Competition in a Consumer Loan Market:

Payday Loans and Overdraft Credit

April 2, 2014

Abstract

Using variation in payday lending restrictions over time and across states, we study competition in the market for small, short-term consumer loans. We find that banks and credit unions reduce overdraft credit limits and prices when payday credit, a possible substitute, is prohibited. These findings suggest that depositories respond to payday loan bans by taking less risk, bouncing checks that they would have otherwise covered. The decline in overdraft prices is surprising when viewed in isolation, but sensible given that depositories incur lower credit losses as they limit overdraft coverage. We find some evidence that credit unions' overdraft activities are more profitable when payday loans are prohibited, consistent with decreased competition. In addition to characterizing the impact of prohibiting payday lending, a common state policy change in recent years, our findings illuminate competition in the small-dollar loan market by highlighting the importance of non-price adjustments to credit offers.

JEL classification: D14 (Personal Finance), G2 (Financial Institutions and Services)

Keywords: Household finance, consumer credit, overdraft credit, payday loan, usury, predatory lending

1. Introduction

This paper studies competition between two very different looking financial intermediaries offering similar credit services. On the one side are mainstream banks and credit unions that supply overdraft credit whenever they cover checks or other transactions that would have overdrawn depositors' accounts. Depository institutions earned an estimated \$23 billion in overdraft lending revenues in 2007.¹ On the other side are payday lenders who advance cash against customers' personal checks for two to four weeks, providing the check-writer with \$50 to \$1000 of credit in the interim. An estimated 19 million households paid between \$8 billion and \$9 billion of interest charges on payday loans in 2007 (Stephens 2008, 2011).²

Both types of credit are controversial, and as a result are increasingly regulated. Payday lenders have long been maligned for high prices, while depositories have come under fire more recently for the high cost of overdraft credit. Fifteen states now prohibit payday loans via usury limits or outright bans. In 2009 both houses of Congress considered legislation limiting the price and frequency of overdraft charges (H.R. 3904 and S. 1799), and in July 2010 the Federal Reserve issued new rules requiring customers to opt-in to overdraft coverage of ATM and debit transactions.

Much of the literature on payday lending studies the effect of credit access on household financial distress. Our focus is different; we ask firstly whether payday lending influences the pricing and provision of short-term credit at depositories. While it has been casually observed

¹ Similar to Parrish (2009), we estimate the amount of overdraft lending revenues by multiplying total deposit account fees at banks and credit unions in 2007 (\$45.6 billion) by estimates of the proportion of fees attributable to overdrafts and bounced checks (74%, FDIC 2008) and the proportion of overdraft and bounced check fees due to paid overdrafts (69%, Parrish 2009).

² Overdraft and payday credit accounted for approximately 65% and 22%, respectively, of all interest and fee revenue on short-term loans in the U.S., according to the authors' calculations and data reported in a 2010 market study by Core Innovation Capital and the Center for Financial Services Innovation (2011). Pawn lending, car title lending and tax refund anticipation lending are small by comparison, with market shares of 7%, 4% and 2%, respectively.

that overdraft credit providers compete with payday lenders (Bair 2005, Stegman 2007) and two thirds of borrowers report "avoiding bounced checks" as a benefit of payday credit (Cirillo 2004), we know of no evidence that payday credit availability directly affects overdraft credit terms. Beyond establishing that competition exists, we ask secondly how is it manifest? Do depositories capitalize on enhanced market power by raising overdraft prices when payday loans are no longer available? Do they extend less overdraft credit when no longer pushed by a competitor? Answering these questions is important not only for evaluating policies that affect payday and overdraft credit availability, but also for understanding the nature of competition in the market for short-term consumer loans.

Research on competition in consumer credit markets highlights the uniqueness of credit relative to other products and services, and emphasizes that competition may not reduce the price of credit. For example, problems of adverse selection (Stiglitz and Weiss 1981; Ausubel 1991; Brito and Hartley 1995; Ausubel 1999) and moral hazard (Karlan and Zinman 2009) may prevent lenders from competing on price, and instead induce them to compete on non-price dimensions of loan contracts, such as loan size, maturity or collateral requirements (Edelberg 2004; Einav, Jenkins and Levin 2012). Drawing on these insights, our analysis examines the effects of payday lending on the price of overdraft credit as well as the most important non-price characteristic, the credit limit.

