

In the Red: Overdrafts, Payday Lending and the Underbanked¹

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Abstract

The reordering of transactions from “high-to-low” is a controversial bank practice thought to maximize fees paid by low-income customers on overdrawn accounts. We exploit multiple class-action lawsuits resulting in mandatory changes to this practice, coupled with payday lending data, to show that after banks cease high-to-low reordering, low-income individuals reduce borrowing from alternative lenders. These consumers increase consumption, experience long-term improvements in overall financial health, and gain access to lower-cost loans in the traditional system. These findings highlight that aggressive bank practices create a 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 do not have a bank account, or have a bank account but also routinely use financial services outside of the traditional banking system, such as payday loans. One of the top reasons that underbanked households cite for not having or exclusively using a bank account, is that bank account fees are too high. Indeed, low-income individuals are estimated to pay at least three times as much as the rest of the population in order to maintain their checking accounts.¹

The issue of financial inclusion has caught the attention of policymakers, with the Federal Reserve Board Chairman Powell stating in 2019: “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.” However, while low income consumers use both traditional and alternative financial systems to obtain financial services, the bulk of research and regulation on financial inclusion in the United States has focused on the high costs associated with, and predatory nature of, alternative service providers such as payday lenders.² As a result, both state and federal regulators have expanded their supervision of the payday lending industry specifically, and as of 2019, nineteen states and the District of Columbia prohibit payday lending or have set interest rate caps and other limits that may force payday lenders out of business.

The commonly proposed solution to the high costs associated with these alternative financial services, is to bank the underbanked, i.e. to integrate underbanked households into the traditional financial system more. On its economic inclusion website, the FDIC states, “Ownership of an account at a federally insured depository institution provides households with a safe place to keep deposits and to save for emergency and long-term needs, and it facilitates households’ financial transactions ... However, despite these benefits, millions of U.S. households continue to use services from high cost alternative financial services providers.”³

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

¹According 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.

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

³See <https://economicinclusion.gov/whatis/>.

inform future policy interventions. In particular, very little is known about the *interaction* between the traditional and alternative financial institutions that both provide services to the underbanked segment of the population.

In this paper we investigate whether practices implemented by traditional financial institutions can 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 fees paid by consumers on their overdrawn bank accounts. We document the impact that this practice has on consumer demand for alternative financial services and subsequent consumer financial health.

Banks are legally allowed to choose the order in which they process a customer’s account transactions. For instance, as illustrated in Figure 1, given an initial \$400 checking account balance, the bank can process a \$500 rent debit before two smaller transactions of \$50 each, even if the rent debit was posted latest in time. 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.⁴

A 2016 report by the Pew Charitable Trusts scrutinized the practices of 50 of the largest banks by deposits.⁵ 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 can be 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 high-to-low ordering on consumer welfare 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 distress⁶. On the other hand, if these procedures result in excessive fees, these households

⁴In this example, for an overdraft fee of \$35, the high-to-low reordering increases the fee burden from 17.5% of the overdrawn balance to 53% – a dramatic increase in the cost of overdraft far above the advertised \$35 sticker price.

⁵See Pew Charitable Trusts (2016).

⁶See Morse (2006) or Morse (2011) for a discussion on access to other forms of short-term distress credit such as payday loans.

are more likely to become unexpectedly overextended and find it difficult to find funds to both bring account balances above zero and pay the cascade of overdraft fees.

It is worth noting that failure to pay overdraft fees and quickly bring account balances above zero leads to severe consequences. This is 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. Involuntary account closure can then prevent a consumer from opening an account at any other bank for up to 5 years.⁷ Once a consumer is unable to obtain a checking account, it becomes very difficult to obtain credit or access financial services like checks, debit cards, direct deposit, digital transfer, and bill payment. Given the severe consequences of defaulting in the traditional banking system, households saddled with overdraft fees may find it optimal to borrow elsewhere to make good on their fees, or they may leave the traditional system altogether. The correct regulatory response to these overdraft procedures crucially depends on which effect dominates in practice.⁸

A key challenge in analyzing these bank practices and their impact on demand for alternative financial services is the availability of data: underbanked households 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. Furthermore, bank practices such as high-to-low reordering are typically very difficult to observe.

We address each 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). Clarity data includes a similar set of variables as those given by traditional bureaus, e.g. loan performance and account information.⁹ We complement this data with traditional credit bureau data from Equifax, one of the major consumer credit bureaus. With Equifax data, we focus on installment loans made to borrowers in the lowest quintile of the income distribution of the dataset, in order to capture similarly constrained borrowers as those observed in Clarity.¹⁰

⁷Failure to pay overdraft fees and balances within 2 months results in involuntary account closure – see Campbell et al. (2012).

⁸There are currently no regulations prohibiting high-to-low reordering.

⁹See Nuñez et al. (2016) for an exploration of Clarity subprime lending data.

¹⁰Installment loans are an alternative to payday loans for individuals with poor credit. For anecdo-

Second, by focusing on the practice of high-to-low transaction reordering, we can exploit a series of lawsuits that challenged this practice at banks throughout the United States. We hand-collect a unique dataset on these lawsuits, documenting the banks sued, lawsuit outcomes (including whether any change to high-to-low reordering was mandated), and geographic areas affected. The lawsuits provide a key source of variation of high-to-low reordering behavior over time, within zip-codes, across zip-codes, and across banks. In our empirical strategy, we match each zip-code with its neighboring zip-codes, defined as those located within a certain distance. We compare outcomes for zip-codes that lie within the same neighborhood but that differ in the presence of banks sued over their overdraft practices. Specifically we compare zip-codes that contain branches of banks required to cease high-to-low reordering with zip-codes within 7 miles that contain branches of sued banks with no mandatory behavior changes. We choose a radius of 7 mile radius to ensure that we are comparing areas with similar economic conditions including consumer demand dynamics.¹¹ 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, relative to branches belonging to banks with no high-to-low reordering policies. This is consistent with the idea that banks, specifically banks with aggressive overdraft policies, and alternative finance providers serve similar customers. While this finding indicates a strong correlation between the bank practice of high-to-low reordering and the existence of payday lenders and check cashers, it does not provide a causal link between bank practices and demand for alternative financial services. Instead, variation in high-to-low reordering induced by lawsuit outcomes provides a suitable setting in which to tease out this interaction and causal effect.

In the next step of our analysis, we confirm that our lawsuit instrument is relevant and resulted in meaningful changes at affected banks. We document a strongly significant, negative, first-stage relationship between the lawsuit behavior change mandate and overdraft

tal evidence, see for example <https://www.nerdwallet.com/best/loans/personal-loans/installment-loans-bad-credit>.

¹¹Our results are not dependent on the exact radius chosen and hold true for radii ranging from 5 to 10 miles.

activity (whether measured as revenues or balances) at banks. In other words, we show that both overdraft revenues and balances declined significantly for banks required to cease the practice of high-to-low reordering. We argue therefore that the lawsuit rulings therefore were likely binding and indeed caused banks to change behavior. We show that no other source of bank revenue is affected by the lawsuit mandate, which reassures us that we are not capturing some other overall shock to these banks.

Next, we make use of the variation in high-to-low reordering practices induced by the 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 by \$284 per borrower/quarter, which is a 6 percent decline relative to its mean. 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 reordering bans.

An important next step is investigating 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, a reduction in debt servicing costs can increase these consumers' ability to smooth consumption, service existing debt, and ultimately access credit later on.¹² We address this question by first investigating several measures of financial health — such as the total amount of loans in good standing, credit card balance and limits, and overall reliance on installment loans¹³. Consistently across these measures, we find that households experience an improvement in these credit health outcomes following high-to-low reordering bans.

We find that credit card limits increase, which suggests that traditional lenders expand access to credit for these households who experience improved financial conditions. Furthermore, we document long term changes in consumer borrowing behavior after high-to-low reordering bans. Specifically, while borrowing from alternative lenders permanently declines

¹²See for example Bacchetta and Gerlach (1997) who show that, for liquidity-constrained consumers, reductions in debt servicing costs (due to monetary policy changes) lead to changes in consumption behavior. We apply this logic to our setting, where the cost of overdraft has been reduced.

¹³to test for a differential impact on the borrowers' reliance on more traditional forms of credit

following high-to-low reordering bans, total credit balances increase. This finding indicates an improved access to more mainstream and likely cheaper credit.

