

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: The Quality of Consumer Instalment Credit

Volume Author/Editor: Geoffrey H. Moore and Philip A. Klein

Volume Publisher: NBER

Volume ISBN: 0-870-14484-7

Volume URL: <http://www.nber.org/books/moor67-1>

Publication Date: 1967

Chapter Title: Borrower Characteristics and Subsequent Collection Experience

Chapter Author: Geoffrey H. Moore, Philip A. Klein

Chapter URL: <http://www.nber.org/chapters/c1459>

Chapter pages in book: (p. 83 - 94)

## 4. Borrower Characteristics and Subsequent Collection Experience

The question whether quality, or credit risk, is measurable at the time the loan is made involves not only the terms on which loans are made but also the characteristics of the borrowers who obtain these terms. The same credit terms offered to different groups of borrowers can represent different degrees of risk exposure to the lender. Having previously considered the terms, we now examine borrower characteristics and their relation to loan quality.

### REVIEW OF EARLIER EVIDENCE

A major contribution toward the analysis of borrower characteristics was David Durand's study for the National Bureau, published in 1941.<sup>1</sup> Durand based his study on data provided by banks and sales finance companies, classified loans by various characteristics of the borrowers on which the lenders had information, and compared the collection experience on loans in the various classes. His findings, together with certain other evidence from previous studies, may be summarized as follows:

1. The higher income groups appear to be moderately better loan risks than the lower income groups according to most of the distributions shown in Table 32. The results are not beyond dispute, however, because for several of the samples the bad-loan relatives behave irregularly and do not show progressively lower figures as higher income groups are reached. For example, the sample of Title I loans shows progressively higher bad-loan relatives as higher income groups

<sup>1</sup> David Durand, *Risk Elements in Consumer Instalment Financing*, New York, National Bureau of Economic Research, 1941.

TABLE 32

Relationship of Loan Experience to Borrower's Income, Bad Loan Relatives

Borrower's Annual Income (dollars)	A. 1935-38				B. 1938		C. 1939-41		D. 1950-51		
	Commer- cial Banks	Indus- trial Banks	Personal Finance Companies	Auto Finance Companies		Home and Farm Authority	Electric	Title I Loans	Commer- cial Banks	Consumer Finance Companies	Credit Unions
				New Cars	Used Cars						
Under 600						1.4					
600-899	0.9	1.1	1.3		1.5	2.2		1.0	9.9	3.2	--
900-1,999				1.7		1.8					
1,200-1,499	1.2	1.1	1.1		1.4	1.3		.9	2.4	2.4	5.0
1,500-1,799						.7					
1,800-2,399	1.0	.9	.9	1.1	.8	.8			2.1	1.8	1.6
2,400-2,999	1.0	1.1	.7	1.2	.5			1.1	1.3	1.1	1.2
3,000-3,599	.8	.8	.8	.7	.9				.8	.8	1.1
3,600-4,799	.8	1.1		.6		.5		1.2	.7	.6	.2
4,800-5,999											
6,000-7,199	.7	.7	1.2	.6	.4			1.3	.8	.5	.2
7,200 and over								1.6	.8	.3	.9

Source: A. -- Durand, *Risk Elements*, Table 4, pp. 46-47; B. -- Plummer and Young, *Sales Finance Companies*, computed from Table 44, p. 181; C. -- unpublished data from a large New York bank, based on sample of 16,000 Title I FHA repair and modernization loans; D. -- Robbins, *Consumer Installment Loans*, compiled from Table 36, p. 110.

Note: Bad loan relatives for Durand material obtained by dividing the percentage each income group contributes to all loans with collection difficulty by the percentage contributed to all good loans. Relatives for other data obtained by using outstanding loans, rather than good loans as denominator.

are considered, the opposite tendency from that observed in the other samples. Durand also noted the conflicting evidence on the relation of borrower income to quality and the doubtful statistical significance of most of the findings. In part, this may be due to a failure to take into account the size of the borrower's obligation. Two available samples of loans classified by the ratio of monthly payments to income show increasing collection difficulties as the burden of payments increases, one of them being the sample of Title I loans that shows inconsistent results when income alone is considered.<sup>2</sup>

2. Ownership of certain assets, such as bank accounts and insurance, is another characteristic closely associated with loan quality.

