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Credit Card Debt and Payment Use

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Abstract: Approximately half of credit card holders in the United States regularly carry unpaid credit card debt. These so-called "revolvers" exhibit payment behavior that differs from the behavior of those who repay their entire credit card balance every month. So far there has been no empirical analysis exploring the relationship between revolving behavior and patterns of payment use, such as substitution away from credit cards to other payment methods. Using data from the 2005 Study of Consumer Payment Preferences, we find that credit card revolvers are significantly more likely to use debit and less likely to use credit than convenience users who repay their balances each month. There is no difference between the two groups in their use of check or cash. Revolvers are also more likely to see debit as superior with respect to control over money and budgeting. The findings suggest that revolvers not only adopt, but also use, debit more frequently, as the means to control their spending.

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1. Introduction

Borrowing money on a credit card is expensive. Despite the cost, over 44 percent of credit card holders carry balances (based on the 2004 Survey of Consumer Finances). The average debt level reported by individuals with card balances was around $5,000 in 2004 (2004 dollars), financed at an average rate of over 11 percent per year (Bucks et al. 2006). Financial distress associated with managing such credit card debt may contribute to personal bankruptcy filing (Domowitz and Sartain 1999; Stavins 2000; White 2007).

High levels of credit card debt and the consequences for the individual debtor make the study of individuals who carry credit card balances an important topic in payments research. Previous research has primarily explored the underlying motivations for carrying credit debt using either cost-based (see Brito and Hartley 1995; Calem and Mester 1995; Calem et al. 2005; Telyukova and Wright 2005; Zinman 2007) or behavioral explanations (see Ausubel 1991; Prelec and Lowenstein 1998; Thaler 1999; Laibson et al. 2000; Bar-Gill 2004; Ausubel and Shui 2005; Meier and Sprenger 2007).

Relatively little attention has been paid to the payment behavior of individuals once credit card debt has been incurred. Individuals who carry credit card debt—commonly called revolvers—face finance charges on the marginal purchase. Absent liquidity constraints, such individuals should prefer alternative, lower-cost payment mechanisms at the point of sale. Zinman (2009) and Klee (2006) document that revolvers do appear more likely to acquire debit cards. However, payment adoption differs from payment use. Whether revolvers actually make payment substitution and therefore alter

their payment behavior in order to curtail their debt, however, remains an open question. Behavioral research on credit card use highlights decoupling: the separation of payment decisions from consumption decisions (for discussions, see Prelec and Lowenstein 1998; Thaler 1999). With a credit card, payment is separated from the act of purchasing and can occur substantially later than purchase or consumption. Psychologically, such temporal separation may encourage credit card spending (Bar-Gill 2004) even when other payment mechanisms have been adopted.

Using data from the Study of Consumer Payment Preferences for over 1,800 individuals who hold both credit and debit cards, we explore differences in payment use between revolvers and convenience users for payments made with four different methods: credit cards, debit cards, checks, and cash. We find significant evidence of substitution of debit for credit by individuals with unpaid credit card balances: Individuals who regularly carry revolving balances make a significantly lower proportion of their total payments with credit and a higher proportion of their total payments with debit. In contrast, there is no significant difference in the use of check or cash between revolvers and convenience users. Furthermore, revolvers are much more likely than convenience users to report debit as being the payment method chosen most frequently at the point of sale.

We complement our analysis of payment behavior with qualitative data on payment attribute perceptions. Perceptions—or perceived differences in payment attributes—have been found to be important determinants of consumer payment behavior (see Hirschman 1982; Miyazaki and Fernandez 2001; Mantel 2000; Ching and Hayashi 2006; Schuh and Stavins 2008). Revolvers' have different perceptions of debit cards from

convenience users, and those differences may be linked to their substitution behavior. We show that individuals with revolving balances are much more likely than convenience users to feel that debit offers superior budgeting and control over money relative to credit. Such attribute perceptions are likely to be important determinants of payment substitution.

Our results are the first to show substitution from credit to debit for actual payments made by individuals with revolving credit card balances. This substitution is likely motivated by concerns about debt and financial control.

The remainder of the paper is organized as follows: Section 2 describes the Study of Consumer Payment Preferences and discusses relevant payment measures. Section 3 presents results related both to substitution behavior and payment attribute perceptions. Section 4 concludes.

2. The Study of Consumer Payment Preferences

We use survey data specifically tailored to answering the question of how revolving credit card balances are related to payment method use. In the spring of 2005, Dove Consulting, jointly with the American Bankers Association, conducted its fourth biannual payments survey, the Study of Consumer Payment Preferences (SCPP). The survey was either distributed by mail or administered on the Internet. A total of 3,008 individuals over 18 years of age across the United States were surveyed. Of the 3,008 respondents, 2,350 completed web-based surveys and the remaining 658 submitted surveys by mail.

