

## Shopping for a Credit Card: Does Information Search Pay Off?

A wide price dispersion in credit card interest rates has made searching for information critical for many consumers. Using the 1995 Survey of Consumer Finances, two measures of payoffs to search were estimated. First, a measure of savings was calculated based on the highest and lowest credit card interest rates. Second, the relationship between consumers' search and credit card interest rate was examined. Both analyses provide empirical support for significant payoffs to search in the credit card market.

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Credit card lending is a competitive market with thousands of card issuers, all free to establish their own prices and other lending terms (Federal Reserve Board, 1994, 1997). While competition in the 1980s focused on efforts to broaden customer bases by increasing the availability of credit to higher risk consumers, competition in the 1990s has focused on interest rates, resulting in declining credit card interest rates in the marketplace (Cargill & Wendel, 1996; Federal Reserve Board, 1997). Also, with more sophisticated marketing tools based on credit scoring, more bank card issuers exercise price discrimination with interest rates, segmenting the market into primary lending and sub-prime lending (Federal Reserve Board, 1997). These recent changes in the credit card market have created greater price dispersion in interest rates, providing an important reason for consumers to shop around.

Several researchers (Ausubel, 1991; Cargill & Wendell, 1996; Chang & Hanna, 1992) argued that borrowers do not search for low credit card interest rates. Reasons include convenience use (i.e. interest rates are irrelevant because consumers pay in full) or low expected value of savings. However, recent data show that between 1992 and 1995 a higher proportion of consumers revolved balances and the average value of those balances has increased (Chimerine, 1997). If credit cards are used as a financing mechanism instead of a medium of convenience, the interest rate of the credit card should be an important determinant of the consumers' choice of which credit card to hold.

Furthermore, the cost of information search on credit cards' interest rates has declined. In 1988 the U.S. Congress passed the Fair Credit and Charge Card Disclosure Act (D'astous & Miquelon, 1991; Federal Reserve Board, 1994). This act amended the Truth in Lending Act to expand disclosure requirements for applications and solicitations mailed to consumers for credit cards, thereby making consumers' comparison shopping easier. More information is coming directly to consumers in the form of direct marketing mail solicitations, which reduces consumers' search costs. An estimated 2.5 billion direct mail solicitations were sent by card issuers during 1996 (Daly, 1997).

In this credit card market with wider price dispersion, greater anticipated savings, and lowered search cost, consumers' search activities are expected to payoff. The purpose of this paper is to explore whether consumers shop for credit and the relationship between search and the payoff to search as measured by the annual percentage rate (APR) of the major credit card a consumer holds. Findings can help consumer educators communicate the potential savings more effectively to consumers. Also, considering concerns about the quality of information provided by credit card issuers, it is possible to analyze whether information provided by the Fair Credit and Charge Card Disclosure Act is helpful to consumers.

### Previous Studies

#### Consumer Credit Search Behavior

Information search behavior has been the focus of numerous researchers in the past. However, there have been few studies of search behavior as it relates to services (versus goods, see Schostack, 1977), such as credit borrowing and savings account (Chang & Hanna, 1992). Stigler's (1961) seminal work on the economics of information explained market price dispersion as the major reason for consumers to engage in information search. Consumers can close price gaps by searching for price information, but at some cost in terms of time and money. According to the economics of information theory, a

consumer will search for lower prices as long as the marginal benefits from additional search exceed the marginal costs of search.

Chang and Hanna (1992) discussed the benefits and costs of search for credit, including immediate benefits such as a lower interest rate and finance charge and indirect benefits including better money management, greater savings and convenience from using appropriate credit, and gains in financial knowledge and experience gathered from the search process. The costs of search include the opportunity cost of time (lost wages) and physical and mental effort spent in search process.