3. Stability of job and stability of residence both seem to be consistently important factors in determining lender risk exposure.

4. Durand found that persons in professional occupations as a group produce the most favorable repayment experience, and other bits of evidence, summarized in Table 33, are consistent with this result. The clerical and sales group ranked next in Durand's study, but other evidence is less clear cut. This group ranked well in some of the samples studied and not so well in others. It seems clear that wage earners constitute the group with the least favorable experience generally, although there are several samples in which proprietors occupied this position.

It is therefore difficult to summarize the findings of previous efforts to evaluate the risk exposure associated with various occupations. The evidence is sparse, and has been acquired from diverse lenders. Some occupations (for example, the professions) are quite consistently as-

<sup>2</sup> One sample, provided by a large New York bank, applies to Title I repair and modernization loans; the other, given in Plummer and Young, *Sales Finance Companies and Their Credit Practices*, Table 45, is based on Electric Home and Farm Authority experience on appliance loans:

<i>Title I Loans</i>		<i>EHFA Loans</i>	
<i>Ratio of Fixed Charges to Income</i> (%)	<i>Delinquency Rate</i> (%)	<i>Ratio of Monthly Payment to Income</i> (%)	<i>Repossession Rate</i> (%)
Less than 10	5.7	Under 2.5	2.4
10-20	6.0	2.5 to 5	3.3
20-30	5.2	5 to 7.5	5.3
30-40	6.9	7.5 to 10	6.5
40-50	6.8	10 to 22.5	4.0
Over 50	8.0		

TABLE 33

## Relationship of Loan Experience to Borrower's Occupation

Occupational Classification	A. 1935-38					B. 1939-41			C. 1950-51	
	Commer- cial Banks	Indus- trial Banks	Personal Finance Companies	Auto Finance Companies		Title I Loans	Commer- cial Banks	Consumer Finance Companies	Credit Unions	
				New Cars	Used Cars					
	<i>Bad-Loan Relatives</i>									
Professions	0.6	0.7	0.7	0.6	0.4	0.8	0.7	0.9	0	
Clerical and sales	0.8	1.0	0.9	1.0	0.8	0.9	0.8	1.2	0.2	
Proprietors	1.0	1.1	1.5	1.3	1.3	1.2	0.1	1.2	0	
Managers and officials	1.3	1.1	1.1	0.7	1.2	1.1	0.9	1.5	0	
Wage earners	1.4	1.2	1.1	1.2	1.3	1.0	1.3	0.9	1.0	
	<i>Rank</i>									
Professions	1	1	1	1	1	1	2	2	2	
Clerical and sales	2	2	2	3	2	2	3	3	5	
Proprietors	3	3	5	5	4	5	1	4	2	
Managers and officials	4	4	4	2	3	4	4	5	2	
Wage earners	5	5	3	4	5	3	5	1	4	

Source: A. -- Durand, *Risk Elements*, Table 13, pp. 70-71. B. --- Unpublished data from a large New York bank relating to Title I FHA repair and modernization loans made July 1939 to July 1941. C. --- Robbins, *Consumer In-  
statement Loans*, Table 35, p. 108.

Note: Bad loan relatives for Durand material obtained by dividing the percentage each occupational group con-  
tributes to all loans with collection difficulty by the percentage contributed to all good loans. Relatives for other  
data obtained by using total loans rather than good loans as denominator. Rank is based on bad-loan relatives  
carried to two decimals.

sociated with good experience and others with less favorable experience (wage earners), but these generalizations are not universally valid and for several occupational groups the evidence is conflicting.

5. With respect to other personal characteristics, Durand found that women seemed to be better risks than men, but he could find no significant difference between married and single people. By age, he found a "slight" tendency for older borrowers to be better risks, though even this failed to show up in the commercial bank samples. The number of dependents he found to be "virtually unimportant."

