

New Perspectives on Consumer Behavior in Credit and Payments Markets

BY MITCHELL BERLIN

A

t the Federal Reserve Bank of Philadelphia's latest conference on consumer credit and payments, researchers presented the results of the following seven studies on topics including household financial decision-making, the effects of regulation on credit card markets, and the effect on individuals of interactions between credit and labor markets.¹

STICKING TO YOUR PLAN: HYPERBOLIC DISCOUNTING AND CREDIT CARD DEBT PAYDOWN

Theresa Kuchler, of New York University's Stern School of Business, reported on an empirical study of individuals' success in carrying out plans to reduce their credit card balances. Broadly, Kuchler had two objectives. Her first objective was to find evidence for *present-biased* behavior, in which consumers make plans to reduce future borrowing but systematically deviate from their plans by acting impatiently in the future. Her second objective was to determine the extent to which individuals are sophisticated about their own behavior, in the sense that they understand that they act in a present-

biased way and make borrowing decisions that reflect this understanding.

Kuchler developed a simple model of consumer borrowing behavior that could be used to make predictions about how different types of consumers would behave. She tested her predictions using a remarkably detailed data set from an online financial management service. Individuals use this service to make plans to reduce their credit card balances, although the service doesn't impose penalties if they fail to meet those plans. Individuals provide demographic information — for example, age, income, and education — as well as information about their paycheck receipts and detailed information about their credit card use, bank account behavior, and expenditures. Moderating concerns that the people using a financial planning service are not representative of the broader population, Kuchler explained that according to observable demographic measures, the sample is reasonably similar to the general population.

¹ The seventh biennial conference on consumer credit was hosted jointly on October 3-4, 2013, by the Philadelphia Fed's Payment Cards Center and Research Department. The papers presented may be found at <http://www.philadelphiafed.org/research-and-data/events/2013/consumer-credit-and-payments/agenda.cfm>.

In the first part of the study, Kuchler sought to measure present bias. Specifically, she measured present bias by the sensitivity of an individual's discretionary expenditures — restaurant and entertainment expenditures — to the receipt of a paycheck. Intuitively, a larger expenditure on discretionary items as soon as a paycheck arrives is consistent with impatient behavior, especially when this expenditure conflicts with a prior plan to use the income to reduce credit card balances. She finds that many consumers' discretionary expenditures are very sensitive to the receipt of a paycheck, a finding consistent with present bias. (Kuchler explained that such behavior was also consistent with other explanations, a matter she addressed later.)

Kuchler argued that present-biased individuals might, nonetheless, be fully rational and aware of their behavior (thus being *sophisticated*). Alternatively, they might be *naïve*, and simply not understand that in the future they are likely to act in a way that frustrates their current plans. Her model offers predictions about how a present-biased but sophisticated individual would behave differently from one who was also present-biased but naïve. Specifically, the model predicts that very impatient but sophisticated individuals will typically pay down less of their debt than those who are also sophisticated but less impatient. Intuitively, a sophisticated, impatient individual reasons that, "I know in the future I am going to consume more than my current plan for future consumption. Therefore, I can achieve a smoother consumption path if I consume more today, which



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will, in turn, reduce future consumption.” Naïve individuals don’t reason this way because they don’t understand that they will act in a way that frustrates their plans for the future. Accordingly, the level of impatience will not affect the extent to which they pay down their debt.

Kuchler’s empirical results confirmed her strategy for identifying individual degrees of impatience and also her distinction between sophisticated and naïve individuals. She found that all individuals reduced their credit card balances less than they had planned but that sophisticated individuals were more successful. She also found that the extent to which sophisticated individuals paid down their debt was related to their level of impatience, while for naïve individuals it was not, as her theory predicted.

She concluded by considering alternative explanations for her empirical results, notably credit constraints or habits-driven behavior. She argued that other plausible models of borrowing behavior are either inconsistent with her results or else have no predictions about behavior regarding debt repayment.