In studying consumer's search for a credit card, it is important to distinguish between "convenience" and "revolving" credit card users since information search patterns may depend on how consumers plan to use their credit cards. "Convenience" users utilize credit cards mainly as a mode of payment and typically pay the balance in full upon receiving the account statement, while "revolving" users use the card principally as a mode of financing and elect to pay interest charges on the unpaid balance (Mathews & Slocum, 1969). Thus, for revolvers, it is preferable to have a card with a low interest rate, while for convenience users, a low interest rate is not as important.

#### Payoffs to Search

Previous researchers indicated that a positive relationship exists between the overall amount of information search undertaken and consumer efficiency. Sproles, Geistfeld, and Badenhop (1978) provided empirical evidence that information improves consumers' abilities to evaluate product quality. Therefore, in the credit market, it can be hypothesized that consumers' search enhances their abilities to evaluate alternative credit cards. However, what consumers shop for can be different for "convenience" and "revolving" users. Consequently, the revolvers who search more extensively should find and choose a credit card with lower interest rate, while the convenience users who engage in extensive search should find a card with the desired feature such as no annual fee.

Morris and Bronson (1970) and Cude (1987) estimated the returns to search using data from 637 *Consumer Reports* product tests between 1961 and 1968 and data from 929 product test in *Consumer Reports* between 1975 and 1984, respectively. Although Morris and Bronson's (1970) and Cude's (1987) definitions of the worst and the best choices are different, the following measure of 'percent monetary loss' was used in both of the studies as a proxy for the potential payoff to search.

$$\text{Percent Monetary Loss} = \frac{\text{The Best Choice} - \text{The Worst Choice}}{\text{The Worst Choice}} \times 100$$

#### **Methods**

Theoretically, consumers' search improves consumer efficiency. In this paper, payoffs-to-search are estimated in two ways. First, Cude's (1987) potential payoff of search measure, percent monetary loss, is calculated based on the best and the worst credit card interest rates. The best choice is the credit card with the lowest interest rate, and the worst choice is the credit card with the highest interest rate. It should be noted that credit card price also involves other elements, including annual fees, fees for cash advances, rebates, minimum finance charges, over-the-limit fees, and late payment charges. In addition, the length of the "interest-free" grace period, if any, and the type of billing cycle can have an important influence on the amount of interest consumers pay when they revolve balances on their credit cards. Acknowledging this limitation, the percent monetary loss was calculated.

Second, it is hypothesized that more shopping or searching will result in a lower interest rate and thereby saving money on interest payments for revolvers, but not for convenience users. In order to test this hypothesis, the credit card annual percentage rate (APR) was estimated separately for revolvers and convenience users using the Ordinary Least Squares analyses including information search and other influencing factors as independent variables. In this study, revolvers were defined as the credit card holders who carried outstanding balances after the last payment, while convenience users were those who paid off the credit card charges. The differences between revolvers and convenience users was examined by estimating a full interaction model (Maddala, 1992). In this section, a description of the data set is presented, and variables and analytical procedures employed in the OLS analyses are discussed.

#### Data

The 1995 Survey of Consumer Finances (SCF) is a triennial survey sponsored by the Federal Reserve with the cooperation with the Statistics of Income Division of the Internal Revenue Service (Kennickell, 1997; Kennickell & Woodburn, 1997). It is designed to provide detailed information on U.S. families' balance sheets,

their use of financial services, and demographics; there is some limited information on shopping behaviors with respect to credit and savings decisions. For the 1995 SCF survey, 4,299 households were interviewed by the National Opinion Research Center at the University of Chicago between July and December.

The SCF collects information on whether consumers "almost always, sometimes, or hardly ever pay off the total balance owed on the account each month." Another question asks: "after the last payment was made on this account, what was the balance still owed on this account?" We use the later, more objective measure to classify respondents. In this study, households who reported a \$0 balance after their last payment were considered "convenience users" and household with a positive balance were classified as "revolvers." Just over two-fifths (40.8 %) of respondents were convenience users (59.2% were revolvers); this is comparable to industry figures of about 40 percent of account holders who are classified as "transactors" or "convenience users" as opposed to revolvers.