Finally, to further corroborate the interpretation that borrowers benefit from less aggressive overdraft fees, we investigate whether borrowers' consumption is impacted by changes in bank practices. We distinguish between durable expenditures related to home and auto (e.g. roof and car repair), non-durable but still essential expenditures (e.g. food and clothing), and other non-durable expenditures. We find that affected households significantly increase their consumption of durable goods related to home and auto and their consumption of essential, non-durable goods.

These results collectively suggest that overdrafts offered by high-to-low reordering banks and payday loans offered by payday lenders are not simply substitutes.¹⁴ Rather, overdrafts can induce 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, can 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 indebtedness¹⁵. Although policymakers today are focused on ensuring that poorer areas get served by traditional financial institutions, our results suggest that bank practices in these areas can be harmful and be part of the reason that households end up using high-cost credit from alternative providers.

One potential effect of forcing banks to lower overdraft fees is the possibility that these banks would then find it optimal to stop providing services altogether to low-income households.¹⁶ Intuitively, since overdraft fees are an important source of revenue for banks, the lawsuits that force banks to cease high-to-low reordering may then prompt banks to close the 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

¹⁴The existing literature has documented a substitute relationship between overdraft and payday lenders. See Bair (2005), Stegman (2007), and Melzer and Morgan (2015).

¹⁵We 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).

¹⁶See for example Dlugosz et al. (2020).

that banks are significantly more likely to close their branches after being required to stop the practice of high-to-low reordering. Furthermore, this effect is concentrated in zip-codes where sued banks have a low number of branches and in low-income zip-codes. These results suggest that the high-to-low reordering bans make it less likely that households will turn to alternative lenders in the near term but more likely that households will lose access to traditional financial services altogether in the longer term. Although a full welfare analysis is outside the scope of the paper, our findings on improved consumer financial health and improved access to more mainstream credit as a result of the lawsuit outcomes, suggest that it is likely the reduced need to borrow from payday lenders is the dominating effect.

The rest of the paper is organized as follows. Section 2 discusses related literature and Section 3 provides background on bank overdrafts and the lawsuits lodged against banks for high-to-low reordering. Section 4 describes the data, while Section 5 presents motivating evidence. 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 linkages between the payday and overdraft short term credit markets. There are a number of studies that show that payday loans and overdrafts are likely substitutes for one another. For example, Morgan et al. (2012) find that the number of returned checks and the amount of bank overdraft fee income increase after payday credit bans, consistent with overdrafts being costlier substitutes for payday loans. Melzer and Morgan (2015) further find that when payday lending is prohibited, both overdraft prices and overdraft limits decline. However, in his review of the payday lending market, Stegman (2007) notices a link between overdrafts and payday loans also as potential complements, 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. Miller and Soo (2020) is a closely related, recent piece of work that links the traditional and alternative credit systems by investigating 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), Hayashi (1987), Zeldes (1989), Jappelli (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 likely 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.¹⁷ While Laibson et al. (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 et al. (2012), 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 slows income growth and reduces saving. Reduced saving feeds back to reduce capital accumulation even further, leading to a

¹⁷See CNBC (2019). Also Dynan (1993) and Guiso et al. (1992) report the missing precautionary savings effect.

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.¹⁸ This finding is consistent with ample anecdotal evidence, such as in Faris and Stegman (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 overdrafts¹⁹.

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, most banks surveyed by the FDIC also assess fees on persistent negative balance status accounts. In 2015, consumer overdraft fees and non-sufficient funds fees (NSF) comprised almost two-thirds of all reported bank deposit account fee revenues.²⁰

Overdrawn accounts can lead to a cascade of fees, 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,

¹⁸Either the loan was “unsustainable” in the first place, or payday borrowing itself causes repeat borrowing.

¹⁹For 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

²⁰We also find that deposit fee income accounts for between 5-30% of bank ordinary revenues.

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, 2017).

Customers also tend to associate overdraft fees with payday loans, and overdrafters tend to be the focus of customer acquisition campaigns by payday lenders.²¹ 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

²¹See for example Pew Charitable Trusts (2015).

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 overdraft policies and the demand for alternative loans, and ultimately the impact these policies have on consumer 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 obtain 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 ar-

cas 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 aggressive overdraft practices, retail customers have sued financial institutions, arguing that aggressive overdraft practices disproportionately impact low-income clients. To identify relevant legal cases and build our lawsuits dataset, we query Nexis Uni for case documents containing “overdraft,” “re-sequenc,” “resequenc,” “reorder,” or “re-order.” For each legal case, we read through the court docket and official documents to determine the final outcome. We limit our focus to lawsuits that settled in court and exclude those that were dismissed or settled via arbitration. Our final dataset includes 37 lawsuits, for which we note key event dates and the terms of settlement between each bank and its consumers. In particular, we document whether and when each bank was required to institute behavioral relief, i.e. cease high-to-low transaction reordering.²² See Table A.1 for an overview of our lawsuits dataset. For each lawsuit, we report the name of the sued bank, the date when the lawsuit was filed, the date when the judge granted final approval of the settlement, and the date when the bank was required to cease high-to-low transaction reordering, if at all.

Haubrich and Young (2019) examine the different components of non-interest income for banks and find that, in the wake of the 2008 crisis, securitization income dried up while service charge income (primarily overdraft fees and non-sufficient funds fees) increased dramatically.²³ One explanation is that the housing crash destroyed an important source of revenue for banks that then reacted by extracting more fees from deposit accounts. Another explanation is that the low interest rate environment following the Great Financial Crisis left banks scrambling to find other sources of non-interest income. Indeed, the wave of lawsuits in our dataset begin in 2008, perhaps because consumers were responding to bank practices

²²In the cases of Trustmark National Bank, Webster Bank, U.S. Bank, and PNC Bank, the exact behavioral relief date could not be found in legal documents or news articles. Instead, we use the settlement final approval date or the date of the earliest document that reports that the bank has recently stopped high-to-low reordering. Given that our analysis is at the quarterly level, this procedure in these few cases should not affect our results.

²³Figure 3 in Haubrich and Young (2019) documents the breakdown of non-interest income through time.

that maximized deposit fees to make up for other lost income.

There is room for non-uniform ruling in these lawsuits because the practice of high-to-low reordering is not, in of itself, illegal. In the deposit account agreement – the contract that sets the rules of the consumer-bank relationship – banks often reserve the right to reorder transactions freely, which makes it difficult for consumers to claim unlawfulness or deception afterwards. All of the lawsuits in our sample were ultimately settled with no admission of liability or wrongdoing from banks. Instead, banks generally claimed that they were only providing monetary relief (a cash payment) and in some cases also behavioral relief (an end to high-to-low reordering) in order to avoid an expensive, drawn-out legal process.

For our outcome variables of interest, we argue that these lawsuit outcomes generate quasi-exogenous shocks to the high-to-low reordering practices of banks. The lawsuits were lodged against a wide array of banks, ranging from systemically important financial institutions (Bank of America, Citibank, JPMorgan Chase, and Wells Fargo) to regional banks (e.g. Independent Bank, Great Western Bank, Northwest Savings Bank, and Umpqua Bank). When we compare banks that were required to stop the practice of high-to-low reordering to those that maintained the practice, we observe a similar presence of systemically important financial institutions and regional banks. For example, JPMorgan Chase and Wells Fargo stopped high-to-low reordering, while Bank of America and Citibank did not. Great Western Bank and Northwest Savings Bank stopped high-to-low reordering, while Independent Bank and Umpqua Bank did not.

More specifically, we argue that the determinants of lawsuit outcomes are plausibly unrelated to our outcome variables of interest (low-income consumers' credit health, consumption, and demand for payday loans and installment loans). One determinant of the lawsuit outcome was whether it became a part of the multi-district litigation MDL 2036. The purpose of multi-district litigation is to consolidate cases with shared key elements and handle them with greater efficiency and speed. In our setting, we find that lawsuits in MDL 2036 had a 68.2% (15 / 22) probability of enacting behavioral relief, while the other lawsuits had a 53.3% (8/15) probability of enacting behavioral relief. This is suggestive evidence that the MDL structure may have influenced lawsuit outcomes by increasing the likelihood of bank behavioral relief. Similarly – as noted in the CFPB 2015 Arbitration Study – while there was broad similarity in business practices and the legal claims against the banks, there was variety in the contracts between the consumers and the banks and also in their approach to

litigation. For example the CFPB note that, “*some banks did not have arbitration clauses in their checking account agreements with consumers and settled the cases, generally providing both monetary and behavioral relief. Other banks had arbitration clauses in their agreements, moved to compel arbitration, and secured dismissal of federal class actions in favor of individual consumer arbitration. Yet other banks had arbitration provisions in their consumer agreements and nevertheless settled either without invoking the arbitration clause or after invoking the clause with something less than complete success*”. We argue that the ex-ante variation in contracts likely led to different lawsuit outcomes, and that it is highly improbable that consumers were aware of these ex-ante contract differences. Hence it is highly unlikely that there is any selection into different banks, and that customers of banks that ultimately ceased the practice of high-to-low reordering are different along any meaningful dimension to customers of sued banks who continued the practice. Finally, empirically, we find no existence of pre-trends in any of our outcome variables, which is consistent with the quasi-exogeneity of the behavioral relief treatment from the lawsuits. In sum therefore, we argue that the lawsuits serve as a natural experiment to study the impact of aggressive bank practices on consumer credit health and activity in the alternative financial system.