FINANCIAL CONSTRAINTS AND CONSUMERS’ RESPONSE TO EXPECTED CASH FLOWS: DIRECT EVIDENCE FROM FILING TAX RETURNS

Brian Baugh from the Ohio State University presented the results of a study conducted with Itzhak Ben-David and Hoonsuk Park on household consumption behavior in response to filing tax returns and receiving tax refunds. Using a proprietary data set from a financial institution that included data on individuals’ credit card usage, as well as information about tax filings, the authors examined the role of credit constraints on consumption behavior. Broadly, the authors found strong evidence of credit constrained behavior,

as households that received refunds increased their consumption only modestly at the filing date but increased consumption by a significantly larger amount when the refund was actually received. Furthermore, household consumption was not affected by the size of the prior year’s refund, even though previous refunds were good predictors of current refunds.

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The authors had anonymized data from a financial institution on the credit and debit card use of 500,000 individuals from July 2010 to December 2012. Ultimately, the sample size was reduced to about 15,000 individuals primarily because the authors required information on the date on which tax returns were filed. Baugh argued that the actual filing provided a good estimate of the household’s expected refund. The authors assumed that the filing date was reasonably well measured by the date on which the individual paid a fee to a tax preparation service such as TurboTax or H&R Block.

The authors’ main findings were that households increased consumption only moderately at the time of filing, but they increased consumption significantly more when the refund was actually received. Specifically, they found that households that received refunds increased consumption by approximately 3 percent at the time of filing, while they increased their consumption by two to four times that amount when the refund was received, depending on the precise empirical specification. Focusing on low-income households alone, the percentage increase in consumption at the filing date was smaller

and the percentage increase when the refund was received was larger. The authors found similar effects for the probability of shopping following these dates. They found no significant effect on consumption by households that did not receive a refund.

Restricting their sample to those for whom they had two successive tax filings, the authors then examined

whether households used the information on past tax refunds to form expectations about future tax refunds. The authors argue that the prior year’s refund is a good (albeit imperfect) predictor of the current year’s refund. Accordingly, they divided the population into households with positive surprises — that is, their refund was larger than the preceding year’s refund — and negative surprises. They found that both those with positive and negative surprises increased consumption when they received the refund. The authors concluded that people’s consumption was unaffected by the prior year’s refund, even though it is a very good predictor. Baugh suggested that this finding raised some doubts about economic models in which households form rational expectations about future consumption.

ARE YOUNG BORROWERS BAD BORROWERS? EVIDENCE FROM THE CREDIT CARD ACT OF 2009

Andra Ghent of Arizona State University presented the results of her study conducted along with Peter Debaut and Marianna Kudlyak on the relative default behavior of young borrowers. One of the goals of the CARD

Act of 2009 was to limit the marketing of credit cards to individuals younger than 21 years old, premised on the view that young borrowers were more likely to get into financial difficulties. While the authors found that the act was largely successful in restricting credit card access for young individuals, they also found evidence that young borrowers were significantly less likely to default than older individuals. Ghent argued that their results called into question the fundamental premise of those sections of the act restricting credit card access — that is, that young borrowers were poorly equipped to manage their credit card borrowings compared with older borrowers.

First, the authors use the Federal Reserve Bank of New York's Consumer Credit Panel/Equifax to evaluate whether the CARD Act had the desired effect.² They found that after implementation of this law, individuals under 21 (i) were 8 percentage points less likely to have a card, (ii) had fewer cards, conditional upon having a card at all, and (iii) were 3 percentage points more likely to have a cosigned card. The authors concluded that the act had successfully restricted access to credit cards by the young.

Then the authors examined whether young borrowers actually were delinquent more often than older borrowers. While young borrowers were more likely to suffer minor delinquencies (less than 90 days), the authors found that young people were actually significantly less likely than older borrowers to be more than 90 days delinquent. Instead, serious delinquencies followed an inverse U-shaped pattern over a borrower's lifetime, increasing until age 40-44, at which point a borrower was 12 percentage points more likely to be seriously delinquent than a 19-year-old.

² All data from this data set are anonymized. The researchers have no access to personally identifiable information about individuals.

