

Do The Expected Real Interest Rate and Consumer Confidence Matter for Credit Card Borrowing?

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Abstract: In this paper I analyze the effect of the expected real interest rate and consumer confidence on credit card borrowing decisions of the U.S. households. Some previous research has found elements of irrationality in consumers' use of credit cards. I use a unique data set that has information both on households' credit card use and their price expectations, and analyze whether or not consumers are taking into account their *expected real interest rate*. Consumer confidence measures are also used. The censored regression results show that consumers do take into account their price and income expectations and borrow rationally on their credit cards based on their future beliefs about the economy. These results suggest that consumers' own price expectations and confidence should be included as predictors of consumer behavior in the credit card market.

Keywords: Credit Cards, Expected Real Interest Rate, Consumer Confidence, Rationality

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1. INTRODUCTION

Credit card use has become an important part of household finances in the U.S. In 2000, 76 percent of all Americans had at least one card, compared to 46 percent in the early 1990s. Not only did more consumers start using credit cards, but also they started carrying more of their balances forward and paying high interest on these outstanding balances. The average American family experienced a 53 percent increase in credit card debt between 1989 and 2001 (Draut and Silva, 2003). According to Survey of Consumer Finance (SCF) statistics, the average credit card debt in 2004, conditional on borrowing, for the average US household was \$8,000. Furthermore, during this period the revolving credit component of total household debt has increased faster than the disposable household income. Hence, these changes have made both policy-makers and the banking community turn more of their attention to the credit card market. Many critical questions remain about what influences a consumer's decision to carry credit card balances forward, especially since credit card interest rates have traditionally been higher than the rates on other types of consumer debt instruments such as bank loans or other secured credit such as home equity lines.

The research presented here examines the issue of how price expectations and different components of the consumer confidence index influence credit card use. I investigate the impact of price expectations and three separate components of consumer confidence index on credit card borrowing. I utilize a new source of household survey data that contains information on credit card use, price expectations, and consumer confidence— all from the same respondents.

I find that the *expected real interest rate* and consumer confidence do matter for credit card borrowing. Price expectations have significant positive effect on consumers' decision about how much to borrow on their credit cards. This result implies that consumers are taking their *expected real interest rates* into account when deciding how much to borrow. Furthermore, two income components of University of Michigan's Index of Consumer Sentiment are also found to significantly influence the household's decision on how much to borrow on their credit cards. Households who have more optimistic expectations about their financial status in the coming year are likely to borrow more on their cards compared to their counterparts. Also, the households who are currently having worse times financially than a year ago are also likely to depend more on their credit cards for extra cash. These results imply that consumers' behavior in the credit card market is rational based on their expectations. They also identify new key variables that are important for the consumer behavior in the credit card market.

This paper is organized as follows. The next section reviews the relevant literature and outlines the theoretical background. The data source that is used along with descriptive statistics is introduced in section 3. Section 4 presents the estimation methodology and empirical results. The paper is concluded in section 5.

2. PREVIOUS RESEARCH

Research in the economics literature on the credit card market is relatively new. This area of research has been pioneered by Ausubel (1991). In his work, he noticed that even though there are many firms in this market, the industry is far from being competitive because of high and sticky interest rates. He attributes the high interest rates

to consumers' irrationality because they borrow on credit cards without realizing that they will not be able to pay off their balance in full. Brito and Hartley (1995) develop a theoretical model that predicts borrowing on high credit card interest rates to be rational because of transaction costs associated with borrowing from banks or other loaning institutions. There is also the adverse selection explanation for high credit card interest rates. Calem and Mester (1995) responded to Ausubel's argument by looking at the relationship between the probability of being denied credit and credit card balance. Using the 1989 SCF data, they find a positive relationship between these two, and hence argue that fear of being denied credit makes the consumers to stick to their high-interest credit card.

Other researchers have challenged the adverse selection argument. Dunn and Kerr (2004) used the 1998 SCF data to analyze the relationship between consumer's propensity to search and probability of being denied credit. According to adverse selection argument, this relationship should be negative. However, the authors find a positive relationship, thus showing that high interest rates cannot be explained by search costs. Crook (2002) also shows that the credit card holders with higher balances do not search less than those with lower balances.