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 (2020), 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.” 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 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 - such as payday borrowing histor - that would not be tracked by a traditional credit bureau. 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, Opploans, OneMain Financial, and Upgrade, who do report to credit bureaus.²⁴ Furthermore, all of the largest payday lenders now offer installment loans, in addition to conventional payday loans that are due in a single lump sum.²⁵ The Consumer

²⁴See for instance this article <https://www.nerdwallet.com/best/loans/personal-loans/installment-loans-bad-credit>.

²⁵See the information available here <https://www.pewtrusts.org/fr/research-and-analysis/issue->

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 quintile. 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 for low income borrowers.

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 7 miles of treated zip-codes that contain branches of sued banks with no mandatory behavior changes. We show the number of branches in treatment and control zip-codes in each of the treatment years identified by the lawsuits data, and next document the number of branches belonging to sued banks in each treatment and control zip-code. Table 3 highlights that sued banks comprise a large portion of total branches within a zip-code on average.

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

We start by examining whether banks with aggressive overdraft policies and payday lenders cater to the same customers.²⁶ If traditional banks tend to serve households with different characteristics than households served by payday lenders, changes in bank behavior may not affect customer demand for alternative financial services.

briefs/2016/08/from-payday-to-small-installment-loans.

²⁶Prager (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 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.

Table 4 tests whether banks, and in particular banks that employ high-to-low reordering, are indeed likely to 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, one can expect them to have physical locations relatively close to each other. Table 4 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.

5.2 The Impact of High-to-Low Reordering Bans on Overdraft Revenues and Balances

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 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 policies 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 date²⁷.

Our second piece of analysis investigates the effects of these lawsuit behavior changes on bank fee income earned from providing overdrafts, and overdraft balances. 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 the provision of overdraft 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 change²⁸. 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: if a bank provides an overdraft, instead of reporting negative deposits, banks are required to report these overdraft balances as part of other consumer loans.²⁹ 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.³⁰ 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 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

²⁷Details of these lawsuits are recorded in Table A.1.

²⁸Each 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.

²⁹See for example Instructions for Preparation of Consolidated Reports of Condition and Income (FFIEC 031 and 041) for details on how overdrafts are accounted for

³⁰Persistent 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.

balances per quarter, which totals around \$720 million annually for all sued banks with high-to-low reordering ban³¹. These findings are confirmed in Table A.2 where we report the corresponding difference-in-differences specification. As a placebo test, we report the same specification but for other outcome variables that should not be affected by the HTLR ban, such as the investment banking or trading revenue, and find that these remain indeed unchanged after the high-to-low reordering ban.

Overall, these findings indicate that the lawsuits forcing banks to eliminate their high-to-low reordering practices significantly reduced the sued bank revenue associated with overdrafts.

6 Main Results

6.1 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. We begin with Table 5, which documents the effect of high-to-low reordering bans on household demand for payday loans.

If overdrafts offered by these banks were simply fairly priced substitutes for payday loans, we would expect the following possible outcomes: since 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. Alternatively, if the price reduction resulted in a supply restriction, the excess unmet demand for short term credit would be absorbed by payday borrowing. Under this substitution hypothesis, we would expect to see the quantities of overdrafts and payday loans move 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 induced by the lawsuits, we estimate the following zip-code quarter level specification:

³¹We show in Table A.3 that it does not look like banks located in close proximity to treated 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

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

where $PaydayBorrowing_{zt}$ is a payday borrowing outcome variable for the zip-code z in quarter t . $Post_t$ is a dummy variable taking a value of 1 for the four quarters following the lawsuit outcome and a value of 0 for the four quarters prior to and including the lawsuit event. $HTLR Ban_z$ 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. We choose to compare zip-codes containing branches of HTLR ban banks with others that are local to them likely experiencing similar local dynamics. In our preferred specification, we choose other zip-codes within 7 miles that contain other lawsuit bank branches with no HTLR ban. We choose this specification to further ensure that we are comparing local areas with likely similar types of consumers (i.e. those targeted by high-to-low reordering practices). However robustness checks in Table’s A.5 and A.6 demonstrate that the choice of neighborhood radius and control zip-codes more generally do not impact our main results.

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 lawsuits. 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 again, two zip-codes are defined to be in the same neighborhood if they are within 7 miles of each other. Intuitively, we are exploiting only variation within neighborhoods during the same quarter. This ensures that, for instance, a sudden unemployment shock correlated with high-to-low reordering bans, 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 and time by double-clustering the standard errors at the neighborhood and quarter 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 loans³², made to borrowers in zip-codes below the median income in any given year. We find that these poorer zipcodes are the ones where the demand for these high-cost loans is concentrated, and argue that this could be a result of within bank heterogeneity in overdraft policies targeted at low-income consumers specifically. We measure the credit demand from alternative lenders with both the average total dollars disbursed per borrower/quarter(Columns 1-3), and the total number of loans per borrower/quarter (Columns 4-6) allowing us to study both the intensive and the extensive margins. 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 HTLR ban, dollars disbursed decrease by \$84 per branch per zip-code which translates to around a 16 per-cent reduction relative to the per borrower/quarter mean. Table 5 further shows that also 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 complements the previous analysis by showing our results within the Equifax sample. We estimate the same differences-in-differences specification and we focus on the installment loans made to the borrowers with income in the lowest quintile. The dependent variables are the dollar amount of loans disbursed and the number of loans. Similarly to the findings reported in Table 5, we find that there is a significant reduction in the amount of installment loans after high-to-low reordering bans. The effects are also economically meaningful with a \$200 reduction per borrower/quarter, which corresponds to around a 6 percent reduction per borrower/quarter.

Overall the results in Tables 5 and 6 indicate that the demand for loans from alternative lenders declines significantly in the locations where banks are forced to cease the high-to-low reordering practice. In other words, our findings suggest that when banks are required to lower arguably 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.

6.2 Long Term Borrowing Activity after HTLR Bans

At this point, we next test whether or not these results reflect a permanent change in borrower behavior or simply a short-term response to the HLTR ban. Table 7 tests this hypothesis

³²Payday loans are formally referred to as single payment micro loans (SPML).

using the same difference-in-differences specification as in the previous analysis using both the Clarity sample (Panel A) as well as the Equifax one (Panel B). The dependent variables are the total dollars of loans outstanding per zipcode/quarter. Each column focuses on a different horizon – one, two and three years – by varying the period post HLTR ban included in the specification. Panel A shows that the reduction in the single period micro loans is persistent over time, although the point estimates suggest its magnitude declines slightly from \$84 in the first year to \$50 after three years. Panel B shows that, if anything, the magnitude of the decline is slightly increasing from \$200 to \$264. Overall, these findings reinforce the hypothesis that aggressive overdraft policies might push borrowers into persistently borrowing from alternative lenders with potentially adverse consequences for their financial health.

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 next investigate whether the financial health of low-income households improves. This improvement in financial health may occur through two 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 borrowers³³, and that payday borrowers hence get caught in “debt traps”³⁴. 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. This, in turn, can 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.

³³For example a 2014 study by the CFPB notes that 4 out of 5 payday loans are rolled over or renewed.

³⁴The 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.

We use several measures of the financial health of low-income consumer using Equifax data: credit card balance and limits, fraction of installment loans, and total borrowing in good standing. While household usage of alternative loans responds to the HTLR ban relatively quickly, we might expect household financial health to take longer to improve. Therefore, Table 8 reports our results for different horizons from 1 to 3 years.

Using the same overall framework utilized in the previous section, we investigate household financial health using the following zip-code quarter level specification:

$$CreditHealth_{zt} = \beta \cdot HTLR Ban_z \cdot Post_t + \eta_{nt} + \varepsilon_{zt} \quad (2)$$

We find that there is a significant increase in household financial health across the various measures. Specifically, we find that, after the high-to-low reordering ban, both credit card balance and credit limits increase significantly, i.e. credit card balances increases by \$110 after two years and \$195 after three, while credit card limits increase by \$190 and \$335 respectively.