We use data from a national survey of banks and credit unions to measure the effects of payday lending on overdraft prices and credit limits. In order to avoid estimation problems created by the endogenous location decisions of payday lenders, we estimate the effects through two different identification schemes. The first, following Morgan, Strain and Seblani (2012), compares how overdraft terms change as states switch from allowing to prohibiting payday

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credit, or vice versa. The second, following Melzer (2011), examines geographic variation in payday lending competition: focusing on states that prohibit payday credit, we compare overdraft terms at institutions located near a state that allows payday credit with overdraft terms at institutions located further away. The rationale behind this comparison is that depositors who have proximate access to payday lenders have an alternative to overdraft credit that depositors banking further away lack. The identifying assumption for the first scheme is that legal changes within states are independent of overdraft terms. The identifying assumption for the second scheme is that the composition of depositors and intermediaries in border areas is independent of payday laws in neighboring states. Importantly, the identifying assumptions of these two models are different, if not completely independent, which strengthens the overall research design.

We find that depository institutions change their overdraft credit programs along two margins when payday credit is unavailable. Surprisingly, they lower prices: both models imply that overdraft fees are roughly 5% lower when payday lenders are absent. At the same time, depositories provide less generous overdraft coverage following payday loan prohibitions. First, they are less likely to offer so-called "bounce protection" programs, under which they automatically cover customer overdrafts up to a credit limit. Second, those still offering bounce protection reduce their credit limits. These decreases are substantial: we estimate an 8% decrease in the frequency of bounce protection and a 12% decrease in overdraft credit limits. Given that overdraft prices decrease by a smaller proportion than do overdraft limits, the price *per* unit of credit limit actually increases when payday lenders are forced to exit, consistent with a decline in competition.

We take these facts – which establish competition between payday lenders and overdraft credit providers, and characterize the impact of payday loan prohibitions on the price and

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availability of overdraft credit – to be our main contribution. Given the agreement in findings across the two models, we find it unlikely that an omitted political variable, such as political pressure to restrict consumer credit, is responsible for these correlations. In falsification exercises, we also show that our two measures of payday credit access are unrelated to unemployment rates, credit card delinquency rates and prices for non-overdraft loans. While we do find that credit card balances decline following payday loan prohibitions, we find no evidence of a downward shift in demand for overdraft credit *per se*; despite lower overdraft prices, overdraft revenues do not seem to decline following prohibitions. These results are useful in reducing the concern that the main findings are driven by an omitted economic variable, such as demand for overdraft credit or the riskiness of consumer credit in general, which might be correlated with payday loan availability.

We maintain that overdraft prices decline when payday loans are prohibited because overdraft providers sustain lower credit losses as they reduce credit limits. Pinpointing the reason why overdraft limits change as they do is more difficult; we highlight two possible interpretations. First, competition from payday lenders may motivate banks and credit unions to extend more overdraft credit by allowing depositors to avoid bounced checks. Depositories earn a similar fee for a bounced check as for a paid overdraft, so limiting overdraft coverage sacrifices little revenue as long as customers continue to bounce checks.³ When payday loans are available, however, they can be used to avoid bounced checks (Morgan et al. 2012), which raises the opportunity cost of limiting overdraft credit and bouncing customer checks. Accordingly, some depositories may find it optimal to provide more generous overdraft coverage when they face

³ Nearly all banks (more than 95% in our sample) charge at least as much for a bounced check as for a paid overdraft, despite the absence of credit losses on bounced checks. This pricing relationship is due to a regulatory friction: overdraft credit is exempt from state usury restrictions and Truth in Lending Act disclosures in part because regulators deem there to be no *incremental* charge for credit as long as an institution's overdraft fee does not exceed its bounced check fee (Joint Guidance on Overdraft Protection Programs 2005).

payday loan competition.⁴ Second, the composition of overdraft customers may change when payday loans are available. In a study of the credit card market, Calem and Mester (1995) highlight differences in search costs across borrowers: they find that customers who maintain higher loan balances are less likely to search for cheaper alternatives, which suggests that incumbents retain customers with relatively higher credit demand following the entry of a competitor. If the same pattern holds in the market for short-term credit, then the entry of payday lenders may leave overdraft providers with customers that demand higher credit balances. Given this change, it may be optimal for overdraft providers to facilitate additional borrowing by increasing credit limits and raising overdraft fees to compensate for the additional credit losses. Lacking depositor-level data, we are unable to distinguish between these two interpretations.

Our study contributes a new dimension to the literature on payday lending. Others have explored the relationship between payday lending and household economic distress, with mixed findings.⁵ None of the literature studies how payday lending affects the market for short-term credit or the price and availability of credit alternatives, as we do. Our paper is closest to Morgan et al. (2012), which finds that customers bounce checks more frequently following payday lending bans. Our analysis differs in two important ways. First, we focus on the market for short-term credit – specifically, the overdraft credit terms offered by depositories – rather than on measures of household financial problems such as bankruptcy filings, complaints about debt

⁴ High search and switching costs may explain why inter-bank competition is not sufficient to push overdraft credit supply to the level observed when payday lenders are present. Search costs are high because depositories were discouraged (until the passage of the Electronic Funds Transfer Act in 2009) from advertising their product unless they also disclosed usage fees on customer statements. Switching costs are high because depositors may have arranged direct deposit and automated bill payments with their current bank; even assuming depositors know that overdraft protection terms are better at a nearby bank, switching costs may outweigh the savings.

