INTERINSTITUTIONAL COMPETITION FOR CONSUMER CREDIT AT THE END OF THE TWENTIETH CENTURY

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CREDITOR, n. One of a tribe of savages dwelling beyond the Financial Straits and dreaded for their desolating incursions. -- Ambrose Bierce (1842-1914), *The Devil's Dictionary*, 1911.

I. Introduction

This paper investigates the changes in segmentation of consumer credit markets by banks and finance companies at the end of the twentieth century. In the past, regulatory barriers largely segmented markets for consumer credit by the class of institution providing the credit (see National Commission on Consumer Finance 1972). Banks lent primarily to low-risk consumers, and finance companies lent to high-income consumers. Research conducted during the 1970s suggested a greater degree of competition between different classes of institutions than had previously been believed. Several researchers found that the volume of personal loans extended by finance companies in different states was influenced by lending activities of other types of creditors (Fand and Forbes 1968; Shay 1970; Stuhr 1972; Smith 1973). Other researchers produced evidence showing considerable overlap in the risk distributions of finance company and bank borrowers (Eisenbeis and Murphy 1974; Boczar 1975, 1978), which suggests that many borrowers obtained finance company loans for reasons other than availability. Subsequently, regulatory reforms relaxed many barriers to competition, and technological advances have increased the availability or information and tools for evaluating risk. financial institutions responded by seeking new customers and offering new credit products. As a result, the structure of consumer credit markets has changed markedly. No recent analysis has examined the extent to which market segmentation in personal lending may have eroded.

This paper reexamines the risk-segmentation hypothesis for non-automobile closed-end consumer instalment credit at banks and finance companies. This category corresponds roughly to the personal loan category examined in much of the previous research on interinstitutional competition. Personal loans have been an important type of credit for some consumers because this type of credit has historically been the means for increasing debt levels beyond those normally accepted by secured lenders (Juster and Shay 1964). The data for the analysis are primarily from the Federal Reserve

Board's 1983 and 1998 Surveys of Consumer Finances. The surveys provide a complete inventory of each consumer debt outstanding by source, information credit attitudes and behavior, and data on demographic characteristics for a representative sample of US households.[1] The analysis estimates a model that allows a comparison of the risk profiles of bank and finance company borrowers in 1983 with risk profiles in 1998. This comparison provides evidence of possible changes in risk segmentation. A reduction in risk segmentation would imply that the market for personal loans has become more competitive.

The paper is organized into five main sections. The second section discusses the historical origins of market segmentation of consumer credit markets and reviews the available evidence before 1977. The third section highlights some of the changes in the frequency of use of different types of consumer credit and creditors between 1977 and 1998. The fourth section presents the analysis and results of our investigation of the risk segmentation hypothesis with the new data. A final section summarizes the conclusions.

II. A Brief History of Consumer Credit Markets in the United States

The regulation of interest rates critically influenced the development of consumer credit markets in the United States. This regulation–consisting of a series of exceptions to usury laws–largely determined which institutions would become the major sources of consumer credit. Because the exceptions were created with little thought to their interaction, they often segmented consumer credit markets along institutional lines. This section briefly describes the development of segmentation in consumer credit markets and reviews the evidence on its existence.

A. The Origins of Market Segmentation for Consumer Credit

After independence, the states retained the usury laws that had been adopted during the colonial period or enacted new usury laws. The prevailing 6-8% usury ceilings were too low to allow lenders to make

[1] The Survey of Consumer Finances were conducted annually from 1947 to 1970 and then discontinued. They were resumed in 1977. The surveys conducted between 1947 and 1970 did not collect information on source of credit.

consumer loans profitably. As a result, consumer credit was generally available only from institutions that were given special exemptions from the usury laws or from lenders that were willing to violate usury laws. Merchants–exempted from usury laws by virtue of the time-price doctrine–were a major source of consumer credit during the nineteenth century.[2] Illegal lenders (loan sharks) were the other major source of consumer credit at that time.

The structure of the modern consumer credit industry began to emerge in the early twentieth century with the passage of legislation intended to curb the growth in illegal lending. Since prohibition had not provided a sufficient deterrent to illegal lending, states attempted create profitable lending opportunities but still limit rates by enacting special ceilings for different classes of creditors.

Legislation authorizing credit unions passed in 1909, and the first credit union was established in the same year. The legislation generally allowed credit unions to charge rates of 12% per annum. The profitability of consumer lending by credit unions was enhanced by certain cost advantages. Credit unions were exempt from taxation and typically received subsidized personnel and facilities from sponsoring organizations.

Industrial banks first appeared in 1910 offering a discount loan at the legal rate under the usury law with a repayment plan in a hypothecated, non-interest-bearing savings account. This arrangement increased the yield to the bank without appearing to violate usury ceilings.[3] As industrial banks became established, many states passed industrial loan laws sanctioning the arrangement. The laws authorized discount rates and sometimes set ceilings for industrial banks that were above the usury ceilings. Although industrial loan companies never became a major supplier of consumer credit, the industrial loan laws helped to legitimize use of discount rates and other arrangements to evade usury laws.

