



## Credit Card Debt Puzzle: Liquid Assets to Pay Bills

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### Abstract:

Using transaction data from a US consumer payments diary, we revisit the credit card debt puzzle—a scenario in which consumers revolve credit card debt while also keeping liquid assets as bank account deposits. This scenario is very common: 42 percent of consumers in our sample were borrower-savers in 2019 (those who carry \$100 or more in credit card debt and \$100 or more in liquid assets). We explain the puzzle by showing that consumers need their liquid assets to pay monthly bills and other necessary expenses, including mortgage or rent. More than 80 percent of bills by value were paid out of bank accounts and could not be charged to credit cards, so bank account balances were needed to cover those basic expenses. On average, borrower-savers' credit card debt exceeded their liquid assets. The average borrower-saver carried almost \$6,400 in unpaid credit card debt and had \$5,400 in liquid assets, including checking and savings accounts, cash, and general-purpose prepaid cards. Only 40 percent of borrower-savers had liquid assets greater than their unpaid credit card balance. In addition, borrower-savers' monthly expenses (bills and purchases) averaged 77 percent of their liquid assets, not leaving enough to repay their credit card debt. On average, the value of their liquid assets could cover only about 60 percent of their unpaid debt plus monthly bills. In almost every category of assets or debts, both housing and non-housing related, borrower-savers were significantly worse off financially than savers. Thus, the differences between borrower-savers and savers are much broader than just their credit card debt and bank account balances; they extend to mortgage debt and home equity. Even when we control for income and demographics in a regression, we find that carrying a mortgage or other debt (such as auto or educational loans) is associated with a higher probability of revolving on a credit card, suggesting that various types of household debt are complements rather than substitutes. During the COVID-19 pandemic in 2020, consumers' unpaid credit card debt decreased and their liquid assets increased, so the fraction of borrower-savers dropped to 35 percent of the sample.

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This paper presents preliminary analysis and results intended to stimulate discussion and critical comment. The views expressed herein are those of the authors and do not indicate concurrence by the Federal Reserve Bank of Boston, the Federal Reserve Bank of Atlanta, the principals of the Board of Governors, or the Federal Reserve System. This paper, which may be revised, is available on the website of the Federal Reserve Bank of Boston at <https://www.bostonfed.org/publications/research-department-working-paper.aspx>.

## I. Introduction

The credit card debt puzzle refers to a scenario in which consumers carry—or, “revolve” — unpaid credit card debt while maintaining some liquid assets, typically as a balance in their bank accounts. While the rates of interest paid on deposit accounts fluctuate somewhat, they are always substantially below the rates of interest on revolving balances charged by credit card issuers. For example, in late 2021 the average interest rate paid on savings account balances was 0.06 percent,<sup>1</sup> and the average interest rate charged on credit card plans was 16.13 percent.<sup>2</sup>

Clearly, there is a mismatch between the potential saving from paying down credit card debt and the behavior of such consumers. Much of the research into this behavior is theoretical, with limited empirical evidence involving a snapshot of consumers’ debt and liquid asset holdings—a balance sheet view. We extend that analysis by incorporating payment flows using transaction data recorded daily by consumers. Using holdings, debt, and transaction data from a consumer payment diary, which participants kept over a three-day period, we analyze how bill payments and purchases are made to assess how much consumers need to keep in their bank accounts, regardless of whether they carry revolving credit card debt—a cash flow view.

By using the actual transaction data, we can separate the transaction-related needs for liquidity from other potential reasons for maintaining liquid assets. If consumers maintain a positive balance in their deposit account to pay their regular monthly bills, they do not view that money as an investment. In such cases, even if the interest rate paid on the deposit account is zero, consumers may want to maintain a positive balance to avoid paying fees for late payments or, once monthly bills and other regular expenses are accounted for, to be able to cover unexpected expenses in an emergency.

Like the existing literature, we use data on consumers’ checking and savings account balances. In contrast to the existing literature, we also use data on consumers’ cash holdings and detailed data on specific transactions paid with various payment methods. We find that the credit card puzzle is very common: 42 percent of consumers in our sample were “borrower-savers” in

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<sup>1</sup> Bankrate.com weekly survey of depository institutions conducted on November 21, 2021, accessed at <https://www.bankrate.com/banking/savings/average-savings-interest-rates/>

<sup>2</sup> <https://www.creditcards.com/credit-card-news/rate-report/>

2019. We define borrower-savers as those who carry \$100 or more in revolving credit card debt and hold \$100 or more in liquid assets.

The puzzle can be explained first by consumers' inability to repay all credit card debt from liquid assets even if they have no monthly expenses and second by consumers' need to pay their monthly bills and other necessary expenses. First, on average, a borrower-saver in our sample had \$5,400 in liquid assets, including checking and savings accounts, cash, and general-purpose prepaid cards, and carried more in unpaid credit card debt—almost \$6,400. Second, the average borrower-saver paid \$2,616 in monthly bills, such as utilities and rent or mortgage, and \$1,555 in purchases, such as groceries and gas, which totals \$4,171, or 77 percent of their liquid assets. More than 80 percent of borrower-savers' bills by value were paid using out-of-bank-account payment instruments, so the account balances were needed to cover those bills.

We use the liquid account balances as a proxy for cash flows in and out; average monthly income is excluded from the analysis of ability to pay, because the diary covers only a three-day period, and so it is not possible to directly match income receipts per person to payments per person over the course of a month. Available income data also do not align with the debt and payments data, because income is reported per household while credit card debt and liquid assets are reported per consumer. In addition, gross household income (which for our sample averages \$7,146 per household per month for all credit card adopters and \$6,321 per household per month for borrower-savers) cannot be directly linked to a change in liquid assets, because gross income is reported before tax withholdings and other deductions (the employee share of employer-provided health care, for example).

We look at other financial assets and home equity to see how borrower-savers differ from credit card adopters who do not carry unpaid credit card debt (hereafter "savers"). We separate homeowners into those with and those without a mortgage and incorporate the value of each homeowner's home equity, as home equity has been found to have a significant effect on households' financial decisions (Chetty, Sandor, and Szeidl 2017). We find that in almost every category of assets or debts, both housing and non-housing related, borrower-savers were significantly worse off financially than savers. Thus, the differences between borrower-savers and savers are much broader than just their credit card debt and bank account balances; they extend to mortgage debt and home equity. For example, only 34 percent of borrower-savers reported that they could meet a \$2,000 emergency expense using liquid assets, compared with 65

percent of savers. The majority of borrower-savers hold liquid assets to cover their typical, non-emergency expenses.

We apply regression analysis to isolate factors that affect the likelihood of being a borrower-saver. Being a borrower-saver is correlated with income and demographics. Even when we control for these attributes, however, we find that carrying a mortgage or other forms of debt is associated with a higher probability of revolving on a credit card, suggesting that various types of household debt are complements rather than substitutes. Among homeowners, carrying a mortgage significantly raises the probability of revolving, although having non-mortgage debt, such as auto or student loans, has a much greater positive effect on the probability of having credit card debt regardless of whether the borrower is a homeowner or a renter. A larger dollar value of home equity lowers the probability of revolving on credit cards but has no significant effect on the amount of credit card debt, conditional on the debt being revolving.

During the COVID-19 pandemic in 2020, consumers' unpaid credit card debt decreased and their liquid assets increased on average, so the borrower-savers fraction dropped from 42 percent to 35 percent of the sample.

The rest of the paper is as follows. Section II summarizes the relevant literature. Section III describes the data used in the analysis. Section IV examines the differences between borrower-savers and savers, including differences in demographics and in purchasing and bill-paying behavior. Section V presents the regressions used in the analysis and summarizes the regression results. Section VI provides an overview of changes from 2019 to 2020 to examine the effects of the COVID-19 pandemic on our results. Section VII concludes.

## II. Literature review

The credit card debt puzzle has been perplexing researchers for decades. Gross and Souleles (2002) found that some households hold both high-interest credit card debt and low-return liquid savings that could be used to pay down those debts. Researchers have used various explanations for the credit card puzzle. Some have suggested that people who rely on costly credit card debt need to maintain positive bank account balances because they might be less likely to get approved for credit cards in the future or face other types of financial uncertainty. For example, Fulford (2015) attributes the prevalence of borrower-savers to the volatility in credit limits: Households hold liquid savings and credit card debt because they may lose access to credit in the

future. Gorbachev and Luengo-Prado (2019) find that individuals who are less confident about their ability to access credit in the future are more likely to use their current credit and to keep some liquid savings at the same time. A related literature studies individuals who pay their credit card bills even at the cost of mortgage delinquencies and foreclosures in order to preserve liquidity (see, for example, Cohen-Cole and Morse 2010).

Another consideration could be the need for liquid assets—money in the bank and cash—to pay for goods and services for which credit cards are not accepted. Telyukova and Wright (2008) and Telyukova (2013) argue that holding money and costly credit card debt simultaneously can be necessary because households need to hold some liquid assets in a bank account to cover expenses that cannot be paid by credit card: mortgage or rent, utilities, childcare, taxes. That explanation allows Telyukova (2013) to account for about half of the households in her data that hold credit card debt and liquidity simultaneously.

We further investigate this explanation by using holdings, debt, and transaction data from a consumer payment diary in which consumers record their daily transactions and the payment instruments they use for each transaction. Rather than assuming that some categories of goods and services are paid for in cash or through bank account payments, we see which transactions were paid with a credit card, which were paid in cash, and which were paid out of a bank account—using checks, debit cards, or electronic payments. Consumers in our sample also reported their checking account balance, whether they revolve their credit card debt, and the dollar amount of their revolving credit card debt. Unlike in Telyukova (2013), our data include consumers' cash holdings and the balances of their general-purpose prepaid cards, as well as detailed information about actual transactions conducted using these and the bank-account-linked payment instruments.

