Consumers as Liquidity Providers in the Retail Industry: An Empirical Analysis

Xin Fan*

University of Pittsburgh

xif28@pitt.edu

This draft: April 1, 2021

Abstract

Prepaid gift cards represent short-term liabilities because retailers receive up-front cash at the sale of prepaid cards and book revenue at redemption. I show that these liabilities are economically important; the average unredeemed prepaid card balance is 7.0% of total liabilities and 3.4% of total assets. Moreover, using a unique natural experiment, I show that after a positive (negative) shock to the financing (marketing) effect of prepaid cards, retailers with high interest expense ratios increased prepaid card balances by 32.4% of the average level. Retailers in competitive markets reduced prepaid card balances by 44.1% of the average level. Meanwhile, the amount (time-to-maturity) of bank loans decreased (increased) for retailers. In addition, prepaid card balances experience a sharp increase following debt covenant violations. Overall, the study implies that the financing benefit of receiving up-front cash is one of the reasons for retailers to sell prepaid cards. Retailers use prepaid cards to substitute short-term bank loans and trade credits.

Keywords: Prepaid Card, short-term debt, bank loan.

JEL classification: G32, M31.

* Joseph M. Katz Graduate School of Business, University of Pittsburgh. I thank David Denis, Diane Denis, Andrew Koch, Leming Lin, Frederik Schlingemann, and Shawn Thomas for constructive comments and suggestions that helped to improve my paper. All errors remain my own.

Consumers as Liquidity Providers in the Retail Industry: An Empirical Analysis

Abstract

Prepaid gift cards represent short-term liabilities because retailers receive up-front cash at the sale of prepaid cards and book revenue at redemption. I show that these liabilities are economically important; the average unredeemed prepaid card balance is 7.0% of total liabilities and 3.4% of total assets. Moreover, using a unique natural experiment, I show that after a positive (negative) shock to the financing (marketing) effect of prepaid cards, retailers with high interest expense ratios increased prepaid card balances by 32.4% of the average level. Retailers in competitive markets reduced prepaid card balances by 44.1% of the average level. Meanwhile, the amount (time-to-maturity) of bank loans decreased (increased) for retailers. In addition, prepaid card balances experience a sharp increase following debt covenant violations. Overall, the study implies that the financing benefit of receiving up-front cash is one of the reasons for retailers to sell prepaid cards. Retailers use prepaid cards to substitute short-term bank loans and trade credits.

Keywords: Prepaid Card, short-term debt, bank loan.

JEL classification: G32, M31.

During the coronavirus pandemic, gift cards are nothing short of a lifeline for some small businesses.

Jessica Dickler (CNBC, "Support small businesses with gift cards – but know the risks," May 6, 2020)

1. Introduction

Total prepaid card sales by US retailers were $140 billion in 2016[1]. The market of prepaid cards flourished because prepaid cards are popular gifts to reduce social risk (Waldfogel, 1993; Austin and Huang, 2012). Moreover, previous surveys and research show that retailers frequently and effectively use prepaid cards as a marketing tool to boost sales and engage consumers (Ernstberger, McDowell, and Parris, 2012) for two reasons. First, companies receive incremental spending. Seventy-four percent of the consumers spend an average of $59 more than what was on their prepaid cards. Second, prepaid cards acquire new customers. Forty-one percent of gift card recipients say that they would have never visited a particular store if they had not received a gift card[2]. Cheng and Cryder (2018) explain the effectiveness of prepaid cards as a promotion tool using double mental discounting that consumers mentally discount some gains multiple times to feel as if they spend less money than they actually do.

However, the literature pays little attention to the fact that firms receive up-front cash at the sale of prepaid cards and book revenue at redemption. The interval that exists between cash flows and revenues makes the prepaid card a type of short-term debt. I find that the average unredeemed prepaid card balance reported by US retailers is as large as $77.94 million and 7% of total liabilities. FirstData, a prepaid card program outsourcer, lists "interest from unredeemed balance" as one of

[1] Alina Comoreanu, *Gift Card Market Size*, 2017
[2] FirstData, *2018 Prepaid Consumer Insights Study*

the benefits[3]. This shows that retailers have taken the financing benefit of receiving upfront cash into consideration. Meanwhile, the mainstream media raises concerns that companies in non-financial industries (e.g., Starbucks, Google, Alibaba, Apple, Facebook, Amazon) are becoming competitors to commercial banks[4]. For example, Starbucks has a $1.6 billion stored value card liability at the end of 2018, which was more than the deposits at a number of financial institutions, including California Republic Bank, Mercantile Bank, and Discover Financial Services. Nearly one-third of the transactions are handled with the company's pre-paid cards. However, the "deposit" at Starbucks is neither insured by FDIC nor monitored by financial regulators. "*Starbucks is essentially an unregulated bank. If they decided to shed their coffee business, all the stored value in those cards is theirs to keep*.[5]" Therefore, a study of such financing effects of prepaid cards has important policy implications.

Despite the importance of prepaid cards on retailers' balance sheets, there is, to my knowledge, no research about the financing effects of prepaid cards. This paper attempts to bridge this gap by addressing three previously ignored questions: What are the characteristics of the prepaid card balances of US retailers? Do retailers not only use prepaid cards as a marketing tool, but also take advantage of the financing benefits? Do retailers use prepaid cards to substitute other debt financing methods?

[3] FirstData describes in *Gift Card Marketing Guide Best Practices* that, "You have possession of the dollars on the gift card from the time that the card is purchased. By depositing the funds into an interest bearing account, you will be able to earn a return on your outstanding gift card balances."

[4] Simon Johnson, 2018, The First Bank of Starbucks; Tonya Garcia, 2016, Starbucks has more customer money on cards than many banks have in deposits; Marcus Wohlsen, 2014, The Next Big Thing You Missed: How Starbucks Could Replace Your Bank; Wayne Busch and Juan Pedro Moreno, 2014, Banks' New Competitors: Starbucks, Google, and Alibaba.

[5] Jason Snyder, global chief technology officer at Momentum, The Most Popular Mobile Payment App Isn't Apple Pay … It's Starbucks

Answering these three questions is challenging for two reasons. First, there is no comprehensive dataset of prepaid cards. Second, it is difficult to disentangle the marketing motive and the financing motive of prepaid cards. The benefit of receiving up-front cash could be one of the reasons for retailers to sell prepaid cards, even with costly promotions. Alternatively, it could just be a side-effect of prepaid cards, which are primarily used as a marketing tool. I address the challenges in the following ways. First, I use a new hand-collected dataset from 10-K SEC filings of US retailers (51<Two-digit SIC<60) from 2004 to 2018. The dataset contains information on unredeemed prepaid card balances for 1,511 firm-year observations. Second, I use the CARD Act of 2009 as a natural experiment to demonstrate that the financing effect is an important determinant of prepaid card balances. The regulation put new restrictions on maturity dates and inactivity fees, thereby creating a positive (negative) shock to the effectiveness of the prepaid card as a financing (marketing) tool. The natural experiment allows me to conduct an analysis that compares the prepaid card balances and debt financing policies in firms with and without significant benefits of upfront cash.

I provide some new evidence about the financing effects of prepaid cards. First, the unredeemed prepaid card balance is a significant part of retailers' balance sheets. On average, the prepaid card balance is 3.4% of total assets and 7.0% of total liabilities. The size of unredeemed prepaid card balance is comparable to the size of retailers' trade credit, credit line, and cash holdings. Second, after a positive (negative) shock to the financing (marketing) effect of prepaid cards, retailers that value the opportunity to receive upfront cash (i.e., high interest expense ratios) increased prepaid card balances by 32.4% of the average Prepaid card balance/Total assets. Retailers that mostly used prepaid cards for consumer engagement or retention (i.e., in a competitive product market) reduced prepaid card balances by 44.1% of the average Prepaid card

balance/Total assets. Third, prepaid card balances increase following covenant violations, as creditors use their acceleration and termination rights to increase interest rates and reduce the availability of credit. Fourth, after a positive (negative) shock to the financing (marketing) effect of prepaid cards, the amounts of small business loans decreased for retailers, relative to those for non-retailers. The result is more significant for loans with time-to-maturity less than a year. The time-to-maturity (cost) of small business loan increased (decreased) for retailers, compared to that for non-retailers. Retailers use prepaid cards to substitute short-term bank loans and trade credits.

My paper adds to the extant marketing and economic literature of prepaid cards. Some papers study social risk reduction by gifting prepaid cards (e.g., Waldfogel, 1993; Austin and Huang, 2012). Other papers find that prepaid cards lead to higher revenue as a marketing tool (Ernstberger, McDowell, and Parris, 2012; Cheng and Cryder, 2018). I study prepaid cards from a new perspective by documenting that the prepaid card is simultaneously used as a debt financing tool.

The paper is related to the trade credit literature because the prepaid card liability is a type of "reversed trade credit". The operation motive of trade credit has been widely understood. Schwartz (1974) introduces the financing motive of trade credit, which means that suppliers have cost advantages over financial institutions in offering credits to customers. Subsequent research extends the financing motive theory using information advantages (e.g., Smith, 1987; Biais, Gollier, and Viala, 1993), advantages in controlling the buyer (Cunat, 2007), and liquidation advantages (Mian and Smith, 1992). The logic of prepaid cards is similar. Previous literature documents that reducing the deadweight loss of gifting and boosting sales are motives for selling prepaid cards. In this paper, I provide evidence for the coexistence of the financing motive.

The remainder of the paper is organized as follows: Section 2 develops hypotheses. Section 3 explains the experimental design. Section 4 provides descriptive evidence of prepaid card balances.

Section 5 reports the main results that receiving upfront cash is one of the reasons for retailers to sell prepaid cards. Section 6 includes evidence that prepaid cards could substitute short-term bank loans. Section 7 summarizes additional results. Section 8 concludes.