Mester (1994) investigates the reason behind high and sticky interest rates on credit cards by using a screening model of consumer credit markets. Her model predicts that credit card rates need not fall when bank's cost of funds go down, because there might be some other factors changing at the same time, such as inflation rate, that will keep the real interest rates at high levels. Thus, she concludes that the demand for credit card borrowing might be influenced by the real interest rates in financial markets. The

real interest rate referred to in this model is the real interest rate decided by the market. However, the consumers and banks might have different perceptions about the inflation rate in the market, hence the *expected real interest rate* differs for the two sides. In this paper I analyze this issue from the demand side of the market.²

There is also a large literature that has examined the effects of consumer confidence and price expectations on consumer behavior although none of the research has looked at the effect on credit card borrowing mainly due to absence of data. Several authors find that some type of the aggregate confidence index for the United States (Carroll et. al., 1995; Eppright et. al., 1998; Bram and Ludvigson, 1998; Howrey, 2001) as well as for other countries (Acemoglu and Scott (1994) for the United Kingdom; Goh (2003) for New Zealand) is useful in predicting aggregate consumption growth. At an individual level, Souleles (2004) finds that individual components of the consumer confidence index and the price expectations measure in the University of Michigan survey are also useful in forecasting household level consumption growth. He also shows that these expectations are biased ex-post, but they are still important for the households when making their decisions. Souleles (1999) also finds that these measures are important factors in consumers' decision of whether or not to purchase a risky portfolio.

In this paper I combine both of these issues to study the ability of these attitudinal measures to predict consumer behavior in the credit card market, specifically credit card borrowing. To the best of my knowledge, nobody has studied this relationship empirically. Part of these results provides a test for the rationality of consumer behavior in the U.S. credit card market.

² Other work on this topic includes but is not limited to Gross and Souleles, 2002; Min and Kim, 2003; Castronova and Hagstrom, 2004; Dunn and Kim, 2004.

Theoretical Considerations:

The price expectations should have a positive effect on credit card debt. This is because, if expected inflation is higher, then the expected real interest rate is lower through the Fisher identity.³ Hence, the lower the real interest rate, the more the borrowing since the cost of borrowing has just gone down.

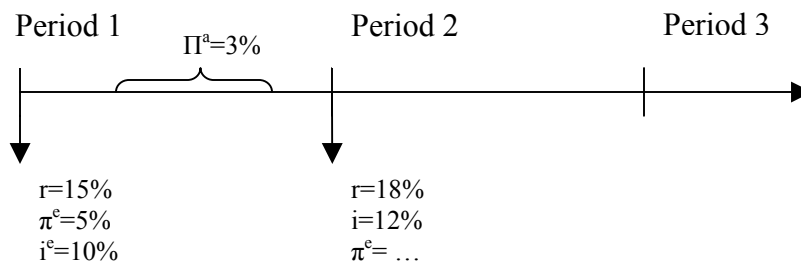


Figure 1 Formation of the *Expected Real Interest Rate*

Figure 1 above demonstrates this prediction. When a consumer receives his/her credit card bill at the beginning of Period 1, he knows the nominal APR ($r=15\%$), but also forms his expectations about the future price level ($\pi^e=5\%$). So the *real interest rate* that is expected to be paid on outstanding balances in the next period is simply 10 percent. Of course, the nominal rate will ultimately be adjusted by the credit issuer (possibly at the end of period 1, the nominal rate will be 18 percent) unless it is a fixed

³ The Fisher identity says that the real interest rate is the difference between the nominal interest rate and expected inflation, i.e. $r = i - \pi^e$.

rate. However, the adjustment will only be made *after* inflation actually occurred.⁴ Thus, a rational consumer will be one step ahead if he acts on his expectations. Since the data we have on price expectations is in the form of a continuous variable, this allows us to construct the expected real interest rate.⁵ Previous empirical studies have used the nominal interest rate on the credit card as an explanatory variable. The realized real interest rate ($i=12\%$ at the beginning of Period 2) and the expected real interest rate at the beginning of Period 1 ($i^e=10\%$) do not need to be the same since the expectations might be biased (Souleles, 2004). However, analyzing the consistency of consumers' behavior with their expectations still provides a test for consumer rationality in the use of credit cards.