### Variables

Dependent Variable. As payoff to search, the Annual Percentage Rate (APR) of the primary credit card, including bank-type cards, store-related cards, and other credit cards was employed as the dependent variable. If consumers held only one card, this card was considered their primary card. If consumers reported outstanding balances on their credit cards, the card with the largest balance was considered the primary card. If consumers held multiple cards and did not carry a balance, the most recently acquired credit card was considered primary.

Independent Variables. Independent variables in the multivariate analysis fell into categories of information search, credit history, credit card use pattern, and demographics. To identify the extent of information search, the following question was asked: "when making major decisions about credit or borrowing, some people shop around for the best terms while others don't. What number would you/your family be on the scale?" The extent of information search was measured on five-level ordinal scale (1 = almost no shopping, 5 = a great deal of shopping).

The borrowers with a bad credit history may face a higher interest rate because of their poor credit records, regardless of their information search efforts. The 1995 SCF gathered data regarding whether respondents had been turned down for a loan application or obtained a smaller loan than they applied for. The borrowers who reported either of these incidents were identified as having a bad credit history. This was coded as a 0-1 dummy.

Credit card issuers price discriminate according to consumers' credit card use patterns. Previously, a discrepancy has been found between consumers' reported tendency to payoff credit card balances and observed use of credit cards as a convenience medium (Ausubel, 1991). Although the payoff to search was separately investigated for revolvers and convenience users, in order to capture this potential discrepancy, respondents' reported level of payoff was also included as an explanatory variable (1 = almost always payoff, 3 = hardly ever). Number of credit cards is another measure of credit card use patterns; it is the absolute number of bank-type credit cards reported by the respondent. If consumers have more than one credit card, they are more likely to put their outstanding balance on credit card which has the lowest interest rate.

Finally, a set of demographic variables were included to capture their possible impacts on interest rate: (a) *age* of reference person (b) *household income*: The natural logarithm of the reconciled annual total household income before taxes was used. (c) *female headed household*: male headed as the base. (d) *race-ethnicity*: The respondent's race was categorized into Hispanics, Blacks, other nonwhites, and non-Hispanic whites (base). (e) *education*: a set of dummies were included with high school graduates or equivalent as the base: other categories were less than high school, some college, B.S., and graduate degree. (f) *marital status*: Three dummy variables, divorced or separated, widowed, and never been married, were included with married or living with a partner as the base. (g) *size of household*: The number of people in household was employed. (h) *region*: 9-level Census Division code was employed for region: Northeast-New England Division (CT, ME, MA, NH, RI, VT); Northeast-Middle Atlantic Division (NY, NJ, PA); South-South Atlantic Division (DE, DC, FL, GA, MD, NC, SC, VA, WV); South-East South Central Division (AL, KY, MS, TN); South-West South Central Division (AR, LA, OK, TX); Midwest-East North Central Division (IL, IN, MI, OH, WI); Midwest-West North Central Division (IA, KS, MN, MO, NE, ND, SD); West-Mountain Division (AZ, CO, ID, MT, NV, UT, WY, NM); West-Pacific Division (AK, CA, HI, OR, WA) as the base.

### Analysis

Because of the sampling frame, the data must be weighted when generating descriptive statistics (Kennickell & Woodburn, 1997). In the multivariate analysis, special techniques, repeated-imputation inferences (RII), must be employed to account for the five implicate data sets (Kennickell, 1997; Montalto & Sung, 1996). Thus, two separate Ordinary Least Squares (OLS) analyses were run to estimate the APR for revolvers and convenience users, using RII technique. We also examined the differences between revolvers and convenience users

by estimating a full interaction model (Maddala, 1992). In the full interaction model, a new variable was created to match each independent variable by multiplying the revolving dummy (whether a respondent carries any outstanding balance or not at the end of billing cycle) by each variable. These interaction terms were added to the set of independent variables, and this full interaction model was estimated using the full sample (all credit card holders). In each case where the estimated coefficient for the interaction term was significant with 95 percent confidence there was evidence of a statistical difference between the revolvers and the convenience users with respect to that independent variable.