⁵ Half the studies find that payday credit access ameliorates hardship, as measured by foreclosure (Morse 2011), bounced check volumes and complaints against lenders and debt collectors (Morgan et al. 2012), expected well-being (Zinman 2010) and simulated well-being within a lab experiment (Wilson et al. 2008). The other half find that payday credit access exacerbates hardship, as measured by bankruptcy (Skiba and Tobacman 2008), difficulty paying important bills (Melzer 2011), poor job performance (Carrel and Zinman 2013) and involuntary bank account closings (Campbell, Martinez-Jerez and Tufano 2008). Finally, Stoianovici and Maloney (2008) find no relationship between payday credit access and bankruptcy filings.

collectors and the frequency of bounced checks as Morgan et al. (2012) do. Second, we identify the effects using cross-sectional differences in payday loan competition as well as payday lending prohibitions.

We also contribute to a small but growing literature on overdraft credit. Fusaro (2008; 2010) analyzes overdraft prices and demand, Hannan (2006) examines the relationship between overdraft protection fees and local banking market structure, and Fusaro (2010) and Stango and Zinman (2011) study the role of consumer inattention in overdraft demand.

While we are the first to study competition between payday lenders and depository institutions, there is a literature that examines competition in the retail banking market. Hannan (2003) studies competition between banks and credit unions and finds that competition from the latter leads to higher interest rates on some classes of bank deposits. Several papers (Cohen 2004; Cohen and Mazzeo 2007; Adams, Brevoort and Kiser 2007) have tested whether, for antitrust purposes, banks and thrifts should be viewed as perfects substitutes. They tend to find limited substitution between those depository institutions.

The rest of the paper proceeds as follows. Section 2 compares overdraft and payday credit and makes the case, based on a variety of evidence, that they are potential substitutes. Section 3 describes the exit and entry of payday lenders that constitute the variation in payday lending that we use in studying overdraft terms. Section 4 presents the regression results on overdraft terms, and Section 5 extends the analysis to overdraft revenues, credit losses and profits. Section 6 includes results from falsification exercises and Section 7 offers further interpretation of the results. Section 8 concludes by discussing implications for consumer welfare.

2. Payday Credit and Overdraft Credit

This section describes the two main players in the small-dollar loan market and makes a *prima facie* case that payday credit and overdraft credit are potential substitutes for some depositors.

2.1. Payday Credit

Payday lending emerged in the mid- to late-1990s, as a variation on a check cashing transaction. Customers receive a short-term cash advance by exchanging a post-dated personal check for cash, paying a \$15 fee for each \$100 of credit. At maturity, two to four weeks later, the loan is repaid when either the lender cashes the check or the borrower repays in cash. Loan amounts range from \$50 to \$1000, with a median of roughly \$350 (Consumer Financial Protection Bureau 2013).

Payday credit underwriting is minimal; applicants must prove that they have a checking account and a job. The checking account prerequisite ensures that substitution between payday loans and overdrafts is possible, provided that the customer's bank offers overdraft protection. The prerequisite also makes checking accounts and payday credit partial complements, implying positive correlation in the individual demand for each. Given a deposit account, however, payday credit and overdraft credit are potential substitutes, implying negative correlation in their individual demand.

Following a period of rapid growth in the 2000s, payday lending is now ubiquitous. As of 2010, there were 20,000 store locations nationwide (Stephens 2011). According to FINRA's 2009 National Financial Capability Study, 9% of households used payday loans over the prior five years, with usage rates ranging as high as 17% in Oklahoma and Nevada and as low as 5% in New Hampshire and Maine.⁶

⁶ FINRA collected data payday loan usage and other financial transactions through an online survey of roughly 28,000 households (FINRA 2009).

2.2. Overdraft Credit

When presented with a transaction that overdraws a customer's account, a bank must decide whether to make the payment, thereby extending credit to the depositor, or reject the item, returning it unpaid. If the bank covers the check (or ATM transaction), the bank charges an overdraft fee. If the bank does not cover the check, it returns ("bounces") the check and charges an insufficient funds (bounced check) fee. Traditionally, banks made those decisions on an *ad hoc* basis, but in the mid- to late-1990s financial advisory firms began marketing trademarked computer algorithms designed to automate and optimize these decisions.

