No. 2006/19

**Credit Cards:
Facts and Theories**

Carol C. Bertaut and Michael Halisassos

Center for Financial Studies

The *Center for Financial Studies* is a nonprofit research organization, supported by an association of more than 120 banks, insurance companies, industrial corporations and public institutions. Established in 1968 and closely affiliated with the University of Frankfurt, it provides a strong link between the financial community and academia.

The CFS Working Paper Series presents the result of scientific research on selected topics in the field of money, banking and finance. The authors were either participants in the Center´s Research Fellow Program or members of one of the Center´s Research Projects.

If you would like to know more about the *Center for Financial Studies*, please let us know of your interest.

Prof. Dr. Jan Pieter Krahnen   Prof. Volker Wieland, Ph.D.

CFS Working Paper No. 2006/19

Credit Cards:
Facts and Theories*

Carol C. Bertaut[1] and Michael Haliassos[2]

April 2005

Abstract:
We use data from several waves of the Survey of Consumer Finances to document credit and debit card ownership and use across US demographic groups. We then present recent theoretical and empirical contributions to the study of credit and debit card behavior. Utilization rates of credit lines and portfolios of card holders present several puzzles. Credit line increases initiated by banks lead households to restore previous utilization rates. High-interest credit card debt co-exists with substantial holdings of low-interest liquid assets and with accumulation of retirement assets. Although available evidence disputes ignorance of credit card terms by card holders, credit card rates do not respond to competition. There is a rising trend in bankruptcy and delinquency, partly attributable to an increased tendency of households to declare bankruptcy associated with reduced social stigma, ease of procedures, and financial incentives. Co-existence of credit card debt with retirement assets can be explained through self-control hyperbolic discounting. Strategic default motives contribute partly to observed co-existence of credit card debt with low-interest liquid assets. A framework of "accountant-shopper" households, in which a rational accountant tries to control an impulsive shopper, seems consistent with both types of co-existence and with observed utilization of credit lines.

JEL Classification: G11, E21

Keywords: Credit Cards, Debit Cards, Revolving Debt, Consumer Credit, Portfolios

1. Introduction

Access to consumer credit in the form of a credit card has grown rapidly to become one of the most frequently held financial instruments by households in the United States. Credit cards offer the convenience of cashless transactions and also allow for purchases over the telephone and, increasingly, via the internet. Credit cards also offer consumers the flexibility of deferring payment to a future date, and thus can allow consumers to smooth spending over temporary liquidity shortfalls. However, invoking a credit card's revolving credit option typically results in paying high rates of interest not only on the existing balance but also on any new charges made on the card as well, and thus is a fairly costly form of credit, especially if the revolving credit feature is used frequently.

This Paper documents features of credit card and debit card ownership and use, over time and across demographic groups in the U.S. population, using data from several waves of a high-quality and detailed survey of finances of U.S. households: the Federal Reserve Board's Survey of Consumer Finances (SCF). We consider household responses from the SCF to questions about access to and attitudes towards credit and debit cards and explore portfolios of households with and without credit card balances.

Our analysis of the data, presented in Sections 2-9, illustrates several puzzling features of credit card usage by US households. In Sections 10 and 11 we discuss recent theories of consumer behavior that may explain some of those puzzles. These include the choice to borrow at high rates of interest; the interplay between spending control problems, credit card borrowing, and personal bankruptcy filing; and the coexistence of credit card debt with considerable levels of liquid and retirement assets. We also explore the growing popularity of debit cards as either a supplement to or an alternative to credit card use. We offer concluding remarks in Section 12.

2. Card ownership over time

Our primary source of information on the spread of credit and debit card use among U.S. households is from several waves of the Survey of Consumer Finances. The SCF has been conducted triennially since 1983, and recent waves have each

consisted of about 3,000 households drawn from a standard representative sample, supplemented with about 1,500 high-wealth households selected on the basis of tax records. Sample weights are provided to make the data representative of the U.S. population as a whole. Each wave of the SCF provides detailed information on household-level holdings of a variety of financial assets as well as sources, terms, and uses of a wide range of consumer credit options, including credit cards. Data are also collected on household characteristics including age, education, family structure, race, and income. Finally, the SCF also asks a number of questions on attitudes towards consumer borrowing, reasons for saving, and investment decisions.[1]

In 1983, 65 percent of U.S. households had a credit card of some kind, including store-specific cards and gas cards (Table 1, column 1). Only 43 percent of households had a bank-type credit card such as a Visa or Mastercard (column 2); that is, a card that is accepted at a broad range of retail establishments, and after making a minimum required payment allows the consumer to revolve the balance if so desired. By 1992, 62 percent of the U.S. population had a bank-type credit card, and by 2001 that percentage had risen to almost 73. Over the same period, the percentage of households with any type of credit card increased much less, and in 2001 that percentage was 76 percent, only slightly higher than the percentage with a bank-type card. There has also been an increase in the number of bank-type credit cards owned per household: in 1983, households with a bank-type card typically held only one such type card. By 2001, one-third of card-holding households still had only one bank-type card, one-third had two, and about one-fourth had three or four. A little more than 7 percent had five or more.

Opening of credit card accounts, either for the first time or as accounts in addition to pre-existing ones, is much more common than other changes in household portfolios (e.g., those associated with stockholding). Another source of data, the January 2001 Consumer Survey on Credit Cards, shows that about 20 percent of bank-type credit card holders had obtained one or more new accounts during the previous year, and most of these were additional or replacement accounts. According to the survey, 41 percent of holders held three or more bank-type credit card accounts (Durkin, 2002). In the remainder of our discussion below, we focus our attention on bank-type credit cards.

3. Trends in card ownership by income, education, and age

Bank-type credit card ownership in the United States is strongly correlated with household income and with education, and this correlation has persisted over all waves of the SCF. However, the increase in bank-card ownership over the last two decades was especially pronounced at lower income and education levels, reflecting in part improvements in industry credit scoring techniques and risk analysis: in 1983, only 21 percent of households with less than a high school education and less than 23 percent of households with incomes between $10,000 and $25,000 owned a bank-type credit card.[2] By 2001, these percentages had doubled, to 42 percent and 54 percent, respectively. Table 1 reports card ownership, both for credit cards generally and for bank-type credit cards, for various demographic groups over time. Such tabulation is useful for describing ownership patterns across demographic groups, but not for identifying how each characteristic contributes to such ownership, controlling for other characteristics.

To help distinguish the relative importance of age, education, and income as well as other factors that contribute to the likelihood of credit card ownership, table 2 presents results of probit regressions of the probability of card ownership using the pooled sample of the 1983, 1992, 1995, 1998, and 2001 waves of the Surveys of Consumer Finances. Columns 1-3 list results from a model where the dependent variable is the 0-1 dummy variable capturing ownership of any type of credit card (including store and gas cards). Columns 4-6 list results for ownership of at least one bank-type credit card.

Higher levels of both education and income contribute significantly and importantly to the probability of ownership of either type of credit card, even controlling for other household characteristics. The difference between the coefficients on having a high school degree but no further education and having a college degree or higher[3] implies an effect about as large as the difference between an income between $10,000 and $24,999 (in 2001 $) and an income of at least $50,000; both these effects are about twice those of the difference in age from less than 35 to aged 50-65. As would be expected, a higher level of financial wealth also contributes positively to card ownership, although the relative contribution of this variable is less notable than that of increased income or education.

As these are reduced-form regressions, findings are the joint product of demand and supply considerations. On the demand side, education is likely to contribute to credit card ownership by increasing awareness of credit card instruments. Financial resources (both income and wealth) contribute in turn as scale variables determining the size of transactions, even though larger resources imply smaller needs for the borrowing feature of credit cards. Supply-side effects arise from the policy of credit card issuers to condition acceptance of applications on financial resources and to target specifically the more educated segments of the population.

Supply-side effects are likely to contribute to the findings on the race variable. Non-white or Hispanic households are found to be significantly less likely to own a credit card, even after controlling for education, income, and financial wealth, and even after including the measure of whether the household reports being liquidity constrained.[4] More limited targeting of credit cards to minorities by credit card issuers may be the main factor behind this result. On the demand side, if future prospects for minorities are worse than what is implied by included controls, then this would tend to discourage both current spending and assumption of debt that would be difficult to repay later on.

In both regressions, age is a significant factor in predicting card ownership. Even after controlling for income and wealth, households with a head aged 35-49 are less likely to own either type of credit card than are those with a head aged 50-65 (the omitted dummy variable), and households aged under 35 are even less likely to be card owners. More limited participation in young ages is likely to arise from supply-side constraints rather than from demand considerations, as young households are more likely to want to have access to credit lines than their middle-aged counterparts. Households with a head 75 years or older are also significantly less likely to be card owners; indeed, the coefficient for age 75 or more is more than twice that of the coefficient for households aged under 35. More limited transaction needs and less familiarity with credit cards are likely to combine with less generous offers of credit cards to the elderly to produce this result.

The regressions also include dummy variables for each of the survey years (with 2001 as the omitted dummy variable). The relative sizes of the coefficients on these dummy variables in the bank-type card regression indicate significant year effects consistent with the spread of bank-type card ownership over the nearly 20-year period from 1983 to 2001 that are not explained by changes in configuration of

already included household characteristics. The coefficients on the year dummies in the regression of the broader class of credit cards are smaller and generally are less significant, consistent with the less dramatic spread in ownership of any type of credit card.

By applying the estimated coefficients from the probit models to characteristics of various "typical" households, we can explore how the probability of card ownership has changed over time for these representative households. Such calculations suggest that in particular young households and those with less education benefited from increased availability of bank-type credit cards. For example, a single, non-white female aged less than 35 with high school education and "typical" income and financial assets for that age and education bracket has only a .32 estimated probability of owning a bank-type credit card in 1983. By 1992, that estimated probability rises to .67, and by 2001 the estimated probability is .74.[5] A typical young college-educated white male has a notably higher estimated probability of bank-type credit card ownership in 1983 (.60) and has a slightly smaller increase in the probability of card ownership by 2001 (to .91). For a middle-aged household, the rise in estimated probability of bank-type card ownership over time is less dramatic. For a 50-64 year old, married, college-educated household, the estimated probability of owning a bank-type card in 1983 is already .88; by 2001 the probability rises to .99.[6]

Similar calculations for a typical elderly household (age 75 or more) at various degrees of education also reveal a significant increase in the estimated probability of bank-type card ownership by 2001. However, especially for these older households, both year effects and cohort effects are present. For example, the typical married household aged 75 or more with some college education has an estimated probability of bank-type card ownership of .93 in 2001, an increase from .64 for elderly households in 1983. But the over-75 household in 2001 would likely have been aged 50-64 in 1983, and the estimated probability of bank-type card ownership for the household at that time would have been .73. Thus, the higher estimated ownership of elderly households by 2001 may largely reflect the continued ownership of households who had acquired cards when younger.

4. **Trends in debit card use**

In 2001, 38 percent of households without a credit card responded that buying

things on an instalment plan was a "bad idea" compared with 27 percent of card-owner households. Although credit cards may lead to spending control problems, debit cards— that is, cards that are linked to a specific account and when used, result in funds being withdrawn immediately—can provide the same benefits of cashless transactions with a form of self-control, as will be discussed below. Credit card ownership has grown rapidly between 1983 and 2001, but debit card use has grown even more rapidly and over a shorter time period. As of the 1992 SCF, less than 10 percent of U.S. households owned a debit card (Table 3, columns 2 and 6). By 1995, one-third of households reported using a debit card, and by 2001 close to half reported debit card use.[7] As debit cards have become more widespread, households that use debit cards but not credit cards appear increasingly willing to describe borrowing on credit as a "bad idea": in 1995, about 30 percent of households gave that response, and this fraction was about the same across credit card owners, debit card users, and non-card owners. By 2001, 40 percent of non-holders of credit cards who were debit card users gave the "bad idea" response, compared with 27 percent of credit card holders.

Table 4 presents results from a probit regression of the probability of debit card use from the pooled sample of the 1992, 1995, 1998, and 2001 Surveys of Consumer Finances.[8] In contrast to the results on credit card ownership, younger households are much more likely to use debit cards than are older households, as the coefficient on households under age 35 is positive and significantly larger than that for age 35-49, which in turn is also positive and significantly different from zero. This result is likely to reflect the known tendency of banks to issue debit cards to younger households who have not yet acquired the financial resources or established the credit history needed for issuance of a credit card.

Higher education is associated with an increased likelihood of debit card use, although households with a college degree are no more likely to use a debit card than those with only some college. Households with higher incomes are also significantly more likely to use debit cards, except for those with incomes over $100,000; these households are actually slightly less likely to use debit cards than are households with incomes between $50,000 and $99,999. Greater financial asset holdings are associated with a small but significant effect on debit card use.

Since education and financial resources tend to encourage provision of credit cards by issuers, these findings do not arise from lack of access to credit cards. Rather, they are likely to reflect a deliberate choice of more educated and well-to-do households to benefit from the ease of using debit cards for payments, as compared to using checks that are less widely acceptable. It is noteworthy that such tendency of using debit cards is observed, despite the fact that use of credit cards for payments but not for borrowing usually contributes extra benefits, such as points or floating opportunities. We return to such issues below. Among other demographics, particularly interesting is the finding that although nonwhite/Hispanic households are significantly less likely than white households to have a credit card, they are no less likely to use a debit card.

As with bank-type card ownership, the year dummies are significant, with relative sizes and signs consistent with the spread in debit card use. Performing the same calculations for various "typical" households as we did for credit cards illustrates the adoption of debit cards over the 1990s particularly by younger households, but also suggests that debit card use has not been universally or exclusively adopted by households who also are very likely to have access to a bank-type credit card. For the young, nonwhite, high-school educated female, the estimated probability of having a debit card in 1992 is .22, less than the likelihood of having a bank-type card in 1992. By 2001, the estimated probability of using a debit card is .65, a sizable increase but still somewhat below that of having a bank-type card. For the single white college-educated male, the estimated probability of using a debit card is .21 in 1992 and increases to .64 in 2001, remaining well below the probability of bank-type card ownership. For the 50-64 year old college-educated married household, the probability of using a debit card rises from .12 in 1992 and reaches only .50 in 2001.

5. Credit card use over time and across demographic groups

While the fraction of households with a bank-type card has increased, the SCF data indicate that the fraction of card holders who at any time revolve a credit card balance has changed relatively little over the past 20 years. In 1983, just over half of all bank-type credit card holders carried a balance on a card, after making the most

recent payment, and before incurring new charges (Table 1, column 5). By 1995, the percentage rose to 56, but it declined slightly in the next two surveys, to 53 percent by 2001. In all of the SCF waves, younger households are much more likely to carry a balance than are older households. In contrast to the inverse relation between level of education and card ownership, the relation between education and carrying a credit card balance, conditional on card ownership (except for college-educated households), is less pronounced,. Between 43 and 49 percent of card-owner households with a college degree revolve a credit card balance in each of the Survey years, generally about 15 percentage points less than households with either a high school degree or some college education.