#### THE 1954-55 SURVEY OF NEW-CAR PURCHASES

As noted earlier, the most recent large-scale study giving attention to borrower characteristics was the Federal Reserve Board's survey of new-car financing in 1954-55. The published report provides information on cash in contrast to credit purchases classified according to various borrower characteristics, but no attempt was made to relate them to collection experience.<sup>3</sup> New computations made for the present study make this possible. Not only does this information permit us to test with recent data the relationship between many of the borrower characteristics previously considered and collection experience, but there is information, albeit scanty, on several other relevant characteristics. Furthermore, it is possible for the first time, to our knowledge, to take borrower characteristics and loan terms jointly into account (see Chapter 5).

These data have been classified in order to group, by borrower characteristics, the number of loans in the sample that were delinquent at the time of the interview, and the number that had resulted in repossession of the automobile by the time of the interview. This information, when related to the total number of loans in the same class, provides the measure of collection experience used in Table 34.

Because of the limitations of the sample, the number in each class is sometimes too small to give reliable results. Moreover, the information on borrower characteristics is provided only by the personal interview sample, and, as noted earlier, the personal interviews disclosed fewer cases of collection difficulty than the lender reports. A number

<sup>3</sup> *Consumer Instalment Credit*, Part IV, p. 33.

TABLE 34

*Borrower Characteristics and Collection Experience  
on New-Car Loans, Personal Interview Sample, 1954-55*

1. Borrower's Income in Year of Purchase	No. of Con- tracts	Bad- Loan Rate (per cent)	2. Borrower's 1955 Income	No. of Con- tracts	Bad- Loan Rate (per cent)
Under \$3,000	325	3.4	Under \$3,000	287	4.5
3,000-3,999	502	4.4	3,000-3,999	463	4.1
4,000-4,999	812	2.7	4,000-4,999	789	2.2
5,000-9,999	2,636	1.9	5,000-9,999	2,685	2.1
10,000 and over	610	1.5	10,000 and over	662	1.7
Total	4,885	2.4	Total	4,886	2.4
3. Borrower's 1955 Disposable Income	No. of Con- tracts	Bad- Loan Rate (per cent)	4. Net Worth of Borrower	No. of Con- tracts	Bad- Loan Rate (per cent)
Under \$3,000	455	4.6	Negative	186	5.4
3,000-3,999	690	3.5	Zero	35	17.1
4,000-4,999	1,058	2.6	\$1-999	351	4.3
5,000-9,999	2,320	1.7	1,000-2,999	626	1.0
10,000 and over	363	0.8	3,000-4,999	440	3.0
Total	4,886	2.4	5,000-9,999	743	2.3
			10,000-24,999	1,024	1.3
			25,000 and over	615	2.3
			Total	4,020	2.3

Source: Unpublished data from the National Analysts New Automobile Purchase Survey for the Federal Reserve Board.

Note: The bad-loan rate is the total number of delinquencies and repossessions expressed as a percentage of the number of contracts in the group. Contracts that could not be classified because information was lacking are excluded.

TABLE 34 (concluded)

5. Liquid Asset Holdings of Borrower	No. of Contracts	Bad-Loan Rate (per cent)	6. Occupation of Borrower	No. of Contracts	Bad-Loan Rate (per cent)
Zero	687	8.0	Professional and technical	623	1.8
\$1-199	747	3.2	Clerical and sales	738	0.9
200-499	767	1.0	Skilled, semi-skilled, unskilled	2,267	3.3
500-999	650	0.9	Self-employed, nonfarm	521	2.7
1,000-1,999	564	1.2	Managers, officials proprietors	645	1.2
2,000-4,999	518	0.8	Farm operators	74	0
5,000-9,999	155	1.3	Housewives	127	1.6
10,000 and over	72	0	Unemployed	52	5.8
Total	4,160	2.5	Total	5,047	2.4

  

7. Life Cycle Status of Borrower	No. of Contracts	Bad-Loan Rate (per cent)	8. Age of Borrower	No. of Contracts	Bad-Loan Rate (per cent)
Under 45 years					
Single	512	2.7	18-29	966	3.0
Married, no children	563	0.4	30-39	1,648	2.6
Married, with children	2,231	3.0	40-49	1,395	2.2
45 Years and over			50 and over	1,041	2.1
Single	163	1.8	Total	5,050	2.5
Married, no children	887	1.5			
Married, with children	617	3.6			
Total	4,973	2.4			



of the inconsistencies in the patterns considered below can no doubt be thus explained.