The SCPP contains a depth of information on payment behavior and consumer perceptions of payments not available from any other survey to date. Individuals are asked over 100 questions related to payment activity. The survey instrument runs over 40 pages. Over 650 payment related variables are present in the SCPP data set. Questions relate to adoption of payment instruments, their use in specific locations, general payment activity and individual perceptions of payment attributes. There are additional questions about socio-demographic characteristics.

For our purposes, we focus on a subsample of SCPP respondents: those individuals who currently hold both credit and debit cards and have provided complete socio-demographic information. (It is assumed that all respondents already have the option to use check or cash at the point of sale.) This choice of sample allows us to examine substitution between credit cards and other payment instruments—debit, cash, and check—after the adoption decisions took place. In the sample, 1,880 individuals hold both debit and credit cards and have provided complete socio-demographic information. Out of that sample, 43 percent report regularly carrying balances on their credit cards, as based on the following question: "I regularly carry a balance on my credit card (do not pay off the balance in full)." The proportion of revolvers is almost identical to that in the 2004 Survey of Consumer Finances, where approximately 45 percent of credit card holders carried balances (authors' calculation).

Table 1 shows the socio-demographic characteristics of individuals included in our analysis along with separate summary statistics for revolvers and convenience users. Individuals in the sample are predominantly white, with at least some college education. On average, individuals in the sample have reasonably high levels of financial

experience: the average length of time for which a person has held his or her primary checking account exceeds 11 years. As can be seen, there are very few significant differences in socio-demographic characteristics between individuals who do and do not carry credit card balances, although revolvers are generally younger than those who repay their balances.

2.1. Payment Measures

Our primary measures of payment use at the point of sale are: (1) the proportion of total payments made with a given payment instrument and (2) the payment instrument cited as the one most frequently used at the point of sale.

2.1.1. Payment Proportions

The survey asks respondents to indicate how many purchases they make with a given payment instrument in stores in a given week. The question is worded as, "How often do you use the following payment methods to make purchases in stores?" The options are "Don't use, once a week or less, 2–4 times per week, 5–7 times per week, or 8 or more times per week."

For payments made with each method *j* we use the midpoint of the interval response as the number of payments made. In the SCPP data, the highest response, "> 8 payments," is top-coded as 10. The results are robust to variations in this top-coding. The lowest response is coded as zero. We divide the number of payments made with payment

j by the total number of payments made by consumer *i*, to obtain the proportion of purchases made by consumer *i* with payment *j*.

$$\Pr oportion_{ij} = \frac{N_{ij}}{\sum_{p \in \{Credit, Debit, Cash, Check\}} N_{ip}}$$

where N_{ij} is the number of payments made by consumer *i* with payment *j*.

The resulting variables *Proportion Credit*, *Proportion Debit*, *Proportion Check*, and *Proportion Cash* are used as dependent variables in our analysis.

2.1.2. Most Frequent Payment

In addition to asking about a total number of payments, the survey also asks respondents to state which payment instrument they use most frequently at the point of sale. The question is worded as, "When you make purchases *overall,* which method of payment do you use most often?"

Responses to this question generate four binary variables used in our analysis: *Most Frequent Credit*, *Most Frequent Debit*, *Most Frequent Check,* and *Most Frequent Cash*. These variables are equal to 1 if the given payment instrument is chosen most frequently, and 0 otherwise.

In addition to these payment behavior variables, the survey also asks respondents to report their participation in credit and debit card rewards programs. Such program participation changes the relative price of using a certain payment instrument and so represents an important determinant of payment behavior (for evidence, see Ching and Hayashi 2006). Of our sample of 1,880 individuals, 1,722 answered the question asking whether or not they had either debit card or credit card rewards, or both. Summary statistics for these payment variables are presented in Table 2, again broken down by revolving behavior. In contrast to the demographic variables, these variables show that individuals with revolving balances exhibit payment patterns that differ significantly from those of convenience users. Even though cash and check payment behavior is similar for revolvers and convenience users, revolvers show significant substitution from credit to debit: they cite a significantly lower proportion of total payments made with credit and a higher proportion of total payments made with debit. Revolvers are also significantly more likely to cite debit, and significantly less likely to cite credit, as their primary payment choice.

2.2. Perceptions of Payments

Perceptions of payments are important in affecting consumer payment decisions (see Ching and Hayashi (2006) for further discussion of perceptions in the SCPP data and Schuh and Stavins (2008) for analysis of the importance of payment perceptions in consumer payment use). In addition to asking about payment use, the SCPP asks a series of questions on individual perceptions of payment instruments. The responses to these

questions allow us to explore underlying reasons for the payment behavior that consumers report. For each payment instrument, respondents were asked whether they view it as: *easy* to use, widely *acceptable*, *safe*, allowing *control* over money, helping in *budgeting*, and easy to get *refunds* or resolve disputes (for the design of these survey questions, please see the appendix). Individuals responded either yes or no to each question, for each payment instrument.