Ghent noted that lower delinquency rates for young borrowers suggested that the young were not less creditworthy. But to evaluate the effect of the restrictions in the act, we must take into account that prior to the imposition of the new law, young borrowers chose whether to acquire credit — that is, there was a selection effect. In principle, this selection effect might go either of two ways. While the borrowers below the age of 21 who acquired credit cards prior to the act might have been less capable of managing their finances than more experienced borrowers, they might also have been more prudent or forward-looking than the typical borrower. The authors use the passage of the act as a laboratory to identify the selection effect.

Specifically, the authors identified two groups of borrowers. Those in Group 1 got their first credit card at age 21 after the act was passed. Those in Group 2 got their first card at age 21 before the act was passed; that is, they

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could have legally acquired a card before age 21 but had not. The differences in behavior of these two groups help identify the selection effect. While not all members of Group 1 would necessarily have qualified to receive a card, presumably some would have qualified and would have chosen to acquire a card had they been permitted to do so.

The authors found that individuals from Group 2 were significantly more likely to experience serious delinquencies than those in Group 1, both in the years immediately after they ac-

quired their cards and also later in life. In addition, Group 1 members were more likely to have a mortgage at age 22 or 23 than were members of Group 2. The authors interpreted these findings as evidence that individuals who entered the credit market early before the passage of the act were likely to have been relatively good credit risks and that these borrowers were trying to establish a good credit history, perhaps to qualify for homeownership. Thus, the authors found no evidence that by limiting access to young borrowers, the act was protecting borrowers who were less prudent or less capable of managing debt than others.

FINANCIAL EDUCATION AND THE DEBT BEHAVIOR OF THE YOUNG

Meta Brown of the Federal Reserve Bank of New York presented the results of her study with Wilbert van der Klaauw, Jaya Wen, and Basit Zafar on the effects of education and the

borrowing behavior of young individuals. Specifically, the authors examined the effects of taking courses in mathematics, financial literacy, and economics on credit market outcomes. Their study exploited the fact that states vary widely in their high school course requirements in these three areas and that a large number of states had introduced new requirements during the sample period, 1998-2012. Brown argued that the authors found that required courses in these three areas had statistically and economi-

cally significant effects on the borrowing behavior of individuals in their twenties. Mathematics and financial education courses appeared to promote more savvy borrowing behavior, although Brown cautioned against drawing welfare conclusions from the empirical results.

The authors created a data set that compiled state-by-state changes in required courses in high school from 1998 through 2012. The data set included whether a state had increased required math courses by one year, whether a state had imposed a new requirement that students take at least one financial literacy course, and whether the state had imposed a new requirement that students take at least one economics course. Using the FRBNY Consumer Credit Panel/Equifax data, the authors followed the borrowing behavior of individuals born in or after 1984 — who were thus likely to have attended high school during the sample period.³ They collected a number of measures of credit market behavior for these individuals at age 22 to 28, including whether they had credit reports, their Equifax risk scores, various measures of delinquency, whether they had entered bankruptcy, and their debt balances, including mortgages, credit card balances, auto loans, and student loans. The authors also collected data on unemployment rates and income in each individual's Zip code to control for economic conditions. In addition, the authors included various measures of educational quality for each state, such as per capita educational expenditures.

The authors found that educational requirements had significant effects on borrowing behavior. Brown argued that focusing on behavior subsequent

to the introduction of a new educational requirement strengthened the view that differences in behavior were causally related to the educational requirement. Qualitatively, the effects of more required math courses and a required financial literacy course had similar effects along most dimensions, with the notable difference that only the financial literacy requirement increased the likelihood that an individual would have a credit report. Brown suggested that having a credit report might be an indicator of an individual's understanding the value of building a credit history. Both math and financial literacy requirements were associated with higher credit scores, lower balances, and, for the most part, fewer adverse credit outcomes. One notable difference is that math requirements were associated with a higher probability of bankruptcy. Brown suggested that this might be an indicator of greater financial savvy, rather than a measure of imprudent behavior, as some prior studies have found that households tend to forgo the option to enter bankruptcy even when it would appear to be economically rational.

These effects were economically significant as well. For example, an additional year of math was associated with a decline in auto loan and credit card balances of \$890. Similarly, the introduction of the financial literacy requirement was associated with a decline in auto loan and credit card balances of \$580.