2. Hypotheses

In Figure 1, I analyze the financing effect of prepaid cards. Although the marketing motive can drive retailers to sell prepaid cards, I do not take it into account for simplicity. ABD is the supply curve of capital, as described in Hubbard (1997). AB is the total amount of internal capital. The cost of internal capital equals the market interest rate. The cost of capital starts to increase at B because of external capital market imperfections. r_0q_0C is the supply curve of capital from prepaid card buyers. q_0 is the maximum amount of prepaid cards sold at face value. The real interest rate of prepaid cards sold at face value is negative at r_0 because of the breakage income (i.e., The breakage income is recognized once the probability of the redemption of a gift card becomes remote.) and time value of money (e.g., inflation and interest rates). In other words, the retailers can raise q_0 at r_0 by selling gift cards at face value and receive upfront cash. If the firm wants to sell beyond q_0, it has to use discounts and promotions to attract new buyers, increasing the cost of prepaid cards (real interest rate). Thus, the supply curve is upward-sloping from q_0 to C. The cost of prepaid cards depends on buyers' preferences. Buyers at the bottom of the supply curve are easy to attract (low cost of prepaid cards). Buyers at the top of the supply curve are difficult to attract and require better deals (high cost of prepaid cards).

[Insert Figure 1]

If it is costly to raise capital from the capital market, then the opportunity of receiving up-front cash is valuable. The financing benefit of an unredeemed prepaid card could be measured as the

difference between the current interest expense and the cost of the prepaid card. Therefore, retailers with high interest expense ratios are more likely to pay high costs to sell additional prepaid cards for upfront cash. In Figure 1, retailers will use only prepaid cards to meet capital demand until the amount reaches q_B, at which costs of prepaid cards equal costs of internal capital. If retailers need more capital beyond q_B, they will start to raise capital through both prepaid cards and the capital market. I assume that the demand for capital remains the same. If the average interest expense increases from ABD to A'B'D', then retailers will only sell prepaid cards to meet capital demand until $q_{B'}$. Beyond $q_{B'}$, they will start to raise capital through both prepaid cards and the capital market. The increase in average interest expense from ABD to A'B'D' increases the prepaid card balance by at least $q_{B'} - q_B$. The slopes of r_0q_0C and ABD affect the growth of capital and prepaid cards. If the slope of r_0q_0C is steeper than that of ABD, then the capital raised from the capital market increases faster than prepaid cards and vice versa. However, the positive relation between the interest expense and prepaid cards remains unchanged as long as both supply curves are upward-sloping.

H1: The prepaid card balance is positively related to the average interest expense ratio.

An important characteristic of prepaid cards as a type of liability is that there is no predetermined "time-to-maturity." The time-to-redemption of prepaid cards significantly influences the effectiveness of prepaid cards as a marketing tool and a financing tool. Procrastination occurs for enjoyable activities because of people's higher discounting of costs but lower discounting of benefits (Soman, 1998; Trope and Liberman, 2003; Zauberman and Lynch, 2005). Therefore, activities with costs and benefits that occur with close temporal proximity appear to have a larger net benefit when imagined being completed in the future than when completed

today (Shu and Gneezy, 2010). Limited windows are most effective at reducing this type of procrastination (Ariely and Wertenbroch, 2002).

Shu and Gneezy (2010) use experiments of gift card redemptions to show that the tendency to procrastinate applies to positive experiences with immediate benefits. They find that people procrastinate in redeeming gift cards with long deadlines more than those with short deadlines, resulting in overall lower redemption rates. If retailers intend to use prepaid cards to engage consumers, then they want a high redemption rate within a short period. Companies are likely to benefit from giving consumers short deadlines. However, the authors agree that companies benefit from high breakage incomes and may not be interested in high redemption rates in some cases. They suggest that public policy efforts to extend expiration dates may be good for the company in terms of higher satisfaction with the cards and lower redemption rates.

There exists a tradeoff between marketing and financing benefits when retailers choose expiration dates of prepaid cards. If retailers emphasize the marketing motive (i.e., acquire new customers, increase customer loyalty, and receive incremental spending), then they prefer short deadlines for prompt redemption and high redemption rate. If retailers value the financing benefits (i.e., delay redemption and low redemption rate), then they choose long deadlines. If there is a minimum requirement for expiration dates, then retailers that emphasize the financing (marketing) effect will increase (reduce) prepaid card balance.

H2a: After a positive shock to expiration dates of prepaid cards, prepaid card balances of retailers with high average interest expense ratios are larger than those of retailers with low average interest expense ratios.

H2b: After a positive shock to expiration dates of prepaid cards, prepaid card balances of retailers in a competitive market are smaller than those of retailers in a concentrated market.

In H1 and H2, the interest expense ratio is a proxy for financing benefits of receiving upfront cash through prepaid cards. However, interest expense and prepaid card balance might be correlated because of alternative explanations instead of financing benefits of unredeemed prepaid cards. To reinforce the conclusions drawn from the positive relation between interest expense ratios and prepaid card balances, I use an alternative proxy for financing benefits of unredeemed prepaid cards.

A sharp decline in the supply of credit could increase financing benefits of prepaid cards. Roberts and Sufi (2009) find that creditors use their acceleration and termination rights to increase interest rates and reduce the availability of credit (Sufi, 2009) in covenant violations. Net debt issuing activity experiences a sharp and persistent decline following debt covenant violations. Zhang (2018) documents that banks intervene in the borrowing firm following covenant violations and reduce trade credit. Raising capital through prepaid cards might be a way to circumvent debt covenants or lenders' intervention after covenant violations. Some debt covenants forbid retailers from borrowing more debt or issuing senior debt. Although prepaid cards have a similar financing effect as short-term debts, they are often not regarded as debt instruments. Therefore, I use debt covenant violations to replace the average interest expense ratio as the proxy for financing benefits of prepaid cards.

H3: The prepaid card balance increases following debt covenant violations.

If the prepaid card is partially used as a debt financing method, then it can substitute other debt financing methods. Garcia-Appendini and Montoriol-Garriga (2013) show that firms provide

liquidity insurance to their clients when bank credit is scarce. Similarly, prepaid cards substitute more bank loans after they become more effective as a financing tool (average time-to-redemption increases, and redemption rate decreases). Therefore, the amounts of other debt financing methods (e.g., bank loan and trade credit) decrease in retailers after a positive shock to expiration dates of prepaid cards.

H4: After a positive shock to expiration dates of prepaid cards, the amounts of bank loan and accounts payable decreased for retailers than those for non-retailers.

3. Data and Summary Statistics

3.1 Data

I begin with a Compustat universe that contains U.S.-based firms in the retail trade industry (two-digit SIC code 51-59) between 2004 and 2018. The sample excludes firms with total assets below $5 million or less than five consecutive years of data. This yields a sample of 361 unique firms and 4,026 firm-year observations. I manually collect prepaid card balances from 10-K SEC filings. Although most retailers have prepaid card programs, some of them do not report the balance exclusively. The final sample has 160 unique firms and 1,511 firm-year observations, which represent 37.5% of the population.

Bank loan data is obtained from SBA 7(a) database. SBA 7(a) database contains loan information of small businesses with a loan amount below $5 million. The covenant violation data in 2004 – 2012 is from Roberts and Sufi (2009). The bankruptcy filing data is from the UCLA-LoPucki Bankruptcy Research Database. The stock CARs of retailers are calculated using Event Study by WRDS.

3.2 Summary Statistics

Table 1 contains summary statistics for the full sample. Retailers have an average unredeemed prepaid balance of $77.93 million. The balance represents 3.4% of total assets and 7% of total liabilities. To further show the significant financing effects of prepaid cards, I construct three measures. On average, the prepaid card balance-to-total credit lines ratio is 83.5%. The prepaid card balance-to-accounts payable ratio is 55.5%. The prepaid card balance-to-cash holdings ratio is 100.1%. The prepaid card balance might be large during the holiday season and small during other months. The average Prepaid card balance-to-Total liabilities is 9.1% for firms with fiscal years end on December 31 (503 firm-year observations). The average ratio decreases to 6.2% for firms with fiscal years end on January 31 (716 firm-year observations). Although the prepaid card balance is indeed larger during the holiday season, the average prepaid card balance is still a significant part of total liabilities at the end of January. Table 1 implies that prepaid cards have a significant financing effect, which is comparable to the financing effects of other short-term debt instruments.

Prepaid cards that are never redeemed could stay as liabilities indefinitely. To keep from having a liability on its balance sheets indefinitely, a retailer typically estimates a breakage amount and recognizes this into revenue. I collect breakage income from 10-K SEC filings as well. Many companies do not regularly record breakage income every year. In the sample, 573 out of 1,474 observations report breakage incomes. Some of the breakage incomes include cumulative breakage incomes in the previous years. The average breakage income is 4.9% of the net income[6].

[6] Retailers can recognize breakage incomes using remote method or redemption pattern method. Remote method: the breakage income is recognized once the probability of the redemption of a gift card becomes remote. Redemption pattern method: the breakage income is recognized on a pro-rated basis determined by the redemption pattern of the outstanding gift cards redeemed. The ASC 606 requires companies to use redemption pattern method after 2018. However, both methods require some estimates.

Firm characteristics are defined as follows. Sales, Cash, Accounts payable, and PPENT are scaled by lagged Total assets. Firm size is measured as the natural logarithm of Total assets. Leverage is defined as Long-term debt plus Current liabilities divided by Total assets. ROA is Net income divided by Total assets. I calculate Profit margin as (Sales-Cost of goods sold)/Sales. Altman Z-score is a proxy for financial distress, which is calculated as 1.2*(Working capital/Total assets) + 1.4* (Retained earnings/Total assets) + 3.3*(EBIT/Total assets) + 0.6 *(Market value of equity/Total liabilities) + 0.999* (Net sales/Total assets). HHI is calculated for each three-digit SIC code. I winsorize all financial variables at the 1st and 99th percentiles.

[Insert Table 1]

Table 2 shows the trend of prepaid card balance over time. The average prepaid card balance increases from $45.6 million to $149.2 million over 14 years. CEB Tower Group documents a similar increase rate of US gift card market size. The balance was low in 2008 and 2009 during the financial crisis. Prepaid card liability/Cash, Prepaid card liability/Line of credit, and Prepaid card liability/accounts payable are high in 2008. Although the prepaid card balance was low because of the demand reduction, the magnitude is much smaller than the magnitudes of decreases in cash, credit line, and accounts payable. Prepaid card balance/Accounts payable grows steadily. Prepaid card balances, as "reversed" trade credit, have started to become important relative to traditional trade credits.

[Insert Table 2]

Table 3 shows prepaid card balances by two-digit SIC code. Prepaid cards are commonly used in some industries, while are sporadically used in other industries. The highest use of prepaid cards is in Eating & Drinking Places and Miscellaneous Retail. The average Prepaid card balance/Total

assets are 4.4% in both industries. The lowest Prepaid card balance/Total assets is in Food Stores and Automotive Dealers & Service Stations. The differences in Prepaid card balance/Total assets could be explained by the nature of the products or services or product market competition.