The perceptions of payments elicited in the SCPP provide an opportunity to see what consumers view as salient features for each payment instrument and to explore how these perceptions correlate with payment use. For the purposes of this paper, we are primarily interested in the consumers' perceptions of debit cards and credit cards.

We use responses to the above perception questions to generate six binary variables that are equal to 1 if the respondent answered "Yes," and 0 if the respondent answered "No"; these variables are: *Easy*, *Acceptable*, *Safe*, *Control*, *Budgeting*, and *Refund*. Further, we generate binary variables that are equal to 1 if the survey respondent answered positively in the case of debit *and* negatively in the case of credit—that is, they show whether or not the respondent clearly perceives debit as superior to credit. The following six variables are used in our analysis of perceptions: *DebitBetterEasy*, *DebitBetterAcceptable*, *DebitBetterSafe*, *DebitBetterControl*, *DebitBetterBudgeting*, and *DebitBetterRefund*.

Table 3 shows summary statistics of these variables, broken down by revolvers and convenience users, for individuals with non-missing socio-demographic characteristics. Individuals with revolving balances are significantly less likely to see debit as superior to credit with respect to ease of use and acceptability, but significantly

more likely to see debit as being better with respect to control over money and budgeting, and see no significant difference between the two payment methods for safety and ease of refunds.

The *t*-tests presented in Table 3 indicate that there are significant differences in perceptions that are directly related to debt and budgeting. That suggests that revolvers substitute debit for credit in order to better manage their debt.

In the next section, we use econometric estimation to further explore differences in payment behavior associated with revolving balances, controlling for socio-demographic characteristics and participation in rewards programs. We also study how perceptions are related to revolving behavior, controlling for socio-demographic characteristics and rewards program participation.

3. Results

3.1. Revolving Balances and Payment Behavior

3.1.1. Revolving Balances and proportion of Payments

If revolvers try to curtail their debt and recognize the advantages of debit in managing their budget, we expect them to substitute away from credit cards and into alternative payment methods for purchases. Consequently, we expect revolving balances to be associated with a lower proportion of credit card payments and a higher proportion of other payments. In Table 4 we present ordinary least squares regressions of the following form, with robust standard errors:

$$\Pr oportion_{ij} = \beta_0 + \beta_1 \text{Re}volvingBalances_i + \gamma \mathrm{x}_i + \varepsilon_i$$

$Proportion_{ij}$ is the proportion of payments made by consumer *i*, using payment *j*. $RevolvingBalances_i$ is a binary variable that takes the value 1 if an individual regularly carries a credit card balance and 0 otherwise. $\mathbf{x_i}$ is a vector of socio-demographic and other characteristics of consumer *i*, which varies with specification but always includes categorical variables for gender, age group, income group, race, education, and a continuous variable for the length of time in years that an individual has held his or her current checking account. The socio-demographic variables are defined as shown in Table 1. Extended results of these regressions are displayed in Table 5.

In Columns 1 and 2 of Table 4 we present regressions with *ProportionCredit* as the dependent variable. In the initial specification of Column 1, we find that, controlling for socio-demographic characteristics, revolving credit card balances is associated with a significantly lower proportion of credit card payments. In Column 2, we additionally control for participation in credit and debit card rewards programs. Although rewards program participation may be endogenous, including it in the regression did not qualitatively change our results. Across all specifications, we find that revolving balances is associated with a reduction of between 2 and 4 percent in the proportion of payments for which credit cards are used. Age and education have the expected effects on the proportion of payments for which credit cards are used, and having rewards on either credit or debit raises the use of that payment card, and lowers the use of the other card, consistently with expectations (see Table 5 for details).

In Columns 3 and 4 of Table 4 we present regressions with *ProportionDebit* as the dependent variable. Socio-demographic characteristics, along with rewards program participation, have strong effects on the proportion of payments for which debit is used (see Table 5 for details). We find evidence for substitution into debit cards by individuals with revolving balances. Controlling for socio-demographic characteristics and rewards program participation, we find that revolving balances are associated with an increase of 4 to 5 percent in the proportion of payments made by debit card.

The results strongly show that for individuals who revolve their balances, the reduction in the proportion of credit card payments is entirely offset by the increase in debit card payments. Columns 5 and 6 of Table 4 present regressions with *ProportionCash* as the dependent variable. We find no significant increases associated with revolving balances in the proportion of payments for which cash is used. In fact, the coefficient on the revolving dummy variable is negative, although the effect is not statistically significant. Columns 7 and 8 of Table 4 present regressions with *ProportionCheck* as the dependent variable. We also find no impact of revolving balances on the proportion of payments for which checks are used.