The distribution of credit card revolvers by income shows a changing pattern over the SCF waves. In earlier waves, card-holder households who fell in the lowest income ranges were less likely to carry a credit card balance than were households in the next two income ranges. In 1998 and 2001, this relationship was reversed, and a larger fraction of low-income card-holders revolved credit than did middle-income card holders. These simple statistics do not allow us to identify the reasons for the increase in low-income credit revolvers, but one likely explanation is that low-income households who nonetheless qualified for credit cards in the earlier waves were older and consequently may have had less need to borrow. Nearly half of card-holder households with incomes under $10,000 in 1983 were over 65, and less than 20 percent were under 35. By 2001, this age pattern had reversed, as households over 65 accounted for less than 30 percent of low-income card-holders, while more than a third were under 35.

In all the SCF waves, a much smaller percentage of card-owner households with incomes over $100,000 than with lower incomes carried a credit card balance. These higher-income households may have had less need or incentive to revolve credit card debt, or may have had better access to other sources of borrowing, particularly through tax-advantaged home equity lines. Indeed, over 90 percent of high-income families in 2001 had home equity against which they could borrow, with the median amount equal to about $130,000.[9] Nonetheless, a significant portion of relatively high-income households revolve credit: more than one-third of households in that income range were credit revolvers in all survey years.

6. Repeated versus occasional credit revolvers

Because the SCF is a cross section sample for each survey year and not a panel, we cannot observe whether a card balance for a given household was a temporary event or whether that household had carried a balance in the previous months. However, we use self-reported information to help distinguish habitual revolvers from those whose card balance is temporary or accidental. In each of the survey waves, households with credit cards were asked whether they "always or almost always" paid off the card balance in full each month, they "sometimes" paid it off in full, or whether they "hardly ever" paid it off. The surveys also collect information on the new charges made on the bank-type card after payment of the last bill. We use these new charges data to get an idea of which households who do not carry a balance on their credit cards appear to actively use their cards.[10]

Table 1 shows the percentages in each survey year of households who had a bank-type credit card (column 2), those who had a card but had no balance on the card and incurred no new charges in the current month (column 3), those who had no balance but did incur new charges (column 4), and those who had a balance and hardly ever paid off the balance (column 6; the complementary percentage had a balance but claimed they usually or sometimes paid off the balance each month). Bearing in mind the difference in how these variables are constructed in the 1983 and later SCF waves, it nonetheless appears that the fraction of card holders who had a card but did not actively use it has declined over time, from about 18 percent of card-holders in 1983 to 10 percent in 1992 and between 7 and 8 percent subsequently.

In all survey waves, the largest percentages of card-holder households who do not use their cards are those who are over 65, have no more than a high school education, and generally are those with incomes under $25,000. It is possible that these households are passive cardholders who have been issued a card without actively seeking one. Alternatively, they may be concerned about their ability to control their spending, and prefer to consider the card for emergency use only. Additional information available only from the 1998 and 2001 Surveys indicates that households in this category were about twice as likely to have ever declared bankruptcy as card-holders who did not carry a balance but did record active card use, suggesting some role for concerns about over-spending and the social stigma of delinquency and bankruptcy.

10

A little less than 40 percent of card-holder households from the 1992-2001 waves had no outstanding balance on their credit card but did record new charges during the month (column 4). For the 1983 SCF, a comparable figure is 30 percent of cardholders who had no balance, but claimed they used their card "often" or "sometimes." These households appear to use their credit cards for ease of transactions and perhaps to benefit from the float offered by deferring payment until the credit card bill is due. According to the 2001 survey, 96 percent of these households report that they "always or almost always" pay off their balance in full each month. In all surveys, the percentages of card-holder households that fall into this category are largest for older households and those with a college degree and at least $100,000 in income: households that presumably have less need to borrow especially at high rates of interest, which are likely to face less income variability, and are more likely to have a sufficient buffer-stock of assets to tide them over income fluctuations. In 1998 and 2001, these households were also the least likely to have declared bankruptcy in the previous 10 years.

About a quarter of all card holders in 2001—and almost half of those who had a balance outstanding on their card—admitted to "hardly ever" paying off the balance each month (column 6). These fractions are relatively unchanged from earlier waves of the SCF. For the most part, this percentage is not much affected by age, education, or income, with the exception that households with incomes over $100,000 are less likely to fall into this category. The fact that this behavior cuts across many demographic and income groups suggests that frequent card revolvers may be motivated by factors other than simply a "need to borrow." One category of households that does seem to have increased slightly over time is cardholders who claim they "always or almost always" pay off the balance in full but nonetheless had a balance outstanding at the time of the survey: that percentage has drifted upwards from less than 10 percent of cardholders in 1992 (18 percent of those with a balance) to 12 percent in 2001 (22 percent of those with a balance). These households may be accidental revolvers who typically do pay off balances but for whatever reason carried a balance in the month preceding the survey.

Table 5 explores the relation between the percentage of U.S. households who have been denied credit by credit card ownership and card payment status. This "liquidity constrained" information is taken from a series of questions asked in the

SCF on whether the household, in the previous five years, had been turned down for credit or had not received as much credit as requested (and had not received the full credit amount on reapplying), or had not applied for credit because they thought they would be turned down. Roughly one-third of households without a bank-type credit card can be classified as "liquidity constrained" according to this definition. Interestingly, as the fraction of households with at least one bank-type credit card has grown, so has the fraction of these card-holder households that can be classified as "liquidity constrained": from 12 percent in 1983 to 17 percent in 2001.

For 1992-2001, we can further distinguish the type of credit for which the household was turned down; roughly one-third of card holders apparently had requested additional credit in the form of a credit card. Households with no balance on their card but with new charges are the least likely to be credit constrained; only about 6 percent are so classified for any type of credit, and about 4 percent for credit other than a credit card. Roughly one-third of the frequent credit card revolvers (those with a balance who hardly ever pay it off in full) can be classified as "liquidity constrained" but only one fifth identify the type of credit denied as other than for a credit card. In other words, about 80 percent of frequent card revolvers do not claim that they have been denied another form of credit. Although they do not appear to be revolving credit card debt by default, they may have decided that switching to lower cost forms of credit is too costly in terms of transactions or time costs, or they may be unaware that other sources of credit, possibly at more attractive terms, are available.

7. Credit card balances, utilization, interest rates

7.1. Median amounts charged

Table 6 shows the median card balance of households who revolve credit, by each survey year, and differentiating between households who claim to "almost always" or "sometimes" pay off the balance each month from those who admit that they "hardly ever" pay off the balance.[11] Households who usually revolve credit tend, not surprisingly, to have larger balances on their credit cards than do households who indicate only occasional credit card revolving. The median amount of credit card debt outstanding for occasional revolvers increased from about $700 in 1983 to over $1,150 in 1995, but has since declined slightly, to about $1,000 in 2001. The median

balance for credit revolvers has increased by more, and in recent years has been more than twice as large: it has grown from $1,244 in 1983 to $3,260 in 1998 and $2,800 in 2001.

Credit card balances of households that are occasional revolvers show less variation by age, education, and income than do the balances of households who usually revolve credit. Among households who usually carry a balance, the median credit card balance generally has been between $2,500 and $3,000 for households aged less than 65, but only about $1,500 for older households. Although Table 1 indicates that a smaller percentage of card-holding households with college education revolve credit card debt, those that do revolve their card debt tend to carry larger balances than do households with less education. The median balance for college educated usual revolvers has increased from about $3,000 in 1992 and 1995 to $4,775 in 1998 and $4,000 in 2001. By contrast, the median balance for a credit-revolving household with high school education generally has been between $2,000 and $2,500. Similarly, although a smaller percentage of higher-income households usually choose to revolve credit than do lower-income households, those that do typically carry larger balances than do households with lower incomes.

7.2.   Credit limits, utilization rates, and interest rates

To some extent, higher card balances of college-educated and higher-income credit revolvers reflects higher credit limits available to such households. Starting with the 1995 survey, data were collected on the total bank-type card limit—that is, the maximum amount that could be charged on the all bank-type credit cards owned by the household—as well as on the interest rate charged on the card with the highest balance (or the most frequently used card, if the balance on all cards was zero).

Table 6 indicates that credit limits are generally highest for households that have demonstrated that they can handle credit card accounts responsibly, and not necessarily those that have the greatest need to borrow. Credit limits tend to be highest for those that carry no balance but actively use their cards, or that carry a balance although they at least sometimes pay the balance in full. The median credit limit for these households ranges from $10,000 to $15,000, depending on the survey year. Households that either do not use their cards actively or usually revolve credit

typically have credit limits of under $10,000 and often closer to $7,500. Credit limits are typically larger for households aged between 35 and 64 than for households under 35, and are somewhat larger than for households over 65. Credit limits also tend to be higher for households with higher levels of education and higher income. Table 6 also indicates that between 1995 and 2001, the median card limit declined for younger households, for those with less than high school education, and for those with incomes below $10,000. Multiple factors are likely to have contributed to the decline in the median card limit, but in part it may reflect the increase in card ownership by these demographic groups. The typical lower-education or lower income household who nonetheless qualified for a bank-type credit card in 1995 may have had a somewhat higher credit rating than the typical such household in 2001.

Columns 8 and 12 show the median credit card utilization rates of households that revolve credit, constructed as the balance remaining on the card after the last payment plus any new charges made on the card over the current month, divided by the available credit limit.[12] Households who have a balance but at least sometimes pay it off had a median card utilization rate of 15 percent in 1995; the utilization rate was just under 20 percent in 1998 and then declined a bit to 17.5 percent in 2001.

Households that hardly ever pay off balances have considerably higher median utilization rates of almost 40 percent in 1995 and about 50 percent in 1998 and 2001. These higher utilization rates reflect both the higher card balances of this group as well as the somewhat lower card limits these households face. Nearly one-tenth of card holders and just under 20 percent of those who revolved credit in 2001 had a credit card utilization rate of 75 percent or more. A similar percentage of card users had high utilization rates in 1998, but only about half as many did in 1995. In all survey waves, these households were more likely to be young and to have less than college level education. Most high-utilization households "hardly ever" pay off their card balance. More than half of high-utilization households (and over 70 percent of young households) can be classified as "liquidity constrained," compared with less than 20 percent of households with lower utilization rates and 6 percent of card users without an outstanding balance. Although the cross-section nature of the SCF prevents us from investigating the relation between current high card utilization rates and future default or bankruptcy filings—a topic we consider in more detail in Section 10—high-utilization households do appear more likely to exhibit indicators of

14

financial difficulty: 18 percent of high-utilization households in 2001 indicated that in the previous year they had been two months or more behind in any type of loan payment, compared with only about 5 percent for all households.[13]

7.3. Average interest rates, new charges, and expenses of revolvers

Although low introductory or "teaser" interest rates of 1 to 5 percent can make the interest costs of carrying a balance on a credit card credit negligible, Table 6 indicates that most habitual credit card revolvers pay relatively high rates of interest.

For the typical household who sometimes paid off the balance in full, the median interest rate charged ranged from 13 to 14.8 percent, depending on the survey year. For households that usually revolve debt, the typical interest rate was 15 to 16 percent, implying an annual interest rate cost of about $400, if the balance during the survey month and new charges recorded are representative of the normal monthly balance and charges. In 2001, less than 4 percent of frequent revolvers had interest rates of 5 percent or less on the bank-type card with the largest balance; almost 19 percent faced interest rates above 20 percent.

8. Asset holdings by card payment patterns and demographic groups

In this section we explore asset holdings of card owners and credit revolvers to highlight the puzzles of simultaneous accumulation of assets with high-cost credit card debt. In all survey years, the highest levels of median liquid assets (defined as amounts held in checking accounts, savings accounts, money market deposit accounts, and call accounts at brokerages), median financial assets, and median total net worth are for those households that used their bank-type credit card to make new charges, but did not have a balance outstanding. This relative ranking holds for all survey years, and for virtually all demographic subgroups, and in fact has become more pronounced over time. In 2001 dollars, median financial assets of households in this category in 2001 were $125,000, more than double the financial assets of such households in 1983, and median net worth at nearly $320,000 was about 50 percent higher. This increase in wealth can be explained in large part by the rise in the equity market over the 1990s and increased ownership of equities by these households: in 1983, less than

half of households in this category were stockholders, but by 2001 that fraction was 75 percent.

The next highest median asset levels are held by those who have a card but did not use it to make new charges. On average, their median asset holdings are about one-third to one-half as large as those of active card users without a balance.

Households who have a balance but at least sometimes pay their balance off have asset levels a bit lower than those of card owners but non-users, indicating that these households are able to accumulate financial assets. Households that hardly ever pay the card balance off have notably lower wealth levels, with median wealth averaging about half as large as for "sometimes" revolvers, and about one-fifth as large as for those who use cards but do not carry a balance. In all survey years, households without bank-type credit cards have the lowest amount of assets. The decline in median net worth of these households between 1983 and 2001 reflects the previously noted spread of card ownership to households with lower incomes.

9. Coexistence of low-interest liquid assets and high-interest card debt

Gross and Souleles (2002a) point out that over 90 percent of households with credit card debt in the 1995 Survey of Consumer Finances have some very liquid assets in checking and savings accounts, which usually yield at most 1–2 percent. One-third of credit card borrowers have more than one month's worth of gross total household income in liquid assets. Such large holdings of low-interest liquid assets are difficult to explain on the basis of transaction needs, and arbitrage considerations would call for them to be used to pay down, if not completely pay off, high-interest credit card debt. [14]

In our tabulations here, we will take a more conservative stance that probably understates the puzzle. Tables 7 and 8 shows median card balances, liquid assets, financial assets, and net worth for all households and for those that carried a balance, differentiating between households that had liquid assets no larger than the credit card balance, and those that had liquid assets greater than the credit card balance (and at least $1,000 and at least half of total monthly income). Households that carry a credit card balance but appear to have more than enough liquid financial assets to pay off the balance in full are remarkably numerous. In 1995, 39 percent of credit card revolvers

16

fell into this category; about 45 percent can be so classified in 1998 and 2001. In all years, the typical household that was a high-liquid-asset revolver had an unpaid bank-type credit card balance of about $1,000, while median liquid assets were six to eight times larger. These households also have fairly substantial holdings of total financial assets and net worth. Although some of these households may be accidental credit revolvers in the survey month, the majority claims only to "sometimes" pay of the balance in full, and about one-third admit to "hardly ever" paying off their card balance.

These households could potentially have greater liquid asset needs than do other households, but this seems unlikely. In comparison with assets held by other survey households on Table 7, their liquid asset holdings appear somewhat larger than those who have a card but do not actively use it, but generally somewhat smaller than those of households that use cards but do not carry a balance. If the balance carried in the survey month is indicative of the balance carried throughout the year and the new charges recorded are indicative of the normal monthly charges, then the estimated annual interest cost paid by these households by not paying off the balance is on the order of $100 to $200.