### III. Data

We use data from the Survey of Consumer Payment Choice (SCPC) and the Diary of Consumer Payment Choice (DCPC),<sup>3</sup> nationally representative surveys of US adults that have been

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<sup>3</sup> The survey/diary is conducted through a collaboration between the Federal Reserve Banks of Atlanta, Boston, and San Francisco. The data and assisting documents (codebooks) are publicly available for downloading from the Federal Reserve Bank of Atlanta consumer payments website, <https://www.frbatlanta.org/banking-and->

administered every October since 2015. In 2021, the SCPC and DCPC were combined into a single survey instrument. In the survey/diary, respondents report the payment instruments they have adopted, including cash, check, credit card, debit card, and two types of electronic payments out of a bank account: online banking bill payment (OBBP) and bank account number payment (BANP). In 2019 and 2020, those who reported having a credit card also reported whether they carried unpaid credit card debt and the dollar amount of their revolving credit card debt.<sup>4</sup> We identify credit card revolvers based on the SCPC responses regarding unpaid credit card debt. Respondents also reported the value of other assets outside of checking and savings accounts, and their other debts outside of credit card debt.<sup>5</sup> Respondents who reported owning a home also reported the market value of their primary home and debt owed on that home (mortgage, home equity loan, and home equity line of credit [HELOC]), allowing us to calculate the value of each homeowner's home equity.

Respondents report liquid assets in the survey/diary each year, including checking account balances, cash holdings, and balances on general-purpose reloadable prepaid cards. As of 2019, respondents also report savings account balances. Liquid assets do not include real estate or any other investments, just bank accounts, cash, and general-purpose prepaid cards. The survey/diary is one of the few data sources for which US consumers report their cash holdings.

In 2019 and 2020, DCPC respondents recorded all of their transactions during three consecutive days in October. Transactions included purchases in person or online, bill payments, person-to-person (P2P) payments, and ATM withdrawals and deposits. For each transaction, respondents reported the dollar value, payment method, type of transaction, and merchant (payee) type. We can identify whether a transaction was a bill payment, a purchase, or a P2P transaction, and also the payee (for example, a financial institution, gas station, or another person). Most respondents took the SCPC very shortly before recording the DCPC. Therefore, it

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[payments/consumer-payments.aspx](#). Summary reports for the 2020 DCPC are given in Greene and Stavins (2021a) and Cole, Kumar, and O'Brien (2021). Similar surveys are conducted by the Bank of Canada; see Henry, Huynh, and Welte (2018).

<sup>4</sup> The SCPC question was, "About how much was the unpaid balance on all of your credit cards that you carried over from the previous month?"

<sup>5</sup> The question asks about total non-housing assets and total non-housing debt. We calculate non-credit card debt by subtracting credit card debt from the total debt.

is possible to link participants' SCPC responses about credit card balances to their transactions data reported in the DCPC.<sup>6</sup>

DCPC respondents who paid their credit card bills during their three-day diary period were asked whether they paid the full balance, and if not, how much of the balance remained unpaid. Respondents who did not pay the full balance also were asked whether they had enough money in their bank accounts to pay the full amount. When respondents did not pay the full balance but indicated that they had enough liquid assets to do so, they were asked to tell, in their own words, why they chose not to pay the full amount (statement balance).<sup>7</sup> Although those answers provide some useful descriptive explanation as to why consumers simultaneously carry unpaid credit card debt and liquid assets, that information is available only for the small subsample of respondents who made a credit card bill payment during their three diary days.

Liquid assets were calculated by using the DCPC data. DCPC data are available for every year from 2015 to 2020; however, respondents were asked to report their savings account balances only in 2019 and 2020, and the 2020 sample was reduced.<sup>8</sup> Therefore, we use the 2019 data in the main part of the analysis and supplement it with the 2020 data to examine the effect of the COVID-19 pandemic on our results. Limiting the 2019 sample to respondents who participated in both the DCPC and SCPC and did not have missing liquid asset data, we end up with 2,994 unique respondents recording 15,077 transactions, of which 12,259 were payments. Of those 12,259 payments, 3,006 were made using a credit card and 453 were to pay a credit card bill.

Because we focus on consumers who decided whether to carry credit card debt, we limit our sample to credit card adopters only. In doing so, we eliminate a potential bias caused by

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<sup>6</sup> Respondents reported their checking and savings account balances on day 0 (that is, the night before respondents begin reporting transactions) and day 3 of the DCPC, prepaid card balances on day 0, and cash balances every day. We use day 0 liquid asset balances, because respondents took the SCPC before taking the DCPC, so using day 0 ensures that the reference dates for the liquid assets and revolving balance values are as close as possible to each other.

<sup>7</sup> First, respondents recorded the transaction's dollar value and merchant. If the merchant was a financial institution, respondents were asked if they were paying a credit card bill. Then, they were asked, "How much was the full amount due (statement balance) of the credit card bill?" If the dollar value of the transaction was less than the statement balance, they were asked, "Did you have enough money in your checking or savings account to pay the full amount due (statement balance) of this credit card bill?" If respondents answered yes to the above question, they were asked, "Why did you choose not to pay the full amount due (statement balance) for this credit card bill?"

<sup>8</sup> The sample size was reduced in 2020 because some panelists were invited to participate in experiments investigating various ways to reduce survey burden (Greene and Stavins 2021a).

supply-side constraints on consumers who might have been denied a credit card. Almost 80 percent of the sample (2,391 respondents) were credit card adopters; that is, they reported having at least one credit card in the 2019 SCPC. We identify credit card adopters who answered “0” in the SCPC for the unpaid balance on all credit or charge cards carried over from the preceding month as non-revolvers. All other credit card adopters are identified as revolvers.<sup>9</sup> In 2019, 47 percent of credit card adopters reported carrying an unpaid balance on their card(s).

We want to learn more about revolvers who maintain some liquid assets to understand the causes of their seemingly puzzling behavior. We calculate liquid assets as the sum of checking account balances, savings account balances, cash holdings, and general-purpose prepaid card balances, all reported in the DCPC.

We investigated various combinations of revolving balances and liquid assets to classify credit card adopters as savers, borrowers, or borrower-savers. For symmetry, we chose a \$100 threshold for both the revolving balance and the value of liquid assets.<sup>10</sup> There was little difference between the number of credit card adopters with any positive revolving debt (any debt greater than \$0) and those with at least \$100 in revolving debt: 47.4 percent of credit card adopters revolved any amount, and 45.5 percent of credit card adopters revolved \$100 or more (both shares are weighted). In our data, the percentage of credit card adopters who carried unpaid balances is comparable to the percentages in other data sources. Based on the Survey of Consumer Finances, 45.4 percent of households held debt in the form of credit card balances in 2019. Among revolvers, the difference between the percentages of our sample with any liquidity (liquid assets > \$0) and with liquidity greater than \$100 was also small: 99 percent had some liquidity, and 92 percent had at least \$100 in liquid assets. Our analysis is robust with respect to the threshold, and consumer attributes are similar when we set the threshold at \$0 instead. We opted not to use a \$0 threshold, as very few consumers have no liquid assets.

Therefore, we classify credit card adopters as follows (Table 1):

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<sup>9</sup> Five credit card adopters did not answer the question and were omitted from the analysis.

<sup>10</sup> Telyukova (2013) uses a \$500 threshold, but we selected a lower threshold, as many households hold less than \$500 in liquid assets. In our sample, 29 percent of all respondents and 18 percent of credit card holders had less than \$500 in liquid assets in 2019.



- Savers: credit card adopters who have at least \$100 in liquid assets and have less than \$100 in unpaid credit card debt. This group comprises 52 percent of credit card adopters.
- Borrower-savers (hereafter “bor-savs”): credit card adopters who have at least \$100 in liquid assets while carrying \$100 or more in unpaid credit card debt. This group comprises 42 percent of credit card adopters.
- Borrowers: credit card adopters who carry \$100 or more in unpaid credit card debt and have less than \$100 in liquid assets. This group comprises 3 percent of all credit card adopters.
- Others: credit card adopters who have less than \$100 in liquid assets and less than \$100 in unpaid credit card debt. This groups comprises 2 percent of the sample.

The share of bor-savs and share of borrowers in our data are consistent with the literature. For example, Gorbachev and Luengo-Prado (2019) use data from the National Longitudinal Survey of Youth (NLSY79) and find that the percentage of bor-savs ranged from 40.5 to 48.4, depending on the year. As in our data, borrowers comprised only a small fraction of the NLSY sample.

## IV. Borrower-savers vs. Savers

### A. Demographics and income

Table 2 shows the demographic breakdown of the sample. All the numbers are weighted. In general, bor-savs tended to be younger and less educated than savers. Compared with savers, bor-savs were significantly less likely to be over 65 (more likely to be middle aged), less likely to have a college or graduate degree, more likely to be employed rather than retired, less likely to be married and more likely to be divorced, and more likely to be Black or Latino.<sup>11</sup>

Table 3a shows the average household income by cardholder category and the fraction of cardholders in each income cohort.<sup>12</sup> Compared with savers, bor-savs had lower income: Their mean annual household income was \$75,850, compared with \$98,589 for savers, and they were

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<sup>11</sup> Using household data from the Survey of Consumer Finances and omitting households with heads older than 65 and retirees, Telyukova (2013) finds few demographic differences between savers and bor-savs. Including consumers over 65 is important, as they are likely to hold a large amount of liquid assets.

<sup>12</sup> Consumers who had not adopted a credit card and were more likely to be in lower income groups were omitted from these distributions.

significantly less likely to have an annual household income over \$100,000. Figure 1 also shows the distributions of savers, bor-savs, and borrowers by income cohort. Table 3b shows a breakdown of each income cohort into the cardholder categories: Almost two-thirds (62 percent) of consumers with annual household income above \$100,000 a year were savers, compared with less than 40 percent of those with household income below \$50,000 a year.

Note that income is at the household level, while purchases and bill payments are recorded at the individual consumer level. Although some of the bills might have been paid by a respondent on behalf of their household, the respondents were instructed to record only the bills they paid themselves. On average, a bor-sav’s monthly household income was \$6,321, but that amount includes taxes and any other potential deductions. We do not have data on the net income at an individual consumer level.