Under such "bounce protection" programs, banks enroll nearly all depositors for credit up to a limit and pay every overdraft transaction as long as the account balance remains within the credit limit (Joint Guidance on Overdraft Protection Programs 2005). For each overdraft transaction they assess a flat fee, regardless of the amount borrowed and the length of the loan (the debt is typically due within one month).⁷ Credit underwriting is minimal beyond screening based on the age of the account, as customer approval rarely depends on a credit check (FDIC 2008). There is also little price discrimination; the *per*-item overdraft fee may differ by type of account, but rarely is there customer-by-customer variation.

The FDIC's (Federal Deposit Insurance Corporation) recent study of bank overdraft programs reveals how widespread overdraft credit programs have become (FDIC 2008); roughly 70 percent of banks with assets over \$250 million now operate automated bounce protection programs of the type we study. These programs generate substantial revenues for depository institutions. For the median bank studied by the FDIC (2008), bounced check and overdraft fee

⁷ Depositories also provide an overdraft line of credit (LOC) to some depositors, but this service is of less interest when studying payday lending. An overdraft LOC is an opt-in service charging interest comparable to credit card rates, and almost always conditional on credit approval that would exclude payday borrowers (FDIC 2008, Table V-2). Bounce protection, by contrast, is the opt-out (default) choice, typically applied without a credit check (FDIC 2008, Table V-2).

income accounted for 43 percent of noninterest income. Those revenues are not earned without taking risk, however. Among institutions surveyed by the FDIC, overdraft credit losses represent 8.5% of overdraft-related fee income and 12.6% of gross losses on all loans and leases (FDIC 2008). Depository institutions also closed 30 million accounts between 2001 and 2005 for "recidivist" check bouncing, and the trend is upward (Campbell et al. 2008). The average loss *per* bad account in 2007 was \$310 (FDIC 2008).

While some overdrafts are undoubtedly accidental and therefore not affected by payday loan availability, a variety of evidence suggests that that payday loans and overdrafts are substitutes for some depositors.

For a start, there similarities in pricing, underwriting and usage that suggest payday loans and overdrafts are potential substitutes. First, the costs of payday and overdraft credit are similar; the median fee charged by depository institutions *per* overdraft was \$27 in 2007 (FDIC 2008), which is comparable to the typical fee on a \$180 payday loan (\$27, assuming the usual payday loan fee of \$15 per \$100 borrowed on a two week loan). In fact, given the additional fee of \$20 to \$30 often assessed by the recipient of the bad check, payday loans are often cheaper than bouncing a check. Second, there is little credit underwriting in either product, ensuring that payday credit is available to overdraft users and vice versa. Third, survey evidence indicates substantial customer overlap, as overdrafts are common among payday credit users.⁸ Fourth, the usage patterns of overdraft and payday credit are also quite similar, with repeated borrowing common for both types of credit.⁹

⁸ Stegman and Faris (2003) find that having bounced a check in the previous five years is a significant determinant of payday credit usage by low-income North Carolina households. In a survey of payday credit users in Oregon, Zinman (2010) finds that 52.4 percent of respondents had bounced a check in the previous three months.

⁹ Thirty five percent of depositors that overdraw their accounts do so ten or more times per year (FDIC 2008). Likewise, thirty six percent of payday borrowers use ten or more loans per year (authors' calculations using data reported in Veritec (2006a, 2006b).

Moreover, there is direct evidence that payday loans and overdrafts are substitutes for some depositors. In a survey of 2,000 payday loan customers Cirillo (2004) finds that 66 percent of borrowers report "avoiding bounced checks" to be a benefit of payday credit. Finally, Morgan et al. (2012) find that bounced check rates fall when payday credit is available. All of this evidence suggests some overlap in the set of customers using payday credit and overdraft credit, as well as substitution between these two sources of credit.

3. Entry and Exit by Payday Lenders as "Experiments"

The controversy over payday credit has led to considerable variation in the state laws. With a few exceptions, Northeastern states have barred entry of payday lenders by strict enforcement of usury limits. Seven additional states have closed markets, outright or indirectly *via* prohibitive usury limits, while one has sanctioned and safe harbored the practice. The appendix documents the regulatory differences in detail. Using those differences, we define two separate indicators of payday credit availability: *Allowed* and *Access*.

Allowed_{sy} equals one for institutions located in a state *s* where payday credit is allowed in year *y*, and zero otherwise. Because our regressions include state fixed effects, the variation that identifies the effect of *Allowed* comes from states that switch from allowing to prohibiting payday credit, or vice-versa. Over our sample period six states and the District of Columbia switched from allowing to prohibiting, while one state, New Hampshire, switched from prohibiting to allowing.¹⁰ Given the prevalence of prohibiting events in our sample, the regression analysis will mainly measure the effect of prohibiting payday lending. However, for ease of comparison with the subsequent model we code the main dependent variable as whether payday lending was allowed rather than prohibited.

¹⁰ These six states are Georgia, Maryland, North Carolina, Pennsylvania, Oregon and West Virginia.

