars	Million dollars	Million dollars	Million dollars
Real estate debt:				
Federal land banks	2,565	---	---	2,565
Insurance companies	2,584	1/ 125	---	2,709
Banks	2,348	---	2/ 155	2,193
FHA	712	---	---	712
Production credit associations	532	---	---	532
Subtotal	8,741	---	---	8,711
Other lending institutions	636	---	---	636
Merchants and dealers	250	---	---	250
Individuals:				
Seller--on mortgage	1,904	---	---	1,904
Seller--on land contract	1,828	---	---	1,828
Others	509	3/ 30	---	539
Subtotal	5,127	---	---	5,157
Total real estate debt	13,868	---	---	13,868
Non-real-estate debt:				
Banks	2,567	---	---	2,567
FHA	159	---	---	159
Production credit associations	613	---	---	613
Subtotal	3,339	---	---	3,339
Other lending institutions	490	---	---	490
Merchants and dealers	1,342	---	---	1,342
Individuals	723	---	---	723
Miscellaneous	135	---	---	135
Subtotal	2,690	---	---	2,690
Total non-real-estate debt	6,029	---	---	6,029
Total farm debt	19,897	---	---	19,897

1/ Estimated loans owned by insurance companies but serviced by banks and reported as owed to banks.
2/ Estimated loans serviced by banks for insurance companies and others reported in survey as owed to banks.
3/ Estimated loans serviced by banks for other than insurance companies.

Table 6.--Adjustment of data reported by agencies to correct for loans on large tracts of timber, loans held by banks as trustee and as supplemental security for non-real-estate loans, and insured loans of the Farmers Home Administration

Type of debt and creditor	Loans reported	Adjustments +	Adjustments -	Adjusted loans reported
	Million dollars	Million dollars	Million dollars	Million dollars
Real estate debt:				
Federal land banks	2,538	---	1/ 15	2,523
Insurance companies	2,975	---	1/ 90	2,885
Banks	1,686	2/ 40 3/ 118	4/ 40	1,804
FHA	482	5/ 203	---	685
Production credit associations	340	---	---	340
Total	8,021	361	145	8,237
Non-real-estate debt:				
Banks	4,984	---	2/ 40	4,944
FHA	418	---	---	418
Production credit associations	1,140	---	---	1,140
Total	6,542			6,502

1/ Estimated loans on large tracts of timber.
2/ Estimated loans reported by banks as non-real-estate loans but which had real estate mortgages as supplemental security.
3/ Estimated farm mortgage loans held by banks in trust departments but not reported by banks.
4/ Estimated loans insured by FHA which respondents reported as owed to FHA.
5/ Insured loans of FHA not included in agency report.

Table 7.--Adjustment of survey data for misclassified chattel mortgages

Type of debt and creditor	Survey estimates after adjustments in table 5	Adjustments for misclassified chattel mortgages		Survey estimates after adjustment for misclassified chattel mortgages
		+	-	
	Million dollars	Million dollars	Million dollars	Million dollars
Real estate debt:				
Federal land banks	2,565	---	---	2,565
Insurance companies	2,709	---	---	2,709
Banks	2,193	---	434	1,759
FHA	712	---	44	668
Production credit associations	532	---	200	332
Subtotal	8,711	---	678	8,033
Other lending institutions	636	---	134	502
Merchants and dealers	250	---	125	125
Individuals:				
Seller--on mortgage	1,904	---	---	1,904
Seller--on sales contract	1,828	---	---	1,828
Other individuals	539	---	108	431
Subtotal	5,157	---	367	4,790
Total real estate debt	13,868	---	1,045	12,823
Non-real-estate debt:				
Banks	2,567	434	---	3,001
FHA	159	44	---	203
Production credit associations	613	200	---	813
Subtotal	3,339	678	---	4,017
Other lending institutions	490	134	---	624
Merchants and dealers	1,342	125	---	1,467
Individuals	723	108	---	831
Miscellaneous	135			135
Subtotal	2,690	367	---	3,057
Total non-real-estate debt	6,029	1,045	---	7,074
Total farm debt	19,897	1,045	1,045	19,897

estate debt was 97 1/2 percent of the adjusted amount reported by the agencies. The adjusted survey estimate of non-real-estate debt was about 62 percent of the adjusted amount reported by the agencies.