The questions for the components of the consumer confidence index that are used in this research can be found in the Appendix. The responses to these questions are discrete (better/worse/the same), so we have created two dummy variables for each question, and the omitted category is the choice of "the same." *The financial position expectation* should positively affect the credit card borrowing. If someone thinks that he will be in a better position financially in a year, then he can afford to borrow more against high-income expectations, a point also argued by Anzatalous (1996). The positive relationship between financial expectations of the households and the amount of total debt they carry has also been shown both theoretically and empirically by Brown et. al. (2005) by using the UK data. *The financial position realization* should have a negative effect on credit card borrowing. If the current income is low, there are two effects. First,

⁴ APR on credit cards is usually adjusted as the prime rate changes. Time of adjustment varies with banks, and some consumers might get longer time before the APR changes.

⁵ The question on price expectations has the same format as the question from the University of Michigan Survey.

the endowment of the consumer is less, hence he can spend less. But now in order to maintain the same level of consumption, more money is needed. Hence, the consumer will utilize his credit cards to finance the necessary extra money. If we assume a CES utility function with elasticity of intertemporal substitution between zero and one, the second effect dominates, and hence borrowing increases when the current income decreases. This behavior is consistent with the consumption models with borrowing constraints (Deaton, 1991). Finally, the expectation about general well being of the aggregate economy is predicted to have positive relationship with credit card borrowing. Optimistic expectations reduce the saving and hence increase borrowing under models of precautionary saving (Carroll, 1997).

To summarize the predictions of this section, the inflationary expectations and income expectations are predicted to have positive effect on credit card borrowing, and current income realization is predicted to be negatively correlated with credit card borrowing. We will use a new survey data set in order to empirically test these predictions.

3. Data and Descriptive Statistics

The data set used in this study comes from the Ohio Economic Survey (OES) conducted by the Center for Survey Research (CSR) of the Ohio State University. OES has been conducted *monthly* between November 1996 and April 2002. Every month at least 500 randomly selected individuals from the state of Ohio have been interviewed by phone. Ohio has been a major “test market” because of its resemblance to the United

States population in terms of its socioeconomic characteristics⁶. The survey includes questions on issues ranging from the respondent's perceptions about the economy to their use of credit cards as well as demographic information. The questions asked on credit cards that are used in this paper can be found in the Appendix.

The OES has some unique questions unavailable in other consumer finance surveys. For example, the SCF has only limited number of attitude questions. Even the ones that ask respondents about their attitudes ask about attitudes for the next five years which might be too long a time for households to think about when making their decision. The OES on the other hand asks the usual consumer confidence questions (as the University of Michigan survey) and inflationary expectations, as well as credit card questions from the same sample. The question about the inflation expectations is particularly important because it allows the respondents to give an exact amount rather than choosing among three discrete options (up/down/the same). Hence we can calculate the expected real interest rate with precision. We also create a dummy variable measuring the default history of the respondents. The corresponding question is "How many times have you missed paying the minimum payment in the last six months?" If the respondent has missed at least once, then the *default* dummy is equal to one, otherwise it is zero. *Default* helps us to control for the riskiness of the credit card user, which is an important determinant in borrowing decisions and is used by banks when evaluating an application. Finally, the Ohio Economic Survey is a monthly survey whereas the SCF is released triennially. Since the credit card market is a very rapidly changing market with seasonal trends, SCF data may not capture consumer behavior accurately.

⁶ Table 1 compares some of the main socioeconomic characteristics between the respondents of the Ohio Economic Survey and 1998 Survey of Consumer Finances.

Descriptive Statistics:

In this section, we present some summary statistics of the sample. The final data set used in the econometric estimation had 9,583 observations. We use observations beginning in December 1998 because the information on credit card interest rate is unavailable prior to this period and the total household income was constrained to be less than \$300,000 in accordance with the previous literature (Calem and Mester, 1995). Table 2 shows the difference between credit card balance, interest rate, and inflation expectations of the households within different demographic groups. It is noteworthy that households with higher income levels tend to have higher balances on their cards, consistent with money demand theories.