## Results

### Descriptive Statistics

Among 4,299 consumers, 75 percent of all respondents said that they had at least one credit card, and 89 percent of the credit card holders reported the APR of their primary credit card. Among these credit card holders, 59.2% carried an outstanding balance after the last payment was made, while 40.8% of the card holders were convenience users.

Respondents showed diversity in their information search behavior. When making major decisions about borrowing, 16% of credit card holders did almost no shopping, while 23% did a great deal of shopping. Comparing the revolvers' extent of information search with that of the convenience users, the revolvers seem to search more extensively than the convenience users; 12% of the revolvers did almost no shopping, compared to 23% of the convenience users.

### Payoff to Information Search: Percent Monetary Savings

As expected, consumers reported a wide price dispersion in terms of the APR of their primary credit card, with interest rates ranging from 2.9 percent to 29.0 percent. The mean and median of APR were 14.5 and 15.0, respectively with variance of 18.41.

Adopting Cude's (1987) measure of the potential payoff, the percent monetary loss was calculated. In this case, the price of the best choice is the lowest APR, and the price of the worst choice is the highest APR. The calculated value for the percent monetary loss in the credit card market was 900 percent, indicating a huge potential payoff of search.

However, this may overstate the benefits somewhat since these rates may include "teaser" introductory rates on some credit cards at the lower end and may include some non-traditional lending in the sub-prime markets at the upper end. We can use the 10th and 90th percentile interest rates, 7.9 percent and 19.0 percent respectively, to more closely reflect the market most consumers face. We find that the percent monetary savings is estimated at 140 percent, still a substantial savings. For a consumer who revolves an "average" amount (a median of \$1,500 in 1995), the monthly interest charge would be \$9.87 versus \$23.75, a savings of \$13.88 per month.

### Payoff to Information Search: APR

The RII of the OLS results are presented in Table 1. Results which were consistent across the five separate implicates were confirmed in the R.I. results, although the levels of significance were generally more stringent under the R.I.. Among the independent variables, the extent of information search, bad credit history, marital status, and the regional variables were found to significantly influence the revolvers' APR, while only the number of credit cards was found to influence the convenience users' APR. The full interaction model supports the difference between the revolvers and the convenience users. According to the full interaction model, statistically significant differential effects were noted for information search, bad credit history, number of credit cards, race, and marital status.

The extent of information search lowered the revolvers' interest rate significantly, but not the convenience users'. Holding all other variables constant, revolvers who did a great deal of search paid 146 basis points less than those who did no shopping and 73 points less than those who did a moderate amount of shopping. As expected, having a bad credit history raised the revolvers' APR by 95 basis points, holding all else constant. In terms of credit card use patterns, neither self-reported level of payoff nor the number of credit cards were significant for the revolvers. On the other hand, the number of credit cards was found to be significant for the convenience users. Among the demographic variables, marital status of the reference person was found to be significant. Widowed revolvers were found to pay a lower APR than married revolvers. Finally, the residents of Pacific West were found to pay more than 131 basis points more than New England and West North Central residents.

Table 1.

RII (Repeated Imputation Inferences) of OLS Regression Results of APR: Parameter Estimates (P-Value)