5. From the adjusted survey estimates, these percentages were then used to derive estimates of the real estate and non-real-estate debts held by nonreporting creditors (shown in table 8).

6. The amounts estimated for nonreporting creditors were added to the amounts reported by reporting lending institutions (as adjusted) to get an estimate of total farm debt, (excluding loans on large tracts of timber).

This procedure may appear to involve the assumption that for each class of debt (real estate and non-real-estate) the percentage differences between the adjusted survey estimates of debt and the amounts of debt actually owed were the same for both nonreporting and reporting lenders. It also may appear that the percentage differences within each class of debt were assumed to be the same for all types of nonreporting lenders. We did not make these assumptions as we knew they would not be justified. However, because the debts owed to nonreporting lenders averaged smaller in size than those owed to reporting lenders, we did assume that they would be underestimated by the survey at least as much as were the debts to reporting lenders. Our estimates of total debt to nonreporting lenders therefore reflect the minimum amounts that we feel can safely be ascribed to these lenders.

Part II: Adjustments for Misclassified Chattel Mortgages

Misclassification of chattel mortgage debt as real estate mortgage debt in the survey was indicated by the apparent over-estimates of real estate debt, and apparent underestimates of non-real-estate debt to banks, the FHA, and the production credit associations. In estimating the amount of chattel mortgages so misclassified, we used the adjusted survey data and the adjusted reports of lending institutions as derived in tables 5 and 6. All amounts shown are in millions of dollars.

1. As a point of departure, we found that the adjusted survey estimate of real estate loans held by Federal land banks and insurance companies combined was 97 1/2 percent of the adjusted amount reported by these institutions. We assumed that the adjusted survey estimates of real estate loans held by banks, the FHA, and the production credit associations also would have been 97 1/2 percent of the adjusted agency reports for these institutions if the adjusted survey estimates had not included misclassified chattel mortgages. Based on this assumption, the amount and percentage of misclassified chattel mortgages included in the adjusted survey estimates of real estate loans were then computed (page 23) for banks, the FHA, and the production credit associations.

Table 8.--Estimates of total farm debt

Type of debt and creditor	Survey data after adjustments in table 7	Agency data after adjustments in table 6	Estimates of total debt to nonreporting creditors	Estimates of total debt to all lenders 1/
	Million dollars	Million dollars	Million dollars	Million dollars
Real estate debt:				
Federal land banks	2,565	2,523		2,523
Insurance companies	2,709	2,885		2,885
Banks	1,759	1,804		1,804
Farmers Home Administration	668	685		685
Production credit associations	332	340		340
Subtotal	8,033	8,237		8,237
Other lending institutions	502)	Divide each by .975	515	515
Merchants and dealers	125)		128	128
Individuals:				
Seller--on mortgage	1,904)		1,953	1,953
Seller--on sales contract	1,828)		1,875	1,875
Other individuals	431)		442	442
Subtotal	4,790		4,913	4,913
Total real estate debt	12,823			13,150
Non-real-estate debt:				
Banks	3,001	4,944		4,944
Farmers Home Administration	203	418		418
Production credit associations	813	1,140		1,140
Subtotal	4,017	6,502		6,502
Other lending institutions	624)	Divide each by .618	1,010	1,010
Merchants and dealers	1,467)		2,374	2,374
Individuals	831)		1,345	1,345
Miscellaneous	135)		218	218
Subtotal	3,057		4,947	4,947
Total non-real-estate debt	7,074			11,449
Total farm debt	19,897			24,599

1/ Excludes loans on large tracts of timber.