This increase in credit card balance and limits represents a substitution away from costly alternative borrowing to cheaper mainstream credit. These findings also demonstrate that traditional institutions might consider these borrowers to be in better financial shape, since credit card limits and hence credit availability increase.

Panel B complements these findings by showing that the percent of installment loans decline significantly after the HTLR ban, indicating indeed a substitution away from installment loans towards likely cheaper credit card debt. Furthermore, borrowers total balance in good standing increase by \$431 after two years and \$611 after three. These results collectively confirm borrower substitution away from likely expensive loan products, towards more mainstream products and an increasing ability to keep finances in order, after a reduction in aggressive overdraft fees.

6.4 Impact on Household Consumption

To further establish that borrowers benefit from constraining bank ability to charge high overdraft prices, we next examine the impact of HTLR bans 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:

$$Consumption_{zt} = \beta \cdot HTLR Ban_z \cdot Post_t + \eta_{mt} + \varepsilon_{zt} \quad (3)$$

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, e.g. car and roof repairs. Non-durable essential refers to expenditures related to food and clothing. Non-durable other includes all other non-durable expenditures.

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 results of this exercise. Focusing on within-neighborhood-quarter variation – we find that after the high-to-low reordering ban – households increase durables consumption by \$107 and one extra unit while non-durables other consumption remains unchanged. Non-durables essential consumption increases by \$34 and roughly one unit also. This finding is consistent with our hypothesis that low-income households likely 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. Thus, the increase in consumption we document is likely the result of both a direct substitution between fees and consumption, but also because of an increased access to mainstream credit. After a reduction in overdraft fees, low-income households now have the capacity to increase their consumption of durables and non-durable essentials - all likely essential expenditures.

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 conditions³⁵. Results in Table 9 suggest that a reduction in debt service costs related to overdrafts cause consumers to not only to in-

³⁵as well as to income.

crease 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.

To put these magnitudes into context, we note that according to the CFPB 28 million customers were involved in the MDL 2036 lawsuit. Scaling up to include other non-MDL 2036 lawsuits, we approximate roughly 48 million customers involved in total³⁶. We note that a bank customer is automatically involved in the lawsuit if it had an account with a sued bank and incurred at least one overdraft within a certain time period. Using FDIC estimates of the percentage of chronic over-drafters and quarterly dollar estimates of the reduction in overdraft related fees as a result of high-to-low reordering bans, we conservatively estimate a cost saving per customer of roughly \$100 per quarter on fees alone (or roughly 3 overdraft fees). We further note the potentially large dollar savings that consumers obtain from substituting away from costly alternative lending to mainstream credit products such as credit cards. For example, switching to a subprime credit card with an annual APR of 56% from a payday loan with an annual APR of 426%³⁷ will result in a quarterly savings of roughly \$135. Hence we argue that customers are plausibly saving in excess of \$230 per quarter in fees and interest payments alone. These savings are consistent with the increases in consumption that we observe. We note that customers potentially also have a reduced precautionary savings motive given greater access to credit and we argue that consumers likely used extra cash as a result of this and cost savings to better service existing debt. While this analysis requires a lot of assumptions and we cannot precisely track savings and expenditures, we argue that the magnitudes across our analysis are roughly consistent with one another.

6.5 Impact on Bank Branch Operations

Finally, we complement the previous analysis by examining whether the lawsuits impacted banks' presence in these low-income regions. For some banks, overdraft fees constitute a significant fraction of revenue, especially in low income areas. Hence, by forcing banks to change their high-to-low overdraft practices, the resulting drop in revenue might make it unprofitable for banks to operate in those areas anymore. We investigate this hypothesis in

³⁶60% of lawsuits were MDL lawsuits, hence $28/0.6$ is approximately 48m.

³⁷arising from a standard cost of \$17.5 per \$100

Table 10 by estimating the following branch/year level regression:

$$Exit_{izt} = \beta \cdot HTLRBan_i \cdot Post_t \cdot + \eta_{z,t} + \varepsilon_{izt} \quad (4)$$

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. $HTLRBan_i$ 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 – $\eta_{z,t}$ – 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 set of three columns we focus on zip-codes where the treated banks only have less than or equal to 2 branches³⁸. In the last set of columns, we check whether the results are any different in zip-codes with low 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 outcomes 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

³⁸Note these results are not dependent on the “low” threshold number of branches, we believe 2 is a reasonable number.

banks are more likely to close their branches after they are forced to change their overdraft policies.

These results can help to inform the debate on “financial deserts”. There are large swaths of neighborhoods without bank branches – indeed starting after the Great Recession, more than 6,000 branches closed across the US.³⁹ This phenomenon has generated concerns among policy makers about the possible adverse effects these closures might have on access to financial services and credit, especially for people most in need of these services. 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 have overdrawn their accounts, are also more likely to have reduced access to traditional financial services as banks likely 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 under-banked is suboptimal, but banking at a “bad bank” is worse.

6.6 Robustness

In this section we discuss a number of robustness checks to show that our main results hinge on the choice of the control group and the choice of neighborhood. In Table A.5. we first check whether our restriction of control zip-codes to contain branches of sued banks with no HTLR ban is material. In Columns (1) and (2) of both Panel A and B, we still restrict our control group zip-codes to be with 7 miles of the treated zip-code. However we eliminate zip-codes that contain branches of sued but non-HTLR ban banks.

Even with this significantly more restrictive specification, we find similar declines in payday and installment loan borrowing. In columns (3) and (4) we eliminate the restriction that control group zip-codes must be within the same 7-mile neighborhood of treated zip-codes and instead simply compare treated zip-codes (those with HTLR ban bank branches) to any other zip-code within the same state. Again we find similar declines in payday and installment loan borrowing, comparable to our main results.

Table A.6 explores whether our results crucially depend on the definition of our neighborhood, which in our main specification is a radius of seven miles from treated zipcodes. We report our main findings for the Clarity sample (Panel A) and the Equifax (Panel B)

³⁹See the statistics reported here https://ncrc.org/wp-content/uploads/2017/05/NCRC_Branch_Deserts_Research_Memo_05

changing our neighborhood distance to 5 miles (Column 1 and 2) and 10 miles (Columns 3 and 4). We find consistent results across specifications with slightly larger magnitudes for the five miles specifications⁴⁰. Results in Tables A.5 and A.6 reassure us that the choice of the control group is not a key driver of our results.

An additional dimension that we can further exploit in our data to test the robustness of our findings is the information about borrowers' income contained in Equifax data. Specifically, we expect our results to be concentrated among low-income individuals only, since these individuals are likely to have bank account balances close to zero and hence are likely impacted by bank overdraft practices. We test this hypothesis in Table A.7 by estimating our main regression using Equifax data separately for each income quintile⁴¹. As expected, we find that installment loans decline significantly after the HTLR ban for the bottom two quintiles only. Similarly, we report in Table A.8 the effects on micro loans and installment loans for high income zipcodes. Both the statistical and economical significance of the results disappear when we focus on richer regions.

Finally, another market characteristic that is likely to be important is market concentration, i.e. the number of treated branches with respect to the total number of branches in the same location. Intuitively, if treated banks operate only a few number of branches in locations where they face significant competition from other banks, it is less likely that high-to-low reordering bans are going to impact aggregate access to payday lending on a per borrower basis. We confirm this hypothesis in Table A.9 where we document no result for the subset of zipcodes where treated branches are a small fraction of the overall bank branches.