[Insert Table 3]

4. Empirical Design

4.1 Identification Strategy

Although I expect that both financing and marketing motives drive retailers to sell prepaid cards, it is challenging to disentangle the financing motive and the marketing motive. I utilize the Credit Card Accountability Responsibility and Disclosure Act of 2009 (CARD Act) as a natural experiment to address this challenge.

The CARD Act primarily instituted new consumer protection and disclosure requirements for credit cards. The goal was to protect consumers against unfair fees and interest[7]. Besides new restrictions on credit cards, Regulation E of the CARD Act put new restrictions on all gift cards sold on or after August 22, 2010. (1) Gift cards cannot expire for at least five years after they were last loaded with money. (2) Inactivity (dormancy) fees may not be imposed unless the card has been unused for at least 12 months. The requirements of expiration dates and inactivity fees require all prepaid cards to have long deadlines and low inactivity fees. Thus, the CARD Act is a positive shock to expiration dates of prepaid cards.

[7] Agarwal, Chomsisengphet, Mahoney, and Stroebel (2015) analyze the effect of the CARD Act on credit card holders, using a panel data set covering 160 million credit card accounts and a difference-in-differences research design. In this paper, I only focus on Regulation E of the CARD Act, which puts new restrictions on prepaid cards, gift certificates, and store gift cards. Financial institutions with credit card business can be affected by the CARD Act. To address this concern, I exclude firms in the financial service sector.

As discussed in Section 2, this increases consumers' tendency to procrastinate and results in delayed redemptions and low redemption rates (Shu and Gneezy, 2010). If a prepaid card is primarily used as a marketing tool to engage consumers, then the retailer wants consumers to redeem it sooner. If a prepaid card is mainly used as a financing tool for upfront cash, then the retailer hopes consumers to delay redemption or never redeem. Therefore, the CARD Act is a negative shock to the effectiveness of prepaid cards as a marketing tool and a positive shock to the financing benefits of prepaid cards.

I verify that the CARD Act is indeed a positive shock to the financing effect of gift cards using an event study of stock returns. The information about the expiration dates of gift cards sold by each retailer is unavailable. According to Shu and Gneezy (2010), retailers that mainly use prepaid cards as a marketing tool are more likely to originally have short expiration dates and be forced to increase expiration dates after the CARD Act. Retailers that mainly use gift cards as a financing tool might already have long expiration dates and are unaffected by the CARD Act. Therefore, the CARD Act is overall more beneficial or less harmful to retailers with high interest expense ratios (in a concentrated market) than retailers with low interest expense ratios (in a competitive market).

The bill was first passed by the House on April 30, 2009. The Senate followed suit and passed an amended version on May 19, 2009. The House passed the amended bill on May 20, 2009. The bill was signed into law on May 22, 2009. Because the event on April 30, 2009, is the most unexpected one compared to the later events, I conduct an event study around April 30, 2009, in Table 4. To account for the possibility of information leakage prior to the event or a lag in the information being incorporated into prices, I also analyze CARs in progressively wider windows centered on the event date. I report stock CARs for the full sample, subsamples of high and low interest expense ratios, and subsamples of concentrated and competitive markets. Firms with high

(low) interest expense ratios are those with above (below) median interest expense ratios in 2008. Firms in a concentrated (competitive) market are those with HHI>0.2 (HHI<0.2) in 2008. The difference between high and low interest expense ratios (concentrated and competitive) is reported using two-sample t-tests.

CARs are significantly positive in [0] for all retailers. The CARD Act is overall positive news to shareholders. The level of significance and magnitude of CARs for retailers with high interest expense ratios are larger than those for retailers with low interest expense ratios. The CARD Act is significantly more beneficial to retailers with high interest expense ratios. Stock CARs are significantly positive in concentrated markets and insignificant in competitive markets. The CARD Act is significantly more beneficial to retailers in concentrated markets than in competitive markets. The results of the event study suggest that the CARD Act is a positive shock to the financing effect of prepaid cards and a negative shock to the marketing effect of prepaid cards.

[Insert Table 4]

4.2 Econometric Model

I use a Difference-in-Differences analysis to examine the causal relation between the financing motive and prepaid card balances.

$$\left(\frac{Prepaid\ card\ balance}{Total\ assets}\right)_{i,t} = \alpha_i + \delta_t + \beta_0 + \beta_1 * Treat_i * Aft_t + \gamma * X_{i,t-1} + \varepsilon_{i,t} \qquad (1)$$

I use two variables to identify treatment groups. $Interest2009_i$ is a dummy variable, which equals one if firm i has above median average interest expense ratio in 2009, and zero otherwise. $Compete2009_i$ is a dummy variable, which equals one if HHI of firm i was in the bottom 30% in 2009, and zero otherwise. Aft_t is a dummy variable, which equals one starting from 2010, and zero

otherwise. I control for firm characteristics, including interest expense, Altman Z-score, sales, size, cash, accounts payable, leverage, ROA, PPENT, profit margin, cash cycle, and firm age. All independent variables are at the end of the previous year. Standard errors are clustered at the firm level, and all regressions include firm and year fixed effects. $Treat_i$ and Aft_t are dropped because of collinearity.

5. Main Results

5.1 Baseline regressions of the prepaid card balance

Table 5 presents the estimation results of baseline regressions of prepaid card balances. The dependent variable is $(\text{Prepaid card balance/Total assets})_{i,t}$. Control variables are as described in Section 4.2. I include firm fixed effects and year fixed effects. Standard errors are clustered by firm. In Column 1, the coefficient of $(\text{Interest expense/Total liabilities})_{i,t-1}$ is significantly positive. Consistent with H1, the prepaid card balance is positively related to the average interest expense ratio. One percent increase in $(\text{Interest expense/Total liabilities})_{i,t-1}$ is related to 0.13% increase in $(\text{Prepaid card balance/Total assets})_{i,t}$. Coefficients of $(\text{Cash/Total assets})_{i,t-1}$ and $(\text{Accounts payable/Total assets})_{i,t-1}$ are significantly negative, suggesting that firms with less access to cash holdings and trade credits have larger prepaid card balances. This implies that prepaid cards might substitute trade credits and internal capital. I further test this inference in Table 7.

The positive association between the prepaid card balance and the average interest expense should only be significant in concentrated product markets. First, the marketing motive of prepaid cards is more important in a competitive product market than in a concentrated product market as engaging consumers is a pressing task in competitive markets. The financing benefit should be similar in both types of markets. Therefore, the financing benefit is a dominating determinant of

selling prepaid cards in a concentrated market. Second, the supply curve of capital from prepaid cards in Figure 1 reflects a price discrimination strategy, which is more effective with monopoly power. Traditional microeconomic theory predicts a negative relation between competition and price dispersion (Gerardi and Shapiro, 2009). If a retailer is a price taker in a perfectly competitive market, then it is difficult to extract economic profit by selling its products (including prepaid cards). Extracting financing benefits from unredeemed prepaid cards is even more difficult. Column 2 tabulates supporting result. $Concentrate_{i,j,t-1}$ is a dummy variable, which equals one if HHI>0.2 for firm i in industry j (three-digit SIC code) in t-1, and zero otherwise. The coefficient of $(Interest\ expense/Total\ liabilities)_{i,t-1}$ is insignificant, while the coefficient of $Concentrate_{i,j,t-1}$ * $(Interest\ expense/Total\ liabilities)_{i,t-1}$ is significantly positive.

[Insert Table 5]

5.2 Prepaid card balances and the CARD Act of 2009

As discussed in Section 4, I utilize the CARD Act of 2009 as a natural experiment to disentangle the impacts of the financing and marketing benefits on prepaid card balances. It creates a positive (negative) shock to the effectiveness of prepaid cards as a financing (marketing) tool. I conduct a DID analysis to compare high and low interest expense ratios (concentrated and competitive) retailers around the CARD Act.

A core assumption of DID is that there is no pre-existing differential trend between treated and control firms. Under this assumption, any difference after the treatment is the result of the treatment. The absence of a pre-treatment parallel trend leads to biased estimates of the causal effect. Figure 2 shows the parallel trend of prepaid card balances of firms with high and low interest expense ratios in 2009. The event date t=0 is 2010. I plot the year-by-year differences in prepaid

card balance of firms with high and low interest expense ratios relative to those in 2004 (t = -6). Prior to 2010, both groups had similar trends. After 2010, the average differences become significantly larger than those in 2004. The difference in 2010 (t=0) is not significantly different from those in 2004 because the regulation took effect on August 22, 2010. The effect of the regulation is not prominent at the end of 2011. Figure 2 supports the pre-treatment parallel trend assumption of DID analysis.

[Insert Figure 2]

Figure 3 shows the parallel trend of prepaid card balances of firms in competitive and non-competitive markets. Before 2010 (t=0), the differences in prepaid card balances between competitive and non-competitive groups are not significantly different from those in 2004 (t= -6). After 2012 (t=2), the average differences become significantly smaller than those in 2004. Similar to Figure 2, the difference in 2010 (t=0) is not significantly different from those in 2004 because the regulation took effect at the end of 2010. The difference in 2011 (t=1) is still not significantly different from those in 2004. However, the coefficient of $Compete2009_i$ * $Year\ 2011_t$ is -0.006 (P value=0.16) is significantly lower than those in previous years. Therefore, there was a sharp decline in the difference in prepaid card balances between competitive and non-competitive groups in 2011.

[Insert Figure 3]

Table 6 tabulates the estimation results of equation (1). In Column 1, the coefficient of $Interest2009_i$ * Aft_t is significantly positive, suggesting that the difference in prepaid card balance between retailers with high and low interest expense ratios significantly increased after 2009. Consistent with H2a, after a positive shock to the financing effect of prepaid cards, retailers with

high interest expense ratios had larger prepaid card balances relative to other retailers. Retailers with above-median interest expense increased Prepaid card balance/Total assets by 0.011, which is 32.4% of the average Prepaid card balance/Total assets. In Column 2, the coefficient of $Competitive2009_i$ * Aft_t is significantly negative. Consistent with H2b, retailers in competitive markets are likely to use prepaid cards as a marketing tool. After a negative shock to the marketing effect of prepaid cards, they reduced prepaid card balances relative to other retailers. Retailers in competitive markets reduced Prepaid card balance/Total assets by 0.015, which is 44.1% of the average Prepaid card balance/Total assets. Results of Table 6 confirm H2a and H2b, suggesting that the financing benefit is one of the reasons for some retailers to sell prepaid cards.