The first three panels in the table pertain to loans in groups classified by income. They differ with respect to the definition of income used, but they are alike in showing that collection difficulties occur relatively more frequently with low-income than with high-income borrowers. Hence these data support the general tendencies shown by earlier surveys. It appears, too, that income as of a given year (1955) discriminates among risks better than income in year of purchase (1954 or 1955), and that disposable income does this somewhat better than total income.

When income is used as the measure of ability to meet financial responsibility it appears to be related to loan quality, but Durand found another type of measure, the possession of a bank account, to be more important. Measures of the borrower's asset position available in the 1954-55 survey data support this finding.

The fourth panel in Table 34 presents the relevant information concerning the significance of the borrower's net worth in relation to collection experience on automobile loans. Individuals with a net worth under \$1,000 represent considerably greater risk than those with net worth above this figure.

A more immediate indication of a borrower's ability to meet his financial obligations is his liquid-asset holdings (panel 5). The results are striking. Borrowers without liquid assets experienced much higher delinquency and repossession rates than those with such assets. Only about one-third of the borrowers had liquid assets of less than \$200, but they accounted for three-fourths of all the repossessions and delinquencies.

It must be observed, however, that the implications of these relationships are not as clear-cut as they might be, because the net worth and liquid-asset holdings were recorded as of the time the car buyer was interviewed in the survey, rather than as of the date the loan was originated. Hence the results do not necessarily mean that low net worth or a weak liquid-asset position at the time of borrowing leads to repayment difficulty, though they may mean that. Of course, it is precisely the people with little or no liquid assets to whom instalment purchasing offers the greatest appeal. Waiving the difficulty just noticed, it appears that information on liquid-asset holdings can be of great importance in evaluating credit quality.

It will be recalled from our summary of earlier studies that borrowers in professional occupations usually had a better, and wage earners a worse, repayment record than those in other occupations. Our new data (panel 6) are generally consistent with this. Clerical and sales groups also turned in a relatively good performance in both the earlier samples and the present one.

The survey data enable consideration of marital status in conjunction with age and the presence or absence of children, a combination of characteristics that may be called the "life cycle status" of the borrower. Whereas Durand found marital status to be of little significance in determining risk, panel 7 suggests that the life cycle status of the borrower may affect significantly the collection experience history of automobile loans. Married couples without children show generally the best collection experience in both age groups. Married couples with children, where the bulk of the loans were concentrated, generally exhibited the poorest experience in both age groups. Among single individuals, the younger group had a poorer record than the older. The association between the borrower's age and credit risk is examined further in panel 8. The results confirm Durand's earlier finding that older borrowers are apt to have the better payment record.

Considering the results of the 1954-55 survey for the several types of borrower characteristics in relation to one another, it appears that the highest rates of collection difficulty are those for borrowers with zero or negative net worth at the time of the survey, for borrowers with no liquid assets, and for borrowers with incomes under \$3,000 (and the unemployed). The lowest rates are for married borrowers under 45 with no children, for farm operators and clerical and sales personnel, and for borrowers with high income and substantial liquid assets. Each of the characteristics investigated appears capable of distinguishing classes of borrowers that differ considerably in their propensity to avoid repayment problems.

#### INTERRELATIONS AMONG BORROWER CHARACTERISTICS

All the data just examined take up borrower characteristics one by one and relate them to loan experience. This does not necessarily mean, of course, that each characteristic independently has some bearing on risk. Several may be reflecting their association with each other, or with some unobserved factor. For example, the relatively high delinquency

TABLE 35

*Median Ratio of Monthly Payment to Monthly Income,  
by Income, Occupation, Marital Status, and Age of  
Borrower, New Automobile Sales Contracts, 1953 and 1957*

