Life Below Zero: Predatory Overdrafts, Payday Lending and the Underbanked*

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Abstract

One highly controversial bank practice that is thought to maximize the fees individuals pay on their overdrawn account is the reordering of transactions from "high-to-low." These practices usually result in multiple overdraft fees each time an account is overdrawn, and are especially problematic for lower-income customers without the resources to keep a safe cash cushion in their bank accounts. We study the effect of high-to-low reordering on consumers' likelihood of accessing payday loans and its consequences. We use multiple class-action lawsuits that resulted in mandatory changes in the practice of high-to-low reordering by banks and data from an alternative credit bureau to measure payday lending. We find that after banks stop high-to-low reordering, borrowing from alternative lenders declines. We also find increases in consumption, long-term improvements in consumers' overall financial health, and increased access to lower cost traditional lenders. Our findings suggest that aggressive bank practices can create demand for alternative financial services, highlighting an important link between the traditional and alternative financial systems.

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1 Introduction

According to the FDIC, at least twenty-five percent of U.S. households are unbanked or underbanked (FDIC, 2017). Individuals in these households either do not have a bank account, or have a bank account but routinely use financial services outside of the traditional banking system, such as payday loans. One of the key reasons that unbanked households state for not having a bank account is that bank account fees are too high. Indeed, low-income individuals pay at least three times as much as other groups to maintain their checking accounts.[1]

This issue has caught the attention of policymakers, with the Federal Reserve Chairman Powell noting: "Access to safe and affordable financial services is vital, especially among families with limited wealth, whether they are looking to invest in education, start a business, or simply manage the ups and downs of life." Although there is a growing interest in this area, the underbanked segment of the population remains relatively under-studied. Furthermore, very little is known about the interaction between the traditional and alternative financial institutions that provide services to this segment of the population.

Given the high costs and risks that tend to be associated with alternative financial services,[2] both state and federal regulators have expanded their supervision of this industry. As of 2019, nineteen states and the District of Columbia prohibit payday lending or have set interest rate and other caps that may force lenders out of business. A better understanding of the factors that influence demand for alternative financial services – and in particular any factors driven by traditional financial institutions – can help inform future policy interventions.

In this paper we investigate whether practices implemented by traditional financial institutions cause customers to migrate towards alternative financial services providers, such as payday lenders. Specifically, we study one highly controversial practice of banks – the high-to-low reordering of deposit account transactions – that is thought to maximize the fees individuals pay on their overdrawn bank accounts. We document the impact this practice has on consumer demand for alternative financial services.

Banks are able to choose the order in which they process their customers' deposit account

[1] According to a 2017 report by Bankrate available at https://www.bankrate.com/pdfs/pr/20171023-Best-Banks.pdf. Low-income is defined as below $30,000 per year.

[2] See Bertrand and Morse (2011) for evidence on the costs associated with using alternative financial services.

transactions. For instance, on a $400 checking account balance, a $500 rent debit can be processed before two smaller transactions of $50 each, even if the rent debit was posted last. In this example, the reordering causes the customer to incur three overdraft fees, rather than just one, as would be the case if transactions were processed in chronological order.[3]

A 2016 report by the Pew Charitable Trusts scrutinized the practices of 50 of the largest banks based on deposits.[4] The study found that high-to-low transaction reordering is widespread. Roughly half of the analyzed banks reserve the right to reorder instead of processing transactions in chronological order. Banks have argued that high-to-low reordering benefits customers because it ensures that big, important payments – like rent, mortgages, and student loans – are made first. Nonetheless, these procedures are considered problematic, especially for younger and lower-income customers who may not have the resources to keep a safe cash cushion in their bank accounts.

The net effect of this practice on low-income consumers is, in theory, ambiguous. On one hand, if these overdraft policies are fairly priced, these procedures allow banks to offer hand-to-mouth households a way to access cash instantaneously via overdraft credit when in distress,[5]. On the other hand, if these procedures result in excessive fees, households exposed to these fees are more likely to become overextended and find it difficult to find the funds to both bring account balances above zero and pay the steep overdraft charges. Failure to pay these fees and bring account balances above zero quickly is also extremely costly. This is in part due to the fact that the banking system is centralized in its record-keeping on consumers. ChexSystems – the primary consumer reporting agency used by banks – records involuntary bank account closures that result from unpaid overdrafts and related fees, and involuntary bank account closures can severely limit a consumer's ability to open another account at any other bank for up to 5 years.[6] Furthermore, without a checking account, it becomes extremely difficult to obtain credit or access other financial services. Given these severe consequences of defaulting, households saddled with overdraft fees may find it optimal to borrow elsewhere to make good on their fees in the traditional system, or they

[3]See Figure 1 for a schematic of this example of high-to-low reordering of transactions. In this example with a $35 overdraft fee, the high-to-low reordering increases the fee burden from 17.5% of the overdrawn amount to 53%– a dramatic increase in the cost of an overdraft far above the advertised sticker price.

[4]See Pew Charitable Trusts (2016)

[5]See Morse (2006) orMorse (2011) for a discussion on access to other forms of short-term distress credit such as payday loans.

[6]Failure to pay overdraft fees and balances within 2 months results in involuntary account closure – see Campbell et al. (2012).

may choose to leave the traditional system altogether. The potential regulatory responses to these overdraft procedures crucially depend on which effect dominates in practice.[7]

A key challenge in analyzing these bank practices and their impact on demand for alternative financial services is the availability of data: households who are underbanked are unlikely to be fully represented in credit bureau data that is routinely employed for household finance studies. An additional challenge is that bank policies and behaviors are endogenous – likely driven by the type of depositors the bank tends to attract and therefore correlated with a vast array of local economic variables.

We are able to address both of these challenges. First, we obtain alternative credit bureau data from Clarity, which covers millions of individuals with non-traditional credit histories (e.g. consumers with relationships with payday lenders and title lenders) and provides data on a similar set of variables to the traditional bureau, e.g. loan performance and account information.[8] We complement this data with additional information from one of the major credit bureaus and focus on installment loans made to borrowers in the lowest quintile of the income distribution in this data set, in order to ensure that we capture similarly constrained borrowers.[9]

Second, by focusing on the high-to-low reordering of transactions, we are able to exploit a series of lawsuits that challenged these practices at banks across the United States. We hand-collect a unique dataset on these lawsuits, which provides a key source of variation of high-to-low reordering behavior over time, within and across zip-codes, and across banks. In particular, we document which banks have been sued, whether the lawsuits resulted in any mandatory behavior changes related to high-to-low reordering, and which geographic areas were affected by the change. We match all zip-codes to zip-code neighbors which we define as being relatively geographically close. We are able to compare outcomes for zip-codes that lie within the same neighborhood but that differ in terms of the presence of banks that have been sued over their overdraft practices. Specifically we compare zip-codes containing branches of banks required to stop practicing high-to-low reordering to zip-codes within 7 miles containing branches of sued banks with no mandatory behavior changes before and after the lawsuit decision. We choose a radius of 7 mile radius to ensure

[7]There are currently no regulations prohibiting high-to-low reordering.

[8]See Nuez et al. (2016) for an exploration of Clarity subprime lending data.

[9]Installment loans are an alternative to payday loans for individuals with poor credit, see for example https://www.nerdwallet.com/best/loans/personal-loans/installment-loans-bad-credit for anecdotal evidence supporting this.

that we restrict attention to areas experiencing similar economic conditions with similar consumer demand dynamics[10]. Furthermore, we control for neighborhood by quarter fixed effects in our preferred specifications. In addition, we test for the absence of pre-trends and find no differences before the lawsuits behavior change date.

Our analysis proceeds in four steps. We start by showing that within the same zip-code, branches belonging to banks with high-to-low reordering policies are more likely to be located in close proximity to payday lenders and check cashers than similarly sized banks without high-to-low reordering policies. This is consistent with the idea that banks, specifically banks with aggressive overdraft policies, and alternative finance providers service similar customers. While this finding indicates a strong correlation between where banks that practice high-to-low reordering and where payday lenders and check cashers locate, it does not provide a causal link between bank practices and demand for alternative financial services. Variation in high-to-low practices induced by lawsuit outcomes, holding all else equal, provides a suitable setting in which to tease out this interaction.

In the next step in our analysis, we confirm that our lawsuit instrument is relevant and resulted in meaningful changes at affected banks by documenting a strong negative first stage relationship between the lawsuits and both revenues associated with overdrafts and overdraft balances at banks with a high-to-low reordering ban. In other words, we show that both revenues associated with overdrafts and overdraft balances significantly declined at sued banks after they were required to cease the practice of high to low reordering. In other words, the lawsuit rulings caused banks to change behavior.

We next make use of the variation in high-to-low reordering practices induced by lawsuit outcomes and analyze household behavior. Our results, perhaps surprisingly, indicate that borrowing from alternative lenders significantly declines after banks no longer reorder transactions from high-to-low. We find that – after high-to-low reordering bans – the total amount of payday loans disbursed declines by roughly $84 per borrower/quarter, which is an economically significant decline of 16 percent relative to its mean. We further show that installment loan borrowing similarly declines and document a reduction of around $284 per borrower/quarter which is roughly a 6 percent decline relative to its mean. We also show that the effects are persistent for several quarters after the change in bank overdraft policies, indicating a permanent decline in borrowing from alternative lenders after high-to-low

[10]Our results are not dependent on the radius chosen.

reordering bans.

An important next question is whether prohibiting aggressive overdraft fee policies actually results in better outcomes for affected consumers. If consumers who use overdrafts have low cash-at-hand and face liquidity constraints, then a reduction in debt service costs can lead to increased ability to smooth consumption and service existing debt and ultimately increase access to credit. [11] We address this question by first investigating several measures of financial health such as the average borrower credit score and the total amount of loans in good standing. Consistently across these measures, we find that households experience an improvement in these credit health outcomes following high-to-low reordering bans.

We next document that consumers borrowing behavior also changes after high-to-low reordering bans. Specifically, while borrowing from alternative lenders permanently declines following high-to-low reordering bans, total credit balances increase. This finding indicates an improved access to more mainstream, and likely cheaper credit e.g. borrowers favor credit card debt over more costly payday loans. Finally, to further corroborate the interpretation that borrowers benefit from less aggressive overdraft fees, we show that expenditures on durables and non-essential non-durables increases significantly following high-to-low reordering bans.

These results collectively suggest that overdrafts offered by banks that employ high-to-low reordering, and payday loans are not simply substitutes for one another[12]. Rather, overdrafts can induce likely cash-strapped low-income households to seek loans from alternative finance providers in order to bring their balances above zero again. In other words, the nature of overdrafts in that they are appealing even at high costs due to the instantaneous access to cash they allow, and the fact that they must be repaid quickly to avoid the severe costs of default, create demand for borrowing in the alternative financial system. Further aggressive pricing of overdrafts can amplify this demand for alternative borrowing and can cause low income consumers to get caught in a potential spiral of growing fees and indebtedness[13].

Finally, one potential adverse effect of forcing banks to lower the cost of overdraft fees

[11] See for example Bacchetta and Gerlach (1997) amongst others who show that for liquidity constrained consumers, reductions in debt service costs resulting from general monetary policy changes results in changes in consumption behavior. We extend this logic to changes in the costs of overdrafts.