3.1.2. Revolving Balances and Most Frequently Used Payment

Evidence of substitution from credit cards to debit cards for payments is further supported when we examine the payment instrument individuals cite as the one most frequently used at the point of sale. In Table 6 we present results from logistic regressions with robust standard errors of the following form:

$$MostFrequent_{ij} = \lambda_0 + \lambda_1 \mathrm{Re}volvingBalances_i + \lambda \mathrm{x}_i + \eta_i$$

$MostFrequent_{ij}$ is a dummy variable equal to 1 if consumer *i* reports using payment *j* most frequently. As before, $RevolvingBalances_i$ is a binary variable indicating whether an individual regularly carries a credit card balance, and $\mathbf{x_i}$ is a vector of socio-demographic and other characteristics of consumer *i*. Extended results of these regressions are displayed in Table 7.

The results in Table 6 largely confirm the evidence presented in Table 4. Individuals with revolving balances are significantly less likely to cite credit card as the payment instrument most frequently used at the point of sale, controlling for socio-demographic characteristics and rewards program participation. The calculated odds ratio indicates that revolvers are around half as likely as convenience users to use credit cards most frequently.

Individuals with revolving balances are, however, significantly *more* likely than convenience users to cite debit card as the payment instrument used most frequently. Calculated odds ratios indicate that revolvers are nearly one-and-a-half times more likely to use debit cards most frequently. There is no significant difference between the two groups in the likelihood of citing cash as the most frequently used payment instrument. Although revolvers are more likely to cite check as their most frequently used payment instrument, this effect becomes insignificant after controlling for credit card and debit card rewards.

3.2. Revolving Balances and Qualitative Perceptions

While we find strong evidence in support of substitution from credit cards to debit cards for individuals who regularly carry revolving balances, the finding provides little insight into the reasons for the substitution. That is, we do not know whether the substitution is carried out because individuals with revolving balances seek to curb their spending, or because they find debit cards more convenient to use, or for some other reason.

The SCPP asks a series of qualitative questions related to perceptions about individual payments. The literature has supported the view that attribute perceptions are strongly associated with payment behavior (for evidence and discussions see Hirschman 1982; Miyazaki and Fernandez 2001; Mantel 2000; Ching and Hayashi 2006; Schuh and Stavins 2008).

Given that perceptions are important factors affecting payment behavior, we are interested in the following question: Which payment attributes do revolvers perceive as different between debit and credit? Or, phrased differently: What are the reasons for their payment substitution?

Even though consumer perceptions have been found to be associated with payment behavior, the causality of the relationship has not been clearly established. It is not known whether a consumer uses a given payment method because he considers it superior to other methods, or whether using that payment helped him realize its advantages. In the following analysis we do not assume causality, but rather examine conditional correlations between revolving credit card debt and the perceptions of payment characteristics.

The results shown in Table 3 indicate that budgeting and control over money may be the key differences in revolvers' perceptions associated with their substitution from credit to debit. This view is supported by regression results. In Table 8 we present results from logistic regressions with robust standard errors of the following form:

$$DebitBetter_{ij} = \delta_0 + \delta_1 \mathrm{Re}volvingBalances_i + \delta \mathrm{x}_i + \nu_i$$

$DebitBetter_{ij}$ is a dummy variable that equals 1 if consumer *i* believes that debit cards outperform credit cards according to that specific perception *j*. $RevolvingBalances_i$ is a binary variable taking the value 1 if an individual regularly carries a credit card balance and 0 otherwise. $\mathbf{x_i}$ is a vector of socio-demographic characteristics and variables for rewards program participation. Extended results of these regressions are displayed in Table 9.

Controlling for socio-demographic characteristics, individuals who revolve balances are significantly *less* likely than convenience users to prefer debit when it comes to ease, acceptability, or refunds. We would expect such differences to be associated with increased use of credit, not decreased use as seen in the data. Revolvers are, however, significantly *more* likely to indicate that debit is better than credit in terms of budgeting and control. Clearly, those are the features that influence their payment choice the most.

Even though revolvers appreciate credit more in terms of ease and acceptability, they use debit more intensely than convenience users. Perceptions of superior debit

budgeting and control are the key perceptual differences between revolvers and convenience users associated with this differing payment behavior.

4. Conclusion

Approximately half of credit card holders in the United States regularly carry unpaid credit card debt. These so-called revolvers exhibit different payment behavior from those who repay their credit card balances every month. Previous research has found that revolvers are more likely than convenience users to adopt debit cards, but so far there have been no empirical studies exploring the relationship between credit card revolving and payment use patterns, such as substitution away from credit cards to other payment methods.

Using data collected in the 2005 Study of Consumer Payment Preferences, we explore the relationship between revolving credit card balances and payment use. We find that credit card revolvers are significantly more likely to use debit and less likely to use credit for point-of-sale purchases, when compared with convenience users who repay their balances each month. We find no significant differences in the use of check or cash between the two groups. The two groups also differ in their perceptions of payments—revolvers are significantly less likely to view debit as superior with respect to ease of use and acceptability, but more likely to see debit as better with respect to control over money and budgeting. The findings suggest that revolvers not only adopt, but also use,

debit more frequently than convenience users do, in order to control their spending and curb their debt.