Consumer finance companies came into existence following passage of small loan legislation in 1914 and later years. The small loan laws authorized state licensed lenders to charge higher rates than

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[2] The other major exempted sources of consumer credit were pawnshops and remedial loan associations. Neither institution provided substantial amounts of consumer credit. Commercial banks were not exempted from usury laws. Their personal lending, being limited to wealthy individuals, was insignificant.

[3] The effective annual yield for such arrangements is higher than the discount rate first because the principal is reduced first the interest and then by periodic repayments of principal.

those allowable under usury laws. The small loan laws generally graduated rate ceilings by the amount of credit extended, with higher rates being allowed for larger loans. Small loan laws also often specified maximum loan sizes and terms to maturity.

Sales finance companies emerged during this period as well. The stimulus for the emergence of the sales finance industry was not the need for legislation, since the sales finance companies could invoke the time-price doctrine to avoid usury laws. Instead the stimulus was the growth of automobile industry, which created a demand for financing not only consumers' purchases but also dealers' working capital. The sales finance companies established by the automobile manufacturers contributed substantially to the growth of consumer credit in the early twentieth century.

Commercial banks became interested in consumer lending in the mid-1930s. Commercial banks tended to offer consumers discount loans, often with a repayment plan like that used by industrial banks. Although a precedent was provided by industrial loan laws, the legality of these bank loans was uncertain. This uncertainty prompted most states to enact personal loan laws exempting commercial bank consumer lending from usury laws. Most of the personal loan laws specified ceilings as discount rates, which were sometimes greater than usury ceilings.

These developments produced the major suppliers of consumer credit in the United States in the second half of the twentieth century. In the mid-1930s, rate ceilings were applied to merchants and sales finance companies as many states enacted retail instalment financing laws supplanting the time-price doctrine. Commercial banks rapidly became the largest single supplier of consumer credit. In addition, the distinction between consumer and sales finance companies faded as both classes of institutions diversified in each others' business.

The application of different special rate ceilings for different classes of creditors in most states fragmented the market for consumer credit. Finance companies typically had rate ceilings that were higher than those for banks, particularly for small loan sizes. Rate ceilings for credit unions were usually closer to rate ceilings for banks, but most credit unions enjoyed cost advantages over the other institutions. The result was a separation of the market into parts with unknown overlap. Banks tended

to make larger, low-cost loans, and credit unions and especially finance companies tended to make smaller, high-cost loans.

Furthermore, most people believed that the institutional segmentation of consumer credit markets also segmented borrowers on the basis of credit risk. Finance companies' higher rate ceilings made small loans to relatively risky borrowers attractive. The limited resources of these borrowers precluded larger loans even if the graduated rate ceilings allowed higher rates. Banks lower rate ceilings made small loans unprofitable because of the relatively high fixed costs associated with consumer lending. Together with banks' historically conservative lending practices, low rate ceilings led banks make large loans to low-risk borrowers. Credit unions' niche was ambiguous, but many believe that credit unions served primarily low and middle-income consumers because of credit unions' working-class origin.[4]

B. Evidence of Competition Between Different Classes of Creditors

For many years, much of the empirical research in the consumer credit area focused on the effects of rate ceilings on the supply of consumer credit. In 1968, Fand and Forbes conducted such a study and found an unexpected result. The result raised a question about the validity of the risk-segmentation hypothesis.

Fand and Forbes specified statewide aggregate demand and supply functions for instalment and personal loans. The supply function included variables representing rate ceilings for personal loans, risk borne by finance companies, and bank portfolio shares for instalment or personal loans. Among the supply variables, bank involvement in consumer lending but not rate ceilings for personal credit or risk borne by finance companies was significantly related to the volume of instalment or personal credit. These results suggested to Fand and Forbes that the influence of bank involvement on the supply of credit may have been underappreciated. Although bank involvement is not necessarily competition, its

[4] For further discussion of the historical development of consumer credit markets, see Michelman (1966), Chapman and Shay (1967), National Commission on Consumer Finance (1972), or Rogers (1974).

significance it stimulated later researchers to consider the possibility of competition between different classes of creditors more seriously.

1. Studies Using Supply or Demand Functions. In the following years, the efforts of several researchers to estimate supply or demand functions produced contradictory evidence on the possibility of interinstitutional competition. Shay (1970) considered a model of aggregate statewide demand and supply for personal loans outstanding from finance companies similar to that of Fand and Forbes. Bank involvement was measured by the ratio of bank offices to finance company offices. Shay estimated several variants of the model and found in each case that bank involvement was inversely related to the volume of personal loans from finance companies. These results led Shay to conclude that "the competition between commercial banks and small loan offices [i.e., finance companies] for the same borrower is stronger than had been anticipated."[5]

Sartoris (1972) also considered effects of competition on the aggregate supply of personal loans from finance companies in a state. He found no significant relationship between the amounts of finance company and commercial bank personal loans per household. In contrast, the amounts of finance company and credit union personal loans per household were significantly inversely related. Thus, Sartoris concluded that credit unions but not commercial banks competed with finance companies.