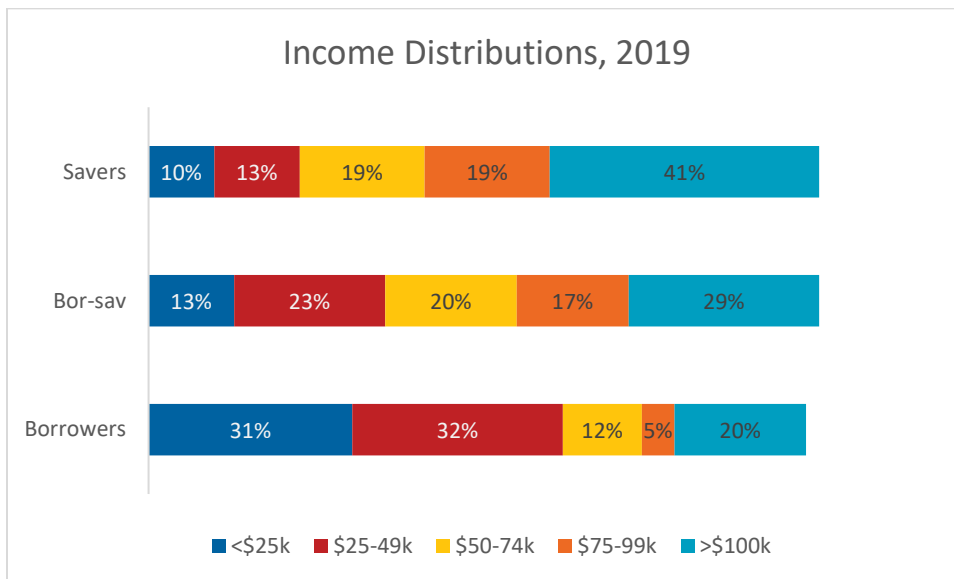


Figure 1. Distributions of savers, bor-savs, and borrowers by income cohort, 2019 DCPC.

In the regression analysis below, we estimate the marginal effects of each demographic and income variable on the probability of being a bor-sav.

#### B. Financial position: non-housing

In addition to differences in demographics and income, bor-savs exhibited a different financial profile compared with savers that extended beyond the obvious distinction involving credit card

balances. Table 4 shows the average values of non-housing financial variables including liquid assets and other non-housing assets and liabilities, credit card revolving and utilization, credit score, and financial distress measures for each group. In almost every type of asset and debt, bor-savs fared significantly worse than savers.

Although both savers and bor-savs held liquid assets, the values of those assets differed substantially between the two groups. On average, savers had more than five times the liquid assets of bor-savs: \$27,765 versus \$5,395. Both groups held most of their liquid assets in savings accounts. With so much less in liquid assets, bor-savs were substantially more liquidity constrained than savers. Total non-housing assets and non-mortgage debt also differed significantly between the groups.<sup>13</sup> On average, a saver held \$270,701 in assets and \$26,902 in debt, resulting in \$245,586 in net worth. In contrast, a bor-sav held \$80,913 in assets and \$43,005 in debt, resulting in \$37,765 in net worth. Thus, the average net worth of savers (excluding housing assets and debt) was nearly 6.5 times that of bor-savs. While 54 percent of savers held some positive non-mortgage, non-credit-card debt, such as auto or educational loans, 87 percent of bor-savs did so. For the majority of bor-savs, debt extends beyond credit cards.

Looking at credit card balances, on average, each bor-sav carried \$6,388 in unpaid credit card balances, whereas each saver carried almost no revolving debt (as noted above, we define savers as having revolving debt of less than \$100). Note that the mean amount of unpaid credit card debt was much higher among bor-savs than among borrowers, who carried \$4,124 in debt on average. The majority of bor-savs carried a substantial amount of debt: 68.4 percent (30.6 percent of all credit card adopters) carried a revolving balance greater than or equal to \$1,000. Large credit card debt could be the result of a shock (such as a divorce) or an accumulation of past shocks (such as large medical bills) that has built up to the current stock of credit card debt and has a long-lasting impact, making repaying the credit card debt very difficult.

Savers also had a significantly higher credit limit than bor-savs: The average limit, summed over all of a respondent's credit cards, was \$27,579 per saver and \$22,062 per bor-sav. As a result, savers had a much larger financial cushion of unused available credit in case of liquidity needs compared with bor-savs. We measure credit card utilization as the ratio of the

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<sup>13</sup> Excluding respondents' primary home, although assets could include other real estate holdings.

cardholder's revolving debt to their credit limit. On average, a saver borrowed only 0.18 percent of their available credit limit, while a bor-sav borrowed nearly 44 percent of their credit limit. For almost one-third of bor-savs (31 percent), credit card utilization exceeded 50 percent of their limit, not including current period charges. High credit card utilization affects a consumer's credit score, further deteriorating their financial position and affecting their ability to open new lines of credit or purchase a house.

Bor-savs were much more likely than savers to overdraw on their bank account: 28 percent of bor-savs compared with only 10 percent of savers reported overdrawing at some point during the 12 months ending in October 2019 (59 percent of borrowers did so). Bankruptcy was very rare among savers but significantly more common among bor-savs and especially among borrowers. Only 1 percent of savers declared bankruptcy at some point during the preceding seven years compared with 6 percent of bor-savs and 22 percent of borrowers. Revolving behavior is incorporated in a consumer's credit score: Unpaid credit card debt has a strong negative effect on a credit score. Therefore, it is not surprising that bor-savs had a lower credit score, on average, compared with savers: Only 30 percent of bor-savs had a FICO credit score above 750, compared with 73 percent of savers.

Differences between savers and bor-savs extend to perceptions of the cost of credit cards. Respondents were asked to rate all payment instruments based on several criteria, including cost, on a scale of 1 to 5, with 1 being the worst (most costly) and 5 being the best (least costly).<sup>14</sup> In general, consumers perceive credit card payments to be costly. In every year of the SCPC, consumers rated credit cards as the costliest way to pay among all payment instruments (credit card, debit card, prepaid card, OBBP, BANP, cash, check, money order). In 2019, bor-savs rated credit cards as most costly, while savers were less negative regarding the cost of cards—which is not surprising, as they do not pay interest on their credit card balances and are likely to benefit from float and from points earned. The difference between the average direct ratings by the groups is statistically significant (bottom of Table 4). Bor-savs rated credit cards at 2.86 and savers rated them at 3.67 on the 1–5 scale, with, as noted above, 5 being the most positive, that is, least costly.

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<sup>14</sup> Besides cost, the criteria included convenience, security, acceptance, record keeping, and ease of setup. Previous research finds these ratings to be significant in predicting payment method adoption and use.

### C. Financial position: housing and total

Table 5 shows the average values of various housing-related measures for each group, as well as each group's average total net worth. Having a mortgage or having home equity is likely to affect consumers' credit card borrowing, even if consumers do not directly use their home equity for everyday spending or for paying their bills. This is because a homeowner with home equity may think about liquidity very differently from how a renter does, everything else being equal. In Table 5, we break down the sample into renters, homeowners with a mortgage, and homeowners without a mortgage.<sup>15</sup> As was the case with non-housing assets and debt discussed above, in almost every category savers were in a significantly better financial position compared with bor-savs.

More than 80 percent of savers and more than 70 percent of bor-savs reported owning a home, while only one-third of borrowers (35 percent) did so. Although most homeowners were carrying a mortgage, 31 percent of savers owned a home with no mortgage, compared with only 12 percent of bor-savs. Among homeowners, the average home value was significantly higher for savers than for bor-savs, while the average mortgage loan was lower. As a result, the average home equity (home value minus mortgage debt) among savers was \$206,799, compared with \$93,772 for bor-savs and \$42,506 for borrowers. Looking at the overall balance sheet for each group of consumers, the average net worth was \$412,584 for savers, \$104,753 for bor-savs, and \$13,207 for borrowers.

### D. Why do puzzlers carry unpaid debt?

In addition to being asked to give quantitative responses about the amount of unpaid credit card debt they had, DCPC respondents who paid some part of a credit card bill during their three-day diary period were separately asked an open-response question that might help explain their behavior. Consumers collectively recorded 453 credit card bill payments in the 2019 DCPC. Of these payments, almost half (204) were for less than the full statement balance. Of the respondents who paid less than the amount due on the statement, about one-third (67) said that

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<sup>15</sup> The category "home loans" includes mortgages, home equity loans, and HELOCs. We cannot separate mortgages from these other types of loans.

they had enough money in their checking or savings account to pay the full amount due.<sup>16</sup> Responding to the question “Why did you choose not to pay the full amount due (statement balance) for this credit card bill?” 33 percent said that they needed to pay other bills and expenses, and 21 percent said that they wanted to build up savings/cushion in their bank.<sup>17</sup> Twelve percent (8 respondents) said their cards were in a zero-interest promotional period. The remaining 34 percent (23 respondents) gave no or unclear answers (12 percent), cited personal preference (13 percent), or mentioned timing issues such as waiting for refunds or a paycheck (6 percent). Two respondents (3 percent) said their cards were shared with others who paid separately. Although available for only a subset of the sample, these responses are consistent with what we observe in the data: Consumers need liquid assets to pay unavoidable bills out of their bank accounts, and some keep liquid assets as a cushion for unexpected expenses.

#### E. Payment behavior

We classify consumers’ payments into purchases, which include person-to-person (P2P) payments, and bills. On average, a consumer paid \$1,707 in purchases and \$3,174 in bills in October 2019 (Table 6). Although savers made fewer transactions on average than bor-savs did,<sup>18</sup> the total value of purchases and bill payments made by the average saver was greater than the total value for the average bor-sav. This makes sense because, as noted above, bor-savs generally have lower income than savers.

Our data include the exact payment method used for each transaction. For the purpose of our analysis, we grouped all the out-of-a-bank-account payment methods into a single category. These include debit cards, check, and electronic payments out of a bank account. The remaining transactions were paid in cash or with a credit card.<sup>19</sup> As measured by shares of the dollar value of all of their transactions, savers used credit cards more than twice as much as bor-savs did, both for purchases and to pay their bills. This aligns with other research finding that credit card

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<sup>16</sup> The exact DCPC question was “Did you have enough money in your checking or savings account to pay the full amount due (statement balance) of this credit card bill?” Of the 67 respondents, 45 were bor-savs as defined by their response to the SCPC question on carrying unpaid credit card debt.

