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**Value Pricing of Bank Card Services**

# VALUE PRICING OF BANK CARD SERVICES

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## Abstract

The purpose of this paper is to explore an alternative, pricing structure that might be adopted for bank credit cards. Under current pricing practices consumers who pay their accounts in full each month (nonrevolvers) pay no finance charges, whereas those who permit a portion of the unpaid balances to carry forward from month to month (revolvers) pay all of the finance charges. These finance charges constitute about three-fifths to three-fourths of total income available to banks from credit card operations.

We propose to permit banks to levy three separate charges: (1) an annual percentage rate from date of purchase or posting to the account to reflect the cardholders' use of credit services; (2) a transaction fee for the value received by cardholders from having a convenient payment mechanism; and (3) an annual fee or commitment fee that would reflect the value of the option upon the line of credit provided cardholders.

An alternative pricing policy should be defensible economically and from the standpoint of public policy. To evaluate proposed changes in the pricing system, policy makers must be able to identify the characteristics of those who, as nonrevolvers, are not paying directly for any of the three basic services provided by credit cards. At issue is how they differ, if at all, from those consumers who are providing most of the income from credit card operations received by banks. Given this information, policy makers can decide whether they wish to allow banks to shift some portion of the cost of providing credit card services to the current nonrevolvers.

Data from a national survey of consumers were used to develop a model to identify distinguishing characteristics of nonrevolvers and revolvers. The results of the analysis indicate that, when compared to revolvers, nonrevolvers have significantly higher incomes, smaller families, and are older. Ranking first in importance as a distinguishing characteristic was the consumer's evaluation of his or her ability to save in advance for major purchases. Nonrevolvers were significantly less likely than revolvers to indicate that they had no trouble saving in advance for major purchases.

The implication of these findings is that bank cardholders are segmented into at least two distinguishable groups that use the card for different purposes and receive different value from the card. The current pricing system for bank cards seems to be perverse in that the nonrevolvers, who are using services provided by the card and pay little or nothing for the services that they receive. In terms of public policy, these results suggest the desirability of permitting banks to price separately for each of the three basic services received by their cardholders.

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## I. Introduction

Between years-end 1972 and 1979, outstanding revolving bank credit grew from \$7.2 billion to \$29.2 billion, a compound annual growth rate of 22.2 percent.<sup>1</sup> To a considerable extent, revolving bank credit has supplanted retail installment credit, and small-unsecured personal loans.

In recent years the remarkable growth in bankcard outstandings has been more frequently characterized by losses than by profits for the credit card issuers. The purpose of this paper is to explore the alternative courses of action that bankcard issuers might take to reverse that trend. On the basis of an analysis of a national sample of bank credit cardholders, we suggest a change in the current pricing structure that is economically rational and acceptable as public policy.

In the next part of the paper we describe briefly the current status of bank credit cards: the pricing structure, patterns of card use, and the profitability of bankcards. The third part examines the economic effects on consumers of the various alternative methods that banks might adopt to price the various services provided by a credit card. In part IV, multiple discriminate analysis is used to describe two groups of cardholders: those cardholders who use their credit card as a substitute to holding money balances for transactions purposes and those cardholders who use their credit card as a source of credit. This analysis is directly relevant to the acceptability of a revision in the pricing structure of bank credit cards. The conclusions are summarized in part V of the paper.

## II. Current Status of Bank Credit Cards

The profitability of bankcards depends on both the pricing structure adopted by card issuers in providing credit card services and the patterns of cardholder use. We briefly discuss both of these factors.

### Current Pricing Structure

Commercial banks obtain revenues from their credit card operations from two principal sources.<sup>2</sup> First, retail paper is purchased from merchants at a discount. Because of the intense competition among banks for merchant business, this discount has fallen to a range of about 2.0 percent to 2.2 percent in metropolitan areas. The most recent available functional cost analysis of the Federal Reserve System (1978) shows that for both large and small banks the average was 2.20 percent [7, p. 13]. Cost studies indicate that this income is about matched or even exceeded by the expenses of servicing the merchant and paying an interchange fee to other banks whose cardholders generated the credit sales [21].<sup>3</sup>

Cardholders provide about three-fifths to three-quarters of total income available to banks from credit card operations [7, p. 13]. Finance charges paid by cardholders are usually regulated by state law, with only Arizona, California, Hawaii, New Hampshire and South Dakota having no legal rate ceiling. Twenty-three states have set a flat ceiling rate of 18 percent per annum on credit card purchases, while most of the remaining states have graduated rate ceilings that decline as unpaid balances rise [12, pp. 10-11].

