

Do Consumers Know the Price of Credit? A Comparison of Consumers' Knowledge of Open- and Closed-end Credit

Consumers' understanding of the prices of open- and close-end credit was examined using data from 1997 Surveys of Consumers. Less than ten percent of mortgage borrowers correctly understood the price of closed-end credit, while 46 percent of credit card holders correctly understood the price of open-end credit. Age and information search were found to be associated with knowledge of open-end credit, while education, information search, and region were associated with knowledge of closed-end credit.

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Perhaps one of the great disappointments for consumer organizations and policy makers over the last three decades has been the slowness with which consumers have made use of the disclosed information they are given about the relative costs of credit (National Consumer Council 1990). When the annual percentage rate (APR) was first introduced under Truth in Lending Act in 1968, very few people understood it. However, consumers' awareness of APR has improved (Day and Brandt, 1974; Durkin and Elliehausen 1978; Shay and Schober 1973). The question remains: does increased awareness lead consumers to know and understand the price of credit?

Both the contract interest rate and the APR indicate the price of credit, but the relationship between the contract interest rate and the APR varies between open- and closed-end credit. Open-end credit establishes a limit or a line of credit, such as credit card plans and home-secured credit lines. Closed-end credit is for a fixed amount of money payable over a fixed period of time, such as home mortgage loans. For open-end credit, the APR is equivalent to the contract interest rate, but for closed-end credit, the APR incorporates other fees and costs in addition to the contract interest rate. There have been serious doubts about how effectively these measures of the price of credit have been understood and utilized by consumers (Kinsey and McAlister 1981; National Consumer Council 1990; Raynard and Craig 1993). Therefore, the purpose of this research is to investigate consumers' understanding of the price of open- and closed-end credit and to determine what factors influence consumers' understanding, with an eye toward consumer education and public policy needs.

Literature Review

Knowledge of the Price of Credit

Mandell (1973) investigated consumer's knowledge and understanding of credit and credit markets based on a nationwide study conducted in 1971 by the Survey Research Center. He found that consumers could generally rank lenders correctly in terms of cost, but they were not aware of current interest rates being charged in the marketplace. He also found that knowledge and understanding of the credit market was closely related to income and education of the family. Using a 1977 survey of 1,330 Minnesota households, Kinsey and McAlister (1981) reported that few respondents had knowledge of the APR for open-end credit or knowledge of the actual dollar finance charge. They also supported Mandell's (1973) findings on the impact of income and education on consumers' understanding of APR.

White and Barclay (1981) asked 250 Colorado homebuyers to indicate problems encountered during search, purchase, and first year of occupancy, and found that lack of knowledge of home financing was one of the major concerns faced by home buyers. Twenty percent of first-time buyers cited a lack of financial knowledge as the most important problem, while twelve percent of repeat buyers acknowledged these problems.

There is a general consensus that consumers' lack of understanding is a problem in credit markets (Chang and Hanna 1992; Kinsey and McAlister 1981; Mandell 1973; Thakor, Beltz and Barefoot 1993). White and Barelay (1981) and Chang and Hanna (1992) argued that this lack of understanding stems from the complexity of financial information and the language of creditors, and Kimball, Frisch and Gregor (1997) additionally pointed out the proliferation of credit product choices.

Search and Consumer's Ability to Understand

Previous researchers indicated that a positive relationship exists between the overall amount of information search undertaken and consumer decision efficiency. Sproles, Geistfeld, and Badenhop (1978) provided empirical evidence that information search improves consumers' abilities to evaluate product quality. In order to enhance consumers' decision making ability, information obtained should be useful, unbiased, accurate, easy to understand, and affordable (Bloom 1989).

Both the quality and quantity of information influence the understandability of information (Keller and Staelin 1987). If the information obtained is too complex, information search may not enhance consumer's ability to understand (Mazis and Staelin 1981). Russo (1988) posited that both the understandability of information provided and consumer's cognitive ability influence consumer's ability to understand information. Consumer's cognitive ability determines their ability to comprehend complex information (Alba and Hutchinson 1987; Johnson and Russo 1984; Russo 1988). Previous knowledge and experience also facilitate the learning of new information, while consumers without such knowledge and experience do not have the memory structure to evaluate and interpret the information.