	Number of Contracts		Median Ratio, Payment to Income (per cent)	
	June 1953	July 1957	June 1953	July 1957
<b>Monthly Income at Annual Rate (\$)</b>				
Under 3,000	484	503	29.5	33.6 <sup>a</sup>
3,000-4,199	1,229	1,572	20.6	26.0
4,200-5,999	1,458	3,272	16.1	19.5
6,000-11,999	975	2,441	12.3	14.2
12,000 and over	120	269	6.0	6.9
<b>Occupation</b>				
Farm				
Operator	96	142	19.4	19.6
Wage earner	41	69	21.2	24.4
Nonfarm				
Proprietor	424	567	14.8	15.5
Professional	246	423	14.9	16.7
Salaried	1,475	2,700	17.1	19.4
Wage earner	1,655	3,685	17.1	19.1
Miscellaneous	309	453	19.0	21.4
<b>Marital Status</b>				
Single	740	1,195	20.5	23.7
Married	3,501	6,836	16.4	18.5
Divorced-widowed	13	--	18.1	--
<b>Age (years)</b>				
30 and under	1,386	2,562	19.1	21.5
31-40	1,343	2,657	15.7	18.2
41-50	963	1,834	16.1	17.8
Over 50	551	984	16.1	18.8
All contracts (including incomplete questionnaires)	4,266	8,057	17.0	19.0

Source: A large sales finance company. Separate groups do not add to total because contracts with incomplete information have been eliminated. For results of a chi-square test of association see Appendix Tables B-13, B-14, B-15, B-16.

<sup>a</sup>Median value falls in open-end class.

rates for younger borrowers may reflect the influence of their lower incomes, or the easier terms they typically obtain. In the next chapter, we will examine some evidence that ties borrower characteristics, credit terms, and risk together, so that the separate influence of each can be tested. Before turning to it, however, we will consider data relating the borrower characteristics we have examined to a measure of the burden of monthly instalment payments<sup>4</sup> (Table 35).

It is not surprising, of course, that the ratio of monthly payments to monthly income is lower for the higher income groups. Some association of this sort would be expected since income is the denominator of the ratio. Nevertheless, this does not render insignificant the fact that in the very lowest income group the instalment payment absorbs nearly a third of the monthly income, whereas in the highest group the payment takes no more than one-fifteenth of income. Differences of this magnitude seem likely to be a significant cause of greater repayment difficulty on the part of low income groups.

The payment-to-income ratio also is higher for the younger age groups, single persons, farmers, and wage earners. With the exception of some of the occupational groups, the differences in payment burden are similar to those in collection experience, with the groups having a greater burden generally showing less satisfactory experience. All of this suggests, though it does not definitely establish the point, that variation in the ratio of instalment payments to income is one of the factors that explain the association between certain borrower characteristics and risk of delinquency or default.

#### SUMMARY

The answer to the question posed in this and the preceding chapter, i.e., whether credit terms and borrower characteristics are related to collection difficulties and loss experience, seems clear. Examination of the evidence has shown that credit terms such as maturity and especially down payment are importantly related to the ultimate outcome of the loan, while borrower characteristics such as income, liquid-asset holdings, and life cycle status also bear a relationship—in some cases a striking relationship—to repayment experience.<sup>4</sup> The results sug-

<sup>4</sup> Three recent studies provide some additional evidence. In a sample of direct instalment loans made during 1952-58 by a commercial bank, Paul Smith derived

gest that, by observing terms of credit or relevant characteristics of borrowers, one can determine in advance certain broad variations in credit risk.

delinquency rates associated with each of some twenty loan and borrower characteristics. The rates were found to vary inversely with the maturity of the loan and with the borrower's income, age, length of time in last residence, and time on last job. Higher delinquency rates were also found for renters than for homeowners, for those without a telephone, for those without a bank account, and for men than for women borrowers. See "Measuring Risk on Instalment Credit," *Management Science*, November 1964, pp. 327-340.

Broadly similar results with respect to repossession rates on new-car contracts written by a large sales finance company during 1957-58 are reported by Paul W. McCracken, James C. T. Mao, and Cedric V. Fricke in *Consumer Instalment Credit and Public Policy*, Ann Arbor, Mich., 1965, pp. 134-140. As in earlier studies, repossession rates were found to vary positively with maturity on new-car contracts and inversely on used-car contracts. They also varied positively with the percentage of dealer cost (new cars) or wholesale value (used cars) financed. The results for income, age, length of residence and of employment, homeownership, occupation, and marital status correspond to those reported above.

Finally, the preliminary results of a new Federal Reserve survey also are generally consistent with the above findings. See *Monthly Review*, Federal Reserve Bank of Atlanta, November 1966, pp. 85-88.