Even in the absence of graduated rates, banks do not realize a gross yield on their portfolio of credit card accounts equal to the disclosed rate of, say, 18 percent. Actual portfolio yields fall below the disclosed rate for two principle reasons: variations in the billing methods [17] and the provision in most agreements that permits cardholders to avoid a finance charge by paying their accounts in full by the specified due date. This "free period" has become a critical factor in the profitability of bankcard operations, as we shall see in the next section.

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<sup>1</sup> The data currently published by the Federal Reserve Board for revolving credit at commercial banks include both check credit and credit cards, with the latter being by far the dominant portion. To provide a consistent comparison, the segregated data for 1972 were combined.

<sup>2</sup> Some bankers argue that the credit card operations should be given credit for returns earned on merchants' deposits. Since retailers would necessarily maintain deposits at some bank, it does not appear economically justifiable to count these returns as incremental income to the credit card division.

<sup>3</sup> Effective October 6, 1980, the interchange fee of MasterCard (formerly Master Charge) will be 1.5 percent of the face amount of the sales slip, plus five cents per slip. The fee for Visa is 1.33 percent of the face, plus 5.2 cents per slip.

## Patterns in Credit Card Use

Credit cards are useful to consumers because they serve as a source of credit and also make transactions more convenient (and less costly in a transactions cost sense) by reducing the need for cash or personal checks.

Consumers may elect to use the credit feature of their bankcards by paying only a portion of the outstanding balance each month. In this case, they must pay a finance charge that may be calculated by a variety of billing methods. These consumers are termed "revolvers." Alternatively, consumers may choose to take advantage of the "free period" and pay their unpaid balance in full each month. In this case, they receive--at no direct cost--as much as 50 to 60 days of credit from date of purchase to the date payment is due. In addition, they use, at no direct cost, the convenience service provided by the cards. These consumers are termed "nonrevolvers."

Currently, banks report that about 30 to 40 percent of their active accounts pay in full each month and that the proportion paying in full has been rising over the past several years. In May 1980, Visa, U.S.A. reported that 37 percent of its active cardholders, who accounted for half of Visa's volume, incurred no finance charges.

A third service is provided by bankcards in the form of a guaranteed credit line. At the end of the fourth quarter, 1979, about one-third of Visa and MasterCard accounts were inactive in that they had no debit transactions for the preceding month [1]. With an average credit line of about \$970 (based on MasterCard reports), banks were providing these inactive account holders with a standby credit line aggregating about \$25.5 billion. Only if these cardholders used their line during the year and were revolvers would they pay for the service. Awh and Waters (3) analyzed the differences in the demographic characteristics and attitudes of active cardholders and those who held a bankcard but did not use it. "Active" users had higher education, higher family income and were younger when compared to "inactive" cardholders. The two groups differed most significantly in terms of their attitudes toward credit cards. Inactive cardholders were more concerned than active users about over-spending or becoming over-extended by using a credit card.

In summary, the current pricing structure for bankcards provides some cardholders with free transactions and standby credit services, while attempting to cover the total costs of serving cardholders through charges to revolvers and merchants. The next section demonstrates that this has not been a profitable pricing strategy for commercial banks.

## Profitability of Bank Cards

In the 1978 functional cost analysis of the Federal Reserve System small card-issuing banks (deposits up to \$50 million) reported losses amounting to about one percent of the card outstandings; medium sized banks reported net earnings of about six-tenths of one percent of outstandings; and large banks (deposits over \$200 million) reported net earnings of about 2.9 percent of outstandings. However, these net earnings were based on an estimated cost of money of about 5.2 percent. With the rising cost of money in 1979-80, it is widely agreed that banks generally are experiencing severe losses on their credit card operations.