Allowed will deliver unbiased estimates of the effect of payday credit access as long as the political economy behind changes in *Allowed* does not separately influence, or respond to, overdraft market conditions. It is natural to question this identifying assumption. State legislators may target payday and overdraft markets at the same time, for example pressuring banks in their state to lower overdraft fees while also prohibiting payday lending. Law changes may also respond to economic conditions, perhaps with prohibitions instituted during better economic times as documented regarding usury laws in the 19th century (Benmelech and Moskowitz 2010). These concerns motivate us to analyze a separate measure of payday credit access and to examine in falsification exercises whether credit market and economic conditions are correlated with *Allowed*.

The second availability measure is a sequence of distance-based indicators. $Access_X_Y_{cy}$, is a county-year level indicator equal to one if an institution is located in a county whose center is within X and Y miles of a state that allows payday lending (and zero if not). For example, $Access_0_10$ equals one if an institution is in a county located 10 miles or less from a state that allows payday loans, and zero otherwise. $Access_10_20$ and $Access_20_30$ are defined analogously. The omitted category is $Access_30$ plus.

For *Access* to be an effective measure of payday credit access, it must be that depositors in border areas borrow in nearby states. Melzer (2011) cites anecdotal evidence that households in prohibiting states borrow across state borders and documents that payday lenders cluster at such borders, as one would expect if they faced demand from across the border.

Note that *Access* varies within state, but only in states that prohibit payday lending.¹¹ Its effect is identified by comparing overdraft terms at institutions relatively near states that allow

¹¹ The 13 states that prohibited payday lending some time during the sample period include the District of Columbia and the seven states that changed laws as well as Connecticut, Massachusetts, New Jersey, New York and Vermont.

payday credit to terms at more remote institutions. The identifying assumption is that the distance between institution *i* and a state where payday credit is allowed is exogenous with respect to overdraft terms at institution *i*, a different assumption than needed for *Allowed*. The former assumption requires, firstly, that payday credit regulations in bordering states are uncorrelated with characteristics of the overdraft market across the border, and secondly, that payday credit availability does not alter the composition of depositories near the border. To weaken the latter condition we control for the institution type, its size (log assets), and the concentration of the local deposit market.

Access is helpful because it isolates different variation than Allowed; importantly, it excludes variation due to home state regulations. Any difference-in-difference model that uses a limited number of law changes, as our model with Allowed does, is subject to the critique that the model captures a spurious relationship between law changes and the dependent variable. Access reduces that concern, since it is doubtful that a spurious result would agree across the two models. Access also reduces the concern that political forces jointly affect payday laws and overdraft prices, as there is little reason to believe that legislators in nearby states directly influence the pricing decisions of banks located outside of their state. Furthermore, to the extent that political decisions correlate among adjacent states, the state-year fixed effects in the Access regressions prevent this source of variation from affecting the Access coefficients. Despite these advantages, Access is still subject to the critique that payday laws may be correlated with economic conditions, in this case conditions in the nearby state that spill across the state border. For that reason, we examine the correlation between Access and local economic conditions.

The institutional and county characteristics defined by *Allowed* and *Access* differ in a few ways (Table 1). States with changes in *Allowed* have higher proportions of Hispanics and blacks,

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and relatively more savings banks than commercial banks. Savings banks are also overrepresented (relative to commercial banks) in counties without access to payday credit ($Access_0_{10} = 1$). Unemployment rates are significantly lower in those counties as well. Importantly, our regression analysis controls for these differences by including institution and county-level controls.

4. How Do Overdraft Terms Vary With Payday Loan Availability?

4.1. Data

The data on overdraft prices and credit limits are from Moebs \$ervices (sic), a research and consulting firm focused on financial services. For its survey of depository institutions, Moebs draws a random sample of institutions – stratified by region, asset size and institution type – and calls a branch close to each institution's main office to assess fees and services for customers at that location.¹² Between 1989 and 2002 this survey was the data source for the Federal Reserve's Annual Report to the Congress on Retail Fees and Services of Depository Institutions; since 2002, Moebs has continued the annual survey. For our study, Moebs made available the survey microdata between 1995 and 2008.

The full space of data spans roughly 20,000 branch-year observations, half on commercial banks, 40 percent on credit unions, and 10 percent on savings banks. There are two variables of interest: *Fee*, the fee charged per overdraft event, and *OD Limit*, the maximum overdraft balance allowed under overdraft protection. *Fee*, measured in constant (2008) dollars, is observed at banks from 1995 to 2008, and at credit unions from 1999 to 2008. Average and

¹² Many banks with regional or national branch networks are chartered separately in each state. Moebs samples from the population of chartered institutions, so a single bank holding company might be sampled multiple times in a given year, across separately chartered subsidiaries.

median *Fee* are \$25 and \$26, but some institutions charge above \$50. *OD Limit* is observed in four years – 2004 through 2008, excluding 2006. The average reported credit limit is \$514.