[12] As is well documented in the existing literature for example Bair (2005), Stegman (2007) and Melzer and Morgan (2015)

[13] We note that the inability to repay an overdraft and the need to roll it over, indicates that borrowers are likely entering into unsustainable debt contracts in the first place of the type discussed in Morgan and Strain (2008).

is the possibility that these banks would then find it optimal to stop providing their services altogether to lower income households with potentially severe adverse consequences. Intuitively, since overdraft fees are an important source of revenue for banks, the lawsuit outcomes we document may nudge banks who were forced to cease the practice of high-to-low reordering, to close some now unprofitable branches. We examine this hypothesis by testing whether behavior change banks are more likely to exit from certain zip-codes after the lawsuit decisions. We find that banks are significantly more likely to close their branches after they are required to stop the practice of high-to-low reordering. Furthermore, this effect is concentrated in zip-codes where the sued banks have a low number of branches and in low income areas. These results suggest that households living in regions affected by the lawsuit outcomes are less likely to access borrowing from alternative lenders, but are also more likely to experience difficulties in accessing financial services from traditional institutions. Given our findings on improved consumer financial health and improved access to credit as a result of the lawsuit outcomes, it is likely that overall the less need to borrow from payday lenders dominates.

The rest of the paper is organized as follows. Section 2 discusses related literature while Section 3 provides background information about the industry and the lawsuits. Section 4 describes the data. Section 5 presents motivating evidence, while Section 6 discusses the main results. Section 7 concludes.

2 Related Literature

This paper is related to three main strands of the existing literature. The first strand of literature examines the linkage between the payday and overdraft short term credit markets. In his review of the payday lending market, Stegman (2007) notices a potential link between overdrafts and payday loans as substitutes, stating "As banks have become fee-based businesses, their bottom lines are better served by levying bounced check and overdraft fees on the payday loan customer base than they would be by undercutting payday lenders with lower cost, short-term unsecured loan products." We find, as Stegman suggests, that payday lenders and banks that charge aggressive overdraft fees seem to compete for a similar customer base. Morgan et al. (2012) find that the number of returned checks and the amount of bank overdraft fee income increase after payday credit bans, suggesting that overdrafts

are costlier substitutes for payday loans. Melzer and Morgan (2015) further find that when payday lending is prohibited, both overdraft prices and overdraft limits decline. Miller and Soo (2020) is a closely related, recent piece of work that investigates how greater access to traditional credit (through the removal of a Chapter 7 bankruptcy flag) affects alternative credit usage. They do not find a significant reduction in payday borrowing perhaps because it is still needed to pay for basic expenses. The papers in this cluster of literature draw a link between payday lending and the pricing and provision of short-term credit by banks, by taking consumers' demand for credit as given and then studying the substitution patterns induced by supply changes in payday lending markets. In this paper we argue and provide evidence consistent with the idea that the nature of overdraft credit can induce demand for payday borrowing and aggressive practices such as high-to-low reordering can amplify this demand.

This paper is also related to the large literature on consumer liquidity constraints. Deaton (1991) introduces the standard framework for impatient consumers with uncertain income and liquidity constraints, while Hayashi (1985), Zeldes (1989), Japelli (1990) and Gross and Souleles (2002) provide indirect and direct empirical evidence of liquidity constraints. A follow-up literature beginning with Bacchetta and Gerlach (1997) shows that, if some consumers are liquidity constrained, aggregate consumption should be excessively sensitive to credit conditions as well as to income. We add to this literature by demonstrating that a reduction in debt service costs (overdrafts in our setting) causes consumers with binding liquidity constraints and little cash on hand not only to increase consumption but also to experience improved credit health and increased access to traditional credit. We note that, according to the standard framework in Deaton (1991), liquidity constraints would heighten the precautionary savings motive, which is at odds with the empirical fact that 60% of Americans cannot come up with $1000 to cover an emergency. [14] While Laibson, Repetto, and Tobacman (1998) and Harris and Laibson (2001) show that hyperbolic discounting can explain the missing precautionary savings effect, we do not take a stand on the exact type of discounting at play. Instead, we take as given the fact that the majority of U.S. consumers have limited access to liquid assets and credit.

Finally, this paper is related to the small literature on debt traps. As noted in Morgan

[14] See CNBC (2019). Also see Dynan (1993), Guiso, Jappelli, and Terlizzese (1992) who report the missing precautionary savings effect.

and Strain (2008), the debt trap concept is close to the poverty trap model in Sachs (1983). Sachs (1983) illustrates how a nation may become trapped in poverty if its debt burden becomes too great: debt servicing slows capital accumulation, which slow income growth and reduces saving. Reduced saving feeds back to reduce capital accumulation even further, leading to a downward spiral. A reduction in borrowing costs in this scenario can reverse the spiral. Our evidence – that a reduction in overdraft costs improves consumer credit health and ultimate access to traditional credit – indicates that either aggressively priced overdrafts themselves or the payday loans obtained to repay such overdrafts create a debt spiral.[15] This finding is consistent with ample anecdotal evidence, such as in Stegman and Faris (2003), that the financial performance of the high cost short term loan industry is significantly enhanced by the successful conversion of more and more occasional users into chronic borrowers.

3 Background

This section draws from several recent policy studies to highlight the key features of the traditional and alternative financial systems that are relevant for our analysis.

We start by noting that bank overdraft programs are widespread. According to a 2009 FDIC report, most banks (approximately 75 percent) automatically enrolled customers in automated overdraft programs. Post Regulation E, customers are now required to affirmatively opt in to an overdraft program, however, persistent use of overdrafts and lawsuits brought by the CFPB against some banks question the effectiveness of Regulation E in reducing the use of overdrafts[16].

An overdraft occurs when a customer makes a purchase but does not have enough money in their account to cover the transaction. Banks can either allow the transaction to proceed and charge an overdraft fee as well as extend credit to cover the transaction, or they can decline the transaction and charge a non-sufficient funds (NSF) fee. As well as charging overdraft and NSF fees, one-fourth of the banks surveyed by the FDIC also assess fees on persistent negative balance status accounts. In 2015, consumer overdraft fees and non-

[15] Either the loan was "unsustainable" in the first place, or payday borrowing itself causes repeat borrowing.

[16] For example, on January 19, 2017, the CFPB sued TCF National Bank in the United States District Court of Minnesota for devising a strategy to persuade its customers to opt-in to overdraft services. Further, a CFPB 2017 White Paper on Overdrafts shows high rates of opt-ins from persistent overdrafters

sufficient funds fees (NSF) comprised almost two-thirds of all reported consumer deposit account fee revenues.[17]

Overdrawn accounts can lead to "debt spirals" and eventually loss of access to financial services. For example, if an overdraft fee remains unpaid after one week, most banks charge additional daily fees for a persistent negative balance account. After around two months of a persistent negative balance account, consumers may face an involuntary account closure, a charge-off of any unpaid balances, which are then taken over by a collections agency, and a black-listing in ChexSystems. The latter is a centralized system used by banks to verify customers' good standing with other institutions before allowing a customer to open a bank account. Hence a black-listing in ChexSystems can make it difficult, if not impossible, to open an account at a different bank. According to the CFPB, among all accounts that were open during a one-year period, six percent experienced an involuntary closure.

The burden of these fees is not equally shouldered by all customers and falls particularly heavily on the financially fragile, as several recent studies have shown. For example, the Consumer Financial Protection Bureau (CFPB) collected data from a representative random sample of checking accounts from several large banks between June 2011 to June 2012 in order to shed light on overdraft practices. Their analysis highlights that around nine percent of all accounts incur more than 10 overdrafts in a 12-month period. This relatively small fraction of all overdrafters account for 79 percent of all overdraft fees earned by the banks studied. In addition, a study by the Pew Charitable Trusts in 2014 highlights the demographic characteristics of overdrafters, documenting that younger, lower-income, and non-white individuals, as well as those who do not possess a credit card, are among those significantly more likely to pay an overdraft fee. Pew further reports that 28 percent of people who paid an overdraft fee decide to close their checking accounts because of overdraft fees. Through interviews, the CFPB has also documented that consumers are surprised by overdraft fees, uncertain about bank policy, and sometimes neglectful of automated payments that trigger overdrafts. Interviewed consumers explain, "If you overdraft, the risk is that you are going to end up with your whole entire deposit being eaten up by overdraft fees" (CFPB, 2017a).

Customers also tend to associate overdraft fees with payday loans, and overdrafters tend

[17]We also find that deposit fee income accounts for between 5-30% of bank ordinary revenues.

to be the focus of customer acquisition campaigns by payday lenders.[18] According to Rivlin (2010), the payday industry grew considerably in recent times because "when the cost of a payday loan is lower than the rising costs of a bounced check or credit card late fee, customers find it optimal to use alternative lenders to cover their monthly shortfalls." Further, a commonly used resource for customers of payday lenders, UStatesLoans.org, clearly states (as of 2020) that "it is a good idea to use payday loans to avoid overdrafts. Short term loans provide fast money required to keep you on track. The loan fee is significantly lower than NSF fee and occurs just once in the loan duration, thus you always know what to expect. All this makes payday loan service much easier to use so you won't have to deal with overdrafts in the future."

Our paper investigates this relation between bank behavior and the demand for alternative lenders and its ultimate effects on individual financial health. To do so, we exploit a series of lawsuits against banks that employed high-to-low reordering of deposit account transactions. More details on these lawsuits can be found in Section 4.

4 Data

One challenge of studying the interaction between the traditional and alternative financial systems is gathering data on either system.

In the traditional financial system, we are rarely privy to the policies of banks over time, especially in the case of an arguably shrouded practice like high-to-low transaction reordering. Bank policies are not highly publicized on a regular basis, and only the most updated policy can be gleaned from reading current bank account disclosures. Therefore, in order to observe overdrafts policies of banks over time, we bring in two data sources – one pre-existing and one novel.

The first data source is a 4-year study of large banks conducted by the Pew Charitable Trusts. Each year from 2012 to 2015, Pew identified the 50 largest banks by domestic deposits and obtained each bank's checking account disclosure whenever available. We use this information by Pew to create an indicator for whether a bank practices high-low overdraft reordering at a given point in time. We combine this information with branch locations from the FDIC's Summary of Deposits data and quarterly bank data from FRY9C to ob-

[18] See for example Pew Charitable Trusts (2015)

tain bank level outcomes. Panels A and B of Table 1 present summary statistics of our Pew/Infogroup/Summary of Deposits merged data set. There are on average 1.38 branches within each zip-code that employ high-to-low transaction ordering out of 4.7 total branches. This high prevalence is likely due to the fact that some of the largest banks employed a high-to-low reordering practice at some point in our sample, and large banks operate across the US. Panel A also shows that on average there is one check cashier and payday lender in each zip-code. However, forty percent of zip-code have at least one check cashier and payday lender, which is consistent with these establishments concentrating in particular areas with higher expected demand for their services. Panel B compares the number of check cashiers and payday lenders that are close to branches with and without aggressive overdraft practices. It shows that on average cash checkers and payday lenders tend to be closer to branches of banks with high-to-low reordering practices, which suggests that both types of institutions might compete for the same customers.