	Banks	FHA	PCA
Adjusted survey estimate of real estate loans------------------ (minus)	$2,193	$712	$532
97 1/2 percent of adjusted agency reports of real estate loans-------------------------- (equals)	1,759	668	332
Estimated chattel mortgages misclassified in survey as real estate loans------------------	434	44	200
Misclassified chattel mortgages as percentage of adjusted survey estimate of real estate loans------------------	20%	6%	38%

2. To check the reasonableness of these estimates, we compiled and charted additional data as described below. The premise underlying this check was that the percentage of misclassified chattel mortgages included in the real estate loan estimates of the survey would vary in accordance with the relative amounts of chattel mortgage loans and real estate loans held by the agencies. For example, if 90 percent of the loans of an agency consisted of chattel mortgage loans and 10 percent of real estate mortgage loans, it was reasoned that a larger percent of the survey estimate of its real estate loans would consist of misclassified chattel mortgages than would be the case if the agency's loans were 90 percent real estate loans. In the first instance, the "exposure" to the risk of misclassification is much greater. Moreover, the survey estimate of real estate loans with which the misclassified loans are compared would be much smaller.

3. From available data it was possible to derive approximations of the chattel mortgages held by banks, the FHA, and the production credit associations.

    a. Virtually all of the FHA non-real-estate loans are secured by chattel mortgages.

    b. Studies of production credit associations loans indicated that about 90 percent of the non-real-estate loans were secured by chattel mortgages in both 1956 and 1962.

    c. A study of bank loans in 1956 indicated that about 60 percent of the non-real-estate loans were then secured by chattel mortgages. Since the production credit associations percentage did not change between 1956 and 1962, it was assumed that the 60 percent for banks would also hold for later dates.

4. These percentages were applied to the adjusted agency reports on their non-real-estate loans to estimate the amount of chattel mortgages held by each, as follows:

Banks	= 60 percent of	$4,944 =	$2,966
FHA	= 100 percent of	$ 418 =	418
Production credit associations	= 90 percent of	$1,140 =	1,026

5. These amounts were then added to the adjusted agency reports on their real estate loans in order to determine the percentages of their total mortgage loans that consisted of chattel mortgages, as follows:

Banks	- Chattel mortgages	$2,966	- 62 percent of total
	Real estate mortgages	1,804	
	Total mortgage loans	$4,770	
FHA	- Chattel mortgages	$418	- 38 percent of total
	Real estate mortgages	685	
	Total mortgage loans	$1,103	
Production credit associations	- Chattel mortgages	$1,026	- 75 percent of total
	Real estate mortgages	340	
	Total mortgage loans	$1,366	

6. In figure 1 the percentages derived in (2) above are plotted against the percentages derived in (6) above. For the three reporting lenders, this figure indicates a relationship consistent with the original premise--viz that the percentages of the survey estimates of real estate debt consisting of misclassified chattel mortgages would be related to the proportions of the agencies' mortgage loans that consisted of chattel mortgages.

7. Adjustments for Nonreporting Lenders. As there were no data on the loans of nonreporting lenders other than those collected in the survey, a different procedure had to be devised for estimating the volume of misclassified chattel mortgages. A possible procedure was suggested by the analysis connected with figure 1. If the percentage of the survey estimate of real estate loans that consisted of misclassified chattel mortgages was related to the percentage of chattel to total mortgage loans held by the agency, might it also be related to the percentage of non-real-estate to total loans indicated by the survey for the agency?