Some clue to the particularly acute problems of the small banks may be gleaned by examining the extent to which they provide convenience services to their cardholders. Whereas, the large banks had an annual volume of 18.5 sales drafts per active account, the small banks reported an annual volume of 54.8 drafts per active account. Even though their total processing costs per sales draft were lower than for large banks (\$0.79 v. \$1.34), small banks' average finance charge income per sales draft was so much less than for large banks (\$0.66 v. \$1.95), that they were unable to show a profit on their card operations [7, p. 13]. (Finance charge revenues amounted to 13.5 percent of credit card outstandings at the large banks, compared with only 12.0 percent at the small banks.) Thus, small banks were apparently providing convenience services to a higher proportion of cardholders than were the large banks.

## III. Alternative Methods of Restoring Profitability

One way to counter the heavy losses that banks are experiencing in their credit card operations is to abandon the business. Given the data presented on the relative profitability of small v. large banks, it is apparent that small banks are more likely to leave the credit card market [18]. A transfer of outstandings may have unfavorable implications for consumers because of the increased market concentration in the industry, but it is certainly a natural outcome of the current cost/revenue squeeze.

A second alternative available to banks to restore profitability to their card operations is to raise the merchant discount. Since retailing is a highly competitive field, the increased merchant discount must ultimately be passed on to both cash and credit buyers in the form of higher cash prices. (Retailers may not legally assess a

surcharge against purchasers using credit cards.) If this is the route taken by banks to restore profitability, the effect is to require the subsidization of credit buyers (especially nonrevolvers) by cash buyers.

A third possibility is for banks to raise the annual percentage rate (APR) levied on unpaid balances. Since most state laws restrict the maximum rate to 18 percent, few banks have the alternative of improving their yield above this level. However, raising the APR does not address the issue of the "free ride" provided nonrevolvers and may, in fact, exacerbate the problem. The nonrevolver is not concerned with the APR, since he or she does not pay a finance charge.<sup>4</sup> Moreover, given the higher APR, some revolvers will be encouraged to become nonrevolvers. Were the APR, high enough, it is entirely possible that an increase in the APR might actually reduce the gross yield on banks' credit card portfolios. '

A final alternative, and the one to which we will direct our attention throughout the rest of this paper, is to change the pricing structure for credit card services. One might contemplate three separate charges:

(1) an APR to reflect the cardholders' use of the credit services; (2) a transaction fee for the value received by cardholders from convenience services; and (3) an annual fee or commitment fee that would reflect the value of the line of credit provided cardholders.<sup>5</sup>

Whether or not such a fee structure would be acceptable to cardholders depends upon the price charged for the service in relation to the value perceived by cardholders. In addition, since most state laws do not permit assessing either a transaction fee or annual commitment fee, legislatures must be convinced that allowing a new structure of finance charges would be in the public interest. To evaluate proposed changes in the pricing system, policy makers must be able to identify the characteristics of those who, as nonrevolvers, are not paying directly for any of the three basic services provided by credit cards. Presumably, they would be adversely affected by value pricing of bankcard services. In the following section we identify the demographic and attitudinal characteristics of cardholders who are revolvers and those who are nonrevolvers. This information can be used to describe user segments in the market that are currently advantaged or disadvantaged under the current price system.

#### **IV. Analysis of Characteristics of Cardholders**

We will use two-group multiple discriminate analysis (MDA) to develop a model both to describe the groups of cardholders being analyzed (credit-usage versus convenience-usage) and to classify a sample of cardholders into those groups. The two-cardholder groups will be described in terms of their divergent and similar demographic and attitude characteristics. Then a classification scheme will be formed and tested in terms of its ability to assign members of a holdout sample to their correct cardholder groups.

#### **Description of Data**

The data used in this study were collected in a national survey of consumers referred to as the 1977 Consumer Credit Survey [5]. The objective of the survey was to obtain a detailed data set concerning consumers' views on and use of credit.

Of the 2,563 respondents to the survey, 947 or 37 percent, had one or more bankcards. Only those respondents who reported their annual income were included in the analysis. Therefore, the number of cases analyzed was reduced to 843. Forty-nine respondents or five percent of bank cardholders who reported income also reported that they never used their bankcards. These respondents were also excluded from the analysis, reducing the number of cases analyzed to 784 or 31 percent of the original sample.