10. Theories of credit card behavior

Before reviewing theories of credit card behavior, it is useful to examine whether puzzling observed tendencies can be attributed imply to ignorance or limited understanding of the terms and conditions of credit card accounts. If so, it should be possible to restore optimal behavior through better information.

10.1. Are households unaware of credit card terms?

Luckily, survey data make it possible to seek an answer to this question. In January 2000, the Credit Research Center sponsored a survey of nearly 500 households (representative of the forty eight contiguous US states) that investigated consumers' attitudes towards credit cards. A more recent such survey was conducted in 2001, and their main findings are reported in Durkin (2000 for the older Survey; 2002 for the newer). Durkin (2000) also contrasts them with findings from earlier Surveys of Consumer Finances in 1970 and 1977. We report Durkin's main findings

in this Section. Which terms of credit card agreements are regarded as important by consumers when opening a new or replacement card account? The January 2001 Survey found that cost items predominate, mainly annual percentage rates and finance charges, as indicated by responses of about two thirds of consumers. This percentage is not influenced by whether respondents did or did not possess a bank-type credit card. Three fifths of those without cards thought that these were the most important terms, compared to slightly more than half of cardholders. The latter assign higher importance than do non-holders to annual fees, fixed versus variable rates, and frequent flier miles.

Respondents in the 2000 Survey are "aware" of the annual percentage rates (APR's) charged on their revolving credit card debt. If we consider as "unaware" only those who state explicitly that they do not know the rate, then 91 percent of holders of bank-type credit cards are aware of their APR. If we also eliminate those who say that they know their rate but report too low an APR (i.e., an APR below 7.9 percent in 2000), then the proportion of aware holders falls to 85 percent.[15] Although awareness varies slightly across demographic groups, it exceeds 80 percent for all groups using either definition. Among groups with highest awareness of APR's were those with more than $1,500 in revolving debt and those reporting that they hardly ever pay off their balance in full. A major factor promoting awareness was the introduction of the Truth in Lending Act of 1969, which requires credit card companies to provide customers with written statements of credit costs, both at the opening of the account and on each monthly bill. After its introduction, awareness jumped from 27 percent of card holders to 63 percent in 1970 and to 71 percent in 1977.

Not only are holders of bank-type credit cards aware of the terms, but two thirds of them report that information about credit terms is easy to obtain; only 7 percent think that it is very difficult. Despite such responses, slightly less than half of bank-type card holders in 2000 agree that card issuers give holders enough information to enable them to use their credit cards wisely. Part of the additional information the rest ask for is already provided on the statements.

Interestingly, but perhaps not surprisingly, households are much more willing to declare negative attitudes regarding the use of credit cards made by others than by themselves. Holders of bank-type credit cards declared in 2000 that "other consumers" are confused about credit card practices, but approximately ninety percent

of them declare satisfaction with their own card companies, and say that it is easy to get another card if they are not treated fairly. In the 2001 Survey, two thirds respond that useful information on credit terms was very easy or somewhat easy to obtain for themselves, but fewer than half say so for others. The same percentages apply also to the question of whether credit card companies provided sufficient information to use credit cards wisely. All in all, these findings suggest that credit card holders are well informed about the terms they face, especially if they revolve credit card debt, though they do not give much credit to their card issuers for providing the information and they have little faith that others are equally well informed.

10.2. Stickiness of credit card interest rates

In his seminal 1991 paper, Ausubel documents considerable stickiness of credit card rates despite extensive competition in the credit card market. This is all the more puzzling in view of the evidence presented above that credit card holders are generally aware of annual percentage rates, and they consider them very important. He points to the low concentration and considerable breadth of the industry, its freedom from interstate banking and branch banking restrictions, the nonresponsiveness of interest rates to fluctuations in the cost of funds to the banks, and to his finding that returns from the credit card business were several times higher than the ordinary rate of return in banking during the period he examines (1983-1988).[16] Ausubel considers search and switch costs that can make it difficult for consumers to move to different, lower-cost providers of credit cards.[17] He bases his adverse-selection theory on a class of consumers who do not intend to revolve credit card debt but find themselves doing so; and on another class of consumers that fully intend to borrow but are bad credit risks. In such a world, good customers exhibit some irrationality and are not particularly responsive to lower interest rates. Banks, on the other hand, do not want to lower interest rates, fearing that they will draw disproportionate numbers of bad risks. Thus, interest rates end up being sticky.[18]

Brito and Hartley (1995) argue that observed revolving of credit card debt need not be attributed to consumer irrationality, but to the ease of borrowing on the credit card compared to transactions costs involved in other types of loans. They construct a model in which relatively small costs of arranging for other types of loans

can induce rational individuals to borrow on high-interest credit cards. Calem and Mester (1995) use data from the 1989 Survey of Consumer Finances to test for the presence of search and switch costs. Controlling for demand and for access to credit, they find that the level of credit card debt is greater among consumers who tend not to shop around for the best terms on loans or deposits. This tendency not to shop around can be attributed perhaps to an irrational belief that debt revolving is likely to be temporary, but it can also arise simply from higher search costs.

Calem and Mester also find that households with higher outstanding balances are more likely to be denied credit and to have experienced payment problems. Thus, customers with high balances face greater costs of switching to a provider that offers more attractive credit terms, because providers are likely to interpret their high balances as a signal of lack of creditworthiness. There may also be good credit risks who have been granted privileges by their existing credit card providers, such as large credit lines, and who therefore face switch costs of a different kind. More recent studies corroborate the view that the size of credit card debt influences the probability of declaring bankruptcy or delinquency. Domowitz and Sartain (1999) find that households with more credit card debt are more likely to file for bankruptcy. Gross and Souleles (2002b), who do not use survey data but an administrative set of credit card accounts, find that, even after controlling for account credit scores used by the credit card companies, accounts with larger balances and purchases, or smaller payments, are more likely to default.

Based on these findings, credit card issuers would be justified to regard high balances and purchases as bad signals, even after taking credit scores into account, despite the potential to earn more on consumers revolving large amounts of debt.[19] In the presence of search or switch costs, issuers would find that lowering interest rates does not attract many consumers who revolve credit card debt but are good credit risks, and this could contribute to stickiness of interest rates. Clearly, understanding the reasons and motives underlying bankruptcy and delinquency is central to understanding credit card behavior. It is to this that we now turn.

10.3. Bankruptcy, delinquency, and strategic default

In the late 1990s, there has been a dramatic increase in the number of personal

bankruptcy filings in the United States, as well as in delinquency rates on credit cards. The former rose by about 75 percent, and the latter almost as sharply (Federal Reserve

Bank of Cleveland, 1998). Personal bankruptcy filings rose from 0.3 percent of households per year in 1984 to around 1.35 percent in 1998 and 1999, while lenders lost about $39 billion in 1998 because of personal bankruptcy filings (Fay, Hurst, White, 2002). In this Section, we first examine this phenomenon in some detail and we then ask whether strategic default motives could justify observed portfolio behavior of debt revolvers.

10.3.1. Bankruptcy and delinquency in credit cards

An important question is whether the recent increase in bankruptcy and delinquency rates signals an increased tendency of households to engage in such activities, controlling for their characteristics, economic conditions, and factors governing credit supply; or whether it simply reflects a worsening of the risk pool due to extension of credit to less credit-worthy individuals. Gross and Souleles (2002b) provide an in-depth study of this issue, using an administrative panel of thousands of individual credit card accounts from several different card issuers.[20] One of the major advantages of this data set is that it includes thousands of observations of low-probability events such as bankruptcy and delinquency, and it encompasses data observed by credit card issuers. The latter feature allows the authors to control for changes in credit supply and risk composition that were observable by the issuers, including increases in credit lines.

The authors find some role for lower credit scores, larger balances and purchases, smaller payments, unemployment, weak house prices, and lack of health insurance in accounting for higher bankruptcy or delinquency rates, but only for a small part of the observed change in the late 1990s. Somewhat surprisingly, increases in credit lines were not found to contribute to the phenomenon of default, suggesting that these were extended to less risky accounts. Even controlling for all of these factors, the propensity to default increased significantly between 1995 and 1997.[21] Interestingly, the size of the increase in propensity to default goes up with the number of people in one's state who have previously filed for bankruptcy.

Fay, Hurst, and White (2002) use retrospective questions on bankruptcy contained in the 1996 PSID and also find that, controlling for state and time fixed effects, households are more likely to file for bankruptcy if they live in districts with higher aggregate filing rates. In addition to social stigma, they cite evidence reported in Braucher (1993) and in Sullivan et al. (1989) that the administration and practice of bankruptcy law by lawyers and judges varies across bankruptcy districts, in a way that can create differential incentives to file for bankruptcy across districts. Such findings are consistent with a role for increased acceptability and ease of filing in determining the incidence of bankruptcy, though it is difficult to make the case conclusive. Fay et al. find little support for the idea that households file for bankruptcy when adverse events reduce their ability to repay.[22] Instead, they find that households are more likely to file when bankruptcy yields higher financial benefits: the authors find that the value of the debt discharged in bankruptcy, but not the value of non-exempt assets, plays a significant role in bankruptcy decision.[23] Fay et al. interpret their findings as evidence in favor of strategic behavior in bankruptcy filings, but perhaps a safer conclusion is that bankruptcy law provisions can encourage bankruptcy, controlling for the overall situation of the household. It should also be noted that the findings here, unlike those of Gross and Souleles (2002b), are subject to limitations imposed by the small number of bankruptcy observations in a survey representative of the entire population.

More recently, Dunn and Kim (2004) utilize Ohio data in the late 1990s from the Ohio Survey Research Center.[24] When the number of missed minimum credit card payments in the last six months is regressed on household financial and socio-economic variables, three financial variables have a significant positive effect: the ratio of the total amount of required minimum payments on credit cards to household income; the number of credit cards on which the consumer has exhausted the credit limit; and the credit card utilization rate, measured as a percentage of the sum total of credit lines available to the consumer. Interestingly, education, income, and homeownership status are not found to influence default in the presence of these three financial variables. Such findings seem to provide support to the notion that ability to repay is an important factor behind delinquencies. The sample is then divided into "convenience users" who pay off the balance each month, borrowers with no default history, and borrowers with default history. Using tabulations, the authors find that the

number of credit cards held increases on average from 2.5 to 4.6 as we move from convenience users to default borrowers, while the total credit line per card halves, from about $10,000 to about $5,000. The sum total of credit lines also drops from about $21,000 to about $18,000. Although no conclusive case can be made yet, these tabulations are consistent with "Ponzi scheme" practices of obtaining additional cards with small credit lines in order to pay off old credit card debt.

The overall conclusion from findings on bankruptcy is that this phenomenon has recently become more frequent, mostly for demand reasons and much less because of a worsening of the risk pool or increased readiness of credit card companies to provide larger credit lines. Households seem to be encouraged to declare bankruptcy by existing financial incentives for doing so, as well as by the prevalence of bankruptcies and by the ease with which bankruptcies are handled by judges and lawyers in their geographical localities. Evidence that default occurs also because of difficulties in meeting minimum payments and in borrowing additional funds is less clear, but need for funds cannot be ruled out as a source of household bankruptcy, especially in view of the role it seems to be playing in delinquencies.

10.3.2. Strategic default as an explanation for debt revolving

The widespread co-existence of credit card debt with substantial liquid assets in Survey of Consumer Finances data could derive, at least for some households, from strategic bankruptcy motives. If a household holds liquid assets and declares bankruptcy, it can take advantage of bankruptcy law provisions that exempt some assets from seizure, up to an exemption level. Thus, households who plan to declare bankruptcy have no incentive to pay off credit card debt with liquid assets. As pointed out by Lehnert and Maki (2001), a household can discharge a large part of unsecured debt based on chapter 7 bankruptcy laws, and may convert liquid assets to a bankruptcy-exempt asset category in its state of residence, like housing for example. Lopes (2003) calibrates and solves a life-cycle model with uncollateralized borrowing and default, and finds that some consumers borrow with the intention of defaulting in the near future. Education matters for the incidence of default, because it affects the slope and level of the earnings profile, and hence the value attached to the loss of credit availability and stigma associated with bankruptcy in the model. Because of

the exemption limit, savings can co-exist with borrowing. Average simulated savings for those who borrow are higher in cases where the probability of default is higher (e.g., they monotonically drop with education).

As to empirical evidence, Lehnert and Maki find in Consumer Expenditure Survey data that households living in states with high bankruptcy exemption levels are 1 to 4.5 percentage points more likely to have both liquid assets and total unsecured debt in excess of a threshold ranging between $2,000 and $5,000 (in 1996 dollars). Lopes regresses liquid financial wealth for debt revolvers on exemption level for the household's region and on demographics, and finds a positive and significant coefficient on exemption level in the 1998 SCF. There is also evidence that links bankruptcy law, and its application, to the incidence of default. Fay et al. (2002) found that state fixed effects are significant for the incidence of default. Indeed, they found that, even after controlling for state fixed effects, households are more likely to file for bankruptcy if they live in a district with higher aggregate bankruptcy rates, or with more lawyers per capita. Gross and Souleles (2002b) similarly found evidence that the tendency to declare bankruptcy is greater for households living in states with greater numbers of people who have previously declared bankruptcy.

While a strategic bankruptcy motive can explain the behavior of some households, it is hard to believe that it does so for the majority of households with substantial liquid assets. For one thing, the phenomenon of portfolio co-existence seems too widespread relative to the still limited incidence of bankruptcies in the population. To suggest that all of these households, across all demographic groups, are motivated in their behavior by strategic bankruptcy motives even though a miniscule portion of them actually default, and some of them not even strategically, seems unwarranted. Moreover, as pointed out by Gross and Souleles (2002a), even if strategic default motives were so widespread, strategic defaulters do not need to pay the interest costs of revolving high-rate balances and holding low-rate assets before they declare bankruptcy. They should instead run up their debts and buy exempt assets right before filing.

10.4. Debt levels and utilization rates of credit lines

Gross and Souleles (2002a) use the same proprietary administrative data set of

individual credit card accounts from different card issuers described above to estimate responses of credit card debt levels and utilization rates of credit lines to exogenous increases in credit lines and to changes in interest rates. By exogenous increases, they mean credit line increases initiated by the credit card providers themselves, and not by card holders.[25] They find that, over the year following an exogenous line increase, each extra $1,000 of liquidity (i.e. credit line) generates on average a $130 increase in credit card debt. Thus, liquidity matters, unlike what is implied by standard permanent income models. Estimates of this "Marginal Propensity to Consume" (MPC) are significantly larger for accounts exhibiting greater utilization of credit lines, rising to about 50 percent for accounts with more than 90 percent utilization. The average long run elasticity of debt to the interest rate on the account is estimated to be approximately -1.3, with less than half of this representing balance-shifting across credit cards. The elasticity is larger than average for interest rate declines, providing a possible justification for the popularity of low introductory ("teaser") interest rates. It is also smaller among accounts with high utilization rates than among those with utilization rates between 50 and 90 percent. The authors uncover a remarkable response of credit card utilization rates to increases in credit lines initiated by banks. Regardless of the credit line utilization rate, the long-run cumulative response of utilization rates to an exogenous line increase is quite small, implying a return of utilization near to its initial level in about five months following the line increase. Although such behavior would be easier to understand had households themselves requested the line increase, it is less straightforward to interpret given that the initiative came from the banks themselves.