The second data source is our own hand-collected set of lawsuits against banks who engaged in high-to-low reordering. In recent years, in an effort to force banks to refrain from potentially predatory overdraft practices, retail customers have sued financial institutions arguing that aggressive overdraft practices disproportionally impact low income clients. To construct our lawsuit database and identify relevant legal cases, we query Nexis Uni for case documents containing "overdraft," "re-sequenc," "resequenc," "reorder," or "re-order." For each case, we read through the court docket and official documents to determine the final outcome. We limit our focus to lawsuits that settle in court, rather than being dismissed or being settled by arbitration outside of court. Our final sample includes 37 lawsuits, for which we note key event dates and the terms of the settlement between the plaintiff consumers and the defendant bank. In particular, we note whether and when the bank was required to institute behavioral relief by ceasing to practice high-to-low transaction reordering[19] See Table A.1 for an overview of our lawsuits dataset. Table A.1 reports the name of the banks involved, the date when the lawsuit was filed, the date when the case was finally settled and the date listed in the official court documents when the bank in question was required to cease to practice high-to-low transaction reordering. The lawsuits involve a wide array of banks, from the largest such as Chase, Citibank, Wells Fargo and Bank of

[19]In a few cases, we are unable to find an exact behavioral relief date from the official court documents or news, so we use the date of the earliest news article that notes that a bank has enacted behavioral relief.

America, to smaller banks such as Norwest Savings Bank and Great Western Bank. We acknowledge that while these lawsuits do not likely generate perfectly exogenous variation in high-to-low reordering practices, the existence of the lawsuit plausibly stems from events that are unrelated to demand for short term high cost loans. We refer to Haubrich and Young (2019)[20], who show that as banks lost significant amounts of non-interest income from securitization activities post financial crisis, the share of income earned from overdraft fees dramatically increased. Since many of our lawsuits were lodged beginning in 2008, we argue that a plausible explanation for the existence of the lawsuits in the first place is that consumers started to complain once banks increased practices designed to maximize fees earned from the provision of deposit accounts as they tried to make up lost securitization income. We find no existence of pre-trends in any of our variables further confirming the quasi-exogeneity of the lawsuit instrument and we also find no other effects at other non-lawsuit banks at the time of high-to-low reordering bans[21]. Furthermore we note that the high-to-low reordering ban outcome seems to some extent to be dependent on external factors such as whether or not the lawsuit was included in a class action lawsuit, how aggressive the plaintiff representative is, and the level of court in which the lawsuit was filed.

In the alternative financial system, there is a similar data availability issue. The alternative financial system is not as centrally organized or regulated as the banking system. Although the Dodd-Frank Wall Street Reform and Consumer Protection Act endowed the CFPB with the ability to regulate payday lenders, there remains state-level variation in payday lending prohibition and rules. There is also no designated regulator in charge of jointly evaluating the different components of the alternative financial system, which includes not only payday lenders but also check-cashers and issuers of prepaid debit cards. We overcome this data availability challenge in the alternative financial system by exploiting several data sources.

The first data source is the Infogroup Historical Business database, which consolidates business names, locations, and other details from public sources such as the Yellow Pages. The data is available from 1997 to 2018. As in Bord (2018), we systematically identify check cashers, payday lenders, and pawn shops in Infogroup. A business is identified as a check casher if it has 6-digit SIC code 609903 or if its name contains both "Check" and "Cash."

[20]See Figure A.1

[21]See for example Table A.2

A business is identified as a payday lender if it has 6-digit SIC code 614113 or if its name contains "Cash" but not "Check" or "Gold." A business is identified as a pawnshop if it has 6-digit SIC code 593229.

We then use the 5-year American Community Survey conducted by the Census Bureau to obtain zip-code-level characteristics (on age, race, education, household type, poverty, income, public assistance, employment, and housing) on an annual basis from 2011 to 2018.

Our main credit data source is Experian's proprietary alternative finance credit bureau Clarity Services. Launched in 2008, Clarity is now the largest alternative credit bureau overseen by the Fair Credit Reporting Act (FCRA). Clarity gathers data from alternative financial service providers, such as check cashers and payday lenders, with a particular emphasis on non-prime and under-banked borrowers. The purpose of Clarity is to provide lenders with information about prospective borrowers that would not be tracked by a traditional credit bureau, such as payday borrowing history. Our Clarity dataset includes an inquiries file and a tradelines file. Inquiries are requests made by prospective borrowers to prospective lenders. We observe inquiries from 2012 to 2020 with details on prospective loan type and borrower characteristics. Tradelines are actual extended loans. We observe tradelines from 2013 to 2020 with details on loan amount, loan type, and repayment behavior. In the inquiries and tradelines dataset, the most granular information we have about a borrower's location is his or her zip-code. Panels A and B of Table 2 present the summary statistics of the Clarity data used in this study. We draw a random sample of one million borrowers and observe the number of inquiries for these borrowers, as well as the number of tradelines and their characteristics, e.g. whether the loan has been repaid or charged off. We also provide separate statistics for single payment micro loans (SPML) which are the way payday loans are recorded in the dataset.

We complement this data with information for a representative sample of borrowers present in Equifax. Although payday lenders do not report payday loans to the major credit bureaus, we can still identify other loan types that are routinely used by credit-constrained borrowers. Installment loans are an alternative to payday loans for individuals with poor credit. There are in fact numerous online installment lenders who serve the same clientele as payday lenders, e.g. Oportun, OneMain Financial, and Upgrade, who do report to credit bureaus.[22] Furthermore, all of the largest payday lenders now offer installment loans, in

[22]See for instance this article https://www.nerdwallet.com/best/loans/personal-loans/installment-loans-

addition to conventional payday loans that are due in a single lump sum.[23] The Consumer Financial Protection Bureau (CFPB) in June 2016 proposed a rule requiring payday loans to be repayable in installments to try to address the debt spirals typical of payday lending. This regulatory pressure is one of the main factors driving this trend toward offering installment loans. Panels C and D report statistics for these loans and specifically for the borrowers in the lowest income quantile. Consistent with the hypothesis that installment loans are payday loans in disguise, we find that the average size of these loans turns out to be similar to the average payday loan size.

We obtain weekly zip-code level aggregate expenditure data from Earnest, who collects credit and debit card transaction-level data for a representative sample of the US.

Finally, Table 3 contains branch summary statistics of treatment and control zip-codes where treated zip-codes are zip-codes that contain branches of sued banks with mandatory behavior changes, and control zip-codes are those within 5 miles of treated zip-codes that contain branches of sued banks with no mandatory behavior changes. We start by showing the number of branches in a zip-code in each of the treatment years identified by the lawsuits data, and next decompose this information between the number of branches belonging to lawsuit banks in control and treated zip-codes. Table 3 highlights that sued banks comprise a large portion of total branches within a zip-code on average. We make use of variation in the number of treated branches within a zip-code in a number of tests.

By connecting the described datasets, we are able to examine the relationship between the U.S. traditional and alternative financial systems at a relatively granular level (zip-code level).

5 Motivating Facts

5.1 Co-location of Banks and Alternative Lenders

The first part of our analysis examines whether banks with aggressive overdraft policies and payday lenders cater to the same customers.[24] If traditional banks tend to serve households

bad-credit.

[23]See the information available here https://www.pewtrusts.org/fr/research-and-analysis/issue-briefs/2016/08/from-payday-to-small-installment-loans.

[24]Prager (2014) investigates the determinants of alternative financial service providers location choice and points to demographic characteristics and the legal and regulatory environment. We offer a complementary

with different characteristics than households served by payday lenders, changes in bank behavior may not affect customer demand for alternative financial services.

Table 4 tests whether banks, and in particular banks that employ high-to-low reordering, indeed likely compete for customers of alternative financial institutions. Since most individuals tend to favor financial institutions that are physically closer to their home or workplace, if banks and alternative lenders compete for the same customers, they are likely to have physical locations relatively close to each other. Panel B explores this hypothesis in a granular way by estimating a within zip-code conditional logit regression. The dependent variable takes a value of 1 if there is a payday lender and/or a check casher within 0.25 miles, 0.5 miles, 1 mile, 1.5 miles or 2 miles, and a value of 0 otherwise. The independent variable is a dummy variable that takes a value of 1 if the branch within the zip-code belongs to a bank with aggressive overdraft policies (high-to-low reordering procedure as identified by Pew), and 0 if the branch belongs to a bank that is within the 50 largest banks studied by Pew but that does not have an aggressive overdraft policy. Comparing branch locations of banks within the largest 50 ensures that we are not comparing locations that are mainly served by regional banks or credit unions with locations where large banks operate. We find the coefficient of interest to be positive and highly significant, and it monotonically declines as the distance from the aggressive branch increases. This within zip-code test provides evidence that banks that practice high-to-low reordering are more likely to have check cashers/payday lenders in close proximity.

Overall, this evidence confirms that it is likely that banks with aggressive overdraft policies service the same customers of alternative financial services providers such as payday lenders and check cashers.

6 The Impact of High-to-Low Reordering Bans

6.1 Impact on Overdraft Prices and Quantities

While results in Table 4 shows a clear correlation between the presence of bank branches belonging to banks with aggressive overdraft policies, and alternative finance providers, these results do not provide a causal link between bank policies and activity in alternative finance

viewpoint by showing that aggressive banks and alternative financial service providers co-locate and we argue that traditional bank policy affects customer demand for alternative financial services.

markets. This is because banks located in particular locations might endogenously tailor their products and pricing to cater to local demographics. In other words a correlation between the location of bank branches with high-to-low reordering and payday lenders, may simply be a result of banks appropriately pricing overdraft products provided to customers who are more likely to use the overdraft service (as well as alternative financial services such as payday loans).

In order to investigate a causal link between bank overdraft polices and migration to the alternative finance market, we make use of lawsuits against banks that employed high-to-low reordering. Some of these lawsuits resulted in mandatory bank behavior changes whereby banks were prohibited from employing high-to-low reordering after a specified date[25].

Our second piece of analysis investigates the effects of these lawsuit behavior changes on bank fee income both at the extensive and intensive margins. Intuitively, this analysis serves as our first stage test of whether or not the lawsuit behavior changes resulted in any meaningful decline in bank revenue from their deposit account services.

Figure 2 plots quarterly coefficients of a difference-in-differences regression for banks affected by lawsuits resulting in mandatory behavior changes relative to similarly sized banks operating in similar geographic areas with no behavior change[26]. In Panel A of Figure 2, the dependent variable is the log of "Other Consumer Loans" category in the FFIEC 031 regulatory call report data, in thousands of dollars. The other consumer loan category contains overdraft balances that are persistently negative: instead of reporting negative deposits, banks are required to report these balances as part of other consumer loans.[27] While measuring overdraft balances directly is not possible with Call Report data, we argue that the other consumer loan category is the best possible proxy for the quantity of persistent overdrafts.[28] For the four quarters prior to the high-to-low reordering ban, the treated banks do not disburse significantly more or less loans within the"other consumer loan" category. However post ban, there is a significant and obvious downward trend for all the quarters

[25]Details of these lawsuits are recorded in Table A.1.

[26]Each bank is assigned a primary state, which is the state that contains the majority of its deposits by total branch deposits, and banks are matched on primary state. Further, banks are sorted into size deciles each year and behavior change banks are also matched to non-lawsuit banks within the same annual size decile.