<sup>17</sup> The exact responses were phrased as “other bills to pay,” “would not have enough money to make mortgage etc.,” “other bills to pay in near future,” etc.

<sup>18</sup> The number of transactions for each category and each payment method is available from the authors.

<sup>19</sup> We omit some less common payment instruments, such as prepaid cards and money orders.

adopters with unpaid balances use credit cards less (Stavins 2020). In the regression analysis below, we test whether carrying a credit card balance is negatively associated with the dollar value of credit card transactions when controlling for other factors such as income and education.

1. How do consumers make purchases?

Purchases include transactions conducted at the point of sale or online, and they include many basic retail categories, such as grocery stores and gas stations, as well as P2P payments. Table 6 shows that on average, a bor-sav spent \$1,555 on purchases per month, while a saver spent \$174 more per month on purchases. Although the amounts spent were similar, the payment methods used diverged: Savers used credit cards more than any other payment instrument for purchases, whereas bor-savs mostly used debit cards (included in payments made out of a bank account), potentially as a disciplinary device to help them limit their spending. Bor-savs spent \$410 with a credit card and \$866 with out-of-a-bank-account payment methods. Savers spent more than twice as much, (\$885) with a credit card and less (\$569) from a bank account (Figure 2).

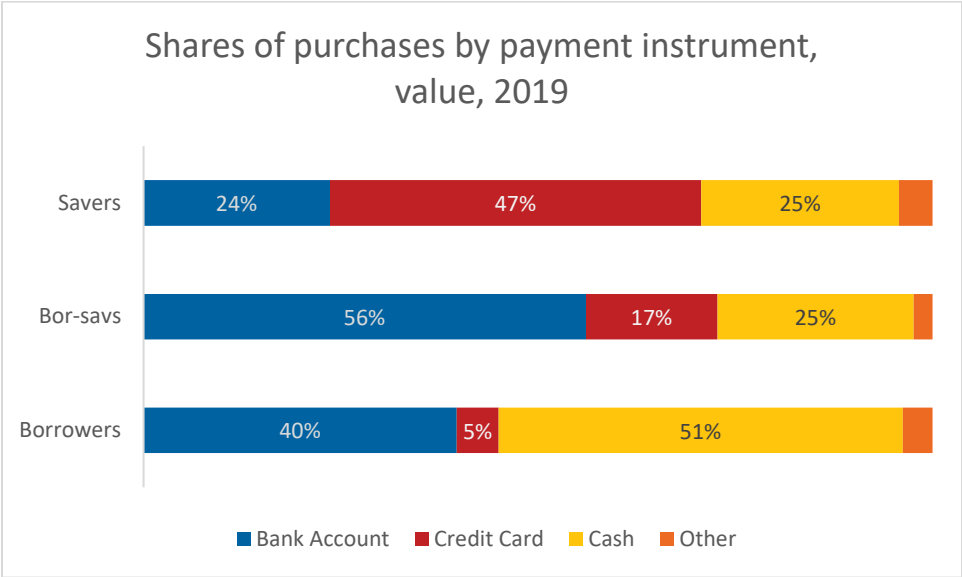


Figure 2: Shares of purchases made with each payment method, by type of credit card adopter. Source: Authors’ calculations based on the 2019 DCPC; “Other” includes prepaid cards, money orders, account-to-account payments, income deductions, and funds stored in mobile payment apps.

2. How do consumers pay their bills?

Some payments were most likely classified as bills by all respondents: rent, mortgage, utilities, insurance payments, etc. The classification of other payments may have been more ambiguous.

For example, if a plumber was paid at the time they performed their service, the respondent might not have classified the payment as a bill payment. But if the plumber had sent an invoice in the mail afterward, the respondent might have classified the payment as a bill payment. The most important bills are also typically the largest by dollar value: rent, mortgage, utility bills, and loan payments. First, we analyze all bill payments identified as such by respondents, and second, we isolate the payments that are typically recognized as bills, namely rent, mortgage, utilities, and loan payments. Unlike some purchases, these bills are unavoidable and therefore must be paid even if a consumer carries costly credit card debt. In terms of methods, bill payments can be made with a credit card, cash, or out of a bank account. Although bills constitute the minority of monthly payments by number—the average credit card adopter paid 8.8 bills and made 34.8 purchases in October 2019—they far outweigh purchases in terms of the dollar value and therefore provide the crucial part of the explanation of the puzzling behavior.

Compared with the payment methods for purchases, those used to pay bills are more likely to be restricted by the payee’s preferences. For example, many bill payments cannot be charged to a credit card (Greene and Stavins 2021b). Many payees require a check or an electronic payment, and many landlords insist on being paid with a paper check (Zhang 2016). Other payees may allow credit card payments but charge a processing fee for accepting those payments, thereby passing their own cost of accepting credit card transactions onto the payers. Therefore, consumers may need to keep large positive balances in their bank accounts to pay their bills, regardless of whether they carry revolving credit card debt.

In contrast to how they paid for purchases, savers and bor-savs paid their bills similarly (Table 6 and Figure 3). Both paid only a relatively small fraction of their bills in cash or with a credit card. The vast majority of bills were paid using out-of-a-bank-account payment methods—about 80 percent by both number and value for all consumers. Savers were more likely to use credit cards to pay their bills compared with consumers in the other two groups, but even savers paid three-quarters of their monthly bills (by both number and value) out of their bank accounts. Bor-savs paid 83 percent of their monthly bills (by both number and value) out of their bank accounts.



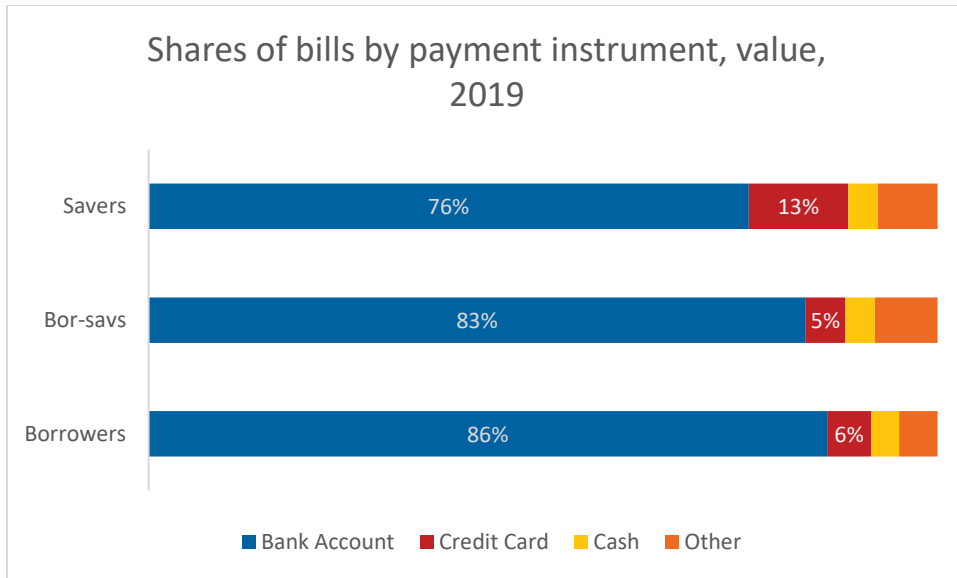


Figure 3: Shares of bills paid with each payment instrument, by type of credit card adopter. Source: Authors’ calculations based on the 2019 DCPC; “Other” includes prepaid cards, money orders, account to account payments, income deductions, and funds stored in mobile payment apps.

Compared with bills in general, the most important and largest monthly payments, as identified by payee and purpose, were even more likely to be paid from a bank account: Mortgage, rent, utilities, and loan payments out of a bank account comprised 85 percent of the total value of these payments for all credit card adopters.<sup>20</sup> These most important bills constituted about 80 percent of the value of all bills. On average, bor-savs paid about the same dollar amount as savers out of a bank account for these bills. However, bor-savs paid a higher share of these payments out of bank accounts than savers did: 89.3 percent compared with 82.1 percent, due to savers’ higher use of credit cards for these types of bills (Table 6).

Bills for utilities (electric, gas, water, etc.) were the most likely of all to be paid from a bank account. On average, credit card adopters made 89 percent of all payments to utilities this way, with bor-savs paying the highest share: Bor-savs paid 91.9 percent of their utility bills from a bank account, and savers paid 86.4 percent.

<sup>20</sup> Monthly payments included in “Mortgage, rent, utilities and loans” is the sum of payments made to merchant category 15 (“Mortgage companies, credit card companies, banks, insurance companies, stock brokers, IRA funds, mutual funds, credit unions, sending remittances”), merchant category 14 (“Rent for apartments, homes, or other buildings, real estate companies, property managers, etc.”), and merchant category 8 (“Utilities: electricity, natural gas, water, sewer, trash, heating oil”).

#### F. Payments and liquid assets in context: Puzzlers vs. savers

Above, we showed that the amount paid by a bor-sav for bills per month was approximately 80 percent of the amount paid by a saver, while the liquid assets of a saver outstripped those of a bor-sav by a factor of five, on average. In addition, consumers in both cohorts made most of their bill payments from a bank account—at least 75 percent of the dollar value of monthly bills. Combining these factors provides insights into the credit card debt puzzle.

For savers, average liquid assets (\$27,765) were more than eight times the value of monthly bill payments (\$3,280); bor-savs' assets were about double the value of monthly bill payments on average (\$5,395 and \$2,616, respectively). Income also differed between the two groups (Table 3a). The average monthly household income before taxes was \$8,216 for savers and \$6,321 for bor-savs. When the average unpaid card balance is added, however, the average value of bor-savs' liquid assets was just 60 percent of the dollar value of their monthly bills. So, although bor-savs' liquid assets exceeded their bill payments on average, they did not have sufficient liquid assets to pay bills *and* repay their credit card debt. And, even if they had no bills to pay, their average liquid assets of \$5,395 were less than their average credit card balance of \$6,388. Besides monthly bills, many monthly purchases, for example groceries and gas, fall primarily into the category of necessities. Bor-savs' liquid assets were just barely sufficient to cover their bills and purchases, a finding supported by their increased propensity to overdraft (Table 4).