[Insert Table 6]

I examine whether retailers increase prepaid cards when they do not get access to similar short-term debt financing methods and internal capital. Trade credit is a similar type of short-term liabilities for two reasons. First, both trade credit and prepaid cards are related to the upstream or downstream firms. The unredeemed prepaid card is considered as "reversed trade credit". Second, they are both short-term liabilities. The average duration of trade credit is 59.2 days (Klapper, Laeven, and Rajan, 2012). A market survey indicates that only 30 percent of recipients use a gift card within a month of receiving it[8]. I investigate whether firms with low accounts payable and cash holdings in 2009 increased prepaid cards after the positive shock to financing benefits. Table 7 reports the estimation results. $Payable2009_i$ is a dummy variable, which equals one if firm i has above-median accounts payable in 2009, and zero otherwise. $Cash2009_i$ is a dummy variable, which equals one if firm i has above-median cash holdings in 2009, and zero otherwise.

[8] S. J. Dubner And S. D. Levitt (2007), The Gift-Card Economy, The New York Times.

Coefficients of $Payable2009_i*Aft_t$ and $Cash2009_i*Aft_t$ are negative in both regressions. Retailers with large trade credits and cash holdings did not value the financing benefits of prepaid cards. After a positive (negative) shock to the financing (marketing) effect, they have smaller prepaid card balances compared to other retailers.

[Insert Table 7]

6. The Substitution Effect

In Section 5.2, I find that the financing benefit of receiving upfront cash is one of the reasons for retailers to sell prepaid cards. In this section, I study whether prepaid cards substitute other financing methods, including bank loans and trade credits. I use the small business bank loan data from SBA 7(a) database to test the change in bank loans. However, the implications apply to both public and small firms.

Table 8 tabulates the change in small business loans around the CARD Act. The dependent variable is the natural logarithm of the amount of small business loan. $Retail_j$ is a dummy variable, which equals one if the borrower of loan j is in the retail industry, and zero otherwise. Aft_t is a dummy variable, which equals one if loan j was approved after September 2010, and zero otherwise. Column 1 reports the baseline regression result. The coefficient of $Retail_j* Aft_t$ is significantly negative, which suggests that the loan amount of retailers decreased after the CARD Act, compared to the loan amount of non-retailers. Consistent with H4, retailers relied less on bank loans after a positive shock to the financing effect of prepaid cards.

A vital difference between prepaid cards and bank loans is that financing through prepaid cards does not have a predetermined maturity date. Although previous literature suggests that expiration dates influence time-to-redemption and redemption rate (e.g., Ariely and Wertenbroch, 2002; Shu

and Gneezy, 2010), consumers have the latitude to redeem prepaid cards any time before the expiration date. Meanwhile, retailers do not have to repay interest and principle before the predetermined date. Public retailers do not canonically disclose the average time-to-redemption and redemption rate. In Column 2, I conduct an analysis to investigate whether prepaid cards primarily substitute bank loans with a certain range of time-to-maturity. One $year_j$, One-to-five $year_j$, and Five-to-ten $year_j$ are dummy variables which equal one if time-to-maturity of loan j is less than 1 year, 1-5 years, and 5-10 years, respectively. The coefficients of $Retail_j * Aft_t *$ One $year_j$, $Retail_j * Aft_t *$ One-to-five $year_j$, and $Retail_j * Aft_t *$ Five-to-ten $year_j$ are -0.482 (P-value=0.000), -0.053 (P-value=0.000), and -0.010 (P-value=0.387) respectively. The level of significance and magnitude are higher for loans with short time-to-maturity than for loans with long time-to-maturity. The amounts of loans with short time-to-maturity decreased more than the amounts of loans with long time-to-maturity after the CARD Act. Column 2 of Table 8 suggests that prepaid cards primarily substitute short-term bank loan as a debt financing method.

[Insert Table 8]

In Table 9, I tabulate the changes in time-to-maturity and cost of small business loans. The dependent variables are the natural logarithm of the number of months to maturity and the natural logarithm of the interest rate. In Column 1, the coefficient of $Retail_j * Aft_t$ is significantly positive. The time-to-maturity of small business loans of retailers increased after the CARD Act, compared to the time-to-maturity of small business loans of non-retailers. As discussed in Table 8, prepaid cards can substitute short-term loans instead of long-term loans. Retailers will borrow from banks when they require a long time-to-maturity, but consumers generally redeem within a short period. After the CARD Act, the average time-to-redemption of prepaid cards increased, allowing prepaid cards to substitute bank loans with longer time-to-maturity. The bank loans that still cannot be

substituted by prepaid cards have even longer time-to-maturity. Therefore, the time-to-maturity of small business loans for retailers increased after the CARD Act.

In Column 2, the coefficient of $Retail_j$* Aft_t is significantly negative. The result is also consistent with the substitution effect of prepaid cards. Given the same time-to-maturity, retailers will use prepaid cards to replace bank loans when costs of prepaid cards are lower than loan interest rates. After the CARD Act, more prepaid cards can substitute bank loans. Bank loans with relatively high interest rates can be substituted, while the remained bank loans that are not substituted have low costs. Thus, the costs of bank loans for retailers decreased, compared to those for non-retailers.

[Insert Table 9]

As discussed in Section 5.2, trade credits are similar short-term liabilities to prepaid cards. Retailers with large amounts of accounts payable increased smaller prepaid card balances after the CARD Act. In Table 10, I report the change in trade credits around the CARD Act. The sample includes all Compustat firms, excluding firms in the Finance, Insurance, and Real Estate industry. $Retail_i$ is a dummy variable, which equals one if firm i is in the retail industry, and zero otherwise. The coefficient of $Retail_i$ * Aft_t is significantly negative. Retailers have lower accounts payable relative to firms in other industries after the CARD Act. After a positive shock to the financing effect of prepaid cards, retailers replaced trade credits with prepaid cards.

[Insert Table 10]

7. Additional Results

7.1 Prepaid card balances and debt covenant violations

As discussed in H3, the average interest expense ratio is not a perfect measure of the benefit of receiving upfront cash. It might correlate with a third variable, which actually drives the change in prepaid card balances. To reinforce the conclusions, I use the covenant violation as an alternative proxy for the benefit of receiving upfront cash. I follow Sufi (2009) to examine the effect of covenant violations on prepaid card balances by estimating equation (2). I include indicators that identify two years before and four years following covenant violations. Standard errors are clustered at the firm level, and all regressions include firm and year fixed effects.

$$\left(\frac{Prepaid\ card\ balance}{Total\ assets}\right)_{i,t} = \alpha_i + \delta_t + \beta_0 + \beta_1 * Violation_{i,t+1} + \beta_2 * Violation_{i,t} + \beta_3 * Violation_{i,t-1} + \beta_4 * Violation_{i,t-2} + \beta_5 * Violation_{i,t-3} + \beta_6 * Violation_{i,t-4} + \gamma * X_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

Table 11 presents estimation results of equation (2). The coefficients of Covenant violation$_{i,t+1}$ and Covenant violation$_{i,t}$ are insignificantly different from zero. Coefficients of Covenant violation$_{i,t-1}$ to Covenant violation$_{i,t-4}$ are significantly positive. Consistent with H3, retailers do not significantly increase prepaid card balances before or during the year of covenant violations but increase prepaid card balances following covenant violations. The test verifies the conclusions drawn from the main results in Section 5.

[Insert Table 11]

7.2 Prepaid card balances and bankruptcy

When the retailer is close to bankruptcy filings, there might be technical or payment defaults, and standard financing options are no longer available. The financing benefits of prepaid cards are

maximized for two reasons. First, unredeemed prepaid cards are categorized as unsecured debt in bankruptcy. Nevertheless, costs of prepaid cards could be lower than costs of other unsecured debts because the claims might be treated as a top priority in bankruptcy. Specifically, the debtor sometimes seeks the permission of the court to continue honoring prepaid cards after bankruptcy filings. Attorneys general often argue in favor of consumers being given priority treatment in bankruptcy (Rosen, 2015). The possible priority treatment in bankruptcy results in lower ex ante costs of prepaid cards. Second, consumers are well diversified and uninformed, compared to other creditors of the retailer. The marginal cost for an individual consumer to collect and analyze financial information far exceeds the marginal benefit. Costs of prepaid cards are not highly sensitive to the bankruptcy risk, compared to costs of other debts.

Some retailers deliberately offer discounts to sell more prepaid cards before bankruptcy filings. For example, in bankruptcy of Radioshack, Texas Attorney General Office claimed that "RadioShack knew after the 2014 holiday season ended that it would be declaring bankruptcy soon, and that gift cards they had issued would lose their value at the time of the bankruptcy or shortly afterward, yet sold the cards anyway [9]." Toys "R" Us was able to increase its gift card balance to $233 million in January 2017 ($222 million, $205 million, $199 million in the previous three years), even though it filed for bankruptcy in September 2017. In the appendix, I provide a list of promotions related prepaid cards of Toys "R" Us in recent years collected from deal information websites. Before 03/31/2016, gift cards were sold by Toys "R" Us at 10% - 30% off. Starting from 08/24/2016, Toys "R" Us frequently offered 50% off. Even two months before the bankruptcy filing, Toys "R" Us still sold its gift cards at 50% off.

[9] https://consumerist.com/2015/12/04/people-holding-onto-radioshack-gift-cards-can-now-file-refund-claims/

Figure 4 shows the trend of Prepaid card balance/Total assets before bankruptcy filings. The sample is limited to firms that ultimately file for bankruptcy. The average prepaid card balance gradually decreases from year -8 to year -3. From year -3 to year -1, the average Prepaid card balance/Total assets increases from 0.020 to 0.027.

[Insert Figure 4]

I also use Penalized Maximum Likelihood Estimation to examine the relation between bankruptcy filings and prepaid card balances. The dependent variable $Bankruptcy_{i,t}$ is a dummy variable, which equals one if firm i files for bankruptcy in year t. The financial data of many retailers stops updating before bankruptcy filing dates. To address for the mismatch, I define $Bankruptcy_{i,t}$ equals one if t is the last observation of firm i in Compustat and firm i files for bankruptcy within two years. Because $Bankruptcy_{i,t}$ equals one in only 14 out of 1,489 firm-year observations, the small-sample bias of conventional logistic regression is serious (King and Zeng, 2001). I use the Penalized likelihood regression (Firth-type) to correct the small sample bias. I include prepaid card balance from t-1 to t-3 as independent variables and follow Jones and Hensher (2004) to control for firm characteristics. In Table 12, the coefficient of Prepaid card balance/Total $assets_{i,t-1}$ is significantly positive. If firm i has a larger prepaid balance in year t-1, then it is more likely to file for bankruptcy in year t. The evidence in Figure 4 and Table 12 suggests that the prepaid card balance jumps shortly before bankruptcy filings.