As the authors suggest, such behavior can be justified in the context of buffer stock models of asset accumulation. In such models, households face nondiversifiable income risk and choose, as a result, to hold a precautionary buffer of assets so as to be able to shield future consumption levels from shocks to their financial resources.[26] The same logic applies to available credit lines. Although these are not assets per se, they perform a similar function as a means to maintain consumption in the face of income shocks. Thus, households facing income uncertainty choose not to utilize their credit lines fully, but to leave a portion unused, adopting target utilization rates for credit cards.

10.5. Self-control explanations of credit card debt

Alternative explanations of portfolio behavior by credit card holders depart from the standard framework by incorporating self-control problems. These models are part of a much broader literature based on Psychology and Marketing insights (for an excellent overview, see Shane et al., 2002). Existing approaches differ, but all assume that the separation of consumption from payment made possible by credit leads to excessive expenditures, and that moderating these tendencies is possible, if costly, through the coexistence of revolving credit card debt and low-interest liquid assets and/or retirement. The types of co-existence that can be justified and the technical complications in solving such models depend crucially on the specific framework, as will be seen below.

10.5.1. Impulsive behavior and costly self control

The idea that self-control matters for credit card behavior is not foreign to either the general public or to professionals in Psychology and in Marketing. Durkin (2000) reports that public opinion regarding credit cards seems more polarized in 2000 than in 1970, with the majority (51 percent) of all families declaring in 2000 that use of credit cards is "bad". Among credit card holders, such negative attitudes are more prevalent among those who typically revolve credit card debt.

Households are much more willing to declare negative attitudes regarding the use of credit cards made by others than by themselves. Durkin (2001) reports that holders of bank-type credit cards declared in 2000 that too much credit is available, and that "others" have difficulty getting out of credit card debt, while ninety percent of them recognized that overspending is the fault of "other consumers" and not of credit card companies. In the 2001 Survey of Consumers, only ten percent of banktype credit card holders responded that credit cards made managing finances more difficult for them, citing overspending and overextending financial resources as the main reasons. However, forty percent felt that managing finances was made more difficult for "others", mainly because of overspending, too much debt, and a continuing cycle of debt (Durkin, 2002).

Among researchers in marketing and in consumer psychology, self-control problems are known to occur when the benefits of consumption come earlier than the

costs (Hoch and Loewenstein, 1991). Credit cards do separate purchases and payments, and there is evidence that liquidity, of the type provided by the acceptability of credit cards, both makes it more likely that the consumer will buy a given item, and increases the amount that the consumer is willing to pay for the item conditional on purchase (see Shefrin and Thaler, 1988; Prelec and Simester, 2001; Wertenbroch, 2003). Indeed, this may be a reason why sellers accept credit card payments despite the service charges this entails.

Imposing self-control is possible, if costly, and there is ample anecdotal evidence on precommitment and self-rationing strategies (see, for example, Hoch and Loewenstein, 1991; Schelling, 1992; Thaler and Shefrin, 1981, and Wertenbroch, 2003). A telling example refers to deadlines that various people, including academics, impose on themselves to avoid procrastination even when missing them entails substantial costs (Thaler, 1980; Ariely and Wertenbroch, 2002). Another one refers to smokers who prefer to purchase small and more expensive packs of cigarettes rather than cartons, so as to discourage themselves from smoking too much. Ausubel (1991)

cites the anecdotal example of card holders who immerse their credit cards in trays of water and place them in the freezer, in an effort to avoid impulsive purchases.

Unfortunately, serious self-control problems are difficult to observe under controlled conditions, and therefore controlled empirical evidence on self-rationing is only now beginning to emerge (see, Wertenbroch, 1998; Soman and Cheema, 2002). Finally, while it is obviously awkward to ask survey participants directly whether they have self-control problems, some survey questions hint at impulsive behavior and other such problems. For example, respondents are sometimes asked whether they find it difficult to plan ahead, or to control their purchases, or whether they smoke, or whether they find it acceptable to borrow in order to buy frivolous luxury items. Still, such variables are not many and their interpretation is not always straightforward.

10.5.2. Hyperbolic discounting and time inconsistency

Laibson, Repetto and Tobacman (2003) study the co-existence of revolving credit card debt with substantial accumulation of assets for retirement in a calibrated model of a household with access to liquid and illiquid assets, and to borrowing through credit cards.[27] They show that a single rate of time preference cannot

simultaneously match the level of accumulated assets upon transition to retirement and the observed level of revolving credit card debt at younger ages. Households appear to act impatiently with respect to short-term objectives facilitated by credit card borrowing, and much more patiently with respect to longer-term objectives regarding retirement planning. The authors propose hyperbolic discounting, under which the household should no longer be thought as a single entity, but as a sequence of temporally separated "selves" with possibly conflicting plans regarding future actions. When viewing two successive periods in the distant future, the two selves discount the second relative to the first differently. The current self is more patient with respect to longer run objectives than he is with respect to current objectives, and also more patient than what he knows his future self will be close to the relevant date. The current self tries to "tie the hands" of future selves and to force them to accumulate more than what they are likely to do on their own. The instrument of self-control is irreversible investment in illiquid assets. The current self simultaneously borrows on the credit card to satisfy short-term objectives, and accumulates illiquid assets that the future self cannot liquidate to ensure that the household will have enough assets at retirement. Hence the observed co-existence of credit card debt and accumulation of retirement assets.

As recognized by the authors, this elegant model of temporally separated selves cannot also account for the observed co-existence of high-interest credit card debt and low-interest liquid assets. Specifically, the model does not imply that the current self should ignore arbitrage opportunities regarding current assets and debts. We now turn to a different model that incorporates self-control considerations between contemporaneous selves.

10.5.3. Accountant-shopper households

Bertaut and Haliassos (2002) propose an "accountant-shopper" model that can account for co-existence of high-interest credit card debt with substantial holdings of low-interest liquid assets. Haliassos and Reiter (2005) develop the underlying computational model of accountant and shopper interaction and show that the model can also account for observed co-existence of credit card debt with considerable accumulation of retirement assets, as well as for target utilization rates of credit card

lines found by Gross and Souleles (2002a) and discussed above. This framework splits each household into two units, which can either represent two distinct partners or two selves. In the case of a single person, it is a model of self-control, while in the other case it should be thought of as a model of "partner-control". In either case, it is a model of contemporaneous self-control, unlike hyperbolic discounting in which the current self builds up illiquid retirement assets to control future selves. The accountant decides the size of payment into the credit card account each month, as well as the overall household portfolio. The accountant is assumed to be fully rational and to solve a standard intertemporal expected utility maximization problem, taking into account all available information, the full implications of current actions for future outcomes, as well as the behavior of the shopper. The shopper goes to stores, with credit card in hand, and determines household consumption. The shopper's self-control problem is manifested in greater impatience compared to the accountant and in more limited understanding of the process governing future payments into the credit card account, which are ultimately influenced by the evolution of household assets and debts. Faced with uncertainty about future payments, the shopper typically refrains from exhausting the entire credit card line but maintains a buffer, consistent with the Gross and Souleles (2002a) empirical finding of target utilization rates. Even under shopper behavior that is fully predictable by the accountant, it is optimal for the accountant to leave part of the credit card balance unpaid so as to restrain the shopper. In equilibrium, the accountant brings about the desired consumption level but pays the interest cost of self-control, namely the cost of not using low-interest assets to pay off high-interest debt.[28]

Since credit card debt is used as an instrument of self-control in addition to its traditional role of smoothing resources intertemporally, revolving debt does not conflict with holdings of either low-interest assets or retirement assets. Both types of assets are held for the usual precautionary and smoothing reasons associated with intertemporal maximization under uncertainty. Had the accountant decided to use some of these assets to lower the credit card balance, the shopper would have responded by charging more on the credit card, frustrating the accountant's attempt. Finally, although the model does not invoke hyperbolic discounting and control of temporally separated selves to justify portfolio co-existence, it seems flexible enough to be combined with intertemporal self-control considerations, if this is desired.

11. The choice between debit and credit cards

As we saw in the data Section , debit cards are a more recent medium than credit cards, but their use is spreading fast, and they are overtaking credit cards as the most prevalent form of electronic payment at the point of sale. Part of the usual motivation for debit cards is that they limit the potential for overspending associated with credit cards. Debit card transactions can either be made online, using a PIN, or off-line using a signature and a process very similar to credit cards. Off-line debit transactions have been aided by the Visa and Mastercard logo, and it is not an exaggeration that debit and credit cards enjoy comparable levels of acceptability today. Use of debit cards is not allowed only for items such as car rentals and some on-line purchases over the internet. Moreover, debit and credit cards now offer essentially identical fraud protection (see also Zinman, 2004). A major advantage of debit cards is that they do not allow over-borrowing, as funds are immediately withdrawn from the account linked to the debit card (or withdrawn within three days in the case of off-line purchases). Debit cards appear to be a natural way of solving self-control problems of relatively impatient and impulsive shoppers. It seems possible to impose discipline on a shopper by replacing the credit card with a debit card and limiting the funds available in the linked account. Indeed, observed usage of debit cards seems to reinforce this idea.[29]

Still, use of debit cards is not a costless way of coping with a self-control problem. Debit card users forego the free-float offered by credit cards, since funds are (almost) immediately withdrawn from the linked account. Interest costs are not limited to those implied by absence of free floating, but also include the cost of keeping available balances in low-interest linked checking accounts, instead of in higher-rate accounts and withdrawing funds only to cover the monthly payment on a credit card. This process can be quite complicated, especially if the debit card holder is not flush with liquid financial resources and tries to avoid overdraft costs and penalties associated with the linked account. Very often, credit card issuers offer additional rewards to credit card users but not to debit card users, such as frequent flier miles and other bonuses. Thus, using debit cards as instruments of self control is costly, although probably less so than revolving credit card debt to reduce the available credit line.[30]

Zinman (2004) questions the usual motivation for use of credit cards based on self-control considerations. He investigates whether choice of debit versus credit cards at the point of sale is in fact consistent with the relative cost of charging an extra dollar to the credit card relative to paying with the debit card. A key factor determining such relative costs is whether the consumer already revolves credit card debt, in which case new purchases cannot benefit from the grace period and are thus subject to high interest rates.

Zinman formulates three testable hypotheses generated by a "canonical" model of consumer choice without self-control considerations. First, credit card debt revolvers should be more likely to use debit than those who do not, as they cannot take advantage of the grace period for new purchases. Second, revolvers who face binding credit constraints should be more likely to use debit than credit, e.g. because they are likely to be close to full utilization of the credit card line. Third, non-revolving bank card holders should be less likely to use debit than those without bankcards. The main rationale for this third prediction is increased likelihood that card holders will want to take advantage of the free float. Using data from the 2001 and other Surveys of Consumer Finances, Zinman finds economically and statistically significant effects on debit use of revolving status and of credit limit constraints in particular, supporting mainly the first two predictions of the canonical model.

However, these results and some stylized facts about debit card use may also be consistent with behavioral models. For example, results also seem consistent with the accountant-shopper model described above. Since credit card debt is revolved mainly as an instrument of self-control in that model, debt revolvers are more likely to exhibit self-control problems and to use debit cards as an additional measure to discipline impulsive shoppers. The same holds a fortiori for those with nearly binding credit card limits. To the extent that these arise from a desire to limit the resources available to the shopper, they will also be associated with a greater likelihood of encouraging the shopper to use a debit card for purchases.

Zinman illustrates problems of distinguishing between standard and behavioral explanations of debit card use using the Prelec and Loewenstein (1998) model of mental accounting. In that model, the act of paying produces cognitive transactions costs and incentives to decouple payments from consumption. The optimal decoupling strategy tends to favor delayed payment for durables, but prepayment for

instantaneous consumption. Credit cards serve as a decoupling device, because they delay payment and they also lump payments together. If there are convexities over losses associated with each distinct payment, both features attenuate "payment pain". Debit provides relatively instantaneous payment and thus less decoupling than credit. This additional decoupling motive in credit versus debit card use could rationalize, for example, the finding of Reda (2003) that debit cards tend to be used for smaller transactions involving instantaneous consumption, while credit cards are used for larger transactions of more durable items.

While it may be difficult to distinguish between traditional and behavioral models of credit versus debit card use by using solely data on choices at the point of sale, distinctions can be facilitated by reference to portfolios of credit card debt revolvers. Traditional models fail to explain co-existence of high-interest credit card debt with often substantial holdings of low-interest liquid assets. The existence of such "arbitrage" opportunities goes against the logic of models that stress rational calculation of interest and other transactions costs: if consumers are so careful about comparing costs of using debit versus credit for each purchase, how do they miss the interest cost of not paying off their outstanding balances? And if debit card use is motivated by nearly binding credit card limits, how is it optimal to keep enough money in the low-interest linked account to finance purchases rather than using these funds to make more of the credit line available to the shopper and to take advantage of points, miles and other advantages of credit card purchases? All in all, it seems that the shortcomings of standard models become apparent when these models are confronted with portfolios of credit card revolvers rather than simply with the payment margin between credit and debit cards.

12. Concluding remarks

This paper documented trends in credit card and debit card access and usage in the United States using data from successive waves of the Survey of Consumer Finances between 1983 and 2001. We documented the spread of access and usage of such cards, examined trends exhibited by different demographic groups, and studied the widespread practice of revolving high-interest credit card debt. The general picture is one of spreading access and usage, but of a fairly stable proportion of bank

card holders who revolve credit card debt. Debt revolvers tend to exhibit partial utilization of credit card lines, and they often combine credit card debt with substantial holdings of low-interest liquid assets and with accumulation of retirement assets.

We then presented an overview of some of the most important recent theoretical and empirical contributions to the study of credit and debit card behavior. Drawing on recent research, we dismissed the possibility that there is widespread ignorance among credit card holders of the terms governing their credit cards, including annual percentage rates. Despite lack of ignorance, there is considerable evidence that credit card interest rates do not respond to competition in the credit card market. This arises because consumers tend to be unresponsive to changes in interest rates, probably as a result of search and switching cost.