Given the financial situation depicted above, it is not surprising that bor-savs were poorly prepared to handle unexpected emergency expenses. Bor-savs were more likely than savers to report that they would have trouble coming up with funds to meet an emergency expense: Only 34 percent of bor-savs reported that they could meet a \$2,000 emergency expense using liquid assets, compared with 65 percent of savers.<sup>21</sup> Holding liquid assets did not prevent the majority of bor-savs from being unprepared for unexpected financial shocks.

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<sup>21</sup> SCPC respondents were asked whether they could meet an unexpected \$2,000 emergency expense using their liquid assets. The Survey of Household Economics and Decisionmaking (SHED) conducted by the Federal Reserve Board in November 2020 found that when faced with a hypothetical expense of \$400, 64 percent of adults (including credit card adopters and non-adopters) said they would have no difficulty covering such an expense with cash or money in their bank account (Federal Reserve Board 2021). Note that the two surveys are not comparable, as our sample includes credit card adopters only—who generally are more financially secure than those without a credit card—and the amounts of hypothetical emergency expenses differ.

Thus, the credit card puzzle is not a puzzle after all. Both savers and bor-savs have liquid assets, but while savers have sufficient liquid assets to pay bills and credit card balances, bor-savs do not have enough to pay both. Instead, they pay their bills and revolve their credit card debt because there is a pecking order in payments.

## V. Regressions

Above we showed differences between bor-savs and savers based on summary statistics. We now estimate the probability of being a bor-sav as a function of the cardholder's demographic and financial attributes to isolate the effect of those attributes. We include home equity in the measures of a consumer's financial position, as previous studies find that home equity is important in influencing households' financial decisions (Chetty, Sandor, and Szeidl 2017). In addition, we estimate the revolving balance conditional on a cardholder being a bor-sav. We apply the two-stage Heckman model, where stage 1 is the probability of being a bor-sav, and stage 2 is the dollar amount of revolving debt conditional on being a bor-sav. Controlling for other factors, we also test whether revolvers spend less on credit cards compared with non-revolvers, as Stavins (2020) finds.

For the probability of the cardholder being a bor-sav in stage 1 of the Heckman model, we estimate the following regression using probit:

$$\Pr(\text{bor-sav}_i) = f(\text{DEM}_i, \text{INC}_i, \text{FIN}_i, \text{CHAR}_i), \quad (1)$$

where  $\text{bor-sav}_i=1$  if  $i$  is a borrower-saver (that is, has at least \$100 in a revolving balance and at least \$100 in liquid assets) and 0 otherwise,  $\text{DEM}_i$  is a vector of  $i$ 's demographic attributes (age, education, gender, ethnicity, race, marital status, employment status),  $\text{INC}_i$  is a set of dummy variables equal to 1 if  $i$ 's household income is in a given range (\$0 to \$24,999, \$25,000 to \$49,999, \$50,000 to \$74,999, \$75,000 to \$99,999, \$100,000 or more),  $\text{FIN}_i$  is a set of variables describing various aspects of  $i$ 's financial situation (homeownership with or without mortgage; dollar value of home equity; dollar value of non-housing net worth; dollar value of credit limit; indicator of positive non-credit-card, non-mortgage debt; indicators for overdrew account, lost a job, or had a credit card account frozen in the past 12 months; bankruptcy or foreclosure in the past seven years), and  $\text{CHAR}_i$  is a vector of  $i$ 's assessment of characteristics of credit cards

relative to other payment instruments based on a 1–5 Likert scale (cost, convenience, security, records, setup, acceptance).

In stage 2 of the Heckman model, we estimate the dollar value of the revolving balance conditional on the cardholder being a bor-sav in the following regression:

$$\text{RevBal}_i = g(\text{DEM}_i, \text{INC}_i, \text{FIN}_i, \text{CHAR}_i, \lambda \mid \text{bor-sav}_i=1), \quad (2)$$

where  $\text{RevBal}_i$  is  $i$ 's dollar amount of unpaid revolving credit card debt, and  $\lambda$  is the inverse Mills ratio. For the Heckman model to be identified, some variables from stage 1 must be excluded from stage 2. We exclude gender, race, and ethnicity, as it is likely that these attributes affect the propensity of a given individual to decide whether to borrow on a credit card but do not affect the dollar amount of their revolving debt.

#### A. Probability of being a bor-sav

As we showed above, most credit card adopters are either savers or bor-savs, and the difference between the two is revolving credit card debt of at least \$100. Very few people are classified as borrowers, because most credit card adopters hold at least \$100 in their bank account and/or hold some cash. Therefore, the factors that affect the likelihood of being in the bor-sav group also affect the probability of revolving credit card debt.<sup>22</sup>

We find few significant demographic differences between bor-savs and the rest of the sample (Table 7, left column). Almost none of the age, education, gender, or race variables are significant in predicting the probability of being a bor-sav. Compared with white consumers, Asian consumers have a 15.4 percentage point lower probability of being bor-savs; the probabilities for consumers of other races are not statistically different from that of white consumers.

Notably, divorce is recognized as one of the strongest negative shocks to an individual's finances (Carroll 1997), and we find that a divorced consumer is 6.5 percentage points more likely than a married consumer to be a bor-sav. Widowed consumers are even more likely to be bor-savs—9.9 percentage points more likely than married individuals.

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<sup>22</sup> The specification with the probability of revolving as the dependent variable instead of the probability of being a bor-sav yields similar estimated coefficients. The results are available from the authors.

Income has a non-monotonic effect on being in the bor-sav group. A consumer whose household income is in the two middle ranges—from \$25,000 to \$74,999—has a significantly higher probability of being a bor-sav compared with other consumers. A consumer with a household income of \$25,000 to \$49,999 has a 19.3 percentage point higher probability of being a bor-sav compared with a consumer whose household income is \$100,000 or more.

Having a mortgage or home equity significantly affects the probability of revolving: Relative to renters, homeowners with a mortgage are 9.4 percentage points *more* likely to revolve, while homeowners without a mortgage are 6.1 percentage points *less* likely to revolve. Greater home equity lowers the probability of revolving, all else being constant, suggesting that homeowners might rely on home equity for some of their spending needs. However, the effect is small in magnitude: An additional \$100,000 in home equity reduces the probability of revolving by 3 percentage points. An additional \$1,000 in credit limit increases the probability of revolving by 0.2 percentage point.

The effect of net worth, while statistically significant, is economically negligible, suggesting that income is a more important determinant of revolving debt compared with wealth. This finding is consistent with our analysis above—consumers use their liquid assets to pay their regular monthly bills and other expenses and may revolve on their credit cards when those liquid assets are insufficient, while their other assets (included in the measure of wealth) have little effect on whether they revolve.

Regardless of a consumer's demographic characteristics, income, or wealth, indicators of shakier finances are predictive for revolving: carrying other types of non-mortgage debt (for example, auto or education loans), overdrawing a bank account in the past 12 months, or filing for bankruptcy in the past seven years. These factors have more predictive power than the demographic variables do, with carrying other non-mortgage debt raising the probability of being a bor-sav by 25.3 percentage points. The importance of carrying other types of debt, either non-mortgage or mortgage, shows that various types of household debt are complements and not

substitutes. Consumers are more likely to borrow on their credit cards when they already carry auto, educational, mortgage, or other loans.<sup>23</sup>

Credit card adopters who rate credit cards as more costly relative to other payment methods are 24 percentage points less likely to revolve. They may avoid revolving either because they face real higher costs of revolving (because they pay interest on all their credit card balances), or because they *perceive* the cost of borrowing on credit cards as high (differences in perception but not necessarily in the real cost).

### B. Value of revolving balances

Conditional on being a bor-sav, what affects the dollar value of credit card debt? The right column of Table 7 shows the results of stage 2 of the Heckman model, estimated using OLS.

Among bor-savs, there is very little evidence that demographics significantly affect the amount revolved. The youngest revolvers carry lower balances. Relative to those over age 65, revolvers under age 25 have a smaller amount of credit card debt. Single (never married) revolvers carry about \$1,739 more in credit card debt than married revolvers do, after we control for household income. Recall that we omitted gender, race, and ethnicity from stage 2 of the Heckman regression.

While the propensity to be a bor-sav exhibits a U-shaped pattern with respect to income, the amount of revolving debt, conditional on the cardholder being a bor-sav, does not significantly vary with income. Higher credit limits significantly increase the amount of revolving debt: A borrower with a \$1,000 higher credit limit borrows \$177 more on their credit cards, all else being constant, suggesting that demand for credit is elastic with respect to credit limits.

Owning a home is associated with a substantially lower amount of credit card debt, but the effect is significant only if a consumer does not carry a mortgage. Compared with renters, a homeowner without a mortgage carries \$3,209 less in revolving credit card debt. A homeowner with a mortgage also carries less debt, but the effect is not statistically significant. This strong

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<sup>23</sup> Although the survey is a cross section and the timing of taking on each loan is unknown, mortgage, education, and auto loans are fixed-period loans that typically span a period of several years, while credit card loans are revolving and can be repaid at any time. Therefore, we treat other loan types as exogenous in the revolving decision.

relationship between homeownership and credit card debt suggests that consumers might rely on home equity to cover their expenses. However, the dollar amount of home equity is not statistically significant.

While home equity and credit cards do not seem to be treated as substitutes by consumers based on our findings, there is some evidence that bank accounts and credit cards might be substitutes: Revolvers who have overdrawn their bank account in the preceding 12 months have \$2,744 more in credit card debt.