On the other hand, a variety of different information sources provide different characteristics of information, and thus a different quality of information (Beales et al. 1981). Some sources provide more useful information than others, while some sources of information are less costly than others. Capon and Lutz (1979) grouped information sources into consumer-oriented/personal, commercial/seller, and independent/third party.

These studies indicate concerns about consumers' lack of understanding in credit markets and suggest that consumers' understanding of credit information varies according to their income, education, and experience as well as the quantity and quality of information obtained through search. In this study consumers' understanding of the price of open- and closed-end credits is examined, and the impacts of income, education, experience, and the quantity and quality of information on consumers' understanding are investigated.

Methodology

Data

The Surveys of Consumers were initiated in the late 1940s by the Survey Research Center at the University of Michigan. The purpose of these surveys is to measure changes in consumer attitudes and expectations and to evaluate how these changes relate to consumer decisions to save, borrow, or make discretionary purchases. In February and March 1997, the Federal Reserve Board commissioned additional questions, including specific questions on consumers' knowledge of the price of credit. For these surveys 1,001 households were interviewed by telephone.

Variables

Understanding the Price of Open- and Closed-End Credit. The respondent's knowledge of the price of open- and closed-end credit was the dependent variables for this study. Households who had applied for a general purpose credit card, such as a Visa or MasterCard, during the past five years were asked the following question: "When a credit card is described as having an 18.9 percent APR - that is, an 18.9 annual percentage rate - does that mean that the interest rate is actually 18.9 percent, or would the interest rate be higher than 18.9 percent or lower than 18.9 percent?" Similarly, the respondents who had applied for a mortgage to buy or build a home were asked about the price of home mortgage loan, and the respondents who refinanced within past five year period were asked about the price of home equity loan. The responses were categorized into (1) the interest rate is equivalent to the APR; (2) the interest rate is higher than the APR; (3) the interest rate is lower than the APR, and (4) don't know. The correct responses for the open and closed-end credit were (1) and (3), respectively. The validity of this measure of consumer knowledge is examined and reported in Lee and Hogarth (1999).

Income. The natural logarithm of the total annual family income in 1996 was employed. The natural logarithm of income was used in order to reduce heteroskedasticity (unequal variance of the disturbances).

Education. In order to capture a potential non-linear effects of education, a set of dummy variables (some college, bachelor's degree, and graduate education) were included as explanatory variables with high school graduates or less education as the base.

Experience. For closed-end credit, refinancing experience is employed as a proxy to indicate consumer's experience (refinanced=1 and did not refinance=0). For open-end credit, there was no information that indicates respondents' previous experience in open-end credit market.

Quantity and Quality of Information Search. As consumers search more extensively, they are expected to learn more about credit products (Chang and Hanna 1992). Thus, it is hypothesized that those who search more are more knowledgeable about the price of credit. The quantity of search was determined in this study based on the following three variables: (1) the number of lenders contacted, (2) the number of terms considered, and (3) the number of information sources consulted. Rather than including these directly in the regression, factor analysis was employed in order to identify the underlying factor of the above three variables, and the factor score was used as the independent variable. The sources of information used are employed as proxies for the quality of information obtained. Previous work grouped sources of information into personal, seller, and third party (Capon and Lutz 1979), so three dummy variables were included to indicate whether or not a respondent obtained information from personal sources, sellers, and/or third parties.

Demographics. The following demographic variables were included to examine the potential impacts of these variables on consumers' knowledge of the price of credit: (1) Age: the respondent's age was employed as a continuous variable; (2) Marital status: included as a binary variable (married = 1, unmarried = 0). (3) Race-ethnicity: included as a binary variable (Hispanics and non-Whites = 1, non-Hispanic Whites = 0). (4) Gender: included as a binary variable (female = 1, male = 0). (5) Household size: a set of dummy variables were included: HH1 (single household), HH3 (3 person household), and HH4 (4 or more person household) with a two person household as the base. (6) Region: A set of dummies, West, Midwest, and Northeast, were included with South as the base.

Analysis

After using descriptive statistics to examine whether consumers correctly understood the prices of open- and closed- end credit, factor analyses were performed to identify the underlying factors related to the extent of information search. Maximum likelihood methods were employed, since maximum likelihood estimation has desirable asymptotic properties and does not require a multivariate normal distribution. The factor score was then used as an independent variable representing the quantity of information search. Finally, two separate logistic analyses were performed to investigate the factors that influence consumers' understanding of open- and closed-end credit.