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Table 1: Demographic Variable Means by Credit Card Revolving Behavior

Variable	Total N = 1880	Convenience Users N = 1073	Revolvers N = 807	p-value from t-test
Revolving Balances (=1)	.429	0	1	
Male	.509	.513	.503	.684
Age				
Over 65 yrs	.099	.116	.078	.007
55-64 yrs	.211	.231	.183	.012
45-54 yrs	.177	.176	.178	.897
35-44 yrs	.245	.219	.280	.002
25-34 yrs	.204	.186	.228	.027
18-24 yrs	.063	.072	.052	.082
Race				
Other	.044	.048	.038	.294
Hispanic	.069	.063	.076	.300
White	.702	.706	.695	.598
Asian	.064	.065	.062	.774
Black	.122	.116	.129	.417
Income				
>$150K	.031	.035	.025	.187
$100-$149K	.096	.097	.094	.841
$60-$99K	.277	.257	.304	.026
$40-$59K	.248	.250	.245	.826
$20-$39K	.246	.248	.244	.850
<$20K	.102	.113	.088	.079
Education				
Grad. School	.141	.150	.130	.220
College	.310	.313	.306	.743
Some College	.380	.376	.387	.626
High School	.157	.148	.169	.230
Some HS	.011	.013	.009	.372
Add'l Cntrls				
Check Account Years	11.5	11.6	11.4	.604

Table 2: Average Payment Method Use by Credit Card Revolving Behavior

Variable	Total N = 1880	Convenience Users N = 1073	Revolvers N = 807	p-value from t-test
Proportion of Payments Made at Point of Sale				
Credit Card	.213	.233	.186	.000
Debit Card	.363	.338	.397	.000
Cash	.308	.316	.298	.087
Check	.116	.113	.119	.418
Proportion Citing Payment Type as Most Frequently Used at Point of Sale				
Credit Card	.237	.277	.183	.000
Debit Card	.388	.341	.450	.000
Cash	.324	.339	.304	.102
Check	.052	.043	.063	.049

Table 3: Proportion of Consumers Reporting Debit Better than Credit

Variable	Total N = 1722	Convenience Users N = 964	Revolvers N = 758	p-value from t-test
Debit Better than Credit for...				
Easy	.167	.200	.125	.000
Acceptability	.171	.186	.152	.063
Safe	.278	.275	.281	.779
Control	.631	.598	.674	.001
Budget	.442	.405	.489	.000
Refund	.146	.158	.131	.114

Table 4: Payment Use and Revolving Balances

Ordinary Least Squares Regressions

	Proportion Credit		Proportion Debit		Proportion Cash		Proportion Check	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Revolving Balances (= 1)	-0.041***	-0.024***	0.051***	0.037***	-0.016	-0.016	0.006	0.003
	(0.010)	(0.009)	(0.012)	(0.012)	(0.010)	(0.010)	(0.007)	(0.007)
Constant	0.177***	0.148***	0.427***	0.458***	0.270***	0.269***	0.126***	0.124***
	(0.018)	(0.016)	(0.023)	(0.023)	(0.018)	(0.018)	(0.013)	(0.013)
Socio-Demographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rewards Participation	No	Yes	No	Yes	No	Yes	No	Yes
N	1880	1722	1880	1722	1880	1722	1880	1722
R-Squared	0.121	0.214	0.086	0.126	0.062	0.065	0.070	0.072

Notes: Robust standard errors in parentheses. Dependent variable: proportion of payments made with credit card (Columns 1 and 2), debit card (Columns 3 and 4), cash (Columns 5 and 6) and check (Columns 7 and 8).
Level of significance: * p <0.1, ** p <0.05, *** p <0.01