Bor-savs who rate credit cards as costly relative to other payment methods have a substantially lower amount of revolving debt. The coefficient on  $\lambda$ , the inverse Mills ratio, is not statistically significant, indicating that using unconditional OLS (that is, not as part of the Heckman model) to estimate the revolving balance might yield unbiased results.<sup>24</sup>

### C. Value of credit card spending

The puzzle analyzed in our paper arises from the fact that revolvers keep a positive balance in their bank account while also borrowing on a credit card. We showed above that bor-savs need their liquid assets to cover bills and other necessary expenses, but are those who already revolve more likely to deteriorate their financial situation by using credit cards and paying high borrowing costs? We test whether the negative relationship between revolving and current-period credit card use shown above holds when controlling for demographic and financial attributes.

We estimate the dollar value of credit card spending per month in the following equation:

$$CCBal_i = f(REV_i, DEM_i, INC_i, FIN_i), \quad (3)$$

where  $CCBal_i$  is the \$ value of  $i$ 's credit card transactions in the current month (not carried over from the preceding month), and  $REV_i$  is a dummy variable equal to 1 if  $i$  revolves their credit card debt.

Table 8 shows that revolving debt is negatively associated with the dollar value of credit card transactions per month: Revolvers charge \$259 less, on average, than non-revolvers do. For

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<sup>24</sup> The coefficient on the inverse Mills ratio could also be insignificant because of insufficient data for detecting a selection bias.

those who carry \$100 or more in revolving debt, the difference is \$250, a similar amount. Thus, there is some evidence that revolvers are either prudent when it comes to charging on credit cards or have reached their credit limits and cannot charge more, even after we control for income and demographics in the regression. Less educated consumers charge significantly less than others in credit card transactions per month.

## VI. 2020: What happened in the first year of the COVID-19 pandemic?

For 2020, the first year of the COVID-19 pandemic, other data sources show that the balance sheets of U.S. consumers were generally improving due to Economic Impact Payments (EIPs) and increased unemployment benefits under the Coronavirus Aid, Relief, and Economic Security (CARES) Act (Adams, Bord, and Katcher 2021; Haughwout et al. 2020; Greig, Deadman, and Noel 2021) and to precautionary reductions in spending and decreased opportunities to make some expenditures (Horvath, Kay, and Wix 2021).

We confirm those findings based on our data (Table 9). We find that credit card adopters were generally better off in 2020, with 38 percent carrying a balance of \$100 or more, down from 45 percent in 2019. The average liquidity for credit card adopters also increased from \$16,744 to \$23,804. As these measures of consumers' financial situation improved, the share of credit card adopters who were bor-savs declined significantly, from 42 percent to 35 percent. In addition, those credit card adopters who were bor-savs in 2020 were financially better off on average than in 2019. They had more liquidity—average liquid assets were up from \$5,395 in 2019 to \$7,804 in 2020, or 45 percent—and less credit card debt, which declined from \$6,388 in 2019 to \$5,572 in 2020, or 13 percent, albeit the latter change is not statistically significant.<sup>25</sup>

While some bor-savs were able to pay back their revolving debt thanks in part to the stimulus payments they received, for others, additional sources of liquidity were either nonexistent or not sufficient to do so. Note that the values of monthly bills and purchases did not decrease for bor-savs (in fact, the dollar amount increased in 2020, although not significantly), suggesting that the value of liquid assets that consumers had to maintain did not decline during the COVID-19 pandemic. For credit card adopters classified as bor-savs in 2020, their average

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<sup>25</sup> These findings are in line with findings of the Survey of Household Economics and Decisionmaking (SHED) that in 2020 fewer cardholders carried a balance and card borrowers reduced their balances (Federal Reserve Board 2021).



monthly bills of \$2,658 and credit card debt of \$5,572 still outstripped their average liquid assets of \$7,804, even without the inclusion of necessary purchases such as gas and groceries (Table 9).

Because some of the respondents were in the panel in 2019 and in 2020, we were able to compare their liquid assets over time while controlling for employment status. Table 10 shows the results based on a balanced panel of 981 respondents who were in the sample in both years, broken down into employment subsamples (including all respondents, whether or not they were credit card adopters). Consumers in all subsamples had significantly more liquid assets in 2020 than in 2019, except for the smallest group of respondents, who were not employed in 2019 but employed in 2020. Interestingly, those who lost or quit their jobs in 2020 had the largest increase in liquid assets—almost doubled—possibly due to generous unemployment benefits and stimulus payments.

The 2020 sample includes 743 credit card adopters who took the 2019 survey, were also credit card adopters in 2019, and have non-missing employment status information for both years. About one-quarter of the 2019 bor-savs who reported in 2020 had improved their position to savers (22 percent). In contrast, only 8 percent of the 2019 savers switched their category to bor-sav in 2020. This is in line with the generally improving financial position of consumers reported in 2020.

## VII. Conclusion

We revisit the credit card debt puzzle and find that even those consumers who carry costly unpaid credit card debt must keep a substantial balance in liquid assets to pay their bills. Thus, the credit card puzzle is not a puzzle at all, and is, in fact, very common. In 2019, 42 percent of our sample were in the borrower-saver group, defined here as those credit card holders who carried at least \$100 in unpaid debt and had at least \$100 in liquid assets.

In almost every category of assets or debts, both housing and non-housing related, borrower-savers were significantly worse off financially than savers. Thus, the differences between borrower-savers and savers are much broader than just their credit card debt and bank account balances, extending to mortgage debt and home equity. Even when we control for income and demographics in a regression, we find that carrying mortgage or other debt (such as

auto or educational loans) is associated with a higher probability of revolving on a credit card, suggesting that various types of household debt are complements rather than substitutes.

Although the fraction of consumers who were bor-savs declined significantly in 2020 during the first year of the COVID-19 pandemic, the amount they paid in monthly bills and for purchases did not decline. It is therefore likely that the fraction of consumers who are bor-savs will increase again when the additional savings accumulated during the period of stimulus payments are depleted. New data collected in 2021 and later will help address the question of whether the decline in the fraction of bor-savs was transient or is permanent.

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Table 1. Percentage share of respondents in each cohort, based on credit card debt and liquid assets, 2019

Percentage share of credit card adopters	
Revolving balance $\geq$ \$100	45.5
Non-revolvers or revolving balance $<$ \$100	54.5
Total	100
Liquid assets $\geq$ \$100	94.3
Liquid assets $<$ \$100	5.7
Total	100
Savers (revolve $<$ \$100, liquid $\geq$ \$100)	52.1
Bor-savs (revolve $\geq$ \$100, liquid $\geq$ \$100)	42.2
Borrowers (revolve $\geq$ \$100, liquid $<$ \$100)	3.3
Other (revolve $<$ \$100, liquid $<$ \$100)	2.4
Total	100
Number of credit card adopters	2391

Note: Results are weighted. Data from 2019 SCPC and DCPC. Sample restricted to credit card adopters.

Table 2. Percentage share of sample in each demographic cohort, by cardholder category, 2019

		All credit card adopters	Savers	Bor-savs	Borrowers
Number of respondents		2391	1281	966	84
Age	<i>Under 25</i>	3.9	4.0	3.5	1.6 *
	<i>25-34</i>	21.4	21.3	21.3	26.3
	<i>35-44</i>	15.7	12.3 ***	18.9 ***	22.8
	<i>45-54</i>	17.1	15.2 *	19.3 *	15.3
	<i>55-64</i>	17.8	18.1	17.7	20.0
	<i>Over 65</i>	24.2	29.0 ***	19.2 ***	14.1 **
Education	<i>Less Than High School</i>	3.6	2.1 **	4.5	11.4
	<i>High School</i>	28.3	26.0	30.5	25.5
	<i>Some College</i>	16.7	13.6 ***	19.0 **	33.1 **
	<i>College</i>	33.7	37.2 **	30.7 **	26.1
	<i>Graduate</i>	17.7	21.1 ***	15.3 **	3.9 ***
Gender	<i>Male</i>	47.9	52.2 ***	44.2 **	28.1 ***
	<i>Female</i>	52.1	47.8 ***	55.8 **	71.9 ***
Ethnicity	<i>Latino</i>	10.3	6.9 ***	13.3 **	25.8 **
	<i>Non-Latino</i>	89.7	93.1 ***	86.7 **	74.2 **
Race	<i>White</i>	84.4	87.1 *	82.5 *	89.3
	<i>Black</i>	11.6	6.4 ***	16.5 ***	11.0
	<i>Asian</i>	5.7	7.6 ***	3.5 **	1.4 ***
	<i>Other</i>	8.1	9.1	6.8	14.1
Work Status	<i>Employed</i>	63.0	59.2 ***	69.6 ***	55.1
	<i>Unemployed</i>	2.4	1.7	2.8	2.4
	<i>Retired</i>	19.1	24.8 ***	13.7 ***	6.3 ***
	<i>Disabled/other</i>	15.3	14.3	13.6	36.2 ***
Marital Status	<i>Married</i>	62.9	68.5 ***	59.4 ***	45.2 **
	<i>Separated</i>	1.1	0.8	1.3	1.0
	<i>Divorced</i>	13.0	9.6 ***	16.0 ***	20.3
	<i>Widowed</i>	5.3	5.2	5.5	5.8
	<i>Never Married</i>	17.7	15.9	17.7	27.7

Notes: Results are weighted. Data from 2019 SCPC and DCPC. Sample restricted to credit card adopters. Stars indicate the result of a t-test for difference in mean between the given category and the other categories combined (e.g., the difference in mean between borrowers and combined savers and bor-savs). \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

Table 3a. Average income by cardholder category and percentage share in each income cohort, 2019

		All	Savers	Bor-savs	Borrowers
Number of credit card adopters		2391	1281	966	84
Annual income (\$000)	<i>median</i>	75.0	82.0 ***	70.0 *	38.0 ***
	<i>mean</i>	85.7	98.6 ***	75.8 ***	49.9 ***
Monthly income	<i>median</i>	6250	6833 ***	5833 *	3167 ***
	<i>mean</i>	7146	8216 ***	6321 ***	4162 ***
Income Cohort	<i>Less than \$25,000</i>	12.8	9.7 **	12.5	31.5 ***
	<i>\$25,000-\$49,999</i>	18.2	13.5 ***	22.7 ***	31.5 *
	<i>\$50,000-\$74,999</i>	18.9	18.6	20.1	12.4
	<i>\$75,000-\$99,999</i>	17.2	18.8	17.0	4.5 ***
	<i>More than \$100,000</i>	34.1	40.6 ***	28.6 ***	20.1 *

Notes: For example, 9.7% of savers, 12.5% of bor-savs, and 31.5% of borrowers had income below \$25,000 a year. Results are weighted. Data from 2019 SCPC and DCPC. Sample restricted to credit card adopters. Stars indicate the result of a t-test for difference in mean between the given category and the other categories combined (e.g., the difference in mean between borrowers and combined savers and bor-savs). \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

Table 3b. Percentage share of each income cohort in each cardholder category, 2019

	Income range				
	< \$25,000	\$25,000-\$49,999	\$50,000-\$74,999	\$75,000-\$99,999	≥ \$100,000
Savers	39.5	38.7	50.9	57.1	62.0
Bor-savs	41.5	52.7	45.2	41.9	35.6
Borrowers	8.1	5.7	2.2	0.9	1.9
Other	10.9	2.9	1.8	0.1	0.5
Number of credit card adopters	303	467	484	410	716

Notes: For example, 39.5% of those with income below \$25,000 a year were savers, 41.5% were bor-savs, and 8.1% were borrowers. Results are weighted. Data from 2019 SCPC and DCPC. Sample restricted to credit card adopters.