In another study using aggregate statewide data, Adie (1973) estimated cross elasticities of demand among consumer finance companies, sales finance companies, commercial banks, and credit unions. He found that the volume of loans at consumer finance companies was directly related to rates charged by banks and that the volume of loans at sales finance companies was directly related to rates charged by banks and credit unions. In contrast, the volume of loans at banks and credit unions was not significantly related to rates charged by either consumer or sales finance companies. The findings that bank loans were substitutes for finance company loans but that finance company loans were not substitutes for bank loans suggests that bank and finance company loans were imperfect substitutes for each other. These results might occur because the risk segmentation was not complete, perhaps

[5] *Op. cit*., p. 513.

because some finance company borrowers are lower risk–thus able to obtain credit from banks–and are sensitive to rates charged by banks.

Smith (1973) estimated regressions for the aggregate statewide volume of personal loans from finance companies, banks, and credit unions on average finance rates, delinquency rates, rate ceilings, and various other variables affecting demand or supply. Smith found significant direct relationships between the volume of personal loans at finance companies rates and rates charged by banks and between the volume of personal loans at credit unions and rates charged by finance companies. These results, which imply positive cross-elasticities, suggest competition across different classes of institutions.

Using the same data as Smith in a different model, Greer (1973) estimated demand, supply, and rejection rate functions for personal loans. Greer measured the price of credit at banks by the ratio of the average finance rate at banks to the average finance rate at finance companies. He found that this variable had no significant effect on the supply of personal loans at finance companies, leading him to conclude that "... interinstitutional competition cannot be considered very intense, perhaps in large part because the variegated legal rate ceilings ... tend to discourage price competition and promote market segmentation by risk classes."[6]

Stuhr (1972) examined data on consumer lending at individual banks in local geographic areas. To account for competition, he used measures of the bank's own market share, including ones that reflected personal lending by finance companies in the denominator. He found that the average rate charged by the bank for consumer credit was significantly inversely related to the measures of its market share. Stuhr's use of local geographic data more accurately reflected actual market conditions than statewide data because consumer credit markets were local. Economic theory provides no justification for the use of a firm's own market share to measure competition, however. Thus, Stuhr's conclusion that interinstitutional competition is indicated by the significance of market share variables that included finance company lending is difficult to accept.

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[6] *Op. cit*., p.58.

2. Studies of the Risk Segmentation Hypothesis. Two studies have compared-risk related characteristics of borrowers at different financial institutions for evidence of that the institutions served different risk classes of customers. In a study of the effects of a rate ceiling on small loan extensions and renewals in Maine, Eisenbeis and Murphy (1974) analysed survey data on applicants who had been denied finance company loans because of a particular state rate ceiling. Using risk-related socio-economic characteristics of the applicants who subsequently obtained credit in a discriminant model, they were unable to predict very accurately the type of creditor from which these applicants obtained the credit. Since risk-related characteristics were nor related to type of institution, Eisenbeis and Murphy concluded that banks, finance companies, and credit unions did not segment the personal loan market in that state on the basis of risk.

Boczar (1978) compared socio-economic and life-cycle characteristics of personal loan borrowers at banks and finance companies, using data from a survey conducted for the Federal Reserve Board in 1970. The characteristics considered–age, home ownership, credit card ownership, number of dependents, marital status, education, race, income, and sex–were frequently used in credit scoring models at that time (before the Equal Credit Opportunity Act prohibited the use of some of these variables in credit evaluation) to differentiate between low and high-risk applicants. Boczar hypothesized that these risk-related characteristics would distinguish between bank and finance company borrowers if banks and finance companies segmented the personal loan market on the basis of risk. To investigate this hypothesis, he estimated a model to predict the probability of being a bank borrower. Boczar found that the risk-related characteristics of borrowers did indeed help distinguish whether a borrower was a bank or finance company customer, a result that is consistent with the risk segmentation hypothesis. Frequency distributions of predicted probabilities showed that many finance company borrowers had low predicted probabilities of being bank borrowers and few had high predicted probabilities of being bank borrowers. Most bank borrowers had high predicted probabilities of being bank borrowers and few had low predicted probabilities of being bank borrowers.

However, the results suggested that risk might not be the only factor distinguishing between bank and finance company borrowers. A graph showed considerable overlap in distributions of predicted probabilities for bank and finance company borrowers. A substantial number of finance company borrowers had risk-related characteristics indicating a high probability of being a bank borrower. This finding led Boczar to conclude that factors other than risk may have accounted for these borrowers' choice of creditor. Thus, bank and finance company personal loans appeared to be substitutes–at least for some borrowers.

III. Changes in Consumer Credit Markets

Subsequent to most of the studies of interinstitutional competition, regulatory reforms relaxed many of the barriers to competition that segmented consumer credit markets in the past. Information about credit use and payment performance of individual consumers has become more complete. And the technology to store, retrieve, and analyse credit histories is less costly and more widely accessible. Financial institutions have responded by seeking new customers and new credit products. As a result, consumer credit markets have changed markedly.