Table 3 compares the mean amount of credit card borrowing for consumers with different confidence and expectations. The mean amount of borrowing is significantly different between different choices at 5% significance level or better. Respondents with high-income expectations tend to borrow more than consumers who have worse income expectations in the next 12 months. Also, those consumers who are experiencing hard times financially borrow more on their credit cards than their counterparts. Finally, those who have poor expectations about the well being of the aggregate economy in the next 12 months tend to borrow more on their cards.

4. Econometric Methodology and the Results

Econometric Methodology:

We use a Tobit model in order to test the effects of price expectations and confidence components on credit card borrowing. Credit card borrowing is defined as the total amount of outstanding balance the respondent has on all of his/her credit cards

combined after the most recent payments. This amount is the amount that interest will be paid on at the end of the next billing cycle. The variables used in the estimation are shown on Table 4 along with their sample means.

Besides the socioeconomic variables, we have dummy variables for consumer confidence components and a continuous variable for price expectations. Since credit card use is a highly seasonal phenomenon, we also include time dummies in the estimation, one for every month of the survey, in order to control for the aggregate seasonal effects. The Tobit model is of the form,

$$Y_i^* = X_i\beta + \epsilon_i, \quad \epsilon_i \sim N(0, \sigma_\epsilon) \quad (1)$$

where Y_i^* is a latent variable that indicates desired level of credit card borrowing, X_i includes all the variables defined in Table 4 as well as the month dummies, and the observed credit card borrowing is $Y_i = \max(Y_i^*, 0)$. There are 2,562 left-censored observations (i.e. $Y_i = 0$), and 7,021 uncensored observations (i.e. $Y_i > 0$). Maximum likelihood estimates of the coefficients are presented in Table 5.

Results:

The results of the estimation are presented in the first column of Table 5. As it can be seen from the table, *price* and *income expectations* are significant determinants of credit card borrowing. Respondents who have high inflationary expectations and high-income expectations tend to borrow more on their credit cards than their counterparts. These results indicate that household's current decisions are influenced rationally by their expectations. This also shows that households are acting rationally on their expectations, whether or not the expectations are realized.

The *current income realization* of the households is also an important determinant of credit card borrowing. Households that are going through bad times financially tend to borrow more on their credit cards. This shows that consumers resort to credit cards in order to smooth their consumption when they experience slumps in their household income. However, a consumer's expectation about the aggregate well-being of the *national* economy is not a statistically significant determinant of his borrowing decision.

Other socioeconomic variables revealed the same signs as in previous studies. Respondents who are employed and those who have higher income tend to borrow more on their credit cards than unemployed respondents and those with lower income. Those who have defaulted in the past and also owe on other type of debt instruments also borrow more on their credit cards than their counterparts. Higher educated respondents on the other hand carry less credit card debt than their less educated counterparts. Finally, males and whites seem to be borrowing less on their credit cards than females and non-whites respectively. Age of the respondent has no significant effect.

One last variable of interest is the dummy variable indicating *homeownership*. Homeowners tend to borrow less on their credit cards than renters. This might be due to the fact that homeowners are eligible for other kinds of credit instruments such as Home Equity Line of Credit (HELOC). Since renters do not have such an option, this might be the reason why they borrow more on their credit cards than homeowners.

We have repeated the estimation by using the ratio of *amount owed to total household income* as the dependent variable. It could be argued that the amount of credit card debt *relative* to total income is more important for the households rather than the absolute debt amount. The results are qualitatively the same as before. Price and income

expectations are found to be positively correlated with the ratio of credit card debt to household income. Finally, current income realization is negatively correlated with amount owed to total income ratio.

Marginal Effects:

The marginal effects of the variables for the Tobit regression presented in Table 5 are displayed on Table 6. The marginal effects are calculated at the sample mean of the variables. For dummy variables, the marginal effects are for a discrete change of the dummy variable from 0 to 1.

The marginal effects can be interpreted as follows. Every one percentage point increase in a person's expected rate of inflation will lead that consumer to borrow more than \$100 per year on his/her credit cards.⁷ Also a one percentage point increase in the nominal interest rate causes the average consumer to borrow \$51 less on his credit cards. Finally, one percent increase in the total household income induces around \$155 more borrowing per month.