Table 5: Payment Use and Revolving Balances: Ordinary Least Squares Regressions

	Proportion Credit		Proportion Debit		Proportion Cash		Proportion Check	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Revolving Balances (=1)	-0.041***	-0.024***	0.051***	0.037***	-0.016	-0.016	0.006	0.003
Male	0.010	0.010	-0.047***	-0.044***	0.069***	0.066***	-0.031***	-0.032***
Age								
Over 65 yrs	0.064***	0.036*	-0.071***	-0.050**	-0.020	-0.021	0.027*	0.036**
55-64 yrs								
45-54 yrs	-0.026	-0.021	0.006	0.006	0.028*	0.020	-0.008	-0.006
35-44 yrs	-0.010	-0.016	0.018	0.022	-0.008	-0.011	-0.000	0.005
25-34 yrs	0.004	-0.006	0.044**	0.048**	-0.012	-0.014	-0.036***	-0.028**
18-24 yrs	0.003	0.002	0.016	0.012	0.030	0.025	-0.048***	-0.038***
Race								
Other	-0.045**	-0.026	0.059**	0.045	0.008	0.004	-0.022	-0.022
Hispanic	0.002	0.016	0.019	-0.006	-0.003	0.005	-0.018	-0.015
White								
Asian	0.122***	0.126***	-0.119***	-0.121***	-0.006	-0.001	0.002	-0.004
Black	-0.055***	-0.031**	0.013	-0.015	0.072***	0.070***	-0.030***	-0.024***
Income								
>$150K	0.116***	0.054	-0.068*	-0.030	-0.007	0.008	-0.041**	-0.032*
$100-$149K	0.093***	0.067***	-0.053**	-0.037	-0.027	-0.022	-0.013	-0.008
$60-$99K	0.034**	0.018	-0.016	-0.005	-0.020	-0.016	0.002	0.003
$40-$59K	0.002	-0.003	-0.001	0.012	-0.008	-0.014	0.007	0.005
$20-$39K								
<$20K	-0.001	0.020	-0.058**	-0.068***	0.053**	0.044**	0.007	0.004
Education								
Grad. School	0.106***	0.076***	-0.076***	-0.062***	-0.023	-0.017	-0.007	0.002
College	0.040***	0.023*	-0.015	-0.011	-0.024**	-0.016	-0.001	0.004
Some College								
High School	-0.018	-0.016	-0.046**	-0.048***	0.035**	0.038**	0.028**	0.026**
Some HS	-0.047	-0.023	0.047	0.002	0.042	0.057	-0.041*	-0.037*
Add'l Cntrls								
Chk. Acct. Yrs.	0.000	-0.000	-0.002***	-0.001**	0.001	0.001	0.001***	0.001***
Cred. Rewards		0.165***		-0.127***		-0.020*		-0.019**
Deb. Rewards		-0.092***		0.124***		-0.019		-0.014*
Constant	0.177***	0.148***	0.427***	0.458***	0.270***	0.269***	0.126***	0.124***
N	1880	1722	1880	1722	1880	1722	1880	1722
R-Squared	0.121	0.214	0.086	0.126	0.062	0.065	0.070	0.072

Notes: Robust standard errors in parentheses. Dependent variable: proportion of payments made with credit card (Columns 1 and 2), debit card (Columns 3 and 4), cash (Columns 5 and 6) and check (Columns 7 and 8). *Level of significance:* * $p<0.1$, ** $p<0.05$, *** $p<0.01$

Table 6: Most Frequent Use and Revolving Balances

Logit Regressions

	Most Frequent Credit		Most Frequent Debit		Most Frequent Cash		Most Frequent Check	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Revolving Balances (= 1)	-0.535***	-0.413***	0.419***	0.356***	-0.158	-0.164	0.454**	0.282
	(0.124)	(0.138)	(0.100)	(0.104)	(0.105)	(0.112)	(0.216)	(0.231)
Constant	-1.903***	-2.373***	-0.259	-0.144	-0.634***	-0.457**	-2.401***	-2.607***
	(0.216)	(0.244)	(0.180)	(0.187)	(0.181)	(0.193)	(0.352)	(0.411)
Socio-Demographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rewards Participation	No	Yes	No	Yes	No	Yes	No	Yes
N	1880	1722	1880	1722	1880	1722	1880	1722
Pseudo R-Squared	0.115	0.187	0.056	0.064	0.050	0.069	0.077	0.081

Notes: Robust standard errors in parentheses.
Columns 1 and 2: dependent variable = 1 if credit card is cited as most frequently used payment instrument at point of sale. Columns 3 and 4: dependent variable = 1 if debit card is cited as most frequently used payment instrument at point of sale. Columns 5 and 6: dependent variable = 1 if cash is cited as most frequently used payment instrument at point of sale. Columns 7 and 8: dependent variable = 1 if check is cited as most frequently used payment instrument at point of sale.
Level of significance: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Most Frequent Use and Revolving Balances