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

⁴⁰Although statistically indistinguishable from the magnitudes in our main results

⁴¹Note, we do not have borrower income level for our Clarity sample.

the policy conversation. We suggest that low income consumers may turn to the alternative system for good reason – if traditional banks do not necessarily serve them well. We argue that 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 is well documented in the literature, payday borrowing and high cost short term loans more generally, can potentially 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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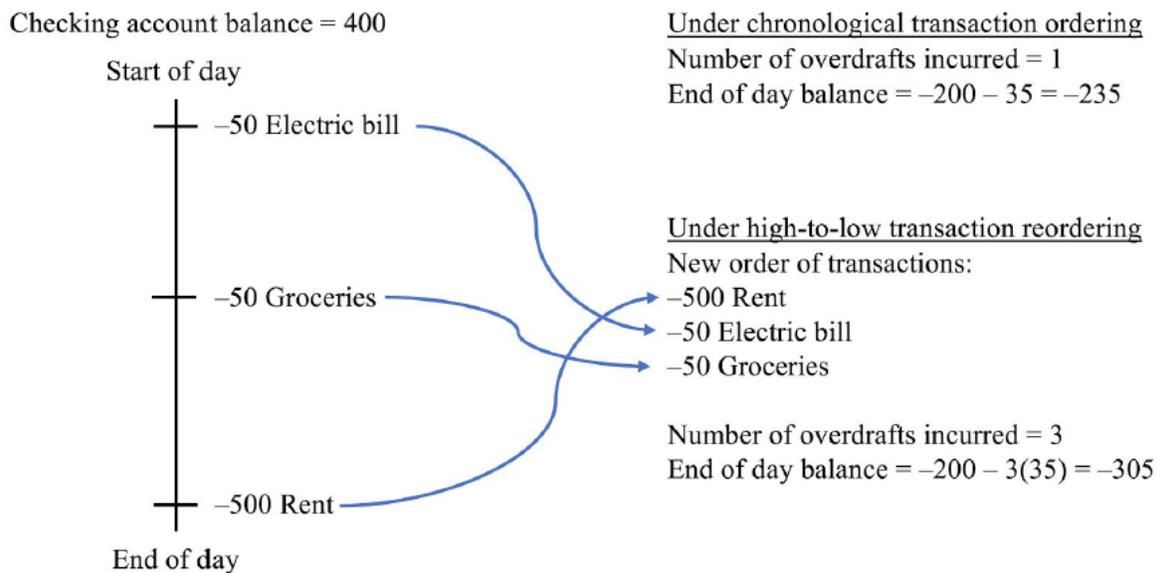
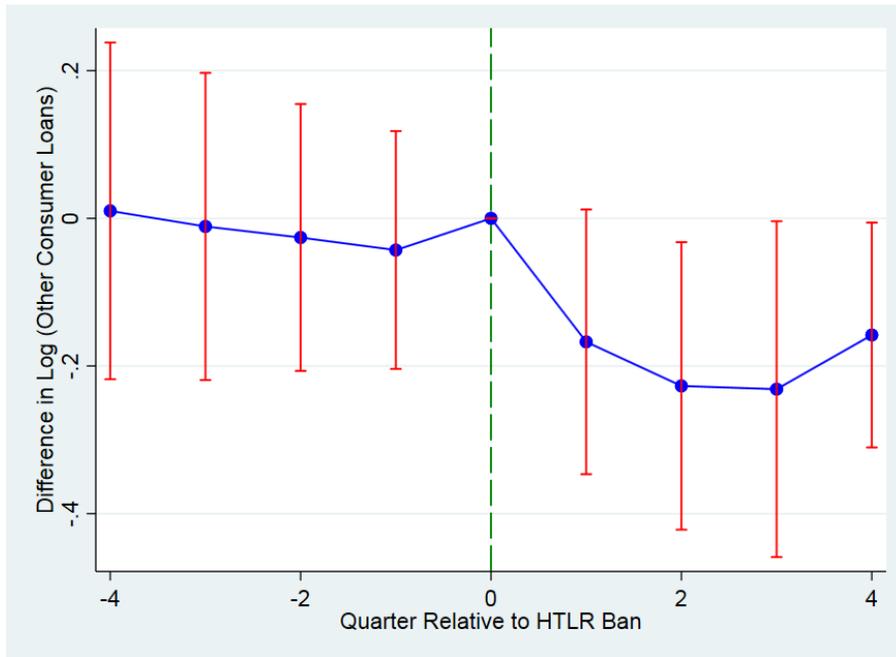
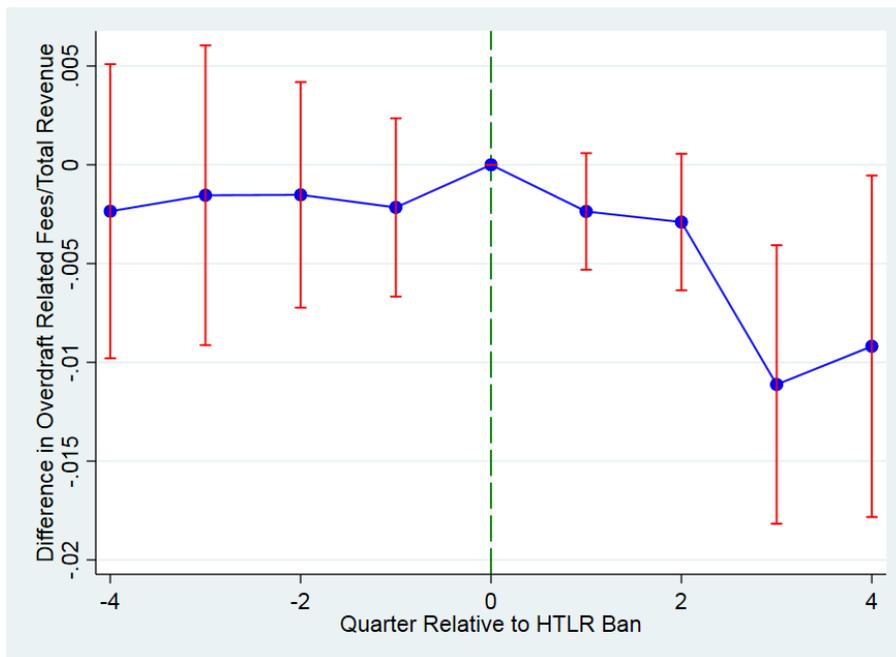


Figure 1: Illustrative example of high-to-low transaction reordering. Figure 1: Illustrative example of high-to-low transaction reordering. This figure illustrates the mechanics of high-to-low transaction reordering for a consumer Annie. Annie begins the month with \$400 in her checking account. Early 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. Annie's 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.