[27]See for example Instructions for Preparation of Consolidated Reports of Condition and Income (FFIEC 031 and 041) for details on how overdrafts are accounted for

[28]Persistent overdrafts include not just one-time overdrafts that are quickly corrected by a consumer, but also chronic overdrafts such as identified by CFPB and FDIC studies.

after the change. Figure 2 panel (b) also shows in a similar results but for the revenues associated with overdrafts defined as the sum of deposit fee income and interest income on other consumer loans divided by total revenue. The results translate to a loss of, on average, approximately $9m of overdraft balances per quarter, which totals around $720 million annually for all sued banks with high-to-low reordering ban[29]. Results in Figure 2 indicate that the mandatory behavior change required from lawsuit outcomes indeed had an effect on sued banks and that revenues associated with overdrafts and overdraft balances declined after high-to-low reordering bans.

6.2 Impact on Household Demand for Alternative Loans

We now turn to our main analysis: assessing the effect of banning high-to-low reordering, an arguably aggressive bank policy, on household behavior. In Table 5, we start by investigating the effect of the high-to-low reordering ban on household demand for payday loans.

If overdrafts offered by these banks were simply fairly priced substitutes for payday loans, we would expect two potential outcomes. The first is that affected banks are no longer able to supply these overdrafts at the newly-mandated, artificially lower price. Banks therefore respond by cutting back on the supply of overdrafts. This reduction in supply would be consistent with a decline in overdraft quantities documented in Figure 2 panel (a) and would also cause an increase in payday borrowing as consumers switch to the closest substitute. The second potential outcome would be that as the lawsuits mandated that banks essentially drop the price of overdrafts, consumers would substitute away from payday borrowing and towards the now cheaper overdraft borrowing. In this case, we would expect to see increases in the quantities of overdrafts and a decline in payday loan quantities. In other words, under this substitution hypothesis, we would expect to see quantities of overdrafts and payday loans move overall in opposite directions post high-to-low reordering bans.

Alternatively, if overdrafts and particularly aggressively priced overdrafts create demand for payday borrowing, we would expect to see quantity declines in both overdrafts and payday borrowing after high-to-low reordering bans.

To study household alternative loan demand response to the bank behavior changes

[29]We show in Table A.2 that it does not look like banks local to behavior change banks are impacted by these changes. Specifically we compare control banks to similar-sized banks operating within the same state and document no effect on overdraft balances or revenues associated with overdrafts

induced by the lawsuits, we estimate the following zip-code quarter level specification:

$$PaydayBorrowing_{zt} = \beta \cdot HTLR\,Ban_z \cdot Post_t + \eta_{nt} + \varepsilon_{zt} \quad (1)$$

where $PaydayBorrowing_{zt}$ is a payday borrowing outcome variable for at the zip-code z in quarter t. $Post_t$ is a dummy variable taking a value of 1 for the four quarters following the behavior change and a value of 0 for the four quarters prior to and including the behavior change. $HTLR\,Ban_z$ is a dummy variable taking on a value of 1 if the zip-code contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory behavior change to cease high-to-low reordering, and a value of 0 if the zip-code contains branches belonging to lawsuit bank where the outcome of the lawsuit required no behavior change and the zip-code is within 7 miles of a treated zip-code.

The coefficient of interest β measures the differential effect of the lawsuits in zip-codes where banks had to stop reordering deposit account transactions from high to low, relative to zip-codes with sued banks present with no such changes to overdraft practices. In other words, the variation we capture is restricted to regions that are in close proximity, i.e. within a 7 miles radius, and where banks in both the treatment and control areas are subject to the lawsuit. To control for heterogeneity across these areas, such as changes in local economic conditions, we include neighborhood, quarter and, in the most conservative specification, neighborhood by quarter fixed effects (η_{nt}), where two zip-codes are defined to be in the same neighborhood if they are within 7 miles of each other. In other words, we are exploiting only variation within neighborhood during the same quarter. This ensures that, for instance, a sudden unemployment shock that could drive both the demand for payday loans and the use of overdraft is not confounding our results. We also allow arbitrary correlation of the standard errors within neighborhood by clustering the standard errors at the neighborhood level.

Table 5 presents the main result of this difference-in-differences specification using the Clarity data which allows us to focus on single payment micro loans[30], made to borrowers in zip-codes below the median income in any given year. We measure the credit demand from alternative lenders with either the average total dollars disbursed per borrower/quarter(Columns 1-3), and the total number of loans per borrower/quarter (Columns

[30]Payday loans are formally referred to as single payment micro loans (SPML).

4-6). Once we focus on within neighborhood variation, we find that there is a significant reduction in all of our outcome variables for the treated zip-codes. Specifically, we find that after the behavior changes dollars disbursed decrease by $84 per branch per zip-code which translates to around a 16 per-cent reduction relative to a per borrower/quarter mean. Table 5 further shows that the number of loans decline by 0.29 per zip-code quarter, which is equivalent to a 15 per-cent reduction relative to its mean.

Table 6 adds to the previous analysis by making use of information in Equifax data. Following the same differences-in-differences methodology, we investigate whether the lawsuit-induced change in bank behavior affects installment loans made to the lowest quintile of income borrowers residing in zip-codes with income lower than the median. The dependent variables are the dollar amount of loans disbursed and the number of loans. Similarly to findings reported in Table 5, we find that there is a significant reduction in the amount and number of installment loans after high-to-low reordering bans. The effects are also economically meaningful with a $284 reduction per borrower/quarter, which corresponds to around a 6 percent reduction per borrower/quarter. Also on the extensive margin, we find a reduction of about 5 percent in the number of loans.

Results in Tables 5 and 6 collectively indicate that demand for loans from alternative lenders significantly declines in the locations where banks that cease the pratice of the the high-to-low reordering of transactions, reside. In other words, our findings suggest that when banks are required to lower overdraft prices, consumers borrow less in alternative financial markets. These findings are consistent with the idea that overdrafts, and particularly aggressively priced overdrafts, create demand for payday and installment loan borrowing.

6.3 Impact on Household Financial Health

Given the reduction in household demand for alternative loans in response to the high-to-low reordering ban, we also expect the financial health of low-income households to improve through two potential channels.

First, if consumers turn to payday lenders to repay overdraft fees and balances, then the high-to-low reordering ban effectively stems the flow of households into the alternative financial system. There is ample anecdotal evidence that payday loan users frequently become

chronic borrowers[31], and that payday borrowers hence get caught in "debt traps"[32]. Hence we argue that a reduced incentive to borrow from payday lenders in the first place reduces the chances of entering into these "debt traps" often associated with payday borrowing, which can likely have knock on effects on ability to service other existing debt and hence overall credit health.

Second, it is also plausible that the high costs that result from high-to-low reordering make the overdraft loan unsustainable in the first place, which again causes payday borrowing and "debt spirals". Hence the reduction in fees that result from the high-to-low reordering ban might be sufficient to render the overdraft loan affordable which then reduces the need to borrow from payday lenders to effectively roll over the loan.

We use two measures of the financial health of low-income consumer: credit score, and total borrowing in good standing for borrowers in the lowest income quintile in the traditional credit bureau Equifax. While household usage of alternative loans may respond to the HTLR ban relatively quickly, we expect household financial health to take longer to respond. For example, even if the credit bureau is perfectly Bayesian, enough time needs to pass where the household remains in improved standing in order for the credit bureau to reduce its weight on mistakes in the borrower's past and to increase the credit score. Therefore, in our analysis, we increase the horizon after the HTLR ban from 4 quarters to 8 quarters. In our analysis, short-term (long-term) indicates that 4 (8) quarters post HTLR ban are included.

Using the same overall framework from before, we investigate household financial health using the following zip-code quarter level specification:

$$CreditHealth_{zt} = \beta \cdot HTLR\,Ban_z \cdot Post_t + \eta_{nt} + \varepsilon_{zt} \tag{2}$$

Tables 7 presents the results of this zip-code/quarter difference-in-differences regressions for the two outcomes variables of credit score, and total balances in good standing. Note that our credit score measure is the Equifax vantage score, which uses the same numerical scale and is designed to be effectively the same as the FICO score. Again as in all previous tests, the sample is restricted to zip-codes with an average income below the median. Behavior Change is a dummy variable taking on a value of 1 if the zip-code contains branches that

[31]For example a 2014 study by the CFPB notes that 4 out of 5 payday loans are rolled over or renewed.

[32]The 2014 CFPB study also notes that 3 out of 5 payday loans are made to borrowers whose fee expenses exceed amount borrowed, indicating that the original payday loan spirals into ever increasing amounts owed.

belong to a lawsuit bank where the outcome of the lawsuit was a mandatory behavior change to cease high-to-low reordering, and a value of 0 if the zip-code contains branches belonging to lawsuit bank where the outcome of the lawsuit required no behavior change and the zip-code is within 7 miles of a treated zip-code.

We find that there is a significant increase in household financial health across both measures. Specifically, we find that, after the high-to-low reordering ban, the credit score for low-income borrowers increases by an average of 14.08 points, and balances in good standing increase by an average of $395.2 per borrower per quarter.

We next assess the long term impact of the reduction in overdraft fees and resulting improvement in credit health on long term access to credit. Table 8 documents that while payday and installment loan borrowing remains depresses post ban, total credit balances increase by roughly $260 per borrower per quarter. This increase in total credit balances represents a substitution away from costly alternative borrowing to likely cheaper mainstream credit.

6.4 Impact on Household Consumption

We next examine the impact on household consumption using zip-code expenditure data from Earnest – a company that collects credit and debit card transaction-level data for a representative sample of the US.

We estimate the following zip-code quarter level specification:

$$Consumption_{zt} = \beta \cdot HTLR\,Ban_z \cdot Post_t + \eta_{nt} + \varepsilon_{zt} \tag{3}$$

where our consumption outcome variables include dollars and items of expenditure for durables, non-durable essentials, and non-durable other. Durable refers to expenditures related to home and auto. Non-durable essential refers to expenditures related to food and clothing. Non-durable other includes all other non-durable expenditures.

Again, the sample is restricted to zip-codes with an average income below the median. $HTLR\,Ban_z$ is a dummy variable taking on a value of 1 if the zip-code contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory behavior change to cease high-to-low reordering, and a value of 0 if the zip-code contains branches belonging to lawsuit bank where the outcome of the lawsuit required no behavior change

and the zip-code is within 7 miles of a treated zip-code.

Table 9 presents our main results. Focusing on within-neighborhood-quarter variation, we find that, after the high-to-low reordering ban, households increase durables consumption by 40.2% in dollars and 28.6% in units and increase non-durables other consumption by 24.9% in dollars or 22.4% in units. Non-durables essential consumption remains unchanged. This finding is consistent with our observation that the low-income households experienced binding liquidity constraints prior to the high-to-low reordering ban and were only able to consume the necessities. The high-to-low reordering ban then reduced their overdraft burden, improved credit health/loosened their constraints which ultimately led to cheaper access to more mainstream credit. Consumption increased perhaps as a result of a direct substitution between fees and consumption, but also because of an increased access to mainstream credit. Consumption of essentials is the same as before, but now low-income households have the capacity to increase their consumption of durables and non-durable non-essentials.

These findings are consistent with a large literature starting with Bacchetta and Gerlach (1997) that shows if some consumers are liquidity constrained, aggregate consumption should be excessively sensitive to credit conditions[33]. Results in Table 9 suggest that a reduction in debt service costs related to overdrafts cause consumers to not only to increase consumption but also to experience improved credit health and increased access to traditional credit. These findings are consistent with the existence of liquidity constrained low-income consumers.