Table 4. Average financial non-housing variables by cardholder category, 2019

	All	Savers	Bor-savs	Borrowers
Number of credit card adopters	2391	1281	966	84
Liquid Assets				
<i>Checking account (\$000)</i>	4.4	7.2 ***	1.6 ***	0.0 ***
<i>Savings account (\$000)</i>	12.2	20.5 ***	3.7 ***	0.0 ***
<i>Cash (\$000)</i>	0.1	0.1 ***	0.1 ***	0.0 ***
<i>General purpose prepaid (\$000)</i>	0.0	0.0	0.0	0.0 ***
<i>Total (\$000)</i>	16.7	27.8 ***	5.4 ***	0.0 ***
Assets and liabilities (Excluding primary home)				
<i>Total Assets (\$000)</i>	177.9	270.7 ***	80.9 ***	38.2 ***
<i>Total Debts (\$000)</i>	33.8	26.9 ***	43.0 ***	40.0
<i>Net Worth (\$000)</i>	145.0	245.6 ***	37.8 ***	-1.8 ***
<i>Non-credit card debt (\$000)</i>	30.9	26.9 **	36.6 *	35.9
<i>Proportion with positive non-credit card debt</i>	69.6	54.1 ***	87.0 ***	90.7 ***
Credit Use				
<i>Revolving balance (\$)</i>	2833.6	1.4 ***	6388.1 ***	4123.9
<i>Credit limit (\$)</i>	23980.0	27579.1 ***	22062.2 **	7229.6 ***
<i>Available credit (limit - revolving)</i>	21126.5	27577.7 ***	15655.5 ***	3105.7 ***
<i>Utilization % (revolving / limit)<sup>1</sup></i>	21.8	0.2 ***	43.9 ***	79.1 ***
<i>Utilization &gt; 30%</i>	22.9	0.0 ***	48.8 ***	70.1 ***
<i>Utilization &gt; 50%</i>	15.0	0.0 ***	30.9 ***	58.1 ***
<i>Utilization &gt; 80%</i>	6.9	0.0 ***	13.5 ***	37.1 ***
In the last 12 months				
<i>Overdrew bank account</i>	18.8	9.7 ***	27.5 ***	58.9 ***
<i>Lost job</i>	4.9	3.6 **	6.6 **	7.7
<i>Credit card frozen</i>	2.9	2.6	3.1	5.7
In the last 7 years				
<i>Bankruptcy</i>	4.0	0.8 ***	6.4 ***	21.8 **
<i>Foreclosure</i>	0.8	0.5	1.2	0.9
FICO Score				
<i>Less than 600</i>	6.7	2.7 ***	8.7 **	36.5 ***
<i>600-649</i>	9.3	4.1 ***	14.0 ***	13.8
<i>650-699</i>	11.5	4.0 ***	18.9 ***	30.9 **
<i>700-749</i>	21.1	16.2 ***	28.4 ***	10.9 **
<i>750-800</i>	22.6	26.6 ***	18.8 ***	6.4 ***
<i>Greater than 800</i>	28.9	46.5 ***	11.2 ***	1.5 ***
Direct rating of credit card's cost (1-bad to 5-good)	3.3	3.7 ***	2.9 ***	2.6 ***

Notes: Results are weighted. Data from 2019 SCPC and DCPC. Sample restricted to credit card adopters. The debt summarized in this table does not include mortgage debt, and the assets do not include the value of the primary home. Stars indicate the result of a t-test for difference in mean between the given category and the other categories combined. \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

<sup>1</sup> 48 credit card adopters have missing observations for utilization.



Table 5. Average housing variables by cardholder category, 2019

	All	Savers	Bor-savs	Borrowers
Number of credit card adopters	2391	1281	966	84
Home Ownership				
<i>Non-homeowner</i>	26.0	19.5 ***	28.5 **	64.6 ***
<i>Homeowner</i>	74.0	80.5 ***	71.5 **	35.4 ***
<i>Homeowner: No home loans<sup>1</sup></i>	21.9	30.6 ***	12.2 ***	13.5 **
<i>Homeowner: Has home loans</i>	51.9	49.8 **	59.1 ***	21.9 ***
Among all homeowners				
<i>Home value (\$000)</i>	263.7	304.1 ***	214.1 ***	125.8 ***
<i>Home loans (\$000)</i>	106.0	97.2 ***	120.6 ***	83.3
<i>Home equity (value - loans) (\$000)</i>	157.9	206.8 ***	93.8 ***	42.5 ***
<i>Proportion with positive home equity</i>	70.8	78.2 ***	67.0 ***	34.8 ***
Assets and liabilities (Including primary home)				
<i>Total assets (\$000)</i>	373.9	516.2 ***	234.3 ***	82.7 ***
<i>Total debts (\$000)</i>	112.3	105.3 **	129.0 ***	69.5 ***
<i>Net worth (\$000)</i>	262.1	412.6 ***	104.8 ***	13.2 ***
<i>Non-credit card debt (\$000)</i>	109.4	105.3	122.6 **	65.3 ***
<i>Proportion with positive non-credit card debt</i>	82.1	72.7 ***	93.4 ***	95.4 ***
<i>Proportion with positive home equity</i>	70.8	78.2 ***	67.0 ***	34.8 ***

Note: Results are weighted. Data from 2019 SCPC and DCPC. Sample restricted to credit card adopters. Stars indicate the result of a t-test for difference in mean between the given category and the other categories combined (e.g., the difference in mean between borrowers and combined savers and bor-savs). \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

<sup>1</sup> Home loans includes mortgage, home equity loan, and home equity line of credit (HELOC).

<sup>2</sup> Includes home debt and “other” (auto, education, etc.).

Table 6. Average value (\$) and percentage share of value (%) of monthly transactions per credit card adopter by transaction type and payment instrument, 2019

	Value of transactions (\$)				Percent share <sup>1</sup> of value (%)			
	All	Sav	Bor-sav	Bor	All	Sav	Bor-sav	Bor
<b>All transactions</b>	4880.3	5009.3	4171.4	1690.4				
<b>All purchases<sup>2</sup></b>	1706.6	1729.6	1555.5	640.5				
Credit card	632.8	884.9	409.8	34.5	32.5	47.1	16.7	5.3
Cash	208.2	190.8	236.9	205.6	26.5	25.0	24.9	51.2
Bank account <sup>3</sup>	792.6	569.4	865.9	287.7	37.5	23.6	56.0	39.7
<b>All bill payments<sup>4</sup></b>	3173.7	3279.7	2615.9	1049.9				
Credit card	108.8	145.0	52.1	4.4	8.7	12.6	5.0	5.6
Cash	27.4	33.8	20.6	15.0	3.8	3.8	3.7	3.5
Bank account	2831.3	2912.8	2383.7	962.5	79.5	76.1	83.3	86.0
<b>Merchant specific analysis</b>								
<b>Mortgage, rent, utilities, and loans payments<sup>5</sup></b>	2517.4	2504.8	2237.3	935.0				
Credit card	42.2	67.6	18.8	0.0	4.8	7.7	1.7	0.0
Cash	7.4	10.3	5.7	1.7	1.4	1.9	0.7	0.2
Bank account	2286.2	2261.2	2086.3	865.2	85.2	82.1	89.3	92.7
<b>Utilities payments<sup>6</sup></b>	181.0	148.4	237.2	164.2				
Credit card	8.5	10.6	5.9	0.0	5.7	8.8	2.3	0.0
Cash	2.8	5.3	0.5	1.7	1.9	3.1	0.6	3.9
Bank account	165.9	131.4	223.8	161.2	89.3	86.4	91.9	90.6

Notes: Results are weighted.

<sup>1</sup> Shares do not sum to 100 because a few less frequently used payment instruments are excluded (money orders, direct deduction from income, stored-value card, etc.).

<sup>2</sup> Purchases include P2P payments.

<sup>3</sup> Bank account payment instruments include check, debit card, OBBP, and BANP.

<sup>4</sup> Whether or not a payment is a bill is specified by the respondent.

<sup>5</sup> Mortgage, rent, utilities, and loans payments is the sum of payments made to merchants 8, 14, and 15. Merchant category 8 is defined as “Utilities not paid to the government: electricity, natural gas, water, sewer, trash, heating oil.” Merchant category 14 is defined as “Rent for apartments, homes, or other buildings, real estate companies, property managers, etc.” Merchant category 15 is defined as “Mortgage companies, credit card companies, banks, insurance companies, stockbrokers, IRA funds, mutual funds, credit unions, sending remittances.”

<sup>6</sup> Utilities payments determined as payments to merchant category 8.