The monthly marginal effects for consumer confidence measures can also be interpreted accordingly. A consumer with household income of around \$49,000 who experiences a slump in current household income compared to a year ago is likely to borrow \$723 more than someone who is doing financially the same compared to a year ago. Income drops causes the consumer to resort to credit cards more often. Also, someone who thinks he will have more income in the next 12 months is likely to borrow around \$350 more than someone who thinks his financial position will be steady. Consumers who have defaulted in the last six months are likely to borrow \$437 more

⁷ This result is for a person with mean household income, borrowing, and interest rate of \$49,000, \$2,559, and %14.4 respectively.

than non-defaulters, and those who also owe other types of debt are likely to borrow \$800 more than those who don't have any other debt. The marginal effects for the estimation where the dependent variable is the ratio of amount owed to total household income can also be interpreted accordingly.

Exogeneity Test for Inflation Expectations:

It could be argued that the *inflation expectations* of the consumers are not exogenously determined and hence using it in equation (1) might lead to biased results. In order to confirm that this variable is in fact exogenously determined I estimate the amount of borrowing by using instrumental variables approach.⁸ The model I estimate is as follows:

$$\begin{aligned} amtowed_i^* &= \beta' X_{1i} + \gamma Y_i + \varepsilon_{1i}, \\ Y_i &= \alpha' X_{2i} + \varepsilon_{2i} \end{aligned} \tag{2}$$

where Y_i includes the inflationary expectations of the individual i , and it is also assumed that $Corr[\varepsilon_1, \varepsilon_2] = \rho_{12}$. I assume that there is a linear relationship between inflationary expectations and other variables that are included in X_2 . Equation (2) is estimated by full information maximum likelihood, and I test the null hypothesis that inflationary expectations are exogenous.

Before I present the results of exogeneity test, let's talk about the variables we include in X_{2i} as instruments. These variables are shown in Table 7. Apart from the usual socioeconomic variables and time dummies⁹, there are two new variables that we include as instruments. These variables are the *number of days the respondent read a newspaper*

⁸ Complete description of this model can be found in Greene (2002).

⁹ In order to reduce the computational complexity, we only include twelve month dummies, and five year dummies in X_1 , and include only five year dummies in X_2 .

last week (DAYSPAP), and the *average number of hours per day the respondent watches television* (TVHRS). Carroll (2003) shows that households form their expectations about inflation based on the news about the inflation they read in the newspapers. Therefore the instruments we select should be related to the formation of inflationary expectations, but there is no reason to believe that these variables are related to credit card borrowing decision. Hence, these variables are believed to be valid instruments.

The results of the estimation provided evidence in favor of the null hypothesis. Hence we cannot reject the null hypothesis that inflationary expectations are exogenous. Therefore the estimation methodology we used in the previous section is valid.

5. Conclusion

This paper is the first attempt that looks at the effect of expected real interest rates on consumers' behavior, specifically their credit card borrowing. I use a new monthly household level survey data that has detailed information on credit cards along with information on inflationary expectations that allows me to construct expected real interest rate variable that was not possible for earlier researchers. I find that the expected real interest rate significantly and positively influence credit card borrowing of the U.S. households. This result is also consistent with view that consumers make rational decisions in the credit card market, which was challenged by some researchers (Ausubel, 1991).

In this paper, I also show that credit card borrowing is significantly influenced by two income components of consumer confidence measures, namely the current financial position and future financial position expectation of the households. More optimistic

future income expectations and worse current income realization leads to more borrowing. The usefulness of consumer confidence measures to predict consumer behavior have been investigated by other researchers, but its application to credit card borrowing has not been studied extensively. There might be heterogeneous forecast errors in households' expectations (Souleles, 2004); however, once these expectations are formed, the consumer behavior is consistent with the theory. The agents might not be informed enough to form the correct expectations, but based on their expectations, they behave rationally.