Data from the Federal Reserve Board's Survey of Consumer Finances document the changes. Consumers shifted from closed-end to revolving consumer credit. The percentage of households using any type of closed-end consumer instalment credit decreased slightly, from 37.5% in 1977 to 34.6% in 1995 (table1). The percentage of families using revolving credit, in contrast, increased dramatically, from 15.7% in 1977 to 37.3% in 1995.

For closed-end consumer instalment credit, consumers increased their use of finance companies at the expense of banks and retailers. The percentage of households using finance companies doubled, increasing from 6.1% in 1977 to 12.6% in 1995 (table 2). Over the same period, the percentage of households using banks fell from 21.6% to 14.8%, and the percentage using retailers fell from 7.1% to 2.5%.

Automobile credit accounted for most of the change in use of closed-end consumer instalment credit. The percentage of households using finance companies for auto credit more than doubled, increasing from 4.6% in 1977 to 11.2% in 1995, while the percentage using banks fell from 18.8% to 12.6%. The percentages of households using finance companies and banks for other closed-end consumer instalment credit was about the same in 1997 and 1995, although there was some variation in intervening years.

Perhaps the most significant change in consumer credit markets was the growth in ownership and use of bank credit cards. In 1977, 38.2% of households had bank credit cards, and, as mentioned, 15.7% of households revolved on bank credit cards. In 1995, the percentage of

households having bank credit cards increased dramatically to 66.5%, and the percentage of households revolving on bank credit more than doubled, increasing to 37.3%.

IV. A Reexamination of the Risk Segmentation Hypothesis with New Data

This section investigates the risk segmentation hypothesis for non-automobile closed-end consumer instalment credit at banks and finance companies.[7] Although a relatively small percentage of households used this type of consumer credit (a fewer than a tenth of households used this type of credit in 1995), non-automobile closed-end consumer instalment credit has been of considerable interest because it was the marginal type of credit for many households. In particular, the personal loan from finance companies offered many households the opportunity to circumvent the equity requirements implicit in the loan terms offered by many other creditors (Juster and Shay 1964; Bizer and DeMarzo 1992). Consequently, this type of credit has significance beyond its frequency of use.

A. The Model

For this study, we reestimated Boczar's model to predict the probability of being a bank borrower in 1983 and 1998. The logit model was used for estimation. As mentioned, the model used nine explanatory variables to predict bank borrowing. They were

1. home ownership
2. possession of a credit card
3. age
4. number in household
5. marital status
6. education
7. race
8. income

[7] Loans over $25,000 (in 1970 dollars) were excluded, since such loans are probably business or investment loans, not consumer loans.

9. sex

Exact definitions of variables are provided in table 4. Some of these variables–for example, home ownership, possession of a credit card, and income–were commonly used in application scoring models. A few of the personal characteristics probably were not used very often in scoring models–for example, race and sex, but such personal characteristics may identify groups that signal creditworthiness differently.[8]

Again, the hypothesis is that if banks and finance companies segmented the market on the basis of risk, the risk-related characteristics of borrowers would distinguish between bank and finance company borrowers. This analysis makes two key assumptions. The first assumption is that the socio-economic and life-cycle characteristics used in the model actually reflect risk. The second assumption is that the relationship between these characteristics and risk is the same for bank and finance company borrowers. The latter assumption would be violated if borrowers self-select themselves on the basis of some variable not included in the model–such as credit history or heavy indebtedness. Suppose that borrowers with, say, poor credit histories and low risk indicated by scored characteristics borrowed from finance companies, and borrowers with good credit histories and low risk indicated by scored characteristics might borrow from banks. In this case, an overlap of risk profiles would not indicate anything about risk segmentation.

The Survey of Consumer Finances contains many more variables than were available to Boczar. The survey contains variables on levels of indebtedness and payment performance, which allows one to address some of the limitations imposed by the assumptions of the model. For this paper, we consider how payment performance may affect conclusions of the model. The survey variable for payment performance indicates whether respondents if they were late or fell behind on scheduled debt repayments during the past three years.

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[8] Chandler and Ewert (1976), for instance, found that sex of applicant did not imply anything about creditworthiness *per se*, but when taken into consideration with other demographic characteristics in a scoring model, sex of borrower increased the model's ability to distinguish low-risk women applicants from high-risk women applicants. Therefore, such variables are appropriate for this exercise, even if they are prohibited under the Equal Credit Opportunity Act.

B. Results

1. 1983 Models. The estimated logit model using the nine explanatory variables was statistically significant at the 99% level of confidence ($?^2$ =72.5 with 13 degrees of freedom). Six coefficients of explanatory variables were significant. Home ownership, high school education, and college education were associated with a greater probability of bank borrowing. Young age, larger household size, and moderate income were associated with a lower probability of bank borrowing (table 5).

The model estimated using risk-related characteristics of borrower was helpful in distinguishing between bank and finance company borrowers. Overall, the model classified 70.4% of observations correctly using the sample percentage of bank borrowers as the criterion for classification (table 6). Seventy-two percent of bank borrowers and 66.1% of finance company borrowers were correctly classified.