Results

Sample

In this sample, 484 respondents applied for a credit card, while 131 respondents applied for a home mortgage, and 88 respondents refinanced their existing home mortgages during the past five year period. Among the open-credit holders, 45.6 percent correctly understood the price of open-end credit, while less than 10 percent of the closed-credit holders correctly understood the price of closed-end credit as expressed by the APR. We considered the cases where consumers in the sample held both open- and closed-end credit products. Naturally, it would be interesting to know if consumers consistently understood or misunderstood the APR price measure. Unfortunately, the sample size was too small (n=143) to do any rigorous analysis. Descriptively, however, only 1.92 percent of consumers understood the APR measure for both open- and closed-end credit, while 55.94 percent did not understand the price of open- nor closed-end credit. There is little transitivity between understanding one type of credit to another.

Factor Analyses

For open-end credit, one underlying factor was found with eigenvalue of 1.7409 (the eigenvalue of the second factor was -0.1166). The chi-square statistic for testing that at least one common factor existed was 269.44 with p-value of .0001. The squared canonical correlation of the variables with the factor was 0.7491. For closed-end credit, one underlying factor was identified with eigenvalue of 2.2905 (the eigenvalue of the second factor was -

0.1524). The chi-square statistic for testing that one common factor existed was 165.16 with p-value of .0001. The squared canonical correlation was 0.7932.

Logistic Analyses

The results of logistic analyses are presented in Table 1. Seller-provided information and age were found to significantly influence credit card holders' understanding of APR as the price of open-end credit, while education, the extent of information search (factor score), seller-provided information, and region were found to be significantly associated with mortgage holders' understanding of the APR as the price of closed-end credit. The log likelihood ratios are significant, indicating that consumers' knowledge of the price of open- and closed-end credit was well estimated by this set of independent variables.

More specifically, regarding consumers' understanding of the price of open-end credit, education and income were not found to be significant, failing to support Mandell (1973) and Kinsey and McAlister (1981)'s studies. One possible bias that contributes to this result is that we were not able to control for consumers' use patterns with credit

Table 1.
Results of Logistic Analyses: Parameter Estimates (P-value).

Source	Open-End (n=454)	Closed-End (n=209)
Intercept	1.5741 (0.3287)	-2.6031 (0.6101)
Information Search		
Extent	-0.1172 (0.4377)	-1.8385 (0.0266)
Source		
Family	0.1756 (0.4991)	0.8086 (0.2841)
Seller	0.6485 (0.0293)	2.5947 (0.0295)
Third party	-0.1834 (0.5408)	1.4255 (0.0850)
Refinancer	NA	-0.6093 (0.3145)
Log of income	-0.1321 (0.3841)	-0.7067 (0.1617)
Age	-0.0266 (0.0007)	0.0366 (0.1614)
Education (High school graduate or less as base)		
Some college	0.0885 (0.7371)	0.1975 (0.8300)
B.S.	-0.3732 (0.1654)	-0.2594 (0.7830)
Graduate education	0.1476 (0.6292)	2.1209 (0.0210)
Married (Unmarried as base)	0.1711 (0.5040)	2.3495 (0.0633)
Nonwhite (Non-Hispanic White as base)	-0.1074 (0.6641)	-0.2615 (0.7283)
Female (Male as base)	0.2243 (0.2608)	-0.5489 (0.3675)
Household size (two people household as base)		
Single household	-0.1881 (0.5849)	1.1833 (0.4121)
Three people household	0.1988 (0.4706)	0.5014 (0.4920)
Four or more people household	-0.0800 (0.7531)	-1.3817 (0.0947)
Region (South as base)		
West	0.0443 (0.8676)	1.9087 (0.0449)
Midwest	0.2841 (0.2732)	2.7302 (0.0047)
Northeast	-0.1283 (0.6505)	1.7876 (0.1049)
-2 Log Likelihood	31.608 (0.0245)	36.306 (0.0097)
degree of freedom	18	19