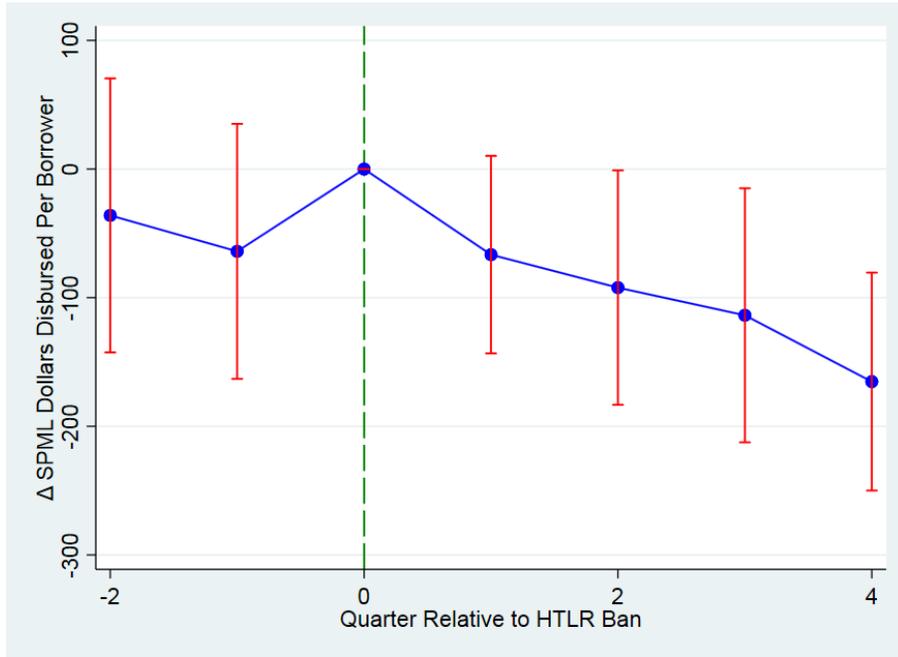


(a) Other Consumer Loans

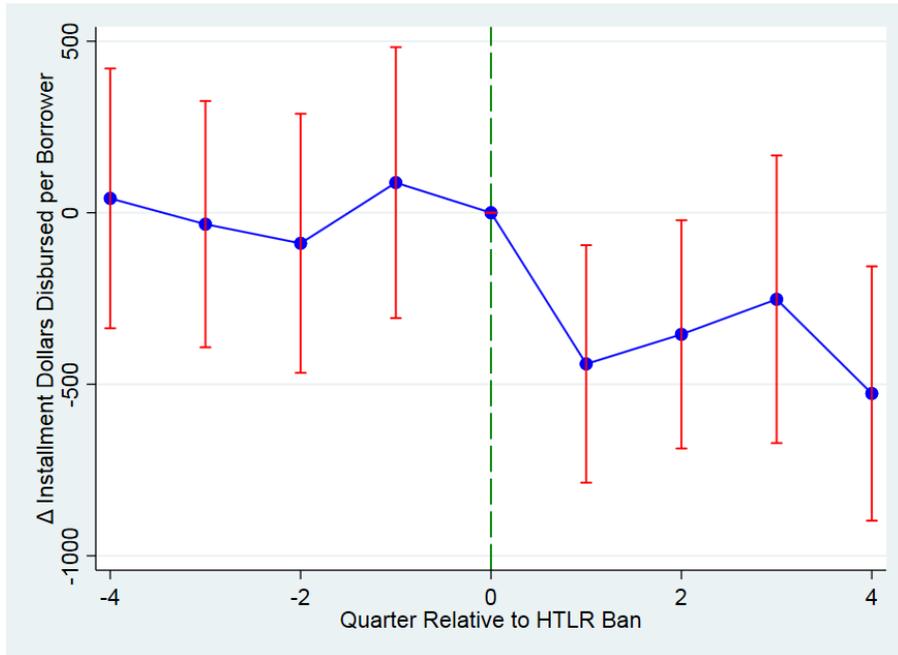


(b) Yield on Other Consumer Loans

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.

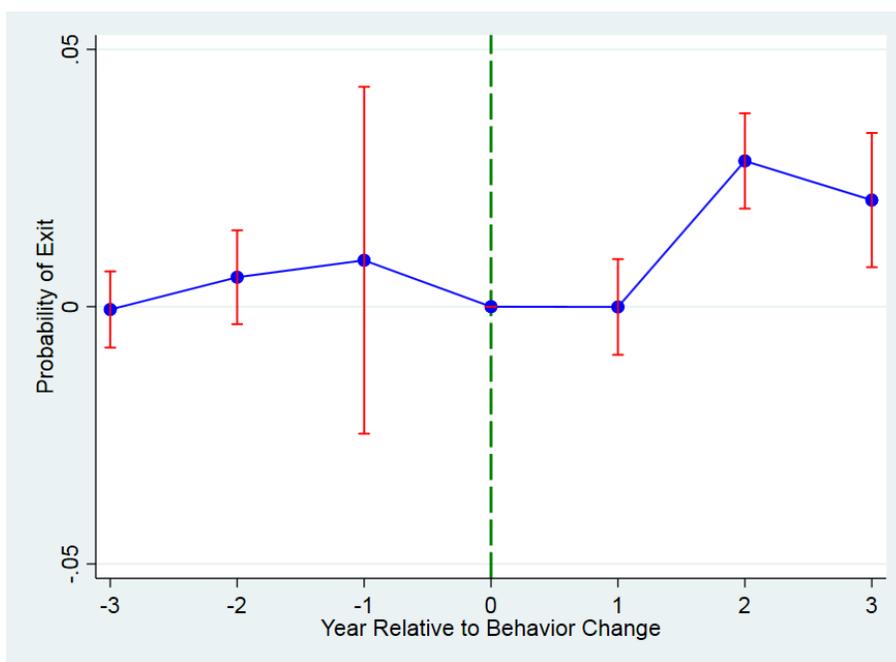


(a) SPML in Lowest Quintile Income Zip-Codes - Clarity Data

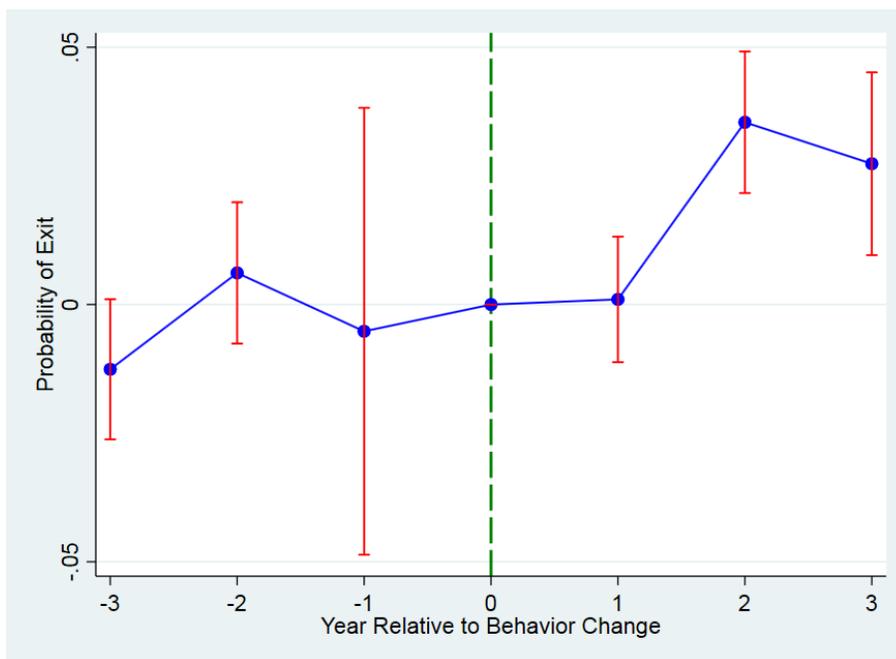


(b) Installment Loans to Lowest Quintile Income Borrowers - Equifax Data

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 and loan type. Panel A contains statistics for single period micro loans (SPML), and Panel B contains statistics for all loans. In Panels C and D we document statistics on extended loans including credit quality statistics such as current balance of loans in good standing. Panel C contains statistics on loans made to borrowers in the lowest income quintile, and Panel D contains statistics on all installment loans. All data for both Equifax and Clarity are for zip-codes with a median income below the median.

Panel A: Clarity Data - SPML

	Mean	Min	25	50	75	Max
Dollars Disbursed	522	50	300	450	600	3,300
Number Opened	1.4	1.0	1.0	1.0	1.0	8.0

Panel B: Clarity Data - All Loan Types

	Mean	Min	25	50	75	Max
Dollars Disbursed	968	42	400	600	1,000	20,920
Number Opened	1.3	1.0	1.0	1.0	1.0	7.0

Panel C: Equifax Data - Installment Loans Lowest Income Quintile Borrowers

	Mean	Min	25	50	75	Max
Dollars Disbursed	4,270	1,484	2,750	3,750	5,112	12,544
Number Opened	1.6	1.0	1.3	1.5	2.0	6.0
Credit Card Balance	1,266	-	84	695	1,800	27,304
Credit Card Limit	2,005	-	204	1,137	2,875	45,303
Total Dollars in Good Standing	13,623	-	9,107	12,430	16,691	99,897

Panel C: Equifax Data - Installment Loans Full Sample

	Mean	Min	25	50	75	Max
Dollars Disbursed	10,415	3,154	6,486	9,226	13,168	30,836
Number Opened	1.4	1	1.2	1.4	1.6	6
Credit Card Balance	9,751	-	3,840	8,147	13,741	60,502
Credit Card Limit	21,221	-	8,616	17,589	29,623	132,372
Total Dollars in Good Standing	58,378	-	40,958	56,250	72,993	392,024

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.

Panel A: Branch Count by Zip-Code									
Year	Num of Neighborhoods		Treated Zip-Codes			Control Zip-Codes			
	With HTLR Ban	Mean Num HTLR Ban	Mean Num HTLR Ban	Mean Num Branches	Mean Num HTLR Branches	Mean Num Branches	Mean Num HTLR Branches	Mean Num Branches	
2011	2171	2.2	2.2	9.5	1.5	8.6			
2013	4,089	2.1	2.1	7.7	1.2	8.3			
2014	93	2.9	2.9	9.3	1.5	8.5			

Panel B: Census Statistics by Zip-Code				
	Total Population	Median Income	Rate Unemployed	Prop Below Poverty Line
Treated Zip-Codes	20,220	\$36,781	11%	25%
Control Zip-Codes	28,447	\$36,637	11%	26%

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*** (0.0167)	0.124*** (0.0164)	0.0364** (0.0178)	0.0272 (0.0209)	0.0139 (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. HTLR Ban is a dummy variable taking on a value of 1 if the zipcode contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory high-to-low reordering ban, and a value of 0 if the zipcode contains branches belonging to lawsuit bank where the outcome of the lawsuit required no ban 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 and year/quarter (where a neighborhood contains treated zip-codes and control zip-codes within 7 miles of each other).