6.5 Impact on Bank Branch Operations

For some banks, overdraft fees constitute a significant fraction of revenue, especially in low income areas. Hence by forcing banks to change their high-low practices, the resulting drop in revenue might make it unprofitable to operate in those areas anymore. We investigate this hypothesis in Table 10 by estimating the following branch/year level regression:

$$Exit_{izt} = \beta \cdot HTLR\,Ban_i \cdot Post_t \cdot + \eta_{z \cdot t} + \varepsilon_{izt} \tag{4}$$

where the dependent variable $Exit_{izt}$ is a dummy variable that takes a value of 1 if a branch belonging to bank i exited the zip-code in that year, and 0 otherwise. $HTLR\,Ban_i$

[33] as well as to income

is a dummy variable taking a value of 1 if bank i the branch belongs to was a lawsuit bank and required to cease high-to-low reordering, and takes a value of 0 for all other branches of all other banks. Post is a dummy variable taking a value of 1 for the year of the HTLR ban and up to three years after, and a value of 0 for the three years prior to the HTLR ban. Zip-code x year fixed effects – $\eta_{z \cdot t}$ – are included.

The first three columns of Table 10 include all zip-codes. Bank incentives to close are strongest in areas where the geographic redundancy is highest, hence in the second three columns we focus on zip-codes where the lawsuit behavior change banks only have less than or equal to 2 branches[34]. In the last set of columns, we check whether the results are stronger in zip-codes below the median level of median household income in any given year, as captured by the dummy *Low*.

We find that banks are significantly more likely, with up to 2 percent higher probability, to close their branches after lawsuit outcome that required the bank to cease high-to-low reordering. This effect is concentrated in zip-codes where the treated banks have a low number of branches and in low income areas. Note that since the data is at the zip-code/year/bank level, we are able to control non-parametrically for a number of other factors that could affect the bank's exit decision. First of all, time-invariant differences across zip-codes and time do not seem to affect the results as we control for zip-code and year fixed effect. However, some zip-codes might be subject to specific economic shocks that might make it unprofitable for some banks to operate. We control for this possibility by including also zip-code by year fixed effects in Columns 3, 6 and 9, which means we are identifying within zip-code/year variation in exits. Finally, there might also be bank-specific preferences for closing some branches in some regions, e.g. economies of scale from having a larger market share in a particular location. That is why we also control for bank by zip-code fixed effects. Consistently across specifications, we find that banks are more likely to close their branches after they are forced to change their overdraft policies.

These results are informative in the debate on "financial deserts," i.e. swaths of neighborhoods without banks, started after the Great Recession, when more than 6,000 branches closed across the US.[35] This phenomenon has generated concerns among policy makers about the adverse effects of these closures on access to financial services and credit, especially from

[34]Note these results are not dependent on the "low" threshold number of branches, we believe 2 is a reasonable number.

[35]See the statistics reported here https://ncrc.org/wp-content/uploads/2017/05/NCRC_Branch_Deserts_Research_Memo_05

people most in need. Furthermore, there is evidence that bank closures have negative real effects on income (Ashcraft, 2005) as well as on small business lending and local employment (Nguyen, 2019). Our results highlight how households living in low income areas, who are more likely to overdrawn their accounts, are also more likely to see a reduction in their access to traditional financial services as banks tend to only marginally value these areas. However given that we find after HTLR bans, consumers financial health and access to traditional credit improves, we argue that it seems likely being unbanked is suboptimal, but banking at a "bad bank" is worse.

7 Conclusion

A growing fraction of Americans are turning to alternative finance providers (such as payday lenders and check cashers) to fulfill their most basic financial needs. This phenomenon has attracted the attention of federal and state regulators, who are concerned that these alternative lenders exploit the financial fragility of these individuals and place them at risk of being blacklisted from financial services altogether. Our paper adds a different perspective to the policy conversation. We suggest that low income consumers may turn to the alternative system for good reason, since banks do not necessarily serve them well. Banks can therefore play a role in "pushing" customers out of the traditional system and into the alternative system.

Our findings provide evidence of a link between overdraft credit provided by traditional banks and alternative credit provided by institutions such as payday lenders. We find that, after a reduction in costs associated with obtaining overdraft credit, consumers borrow less in alternative credit markets, suggesting that overdrafts may create a demand for payday borrowing.

This may come at a hefty price tag. As well documented in the literature, payday borrowing and high cost short term loans more generally, can trap consumers in a cycle of debt. Indeed we find that, after a reduction in overdraft fees and a subsequent reduction in alternative credit borrowing, consumers financial health and access to cheaper traditional credit improves.

Results in this paper may inform policy makers in their attempt to regulate the use of payday loans and ultimately improve the overall financial health of lower-income consumers.

Furthermore, our findings cast doubt on the notion that being "banked" is necessarily a panacea for individuals living below zero.

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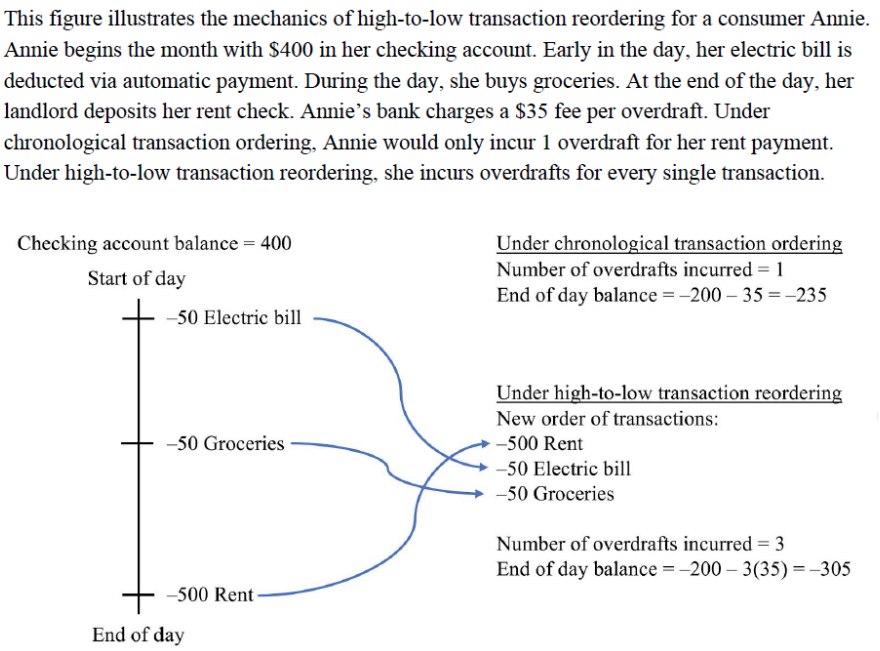
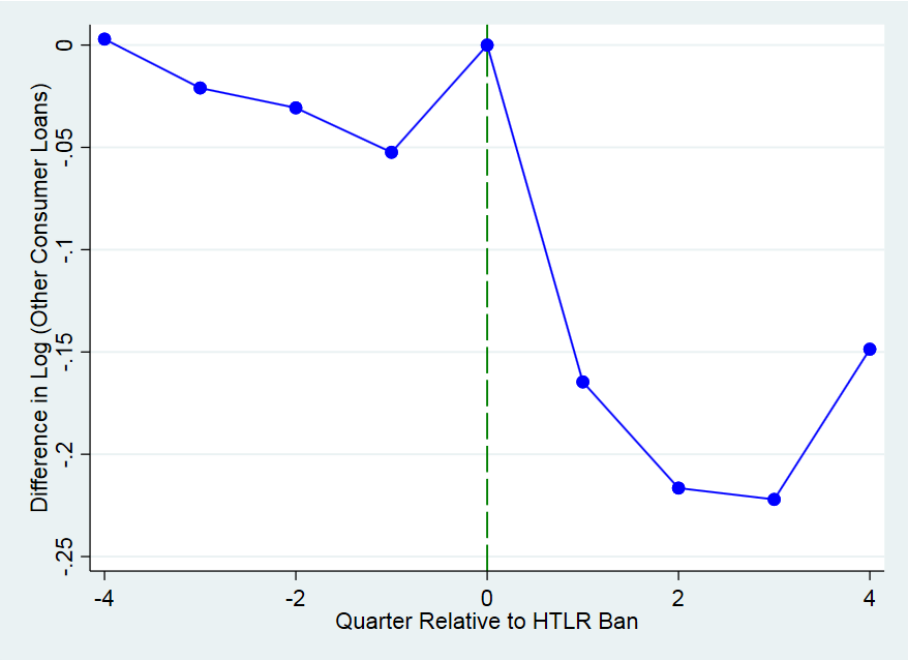
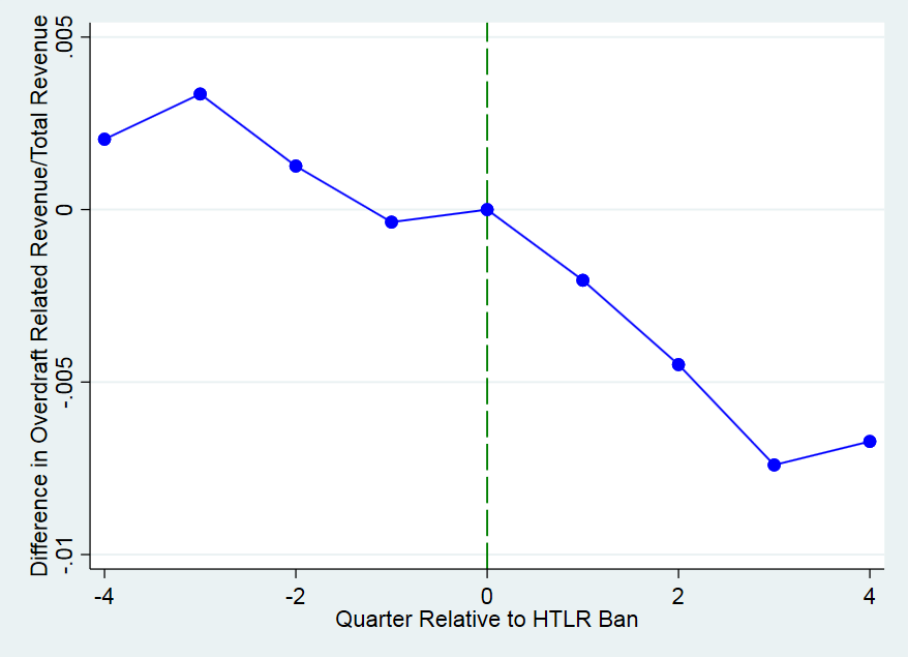


Figure 1: Illustrative example of high-to-low transaction reordering. Figure 1: Illustrative example of high-to-low transaction reordering. This figure illustrates the mechanics of high-to-low transaction reordering for a consumer Annie. Annie begins the month with $400 in her checking account. Early in the day, her electric bill is deducted via automatic payment. During the day, she buys groceries. At the end of the day, her landlord deposits her rent check. Annies bank charges a $35 fee per overdraft. Under chronological transaction ordering, Annie would only incur 1 overdraft for her rent payment. Under high-to-low transaction reordering, she incurs overdrafts for every single transaction.