[Insert Table 12]

8. Conclusion

The literature and survey in marketing argue that the prepaid card is a standard tool to boost sales. Meanwhile, the unredeemed prepaid card balance is reported as short-term liabilities on the

balance sheets. The financing benefit of prepaid cards has become noteworthy in daily life. However, the extant literature has not discussed the financing effect of prepaid cards. I provide the first comprehensive study of the financing effects of prepaid cards of US retailers. It shows that retailers value the opportunity of receiving upfront cash flows through selling prepaid cards.

There are four main findings in this article. First, unredeemed prepaid card balance accounts for 3.4% of total assets and 7.0% of total liabilities. Prepaid cards inevitably have a considerable financing effect on retailers. Second, retailers with high interest expense ratios increased prepaid card balances after a positive shock to the financing effect of prepaid cards. Retailers in competitive markets decreased prepaid card balances after a negative shock to the marketing effect of prepaid cards. Third, the prepaid card balance increases following debt covenant violations. The average prepaid card balance jumps one year before bankruptcy filings when the financing benefit hits its peak. Fourth, prepaid cards substituted short-term bank loans and accounts payable after a positive shock to the financing effect of prepaid cards.

The paper exhibits the trend that the lines between industry sectors blur and non-banks are capturing more and more of the banking value chain. For example, Paypal is a strong competitor in the payment area. T-mobile has launched a new checking service. Whether to raise or lower regulatory barriers to these new players is an important question facing policymakers. My paper provides evidence for the financial features of non-financial tools that are used in non-financial business sectors. It calls financial regulators' attention to these new phenomena.

Reference

Agarwal, S., Chomsisengphet, S., Mahoney, N. and Stroebel, J., 2015. Regulating consumer financial products: Evidence from credit cards. The Quarterly Journal of Economics, 130(1), pp.111-164.

Almeida, H., Campello, M. and Weisbach, M.S., 2004. The cash flow sensitivity of cash. The Journal of Finance, 59(4), pp.1777-1804.

Altman, E. and Ratios, F., 1968. Discriminant analysis and the prediction of corporate bankruptcy. Journal of Finance, 23(4), pp.589-609.

Ariely, D. and Wertenbroch, K., 2002. Procrastination, deadlines, and performance: Self-control by precommitment. Psychological science, 13(3), pp.219-224.

Austin, C.G. and Huang, L., 2012. First choice? Last resort? Social risks and gift card selection. Journal of Marketing Theory and Practice, 20(3), pp.293-306.

Biais, B. and Gollier, C., 1997. Trade credit and credit rationing. The Review of Financial Studies, 10(4), pp.903-937.

Chava, S., & Purnanandam, A. (2010). Is default risk negatively related to stock returns?. The Review of Financial Studies, 23(6), 2523-2559.

Cheng, A. and Cryder, C., 2018. Double mental discounting: When a single price promotion feels twice as nice. Journal of Marketing Research, 55(2), pp.226-238.

Cunat, V., 2006. Trade credit: suppliers as debt collectors and insurance providers. The Review of Financial Studies, 20(2), pp.491-527.

El-Gazzar, S. A. M. I. R., & Pastena, V. (1991). Factors affecting the scope and initial tightness of covenant restrictions in private lending agreements. Contemporary Accounting Research, 8(1), 132-151.

Ernstberger, K.W., McDowell, D. and Parris, J., 2012. Impact of Closed-Loop Gift Card Promotions By Businesses. International Journal of Business and Social Research, 2(6), pp.190-197.

Firth, D., 1993. Bias reduction of maximum likelihood estimates. Biometrika, 80(1), pp.27-38.

Garcia-Appendini, E. and Montoriol-Garriga, J., 2013. Firms as liquidity providers: Evidence from the 2007–2008 financial crisis. Journal of Financial Economics, 109(1), pp.272-291.

Gerardi, K.S. and Shapiro, A.H., 2009. Does competition reduce price dispersion? New evidence from the airline industry. Journal of Political Economy, 117(1), pp.1-37.

Hubbard, R.G., 1997. Capital-market imperfections and investment (No. w5996). National Bureau of economic research.

Jones, S. and Hensher, D.A., 2004. Predicting firm financial distress: A mixed logit model. The Accounting Review, 79(4), pp.1011-1038.

King, G. and Zeng, L., 2001. Logistic regression in rare events data. Political analysis, 9(2), pp.137-163.

Mian, S.L. and Smith Jr, C.W., 1992. Accounts receivable management policy: theory and evidence. The Journal of Finance, 47(1), pp.169-200.

Roberts, M.R. and Sufi, A., 2009. Renegotiation of financial contracts: Evidence from private credit agreements. Journal of Financial Economics, 93(2), pp.159-184.

Rosen, K. A., 2015. The Gift Card Problem For Retailers In Chapter 11. Law360

Schwartz, R.A., 1974. An economic model of trade credit. Journal of Financial and Quantitative Analysis, 9(4), pp.643-657.

Shu, S.B. and Gneezy, A., 2010. Procrastination of enjoyable experiences. Journal of Marketing Research, 47(5), pp.933-944.

Smith, J.K., 1987. Trade credit and informational asymmetry. The Journal of Finance, 42(4), pp.863-872.

Soman, D., 1998. The illusion of delayed incentives: evaluating future effort–money transactions. Journal of Marketing Research, 35(4), pp.427-437.

Sufi, A., 2007. Bank lines of credit in corporate finance: An empirical analysis. The Review of Financial Studies, 22(3), pp.1057-1088.

Trope, Y. and Liberman, N., 2003. Temporal construal. Psychological Review, 110(3), p.403.

Waldfogel, J., 1993. The deadweight loss of Christmas. The American Economic Review, 83(5), pp.1328-1336.

Zauberman, G. and Lynch Jr, J.G., 2005. Resource slack and propensity to discount delayed investments of time versus money. Journal of Experimental Psychology: General, 134(1), p.23.

Zhang, Z. (2018). Bank interventions and trade credit: evidence from debt covenant violations. Journal of Financial and Quantitative Analysis, 1-29.

Appendix

Promotions of prepaid cards by Toys "R" Us

Date	Promotion
7/15/2017	Groupon: Toys “R” Us $20 eGift Card Only $10
3/12/2017	Groupon: $20 Toys “R” Us eGift Card Only $10
2/7/2017	eBay: $100 Toys “R” Us Gift Card Only $93 shipped
12/6/2016	Groupon: $10 Toys “R” Us eGift Card ONLY $5
10/19/2016	eBay: $50 Toys “R” Us eGift Card – ONLY $40
8/24/2016	Groupon: $20 Toys “R” Us eGift Card Only $10
3/31/2016	eBay: $100 Toys “R” Us Gift Card for $70
3/1/2016	eBay: $100 Toys “R” Us eGift Card for only $85
12/16/2015	eBay: $100 Toys “R” Us Gift Card Only $90
9/24/2015	eBay: $100 Toys “R” Us Gift Card Only $85 Shipped
12/23/2014	Groupon: Free $5 Groupon Bucks with the purchase of a $25.00 Toys “R” Us eGift Card
10/21/2014	eBay: $100 Toys “R” Us Gift Card Only $85 Shipped

The promotions are collected from Hip2Save, Slickdeals, and Clarkdeals. The list provides anecdote evidence that retailers have incentives to offer a deeper discount for prepaid cards when they are close to bankruptcy. I try to capture promotions directly offered by Toys “R” Us, by only including promotions from Groupon and PayPal Official Digital Gift Card on eBay. Price information from exchange platforms is excluded.