The distributions of predicted probabilities (figure 1) show clearly that bank borrowers had higher average predicted probabilities than finance company borrowers (0.799 for bank borrowers versus 0.326 for finance company borrowers). This result is consistent with the view that bank borrowers were less risky than finance company borrowers and supports the risk segmentation hypothesis. However, the results suggest that risk may not be the only factor distinguishing bank and finance company borrowers. The distributions of bank and finance company borrowers overlapped substantially. A third of finance company borrowers were incorrectly classified as bank borrowers. In other words, these finance company borrowers had a high predicted probability of being a bank borrower. These borrowers possibly could have obtained bank loans.

Next, we considered the effect of borrowers' payment performance in the model. We added variables the model to allow the late payment variable to have an effect by itself and in interaction with the other explanatory variables. The late payment and interaction variables were jointly significant ($?^2$ =23.0 with 14 degrees of freedom) at the 90% confidence level. However, the predictions of the model were slightly worse than the predictions of the model that did not consider credit history. Therefore, this measure of credit history did not help distinguish between bank and finance company

borrowers. Boczar's second assumption–that the relationship between characteristics and risk was the same for both creditors–does not appear to be violated.

In summary, the model estimated using 1983 data produced results similar to those of Boczar. Bank borrowers appeared on average less risky than finance company borrowers. However, risk profiles of bank and finance company borrowers overlapped substantially, suggesting that for many borrowers bank and finance company loans may have been substitutes for each other.

2. 1998 Models. The estimated logit model using the nine explanatory variables was statistically significant at the 99% level of confidence ($?^2$ =208.2 with 13 degrees of freedom). Explanatory variables that were significant in 1983 were generally also significant in 1998, but a few other variables were also significant. Home ownership was associated with a higher probability of bank borrowing. In addition, having a credit card and male family heads were associated a higher probability of bank borrowing in the 1998 model. Younger age, larger household size and married family heads were associated with a lower probability of bank borrowing. College education and moderate income changed signs. College income was associated with a lower probability of bank borrowing in 1998, and moderate income was associated with a higher probability of bank borrowing (table 5). These differences suggest that risk profiles of bank and finance company borrowers may have changed between 1983 and 1998.

Although the model was statistically significant, it does not distinguish very well between bank and finance company borrowers. Overall, the model classified 51.6% of observations correctly (table 6). Only 17.7% of bank borrowers were correctly classified. The 90.4% correct classification rate for finance company borrowers was achieved at the expense of incorrectly classifying nearly all bank borrowers as finance company borrowers.

Distributions of estimated probabilities for bank and finance company borrowers overlapped almost entirely (figure 2). The average predicted probability for bank borrowers, 0.539, is not much different from the average predicted probability for finance company borrowers, 0.546. These results suggest that the risk profiles of bank and finance company borrowers were quite similar in 1998. Bank borrowers could no longer be distinguished from finance company borrowers on the basis of risk.

Our findings did not change when we take borrowers' payment performance into account. The late payment variables were jointly significant at the 99% confidence level ($?^2$ =75.5 with 14 degrees of freedom), but the improvement in predictions from these variables was negligible. The percentage of borrowers correctly classified increased from 51.6% to 52.4%. The percentage of bank borrowers correctly classified increased from 17.7% to 20.1%, while the percentage of finance company borrowers correctly classified fell slightly from 90.4% to 89.4%. These small improvements did not alter the conclusion that the distributions of estimated probabilities for bank and finance company borrowers overlap almost entirely

In summary, the model did not distinguish very well between bank and finance company borrowers in 1998. The distributions of predicted probabilities of bank and finance company borrowers overlapped almost entirely. This result suggests that bank and finance company customers had similar risk profiles in 1998 and provides no support for the risk-segmentation hypothesis. The 1998 result stands in sharp contrast to the 1983 result, which suggested that the average finance company borrower was riskier than the average finance company borrower.

V. Conclusions

Consumer credit markets experienced major changes at the end of the twentieth century as relaxation of regulatory restrictions and advances in the information technology created new opportunities for lending. The paper investigates changes in non-automobile closed-end consumer instalment lending at banks and finance companies. This category of credit roughly corresponds to personal lending, which has been significant because personal loans–especially personal loans from finance companies–have historically been the marginal source of debt for many consumers.

The results of this investigation suggest that the risk segmentation by banks and finance companies that characterized the personal loan market in the past disappeared by the end of the twentieth century. Risk profiles of bank and finance company borrowers overlapped but were quite distinct in 1983. The average bank borrower was clearly less risky than the average finance company borrower. In contrast, risk profiles of bank and finance company borrowers overlapped almost entirely

in 1998. On the basis of risk-related personal characteristics, bank borrowers did not appear to be different from finance company borrowers.

These results seem quite reasonable when one considers the changes in consumer loan markets since 1983. State rate ceilings and loan size limits, which often prevented creditors of one type from offering loans allowed for another type, were relaxed in the late 1970s and early 1980s. Credit reporting increased, making information on payment performance more complete. This development reduced the information advantage creditors had when lending to existing customers. The introduction of credit bureau scores further eroded the information advantage in lending to existing customers. Credit bureau scores provided measures of relative credit risk based on a large sample of existing borrowers. Creditors were no longer limited to statistical risk evaluations developed solely from their own experience. Moreover, the technological advances that made collection and processing of large amounts of data possible also reduced the cost of collecting and analysing credit histories. As a consequence of these developments, one could argue, finance companies' largely lost their advantage in the high-risk segment of the market.