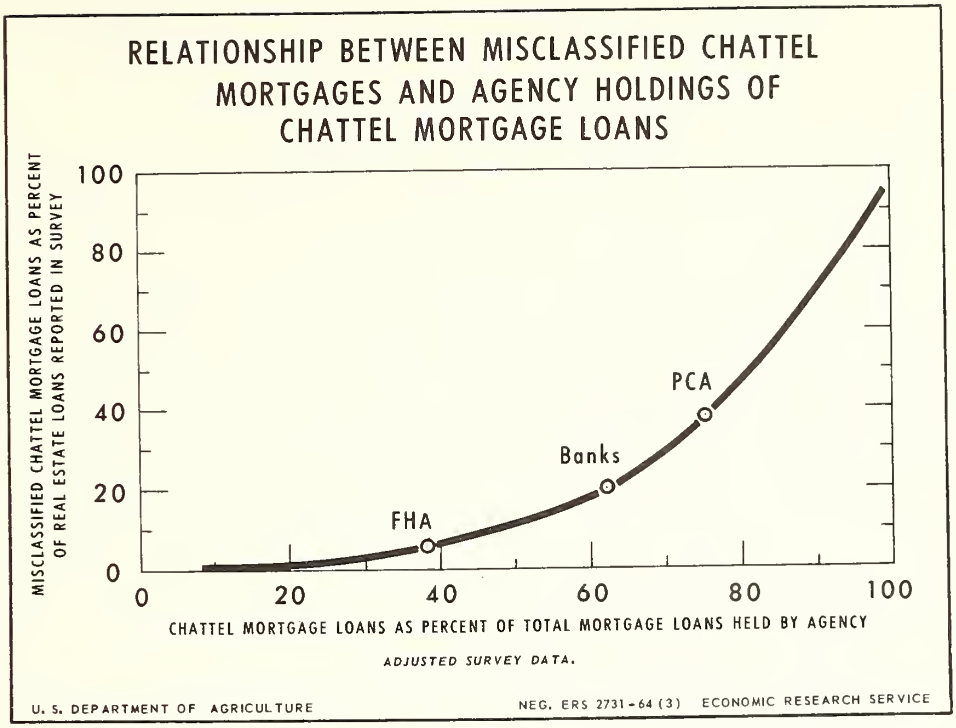

Figure 1

To test this hypothesis, the percentages of non-real-estate to total loans estimated in the survey (using the adjusted data in table 5) were computed for banks, the FHA, and the production credit associations. They were as follows: Banks, 54 percent; FHA, 18 percent; production credit associations, 54 percent. These percentages were then plotted in figure 2 against the percentages of real estate loans (survey estimate) that we had estimated to be misclassified chattel mortgages.

This chart showed that banks and production credit associations, for which we had estimated larger proportions of misclassified chattel mortgage loans also, according to the survey, had larger percentages of non-real-estate to total loans than did the FHA. This finding was consistent with our hypothesis. However, the points plotted for the three agencies established no definite trend line.

Study of the data suggested that the point for the production credit associations was above the point for banks (survey data indicated that both agencies had the same percentage of non-real-estate loans) for two reasons:

(1) According to agency data, 90 percent of the non-real-estate loans of the production credit associations, compared with only 60 percent for banks, were chattel mortgage loans--the types of loans subject to misclassification.

(2) A higher proportion of the chattel mortgages of the production credit associations than of those of banks (19 percent compared with 15 percent) had been misclassified, according to our estimates.

From these facts it was reasoned that a trend line based on the points plotted for banks, the production credit associations, and the FHA could be drawn for use in preparing estimates of misclassified chattel mortgages for the non-reporting creditors. This trend line is shown in figure 2. The line was started at a point below the FHA point because it was not considered probable that any other general type of lender would have all of its non-real-estate loans secured by chattel mortgages. It was drawn between the points for banks and the production credit associations on the assumption that the "other" lending institutions, and probably also merchants and dealers and other individuals, would have percentages of non-real-estate loans secured by chattel mortgages that would fall between those of banks and production credit associations. It then was drawn toward the 100 percent point on both axes because, as the percentage of non-real-estate loans reported approached 100 and the percentage of real estate loans reported approached 0, the exposure to risk of misclassification would increase and any misclassified chattel mortgage loans would represent higher and higher percentages of the diminishing volume of loans reported as secured by real estate.