Figure 1 The supply of capital through prepaid cards

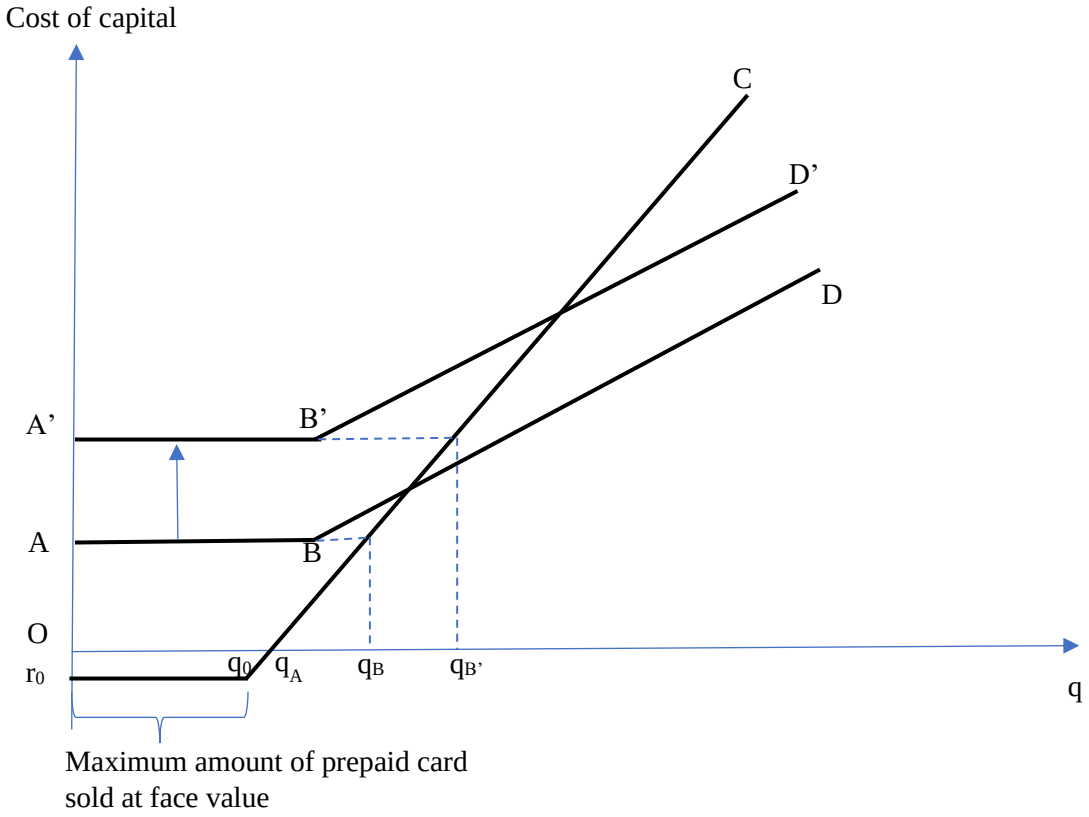
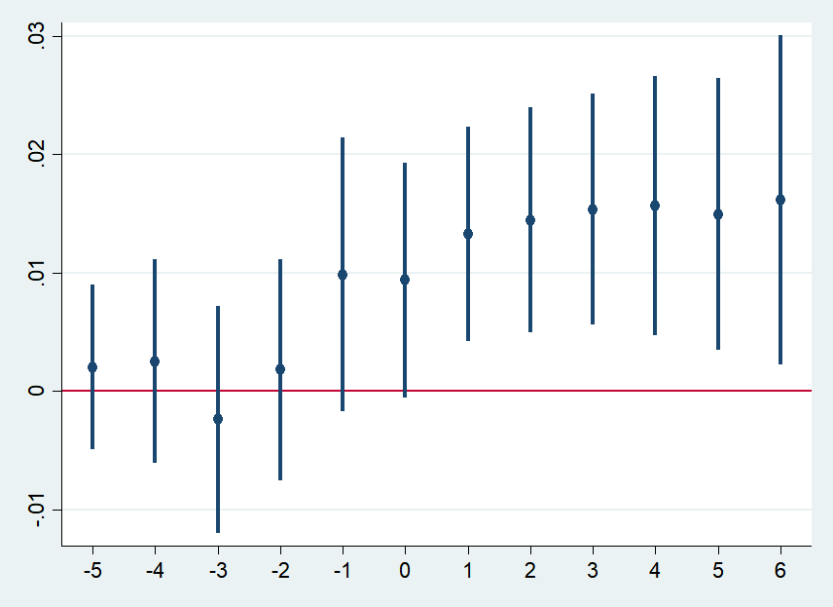
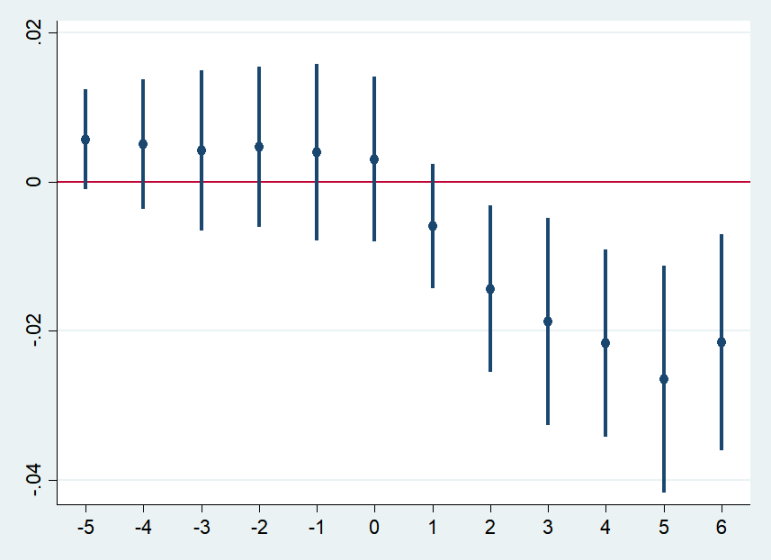


Figure 2 Prepaid card balances and interest expense ratios



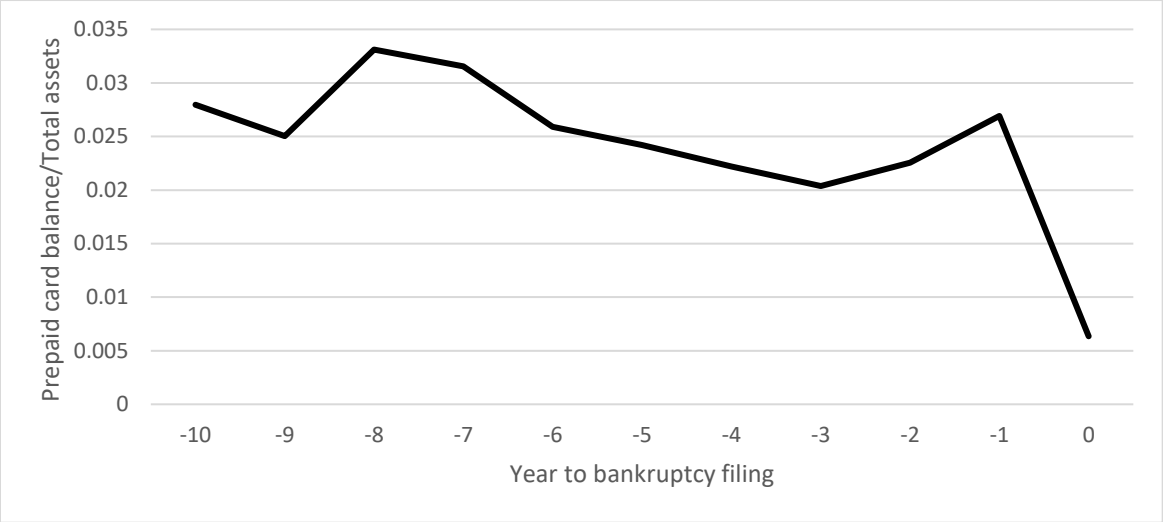
The figure shows coefficients of interactions between year dummy variables and Interest2009$_i$ and 95% confidence intervals of coefficients. Interest2009$_i$ equals one if firm i's average interest expense ratio is above median in 2009, and zero otherwise. The event date 0 is 2010. The sample includes all US retailers from Compustat that report prepaid card balances.

Figure 3 Prepaid card balances and market competition



The figure shows coefficients of interactions between year dummy variables and $Compete2009_i$ and 95% confidence intervals of coefficients. $Compete2009_i$ equals one if firm i's HHI is in the bottom 30% in 2009, and zero otherwise. The event date 0 is 2010. The sample includes all US retailers from Compustat that report prepaid card balances.

Figure 4 Prepaid card balance/Total assets before bankruptcy filing



The figure maps the average Prepaid card balance/Total assets before bankruptcy filing. t = 0 is the year, in which a firm files for bankruptcy, and the y-axis represents the average Prepaid card balance/Total assets before bankruptcy.

Table 1 Summary statistics

Variable	Mean	St. Dev	Minimum	Median	Maximum	N
Prepaid card balance						
Unredeemed prepaid card balance ($ million)	77.936	154.585	0.108	15.716	970.000	1,511
Unredeemed prepaid card balance$_{i,t}$/Total assets$_{i,t-1}$	0.034	0.038	0.000	0.024	0.263	1,505
Unredeemed prepaid card balance$_{i,t}$/Total liabilities$_{i,t-1}$	0.070	0.072	0.001	0.046	0.401	1,490
Unredeemed prepaid card balance$_{i,t}$/Cash holdings$_{i,t}$	1.001	2.614	0.007	0.233	19.088	1,511
Unredeemed prepaid card balance$_{i,t}$/(Used + unused credit line)$_{i,t}$	0.835	2.317	0.003	0.224	17.876	436
Unredeemed prepaid card balance$_{i,t}$/Accounts payable$_{i,t}$	0.555	1.139	0.002	0.238	8.187	1,511
Breakage income$_{i,t}$/Net income$_{i,t-1}$	0.049	0.328	-1.190	0.019	2.094	573
Breakage income$_{i,t}$/Total assets$_{i,t-1}$	0.004	0.006	0.000	0.002	0.037	573
Firm characteristics						
(Interest expense/Total liabilities)$_{i,t-1}$	0.023	0.021	0.000	0.018	0.106	1,321
HHI$_{i,j,t-1}$	0.201	0.154	0.075	0.147	1.000	1,314
Altman's Z-score$_{i,t-1}$	4.776	3.111	-3.533	4.265	19.077	1,358
Sales$_{i,t-1}$	1.959	0.758	0.338	1.850	5.949	1,468
Size$_{i,t-1}$	6.689	1.620	2.541	6.556	10.893	1,505
Cash$_{i,t-1}$	0.155	0.153	0.002	0.105	0.767	1,468
Accounts payable$_{i,t-1}$	0.122	0.094	0.008	0.097	0.555	1,451
Leverage$_{i,t-1}$	0.212	0.251	0.000	0.139	1.435	1,486
ROA$_{i,t-1}$	0.041	0.107	-0.431	0.055	0.286	1,504
PPENT$_{i,t-1}$	0.395	0.202	0.024	0.361	0.881	1,505
Profit margin$_{i,t-1}$	0.335	0.125	0.071	0.335	0.725	1,502
Age$_{i,t-1}$	2.715	0.799	0.000	2.773	4.220	1,495

This table presents summary statistics of prepaid card balance and firm characteristics. HHI is the Herfindahl – Hirschman Index for the firm's three-digit SIC industry. Altman Z-score is calculated as 1.2*(Working capital/Total assets) + 1.4* (Retained earnings/Total assets) + 3.3*(EBIT/Total assets) + 0.6 *(Market value of equity/Total liabilities) + 0.999* (Net sales/Total assets). Sales, Cash, Accounts payable, and PPENT are scaled by lagged Total assets. Firm size is

measured as the natural logarithm of Total assets. Leverage is defined as Long-term debt plus Current liabilities divided by Total assets. ROA is Net income divided by Total assets. I calculate Profit margin as (Sales-Cost of goods sold)/Sales. I winsorize all financial variables at the 1st and 99th percentiles.