A finding that banks and finance companies do not segment the personal loan market on the basis of risk implies that borrower risk is not a barrier to inter-industry competition. This conclusion has important implications for managers of lending institutions and officials at regulatory agencies. Managers should consider the actions of other types of creditors in developing its personal lending policies and marketing programs, and officials should be concerned with interinstitutional competition in the personal loan market in analysing the competitive effects of proposed mergers and acquisitions. In addition, this conclusion may have implications beyond the personal loan market. The National Commission on Consumer Finance (1972) found that factors that produced risk segmentation in the personal loan market were at least to some extent present in markets for other types of consumer credit. A relaxation of regulatory restrictions and advances in the information technology also affected other types of consumer credit. It seems reasonable to believe that any institutional risk segmentation for other types of consumer credit would have been similarly affected. Future research will address this hypothesis.

The findings presented in this paper should be viewed as preliminary. For this paper, we reestimated an existing model. This model probably is not the best one that we can find. Many more potential explanatory variables are available from the Survey of Consumer Finances. Another model with different variables may better distinguish bank and finance company borrowers from each other. Furthermore, different models may be appropriate for different. Variables that reflect risk in 1983 may not reflect risk very well in 1998. For example, considering the growth in bank card holding and the emergence of subprime bank card issuers, having a bank card may indicate risk very well in 1983 but not in 1998. Finally, surveys may not be able to provide the some of data necessary to determine risk and distinguish between bank and finance company borrowers. Consumer surveys may not be able to capture the detailed payment history available in credit reports. Such payment history data may have played a greater role in evaluating credit risk in 1998 than in 1983. Despite these qualifications, however, the changes in risk profiles of bank and finance company borrowers between 1983 and 1998 are dramatic. The conclusion that risk segmentation declined and interinstitutional competition increased probably would stand even with better models and data.

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1. USE OF SELECTED TYPES OF CLOSED-END CONSUMER INSTALMENT CREDIT, BY SOURCE

Percent of families

Type of credit and source	1977	1983	1989	1992	1995	1998
Home improvement						
Commercial bank	2.2	2.1	.7	.5	.7	
Savings institution	n.a.	1.0	.4	.1	...	
Credit union	.5	.7	.4	.4	.3	
Finance company	.3	.2	.6	.3	.2	
Merchant	.6	.6	.3	...	.1	
Any source	3.5	4.5	2.4	1.3	1.3	
Automobile						
Commercial bank	18.8	12.8	12.9	11.7	12.6	
Savings institution	n.a.	1.6	2.8	1.4	1.2	
Credit union	8.0	5.4	5.5	6.2	6.8	
Finance company	4.6	8.3	10.3	8.3	11.1	
Merchant	2.3	1.0	2.9	1.5	.1	
Any source	31.9	27.6	32.1	27.5	29.6	
Other						
Commercial bank	2.0	4.4	4.4	2.5	2.2	
Savings institution	n.a.	.4	1.4	.2	.2	
Credit union	.7	1.7	2.2	1.2	2.0	
Finance company	1.6	3.3	2.8	1.9	1.8	
Merchant	4.4	6.2	6.2	3.0	2.4	
Any source	8.4	14.8	15.5	8.3	8.3	
Any type						
Commercial bank	21.6	17.6	16.7	13.8	14.8	
Savings institution	n.a.	2.9	4.5	1.6	1.4	
Credit union	8.7	7.4	7.1	7.3	8.3	
Finance company	6.1	11.3	13.2	10.3	12.6	
Merchant	7.1	7.7	9.0	4.4	2.5	
Any source	37.5	38.9	41.1	33.0	34.6	

2. USE OF OPEN-END CONSUMER INSTALMENT CREDIT, BY SOURCE

Percent of families

Type of credit and source	1977	1983	1989	1992	1995	1998
Credit line						
Commercial bank	n.a.	5.3	5.7	6.7	6.4	
Savings institution	n.a.	1.2	1.8	1.4	.9	
Credit union	n.a.	5.3	2.0	2.3	2.0	
Finance company	n.a.	1.4	1.7	.8	.8	
Any source	n.a.	11.5	10.6	10.5	9.5	
Credit card						
Bank credit card	15.7	21.9	29.1	32.9	37.3	
Merchant credit card	24.4	28.4	27.8	24.0	24.6	
Memo:						
Has bank credit card	38.2	42.4	56.2	63.4	66.5	
Has merchant credit card	54.3	57.3	60.8	58.7	57.7	
Usually pays credit card balances in full						