This sub sample was divided into revolvers and nonrevolvers on the basis of their response to the question, "When you use bank cards or store cards, do you almost always pay the total amount due each month to avoid a finance charge, do you sometimes do this, or do you hardly ever pay in full and have to pay a finance charge?" Those respondents who said they almost always paid in full were classified as nonrevolvers. Nonrevolvers made up 50 percent of the sample of bank cardholders.

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<sup>4</sup> In fairness, it should be pointed out that nonrevolvers do not generate bad debts, since they pay their accounts in full.

<sup>5</sup> Greenbaum pointed out in [10] that in the case of a commercial bank selling a commitment to provide a fixed rate line of credit to a commercial customer, the commitment should be viewed as a put option bought by the customer, which provides protection against "losses that might result from increases in market rates of interest or in the customer's appropriate default risk premium." A variable rate commitment insures customers against risk associated with changes in their own default risk premium.

Rates on credit cards are fixed by law and are typically at the maximum. Thus, the commitment sold by the card issuer to the customer insures customers against costs associated with changes in their own default risk premium.

## Demand for Bank Cards for Credit Versus Convenience

As was stated at the outset, revolving bank credit has grown largely as a substitute for money balances for transactions purposes, for retail revolving credit, and other forms of installment credit. There have been several studies of the effect of credit card ownership on the purchasing behavior of cardholders and extensive analysis of how and where cardholders use various cards.<sup>6</sup> However, there have been few studies [4, 20] of the characteristics of those individuals who use credit cards for the credit service feature and those who use cards for the convenience or transaction feature. In [13] Johnson analyzed the relationship between the average annual finance charge paid by a sample of bank cardholders for services received from the cards and cardholder characteristics. The annual percentage rate (APR) paid over a 12-month period was calculated by dividing the total finance charges paid by the average daily unpaid balance of the account over the period. Thus, a person who was a nonrevolver paid a zero APR for services received. Johnson found that consumers with annual incomes of \$25,000 and above used their bankcards very frequently but largely avoided paying any finance charge. Johnson also found that frequency of card use (debits per month), age, and education were correlated with the level of finance charge consumers paid. The more debit services consumers used per month, the lower the APR they paid. The "high users" found bankcards to be a convenient alternative to cash, but paid little or nothing to the card issuer for the service. The older the consumer (especially the 50 and over group) the lower the effective finance rate paid. Also, the higher the level of education, the lower the APR paid.

### Variables Used in Analysis

The variables included in this analysis were family income, number in household, race, education, age, an expression of the consumer's self evaluation of his or her ability to save, the importance to the consumer of size of monthly payment relative to other installment credit contract terms, and a measure of the frequency with which the consumer used a bank card in a month. Johnson concluded that the demographic characteristics that would be most useful in distinguishing consumers who use bankcards for credit purposes from those who hold bank cards for convenience purposes would be age, income, and education. He also found that the rate paid for bank card services was a function of the frequency of use of the card. A preliminary analysis of installment credit use with the 1977 Consumer Credit Survey data [5, p. 95] revealed that blacks used more installment credit per family than whites and that credit card ownership was positively related to installment debt use. Therefore, we included a race (black, nonblack) variable in the analysis. The group means for each of-the variables are shown in Exhibit 1. (A complete description of the variables is provided in Appendix A.)

Respondents who were classified as nonrevolvers had an average monthly income of \$2,305 compared to an average of \$1,765 for the revolver group. Compared to revolvers, nonrevolvers were significantly more likely to be 55 years old or older and to have smaller families. Forty-six percent of nonrevolvers reported that they had no difficulty in saving in advance for a major purchase compared to only 17 percent of revolvers. Thirty-nine percent of nonrevolvers indicated that size of monthly payment was not among the first three most important credit contract terms compared to only 24 percent of revolvers who gave size of monthly payment a similar importance ranking. Thirty-nine percent of nonrevolvers indicated that they used their bank cards frequently compared to only 24 percent of revolvers. Nine percent of revolvers were black compared to only three percent of nonrevolvers. The two groups did not differ significantly in terms of the percentage that had a high school education or more.