We match the Moebs survey data with assets for each institution, as reported to the FDIC and NCUA (National Credit Union Administration). We also use the FDIC's Summary of Deposits database to calculate the HHI (Herfindahl–Hirschman Index) of bank deposit market concentration for each county and year.¹³ County characteristics including median income, racial composition, home ownership, population, and percent urban population, are from the 2000 Census. Unemployment rates, by county and year, are from the Bureau of Labor Statistics' Local Area Unemployment Statistics.

4.2. Findings with *Allowed*

We estimate the impact of payday credit availability using difference-in-difference regressions of the form:

$$Y_{icsy} = \alpha + a_s + a_y + \beta Allowed_{sy} + \theta HHI_{cy} + \vec{\gamma} Cnty_{cy} + \vec{\pi} Inst_{iy} + \varepsilon_{icsy}.$$
 (1)

 Y_{icsy} represents *Fee* or *OD Limit* at institution *i* in county c, state *s*, at year *y*. The fixed effects (a_s and a_y) control for differences in the mean of *Y* across states and years. *HHI* measures bank deposit market concentration in each county-year. *Cnty* is a vector of county-level control variables, including the unemployment rate, which varies across years.¹⁴ *Inst* controls for the natural log of assets and institution type (with dummy variables): savings bank, credit union, or commercial bank (the omitted category). The data are a repeated cross-section rather than a panel, so institution fixed effects are not feasible. The regressions are estimated by ordinary least

¹³ NCUA does not collect the equivalent data for credit unions so credit union market shares cannot be calculated.
¹⁴ The other county-level controls are from the 2000 Census: cubics in median income, population and percent urban population; percent black, white, Hispanic and Asian; percent home ownership and percent foreign born.

squares, and observations are clustered by state in calculating Huber-White robust standard errors.

Table 2 reports the regression estimates. The results indicate that access to payday credit is associated with higher overdraft fees and credit limits; the coefficient on *Allowed* is positive and significantly different from zero in both *Fee* regressions. The baseline difference-indifference model, without county and institution controls, implies that overdraft fees are higher by \$1.73 when payday credit is allowed. Adding county and institution controls raises the estimated effect to \$1.84, a 7.4 percent change relative to the average overdraft fee of \$25.¹⁵ *Allowed* also has a positive and significant coefficient in both *OD Limit* regressions. In the second model, the coefficient on *Allowed* of 59.2 implies that overdraft limits are 12% higher (relative to the average limit of \$514) when payday credit is available.

Figure 1 shows the timing of the change in overdraft fees. Immediately following the prohibition of payday lending, overdraft fees decline by roughly \$1.00. Fees remain at roughly that level for three years before falling further five to seven years after the prohibition. In the years prior to the prohibition, overdraft fees do not display a broad downward trend, but do show some sign of decline in the two years prior to the law change. It is possible that some exit occurred prior to the prohibition date that we have coded; for example, the exit of lenders from Maryland, North Carolina and Pennsylvania was somewhat protracted, as state attorneys general pursued cases against lenders over time and faced appeals by particular lenders.

In the next section, we document very similar findings on overdraft fees using another measure of payday credit availability.

4.3. Findings with Access

¹⁵ The estimated coefficient on *Allowed* is also stable when county fixed effects are used in place of the *Cnty* vector (results not reported).

The regression model using Access is:

$$Y_{icsy} = \alpha + a_{sy} + \beta Access_{cy} + \vec{\gamma} Cnty_{cy} + \delta BORDER_c + \theta HHI_{cy} + \vec{\pi} Inst_{icsy} + \varepsilon_{icsy}.$$
 (2)

Apart from replacing *Allowed* with *Access*, model (2) differs from (1) in two ways. First, model (2) includes a state-year fixed effect (instead of state and year fixed effects) to exclude variation in *Access* created by the state-level changes in payday availability captured by *Allowed*. Second, some specifications of (2) include *Border*, a dummy indicating whether an institution is located in a county within 25 miles of a state border. *Border* controls for general differences between institutions located near a state border and interior counties. To improve precision in estimating the effect of covariates aside from the *Access* variables, we include all observations in the thirteen states that prohibit payday lending at some time during the sample.