Brown explained that the effects of the economics course requirement were quite different. The economics requirement was not associated with a higher probability of having a credit score, but it was associated with higher average debt balances, as well as a greater prevalence of repayment problems. Brown suggested that an economics course might demystify debt usage without promoting greater financial savvy.

HOUSE PRICES, COLLATERAL, AND SELF-EMPLOYMENT

Manuel Adelino of Duke University discussed the results of his study with Antionette Schoar and Felipe Severino on the effects of higher house prices during 2002-07 on the growth of very small businesses. Adelino explained that there are numerous channels through which higher house prices might affect small-business growth. The authors sought evidence for the collateral effect, in which higher house prices ease credit constraints by permitting small-business owners to post their houses as collateral for bank loans. Adelino argued that the authors had indeed found compelling evidence for this collateral channel, despite formidable empirical challenges.

The main challenge was to disentangle the collateral channel from demand-driven effects, in which stronger demand promotes both small-business growth and higher house prices. The authors' primary identifying assumption was that while higher demand should affect both larger and smaller firms, the collateral channel should operate only for small firms. Since borrowing needs for larger firms are likely to be much larger than the value of a house, higher house prices were unlikely to have an appreciable effect on larger firms' ability to borrow. Using county-level data from the Census Bureau that identifies the number of employees at each establishment, the authors found that higher house prices were significantly associated with higher employment growth at the smallest enterprises (one to four employees) and that this positive effect declined monotonically with firm size, consistent with growth at the small enterprises being driven by the collateral channel.

The authors proceeded to use detailed data about firm characteristics from a number of other sources, both to lend greater plausibility to their claim for the collateral channel

³ All data from this data set are anonymized. The researchers have no access to personally identifiable information about individuals.

and, particularly, to rule out demand-driven effects. Adelino argued that even for very small firms, house values were unlikely to be an important determinant of the ability to borrow if the firms' capital needs were large. The authors used the Census Bureau's Survey of Business Owners Public Use Microdata Sample, which surveys small firms about capital outlays at their startup, among other firm characteristics. Consistent with the authors' hypothesis, the positive effect of higher house prices was much stronger for those firms with lower capital needs. They examined whether their results were driven by firms in the nontradable goods sector — arguably those firms most likely to be affected by local demand — or by firms engaged in construction — those firms most likely to be directly affected by a local housing boom. They found that the positive relationship between house prices and employment growth was not driven by these types of firms. The authors also found that their results held for firms in industries that ship their goods long distances, again addressing the concern that employment growth might be affected by local demand.

Finally, the authors performed a back-of-the-envelope calculation to estimate the economic importance of the collateral channel. Adelino estimated that the collateral channel can account for 15 percent to 25 percent of the increase in employment growth due to higher house prices during the sample period, compared with approximately 40 percent that can be assigned to the effect of higher home prices on household demand.

UNEMPLOYMENT INSURANCE AND CONSUMER CREDIT

Brian Meltzer of Northwestern University reported on the results of a study with Joanne Hsu and David Matsa that measured the effects of unemployment insurance (UI) on

both household delinquency and the supply of credit. Meltzer argued that while other studies have examined the various effects of unemployment insurance — for example, the effect on labor search or on households' ability to smooth consumption — the authors' study was the first to examine whether more generous unemployment insurance might affect credit market outcomes. Broadly, the authors found

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evidence that more generous unemployment insurance was associated with statistically and economically significant reductions in household delinquency and increases in access to credit. The authors' approach was to exploit the variation across states and over time in the generosity of unemployment benefits as a means to identify the causal effects of UI on credit markets. They used a number of different data sets, covering the sample period 1992-2011.

The main results were striking. In particular, the authors found that unemployment was less likely to lead to mortgage delinquency and foreclosure in those states where unemployment insurance was more generous. The economic effects were large. For example, a \$1,000 increase in a state's maximum unemployment benefit was associated with a 5 percent decline in delinquency (compared with the sample mean) for unemployed households in that state. Furthermore a \$1,000 increase was associated with a 12 percent decline (compared with the sample mean) in foreclosures for unemployed households. The authors found similar effects when they examined the

cross-state differences in household delinquency and foreclosure associated with differences in extended unemployment benefits put in place during the Great Recession.