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Revolving Balances (=1)	-0.535***	-0.413***	0.419***	0.356***	-0.158	-0.164	0.454**	0.282
Male	0.308**	0.338**	-0.332***	-0.320***	0.298***	0.311***	-0.733***	-0.925***
Age								
Over 65 yrs	0.467**	0.372	-0.402*	-0.271	-0.065	-0.090	0.084	0.161
55-64 yrs								
45-54 yrs	-0.268	-0.330	0.128	0.141	0.171	0.092	-0.418	-0.216
35-44 yrs	-0.051	-0.166	0.259*	0.271*	-0.196	-0.193	-0.120	-0.021
25-34 yrs	-0.019	-0.158	0.524***	0.557***	-0.365**	-0.416**	-1.169***	-0.876**
18-24 yrs	0.200	0.187	0.172	0.171	-0.060	-0.094	-1.888*	-1.622
Race								
Other	-0.448	-0.374	0.292	0.222	0.107	0.084	-0.709	-0.551
Hispanic	-0.012	0.330	0.189	0.087	-0.072	-0.210	-1.042	-0.848
White								
Asian	1.316***	1.459***	-1.343***	-1.383***	-0.174	-0.082	-0.589	-0.405
Black	-0.687***	-0.430*	-0.165	-0.285*	0.679***	0.633***	-0.572	-0.424
Income								
>$150K	1.105***	0.548	-0.113	0.102	-0.879**	-0.544	-0.641	-0.783
$100-$149K	0.858***	0.654***	-0.099	-0.044	-0.478**	-0.385*	-0.630	-0.299
$60-$99K	0.524***	0.403**	0.090	0.159	-0.393***	-0.419***	-0.348	-0.120
$40-$59K	0.195	0.177	0.110	0.180	-0.194	-0.262*	-0.111	-0.034
$20-$39K								
<$20K	0.115	0.432*	-0.391**	-0.425**	0.301*	0.128	-0.130	0.074
Education								
Grad. School	0.962***	0.775***	-0.442***	-0.388**	-0.551***	-0.475**	0.514	0.848**
College	0.527***	0.423***	-0.126	-0.093	-0.296**	-0.269*	0.148	0.340
Some College								
High School	-0.298	-0.305	-0.454***	-0.475***	0.418***	0.448***	0.579**	0.632*
Some HS	-0.798	-0.667	0.030	-0.184	0.260	0.336	0.543	0.605
Add'l Cntrls								
Chk. Acct. Yrs.	0.008	0.006	-0.014**	-0.010	0.008	0.006	-0.001	0.002
Cred. Rewards		1.662***		-0.595***		-0.782***		-0.609*
Deb. Rewards		-0.776***		0.664***		0.013		-0.122
Constant	-1.903***	-2.373***	-0.259	-0.144	-0.634***	-0.457**	-2.401***	-2.607***
N	1880	1722	1880	1722	1880	1722	1880	1722
Pseudo R-Squared	0.115	0.187	0.056	0.064	0.050	0.069	0.077	0.081

Notes: Columns 1 and 2: dependent variable = 1 if credit card is cited as most frequently used at point of sale.
Columns 3 and 4: dependent variable = 1 if debit card is cited as most frequently used at point of sale.
Columns 5 and 6: dependent variable = 1 if cash is cited as most frequently used at point of sale.
Columns 7 and 8: dependent variable = 1 if check is cited as most frequently used at point of sale.
Level of significance: * p <0.1, ** p <0.05, *** p <0.01

Table 8: Perceptions and Revolving Balances

Logit Regressions

Debit Better than Credit for:	Ease (1)	Acceptability (2)	Safety (3)	Control (4)	Budgeting (5)	Refunds (6)
Revolving Balances (= 1)	-0.623***	-0.279**	-0.001	0.307***	0.336***	-0.263*
	(0.141)	(0.135)	(0.114)	(0.107)	(0.102)	(0.145)
Constant	-0.767***	-0.943***	-0.140	1.111***	0.398**	-0.943***
	(0.244)	(0.236)	(0.200)	(0.192)	(0.185)	(0.253)
Socio-Demographics	Yes	Yes	Yes	Yes	Yes	Yes
Rewards Participation	Yes	Yes	Yes	Yes	Yes	Yes
N	1722	1722	1722	1722	1722	1722
Pseudo R-Squared	0.073	0.042	0.055	0.057	0.045	0.068

Notes: Robust standard errors in parentheses.
Dependent variable =1 if individual responded positively for debit cards and negatively for credit cards; zero otherwise.
Level of significance: * p <0.1, ** p <0.05, *** p <0.01