Table 3 reports the regression estimates. For overdraft fees, the results with *Access* are very similar to those with *Allowed*, both in direction and magnitude. Given the type and size of institutions and other controls, overdraft fees are \$1.38 higher when payday credit is available within 10 miles. Access beyond ten miles does not significantly affect overdraft prices.¹⁶ The coefficients on *Access_0_10* also do not appear to be driven by differences in institutions or economic conditions in border areas; adding *Border* and other county covariates actually increases the estimated effect of *Access_0_10*. The results for *OD Limit* display no consistent pattern between proximity to payday lending and overdraft limits. However, given the large

¹⁶ F-tests reject equality between the coefficients on $Access_0_10$ and $Access_10_20$ (p-value 0.06), and between the coefficients on $Access_0_10$ and $Access_20_30$ (p-value 0.01).

standard errors on the *Access* coefficients, the results do not rule out a substantial effect in either direction.¹⁷

To summarize our main results: we find robust evidence that banks and credit unions reduce overdraft credit prices and when payday lending competition is either absent or more distant. In addition, we find that overdraft credit limits decline when payday loans are prohibited, though they show no relationship with our measure of distance to payday lending competition in the cross-section.

4.4. Robustness

Table 4 shows regression results for several variations on the models discussed above. These results are helpful in assessing the robustness of the results to alternative functional forms and sample restrictions.

The two models in Panel A are regressions of *Fee* on $Access_0_10$, within a sample that excludes payday-allowing states. For the first model, this change has no effect on the identifying variation in *Access*, but it does affect the coefficient estimates on control variables such as *Border*. The results are consistent with the main findings: there is a positive and significant coefficient on *Access_0_10* that is slightly larger than the effects estimated in the full sample (1.69 compared to 1.38). The second model (reported in Column 2) maintains the same sample but also includes county fixed effects as control variables. Adding fixed effects changes the identifying variation in *Access* by isolating time-series variation created by law changes in states that border payday access counties (e.g., *Access* changes for some New Jersey border counties when Pennsylvania prohibits payday lending). In effect, this exercise combines the two identification strategies by examining how overdraft prices respond to changes in cross-border

¹⁷ Since a number of law changes occur between 2004 and 2008, the identifying variation in *Allowed* is not dramatically reduced because of the limited time series available for *OD Limit*. However, the identifying variation in *Access* comes from all sample years, so it is reduced dramatically by the sample reduction.

loan access created by state law changes. For this model, the estimated coefficient on *Access_0_10* of 1.46 is similar in magnitude to the main estimates for *Allowed* and *Access*, but is estimated quite imprecisely and is not statistically different from zero (p-value 0.27).

Panel B shows results for a log-linear model with *Log Fee* and *Log OD Lim* as dependent variables. For *Log Fee*, the estimated effect of *Allowed* and *Access* is between 4.7 percent and 8 percent, similar to the main results. This analysis confirms that the nominal to real price adjustment does not meaningfully change the results. For the dependent variable *Log OD Lim*, *Allowed* corresponds to an 11 percent increase, which is very close to the baseline estimate of 12 percent. As in the baseline model, the estimated effect of *Access* on *Log OD Lim* is imprecise and insignificant.

Within Panels C and D, Columns 7 and 10 show results for a model that uses a continuous measure of loan access, *LogDistance*, instead of *Access*. These results imply that a one log point increase in the distance to a state that allows payday credit decreases overdraft fees about 43 cents (p-value 0.11). As with the main *Access* regressions, the *OD Limit* results are imprecisely estimated.

The last two columns of Panels C and D show that the main findings are stable when the sample is restricted to institutions that have 100 percent of deposits in the state or county of the surveyed branch. These results confirm that the effects of *Allowed* and *Access* are not driven by large banks that operate across multiple states or counties. For such institutions, it is less plausible that payday loan availability in the area of the surveyed branch influences overdraft and checking account terms, which are possibly set uniformly across the entire branch network.

4.5. Overdraft Credit Offerings at Credit Unions

In this section we validate the findings on overdraft credit supply using additional data on overdraft product offerings reported by credit unions in their regulatory filings (Call Reports). Since the mid-2000s, the credit union supervisor NCUA has mandated detailed disclosure on overdraft programs: credit unions must report whether they offer overdraft protection or overdraft lines of credit. These data are available at semiannual frequency, beginning in 2004 for overdraft lines of credit and 2006 for overdraft bounce protection. Banks are not required to report such data. In the analysis discussed below, all *Allowed* regressions include not only state fixed effects but also institution fixed effects; because of the panel nature of these data, this form of difference-in-difference analysis is feasible.

The results in Table 5 show that credit unions increase overdraft coverage when they compete with payday lenders, consistent with our findings in the survey data. In the analysis of bounce protection, the coefficients on *Allowed* and *Access_0_10* are 3.1 percentage points and 1.9 percentage points, respectively, with the coefficient on *Allowed* significant at the 5 percent level. Given that 37% of credit unions offer bounce protection during the sample period, these coefficients equate to a 5-8 percent increase in the likelihood of offering bounce protection when payday loans are available.