cards. If consumers are convenience users rather than revolvers, they are less likely to be concerned with the relevant price of the APR or the contract interest rate (Lee and Hogarth 1998). Therefore, before drawing a conclusion on the impact of education and income on consumers' knowledge of the price of open-end credit, additional studies need to be done, controlling for the way in which consumers use their credit cards. While the quantity of information search was not found to be associated with consumers' understanding of the price of open-end credit, the sources from which consumers obtained information were found to influence their understanding of the APR. Among information sources, only seller-provided information was positively associated with consumers'

understanding. Sellers play a positive role in helping consumers understand the price of open-end credit. Interestingly, the most influential factor on consumers' understanding of the price of open-end credit was age. The older the respondent was, the less likely s/he was to understand the price of open-end credit. Since older consumers tend to have a negative attitude toward using credit cards, their lack of knowledge may be less of a problem in credit card markets. However, with a greater availability of home equity lines of credit and an increasing number of older consumers who are considering this credit product, their lack of understanding of the APR price of open-end credit can be potentially disastrous.

For closed-end credit, education was found to influence consumers' understanding of its price, while income was not found to be significant. Specifically, those who had graduate education were more likely to understand the APR price of closed-end credit than those who were high school graduates or less. It is worth noting that the college education variable was not found to be significant. The negative impact of the extent of information search on consumers' understanding further suggests that the more consumers engage in search, the more they get confused. However, we cannot rule out the possibility that some borrowers with poor credit histories might have engaged in extensive information search, and it is the effects of credit history, not search that we are capturing. The data did not provide any information about the respondent's credit history, thus it could not be controlled in the analysis. Again, before drawing a conclusion on the impact of the extent of information search, further analysis needs to be done controlling the impact of credit worthiness. Consistent with the results on open-end credit, seller-provided information was found to significantly influence consumers' understanding of the APR price of closed-end credit. In addition, third party provided information was marginally associated with consumers' knowledge, indicating its positive role in consumer education. Married couples and those living in two people households were more likely to understand the price of closed-end credit than unmarried and those living in four or more people households, respectively. Residents of South were less likely to understand the APR price of closed-end credit than the residents of other regions.

Conclusions and Implications

Consumers' understanding of the APR price of open- and closed-end credit was examined in this study, using data from the February and March, 1997 University of Michigan's Survey of Consumers. Less than ten percent of mortgage borrowers and refiners understood the price of closed-end credit, while 46 percent of credit card holders understood the price of open-end credit as given by the APR. This study provides empirical evidence regarding consumers' confusion with the APR price of open- and closed-end credit. Currently provided information under the Truth in Lending Act may not be particularly helpful in consumer's shopping and decision making among credit products. The problem is particularly severe in closed-end credit markets. Considering that less than 10 percent of mortgage borrowers could understand the APR price of a closed-end loan, we conclude that for a majority of consumers APR price information is not understandable. Therefore, for many consumers, comparison shopping for APR price may not help them make optimal decisions.

Given this conclusion, public policy makers may want to consider more effective way to disclose the price information at the shopping stage for consumers. Several previous researchers (Durkin 1981; Kinsey and McAlister 1981; Raynard and Craig 1993) repeatedly pointed out that consumers tend to understand the dollar figures of total interest charge better than the APR. Converting percentages into dollars (e.g. dollars per thousand of loan) may be a more meaningful tool for helping consumers understand the price of credit. If the current APR disclosure is retained, then it would be helpful to compare the contract interest rate and the APR specifically, using an example, in order to enhance consumers' understanding.

There is a need for consumer education across the board but most especially for consumers who are older and less well educated. Considering that age is particularly strongly associated with consumers' knowledge of the price of open-end credit, educational efforts on open-end credit, especially home equity lines of credit, will greatly benefit older consumers. The finding that even college education did not make a difference in understanding the APR price of closed-end credit suggests that personal finance education, specifically with respect to closed-end loans, is important for both high schools and colleges to provide for their students. In addition, since some subgroups (e.g. minority household, females) in this survey did not understand the price of credit correctly, consumer education programs tailored for targeted audiences should have high marginal benefits.

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Endnotes

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The analysis and conclusions set forth in this paper are those of the authors and do not necessarily indicate concurrence of the Board of Governors, the Federal Reserve Banks, or members of their staffs.