There is a rising trend in bankruptcy and delinquency in credit cards, partly attributable to an increased tendency of households to declare bankruptcy, controlling for the quality of the card holder pool and for supply-side factors. To the extent that bankruptcy is now more widespread, and presumably more socially acceptable, it can influence portfolio behavior. Strategic default motives may contribute to the observed co-existence of credit card debt with low-interest liquid assets, though we doubt that this mechanism alone is sufficient to account for the widespread incidence of the phenomenon. Recent research on the determinants of the level of credit card debt and of the extent of utilization of credit lines has found that credit line increases initiated by banks themselves do contribute to increases in the amount of debt revolved, such that credit line utilization returns in about 5 months or so to its rate prior to the line increase. Credit card debt revolvers appear to have target utilization rates of their credit lines, and it is possible to justify such "buffer-stock" behavior in the context of modern computational models of credit card behavior.

Credit and debit cards provide a natural means of testing the relevance of emerging self-control models of consumer preferences. A considerable fraction of card holders believe that credit cards create problems of self-control, mainly because of the probability of overspending, at least by others if not by themselves. Debit cards are widely regarded as instruments for self-control that reduce this possibility. Although the choice of debit versus credit cards at the point of sale can be largely justified by the relative costs of these two modes of transacting, portfolio co-existence

of credit card debt with liquid and with retirement assets seems to require departures from the standard framework. Hyperbolic discounting has been shown to account for the first type of co-existence. An alternative framework of "accountant-shopper" households, in which a fully rational accountant tries to control an impulsive shopper, has been shown to be consistent with both types of co-existence and with buffer-stock utilization behavior.

Based on this survey of facts and of existing literature, we are led to the conclusion that credit cards provide a most fertile ground for analyzing consumption behavior, payment and repayment choice (including bankruptcy and delinquency), portfolio selection regarding both assets and debts, and the elusive nature of consumer preferences.

References

Ariely, Dan and Klaus Wertenbroch (2002). "Procrastination, Deadlines, and Performance: Self-Control by Precommitment", *Psychological Science*, 13, 219-24.

Ausubel, Lawrence (1991). "The Failure of Competition in the Credit Card Market", *American Economic Review*, 81, 50-81.

Aizcorbe, Ana M., Arthur B. Kennickell, and Kevin B. Moore (2003). "Recent Changes in U.S. Family Finances: Evidence from the 1998 and 2001 Survey of Consumer Finances", *Federal Reserve Bulletin*, January 2003, 1-32.

Bertaut, Carol C. and Michael Haliassos (2002). "Debt Revolvers for Self-Control", mimeo.

Braucher, Jean (1993). "Lawyers and Consumer Bankruptcy: One Code, Many Cultures", *American Bankruptcy Law Journal*, 67, 501-83.

Brito, Dagobert L. and Peter R. Hartley (1995). "Consumer Rationality and Credit Cards", *Journal of Political Economy*, 103, 400-33.

Calem, Paul S. and Loretta J. Mester (1995). "Consumer Behavior and the Stickiness of Credit-Card Interest Rates", *American Economic Review*, 85, 1327-36.

Domowitz, Ian and R. Sartain (1999). "Determinants of the Consumer Bankruptcy Decision", *Journal of Finance*, 54, 403-20.

Dunn, Lucia F. and Tae-Hyung Kim (2004). "An Empirical Investigation of Credit Card Default: Ponzi Schemes and Other Behaviors", Ohio State University Working Paper.

Durkin, Thomas (2000). "Credit Cards: Use and Consumer Attitudes, 1970-2000", *Federal Reserve Bulletin*, September, 623-34.

Durkin, Thomas (2002). "Consumers and Credit Disclosures: Credit Cards and Credit Insurance", *Federal Reserve Bulletin*, April, 201-13.

Fay, Scott, Eric Hurst, and Michelle White (2002). "The Household Bankruptcy Decision", *American Economic Review,* 92, 708-18.

Federal Reserve Bank of Cleveland (1998). *Economic Trends*, July.

Gross, David B. and Nicholas S. Souleles (2002a). "Do Liquidity Constraints and Interest Rates Matter for Consumer Behavior? Evidence from Credit Card Data", *Quarterly Journal of Economics*, 149-85.

Gross, David B. and Nicholas S. Souleles (2002b). "An Empirical Analysis of Personal Bankruptcy and Delinquency", *The Review of Financial Studies*, 15, 319-47.

Haliassos, Michael and Michael Reiter (2005). "Credit Card Debt Puzzles", mimeo.

Hoch, Stephen J. and George F. Loewenstein (1991). "Time-Inconsistent Preferences and Consumer Self-Control", *Journal of Consumer Research*, 17(4), 492-507.

Laibson, David, Andrea Repetto, and Jeremy Tobacman (2003). "A Debt Puzzle", in Philippe Aghion, Roman Frydman, Joseph Stiglitz, and Michael Woodford (Eds.), *Knowledge, Information, and Expectations inModern Economics: In Honor of Edmund S. Phelps*, Princeton University Press.

Lehnert, Andreas and Dean M. Maki (2001). "Consumption, Debt, and Portfolio Choice: Testing the Effect of Bankruptcy Law", mimeo.

Lopes, Paula (2003). "Credit Card Debt and Default over the Life Cycle", Working Paper, Financial Markets Group, London School of Economics.

Moss, David A. and Gibbs A. Johnson (1999). "The Rise of Consumer Bankruptcy: Evolution, Revolution, or Both?," *American Bankruptcy Law Journal* 73, 311-351

Prelec, Drazen and Duncan Simester (2001). "Always Leave Home Without It: A Further Investigation of the Credit-Card Effect on Willingness to Pay", *Marketing Letters,* 12, 5-12.

Prelec, Drazen and George Loewenstein (1998). "The Red and the Black: Mental Accounting of Savings and Debt", *Marketing Science*, 17, 4-28.

Reda, Susan (2003). "2003 Consumer Credit Survey", *STORES Magazine*, November.

Schelling, Thomas C. (1992). "Self-Command: A New Discipline", in Loewenstein, G. and J. Elster (eds), *Choice Over Time*, New York: Russell Sage Foundation, 167-76.

Shane, Frederick, George Loewenstein, and Ted O'Donoghue (2002). "Time Discounting and Time Preference: A Critical Review", *Journal of Economic Literature*, 40, 351-401.

Shefrin, Hersch M. and Richard H. Thaler (1988). "The Behavioral Life-Cycle Hypothesis", *Economic Inquiry*, 26, 609-43.

Soman, Dilip and Amar Cheema (2002). "The Effect of Credit on Spending Decisions: The Role of the Credit Limit and Credibility", *Marketing Science*, 21, 32-53.

Sullivan, Teresa A., Elizabeth Warren, and Jay Lawrence Westbrook (1989). *As We Forgive Our Debtors: Bankruptcy and Consumer Credit in America*, New York: Oxford University Press.

Thaler, Richard H. (1980). "Toward a Positive Theory of Consumer Choice", *Journal of Economic Behavior and Organization*, 1, 39-60.

Thaler, Richard H. and Hersch M. Shefrin (1981). "An Economic Theory of Self-Control", *Journal of Political Economy*, 89, 392-406.

Wertenbroch, Klaus (1998). "Consumption Self-Control via Purchase Quantity Rationing of Virtue and Vice", *Marketing Science*, 17, 317-37.

Wertenbroch, Klaus (2003). "Self-Rationing: Self-Control in Consumer Choice," in George Loewenstein, Roy Baumeister, and Daniel Read (Eds), *Time and Decision: Economic and Psychological Perspectives on Intertemporal Choice*, New York, NY: Russell Sage Foundation, 491-516.

Zinman, Jonathan (2004). "Why Use Debit Instead of Credit? Consumer Choice in a Trillion Dollar Market", mimeo, Federal Reserve Bank of New York.

Table 1: Percentage of Households by Bank-Type Credit Card Payment Pattern

| | | Has any credit card (1) | Has Bank-Type card (2) | Among of those with a bank-type card: | | | |
				No balance and no new charges (3)	No balance but has new charges (4)	Carries balance (5)	Hardly ever pays it off (6)
	1983	65.4	43.0	18.3	30.5	51.1	43.9
	1992	72.0	62.3	10.7	36.8	52.6	48.9
	1995	74.6	66.5	7.3	36.7	56.0	47.3
	1998	72.2	67.2	8.3	36.9	54.8	47.6
	2001	76.2	72.6	7.2	39.4	53.4	45.9
	1983						
by age:							
lt 35		57.2	34.0	14.9	24.5	60.6	49.2
35-54		73.7	52.0	14.4	24.8	60.8	43.0
55-64		75.0	53.1	21.0	35.6	43.4	42.4
65 +		55.9	33.3	31.7	50.2	18.1	28.4
by education							
less than high school		41.5	21.4	24.6	28.4	47.0	46.9
high school		65.1	39.2	22.7	22.9	54.5	45.9
some college		73.1	49.4	18.4	28.9	52.7	46.4
college degree +		89.1	69.8	12.7	38.1	49.2	39.7
by income							
lt $10,000		20.2	5.3	38.0	20.8	41.2	75.2
10,000-24999		43.2	22.4	26.1	28.0	45.9	43.0
25000-49999		70.8	41.3	19.8	25.2	55.0	46.8
50000-99999		88.8	68.0	15.5	28.7	55.8	43.9
100,000 +		97.2	83.4	15.0	49.5	35.5	32.4
by marital status							
Unmarried		51.7	29.9	20.5	32.4	47.0	44.1
married or partner		74.3	51.6	17.5	29.8	52.7	43.9
by race							
white nonhispanic		70.3	46.8	19.3	32.5	48.2	42.4
Black		41.9	23.3	12.1	13.9	73.9	54.1
Hispanic		38.9	26.3	3.3	5.9	90.7	47.5
Other		60.7	46.3	11.1	28.4	60.4	55.6
	1992						
by age:							
lt 35		67.3	56.1	5.8	27.3	66.9	50.1
35-54		74.9	67.2	7.0	33.6	59.4	51.2
55-64		75.8	67.3	16.0	42.8	41.2	43.7
65 +		70.1	57.9	20.1	49.9	30.0	41.9
by education							
less than high school		39.6	27.5	22.5	28.0	49.6	70.7
high school		69.2	56.5	12.1	29.2	58.7	53.5
some college		78.9	70.0	10.2	33.5	56.3	37.1
college degree +		91.5	85.6	7.6	44.8	47.6	47.3
by income							
lt $10,000		28.5	18.9	23.1	25.0	51.9	70.4
10,000-24999		60.6	47.4	18.1	31.1	50.8	54.0
25000-49999		77.7	66.1	10.2	29.2	60.7	49.0

50000-99999	91.0	84.3	6.9	38.1	54.9	47.9
100,000 +	95.9	93.5	7.0	59.1	33.9	34.4
by marital status						
Unmarried	58.7	49.0	13.1	35.5	51.4	50.7
Married or partner	81.9	72.2	9.4	37.4	53.2	48.1
by race						
white nonhispanic	78.9	69.7	10.8	39.4	49.8	47.6
Black	47.0	35.5	9.6	13.1	77.4	47.7
Hispanic	43.6	33.7	9.5	16.0	74.5	77.8
Other	74.4	61.8	11.5	43.6	44.9	37.5
1995						
by age:	67.6	58.8	6.0	25.2	68.8	49.5
lt 35	78.2	71.9	5.1	28.7	66.2	46.5
35-54	78.7	72.0	6.3	45.9	47.8	43.5
55-64	73.4	62.0	13.9	60.6	25.6	49.9
65 +						
by education	48.5	34.8	15.0	31.9	53.1	56.0
less than high school	70.8	61.8	9.0	29.7	61.4	48.0
high school	79.3	71.2	7.2	28.8	63.6	49.2
some college	91.3	87.7	4.2	47.0	48.7	42.8
college degree +						
by income	33.6	25.7	17.8	31.6	50.6	46.4
lt $10,000	61.3	49.1	8.9	32.2	58.9	57.4
10,000-24999	81.6	73.1	6.8	35.0	58.2	50.3
25000-49999	95.3	90.0	6.6	34.3	59.1	42.2
50000-99999	98.9	96.9	3.6	55.6	40.8	33.2
100,000 +						
by marital status	63.2	54.8	8.6	35.6	55.9	51.1
Unmarried	82.6	74.8	6.6	37.4	56.0	45.3
married or partner						
by race	79.4	71.9	7.6	40.2	52.2	46.4
white nonhispanic	51.7	41.0	6.2	12.2	81.5	54.5
Black	60.1	49.7	4.0	10.2	85.7	51.4
Hispanic	75.5	67.6	5.2	40.9	53.9	37.1
Other						
1998						
by age:	62.9	57.9	5.2	23.3	71.4	52.4
lt 35	76.7	72.6	6.9	31.8	61.2	50.3
35-54	79.6	75.4	9.0	41.4	49.6	38.7
55-64	69.0	61.6	14.1	59.3	26.8	31.4
65 +						
by education	42.5	34.7	14.8	26.0	59.2	53.7
less than high school	68.9	62.8	10.9	31.9	57.1	51.8
high school	76.6	73.3	7.4	29.0	63.5	50.1
some college	91.6	88.2	5.4	46.4	48.2	41.0
college degree +						
by income	29.4	23.5	8.6	29.7	61.7	51.1
lt $10,000	54.8	47.7	14.1	30.4	55.4	44.4
10,000-24999	77.0	71.0	9.4	32.8	57.8	52.6
25000-49999	91.0	87.7	6.5	34.7	58.8	47.5
50000-99999	98.9	98.0	3.6	59.1	37.3	35.3
100,000 +						

by marital status	59.3	54.9	10.7	35.1	54.2	46.5
Unmarried	81.5	76.1	7.0	37.8	55.1	48.1
married or partner						
by race	77.9	73.5	8.2	39.8	52.0	46.5
white nonhispanic	48.2	39.7	10.3	15.6	74.2	57.6
Black	54.2	48.4	7.7	15.6	76.6	48.1
Hispanic	66.5	60.2	5.9	43.7	50.5	40.7
Other						

Table 2 Probit Estimation of Credit Card Ownership in the United States from the 1983, 1992, 1995, 1998, and 2001 Surveys of Consumer Finances