3. USE OF SELECTED TYPES OF CONSUMER INSTALMENT CREDIT, BY SOURCE

Percent of families

Type of credit and source	1977	1983	1989	1992	1995	1998
Closed-end instalment						
Commercial bank	21.6	17.6	16.7	13.8	14.8	
Savings institution	n.a.	2.9	4.5	1.6	1.4	
Credit union	8.7	7.4	7.1	7.3	8.3	
Finance company	6.1	11.3	13.2	10.3	12.6	
Merchant	7.1	7.7	9.0	4.5	2.5	
Any source	37.5	38.9	41.1	33.0	34.6	
Any instalment credit						
Commercial bank	21.6	20.9	21.1	18.7	19.8	
Bank credit card	15.7	21.9	29.1	32.9	37.3	
Savings institution	n.a.	3.9	6.0	3.0	2.2	
Credit union	8.7	10.8	8.8	8.8	9.7	
Finance company	6.1	12.1	14.3	10.8	13.2	
Merchant	7.1	7.7	9.0	4.5	2.5	
Merchant credit card	24.4	28.4	27.8	24.0	24.6	
Any source	48.2	53.6	56.4	55.0	59.2	

4. DEFINITIONS FOR LOGISTIC REGRESSION PREDICTING BANK BORROWING

Dependent variable

OTHCB	Obtained credit from bank = 1; otherwise = 0

Independent variables

HO	Owns home = 1; otherwise = 0
CC	Has credit card from merchant or gasoline company = 1; otherwise = 0
AY	Age of family head 25 to 34 years = 1; otherwise = 0[9]
AM	Age of family head 35 to 44 years = 1; otherwise = 0
AO	Age of family head 45 years or older = 1; otherwise = 0
NH	Number of persons in household
M	Married = 1; otherwise = 0
EHS	Family head has high school diploma = 1; otherwise = 0[10]
EC	Family head has college degree = 1; otherwise = 0
R	Non-Hispanic Caucasian = 1; otherwise = 0
YM	Family income $5,000 to $9,999 (in 1970 dollars) = 1; otherwise = 0[11]
YH	Family income $10,000 or more (in 1970 dollars) = 1; otherwise = 0
S	Family head is a male = 1; otherwise = 0
LATE	Made late payments (60+ days) on debts in last three years = 1; otherwise = 0

[9] Excluded category is "age of family head less than 25 years."

[10] Excluded category is "education of family head less than high school diploma."

[11] Excluded category is "family income less than $5,000 (in 1970 dollars)."

5. ESTIMATION RESULTS FOR LOGISTIC REGRESSION PREDICTING BANK BORROWING

	1983 SCF		1998 SCF	
Variable	Basic model	With credit history	Basic model	With credit history
HO	.522***	.379**	.321***	.231***
	(12.766)	(4.268)	(22.716)	(7.825)
CC	.219	- .043	.158***	.122*
	(2.153)	(.049)	(7.423)	(3.086)
AY	- .383*	- .330	- .236**	- .158
	(2.865)	(1.316)	(4.351)	(1.389)
AM	- .158	- .179	- .080	-1.000
	(.381)	(.315)	(.460)	(.504)
AO	.313	.558**	.122	.379***
	(1.482)	(2.876)	(.987)	(6.870)
NH	- .081 *	- .007	- .069***	- .034
	(3 .273)	(.012)	(9.336)	(1.251)
M	- .073	- .381	- .233***	- .385***
	(.109)	(1.537)	(7.993)	(14.185)
EHS	.405**	.382*	.033	.133
	(5.541)	(2.750)	(.203)	(2.193)
EC	.864**	.778***	- .314***	- .370***
	(16.255)	(8.041)	(24.405)	(23.445)
R	.197	.163	- .023	.046
	(1.475)	(.453)	(.126)	(.315)
YM	- .434**	- .307	.155**	.244***
	(5.840)	(1.650)	(4.057)	(6.037)
YH	- .267	- .189	.079	.175*
	(1.841)	(.579)	(.892)	(2.922)
S	.120	.487	.620***	.633***
	(.273)	(2.510)	(55.732)	(37.768)
LATE and late payment interaction variables (joint significance)	n.a.	* (22.096)	n.a.	*** (75.524)
Intercept	.246	.231	- .296**	- .444***
	(.664)	(.327)	(4.931)	(8.183)
?-square	72.429	95.425	208.218	283.742
Degrees of freedom	13	27	13	27

*/**/*** Significantly different from zero at the 90%/95%/99% level of confidence. ?-square statistics are in parentheses.

6. CLASSIFICATION RESULTS

(Percent of observations correctly classified)

	All borrowers	Bank borrowers	Finance company borrowers
1983 SCF			
Basic model	70.4	71.5	66.1
With credit history	66.1	65.9	66.9
1998 SCF			
Basic model	51.6	17.7	90.4
With credit history	52.4	20.1	89.4