Meltzer and his coauthors hypothesized that suppliers of credit would be more prone to offer credit on attractive terms in those states where household income was stabilized through higher unemployment insurance. Consis-

tent with their hypothesis, the authors found evidence of lower mortgage spreads in those states with higher maximum unemployment insurance benefits. In addition, the authors examined cross-state variation in home equity line of credit (HELOC) offers using data from Mintel Comperemedia, a data provider that tracks credit card offers reported by their sample of households. The Mintel data set contains demographic information about participating households, which permitted the authors to identify supply effects with more precision. During the sample period 2000-11, the authors found that unemployed homeowners in those states with more generous unemployment benefits were more likely to receive a HELOC offer. In addition, they found that all households in such states were more likely to receive credit card offers and that the offers were on more generous terms, while the effects were strongest for low-income households. Specifically, they found that for every \$1,000 of additional maximum UI benefits, low-income households were offered \$900 in additional credit and that interest rates were 50 basis points lower.

BANK PROFITABILITY AND DEBIT CARD INTERCHANGE REGULATION: BANK RESPONSES TO THE DURBIN AMENDMENT

Mark Manuszak of the Federal Reserve Board presented his joint research with Benjamin Kay and Cindy Vojtech into the effects of the Durbin Amendment of the Dodd-Frank Act on bank profitability. Among other provisions, the Durbin Amendment, codified in Regulation II, included ceilings on interchange fees for debit card transactions for all banks with assets exceeding \$10 billion. Manuszak cited industry participants who predicted that banks would respond to the price ceiling by raising deposit account fees or by cutting costs in other parts of their operations. Broadly, the authors found evidence that banks did raise deposit account fees, although not enough to offset the decline in fees due to price ceilings, but they found no evidence of changes in operations to reduce costs.

The authors' identification strategy was to exploit the exemption from the interchange fee ceiling for banking organizations with assets of less than \$10 billion, plausibly an exogenous source of variation. Manuszak argued that balance sheet differences between banks above and below the \$10 billion cutoff after the imposition of Regulation II can be ascribed to the imposi-

tion of price ceilings.

Using data collected quarterly by banking regulators to examine progressively broader revenue categories, the authors found that interchange fee income — the narrowest category, which includes both credit card and debit card interchange income — declined approximately 36 percent in response to the price ceiling.⁴ Thus, banks did not successfully make up for their loss of interchange income on debit cards by increasing interchange income on credit cards (which were not subjected to price ceilings under the new regulation). A broader category, other noninterest income, fell by nearly 20 percent, suggesting that other sources of noninterest income did not rise enough to offset the fee ceiling.

The broadest category they considered, total noninterest income, was not affected significantly by the ceiling. Manuszak explained that one of the components of total noninterest income, deposit fees, increased by 4 percent to 8 percent. This offset 13 percent to 25 percent of the lost interchange income. The authors viewed this increase as evidence of market power, with banks raising the price of a bundled product in response

⁴ Specifically, the authors use data collected about bank holding companies, the so-called Y-9R.

to a price ceiling on another product in the bundle.

Using the Federal Deposit Insurance Corporation's Summary of Deposit data set, the authors found no evidence that Regulation II led to branch closings. Nor did they find any evidence from Call Report data of other adjustments in operations to cut costs in response to the lost revenue from the ceilings; instead, the authors found evidence of higher expenses, perhaps an indication of higher quality, according to the authors.

Finally, the authors examined in more detail their assumption that the \$10 billion cutoff was actually exogenous. Informally, Manuszak argued that while many provisions of the Dodd-Frank Act included revenue cutoffs — including some with the \$10 billion cutoff — these provisions were imposed at many different times. Using the actual date on which Regulation II was imposed as the event date for the present study significantly reduced the likelihood that other provisions were muddying their findings. Formally, the authors tested for the possibility that banks near the \$10 billion cutoff might have strategically limited asset growth or reduced total assets to fall below the threshold. Supporting their assumption that the \$10 billion threshold was exogenous, they found no evidence for such behavior. 