### Statistical Methodology

Multiple discriminate analysis (MDA) was used to test the extent to which a combination of this set of variables could be used to distinguish between revolvers and nonrevolvers. Discriminate analysis is a multivariate classification technique that allows the user to (1) evaluate the extent to which distinct groups differ and to describe the overlaps among groups and (2) construct classification schemes based upon the set of m variables in order to assign previously unclassified observations to the appropriate groups. The underlying assumptions of discriminate analysis are that (1) the groups being investigated are discrete and identifiable, (2) each observation in each group can be described by a set of measurements on m characteristics or variables, and (3) these m variables are assumed to have a multivariate normal distribution.

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<sup>6</sup> See [6] for an extensive listing of research dealing with this topic.

## EXHIBIT 1

### GROUP MEANS OF VARIABLES INCLUDED IN ANALYSIS

Variable	Non-Revolvers n = 389	Group Means Revolvers n = 395	t-statistic
x <sub>1</sub> Monthly Income	\$2305	\$1765	5.60*
x <sub>2</sub> Difficulty in saving for major purchases (1=No)	.46	.17	9.13*
x <sub>3</sub> Age greater than 55	.30	.15	5.12*
x <sub>4</sub> Number in household	2.78	3.34	5.24*
x <sub>5</sub> Race (1=01ack)	.03	.09	3.48* b
x <sub>6</sub> High School Education or more	.72	.69	.94
x <sub>7</sub> Do not consider size of monthly payment an important loan contract term	.39	.24	4.59*
x <sub>8</sub> Use bank card frequently	.39	.24	4.59*

\*Significant at .01 level of confidence

a The t-statistics were calculated on the assumption that for relatively large numbers of observations a binomial distribution can be approximated by a normal distribution.

b The t-statistic for the race variable is significant at the 1 percent level of confidence. However, with the small proportions for race, the test of difference may not be reliable.

Violation of any of the assumptions of discriminate analysis results in a biased evaluation of the classification power of the derived function. In this application of discriminate analysis the two groups analyzed were bank cardholders who were classified as revolvers or nonrevolvers. The classification criteria used in this study results in having consumer who sometimes pay in full classified as revolvers. This no discreteness of the groups to be analyzed will result in a higher level of misclassification error in the MDA than may have otherwise been the case.<sup>7</sup>

The assumption of normality of the independent variables is violated because dichotomous variables (0-1 dummy variables) were used to specify all but two of the independent variables used in the analysis. However, with large samples, dichotomous variables may be used in a discriminate analysis without significantly biasing the results [6, p. 37].

Another assumption of discriminate analysis is equality of  $\underline{n}$  group dispersions. If data arise from  $\underline{n}$  multivariate normal populations with equal dispersion, linear classification techniques can be used. If the hypothesis of equal dispersion matrices is rejected, quadratic classification rules should be used. The hypothesis of equal dispersion matrices was tested by calculation of the Box's M and its associated F test. The hypothesis was rejected at the one percent level of confidence.<sup>8</sup> This result implies that it is not appropriate to use a linear function for classification, but that a quadratic classification rule should be used.

### The Results

The total sample of cardholders was randomly split into an analysis group and a holdout sample. The eight variables shown in Exhibit 1 were included in the derivation of the quadratic discriminate function that had the greatest power for distinguishing between revolvers and nonrevolvers. The function was formed in a step-wise fashion. The standardized coefficients of the variables included in the analysis are shown in Exhibit 2.

The discriminatory power of the function was evaluated by classifying the holdout sample of cardholders. This holdout sample was a random sample consisting of approximately 50 percent of the original group identified for this analysis. Previous criticisms of applications of MDA [8] have pointed out that an unbiased evaluation of the classification power of a discriminate function can be obtained only by applying the model to an independent holdout sample. When the original sample used in deriving the function is reclassified by the MDA model the resulting accuracy of the classification is biased upward by: (1) sampling errors in the original sample, and (2) search bias.