Dependent Variable	Amount			Number		
Post x HTLR Ban	-45.35*	-44.60*	-84.84***	-0.222**	-0.210*	-0.289***
	(22.37)	(22.20)	(24.04)	(0.0902)	(0.0930)	(0.0714)
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. HTLR Ban is a dummy variable taking on a value of 1 if the zipcode contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory high-to-low reordering ban, and a value of 0 if the zipcode contains branches belonging to lawsuit bank where the outcome of the lawsuit required no ban 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 and year/quarter 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	-98.61 (58.10)	-166.6** (62.05)	-200.3** (74.70)	-0.0352 (0.0263)	-0.0342 (0.0223)	-0.0314 (0.0297)
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	38,313	38,313	38,313	38,313	38,313	38,313
R-squared	0.084	0.104	0.278	0.091	0.128	0.294

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

Table 7: **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. Panel A contains results for single period micro loans using Clarity data. Panel B contains results using installment loans disbursed from Equifax data. The sample is restricted to zip-codes with an average income below the median. HTLR Ban is a dummy variable taking on a value of 1 if the zipcode contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory high-to-low reordering ban, and a value of 0 if the zipcode contains branches belonging to lawsuit bank where the outcome of the lawsuit required no ban 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 (column (1)), 8 (columns (2)), or 12 (column(3)) 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 and year/quarter level (where a neighborhood contains treated zip-codes and control zip-codes within 7 miles of each other).

Panel A

Dependent Variable	SPML		
	1 Year	2 Years	3 Years
Post x Behavior Change	-84.84*** (24.04)	-72.02*** (19.62)	-50.47** (17.58)
Neighborhood x Year/Quarter FE	Y	Y	Y
Observations	9,870	18,813	31,348
R-squared	0.421	0.450	0.460

Panel B

Dependent Variable	Installment		
	1 Year	2 Years	3 Years
Post x Behavior Change	-200.3** (74.70)	-230.0** (86.77)	-264.8*** (81.08)
Neighborhood x Year/Quarter FE	Y	Y	Y
Observations	38,313	54,847	70,852
R-squared	0.278	0.283	0.278

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

Table 8: **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. Panel A contains results for total credit card balances (columns (1-3)) and credit card limits (columns(4-6)). Panel B contains results for the total percentage of outstanding balances comprised of installment loans (columns (1-3)) and the total balance of credit in good standing (columns(4-6)), for borrowers in the bottom income quintile. The sample is restricted to zip-codes with an average income below the median. HTLR Ban is a dummy variable taking on a value of 1 if the zipcode contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory high-to-low reordering ban, and a value of 0 if the zipcode contains branches belonging to lawsuit bank where the outcome of the lawsuit required no ban 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 (column (1)), 8 (columns (2)), or 12 (column(3)) 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 and year/quarter level (where a neighborhood contains treated zip-codes and control zip-codes within 7 miles of each other).

Panel A

Dependent Variable	Credit Card Balance			Credit Card Limits		
	1 Year	2 Years	3 Years	1 Year	2 Years	3 Years
Post x Behavior Change	53.07 (57.27)	110.9* (63.29)	195.5*** (69.42)	124.8 (76.43)	190.7** (91.08)	334.8*** (116.0)
Neighborhood x Year/Quarter FE	Y	Y	Y	Y	Y	Y
Observations	60,085	86,516	112,260	60,785	87,510	113,541
R-squared	0.366	0.383	0.420	0.386	0.406	0.444

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

Panel B

Dependent Variable	Percent Installment			Total Balance in Good Standing		
	1 Year	2 Years	3 Years	1 Year	2 Years	3 Years
Post x Behavior Change	-0.00570* (0.00294)	-0.00710** (0.00288)	-0.00679** (0.00285)	134.4 (219.2)	431.1* (237.8)	611.5** (238.1)
Neighborhood x Year/Quarter FE	Y	Y	Y	Y	Y	Y
Observations	51,479	74,937	98,178	59,397	85,605	111,196
R-squared	0.320	0.315	0.316	0.251	0.259	0.266

*** 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 Earnest. The dependent variables are the total dollars of expenditures per consumer/zipcode/quarter. Columns (1)-(2) is total durables expenditures /number of units - where durables are defined as home and auto expenditures. Columns (3)-(4) is total food and clothing expenditures /number of units. Columns (5)-(6) is total non-durable non-essential expenditures/number of units where non-durable essentials are defined as all other non-durable consumption except food and clothing. The sample is restricted to zip-codes with an average income below the median. HTLR Ban is a dummy variable taking on a value of 1 if the zipcode contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory high-to-low reordering ban, and a value of 0 if the zipcode contains branches belonging to lawsuit bank where the outcome of the lawsuit required no ban 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 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. Neighborhood x year/quarter are included, and standard errors are clustered at the neighborhood and year/quarter level (where a neighborhood contains treated zip-codes and control zip-codes within 7 miles of each other).

Dependent Variable	Durables		Food/Clothing		Non-Durable Other	
	Amount	Num. Units	Amount	Num. Units	Amount	Num. Units
Post x Behavior Change	107.7** (52.6)	1.036** (0.505)	34.07* (7.97)	1.107** (0.563)	21.67 (27.15)	0.342 (0.502)
Neighborhood x Year/Quarter FE	Y	Y	Y	Y	Y	Y
Observations	9,912	9,912	7,077	7,077	7,028	7,028
R-squared	0.523	0.518	0.583	0.673	0.566	0.586

*** 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. HTLR ban 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 and zipcode.

Dependant Variable	All			Exit Low Number			All		
	Post x HTLR Ban	0.00711*** (0.000811)	0.00896*** (0.000828)	0.0108*** (0.000939)	0.0164*** (0.000972)	0.0185*** (0.000989)	0.0206*** (0.00117)	0.00517*** (0.00136)	0.00682*** (0.00137)
Post x Behavior Change x Low							0.00298* (0.00170)	0.00334** (0.00169)	0.00481** (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

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	31-Jul-2013	11-Jan-2018	
JPMorgan Chase Bank	24-Jul-2009	19-Dec-2012	29-Mar-2010
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	
Carolina First Bank (including 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 Overdraft Responses to HTLR Ban**

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. Each year banks are sorted in size deciles. HTLR Ban is a dummy variable taking on a value of 1 if the bank is a lawsuit bank with a mandatory high-to-low reordering ban, and a value of 0 otherwise. Post is a dummy variable taking a value of 1 for the 4 quarters post the behavior change and a value of 0 for the 4 quarters prior. Year/Quarter x Primary State and size decile and bank fixed effects are also included. Standard errors are clustered by bank and year/quarter.

Dependent Variable	Log (Other Consumer Loans)	Overdraft Income/Revenue
Post x HTLR Ban	-0.155* (0.0834)	-0.00693*** (0.00185)
State x year/quarter FE	Y	Y
Size Decile FE	Y	Y
Bank FE	Y	Y
Observations	3,676	3,671
R-squared	0.993	0.988

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

Table A.3: **Other Bank Responses to HTLR Ban - Local Non-Lawsuits 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 4 quarters post the behavior change and a value of 0 for the 4 quarters prior. Year/Quarter x Primary State and size decile and bank fixed effects are also included. Standard errors are clustered by bank and year/quarter.

Dependent Variable	Log (Other Consumer Loans)	Overdraft Income/Revenue
Post x Matched	0.00489 (0.0924)	-0.000973 (0.00243)
State x Year/quarter FE	Y	Y
Size Decile FE	Y	Y
Bank FE	Y	Y
Observations	3,493	3,488
R-squared	0.991	0.988

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

Table A.4: **Bank Level Responses to HTLR Ban - Non-Overdraft Related Revenue**

This table contains results of a bank/quarter level regression. The dependent variable is either log(total revenue) or – revenue from the sale of other assets, revenue from the sale of real estate assets, revenue from the sale of loans or leases, revenue related to insurance activities, revenue related to servicing mortgages, revenues from investment banking activities, revenues from trading, revenues from fiduciary activities and other– each 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. Each year banks are sorted in size deciles. HTLR Ban is a dummy variable taking on a value of 1 if the bank is a lawsuit bank with a mandatory high-to-low reordering ban, and a value of 0 otherwise. Post is a dummy variable taking a value of 1 for the 4 quarters post the behavior change and a value of 0 for the 4 quarters prior. Year/Quarter x Primary State and size decile and bank fixed effects are also included. Standard errors are clustered by bank and year/quarter.