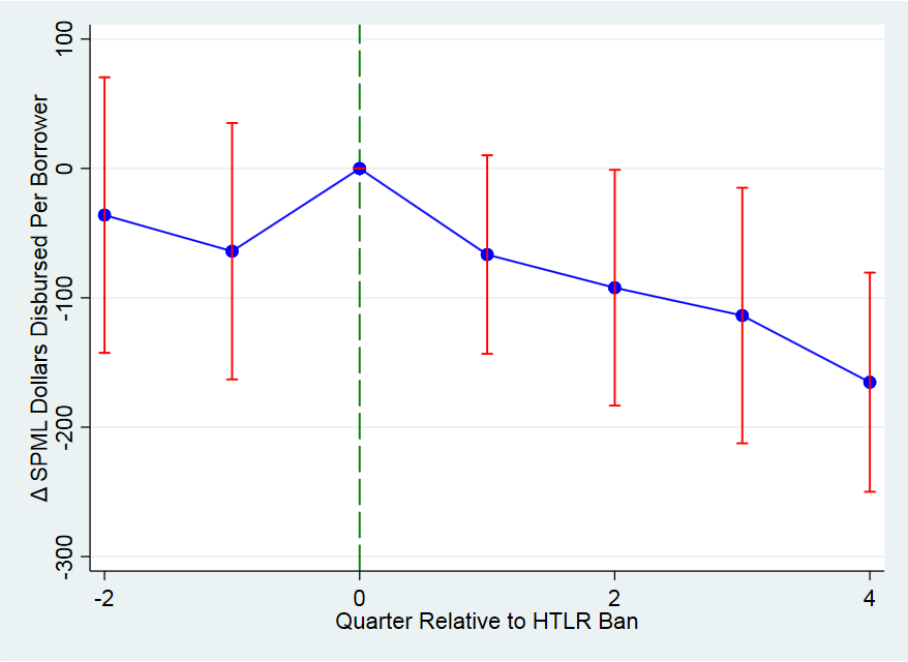


(a) Other Consumer Loans

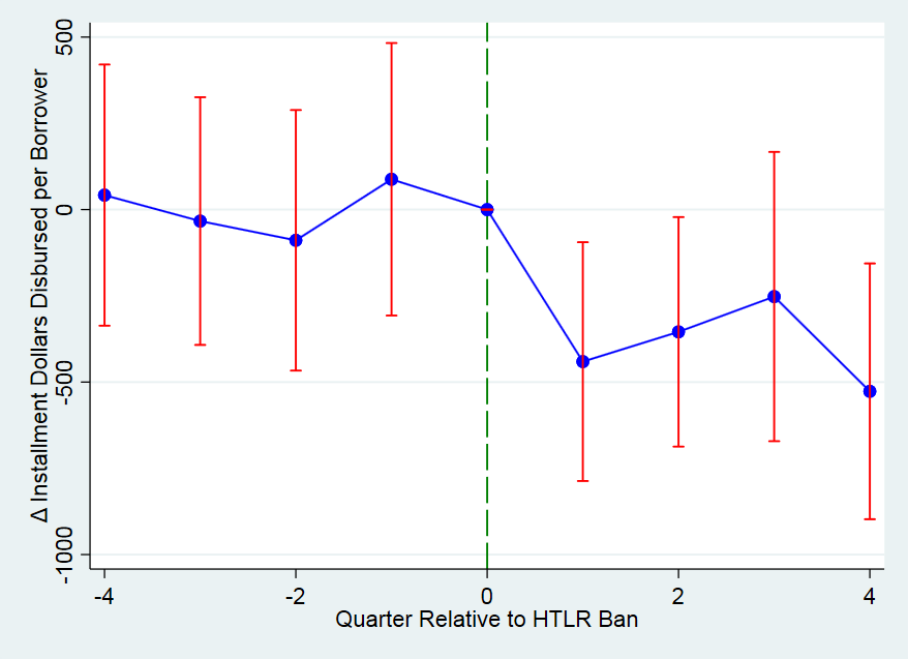


(b) Yield on Other Consumer Loans

Figure 2: Coefficients are plotted for -4 quarters to +4 quarters for a difference-in-differences regression of the log of other consumer loans and deposit account related income (defined as total interest income on other loans plus fees related to deposit accounts) , divided by total revenues, for banks with mandatory behavior change relative to similar-sized banks with no behavior change. Quarters are relative to the behavior change.

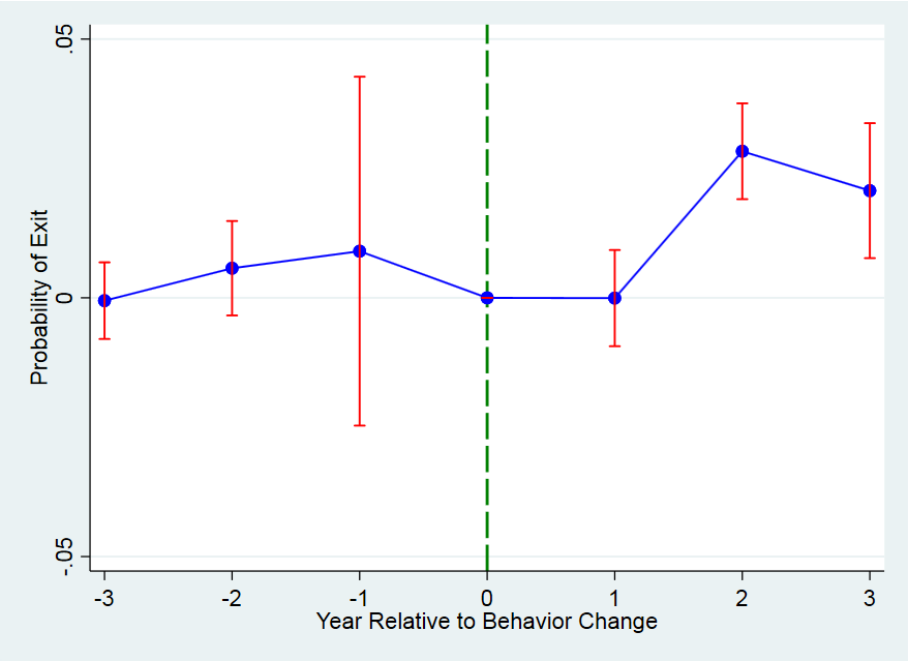


(a) SPML in Lowest Quintile Income Zip-Codes - Clarity Data

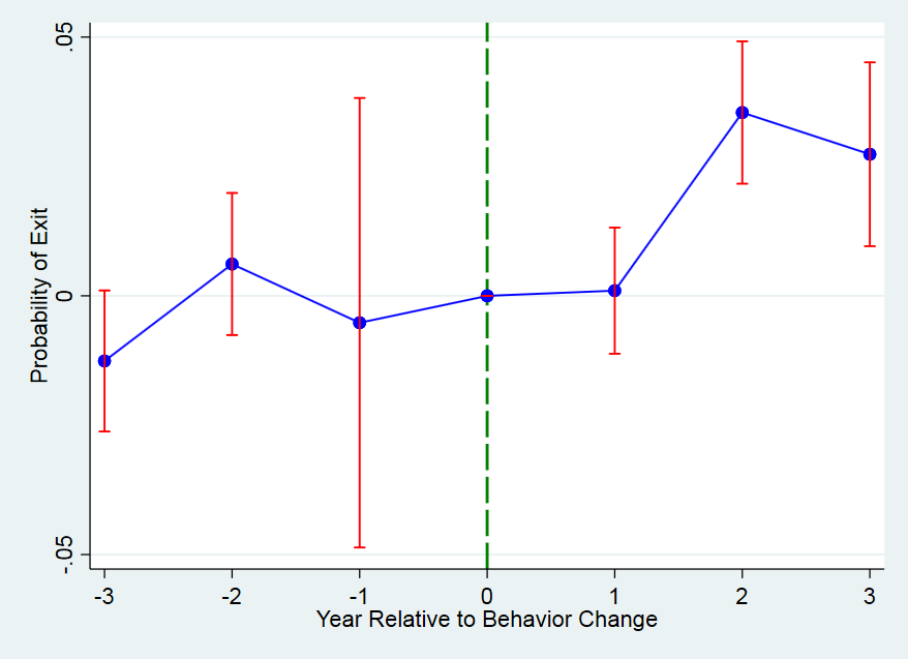


(b) Installment Loans to Lowest Quintile Income Borrowers - Equifax Data

Figure 3: Coefficients are plotted for -4 quarters to +4 quarters (when available) for a difference-in-differences regression of dollars disbursed, for zip-codes containing mandatory behavior change banks relative to zip-code neighbors within 5 miles containing lawsuit non-behavior change banks. Quarters are relative to the quarter of the behavior change.



(a) All Zip-Codes



(b) Zip-Codes with Few Treated Branches

Figure 4: Coefficients are plotted for -3 years to +3 years for a within zip-code difference-in-differences regression of exit, a dummy variable taking a value of 1 if the bank exits the zip-code in any given year, for banks with mandatory behavior change relative to all other banks. Years are relative to the year of the behavior change.

Table 1: **The Largest 50 Banks Summary Statistics**

This table contains summary statistics for the banks included in the Pew study on overdrafts from 2012 and 2015. In each year of study, the Pew study covered the largest 50 US. banks. Aggressive banks are defined as banks that employ high-to-low reordering of deposit transactions. Large banks are defined as the 50 largest banks identified by Pew. Below, bank-level data comes from the Summary of Deposits, while establishment-level data comes from InfoGroup. Panel A provides zipcode-level statistics, and Panel B provides branch-level statistics.

Panel A - Zip Code Level Stats

Variable	Mean	Std. Dev.	Min	Max
No. Branches Aggressive	1.38	2.27	0	30
No. Branches Large Banks	2.15	3.19	0	51
No. Branches	4.72	5.19	1	66
No. Banks	3.72	3.45	1	42
Total Deposits Aggressive ($1000's)	198	3,294	0	351,000
Total Deposits Aggressive Large ($1000's)	309	4,504	0	427,000
Total Deposits ($1000's)	484	5,012	0	429,000
No. Check Cashers	1.03	2.17	0	25
No. Payday Lenders	1.13	2.43	0	58
No. Establishments	729	902	1	14,133
Fraction of Zip Codes¿0 payday lenders/check cashers	0.40	0.49	0	1

Panel B - Branch Level Stats

Bank Type	Aggressive	Non- Aggressive	All Branches
No. Check Cashers Within 0.25 miles	0.28	0.23	0.26
No. Check Cashers Within 0.5 miles	0.59	0.51	0.56
No. Check Cashers Within 1 mile	1.40	1.22	1.34
No. Check Cashers Within 1.5 miles	2.54	2.18	2.41
No. Check Cashers Within 2 miles	3.93	3.33	3.71
No. Payday Lenders Within 0.25 miles	0.34	0.31	0.32
No. Payday Lenders Within 0.5 miles	0.72	0.66	0.69
No. Payday Lenders Within 1 mile	1.63	1.52	1.59
No. Payday Lenders Within 1.5 miles	2.84	2.63	2.76
No. Payday Lenders Within 2 miles	4.26	3.91	4.13

Table 2: **Clarity and Equifax Data - Summary Statistics**

This table contains zipcode/quarter level summary statistics of data from Clarity (Panels A and B), which contains consumer level borrowing activity from non-traditional sources such as payday lenders, and Equifax (Panels C and D), which contains borrowing activity from traditional lenders. In Panels A and B we observe data on extended loans from 2013 to 2020 with details on loan amount, loan type, and repayment behavior. Panel A contains statistics for all loans, and Panel B contains statistics for single period micro loans (SPML). In Panels C and D we observe data on extended loans including credit quality statistics such as current balance of loans in good or bad standing (where bad standing is defined as severe derogatory, bankruptcy, chargeoffs). Panel C contains statistics on all installment loans and panel D contains statistics on installment loans made to borrowers in the lowest income quintile.