Table 9: Perceptions and Revolving Balances

	(1)	(2)	(3)	(4)	(5)	(6)
Revolving Balances (=1)	-0.623***	-0.279**	-0.001	0.307***	0.336***	-0.263*
Male	-0.357***	-0.278**	-0.302***	-0.337***	-0.390***	-0.450***
Age						
Over 65 yrs	-0.080	-0.088	-0.475**	-0.378*	-0.448**	-0.908***
55-64 yrs						
45-54 yrs	-0.057	0.137	-0.060	-0.004	-0.191	-0.421*
35-44 yrs	0.261	0.095	-0.114	0.012	-0.192	-0.017
25-34 yrs	0.019	-0.078	-0.160	0.125	-0.208	0.009
18-24 yrs	-0.103	-0.363	-0.541*	-0.307	-0.518**	-0.177
Race						
Other	0.104	0.238	0.441*	-0.020	-0.038	0.456
Hispanic	-0.333	-0.790**	-0.183	-0.347	-0.673***	-0.332
White						
Asian	-0.586	-0.643*	-0.846***	-0.876***	-0.561**	-0.388
Black	-0.277	-0.756***	0.035	-0.043	-0.061	-0.162
Income						
>$150K	0.345	-0.095	-0.039	-0.275	-0.043	-0.158
$100-$149K	-0.753**	-0.447	-0.832***	-0.394*	-0.068	-0.747**
$60-$99K	-0.324*	-0.062	-0.201	-0.079	-0.049	-0.237
$40-$59K	-0.071	0.074	-0.061	0.039	0.203	-0.063
$20-$39K						
<$20K	-0.555**	-0.421*	-0.365*	-0.527***	-0.293	-0.283
Education						
Grad. School	-0.232	-0.307	-0.238	-0.379**	-0.284*	-0.184
College	-0.164	-0.194	-0.186	-0.046	0.038	0.070
Some College						
High School	0.252	0.209	0.023	-0.090	-0.278*	0.372*
Some HS	1.301***	0.893*	0.917**	0.968	0.191	1.167**
Add'l Cntrls						
Chk. Acct. Yrs.	0.001	-0.003	-0.015**	-0.002	-0.016**	-0.008
Cred. Rewards	-1.191***	-0.485***	-0.751***	-0.744***	-0.480***	-1.154***
Deb. Rewards	0.599***	0.266	0.708***	0.266*	0.594***	0.684***
Constant	-0.767***	-0.943***	-0.140	1.111***	0.398**	-0.943***
N	1722	1722	1722	1722	1722	1722
Pseudo R-Squared	0.073	0.042	0.055	0.057	0.045	0.068

Notes: Dependent variable =1 if individual responded positively for debit cards and negatively for credit cards; zero otherwise. Column 1 is *ease*, column 2 is *acceptability*, column 3 is *safety*, column 4 is *control*, column 5 is *budgeting*, and column 6 is *refunds*.
Level of significance: * $p<0.1$, ** $p<0.05$, *** $p<0.01$

Table 10: Proportion of Consumers with Credit and Debit Card Rewards

Variable	Total N = 1722	Non-Revolvers N = 964	Revolvers N = 758	p-value from t-test
Credit Card Rewards	.305	.303	.309	.796
Debit Card Rewards	.146	.122	.175	.002

Table 11: Proportion of Consumers with Payment Perceptions

Variable	Total N = 1880	Non-Revolvers N = 1073	Revolvers N = 807	p-value from t-test
Credit Card				
Easy	.740	.698	.796	.000
Acceptability	.580	.555	.612	.014
Safe	.398	.401	.395	.811
Control	.298	.324	.263	.004
Budget	.179	.207	.143	.000
Refund	.655	.625	.694	.002
Debit Card				
Easy	.723	.671	.792	.000
Acceptability	.506	.486	.533	.042
Safe	.482	.452	.523	.002
Control	.851	.829	.880	.002
Budget	.504	.473	.545	.002
Refund	.493	.451	.549	.000
Cash				
Easy	.894	.887	.902	.301
Acceptability	.765	.772	.757	.462
Safe	.552	.548	.558	.678
Control	.662	.646	.684	.083
Budget	.604	.594	.618	.279
Refund	.567	.562	.574	.611
Check				
Easy	.269	.259	.283	.257
Acceptability	.072	.075	.068	.595
Safe	.225	.22	.229	.703
Control	.384	.365	.409	.054
Budget	.303	.285	.326	.057
Refund	.171	.185	.152	.067

Appendix: Construction of Perceptions Variables

The SCPP asks respondents to fill in a grid below to indicate their perceptions of each payment instrument. The respondents can check as many cells as they want to show whether they agree with a given statement. The grid is introduced as follows:

Please select all the methods of payment for in-store purchases that you believe fit the following descriptions: (You may select more than one in each row.)

	Cash	Paper Check	Credit Card	Debit Card; enter PIN	Debit Card; sign receipt	Gift/ Prepaid Card
1) Is convenient						
2) Is easy to use						
3) Is preferred by stores/sales people						
4) Keeps my money/accounts safe						
5) Money leaves my account right away						
6) Helps me budget/spend within my means						
7) Gives me control over my money						
8) Is easy to get a refund for returned items/disputes						

It is not required that an individual respondent be a user of a particular instrument for him/her to register his/her perceptions. In order to develop the variables for each payment instrument we used the following mapping:

a) "Yes" for the first and second perceptions map into a dummy variable, *easy* to use.
b) "Yes" for the third perception maps into a dummy variable, widely *acceptable*.
c) "Yes" for the fourth perception maps into a dummy variable, *safe*.
d) "Yes" for the fifth and seventh perceptions map into a dummy variable, allowing *control* over money.
e) "Yes" for the sixth perception maps into a dummy variable, helping in *budgeting*.
f) "Yes" for the eighth perception maps into a dummy variable, easy to get *refunds*.