Dependent Variable	Post x Behavior Change	Standard Error	Observations	R-squared
Log (Revenue)	0.0259	(0.0284)	3,613	0.998
Sale Other Assets /Revenue	-0.000611	(0.000660)	3,671	0.517
Sale Other Real Estate/Revenue	0.000893	(0.00106)	3,671	0.592
Sale Loans Leases /Revenue	-0.000897	(0.00471)	3,671	0.841
Insurance /Revenue	0.000176	(0.00107)	3,671	0.976
Servicing /Revenue	0.000655	(0.00156)	3,671	0.851
Investment Banking /Revenue	-0.00115	(0.00107)	3,671	0.949
Trading Revenue/Revenue	0.000521	(0.000869)	3,671	0.824
Fudiciary /Revenue	0.00157	(0.00147)	3,671	0.996
Other /Revenue	0.00590	(0.00755)	3,671	0.867

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

Table A.5: **Robustness - Alternative Control Groups**

This table contains the results of zipcode/quarter difference-in-differences regressions using the Clarity alternative credit bureau and Equifax data. In Panel A the dependent variables are the total dollars of single period micro loans disbursed per zipcode/quarter, and the number of loans made per zipcode/quarter. In Panel B the dependent variable is 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. In columns (1) and (2) of Panels A and B, HTLR Ban is a dummy variable taking on a value of 1 if the zipcode contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory high-to-low reordering ban, and a value of 0 if the zipcode is within 7 miles of a treated zip-code and contains no HTLR Ban branches. In Columns (3) and (4) of Panels A and B, HTLR Ban is a dummy variable taking on a value of 1 if the zipcode contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory high-to-low reordering ban, and a value of 0 if the zipcode is within the same state and contains no HTLR Ban branches. 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. Neighborhood x year/quarter or state x year/quarter fixed effects are included, and standard errors are clustered at the neighborhood level and year/quarter (where a neighborhood contains treated zip-codes and control zip-codes within 7 miles of each other) or state and year/quarter level.

Panel A - Clarity

Dependent Variable	Within Neighborhood		Within State	
	Amount	Number	Amount	Number
Post x HTLR Ban	-64.61** (29.03)	-0.232*** (0.0813)	-114.9*** (25.28)	-0.248*** (0.0806)
Neighborhood x Year/Quarter FE	Y	Y	N	N
State x Year/Quarter FE	N	N	Y	Y
Observations	6,658	6,658	13,927	13,500
R-squared	0.443	0.408	0.271	0.328

Panel B - Equifax

Dependent Variable	Within Neighborhood		Within State	
	Amount	Number	Amount	Number
Post x HTLR Ban	-190.1** (81.77)	-0.0273 (0.0267)	-131.00** (64.43)	-0.0260 (0.0124)
Neighborhood x Year/Quarter FE	Y	Y	N	N
State x Year/Quarter FE	N	N	Y	Y
Observations	48,798	48,798	60,128	60,128
R-squared	0.286	0.304	0.061	0.059

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

Table A.6: **Robustness - Alternative Control Group Neighborhood Radii**

This table contains the results of zipcode/quarter difference-in-differences regressions using the Clarity alternative credit bureau and Equifax data. In Panel A the dependent variables are the total dollars of single period micro loans disbursed per zipcode/quarter, and the number of loans made per zipcode/quarter. In Panel B the dependent variable is 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. In columns (1) and (2) of Panels A and B, HTLR Ban is a dummy variable taking on a value of 1 if the zipcode contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory high-to-low reordering ban, and a value of 0 if the zipcode is within 5 miles of a treated zip-code and contains branches belonging to sued banks with no HTLR Ban. In Columns (3) and (4) of Panels A and B, HTLR Ban is a dummy variable taking on a value of 1 if the zipcode contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory high-to-low reordering ban, and a value of 0 if the zipcode is within 10 miles of a treated zip-code and contains branches belonging to sued banks with no HTLR Ban. 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. neighborhood x year/quarter fixed effects are included, and standard errors are clustered at the neighborhood level and year/quarter level (where a neighborhood contains treated zip-codes and control zip-codes within 5 or 10 miles of each other).

Panel A - Clarity

Dependent Variable	5 miles		10 miles	
	Amount	Number	Amount	Number
Post x Behavior Change	-106.4** (36.95)	-0.386** (0.125)	-67.91** (27.46)	-0.257** (0.0987)
Neighborhood x Year/Quarter FE	Y	Y	Y	Y
Observations	4,359	4,359	16,302	16,302
R-squared	0.444	0.450	0.363	0.391

Panel B - Equifax

Dependent Variable	5 miles		10 miles	
	Amount	Number	Amount	Number
Post x Behavior Change	-205.5** (96.93)	-0.0430 (0.0303)	-218.7*** (54.09)	-0.0197 (0.0247)
Neighborhood x Year/Quarter FE	Y	Y	Y	Y
Observations	20,662	20,662	71,555	74,183
R-squared	0.326	0.349	0.226	0.241

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

Table A.7: Household Demand for Installment Loans after HTLR Bans by Income Level

This table contains the results of zipcode/quarter difference-in-differences regressions using data from Equifax, a traditional credit bureau. The dependent variable is the dollar amount of installment loans disbursed to borrowers with income by income quintile (quintile 1 is borrowers with income less than the 20th percentile). The sample is restricted to zip-codes with an average income below the median. HTLR Ban is a dummy variable taking on a value of 1 if the zipcode contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory high-to-low reordering ban, and a value of 0 if the zipcode contains branches belonging to lawsuit bank where the outcome of the lawsuit required no ban 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 and year/quarter level (where a neighborhood contains treated zip-codes and control zip-codes within 7 miles of each other).

Dependent Variable	Log (Installment Loans)				
	1	2	3	4	5
Post x Behavior Change	-200.3*** (74.96)	-494.8** (211.4)	70.63 (292.6)	-220.4 (499.8)	-270.2 (866.9)
Neighborhood x Year/Quarter FE	Y	Y	Y	Y	Y
Observations	38,313	33,422	29,938	19,948	11,064
R-squared	0.278	0.282	0.302	0.312	0.373

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

Table A.8: Household Demand for Payday and Installment Loans after HTLR Bans - High Income Zip-codes

This table contains the results of zipcode/quarter difference-in-differences regressions using data from Clarity and Equifax. The dependent variable in columns (1) and (2) is the dollar and number of single period micro loans and in columns (3) and (4), the dollar amount of and number of installment loans disbursed to borrowers with income less than the 20th percentile. The sample is restricted to zip-codes with an average income above the median. HTLR Ban is a dummy variable taking on a value of 1 if the zipcode contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory high-to-low reordering ban, and a value of 0 if the zipcode contains branches belonging to lawsuit bank where the outcome of the lawsuit required no ban 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 and year/quarter level (where a neighborhood contains treated zip-codes and control zip-codes within 7 miles of each other).

Dependent Variable	SPML		Installment Loans	
	Amount	Number	Amount	Number
Post x Behavior Change	15.95 (30.04)	-0.0195 (0.0798)	-68.46 (101.1)	-0.0267 (0.0252)
Neighborhood x Year/Quarter FE	Y	Y	Y	Y
Observations	5,910	5,910	40,839	40,839
R-squared	0.262	0.251	0.293	0.315

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

Table A.9: Household Demand for Payday and Installment Loans after HTLR Bans -Zip-codes with few HTLR Ban Branches

This table contains the results of zipcode/quarter difference-in-differences regressions using data from Clarity and Equifax. The dependent variable in columns (1) and (2) is the dollar and number of single period micro loans and in columns (3) and (4), the dollar amount of and number of installment loans disbursed to borrowers with income less than the 20th percentile. The sample is restricted to zip-codes with an average income below the median, with less than the median number of treated branches and greater than the median number of branches overall. HTLR Ban is a dummy variable taking on a value of 1 if the zipcode contains branches that belong to a lawsuit bank where the outcome of the lawsuit was a mandatory high-to-low reordering ban, and a value of 0 if the zipcode contains branches belonging to lawsuit bank where the outcome of the lawsuit required no ban 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 and year/quarter level (where a neighborhood contains treated zip-codes and control zip-codes within 7 miles of each other).

Dependent Variable	SPML		Installment Loans	
	Amount	Number	Amount	Number
Post x Behavior Change	27.20 (40.36)	0.0143 (0.109)	-86.82 (108.4)	-0.0465 (0.0280)
Neighborhood x Year/Quarter FE	Y	Y	Y	Y
Observations	3,949	3,949	14,364	14,364
R-squared	0.258	0.265	0.302	0.300

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