<u>Independent Variables</u>	<u>Revolvers</u>	<u>Convenience Users</u>	$\beta_{Ri} \neq \beta_{Ci}$
Intercept	17.2280 (0.0000)	14.5489 (0.0000)	
Extent of information search	<b>-0.3661 (0.0003)</b>	-0.0082 (0.9058)	*
Bad credit history	<b>0.9457 (0.0015)</b>	-0.2350 (0.5847)	*
Credit card usage characteristics:			
- Level of payoff	0.0853 (0.2702)	-0.0246 (0.9068)	
- Number of credit cards	-0.0978 (0.1471)	<b>-0.2618 (1.3796E-6)</b>	*
Demographics			
- Age of reference person	0.0042 (0.6981)	0.0109 (0.2013)	
- Household income	-0.1175 (0.2193)	0.0821 (0.1779)	
- Female headed household	-0.2382 (0.5321)	-0.1901 (0.6203)	
- Race (Non-Hispanic White as base)			
Black	0.0229 (0.9590)	-0.0178 (0.9822)	
Hispanic	0.4432 (0.4160)	-1.5564 (0.2057)	
Other Non-Whites	1.0553 (0.0887)	-0.4932 (0.2658)	*
- Education (high school graduates as base)			
Less than high school	-0.4228 (0.4545)	-0.5342 (0.3063)	
Some college	-0.1963 (0.1058)	-0.1255 (0.7330)	
B.S.	-0.3802 (0.2786)	0.0466 (0.8930)	
Graduate degree	-0.4886 (0.2515)	0.1336 (0.4598)	
- Marital status (married or living with partner as base)			
Divorced/Separated	-0.6962 (0.1058)	0.0912 (0.8076)	
Widowed	<b>-1.5533 (0.0302)</b>	0.3172 (0.4598)	*
Never been married	0.0624 (0.5287)	-0.1711 (0.7103)	
- Household size	0.0624 (0.5287)	0.1256 (0.1919)	
- Region (Pacific West as base)			
Northeast: New England	<b>-1.3098 (0.0241)</b>	0.2741 (0.6320)	
Northeast: Middle Atlantic	-0.2745 (0.5520)	-0.2643 (0.5612)	
South: South Atlantic	-0.8006 (0.0617)	-0.6882 (0.0731)	
South: East South Central	-0.0078 (0.9895)	-0.3468 (0.5828)	
Midwest: East North Central	-0.5879 (0.1532)	-0.0019 (0.9959)	
Midwest: West North Central	<b>-1.3094 (0.0150)</b>	-0.5064 (0.3980)	
West: Mountain	-0.5805 (0.3551)	0.1081 (0.8390)	
F-Statistics	<b>2.3516 (0.0001)</b>	<b>1.5163 (0.0466)</b>	
Degree of freedom	26	26	

\* implies significance of the variable in the full interaction model, thus  $\beta_{Ri} \neq \beta_{Ci}$

### Conclusions and Implications

Payoffs to consumer search in credit card markets were investigated using the 1995 Survey of Consumer Finances data. Credit card holders showed diversity in their search behavior. Facing major borrowing decisions, 16% of borrowers did almost no shopping, while 23% did a great deal of shopping. Using Repeated Imputation Inferences (RII) techniques with Ordinary Least Squares analyses, the relationship between the extent of information search and its payoff was found to be positive for revolvers but was not significant for convenience users. Information search paid off for revolvers: revolvers who searched more tended to have credit cards with lower APRs and saved money in annual interest payments. On the other hand, the extent of search reported by convenience users was not related to credit card APR, an indication that they shop for other features such as annual fee or rebates.

Calculations on price dispersion in credit card markets show that consumers can save substantially by shopping more for credit card interest rates. Consumer educators can help consumers understand the benefits of saving even a few basis points on their interest rates. For example, we calculated a 140 percent savings between the 10th and 90th percentile interest rates and a savings of \$13.88 per month in interest. If consumers even moved

from the 90th percentile (19.0%) to the median (15.0 %), they could save \$5.00 per month in interest charges if they had average balances. Carrying out this calculation over a year could help consumers understand the opportunity cost of not shopping for the best --or even an average-- interest rate.

From policy perspective, it seems that disclosures have been effective in helping consumers who revolve to shop for credit cards with lower interest rates. It is less clear if convenience users are able to use current disclosure information in their shopping. Open end credit products like credit cards are relatively easy to understand because the APR is identically the contract interest rate consumers pay, although cash advance fees, late fees, over-the-limit fees and annual fees are also a part of the total cost of credit. In many other closed end credit products, such as mortgages and installment loans, the APR and the contract interest rate are not the same. Consumer shopping for these products needs to be studied to see if disclosures are equally effective.

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### Endnotes

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