Panel A: Clarity Data - All Loans

	Mean	Min	25	50	75	Max
Number Opened	3	1	1	2	4	76
Dollars Disbursed	5,300	1	850	2,250	7,455	167,900
Number Closed Repaid	2	-	-	1	3	59
Number Closed Chargeoff	0.3	-	-	-	1	20

Panel B: Clarity Data - SPML

	Mean	Min	25	50	75	Max
Number Opened	2	-	-	1	2	73
Dollars Disbursed	584	-	-	-	600	47,800
Number Closed Repaid	2	-	-	1	3	59
Number Closed Chargeoff	0.2	-	-	-	1	15

Panel C: Equifax - All Installment Loans

	Mean	Min	25	50	75	Max
Number Opened	3	-	-	1	4	90
Dollars Disbursed	29,503	-	-	7,500	34,340	3,493,406
Total Indebtedness	9,854	1	5,679	8,237	11,410	2,000,000
Dollars Outstanding In Bad Standing	25,387	-	-	-	24,069	4,239,630

Panel C: Equifax - All Installment Loans - Lowest Income Quintile

	Mean	Min	25	50	75	Max
Number Opened	1	-	-	-	1	53
Dollars Disbursed	3,631	-	-	-	3,443	457,458
Total Indebtedness	5,143	1	3,080	4,237	5,734	519,565
Dollars Outstanding In Bad Standing	7,085	-	-	-	4,483	487,042

Table 3: **Lawsuit Banks - Treatment/Control Summary Statistics**

This table contains summary statistics of treatment and control zipcodes. The first set of columns report the average, minimum, and maximum number of branches in a zipcode in each of the treatment years from events listed in Table A.1. An event is defined as an instance where a lawsuit bank was required to change behavior and cease the practice of high to low reordering. The second set of columns reports the number of branches belonging to lawsuit banks in control zip codes, which are defined as zip-codes containing lawsuit bank branches (and no behavior change branches) that are within 5 miles of zip-codes containing lawsuit behavior change branches. The third set of columns reports the number of branches belonging to lawsuit behavior changes banks in treated zip codes, which are defined as zip-codes containing branches belonging to banks that were required to stop the practice of high-to-low reordering.

	Total				Lawsuit Zip-Codes ¡ 5 miles of Behavior Change Zip-Codes					Behavior Change Zip-Codes				
	No. zipcode-year observations	No. branches			No. zip-codes	No.lawsuit branches			% lawsuit branches	No. zip-codes	No. behavioral Change branches			% behavior Change branches
		Mean	Min	Max		Mean	Min	Max			Mean	Min	Max	
2010	20,665	4.44	1	58	819	1.9	1	9	28%	398	1.70	1	5	18%
2011	20,756	4.73	1	64	1,905	1.9	1	9	24%	1,406	1.80	1	8	20%
2013	20,413	4.72	1	66	3,228	1.8	1	17	25%	1,697	1.60	1	9	18%
2014	20,193	4.69	1	65	56	2.1	1	9	24%	34	1.30	1	5	12%

Table 4: **The Largest 50 Banks Extensive Margin Tests**

This table presents the results of a conditional logit regression using bank branch/year level data. The dependent variable is a dummy variable that takes on a value of 1 if there is a payday lender and/or check casher within a certain radius (ranging from 0.25 to 2 miles) of the bank branch. The independent variable is a dummy variable that takes on a value of 1 if the branch belongs to a bank that practices high-to-low transaction reordering (as documented by the Pew study on overdrafts from 2012 to 2015). The dummy variable takes on a value of 0 if the branch belongs to a bank that is among the large Pew-studied banks but that does not practice high-to-low reordering at the given point in time. Zipcode x year fixed effects are included, and standard errors are clustered by zipcode. Zipcode level data on payday lenders and check cashers comes from Infogroup, zipcode level data on branches comes from the Summary of Deposits, and data on the overdraft policy of banks comes from the Pew study of bank overdrafts.

Dependent Variable	0.25 miles	0.5 miles	1 mile	1.5 miles	2 miles
HTLR Branch	0.140***	0.124***	0.0364**	0.0272	0.0139
	(0.0167)	(0.0164)	(0.0178)	(0.0209)	(0.0242)
Zip x Year FE	Y	Y	Y	Y	Y
Observations	102,618	104,635	90,492	71,495	55,823

*** p<0.01, ** p<0.05, * p<0.1

Table 5: **Household Demand for Payday Loans after HTLR Bans**

This table contains the results of zipcode/quarter difference-in-differences regressions using the Clarity alternative credit bureau data. Loans are single period micro loans. The dependent variables are the total dollars of loans disbursed per zipcode/quarter, and the number of loans made per zipcode/quarter. The sample is restricted to zip-codes with an average income below the median. Behavior Change is a dummy variable taking on a value of 1 if the zipcode is treated i.e. contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory behavior change to cease high-to-low reordering, and a value of 0 if the zipcode contains branches belonging to lawsuit bank where the outcome of the lawsuit required no behavior change and the zipcode is within 7 miles of a treated zip-code. Lawsuit and behavior change banks are listed in Table A.1. Post is a dummy variable taking a value of 1 if the quarter is greater than 0 quarters and less than 4 after the behavior change and a value of 0 if the quarter is less than or equal to the quarter of behavior change and greater than 4 quarters prior. Varying levels of fixed effects are included, and standard errors are clustered at the neighborhood level (where a neighborhood contains treated zip-codes and control zip-codes within 7 miles of each other).

Dependent Variable	Amount			Number		
Post x Behavior Change	-45.35	-44.60	-84.84***	-0.222***	-0.210***	-0.289***
	(28.23)	(27.82)	(31.47)	(0.0775)	(0.0760)	(0.0905)
Neighborhood FE	Y	Y	N	Y	Y	N
Year/Quarter FE	N	Y	N	N	Y	N
Neighborhood x Year/Quarter FE	N	N	Y	N	N	Y
Observations	9,870	9,870	9,870	9,870	9,870	9,870
R-squared	0.311	0.317	0.408	0.319	0.334	0.384

*** p<0.01, ** p<0.05, * p<0.1

Table 6: **Household Demand for Installment Loans after HTLR Bans**

This table contains the results of zipcode/quarter difference-in-differences regressions using data from Equifax, a traditional credit bureau. The dependent variables are the dollar amount of installment loans disbursed, and the number of installment loans disbursed to borrowers with income below the 20th percentile. The sample is restricted to zip-codes with an average income below the median. Behavior Change is a dummy variable taking on a value of 1 if the zipcode is treated i.e. contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory behavior change to cease high-to-low reordering, and a value of 0 if the zipcode contains branches belonging to lawsuit bank where the outcome of the lawsuit required no behavior change and the zipcode is within 7 miles of a treated zip-code. Lawsuit and behavior change banks are listed in Table A.1. Post is a dummy variable taking a value of 1 if the quarter is greater than 0 quarters and less than 4 after the behavior change and a value of 0 if the quarter is less than or equal to the quarter of behavior change and greater than 4 quarters prior. Varying levels of fixed effects are included, and standard errors are clustered at the neighborhood level (where a neighborhood contains treated zip-codes and control zip-codes within 7 miles of each other).

Dependent Variable	Amount			Number		
Post x Behavior Change	-255.2***	-289.4***	-284.5**	-0.0322**	-0.0326**	-0.0309*
	(81.74)	(81.11)	(112.2)	(0.0131)	(0.0129)	(0.0177)
Neighborhood FE	Y	Y	N	Y	Y	N
Year/Quarter FE	N	Y	N	N	Y	N
Neighborhood x Year/Quarter FE	N	N	Y	N	N	Y
Observations	40,798	40,798	40,798	40,798	40,798	40,798
R-squared	0.080	0.105	0.281	0.093	0.135	0.300

*** p<0.01, ** p<0.05, * p<0.1

Table 7: **Long Term Credit Health After HTLR Bans**

This table contains the results of zipcode/quarter difference-in-differences regressions using data from the traditional credit bureau Equifax. The first dependent variable is the average credit score of borrowers in the bottom income quintile. Note that our credit score measure is the Equifax vantage score, which uses the same numerical scale and is designed to be effectively the same as the FICO score. The second dependent variable is the total balance of credit in good standing for borrowers in the bottom income quintile. The sample is restricted to zip-codes with an average income below the median. Behavior Change is a dummy variable taking on a value of 1 if the zipcode is treated, i.e. if the zipcode contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory behavior change to cease high-to-low reordering, and a value of 0 if the zipcode contains branches belonging to lawsuit bank where the outcome of the lawsuit required no behavior change and the zipcode is within 7 miles of a treated zip-code. Lawsuit and behavior change banks are listed in Table A.1. Post is a dummy variable taking a value of 1 if the quarter is greater than 0 and less than 8 quarters after the behavior change and a value of 0 if the quarter is less than or equal to the quarter of behavior change and greater than 4 quarters prior. Varying levels of fixed effects are included, and standard errors are clustered at the neighborhood level (where a neighborhood contains treated zip-codes and control zip-codes within 7 miles of each other).

Dependent Variable	Credit Score			Total Balance in Good Standing		
Post x Behavior Change	12.25***	7.278***	14.08***	813.7***	651.7***	395.2**
	(2.848)	(2.781)	(3.689)	(166.6)	(164.3)	(193.8)
Neighborhood FE	Y	Y	N	Y	Y	N
Year/Quarter FE	N	Y	N	N	Y	N
Neighborhood x Year/Quarter FE	N	N	Y	N	N	Y
Observations	82,460	82,460	82,460	84,750	84,750	84,750
R-squared	0.005	0.113	0.332	0.252	0.263	0.289

*** p<0.01, ** p<0.05, * p<0.1

Table 8: **Long Term Borrowing Activity After HTLR Bans**

This table contains the results of zipcode/quarter difference-in-differences regressions using the Clarity alternative credit bureau and Equifax data. The dependent variables are the total dollars of loans outstanding per zipcode/quarter. Column (1) is total SPML, column (2) is total installment loan balances for the bottom quintile income borrowers and column (3) is total balances for the bottom quintile income borrowers. The sample is restricted to zip-codes with an average income below the median. Behavior Change is a dummy variable taking on a value of 1 if the zipcode is treated i.e. contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory behavior change to cease high-to-low reordering, and a value of 0 if the zipcode contains branches belonging to lawsuit bank where the outcome of the lawsuit required no behavior change and the zipcode is within 7 miles of a treated zip-code. Lawsuit and behavior change banks are listed in Table A.1. Post is a dummy variable taking a value of 1 if the quarter is greater than 0 quarters and less than 4 after the behavior change and a value of 0 if the quarter is less than or equal to the quarter of behavior change and greater than 4 quarters prior. Varying levels of fixed effects are included, and standard errors are clustered at the neighborhood level (where a neighborhood contains treated zip-codes and control zip-codes within 5 miles of each other).