This research has noteworthy implications. First of all, we have identified several new factors that are important determinants of credit card borrowing that no previous research has shown. Given the rapid increase in credit card debt among the U.S. households, it is very important to find the drivers behind this phenomenon. It is imperative that these new variables should be included in forecasting models of consumer behavior in this market.

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Table 1. Mean Comparison of Certain Socioeconomic Characteristics of Ohio Economic Survey (OES) and 1998 Survey of Consumer Finances (SCF)

	OES	SCF⁰
Annual Percentage Rate	14.37	14.52
Log of Household Income	10.7	11.10
Family Size	2.64	2.65
Age of Respondent	48.11	50.02
Race of Respondent¹	0.90	0.86
Education	13.49	14.32
Gender of Respondent^{2,4}	0.41	0.76
Employment Status of the Respondent³	0.65	0.76

⁰ These means are taken from Table 2 of Min and Kim (2003).

^{1,2,3} These variables are, respectively, dummy variable equal to 1 if the respondent is white and equal to zero otherwise; dummy variable equal to 1 if the respondent is male and equal to zero otherwise; dummy variable equal to 1 if the respondent is employed full- or part-time and equal to zero otherwise.

⁴ The disproportionate number of males in the *SCF* arises from its personal interviewing of household heads in a sample that over-represents the wealthy. The Ohio sample's gender breakdown is closer to the actual national proportions, which results from its random sampling.

Table 2. Summary statistics of the credit card holders by different socioeconomic groups- Mean (std. error)

		Credit Card Balance	Interest Rate	Inflationary Expectations	Expected Real Interest Rate	
Age	18-30	\$2,264 (95.24)	14.39 (0.13)	4.52 (0.17)	9.95 (0.22)	
	31-50	\$2,755 (62.78)	14.24 (0.07)	4.55 (0.08)	9.71 (0.11)	
	51+	\$1,521 (60.15)	14.57 (0.08)	4.77 (0.09)	9.78 (0.14)	
Education	Less than High School	\$1,731 (146.55)	15.43 (0.26)	7.01 (0.38)	8.58 (0.50)	
	High School	\$1,979 (60.8)	14.7 (0.09)	5.53 (0.11)	9.15 (0.16)	
	Some College	\$2,349 (56.03)	14.2 (0.07)	4.21 (0.08)	9.99 (0.10)	
	College and more	\$2,146 (141.25)	13.90 (0.12)	3.36 (0.10)	10.51 (0.17)	
	Income	Income	\$1,722 (70.9)	14.1 (0.1)	4.38 (0.11)	9.79 (0.15)
	Missing					
Less than \$30K	\$1,538 (64.5)	15.2 (0.11)	6.25 (0.16)	8.89 (0.21)		
\$30-\$50K	\$2,294 (100.5)	14.7 (0.11)	4.75 (0.13)	9.98 (0.18)		
\$50-\$70K	\$2,805 (107.87)	14.0 (0.12)	4.29 (0.14)	9.62 (0.19)		
\$70-\$90K	\$2,911 (141.46)	13.7 (0.14)	3.61 (0.16)	10.13 (0.21)		
\$90-\$110K	\$3,131 (249)	13.75 (0.22)	3.53 (0.22)	10.43 (0.32)		
More than \$110K	\$2,568 (202.4)	14.02 (0.19)	3.11 (0.15)	10.75 (0.25)		
Race	White	\$2,133 (41.24)	14.34 (0.05)	4.47 (0.06)	9.88 (0.08)	
	Non-White	\$2,583 (153.45)	14.67 (0.17)	6.01 (0.25)	8.72 (0.31)	
Gender	Female	\$2,162 (50.8)	14.58 (0.06)	5.48 (0.09)	9.15 (0.12)	
	Male	\$2,181 (63.4)	14.09 (0.07)	3.55 (0.06)	10.50 (0.10)	

Table 3. The Comparison of Mean Credit Card Borrowing Between Consumers with Positive and Negative Confidence Measures

Variable	Mean	Std Deviation	N
<i>Positive Expected Income</i>	\$2,770.56	\$5,824.22	5,873
<i>Negative Expected Income</i>	\$1,971.16	\$4,455.5	1,180
<i>Positive Income changes in the past 12 months</i>	\$2,163.79	\$4,571.91	7,466
<i>Negative Income changes in the past 12 months</i>	\$3,126.21	\$6,907.12	3,121
<i>Positive National Economic Outlook</i>	\$2,066.75	\$4,578.87	7,796
<i>Negative National Economic Outlook</i>	\$2,401.97	\$4,885.09	4,204