<sup>7</sup> Had the grouping variable been continuous, multiple regression would be appropriate analysis technique. However, in this case, the dependent variable used in a multiple regression would have been the same dichotomous variable used to identify the groups of interest. Therefore, the results obtained in that analysis would be a linear of that obtained from the MDA analysis performed here.

<sup>8</sup> The F statistic testing the difference between the covariance matrices of the two groups was 18.049. This statistic allows us to reject the hypothesis of equal covariance matrices at the one percent level of confidence.

**EXHIBIT 2**

**CLASSIFICATION MODEL COEFFICIENTS  
(n = 784)**

<b>Variable</b>	<b>Brief Description</b>	<b>Standardized Coefficient</b>
X <sub>1</sub>	Monthly Income	- .48
X <sub>2</sub>	Ability to save in advance	- .36
X <sub>3</sub>	Age greater than 55	- .47
X <sub>4</sub>	Number in household	.53
X <sub>5</sub>	Race	.37
X <sub>7</sub>	Importance of size of monthly payment	- .25
X <sub>8</sub>	Frequency of car use	- .26
<b>Interaction of:</b>		
X <sub>2</sub> X <sub>4</sub>	Ability to save and number in household	.22
X <sub>2</sub> X <sub>5</sub>	Ability to save and race	.14
X <sub>3</sub> X <sub>4</sub>	Age and number in household	.30
X <sub>4</sub> X <sub>5</sub>	Number in household and race	.22
X <sub>5</sub> X <sub>1</sub>	Race and monthly income	.24
X <sub>3</sub> X <sub>7</sub>	Age and importance of monthly payment size	- .14
X <sub>4</sub> X <sub>7</sub>	Number in household and importance of monthly payment size	- .32
X <sub>5</sub> X <sub>6</sub>	Race and education	.14
X <sub>5</sub> X <sub>7</sub>	Race and importance of monthly payment size	.16
X <sub>1</sub> X <sub>7</sub>	Monthly income and importance of payment size	.41
X <sub>5</sub> X <sub>8</sub>	Race and frequency of card use	.15

The results of the classification of the holdout sample of cardholders are shown below:

Holdout Sample  
Predicted Group Membership

<b>Actual</b>	<b>Total</b>	<b>Nonrevolvers</b>	<b>Revolvers</b>
Nonrevolvers	197	117 59.4%	80 40.6%
Revolvers	<u>195</u> 392	50 25.6%	145 74.4%

Percent of Holdout Sample Correctly Classified 66.84%

$$\chi^2 = 44.42^*$$

\*Significant at the one percent level of confidence.

If it is assumed that the probability of a successful random classification is 50 percent, the chi-square statistic indicates that the use of the discriminate function resulted in classification that was significantly better than chance at the one percent level of confidence.<sup>9</sup>

There has been considerable discussion in the literature about the merits of the various methods of assessing the relative contribution of individual variables to the discriminatory power of the MDA function [2, 6, 15, 16]. However, Altman and Eisenbeis [2] suggest that there is no absolute test of the importance of variables. They state that "inferences about the relative importance of individual variables are extremely sensitive to the criterion of importance being employed." They further note that when the variables are

<sup>9</sup> The chi-square statistic is  $\frac{(N-nk)^2}{N(k-1)}$  where: N is total number in sample  
n is number of correct classifications  
k is total number of groups

uncorrelated, there is strong agreement among the ranking methods. To assess the relative contribution of the variables to the function, we used four different ranking criterion: the univariate-F statistic, the standardized coefficient, the Wilkes lambda,<sup>10</sup> and the Mosteller and Wallace method explained by Tollefson and Joy [15].

The results of that analysis reveal that the individual rankings differ considerably across the four methods. This variation suggests a high level of correlation among the variables. However, it is important to note that three of the four methods resulted in the same variable being ranked as first in terms of discriminatory power. That variable (x2) is the respondent's self-evaluation of his or her ability to save in advance for major purchases. The age (x3), monthly income (x1), and number in household (x4) variables were also consistently ranked in the top three or four variables in terms of explanatory power by most of the rating criterion.

The results of the discriminate analysis show that bank cardholders, grouped according to the basic services that they used, are distinguishable in terms of demographic and attitudinal characteristics. The variables that contribute most significantly to the discriminatory power of the discriminate function are the individual's evaluation of his or her ability to save in advance for major purchases, age, monthly income, and size of household. These results are consistent with and add to those reached from an univariate analysis of an earlier data set performed by Johnson [13].