Table 2 Prepaid card balance by year

Year	(1) Prepaid card balance ($ million)	(2) Prepaid card balance/Total assets	(3) Prepaid card balance/Total liabilities	(4) Prepaid card balance/Cash	(5) Prepaid card balance/Line of credit	(6) Prepaid card balance/Accounts payable	(7) Breakage income/Total assets
2004	45.626	0.035	0.086	0.767	1.794	0.357	0.003
2005	53.022	0.036	0.076	0.959	0.431	0.457	0.001
2006	56.570	0.036	0.081	0.909	0.389	0.404	0.004
2007	62.504	0.033	0.075	0.897	0.810	0.411	0.004
2008	57.385	0.030	0.063	1.165	1.045	0.487	0.003
2009	59.199	0.033	0.063	1.117	0.458	0.529	0.004
2010	66.378	0.034	0.070	1.027	1.377	0.511	0.003
2011	72.103	0.034	0.068	0.758	1.300	0.583	0.004
2012	74.962	0.033	0.066	0.661	1.149	0.550	0.004
2013	75.868	0.033	0.066	0.803	0.544	0.542	0.003
2014	89.439	0.034	0.069	0.907	0.967	0.611	0.003
2015	106.630	0.037	0.072	1.290	1.000	0.704	0.003
2016	111.630	0.036	0.064	1.198	0.694	0.706	0.004
2017	110.547	0.038	0.064	1.442	0.991	0.697	0.005
2018	149.155	0.034	0.058	1.272	0.294	0.679	0.003

This table presents summary statistics of prepaid card balance by year. Prepaid card balance and breakage income are hand collected from SEC 10-K filings. The financial data is obtained from Compustat. I winsorize all financial variables at the 1st and 99th percentiles.

Table 3 Summary statistics by industry

	(1) Prepaid card balance/Total assets	(2) Breakage income/Total assets	(3) Accounts payable/Total assets	(4) Total credit line/Total assets	(5) Cash/Total assets	(6) Interest expense/Total liabilities	(7) Profit margin
General Merchandise Stores	0.015	0.001	0.129	0.022	0.073	0.032	0.34
Food Stores	0.006	.	0.140	0.073	0.080	0.028	0.303
Automative Dealers & Service Stations	0.011	0.002	0.282	0.020	0.061	0.019	0.426
Apparel & Accessory Stores	0.029	0.003	0.125	0.046	0.219	0.017	0.414
Furniture & Home furnishings Stores	0.039	0.004	0.195	0.035	0.166	0.017	0.37
Eating & Drinking Places	0.044	0.005	0.047	0.121	0.097	0.027	0.227
Miscellaneous Retail	0.044	0.005	0.188	0.073	0.173	0.020	0.380

This table presents data on the prepaid card balance, breakage income, trade credit, credit line, cash holdings, cash, average interest expense, and profit margin. The industry is defined according to two-digit SIC code. I winsorize all financial variables at the 1st and 99th percentiles.

Table 4 Univariate tests on stock CARs

Event window	Full	High (Interest expense/Total liabilities)	Low (Interest expense/Total liabilities)	High-Low	Concentrated	Competitive	Concentrated - Competitive
[-5,5]	0.059	0.155	0.037	0.118	-0.042	0.099	-0.141
[-3,3]	0.033	0.102	0.011	0.091	-0.017	0.053	-0.070
[-1,1]	-0.006	0.022	-0.012	0.034*	0.003	-0.009	0.012
[0]	0.018***	0.034***	0.015*	0.018*	0.034***	0.012	0.022*

Table 4 shows univariate tests of stock CARs of retailers around April 30, 2009. All retailers in the sample are split into two groups by (Interest expense/Total liabilities) or HHI index in 2008. Firms with high (low) interest expense ratios are those with above (below) median interest expense ratios in 2008. Firms in a concentrated (competitive) market are those with HHI>0.2 (HHI<0.2) in 2008. Abnormal returns are estimated using the Fama-French three-factor model. Estimation window is [-200, -50]. Differences in CARs between the two groups are reported. *, **, *** Statistical significance in two-tailed t-tests at the 10%, 5%, 1% levels, respectively.

Table 5 Prepaid card balances and interest expense ratios

	Unredeemed prepaid card balance$_{i,t}$/Total assets$_{i,t-1}$	
	(1)	(2)
(Interest expense/Total liabilities)$_{i,t-1}$	0.130**	0.065
	(2.16)	(0.88)
Concentrate$_{i,j,t-1}$ * (Interest expense/Total liabilities)$_{i,t-1}$		0.281***
		(2.74)
Altman Z-score$_{i,t-1}$	-0.000	0.000
	(-0.13)	(0.23)
(Sale/Total assets)$_{i,t-1}$	0.015***	0.015***
	(4.10)	(3.88)
Size$_{i,t-1}$	-0.017***	-0.021***
	(-3.36)	(-4.04)
(Cash/Total assets)$_{i,t-1}$	-0.030***	-0.025***
	(-4.06)	(-3.51)
(Accounts payable/Total assets)$_{i,t-1}$	-0.097***	-0.099***
	(-4.00)	(-3.65)
Leverage$_{i,t-1}$	-0.010	-0.013
	(-1.08)	(-1.37)
ROA$_{i,t-1}$	0.003	0.002
	(0.30)	(0.19)
(PPENT/Total assets)$_{i,t-1}$	-0.016	-0.014
	(-0.95)	(-0.69)
Margin$_{i,t-1}$	0.008	0.006
	(0.26)	(0.21)
Age$_{i,t-1}$	0.021**	0.023**
	(2.50)	(2.49)
Cashcycle$_{i,t-1}$	-0.000	-0.000
	(-1.27)	(-0.90)
Concentrate$_{i,j,t-1}$		-0.008**
		(-2.35)
Constant	0.087***	0.110***
	(2.65)	(2.86)
Firm FEs	Yes	Yes
Year FEs	Yes	Yes
N	1,119	1,022
Adj. R^2	0.911	0.917

This table presents coefficient estimates from regressions of prepaid card balance to average interest expense. High margin$_{i,t-1}$ is a dummy variable, which equals one if firm i's profit margin in t-1 is above median, and zero otherwise.

$Concentrate_{i,j,t-1}$ is a dummy variable, which equals one if HHI>0.2 in t-1, and zero otherwise. Altman Z-score is calculated as 1.2*(Working capital/Total assets) + 1.4* (Retained earnings/Total assets) + 3.3*(EBIT/Total assets) + 0.6 *(Market value of equity/Total liabilities) + 0.999* (Net sales/Total assets). Sales, Cash, Accounts payable, and PPENT are scaled by lagged Total assets. Firm size is measured as the natural logarithm of Total assets. Leverage is defined as Long-term debt plus Current liabilities divided by Total assets. ROA is Net income divided by Total assets. I calculate Profit margin as (Sales-Cost of goods sold)/Sales. Regressions include firm and year fixed effects. Standard errors are clustered at the firm level. *, **, and *** significant at 10, 5, and 1%, respectively.

Table 6 Prepaid card balances: difference-in-differences results around the CARD Act

	Unredeemed prepaid card balance$_{i,t}$/Total assets$_{i,t-1}$	
	(1)	(2)
Interest2009$_i$ * Aft$_t$	0.011***	
	(3.90)	
Competitive2009$_i$ * Aft$_t$		-0.015***
		(-3.50)
(Interest expense/Total liabilities)$_{i,t-1}$	0.154*	0.098
	(1.95)	(1.34)
Altman Z-score$_{i,t-1}$	-0.000	-0.000
	(-0.35)	(-0.42)
(Sale/Total assets)$_{i,t-1}$	0.020***	0.016***
	(4.54)	(4.02)
Size$_{i,t-1}$	-0.014**	-0.018***
	(-2.45)	(-3.45)
(Cash/Total assets)$_{i,t-1}$	-0.032***	-0.034***
	(-3.68)	(-3.70)
(Accounts payable/Total assets)$_{i,t-1}$	-0.116***	-0.101***
	(-4.10)	(-3.86)
Leverage$_{i,t-1}$	-0.017	-0.013
	(-1.62)	(-1.25)
ROA$_{i,t-1}$	-0.006	-0.004
	(-0.54)	(-0.38)
(PPENT/Total assets)$_{i,t-1}$	-0.020	-0.018
	(-1.12)	(-0.93)
Age$_{i,t-1}$	0.026***	0.025***
	(2.70)	(2.88)
Cashcycle$_{i,t-1}$	-0.000	-0.000
	(-0.97)	(-1.46)
Constant	0.051	0.093***
	(1.33)	(2.66)
Firm FEs	Yes	Yes
Year FEs	Yes	Yes
N	850	930
Adj. R^2	0.914	0.911

This table presents OLS estimates of prepaid card balances regressions. The sample contains firm-year observations from Compustat from 2004 to 2018. The dependent variable is (Prepaid card balance/Total assets)$_{i,t}$. Interest2009$_i$ is a dummy variable, which equals one if firm i has above median average interest expense in 2009, and zero otherwise. Compete2009$_i$ is a dummy variable, which equals one if HHI of firm i was in the bottom 30% in 2009. Aft$_t$ is a dummy variable, which equals one starting from 2010, and zero otherwise. Other control variables are the same as in Table 5.

Standard errors are clustered at the firm level, and all regressions include firm and year fixed effects. *, **, and *** significant at 10, 5, and 1%, respectively.

Table 7 Prepaid card balance, trade credit, and cash holdings

	Unredeemed prepaid card balance$_{i,t}$/Total assets$_{i,t-1}$	
	(1)	(2)
Payable2009$_i$*Aft$_t$	-0.015***	
	(-4.89)	
Cash2009$_i$*Aft$_t$		-0.008**
		(-2.46)
(Interest expense/Total liabilities)$_{i,t-1}$	0.140**	0.161**
	(2.41)	(2.43)
Altman Z-score$_{i,t-1}$	0.000	-0.000
	(0.44)	(-0.22)
(Sale/Total assets)$_{i,t-1}$	0.013***	0.015***
	(4.27)	(4.08)
Size$_{i,t-1}$	-0.017***	-0.016***
	(-3.55)	(-3.02)
(Cash/Total assets)$_{i,t-1}$	-0.028***	-0.029***
	(-4.38)	(-3.72)
(Accounts payable/Total assets)$_{i,t-1}$	-0.083***	-0.097***
	(-3.51)	(-3.72)
Leverage$_{i,t-1}$	-0.008	-0.011
	(-0.94)	(-1.15)
ROA$_{i,t-1}$	0.004	0.002
	(0.39)	(0.21)
(PPENT/Total assets)$_{i,t-1}$	-0.005	-0.012
	(-0.33)	(-0.71)
Age$_{i,t-1}$	0.023***	0.023***
	(2.92)	(2.65)
Cashcycle$_{i,t-1}$	-0.000	-0.000
	(-0.98)	(-0.97)
Constant	0.084***	0.076**
	(2.90)	(2.34)
Firm FEs	Yes	Yes
Year FEs	Yes	Yes
N	1,110	1,021
Adj. R^2	0.918	0.912

This table presents OLS estimates of prepaid card balances regressions. The sample contains firm-year observations from Compustat from 2004 to 2018. The dependent variable is (Prepaid card balance/Total assets)$_{i,t}$. Payable2009$_i$ is a dummy variable, which equals one if firm i has above median accounts payable in 2009, and zero otherwise. Cash2009$_i$ is a dummy variable, which equals one if firm i has above median cash holdings in 2009, and zero otherwise.