Table 4. Defined Variables and Summary Statistics
(Standard Deviations are in the parentheses)

Variable	Definition of Variables	Mean
<i>Inflation</i>	Next 12 months inflationary expectations	4.65 (7.25)
<i>Nominal Interest Rate</i>	The APR charged on the one credit card that is used the most often	14.37 (5.46)
<i>Credit Card Balance</i>	Amount owed on all of credit cards after the most recent payment	\$2,170 (4,932)
<i>Total Credit Limit</i>	Total line of available credit on all credit cards combined	\$20,426 (77,758)
<i>Log Income</i>	Log of household income	10.7 (0.75)
<i>Gender</i>	Dummy =1 if the respondent is male, and =0 otherwise	0.41 (0.49)
<i>White</i>	Dummy =1 if the respondent is white =0 otherwise	0.90 (0.3)
<i>High Income Expectation</i>	Dummy =1 if the respondent thinks he and his family will be better off financially in 12 months =0 otherwise	38% (0.48)
<i>Low Income Expectation</i>	Dummy =1 if the respondent thinks he and his family will be worse off financially in 12 months =0 otherwise	7.5% (0.26)
<i>High Income Realization</i>	Dummy =1 if the respondent thinks he and his family are better off financially now than a year ago =0 otherwise	48% (0.5)
<i>Low Income Realization</i>	Dummy =1 if the respondent thinks he and his family are worse off financially now than a year ago =0 otherwise	20% (0.4)
<i>Better Economic Expectation</i>	Dummy =1 if the respondent thinks the economy will be better in 12 months =0 otherwise	50% (0.5)
<i>Worse Economic Expectation</i>	Dummy =1 if the respondent thinks the economy will be worse in 12 months =0 otherwise	27% (0.44)
<i>Family Size</i>	Total number of adults and kids living in the household	2.6 (1.46)
<i>Homeownership</i>	Dummy =1 if the respondent owns his house =0 otherwise	83% (0.37)
<i>Education</i>	Education level of the respondent	13.49 (1.97)
<i>Age</i>	Age of the respondent	48.12 (15.85)
<i>Employment Status</i>	Dummy =1 if the respondent is employed =0 otherwise	65% (0.48)
<i>Credit Card Default</i>	Dummy =1 if the respondent has missed paying the minimum payment at least once in the last six months, =0 otherwise	10% (0.30)

Table 5. Tobit Estimates of the Coefficients

Variable	Dependent variable is	Dependent variable is the ratio of
	<i>amount owed</i>	<i>amount owed to household income</i>
	Coefficient (standard error)	Coefficient (standard error)
<i>Inflation Expectation</i>	21.13** (9.96)	0.0010*** (.00028)
<i>Interest rate</i>	-125.73*** (12.92)	-0.0027*** (.00037)
<i>Log household Income</i>	414.46*** (121.72)	
<i>High Income Realization</i>	1.35 (177.33)	-0.0057 (.0051)
<i>Low Income Realization</i>	1709.83*** (208.10)	0.052*** (.0059)
<i>High Income Expectation</i>	819.42*** (150.76)	0.022*** (.0043)
<i>Low Income Expectation</i>	-51.28 (281.77)	-0.0041 (.0081)
<i>Better Economic Expectation</i>	-275.59 (188.25)	-0.013** (.0054)
<i>Worse Economic Expectation</i>	47.82 (207.57)	-0.0022 (.0059)
<i>Homeownership</i>	-885.63*** (199.17)	-0.053*** (.0055)
<i>Family size</i>	233.38*** (53.16)	-0.00036 (.0015)
<i>Credit Card Default</i>	1003.54*** (213.89)	0.035*** (.0061)
<i>Other debt</i>	1960.27*** (219.85)	0.039*** (.0063)
<i>Employment Status</i>	1018.88*** (172.08)	0.015*** (.0048)
<i>Education</i>	-183.72*** (39.56)	-0.0092*** (.0011)
<i>White</i>	-655.10*** (234.79)	-0.022** (.0067)
<i>Gender</i>	-636.95*** (143.13)	-0.024*** (.0041)
<i>Age</i>	-8.77 (6.25)	-0.00028 (.00018)
<i>Total Credit Limit</i>	0.0037*** (.0007)	5.59e-08*** (2.00e-08)