	Has at least one credit card			Has a bank-type credit card		
	Coefficient	Standard Error	Significance	Coefficient	Standard Error	Significance
Intercept	-0.007	0.074	0.920	-0.136	0.072	0.059
Married	0.412	0.036	<.0001	0.289	0.035	<.0001
Single female	0.267	0.039	<.0001	0.154	0.038	<.0001
Number of children	-0.039	0.009	<.0001	-0.036	0.009	<.0001
Nonwhite/Hispanic	-0.167	0.030	<.0001	-0.174	0.030	<.0001
Age < 35	-0.210	0.038	<.0001	-0.153	0.036	<.0001
Age 35-49	-0.120	0.037	0.001	-0.061	0.033	0.065
Age 65-74	-0.022	0.047	0.641	-0.071	0.043	0.097
Age 75+	-0.469	0.049	<.0001	-0.551	0.047	<.0001
Less than HS diploma	-0.584	0.040	<.0001	-0.608	0.038	<.0001
High School diploma or equiv.	-0.257	0.035	<.0001	-0.261	0.033	<.0001
College degree or higher	0.269	0.039	<.0001	0.237	0.035	<.0001
Income < $10,000	-0.646	0.044	<.0001	-0.615	0.046	<.0001
Income $10,000-$24,999	-0.293	0.033	<.0001	-0.237	0.032	<.0001
Income $50,000-$99,9999	0.256	0.037	<.0001	0.263	0.033	<.0001
Income $100,000 +	0.380	0.054	<.0001	0.357	0.044	<.0001
ln (financial assets)	0.108	0.005	<.0001	0.116	0.005	<.0001
Self employed	0.094	0.039	0.016	0.059	0.034	0.084
Not currently working	-0.240	0.054	<.0001	-0.192	0.055	0.001
Saver	0.056	0.027	0.036	0.028	0.025	0.252
Liquidity constrained	-0.324	0.030	<.0001	-0.394	0.029	<.0001
Has checking account	0.317	0.063	<.0001	0.313	0.075	<.0001
d1983	-0.436	0.065	<.0001	-1.111	0.077	<.0001
d1992	0.014	0.040	0.731	-0.209	0.037	<.0001
d1995	0.088	0.039	0.026	-0.068	0.037	0.067
d1998	-0.079	0.039	0.040	-0.114	0.037	0.002
number of observations	21,055			21,055		
-2 log likelihood	13,706.625			15,772.164		

3. Bank-type credit card and debit card use, by age, education, and income

1992, 1995, 1998, 2001 Surveys of Consumer Finance

	Neither	Debit card but no credit card	Credit card but no debit card	credit card, no debit card, no balance	credit card, no debit card, has balance	Both debit and credit cards	Both debit and credit cards, no balance	Both debit and credit cards, has balance
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1992								
All	36.3	1.4	54.6	25.8	28.8	7.8	3.8	4.0
by age:								
lt 35	41.8	2.1	47.5	15.5	32.0	8.5	3.0	5.5
35-54	31.0	1.8	57.6	23.1	34.5	9.7	4.2	5.5
55-64	32.1	0.6	59.9	34.0	25.9	7.5	5.6	1.9
65 +	41.7	0.5	54.3	37.6	16.7	3.5	2.9	0.6
by ed								
lt hs	72.5	0.0	26.5	13.3	13.2	1.0	0.6	0.4
Hs	42.5	1.0	52.0	22.3	29.7	4.6	1.1	3.5
some college	26.9	3.1	60.1	26.3	33.8	10.0	4.3	5.7
college degree +	12.6	1.8	71.9	36.8	35.1	13.8	8.1	5.7
by inc								
lt $10,000	79.9	1.3	16.5	7.8	8.7	2.4	1.3	1.1
10,000-24999	51.5	1.1	43.7	21.0	22.7	3.8	2.4	1.4
25000-49999	32.5	1.4	59.5	24.0	35.5	6.6	2.0	4.6
50000-99999	13.8	1.9	72.7	32.5	40.2	11.6	5.5	6.1
100,000 +	5.1	1.4	74.8	50.4	24.4	18.7	11.4	7.3
1995								
all	30.4	3.1	52.0	23.8	28.2	14.6	5.5	9.1
by age:								
lt 35	35.5	5.7	40.8	13.4	27.4	18.0	5.0	13.0
35-54	24.7	3.4	55.1	18.7	36.4	16.8	5.6	11.2
55-64	26.5	1.5	60.0	32.1	27.9	12.0	5.4	6.6
65 +	37.4	0.6	54.2	40.4	13.8	7.7	5.7	2.0
by ed								
lt hs	61.8	3.4	30.0	14.6	15.4	4.9	1.8	3.1
hs	35.4	2.9	51.3	20.4	30.9	10.5	3.5	7.0
some college	24.6	4.1	53.8	20.6	33.2	17.5	5.1	12.4
college degree +	9.8	2.5	65.0	35.0	30.0	22.8	10.0	12.8
by inc								
lt $10,000	71.7	2.7	22.5	12.1	10.4	3.2	0.6	2.6
10,000-24999	48.0	2.9	40.6	16.9	23.7	8.5	3.3	5.2
25000-49999	22.7	4.3	57.3	25.6	31.7	15.8	5.0	10.8
50000-99999	6.7	3.3	67.2	28.4	38.8	22.9	8.5	14.4
100,000 +	2.9	0.2	73.5	44.4	29.1	23.5	13.0	10.5
1998								
all	25.7	7.2	40.7	20.8	19.9	26.5	9.6	16.9
by age:								
lt 35	30.5	11.6	23.9	7.7	16.2	33.9	8.8	25.1
35-54	20.4	6.9	41.8	17.5	24.3	30.8	10.6	20.2
55-64	18.1	6.5	52.6	27.6	25.0	22.8	10.4	12.4
65 +	35.3	3.2	49.7	37.5	12.2	11.9	7.7	4.2
by ed								
lt hs	58.1	7.2	25.3	11.2	14.1	9.3	2.9	6.4
hs	27.6	9.6	41.6	20.1	21.5	21.2	6.8	14.4
some college	17.8	8.9	42.0	18.3	23.7	31.4	8.5	22.9
college degree +	7.7	4.1	49.1	29.0	20.1	39.2	16.8	22.4
by inc								
lt $10,000	68.4	8.1	15.4	6.5	8.9	8.1	2.5	5.6
10,000-24999	43.3	9.1	32.6	15.9	16.7	14.9	5.3	9.6
25000-49999	20.1	9.0	45.4	21.5	23.9	25.5	8.4	17.1
50000-99999	6.7	5.7	47.4	22.7	24.7	40.3	13.4	26.9
100,000 +	1.2	0.8	57.1	41.0	16.1	41.0	20.5	20.5
2001								
all	18.2	9.2	33.8	18.9	14.9	38.8	15.9	22.9
by age:								
lt 35	20.8	15.1	17.4	6.1	11.3	46.7	14.3	32.4
35-54	12.0	9.7	34.3	15.3	19.0	44.1	16.3	27.8

55-64	17.3	6.6	42.0	23.8	18.2	34.1	15.6	18.5
65 +	28.5	3.4	50.4	37.0	13.4	17.7	12.5	5.2
by ed								
lt hs	43.6	14.9	24.6	12.0	12.6	16.8	6.0	10.8
hs	20.8	9.0	37.3	16.6	20.7	32.9	9.9	23.0
some college	11.5	10.0	34.0	15.3	18.7	44.6	15.2	29.4
college degree +	4.4	5.4	39.5	26.9	12.6	50.8	24.3	26.5
by inc								
lt $10,000	59.1	12.5	20.6	7.1	13.5	7.8	2.1	5.7
10,000-24999	32.1	14.2	30.7	15.7	15.0	23.1	8.0	15.1
25000-49999	13.0	10.4	38.0	18.9	19.1	38.6	10.7	27.9
50000-99999	6.1	6.2	36.1	19.0	17.1	51.6	21.8	29.8
100,000 +	1.8	2.5	42.3	31.7	10.6	53.5	29.7	23.8

Variable definitions:

debit card: in 1992; household owns a debit card. In 1995, 1998, and 2001: households uses a debit card.

has a balance: in all years, household has a bank-type credit card and had remaining balance after last bill was paid.

hs=high school, lt hs= did not finish high school.

Table 4: Probit Estimation of Debit Card Use in the United States from the 1992, 1995, 1998, and 2001 Surveys of Consumer Finances

Uses a debit card*

	Coefficient	Standard Error	Significance
Intercept	-0.739	0.078	<.0001
Married	0.037	0.037	0.318
Single female	0.037	0.042	0.388
Number of children	-0.012	0.011	0.290
Nonwhite/Hispanic	-0.008	0.032	0.806
Age < 35	0.510	0.037	<.0001
Age 35-49	0.307	0.031	<.0001
Age 65-74	-0.209	0.042	<.0001
Age 75+	-0.658	0.056	<.0001
Less than HS diploma	-0.327	0.046	<.0001
High School diploma or equiv.	-0.229	0.036	<.0001
College degree or higher	0.001	0.032	0.983
Income < $10,000	-0.346	0.057	<.0001
Income $10,000-$24,999	-0.149	0.040	0.000
Income $50,000-$99,9999	0.127	0.035	0.000
Income $100,000 +	0.036	0.041	0.382
ln J20(financial assets)	0.017	0.005	0.001
Self employed	-0.240	0.029	<.0001
Not currently working	-0.130	0.058	0.024
Saver	0.462	0.034	<.0001
Liquidity constrained	-0.042	0.026	0.113
Has checking account	0.213	0.031	<.0001
Buying on credit usually bad idea	0.083	0.024	0.001
d1983	-1.155	0.035	<.0001
d1992	-0.843	0.031	<.0001
d1995	-0.357	0.029	<.0001
d1998	-0.079	0.039	0.040

* for 1992, dependent variable is debit card ownership
number of observations   16,952
-2 log likelihood   16,470.584

Table 5: Percentage of Liquidity Constrained Households, by Bank-Type Credit Card Payment Pattern
1983, 1992, 1995, 1998, and 2001 Surveys of Consumer Finances

	1983	1992	1995	1998	2001
Percent with no bank-type credit card	57.0	37.7	33.5	32.8	27.4
of which: percent liquidity constrained	27.9	34.0	39.3	34.0	34.3
of which: percent liquidity constrained for credit other than credit card		25.6	30.6	27.2	27.3
Percent with bank-type credit card	43.0	62.3	66.5	67.2	72.6
of which: percent liquidity constrained	12.4	14.8	15.0	16.9	17.0
of which: percent liquidity constrained for credit other than credit card		10.0	10.1	10.5	11.2
Percent that has Bank-Type Card but no balance and no new charges:	18.3	10.7	7.3	8.3	7.2
of which: percent liquidity constrained	6.9	9.7	10.7	8.8	7.5
of which: percent liquidity constrained for credit other than credit card		6.6	8.2	6.6	6.7
Percent that has Bank-Type Card; no balance but has new charges	30.5	36.8	36.7	36.9	39.4
of which: percent liquidity constrained	4.4	5.2	5.6	6.1	6.4
of which: percent liquidity constrained for credit other than credit card		3.4	3.9	3.9	4.3
Percent with Bank-Type Card; balance but at least sometimes pays balance in full	56.1	51.1	52.7	52.4	54.1
of which: percent liquidity constrained	10.3	17.7	14.7	18.0	18.5
of which: percent liquidity constrained for credit other than credit card		11.5	10.1	11.7	13.6
Percent with Bank-Type Card; balance and hardly ever pays balance in full	43.9	48.9	47.3	47.6	45.9
of which: percent liquidity constrained	16.0	27.5	29.7	33.6	35.2
of which: percent liquidity constrained for credit other than credit card		19.0	19.3	19.9	20.7

Table 6: Credit card limits and interest rates charged on card with the highest balance

1995, 1998, 2001 Surveys of Consumer Finance

All Figures in 2001 Dollars

	No balance and no new Charges		No balance but has new charges		Carries balance and at least sometimes pays it off in full				Carries balance and hardly ever pays it off			
	credit limit on bank-type credit Cards	interest rate	credit limit on bank-type credit cards	interest rate	Median balance on bank-type cards	credit limit on bank-type credit cards	interest rate	card utlization rate	Median balance on bank-type cards	credit limit on bank-type credit cards	interest rate	card utlization rate
1995	6,679	15.0	13,359	16.0	1,162	13,359	14.0	15.1	2,905	9,351	15.0	38.3
1998	7,620	14.0	10,885	15.0	1,087	10,885	14.8	19.8	3,260	8,708	16.0	50.6
2001	7,500	16.0	15,000	15.0	1,000	10,000	13.0	17.5	2,800	7,500	16.0	50.0
1995												
by age:												
less than 35	2,672	14.0	10,153	15.3	1,045	9,351	14.8	15.9	2,903	6,679	14.0	44.4
35-54	6,679	13.9	13,359	16.0	1,510	13,359	14.0	17.4	3,136	10,153	16.0	39.8
55-64	6,679	14.0	13,359	15.0	1,742	13,359	13.5	15.4	2,671	8,015	14.7	35.3
65 +	6,679	16.0	12,023	17.0	325	12,023	14.4	6.7	1,161	9,351	15.9	16.8
by education:												
less than high school	6,679	15.0	8,015	17.0	592	11,622	15.9	10.9	1,510	6,679	15.0	27.3
high school	6,011	15.0	10,019	16.9	1,045	9,351	14.0	17.4	2,439	7,080	16.0	39.8
some college	6,679	14.5	12,824	16.9	1,161	13,359	14.5	14.5	2,323	9,351	14.0	43.6
college degree +	6,679	14.5	14,694	16.5	1,510	16,030	14.0	14.6	3,252	13,359	15.0	36.9
by income:												
lt $10,000	3,473	15.0	6,679	18.0	290	8,015	13.9	9.9	1,743	6,679	15.9	57.8
$10,000-$24,999	4,008	17.0	9,351	17.9	813	7,247	16.5	20.6	2,208	6,679	16.0	46.9
$2,5000-$49,999	6,679	14.5	11,355	16.9	1,278	11,622	14.0	17.4	2,324	6,679	15.0	41.7
$50,000-$99,999	6,679	14.5	13,349	14.0	1,278	14,695	14.0	12.7	3,486	12,023	14.7	30.2
$100,000 +	6,679	12.0	21,379	16.5	2,324	26,717	14.0	16.8	6,043	26,717	15.0	37.3
1998												
by age:												
less than 35	3,810	12.9	10,885	14.0	1,042	6,531	15.0	28.9	2,498	5,769	16.0	60.9
35-54	9,361	13.5	16,328	14.9	1,194	10,885	14.0	18.6	3,258	10,885	15.9	45.4
55-64	10,885	14.0	13,062	14.9	1,086	14,151	15.0	14.4	3,801	10,885	18.0	57.7
65 +	6,531	15.0	10,885	15.0	869	8,164	15.0	14.4	1,629	10,885	15.7	38.9
by education:												
less than high school	5,443	15.0	10,885	15.0	760	6,096	17.0	30.4	2,172	4,898	18.0	56.9
high school	7,293	13.0	8,708	15.0	869	8,164	15.0	17.6	2,715	7,946	16.0	46.8
some college	10,885	14.9	10,885	14.0	1,194	8,708	14.5	24.9	3,475	7,620	17.0	47.4
college degree +	10,885	14.0	16,328	15.0	1,303	13,062	14.0	16.1	4,778	10,885	15.0	53.3
by income:												
lt $10,000	2,286	12.0	5,443	14.0	554	5,443	15.0	29.9	2,390	2,939	18.0	66.5
$10,000-$24,999	5,443	15.9	9,797	15.1	652	5,443	15.0	23.2	1,630	4,898	18.0	53.3
$2,5000-$49,999	7,620	12.5	10,885	15.0	1,087	8,164	14.5	22.4	3,260	7,620	16.9	50.9
$50,000-$99,999	13,062	14.0	13,062	14.8	1,087	11,974	14.0	15.4	3,803	11,974	14.0	44.5
$100,000 +	10,855	13.0	21,770	15.0	2,173	20,682	14.0	20.0	5,433	16,328	15.9	51.9
2001												
by age:												
less than 35	5,000	14.9	10,000	14.0	1,000	7,000	14.0	31.0	3,000	6,000	16.0	65.5
35-54	8,700	14.0	15,000	15.0	1,200	13,000	13.0	17.3	3,000	8,000	16.0	47.8
55-64	9,600	17.0	20,000	15.6	1,000	10,000	12.0	11.5	3,000	8,000	18.0	48.5
65 +	8,000	17.0	15,000	16.0	600	10,000	14.9	8.8	1,500	9,000	14.9	35.4
by education:												
less than high school	6,000	16.3	10,000	16.7	500	5,500	15.0	20.8	1,200	5,000	17.0	47.0
high school	7,700	16.0	10,000	16.0	900	10,000	14.0	15.5	2,000	6,000	16.9	53.0
some college	5,000	14.9	10,000	14.9	1,000	10,000	13.5	23.3	3,000	7,500	17.0	59.1
college degree +	7,500	15.0	20,000	15.5	1,500	15,000	12.5	16.4	4,000	11,000	14.0	49.5
by income:												
lt $10,000	8,500	15.0	5,000	15.0	710	2,500	18.0	40.0	1,000	2,500	18.9	50.0
$10,000-$24,999	5,000	17.0	6,500	17.0	500	5,000	14.5	21.2	1,800	4,500	16.0	60.0
$2,5000-$49,999	5,800	15.0	11,000	15.0	800	9,000	14.9	20.0	2,700	6,000	16.9	60.0
$50,000-$99,999	7,700	17.0	15,000	14.0	1,500	15,000	11.0	14.7	4,000	12,000	14.0	50.0
$100,000 +	20,000	14.0	25,000	16.7	2,300	20,000	13.0	17.0	4,000	15,000	15.0	31.9