Aft_t is a dummy variable, which equals one starting from 2010, and zero otherwise. Other control variables are the same as in Table 5. Standard errors are clustered at the firm level, and all regressions include firm and year fixed effects. *, **, and *** significant at 10, 5, and 1%, respectively.

Table 8 Small business loan amounts around the CARD Act: retailer vs non-retailer

	Ln(New loan amount)$_{j,t}$	
	(1)	(2)
$Retail_j$ * Aft_t	-0.017***	-0.051***
	(-3.009)	(-5.106)
Aft_t	-0.230***	-0.060***
	(-10.169)	(-2.770)
$Retail_j$ * Aft_t * One $year_j$		-0.482***
		(-12.022)
$Retail_j$ * Aft_t * One-to-five $year_j$		-0.053***
		(-3.614)
$Retail_j$ * Aft_t * Five-to-ten $year_j$		-0.010
		(-0.865)
One $year_j$		1.434***
		(94.628)
$Retail_j$ * One $year_j$		-0.226***
		(-13.517)
Aft_t * One $year_j$		0.235***
		(14.324)
One-to-five $year_j$		-0.352***
		(-42.266)
$Retail_j$ * One-to-five $year_j$		-0.032***
		(-3.463)
Aft_t * One-to-five $year_j$		-0.369***
		(-45.885)
Five-to-ten $year_j$		-0.830***
		(-138.066)
$Retail_j$ * Five-to-ten $year_j$		0.127***
		(15.841)
Aft_t * Five-to-ten $year_j$		-0.083***
		(-12.232)
Ln(Maturity)$_{j,t}$	0.747***	0.920***
	(451.738)	(234.230)
Constant	8.199***	7.889***
	(691.852)	(340.093)
Year FEs	Yes	Yes
County FEs	Yes	Yes
Six-digit NAICS code FEs	Yes	Yes
N	1,215,234	1,215,234
Adj. R^2	0.435	0.435

This table presents OLS estimates results. The sample contains SBA 7(a) data from 2004 to 2018, excluding firms in the Finance and Insurance (Two-digit NAICS=52). The dependent variables are the natural logarithm of loan amount. $Retail_j$ is a dummy variable, which equals one if the borrower of loan j is in the retail industry, and zero otherwise. Aft_t is a dummy variable, which equals one starting from 2010, and zero otherwise. One $year_j$ is a dummy variable, which equals one if the time-to-maturity of loan j is less than one year. One-to-five $year_j$ is a dummy variable, which equals one if the time-to-maturity of loan j is between one and five years. Five-to-ten $year_j$ is a dummy variable, which equals one if the time-to-maturity of loan j is between five and ten years. Standard errors are clustered at the firm level, and all regressions include year, county, and NAICS code fixed effects. *, **, and *** significant at 10, 5, and 1%, respectively.

Table 9 Small business loan around the CARD Act: time-to-maturity and interest rate

	$Ln(Maturity)_{j,t}$	$Ln(Interest\ rate)_{j,t}$
	(1)	(2)
$Retail_j * Aft_t$	0.009***	-0.004**
	(3.31)	(-2.41)
Aft_t	-0.017	0.006**
	(-1.48)	(1.97)
$Ln(Maturity)_{j,t}$		0.024***
		(38.02)
$Ln(New\ loan\ amount)_{j,t}$	0.193***	-0.068***
	(451.74)	(-220.96)
Constant	2.259***	2.499***
	(331.70)	(613.37)
Year FEs	Yes	Yes
County FEs	Yes	Yes
Six-digit NAICS code FEs	Yes	Yes
N	1,215,234	189,463
Adj. R^2	0.296	0.303

This table presents OLS estimates results. The sample contains SBA 7(a) data from 2004 to 2018, excluding firms in the Finance and Insurance (Two-digit NAICS=52). The dependent variables are the natural logarithm of time-to-maturity and the natural logarithm of interest rate. $Retail_j$ is a dummy variable, which equals one if the borrower of loan j is in the retail industry, and zero otherwise. Aft_t is a dummy variable, which equals one starting from 2010, and zero otherwise. Because loan interest rates are available starting from 2008, the sample period for Column 2 is limited to 2008 – 2012. Standard errors are clustered at the firm level, and all regressions include year, county, and NAICS code fixed effects. *, **, and *** significant at 10, 5, and 1%, respectively.

Table 10 Trade credit around the CARD Act: retailer vs non-retailer

	Accounts payable$_{i,t}$/Total assets$_{i,t-1}$
Retail$_i$ * Aft$_t$	-0.022***
	(-2.64)
(Interest expense/Total liabilities)$_{i,t-1}$	-0.331***
	(-3.96)
(Sale/Total assets)$_{i,t-1}$	0.025***
	(3.92)
Size$_{i,t-1}$	-0.103***
	(-13.29)
(Cash/Total assets)$_{i,t-1}$	-0.022**
	(-2.53)
Leverage$_{i,t-1}$	0.193***
	(10.42)
ROA$_{i,t-1}$	-0.101***
	(-12.70)
(PPENT/Total assets)$_{i,t-1}$	-0.068*
	(-1.68)
Margin$_{i,t-1}$	-0.001
	(-1.07)
Age$_{i,t-1}$	0.037***
	(3.32)
Cashcycle$_{i,t-1}$	-0.000***
	(-3.44)
Constant	0.535***
	(11.16)
Firm FEs	Yes
Year FEs	Yes
N	57,137
Adj. R^2	0.759

This table presents OLS estimates of prepaid card balances regressions. The sample contains all firm-year observations from Compustat from 2004 to 2018, excluding firms in the Finance, Insurance and Real Estate (SIC 6000-6799). The dependent variable is (Accounts payable/Total assets)$_{i,t}$. Aft$_t$ is a dummy variable, which equals one starting from 2010, and zero otherwise. Retail$_i$ is a dummy variable, which equals one if firm i is in the retail industry, and zero otherwise. Other control variables are the same as in Table 5. Standard errors are clustered at the firm level, and all regressions include firm and year fixed effects. *, **, and *** significant at 10, 5, and 1%, respectively.

Table 11 Prepaid card balance and debt covenant violations

	Unredeemed prepaid card balance$_{i,t}$/Total assets$_{i,t-1}$
Covenant violation$_{i,t+1}$	-0.016
	(-0.80)
Covenant violation$_{i,t}$	-0.004
	(-0.25)
Covenant violation$_{i,t-1}$	0.019**
	(2.33)
Covenant violation$_{i,t-2}$	0.005
	(0.81)
Covenant violation$_{i,t-3}$	0.017**
	(2.32)
Covenant violation$_{i,t-4}$	0.010**
	(2.21)
(Interest expense/Total liabilities)$_{i,t-1}$	0.188**
	(2.45)
Altman Z-score$_{i,t-1}$	-0.001**
	(-2.08)
(Sale/Total assets)$_{i,t-1}$	0.014***
	(4.05)
Size$_{i,t-1}$	-0.017***
	(-3.98)
(Cash/Total assets)$_{i,t-1}$	-0.021**
	(-2.55)
(Accounts payable/Total assets)$_{i,t-1}$	-0.103***
	(-4.08)
Leverage$_{i,t-1}$	-0.012
	(-1.29)
ROA$_{i,t-1}$	0.009
	(0.89)
(PPENT/Total assets)$_{i,t-1}$	-0.003
	(-0.19)
Age$_{i,t-1}$	0.017**
	(2.16)
Cashcycle$_{i,t-1}$	-0.000
	(-0.56)
Constant	0.095***
	(3.53)
Firm FEs	Yes

Year FEs	Yes
N	806
Adj. R^2	0.906

This table presents coefficient estimates from regressions of prepaid card balance to covenant violations. The covenant violation data from Roberts and Sufi (2009) is available in 2004 – 2012. The sample contains firm-year observations from 2004 to 2014. Covenant violation$_{i,t}$ equals one if firm i has a covenant violation during the year. Covenant violation$_{i,t-1}$ equals one if firm i has a covenant violation in the previous year. Covenant violation$_{i,t-2}$ equals one if firm i has a covenant violation two years ago. Covenant violation$_{i,t-3}$ equals one if firm i has a covenant violation three years ago. Covenant violation$_{i,t-4}$ equals one if firm i has a covenant violation four years ago. Other control variables are the same as in Table 5. Regressions include firm and year fixed effects. Standard errors are clustered at the firm level. *, **, and *** significant at 10, 5, and 1%, respectively.

Table 12 Bankruptcy filing and prepaid card balance: penalized maximum likelihood estimation

	$Bankruptcy_{i,t}$
Unredeemed prepaid card balance$_{i,t-1}$/Total assets$_{i,t-1}$	16.429*
	(1.80)
Unredeemed prepaid card balance$_{i,t-2}$/Total assets$_{i,t-2}$	-35.341
	(-0.98)
Unredeemed prepaid card balance$_{i,t-3}$/Total assets$_{i,t-3}$	14.632
	(0.61)
(Sale/Total assets)$_{i,t-1}$	0.948**
	(2.13)
(Cash/Total assets)$_{i,t-1}$	-4.167
	(-1.38)
Leverage$_{i,t-1}$	3.624***
	(2.96)
(CF/Total assets)$_{i,t-1}$	-8.225***
	(-4.10)
(Working capital/Total assets)$_{i,t-1}$	0.985
	(0.65)
Constant	-6.177***
	(-3.35)
Year FE	Yes
N	988
Prob > chi2	0.030

The table tabulates coefficient estimates from Penalized Maximum Likelihood Estimation. $Bankruptcy_{i,t}$ equals one if year t is the last observation of firm i in Compustat and firm i files for bankruptcy within two years. $(CF/Total\ assets)_{i,t-1}$ is the sum of income before extraordinary items and depreciation and amortization, divided by total assets. $(Working\ capital/Total\ assets)_{i,t-1}$ is (Current assets-Current liabilities)/Total assets. I control for year fixed effects. *, **, and *** significant at 10, 5, and 1%, respectively.