Table 7. Regression results for stage 1 (probit) and stage 2 (OLS) of Heckman model

		Stage 1		Stage 2	
		1 if bor-sav		revolving balance (\$)	
Age	<i>Under 25</i>	-0.081		-5428.1	**
	<i>25-34</i>	-0.016		-2044.6	
	<i>35-44</i>	0.024		990.0	
	<i>45-54</i>	0.080	*	1714.6	
	<i>55-64</i>	0.060		-481.3	
	<i>Over 65</i>	--	--	--	--
Education	<i>Less Than High School</i>	-0.020		-869.9	
	<i>High School</i>	0.017		1350.4	
	<i>Some College</i>	-0.009		223.8	
	<i>College</i>	-0.041		713.6	
	<i>Graduate</i>	--	--	--	--
Gender	<i>Male</i>	-0.025			
	<i>Female</i>	--	--		
Ethnicity	<i>Latino</i>	0.050			
	<i>Non-Latino</i>	--	--		
Race	<i>Black</i>	0.044			
	<i>Asian</i>	-0.154	**		
	<i>Other</i>	-0.022			
	<i>White</i>	--	--		
Marital Status	<i>Separated</i>	-0.099		372.8	
	<i>Divorced</i>	0.065	*	513.5	
	<i>Widowed</i>	0.099	*	-675.1	
	<i>Never Married</i>	0.031		1738.9	*
	<i>Married</i>	--	--	--	--
Work Status	<i>Unemployed</i>	0.006		1469.4	
	<i>Retired</i>	-0.042		-973.0	
	<i>Disabled/other</i>	-0.086	***	-30.7	
	<i>Employed</i>	--	--	--	--
Income	<i>Less than \$25,000</i>	0.121	***	-526.3	
	<i>\$25,000-\$49,999</i>	0.193	***	149.0	
	<i>\$50,000-\$74,999</i>	0.137	***	572.1	
	<i>\$75,000-\$99,999</i>	0.069	**	1890.9	*
	<i>More than \$100,000</i>	--	--	--	--
Home Ownership	<i>Homeowner: Loans<sup>1</sup></i>	0.094	***	-1421.2	
	<i>Homeowner: No loans</i>	-0.061	*	-3208.7	***
	<i>Non-homeowner</i>	--	--	--	--
Home Equity (unit: \$10,000)		-0.003	***	-38.3	
Net Worth (Assets - Debts) <sup>2</sup> (unit: \$10,000)		-0.001	***	-9.4	
Credit Limit (unit: \$1000)		0.002	***	176.6	***
Positive Non-credit Card Debt <sup>3</sup>		0.253	***	416.6	
In the last 12 months	<i>Overdrew bank account</i>	0.120	***	2743.6	**
	<i>Lost Job</i>	0.055		387.2	
	<i>Credit Card Frozen</i>	-0.007		864.1	
In the last 7 years	<i>Bankruptcy</i>	0.123	*	-1401.8	
	<i>Foreclosure</i>	0.007		-187.2	
Relative Characteristics	<i>Security</i>	-0.026		-1381.4	**
	<i>Records</i>	-0.002		-1238.6	
	<i>Cost</i>	-0.240	***	-4070.7	**
	<i>Convenience</i>	0.018		347.1	
	<i>Set up</i>	0.081	*	2198.9	*
	<i>Acceptance</i>	0.063		632.4	
Inverse Mills Ratio				4207	
R-Squared		0.199		0.253	
Selected Number of Observations				940	
Number of Respondents		2303		2303	

Notes: Stage 1 (probit) results are reported as marginal effects at means. Reference group marked as "--." Data from 2019 SCPC and DCPC. Sample restricted to credit card adopters. All demographics are included in stage 1, and gender, ethnicity, and race are omitted in stage 2. The pseudo R-squared is reported for stage 1 and the adjusted R-squared is reported for stage 2.

<sup>1</sup> The category home loans includes mortgage, home equity loan, and HELOC. <sup>2</sup> Net Worth excludes the respondent's primary home. <sup>3</sup> Positive non-credit card debt excludes home loans.

Table 8. Regression results, dependent variable is \$ amount of credit card transactions per month, OLS

		(1)	(2)
Revolving balance	> \$0	-258.7 ***	
	≥ \$100		-250.2 ***
Age	<i>Under 25</i>	340.6	334.8
	<i>25-34</i>	105.4	104.0
	<i>35-44</i>	219.1	214.2
	<i>45-54</i>	461.0 ***	460.3 ***
	<i>55-64</i>	88.0	87.0
	<i>Over 65</i>	-- --	-- --
Education	<i>Less Than High School</i>	-529.2 **	-544.0 **
	<i>High School</i>	-482.5 ***	-484.0 ***
	<i>Some College</i>	-294.6 **	-295.7 **
	<i>College</i>	-97.4	-95.4
	<i>Graduate</i>	-- --	-- --
Gender	<i>Male</i>	145.8 *	145.5 *
	<i>Female</i>	-- --	-- --
Ethnicity	<i>Latino</i>	-101.7	-100.1
	<i>Non-Latino</i>	-- --	-- --
Race	<i>Black</i>	172.9	159.7
	<i>Asian</i>	-297.9	-304.1
	<i>Other</i>	42.1	29.0
	<i>White</i>	-- --	-- --
Marital status	<i>Separated</i>	-139.4	-173.0
	<i>Divorced</i>	-265.9 **	-269.5 **
	<i>Widowed</i>	-296.7	-294.6
	<i>Never Married</i>	-105.7	-109.3
	<i>Married</i>	-- --	-- --
Work status	<i>Unemployed</i>	30.2	27.5
	<i>Retired</i>	377.0 ***	376.4 ***
	<i>Disabled/other</i>	66.1	61.6
	<i>Employed</i>	-- --	-- --
Income	<i>Less than \$25,000</i>	-74.0	-79.6
	<i>\$25,000-\$49,999</i>	-119.1	-121.4
	<i>\$50,000-\$74,999</i>	-14.2	-14.8
	<i>\$75,000-\$99,999</i>	-217.1 *	-218.7 *
	<i>More than \$100,000</i>	-- --	-- --
Home ownership	<i>Homeowner: Loans<sup>1</sup></i>	-44.5	-46.3
	<i>Homeowner: No loans</i>	103.4	104.3
	<i>Non-homeowner</i>	-- --	-- --
Home equity (unit: \$10,000)		4.7 **	4.7 **
Credit limit (unit: \$1000)		7.4 ***	7.4 ***
adjusted R-Squared		0.052	0.052
Number of respondents		2367	2367

Notes: Data from 2019 SCPC and DCPC. Sample restricted to credit card adopters.

<sup>1</sup> The category home loans includes mortgage, home equity loan, and HELOC.

Table 9. Balance, liquidity, and spending, 2019 and 2020, weighted

	2019	2020	
<b>Percent of credit card adopters</b>			
Revolving balance $\geq$ \$100	45.5	38.2	***
Non-revolvers or revolving balance $<$ \$100	54.5	61.8	***
Liquid assets $\geq$ \$100	94.3	94.4	
Savers (revolve $<$ \$100, liquid $\geq$ \$100)	52.1	59.1	***
Bor-savs (revolve $\geq$ \$100, liquid $\geq$ \$100)	42.2	35.3	***
Borrowers (revolve $\geq$ \$100, liquid $<$ \$100)	3.3	2.8	
Other (revolve $<$ \$100, liquid $<$ \$100)	2.4	2.8	
<b>Average Liquid Assets<sup>1</sup> (\$)</b>			
All credit card adopters	16744.23	23803.93	**
Savers	27764.59	35627.55	
Bor-savs	5395.31	7803.70	*
Borrowers	31.99	9.63	
<b>Average Revolving Balance (\$)</b>			
All credit card adopters	2833.60	2050.48	***
Savers	1.44	1.62	
Bor-savs	6388.14	5572.13	
Borrowers	4123.89	2843.51	
<b>Average \$ Value of Purchases</b>			
All credit card adopters	1706.61	1853.35	
Savers	1729.59	2088.91	
Bor-savs	1555.48	1707.34	
Borrowers	640.54	792.59	
<b>Average \$ Value of Bills</b>			
All credit card adopters	3173.71	3323.65	
Savers	3279.72	3378.99	
Bor-savs	2615.94	2657.68	
Borrowers	1049.88	1272.00	
<b>Percent of Value of Bills Paid from Bank Account<sup>2</sup></b>			
All credit card adopters	79.5	76.2	
Savers	76.1	77.2	
Bor-savs	83.3	76.6	
Borrowers	86.0	71.3	
<b>Number of Credit Card Adopters</b>			
	2391	1235	

Note: Results are weighted. Stars indicate the result of a test for difference in mean between 2019 and 2020. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . For the “Share of credit card adopters,” “Average liquid assets,” and “Average revolving balance” variables, difference in means between years is based on a two-sample t-test. For the spending variables, the means are compared by applying a procedure used in the official DCPC tables. None of those changes is significant due to large variances. Three outlier purchases with values greater than \$20,000 were removed from the sample, one from 2019 and two from 2020.

<sup>1</sup> Liquid assets is the sum of cash, checking account, savings account, and general purpose prepaid.

<sup>2</sup> Bank account payment instrument includes check, debit card, OBBP, and BANP.

<sup>3</sup> The sample size was reduced in 2020 because some panelists were invited to participate in experiments investigating various ways to reduce survey burden.

Table 10. Liquid assets by employment status, balanced 2019–2020 panel

	Total liquid assets (\$)			Number of respondents	
	2019	2020		2019	2020
All respondents:					
Overall	14706	18891	***	981	981
Employed both years	10875	15637	***	467	467
Not employed both years	21548	24705	*	430	430
Employed 2019, not employed 2020	7429	14398	***	69	69
Not employed 2019, employed 2020	6813	5205		13	13
Credit card adopters in both years:					
Overall	18982	24141	***	743	743
Employed both years	12651	18257	***	373	373
Not employed both years	31166	35596	*	307	307
Employed 2019, not employed 2020	8532	15590	**	52	52
Not employed 2019, employed 2020	12839	3251		10	10

Notes: Results are weighted. Data from 2019 and 2020 SCPC and DCPC. Sample limited to respondents who took both surveys both years. Stars indicate the result of a paired t-test for difference in mean between 2019 and 2020, \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.