## V. Conclusions for Pricing Policy

At the outset, we proposed to identify a discriminate pricing policy that was acceptable from both an economic and public policy point of view. In pricing card services for segmented markets, card issuers should attune the price structure to the value of services received by consumers. The results of our discriminate analysis suggests that cardholders who do not revolve their accounts are significantly different from revolvers and do not hold the card for the credit features provided by the card. The strategy suggested is one of setting a price for the use of credit by revolvers (a finance charge payable on the average unpaid balances owed from date of purchase or posting); for the frequency of use (a transaction charge for each debit to the account); and a commitment fee for the value to the consumer of having an option on a standby line of credit at a fixed rate.

Would it be acceptable public policy to allow creditors to develop such a value pricing strategy? Currently, those who use the card for credit provide all of the finance charges to the card-issuing bank, while nonrevolvers pay no direct charges for making use of the credit and transaction services and having available a standby line of credit. We have shown that the consumers paying finance charges are more likely than nonrevolvers to be young, with low incomes and large families. They find it significantly more difficult to save for major purchases than do nonrevolvers. The current pricing strategy thus, has the young, less wealthy cardholders with more dependents paying for the noncredit services used by older, more wealthy families. From a public policy viewpoint, shifting those costs to the group receiving the service should be considered just and acceptable.

### EXHIBIT 3 RANKINGS UNDER MEASURES OF CONTRIBUTION OF EACH VARIABLE TO DISCRIMINATORY POWER OF FUNCTION

Variable	Method Standardized Coefficient	Mosteller and Wallace	Univariate F	Wilkes Lambda
X <sub>1</sub>	2	3	3	6
X <sub>2</sub>	6	1	1	1
X <sub>3</sub>	3	4	5	10
X <sub>4</sub> <sup>2</sup>	1	2	4	3
X <sub>5</sub>	5	6	11	2
X <sub>7</sub>	10	7	8	16
X <sub>8</sub>	9	8	9	9
X <sub>2</sub> X <sub>4</sub>	12	5	2	15
X <sub>2</sub> X <sub>5</sub>	17	14	18	17
X <sub>3</sub> X <sub>4</sub>	8	17	10	12
X <sub>4</sub> X <sub>5</sub>	13	16	13	11
X <sub>5</sub> X <sub>1</sub>	11	15	14	18
X <sub>3</sub> X <sub>7</sub>	16	10	7	8
X <sub>4</sub> X <sub>7</sub>	7	9	16	4
X <sub>5</sub> X <sub>6</sub>	18	11	12	14
X <sub>5</sub> X <sub>7</sub>	14	12	15	5
X <sub>1</sub> X <sub>7</sub>	4	18	6	7
X <sub>5</sub> X <sub>8</sub>	15	13	17	13

<sup>10</sup> Eisenbeis explains in [6, p. 71] that the Wilkes lambda may be used to assess relative contribution of variables in the function.

## APPENDIX A

### DESCRIPTION OF VARIABLES USED IN DISCRIMINANT ANALYSIS

#### Variable

$x_1$  = Annual family income/12

What about saving money in advance for large purchases like furniture, refrigerators and things like that--do you find it very difficult to save in advance?

$X_2$  = 1 If respondent said Not at all difficult

$X_3$  = 1 If respondent's age was greater than 55 years

$X_4$  = Number in household

$X_5$  = 1 If respondent was Black, except Hispanic

$X_6$  = 1 If respondent had at least a High School diploma plus nonacademic training

Which things listed on this card would be most important to you, if you were going to use credit to purchase a car? Which comes next? Which is third?

Alternatives:

- a. Amount financed
- b. Finance charge
- c. Size of monthly payments
- d. Annual percentage rate of interest
- e. Charge for late payment
- f. Security or collateral
- g. Rebate for early payoff

$X_7=1$  If respondent did not rank choice c. Size of monthly payment, either first, second, or third

$X_8=1$  If respondent indicated they used their bank card frequently each month

#### REFERENCES

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