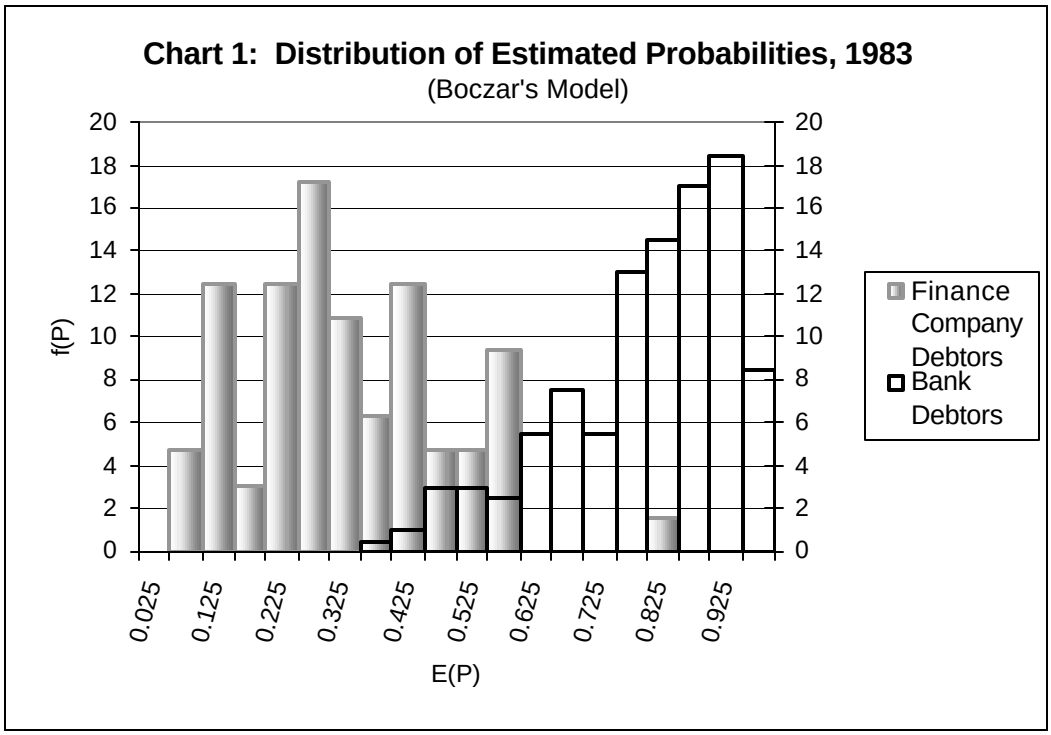
Chart 1: Distribution of Estimated Probabilities, 1983
(Boczar's Model)
f(P)
E(P)
0.025
0.125
0.225
0.325
0.425
0.525
0.625
0.725
0.825
0.925
Finance Company Debtors
Bank Debtors

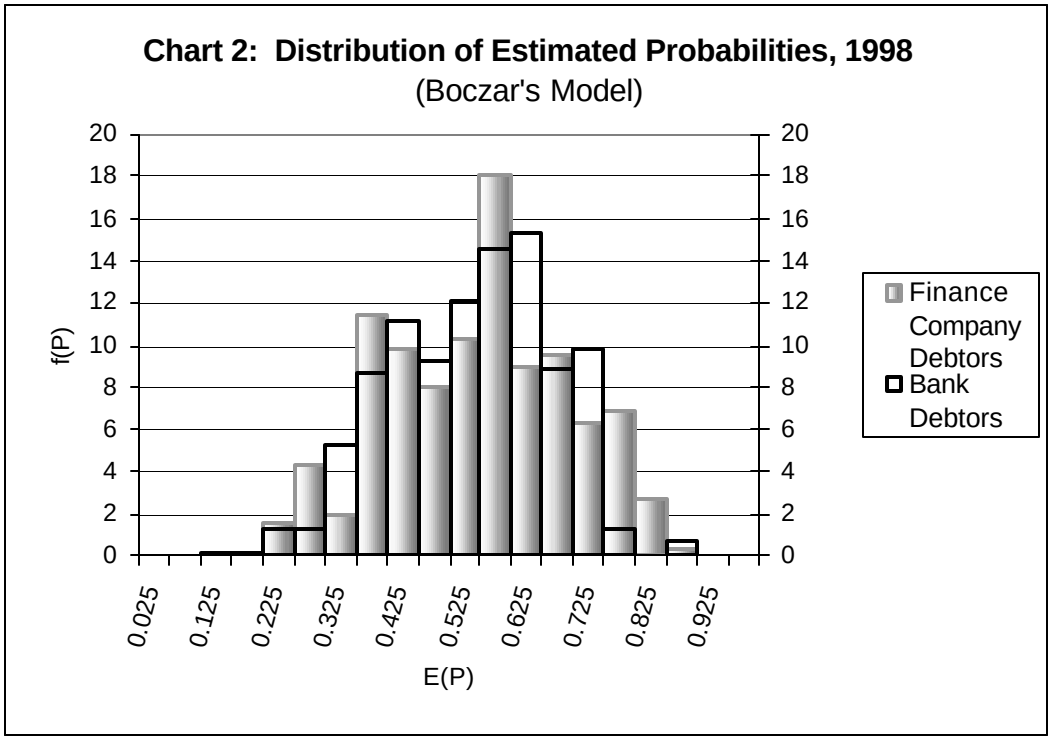
Chart 2: Distribution of Estimated Probabilities, 1998
(Boczar's Model)
f(P)
E(P)
0.025
0.125
0.225
0.325
0.425
0.525
0.625
0.725
0.825
0.925
Finance Company Debtors
Bank Debtors

Chart 3: Distribution of Estimated Probabilities, 1998
(Model with interactions of 'Late' with other variables)