*** Significant at 1% level or better, ** Significant at 5% level or better

Table 6. The Marginal Effects at the Sample Mean

Variable	Dependent variable is	Dependent variable is the ratio of
	<i>amount owed</i>	<i>amount owed to household income</i>
	Coefficient	Coefficient
<i>Inflation Expectation</i>	8.70**	0.00041***
<i>Interest rate</i>	-51.76***	-0.0011***
<i>Log Household Income</i>	170.61*	
<i>High Income Realization</i>	0.56	-0.0022
<i>Low Income Realization</i>	737.22***	0.021***
<i>High Income Expectation</i>	339.42***	0.0086***
<i>Low Income Expectation</i>	-21.07	-0.0016
<i>Better Economic Expectation</i>	-113.51	-0.0051**
<i>Worse Economic Expectation</i>	19.71	-0.00086
<i>Homeownership</i>	-374.11***	-0.022***
<i>Family size</i>	96.07***	-0.00014
<i>Credit Card Default</i>	427.84***	0.014***
<i>Other debt</i>	822.06***	0.016***
<i>Employment status</i>	411.56***	0.057
<i>Education</i>	-75.63***	-0.0036***
<i>White</i>	-276.3***	-0.0088**
<i>Gender</i>	-261.42***	-0.0094***
<i>Age</i>	-3.61	-0.00011***
<i>Total Credit Limit</i>	0.0015***	2.20e-08*

*** Significant at 1% level or better, ** Significant at 5% level or better, * Significant at 10% level or better. The marginal effects are calculated at the sample mean. For discrete variables the marginal effect is the change of dummy variable from 0 to 1.

Table 7. Variables Used in X_{2i} for Exogeneity Test of Inflationary Expectations

Variable	Definition
TVHRS	Number of hours on average the respondent watches TV per day
DAYSPAP	Number of times the respondent read a daily newspaper in the past seven days
EDUCAT	Education level of the respondent
LNINCOME	Log of household income
YRSOLD	Age of the respondent
GENDER	Sex of the respondent (=1 if male, =0 if female)
WHITE	Race of the respondent (=1 if white, =0 otherwise)
TIME	Five year dummies (1998,1999,2000,2001,2002)

APPENDIX A

A1. The following are the credit card questions from the OES that are used in this paper.

1. Do you have any credit cards?
2. Did you make any charges last month on any of your credit cards?
3. According to your most recent statements, approximately what did the total charges and/or cash advances amount to for the last month for all your credit cards together?
4. Have you or will you pay off all of the last month's charges and/or cash advances on your most recent statements or did you or will you carry some of them over?
5. Approximately how much of the total amount of your balance for last month have you or will you pay off?
6. Right now, approximately what is the total amount you owe on all your credit cards after your most recent payments?
7. Considering all the credit card accounts that you have, approximately what is your total line of credit?
8. In the past six months, how many times did you not pay off at least the minimum amount due on any of your credit cards?
9. I would like to ask you to think about the one credit card your household uses most often. If you do not pay back all of your charges from a previous month, what is the interest rate that your credit card issuer will charge you for carrying a balance on that card?

A2. The following are the components of consumer confidence and the price expectations questions used in this paper.

1. We are interested in how people are getting along financially these days. Would you say that you and your family living there are better off or worse off financially than you were a year ago?
2. Now looking ahead, do you think a year from now you (and your family living there) will be better off financially, or worse off, or just about the same as now?
3. Now, turning to business conditions in the country as a whole, do you think that during the next 12 months we'll have good times financially, or bad times, or what?
4. During the next 12 months, do you think that prices in general will go up, or go down, or stay where they are now?
5. By about what percent do you expect prices to go up (to go down), on the average, during the next 12 months?