Dependent Variable	Balances		
	SPML	Installment	Total
Post x Behavior Change	-72.02**	-235.5**	258.2*
	(29.45)	(99.57)	(134.9)
Neighborhood x Year/Quarter FE	Y	Y	Y
Observations	18,813	58,741	69,150
R-squared	0.450	0.259	0.247

*** p<0.01, ** p<0.05, * p<0.1

Table 9: **Lawsuit Banks - Differences-in-Differences - Consumption**

This table contains the results of zipcode/quarter difference-in-differences regressions using consumption data from. The dependent variables are the total dollars of expenditures per zipcode/quarter. Columns (1) and (2) are the log of total durables expenditures/units where durables are defined as home and auto. Columns (3) and (4) are the log of total non-durable essential expenditures/units where non-durable essentials are defined as food and clothing. Columns (5) and (6) are the log of total non-durable other expenditures/units where non-durable other are defined as all other non-durable expenditure. The sample is restricted to zip-codes with an average income below the median. Behavior Change is a dummy variable taking on a value of 1 if the zipcode is treated i.e. contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory behavior change to cease high-to-low reordering, and a value of 0 if the zipcode contains branches belonging to lawsuit bank where the outcome of the lawsuit required no behavior change and the zipcode is within 7 miles of a treated zip-code. Lawsuit and behavior change banks are listed in Table A.1. Post is a dummy variable taking a value of 1 if the quarter is greater than 0 quarters and less than 8 after the behavior change and a value of 0 if the quarter is less than or equal to the quarter of behavior change and greater than 4 quarters prior. Neighborhood/zip-code/year-quarter fixed effects are included, and standard errors are clustered at the neighborhood level (where a neighborhood contains treated zip-codes and control zip-codes within 7 miles of each other).

	Durables		Non-Durables Essentials		Non-Durables Other	
Dependent Variable	Total Expenditure	Num. Units	Total Expenditure	Num. Units	Total Expenditure	Num. Units
Post x Behavior Change	0.402***	0.286***	0.111	0.0721	0.249**	0.224**
	(0.121)	(0.0904)	(0.100)	(0.0857)	(0.119)	(0.0972)
Neighborhood x Year/Quarter FE	Y	Y	Y	Y	Y	Y
Observations	9,905	9,905	12,450	12,450	11,079	11,079
R-squared	0.913	0.862	0.948	0.932	0.944	0.903

*** p<0.01, ** p<0.05, * p<0.1

Table 10: **Behavior Change Banks - Bank Branch Closures**

This table contains results of a zipcode/year/bank level regression. The dependent variable - exit - is a dummy variable that takes a value of 1 if the bank exited the zip-code in that year, and 0 otherwise. Behavior Change is a dummy variable taking a value of 1 if the bank was a lawsuit bank and required to cease high-to-low reordering as outlined in Table A.1, and takes a value of 0 for all other banks. Post is a dummy variable taking a value of 1 for the year of the behavior change and up to three years after, and a value of 0 for the three years prior to the behavior change. The first three columns All are tests on all zip-codes, the second three columns Low are tests restricted to zip-codes where the lawsuit behavior change banks only have less than or equal to 2 branches, low is a dummy variable taking a value of 1 for zip-codes below the median level of median household income in any given year. Increasing levels of fixed effects are included. Standard errors are clustered by bank/zipcode.

Dependant Variable	Exit								
	All			Low Number			All		
Post x Behavior Change	0.00711***	0.00896***	0.0108***	0.0164***	0.0185***	0.0206***	0.00517***	0.00682***	0.00761***
	(0.000811)	(0.000828)	(0.000939)	(0.000972)	(0.000989)	(0.00117)	(0.00136)	(0.00137)	(0.00158)
Post x Behavior Change x Low							0.00298*	0.00334**	0.00481**
							(0.00170)	(0.00169)	(0.00196)
Zip-Code FE	Y	Y	N	Y	Y	N	Y	Y	N
Year FE	N	Y	N	N	Y	N	N	Y	N
Zip-Code x Year FE	N	N	Y	N	N	Y	N	N	Y
Bank x Zip FE	N	N	Y	N	N	Y	N	N	Y
Observations	509,807	509,807	496,461	457,857	457,857	444,292	509,807	509,807	496,461
R-squared	0.025	0.028	0.298	0.027	0.030	0.302	0.026	0.028	0.298

*** p<0.01, ** p<0.05, * p<0.1

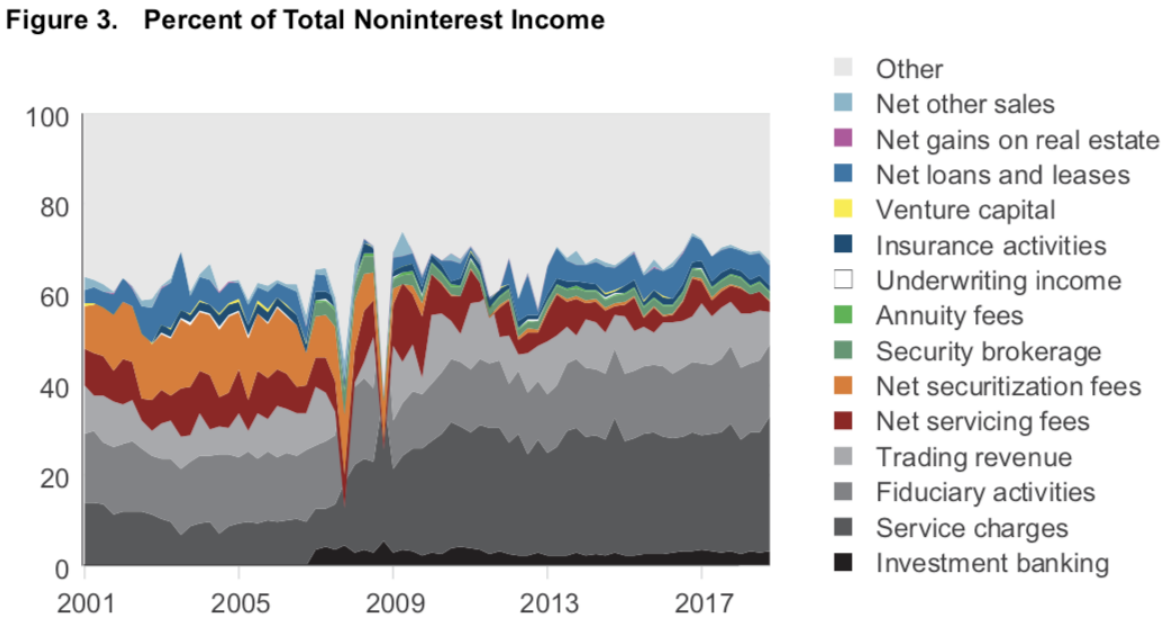


Figure A.1: Source: Haubrich and Young (2019). This figure shows that as income from securitization declined post financial crisis, income earned from deposit account fees increased dramatically.

Table A.1: **Key Events of Lawsuits Lodged Against Banks for High-to-low Transaction Reordering**

This table contains a list of the banks that were sued by customers for the high-to-low reordering (also known as high-to-low re-sequencing) of transactions posted to customers' deposit accounts. The date of lawsuit filing is the date when the lawsuit was initially filed. The date of final settlement is the date when the litigation reached a final settlement, and the date of behavioral relief is the date found in official court documents (often the settlement agreement) when the defendant bank instituted behavioral relief by ceasing to practice high-low transaction reordering.

Bank	Date of Lawsuit Filing	Date of Final Settlement	Date of Behavioral Relief (if any)
Associated Bank	2-Apr-2010	2-Aug-2013	1-Feb-2011
Banco Popular North America	14-Nov-2012	7-Aug-2018	1-Aug-2013
BancorpSouth Bank	18-May-2010	15-Jul-2016	
Bank of America	1-Dec-2008	22-Nov-2011	
Bank of the West	5-Apr-2010	18-Dec-2012	1-Jul-2011
BOKF	17-Aug-2010	13-Sep-2012	
Capital One	18-May-2010	22-May-2015	
Citibank	19-Dec-2011	14-Nov-2014	
Citizens	26-Jan-2010	12-Mar-2013	30-Jun-2013
Comerica Bank	17-Feb-2010	10-Jun-2014	
Commerce Bank	6-Apr-2010	2-Aug-2013	29-Mar-2013
Community Bank	20-Jul-2012	25-Nov-2013	1-Mar-2011
Compass Bank	4-May-2010	7-Aug-2013	12-Mar-2013
Fifth Third Bancorp	21-Oct-2009	29-Jul-2011	1-Apr-2011
Great Western Bank	15-Jun-2010	2-Aug-2013	1-Jul-2010
Harris	23-Apr-2010	5-Aug-2013	31-Mar-2013
HSBC Bank USA	1-Mar-2011	18-Oct-2016	
IBERIABANK Corporation	18-Feb-2011	26-Apr-2012	1-Nov-2011
Independent Bank Corporation	31-Jul-2013	11-Jan-2018	
JPMorgan Chase Bank	24-Jul-2009	19-Dec-2012	29-Mar-2010
M & I Marshall & Ilsley Bank	16-Jun-2010	2-Aug-2013	31-Mar-2013
M&T Bank	21-Aug-2009	13-Mar-2015	1-Jan-2013
National City Bank	17-Feb-2010	1-Dec-2011	
Northwest Savings Bank	7-May-2012	7-Apr-2015	1-Jul-2011
PNC Bank	8-Oct-2009	5-Aug-2013	5-Aug-2013
RBC Bank (USA)	2-Jul-2010		
Susquehanna Bank	29-Jul-2011	1-Apr-2014	1-Oct-2011
Synovus Bank	21-Sep-2010	2-Apr-2015	
TD Bank	15-Dec-2009	18-Mar-2013	
TD Bank, including Carolina First Bank and Mercantile Bank	21-Aug-2013	24-Jan-2020	
Trustmark National Bank	2-Dec-2011	25-Mar-2014	25-Mar-2014
U.S. Bank	17-Apr-2009	3-Jan-2014	24-Jul-2013
Umpqua Bank	29-Dec-2011	28-Apr-2015	
Union Bank	16-Jul-2009	4-Oct-2012	1-Aug-2010
Webster Bank	29-Apr-2010	28-Mar-2011	30-Sep-2010
Wells Fargo & Company	21-Nov-2007	5-Aug-2013	1-Jan-2010
Woodforest National Bank	11-Jan-2012	19-May-2014	1-Mar-2010

Table A.2: **Bank Level Price/Quantity Responses to Behavior Change - Non-Affected Banks**

This table contains results of a bank/quarter level regression. The dependent variable is either the log of other consumer loans or overdraft related revenue, which is defined as the sum of fees associated with deposit accounts plus interest income on other consumer loans, all divided by total revenue. Each bank is assigned a primary state, which is the state in which the bank primarily operates as measured by fraction of total branches, and similarly a primary county. Each year banks are sorted in size deciles. Matched is a dummy variable that takes a value of 1 for banks in the same size decile and primary county as HTLR ban banks, and a value of 0 for all other banks in the same decile and same primary state as HTLR ban banks. Post is a dummy variable taking a value of 1 for the 12 quarters post the behavior change and a value of 0 for the 12 quarters prior. Year/Quarter x Primary State fixed effects are included, and bank fixed effects are also included. Standard errors are clustered by bank and year/quarter.

Dependent Variable	Log (Other Consumer Loans)	Overdraft Revenue/Total Revenue
Post x Matched	0.0800	0.000794
	(0.107)	(0.00252)
State x Quarter FE	Y	Y
Observations	30,134	29,697
R-squared	0.964	0.950

*** p<0.01, ** p<0.05, * p<0.1