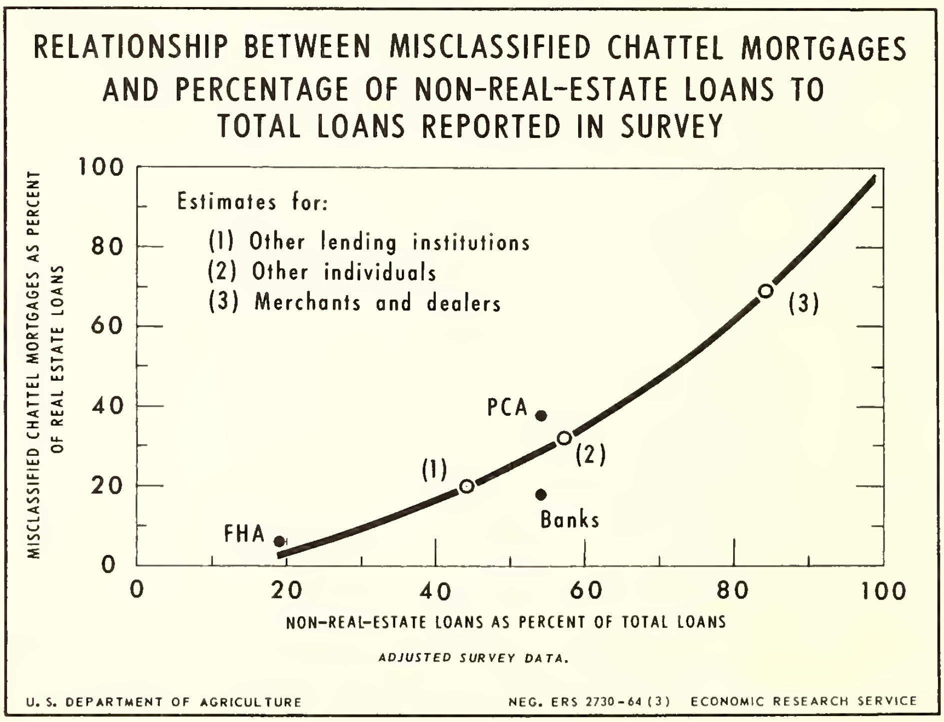

Figure 2

For nonreporting lenders, the percentages of non-real-estate loans to total loans shown by the adjusted survey estimates in table 5 were:

Other lending institutions-- 44 percent

Individuals other than sellers of farms---------- 57 percent

Merchants and dealers------- 84 percent

These percentages were plotted on the trend line in figure 2, and the vertical ordinates were taken as the percentages of real estate loans reported in the survey consisting of misclassified chattel mortgages. The percentages so derived were as follows:

Other lending institutions-- 21 percent

Other individuals----------- 32 percent

Merchants and dealers------- 70 percent

These estimates are based on the assumption that, for any given relationship of non-real-estate to total loans reported in the survey, the percentage of real estate loans consisting of misclassified chattel mortgages would average about the same for nonreporting lenders as for reporting lenders. Study of a sample of individual case records drawn by the Census suggested that these assumptions may have resulted in overestimates for merchants and dealers and for other individuals. Accordingly, the percentages for these lenders were reduced to 50 percent and 20 percent respectively.

Applied to the adjusted survey estimates of real estate loans, the above percentages gave the following estimates for misclassified chattel mortgage loans:

Other lending institutions ------ .21 x \$636 = \$134

Other individuals --------------- .20 x \$539 = \$108

Merchants and dealers ----------- .50 x \$250 = \$125

From study of the same sample case records, Ray Hurley, Chief, Agriculture Division, Bureau of the Census, concluded that the maximum percentages of misclassified real estate loans would be as follows:

Other lending institutions-- 22 percent

Other individuals----------- 7 percent

Merchants and dealers------- 51 percent

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