Table 7 Median Liquid Assets, Total Financial Assets, and Bank-Type Credit Card Balances of U.S. Households by Credit Card Payment Patterns

1983, 1992, 1995, 1998, and 2001 Surveys of Consumer Finance
All Figures in 2001 Dollars

	Non-card holders			Card holders with no balance and no new charges			Card holders with no balance but made new charges			Cardholders who carry balance but "almost always" or "sometimes" pay off in full				hardly ever pay off in full			
	Total Liquid Assets	Total Financial Assets	Net Worth	Total liquid assets	Total Financial assets	Net Worth	Total Liquid Assets	Total Financial Assets	Net Worth	Median balance on bank type cards	Total Liquid Assets	Total Financial Assets	Net Worth	Median balance on bank-type cards	Total Liquid Assets	Total Financial Assets	Net Worth`
1983	889	2,488	27,929	7,247	23,902	133,136	12,706	54,941	214,701	711	3,821	15,994	101,096	1,244	2,133	8,928	56,782
1992	252	884	13,330	3,787	25,246	133,425	11,108	76,407	220,524	800	3,042	18,871	95,910	1,800	1,515	7,485	43,297
1995	277	1,158	15,603	3,699	22,538	111,246	8,668	73,393	211,280	1,162	2,427	21,960	80,079	2,905	1,618	10,460	48,763
1998	435	1,401	13,661	4,278	33,961	117,776	10,885	96,223	244,477	1,087	4,071	30,478	97,682	3,260	2,177	14,151	42,452
2001	400	1,300	12,200	5,000	25,400	116,000	13,020	125,300	319,250	1,000	4,000	32,500	101,260	2,800	1,500	8,550	39,430
1983																	
by age:																	
lt 35	480	968	6,140	5,247	10,766	29,850	5,420	15,822	48,915	533	2,133	7,508	44,108	1,066	1,777	6,131	34,510
35-54	967	3,199	48,506	7,002	20,081	138,611	12,440	50,114	217,342	711	4,414	21,325	114,543	1,244	3,021	10,041	75,177
55-64	2,388	6,719	71,448	7,642	43,786	184,441	17,327	114,737	300,742	711	3,821	22,392	156,627	889	1,422	9,392	106,507
65 +	1,777	7,748	62,035	11,995	57,756	187,007	19,193	115,898	301,790	576	5,198	34,241	110,534	970	613	613	53,578
by education																	
less than high school	467	1,155	22,082	3,554	12,316	101,270	7,338	31,878	139,574	533	1,822	5,893	100,956	1,066	1,066	6,780	39,461
high school	1,022	3,554	32,119	6,398	23,902	128,858	8,886	32,992	189,262	551	3,243	9,774	78,070	1,155	1,654	8,379	60,750
some college	1,066	2,844	17,423	8,352	22,557	119,011	11,516	52,139	210,879	711	4,002	26,577	123,186	1,422	2,088	5,047	53,594
college degree +	2,799	8,886	57,228	10,307	38,422	154,125	18,660	80,503	272,114	800	6,131	23,509	117,806	1,244	3,465	11,409	67,278
by income																	
lt $10,000	44	203	3,643	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10,000-24999	467	1,066	10,570	3,879	8,823	86,165	3,865	19,815	87,098	622	1,550	4,883	38,604	889	613	1,955	22,658
25000-49999	1,422	3,764	35,761	7,528	22,557	93,280	7,286	23,328	120,978	800	2,342	8,352	71,536	1,244	1,599	5,278	41,501
50000-99999	3,377	19,255	111,089	8,175	27,719	138,220	13,506	57,223	196,465	889	4,530	23,591	117,806	1,066	2,843	12,664	81,864
100,000 +	20,661	106,760	345,287	38,826	159,531	382,833	34,654	267,458	850,652	800	14,750	57,409	324,230	4,442	8,886	26,138	115,208
1992																	
by age:																	
lt 35	88	379	2,714	3,534	9,846	33,200	5,239	23,416	66,662	1,010	2,121	5,491	24,668	1,389	1,250	3,724	12,232
35-54	189	732	11,234	3,534	22,216	112,850	10,565	92,779	236,138	1,010	4,418	25,498	109,631	2,525	1,856	10,351	64,125
55-64	252	884	27,543	2,525	31,558	167,255	13,822	131,910	332,237	884	3,320	63,999	181,064	2,525	2,272	10,351	95,938
65 +	1,262	4,418	53,080	5,302	34,208	148,825	15,148	94,420	268,807	884	3,282	19,793	138,790	1,641	947	2,525	64,213
by education																	
less than high school	126	265	10,704	2,146	13,254	89,245	6,943	40,520	164,478	1,262	1,389	11,840	108,659	1,262	568	1,262	44,054
high school	379	1,010	12,143	4,166	21,068	134,877	9,467	61,348	200,581	631	2,525	15,148	83,249	2,020	1,452	6,059	35,269
some college	417	1,893	16,284	3,030	19,882	103,698	10,730	81,671	235,545	884	2,777	13,254	88,614	1,893	1,553	6,690	39,384
college degree +	985	4,355	31,558	5,807	35,445	151,615	11,992	93,789	247,663	1,010	4,166	28,528	108,798	3,157	2,146	11,361	58,482
by income																	
lt $10,000	13	126	1,893	947	4,671	38,412	2,777	17,925	23,605	1,010	631	3,408	54,001	1,010	454	871	16,991
10,000-24999	153	631	10,843	3,787	15,021	103,130	4,393	21,459	89,484	947	1,264	4,418	35,029	1,262	619	2,083	32,264
25000-49999	631	2,903	23,100	3,661	22,216	133,425	7,952	54,304	179,499	757	2,272	11,752	74,072	1,893	1,262	5,945	30,030
50000-99999	2,146	13,393	70,891	6,690	39,131	138,853	10,730	72,230	210,388	1,010	3,787	25,498	108,621	2,651	2,651	13,393	71,875
100,000 +	12,623	30,926	177,984	7,826	96,541	257,295	27,771	266,598	746,273	1,262	16,284	81,545	280,736	5,049	11,234	56,804	206,108

Table 7 Median Liquid Assets, Total Financial Assets, and Bank-Type Credit Card Balances of U.S. Households by Credit Card (cont'd) **Payment Patterns**

1983, 1992, 1995, 1998, and 2001 Surveys of Consumer Finance
All Figures in 2001 Dollars

	Non-card holders			Card holders with no balance and no new charges			Card holders with no balance but made new charges			Cardholders who carry balance but "almost always" or "sometimes" pay off in full				Cardholders who carry balance but hardly ever pay off in full			
	Total liquid assets	Total Financial assets	Net Worth	Total liquid assets	Total Financial assets	Net Worth	Total liquid assets	Total Financial assets	Net Worth	Median balance on bank-type cards	Total liquid assets	Total Financial assets	Net Worth	Median balance on bank-type cards	Total liquid assets	Total Financial assets	Net Worth
1995																	
by age:																	
lt 35	58	474	4,843	1,040	8,356	30,282	4,623	23,347	59,177	1,045	1,618	8,830	31,785	2,903	1,214	5,005	11,523
35-54	231	1,791	17,164	4,392	27,369	128,063	8,091	78,363	211,280	1,510	3,340	31,345	119,105	3,136	1,734	12,251	64,089
55-64	347	705	26,237	9,246	41,840	150,138	9,246	123,566	319,579	1,742	2,543	24,561	142,367	2,671	1,502	13,349	77,670
65 +	925	2,196	55,733	5,548	23,232	131,414	12,483	86,801	251,502	325	4,623	36,754	123,416	1,161	1,849	10,749	79,866
by education																	
less than high school	59	347	12,275	4,623	21,036	121,914	4,623	21,960	134,951	592	2,312	11,015	87,517	1,510	982	3,814	36,662
high school	347	1,422	18,493	2,485	22,885	110,541	6,935	61,489	193,193	1,045	1,734	14,898	92,741	2,439	1,156	6,785	43,805
some college	254	1,156	9,189	4,276	27,369	102,404	8,669	64,759	205,964	1,161	2,312	18,435	83,911	2,323	1,803	9,709	41,678
college degree +	1,156	7,513	31,022	3,999	23,116	103,213	10,402	108,622	255,432	1,734	3,571	31,149	90,233	3,252	2,219	19,140	58,368
by income																	
lt $10,000	0	69	2,520	2,312	8,091	76,664	1,734	7,166	20,920	290	1,040	3,930	29,253	1,743	566	1,075	4,300
10,000-24999	347	1,156	13,338	3,467	14,101	102,404	3,930	23,232	111,766	813	1,248	4,219	48,312	2,208	647	2,890	33,981
25000-49999	578	3,467	26,930	2,890	34,443	131,414	6,588	54,091	185,275	1,278	1,907	18,493	67,984	2,324	1,271	8,322	35,830
50000-99999	2,219	18,527	59,061	3,699	21,960	110,541	11,026	95,931	244,452	1,278	3,363	37,564	113,731	3,486	2,658	21,209	61,812
100,000 +	5,652	34,096	112,979	22,307	96,278	415,048	26,583	310,332	724,455	2,324	10,402	85,529	268,550	6,043	6,184	58,541	169,336
1998																	
by age:																	
lt 35	174	620	3,374	2,286	12,344	29,368	4,354	23,610	54,654	1,042	2,395	8,545	31,828	2,498	1,252	4,572	8,675
35-54	327	1,306	15,587	6,313	35,071	117,231	10,885	93,938	258,519	1,194	4,898	38,206	118,973	3,258	2,286	23,839	66,594
55-64	631	2,057	28,911	6,531	64,222	139,219	13,062	138,240	316,862	1,086	5,225	47,415	148,744	3,801	3,048	23,457	74,203
65 +	1,306	5,029	72,930	4,354	34,832	146,948	12,953	130,337	278,656	869	3,472	24,165	114,510	1,629	2,068	9,579	85,382
by education																	
less than high school	109	490	8,708	2,286	30,228	91,358	7,837	40,819	152,259	760	1,850	6,967	67,552	2,172	1,089	11,974	31,817
high school	545	2,188	16,491	2,634	13,269	111,125	9,361	83,325	206,869	869	2,482	21,389	78,274	2,715	1,742	9,426	43,257
some college	653	1,961	13,693	10,493	37,009	134,854	9,034	72,385	214,761	1,194	4,354	30,478	97,040	3,475	2,068	13,334	41,766
college degree +	1,089	10,450	46,098	6,096	85,121	187,331	12,300	141,505	294,004	1,303	5,987	53,337	125,221	4,778	3,113	25,374	50,561
by income																	
lt $10,000	1	131	1,959	762	1,056	91,358	2,504	8,708	92,991	554	1,143	2,612	21,639	2,390	218	958	8,588
10,000-24999	327	795	6,640	2,286	15,892	80,549	3,461	40,819	152,259	652	1,089	2,743	30,707	1,630	1,034	1,948	11,135
25000-49999	980	5,660	29,477	4,191	29,934	100,501	8,817	42,854	173,126	1,087	2,504	19,038	79,069	3,260	1,306	9,165	28,192
50000-99999	1,959	16,437	58,942	8,164	47,132	176,555	11,429	114,510	265,812	1,087	5,606	53,380	142,463	3,803	3,277	31,131	76,739
100,000 +	12,572	291,577	378,852	17,971	174,444	279,702	27,212	350,323	756,834	2,173	12,017	124,415	287,689	5,433	6,966	115,381	204,856
2001																	
by age:																	
lt 35	150	500	4,140	2,700	10,900	78,030	6,000	32,505	69,550	1,000	2,190	7,590	19,390	3,000	1,420	4,350	7,700
35-54	300	1,200	10,430	4,000	22,700	155,600	12,700	114,500	297,000	1,200	4,350	45,500	133,100	3,000	2,000	13,320	53,620
55-64	560	2,000	40,800	8,000	40,000	174,900	17,000	283,300	542,002	1,000	5,360	40,740	177,379	3,000	1,500	13,150	76,580
65 +	1,500	4,400	66,000	10,901	25,400	114,840	17,200	179,600	405,300	600	7,500	26,700	147,700	1,500	1,110	4,150	74,000
by education																	
less than high school	100	300	8,400	4,500	17,500	112,500	11,100	46,000	196,820	500	2,000	9,000	59,200	1,200	1,000	2,800	23,110
high school	500	1,400	15,100	6,000	22,000	90,700	7,000	69,700	197,800	900	3,000	23,330	87,800	2,000	1,200	6,800	34,800
some college	660	2,300	10,250	4,000	22,700	155,600	12,400	122,000	304,600	1,000	3,700	19,320	71,070	3,000	1,520	9,200	34,050
college degree +	1,600	12,670	41,500	8,000	43,900	179,000	17,200	218,300	465,300	1,500	5,820	60,950	178,001	4,000	2,400	22,460	69,500
by income																	
lt $10,000	10	40	1,600	1,100	1,110	60,390	2,000	14,540	67,000	710	645	800	14,900	1,000	250	650	6,300
10,000-24999	230	700	7,800	3,400	10,901	79,190	4,400	37,900	137,400	500	1,500	4,500	41,280	1,800	720	1,400	9,975
25000-49999	1,000	4,610	23,300	7,000	31,000	110,600	7,300	63,820	197,420	800	2,500	13,650	49,700	2,700	1,400	6,590	24,100
50000-99999	1,600	15,000	70,750	6,200	32,400	193,600	12,200	118,800	304,100	1,500	5,500	49,000	130,000	4,000	2,950	29,000	74,240
100,000 +	4,950	98,200	249,100	21,100	127,420	467,270	38,500	452,200	980,500	2,300	10,300	148,300	382,129	4,000	6,430	79,300	189,700

Table 8: Median Liquid Assets, Total Financial Assets, and Bank-Type Credit Card Balances of U.S. Households that Carried a Credit Card Balance, by High Liquid Asset Holding

1995, 1998, and 2001 Surveys of Consumer Finances

All Figures in 2001 Dollars

	Households with Bank-type Card Balance Greater than Liquid Assets					Households with Liquid Assets Greater than Bank-type Card Balance (and at least $1,000 and at least one-half monthly income)					
	Percent of card-holders with balance	Median balance on bank-type cards	Liquid assets	Total financial assets	Total net worth	Percent of card-holders with balance	Median balance on bank-type cards	Liquid assets	Total financial assets	Total net worth	percent that "hardly ever pay off" in full
1995	61.0	2,440	982	7,478	48,140	39.0	1,162	6,588	36,986	104,854	35.5
1998	53.0	3,260	1,089	10,341	38,391	47.0	1,087	7,837	37,009	107,587	33.8
2001	55.5	2,500	1,000	6,100	36,295	44.5	1,000	8,000	40,710	127,400	30.8
1995											
by age:											
less than 35	67.7	2,324	867	3,699	12,367	32.3	1,081	4,635	18,435	45,423	35.5
35-54	60.3	3,138	1,156	11,292	68,851	39.7	1,394	7,975	42,649	123,093	34.9
55-64	58.2	2,324	809	7,165	88,176	41.8	1,743	6,993	44,787	159,385	35.8
65 +	48.2	1,162	670	5,779	79,866	51.8	383	6,599	49,410	137,829	36.1
by education:											
less than high school	60.2	1,743	462	1,676	22,249	39.8	825	3,930	13,292	87,517	43.3
high school	67.3	2,092	751	5,328	45,585	32.7	1,162	6,761	37,564	113,765	31.1
some college	60.5	2,324	982	6,704	40,834	39.5	1,046	5,779	36,986	95,226	41.1
college degree +	55.6	3,486	1,387	16,990	60,471	44.4	1,511	8,091	42,996	119,510	31.2
by income:											
lt $10,000	70.2	1,511	347	774	6,068	29.8	151	3,583	8,333	27,589	30.2
$10,000-$24,999	67.2	2,092	462	1,167	15,846	32.8	709	4,276	13,292	80,328	38.8
$2,5000-$49,999	63.8	2,557	925	7,166	36,489	36.2	1,162	4,623	24,561	83,067	37.7
$50,000-$99,999	57.4	3,138	1,503	16,644	72,550	42.6	1,511	7,859	51,433	134,951	34.7
$100,000 +	45.0	5,810	3,514	47,041	169,336	55.0	2,440	21,960	134,304	337,378	23.4
1998											
by age:											
less than 35	41.7	2,608	1,001	3,314	8,675	58.3	1,087	4,441	11,538	31,512	40.1
35-54	38.0	3,803	1,306	18,221	51,160	62.0	1,304	8,817	57,146	127,790	36.6
55-64	33.1	3,803	1,393	15,326	94,808	66.9	1,195	8,599	72,821	192,621	24.3
65 +	21.0	3,368	577	2,112	64,232	79.0	760	6,749	35,921	130,903	21.0
by education:											
less than high school	61.8	2,282	435	2,112	31,022	38.2	761	5,443	22,314	98,455	41.7
high school	56.8	3,260	1,089	66,966	39,077	43.2	761	4,844	27,757	96,267	36.3
some college	53.9	3,477	1,143	12,137	34,299	46.1	1,195	7,717	37,009	104,768	34.8
college degree +	46.9	4,781	1,524	20,028	47,676	53.1	1,521	9,666	63,133	125,221	29.1
by income:											
lt $10,000	72.3	1,956	218	675	9,285	27.7	272	2,558	5,769	15,402	16.5
$10,000-$24,999	57.1	1,956	381	925	5,693	42.9	652	3,048	9,579	48,003	34.7
$2,5000-$49,999	57.4	3,585	925	6,390	30,141	42.6	1,087	5,769	23,457	81,692	36.9
$50,000-$99,999	48.1	4,346	2,068	26,668	67,106	51.9	1,304	9,002	61,609	150,344	34.3
$100,000 +	40.7	6,084	4,572	90,346	208,557	59.3	2,173	17,416	155,797	303,006	24.7
2001											
by age:											
less than 35	66.6	2,500	950	2,850	7,180	33.4	1,000	5,000	19,420	38,350	35.5
35-54	55.5	2,600	1,200	11,500	53,960	44.5	1,500	8,000	52,400	146,800	31.2
55-64	44.1	3,080	600	6,100	43,260	55.9	1,200	10,000	75,720	196,730	30.2
65 +	41.4	2,000	900	1,880	76,500	58.6	400	8,000	37,550	147,700	22.8
by education:											
less than high school	60.6	1,000	500	1,100	17,350	39.4	700	4,600	12,300	80,750	14.7
high school	60.0	2,000	910	5,030	36,800	40.0	700	7,100	33,630	96,720	28.8
some college	59.7	2,900	1,000	5,750	22,840	40.3	800	8,000	27,950	121,250	22.3
college degree +	46.7	4,000	1,500	16,560	54,850	53.3	1,700	9,700	74,300	195,910	34.2
by income:											
lt $10,000	87.3	1,000	245	510	6,410	12.7	480	1,580	6,100	61,850	13.8
$10,000-$24,999	60.0	1,700	500	1,000	9,975	40.0	510	3,300	10,150	5,010	29.4
$2,5000-$49,999	58.1	2,900	870	3,300	17,350	41.9	700	5,300	25,360	81,860	41.2
$50,000-$99,999	51.7	4,000	2,000	22,910	69,400	48.3	1,200	9,300	58,600	169,150	28.1
$100,000 +	40.4	4,000	4,000	79,300	223,500	59.6	2,500	17,200	165,000	399,050	19.5

Endnotes

[1] We use information from the 1983, 1992, 1995, 1998, and 2001 waves of the SCF. For a more complete discussion of features of the SCF as well as findings from the 2001 wave, see Aizcorbe, Kennickell, and Moore (2003).

[2] For ease of comparison, all dollar figures are converted to 2001 prices using the urban consumers all items Consumer Price Index.

[3] The omitted dummy variable is some college but not a four-year degree.

[4] The probit regressions also include a number of other explanatory variables that have been found to be significant in explaining credit card ownership, including marital status, number of children, whether the household head is self-employed or not currently employed, whether the household can be considered "liquidity constrained" because it has been turned down for credit or discouraged from applying for credit, whether the household over the past year spent less than its income, and whether the household had a checking account.

[5] In comparison, the estimated probability that this same individual would have any type of credit card rises from .63 in 1983 to .78 in 2001.

[6] In estimating the probabilities of card ownership, income and financial assets were assigned using the median values for the age-education range under consideration. For a typical less-than-35 year old with high school education, the median income was slightly over $30,000 (in 2001 $) with about $1,900 in financial assets. For the same aged household with a college degree, the median income is just under $45,000 and median financial assets were just under $10,000. For a household aged 50-64 with a college education, median income was just under $82,000 and median financial assets were slightly over $111,000. All representative households were assumed to be "savers," all were assumed to have a checking account, and none were assumed to be liquidity constrained.

[7] In the 1992 SCF, the question was about debit card ownership. In subsequent surveys, the question was rephrased to elicit a response explicitly on debit card usage. Thus, the 1992 figure is an upper bound to actual debit card use in 1992.

[8] For observations from the wave of the 1992 SCF, the dependent variable is debit card ownership instead of debit card use as in the 1995-2001 waves. However, the including the 1992 sample provides a useful base from which to measure the spread of debit card use, and size and significance of coefficients on the explanatory variables are little affected if the regression is run instead only on the 1995-2001 subset.

[9] In contrast, about two-thirds of all U.S. households had home equity, and slightly over half of households with incomes under $50,000.

[10] Information on new charges was not asked of households in 1983. We use instead a question that asked about frequency of use of the card in question. We consider households who had no balance on their bank-type card and answered that the card was used "hardly ever" or "never" to be non-active card users.

[11] As noted by Gross and Souleles (2002a, p. 151n) and others, SCF data are subject to the limitation that households substantially underreport their bankcard debt. As an example, Gross and Souleles compare the average credit card debt (including retail-store debt) across households with credit cards given by the 1995 SCF to that given by aggregate data on revolving consumer credit collected by the Board of Governors of the Federal Reserve System. The figures are around $ 2,000 and $5,000, respectively.

[12] Since utilization rates are based on reported credit card balances, they are subject to the same underreporting that we noted in footnote 6 above for credit card balances. Gross and Souleles (2002a) tend to find greater utilization rates based on administrative account data than those reported here, but their unit is an account rather than a household, and they have less information on demographics and on the overall household portfolio.

[13] Less than 1 percent of card holder households without a card balance were behind two months or more on any type of loan payment.

[14] This relationship between the size of the credit card balance to available liquid assets holds even accounting for an understatement of credit card debt in the SCF as indicated in Gross and Souleles. Indeed, readily available resources to pay off the balance are somewhat understated, as the SCF does not collect data on cash held by respondents.

[15] Note that some holders classified as "unaware" under the stricter criterion may be actually facing very low ('teaser') rates.

[16] For example, Ausubel estimated that, while the ordinary pre-tax return on equity in banking for the 50 largest issuers of credit cards was on the order of 20 percent per year, these issuers earned annual returns of 60 to 100 percent or more on their credit card business during the period.

[17] Examples include costs of locating other providers and of filling in new applications, and the perception that credit ratings and credit limits are functions of the length of time during which a particular credit card account is held, but he doubts that they are sufficiently important by themselves.

[18] Although banks do not alter interest rates, they can be generous to credit-worthy customers by providing grace periods, small or no annual fees, and points or miles; and strict with bad customers by imposing heavy penalties on those who miss their payments or exceed their limits.

[19] As Brito and Hartley (1995) put it, '[t]he most desirable customers are those who borrow a substantial amount on their cards and yet remain well within their credit limits and therefore are unlikely to default' (p. 409).

[20] Previous empirical studies of bankruptcy using household-level data include Moss and Johnson (1999), and Domowitz and Sartain (1999). The first uses data from the Survey of Consumer Finances, which does not include observations on bankruptcy filings. The second combines SCF data with a separate data set on a relatively limited set of bankruptcy petitions under Chapter 7 in the early 1980's, and finds that households with more credit card debt were more likely to file for bankruptcy.

[21] The probability of an average credit card holder to declare bankruptcy rose by 1 percentage point, and that to declare delinquency by 3 percentage points over the period.

[22] Although income variables turn out to be significant in predicting bankruptcy, they may also be interpreted as reflecting unmeasured changes in wealth for the years in which the PSID did not collect wealth data. More direct measures of financial need in the data turn out to be insignificant or marginally significant, but of course this may be because better proxies for need are not available and not because need does not play a role.

[23] Quantitatively, their model predicts that an increase of $1,000 in households' financial benefit from bankruptcy would result in a 7-percent increase in the number of bankruptcy filings.

[24] This is a random household telephone survey conducted monthly by the Ohio State University Survey Research Center, and it includes variables unavailable in other surveys. The period is February 1998 through May 1999, with additional data from September 1999.

[25] It is obvious that debt levels would rise more in response to any given increase if the customer had requested it with a specific expenditure in mind than if the bank initiated it.

[26] Households exhibit such behavior when they are characterized by "prudence", usually identified with a positive third derivative of the felicity function.

[27] The household has a finite lifetime of uncertain length, an effective size that varies over its life-cycle, and a bequest motive. It is faced with non-diversifiable income risk and age-income profile determined by its education level and estimated from PSID data.

[28] This desired consumption level will not be the same in general as the level that would prevail in the absence of the problem of self-control. This is because the household bears costs in the effort to restrain the behavior of the shopper.

[29] Reda (2003), quoted in Zinman (2004), reports that debit cards tend to be used for smaller transactions involving instantaneous consumption, while credit cards are used for larger transactions of more durable items.

[30] Haliassos and Reiter (2005) compare simulated costs of revolving credit card debt and of using a debit card to cope with a self-control problem. They find that, even if we abstract from bonuses and fraud protection offered by credit cards, the benefits from switching to debit cards are small for a household with a self-control problem. These can plausibly be eliminated by such additional benefits offered by credit cards and by any differential transaction fees or informational requirements in acquiring the newer instrument, debit cards.

CFS Working Paper Series:

No.	Author(s)	Title
2006/19	**Carol C. Bertaut** **Michael Haliassos**	Credit Cards: Facts and Theories
2006/18	**Dirk Krueger** **Alexander Ludwig**	On the Consequences of Demographic Change for Rates of Returns to Capital, and the Distribution of Wealth and Welfare
2006/17	**Franklin Allen** **Elena Carletti**	Mark-to-Market Accounting and Liquidity Pricing
2006/16	**Erik Hurst** **Arthur Kennickell** **Annamaria Lusardi** **Francisco Torralba**	Precautionary Savings and the Importance of Business Owners
2006/15	**Arthur Kennickell** **Annamaria Lusardi**	Disentangling the Importance of the Precautionary Saving Motive
2006/14	**Yanis Bilias,** **Dimitris Georgarakos** **Michael Haliassos**	Portfolio Inertia and Stock Market Fluctuations
2006/13	**Lars Jonung** **Ludger Schuknecht** **Mika Tujula**	The Boom-Bust Cycle in Finland and Sweden 1984-1995 in an International Perspective
2006/12	**Julia Hirsch** **Uwe Walz**	Why Do Contracts Differ between VC Types? Market Segmentation versus Corporate Governance Varieties
2006/11	**Carsten Bienz** **Julia Hirsch**	The Dynamics of Venture Capital Contracts
2006/10	**Renata Bottazzi** **Tullio Jappelli** **Mario Padula**	Retirement Expectations, Pension Reforms, and Their Impact on Private Wealth Accumulation

Copies of working papers can be downloaded at http://www.ifk-cfs.de