These changes appear to be specific to the bounce protection program, with which payday loans compete most directly; as shown in columns 3 and 4, the coefficients on *Allowed* (0.9 percentage points) and *Access_0_10* (0.6 percentage points) are smaller and statistically insignificant in a model explaining overdraft line of credit availability. This insignificant finding for overdraft lines of credit helps to address the concern that depositories happen to reduce credit supply broadly when payday loans are prohibited. Indeed, the change in supply is very specific

to the overdraft product for which payday loans are the likely substitute, which suggests that we are measuring a response to payday lending *per se*.

5. Fee Income, Credit Losses and Profits from Deposit Accounts

To complete the picture of how payday lending affects bank overdraft activities we examine the components of profits using Call Report data. Banks and credit unions report fee income earned on deposit accounts (*Fee Income*), which includes account maintenance fees, ATM fees, and fees charged on overdrafts and bounced checks. They also report overdraft credit losses in a residual loan loss category (*Loan Losses Other*), as well as pre-tax profits (*Operating Income*). Our analysis uses semi-annual data, covering June 1995 through December 2008 for credit unions and June 2001 through December 2008 for banks.¹⁸ We aggregate each variable to the state level for *Allowed* regressions and the county level for *Access* regressions, based on the headquarters location of the bank.

We use *Fee Income* as a proxy for overdraft revenue and test whether revenue increases or decreases with payday loan availability. Given that the average price per overdraft attempt is 5-7% higher when payday loans are available, we would expect overdraft revenues to be higher as well if the number of overdraft attempts also increased, as one would expect if the price increase were caused by increased demand for overdraft credit, for example. As in model (1), we use a difference-in-difference approach, with *Log Fee Income*, aggregated to the state level, regressed on *Allowed*, state fixed effects, time fixed effects and two time-varying controls, personal income (from the Bureau of Economic Analysis) and the unemployment rate (from the Bureau of Labor Statistics). Estimation results are reported in the first column of each panel in Table 6. In neither case is fee income significantly related to *Allowed*. For credit unions, the point estimate for *Allowed* suggests a 0.2% increase in fee income when payday loans are

¹⁸ Bank Call Report data for *Loan Losses Other* is only available as of June 2001.

available. For banks, the coefficient on *Allowed* of 0.04 suggests a 4% increase in revenues in the presence of payday lending. In both cases, but particularly for banks, there are wide confidence intervals around these estimates. The 95 percent confidence intervals, for example, include changes as large as 10% in either direction.

Next, we consider loan losses in the "other loans" category that includes overdraft credit. For credit unions, we find a positive and significant coefficient on *Allowed*, suggesting that credit unions bear additional credit losses as they expand overdraft protection. The magnitude of the increase is substantial; the point estimate of 0.21 implies that other loan losses are approximately 20% higher when payday loans are available. The magnitude of the increase in credit losses is similar to the increase in outstanding overdraft protection commitments (Panel A, Column 5) when payday loans are available. Among banks, we find no relationship between losses and *Allowed*, perhaps because of greater measurement error in the residual loss category.

Finally, we consider profitability. For credit unions we find that the ratio of loan losses to fee income increases with *Allowed*. This estimate is not quite significant at the 10% level (p-value of 0.101), but the point estimate suggests higher profitability in overdraft activities following prohibitions. That is, for every dollar of fee income earned, credit unions give up a smaller share to defaults, roughly 20% less than when payday loans are available. Based on point estimates, *Log Operating Income* at credit unions also declines modestly with *Allowed*, but this test has very little statistical power and fails to rule out changes of 10% or more in either direction.

6. Economic and Credit Market Conditions and Payday Loan Availability

As noted earlier, it is important to consider whether our findings result from an underlying correlation between payday loan laws and economic conditions. For example, if payday loan availability coincides with greater demand for credit or higher default risk among borrowers, overdraft prices may increase with *Access* and *Allowed*, but not due to payday lending *per se*. Our thesis, of course, is that payday lenders compete with overdraft providers directly, and under that hypothesis we would expect the competitive response to be specific to the overdraft market.

To further examine omitted variables concerns, we run four falsification exercises that test whether payday availability is correlated with unemployment rates, credit card loan balances, credit card loss rates and interest rates on non-overdraft consumer loans. In addition to annual employment data by state and county from the Bureau of Labor Statistics (1995 through 2008), we use annual data on loan balances and loan delinquency rates from the Federal Reserve Bank of New York/Equifax Consumer Credit Panel (1999 through 2008). These data, which are compiled from a random 5% sample of consumer credit reports and aggregated by state or by county, are available going back to 1999. Lastly, we use institution-level data on interest rates reported by credit unions in their Call Report filings (the same source as described in Section 4.5 above). For each consumer loan category, credit unions are required to report the most common interest rate charged on outstanding loans, which provides us semi-annual observations at the credit union level for four loan categories (credit cards, consumer loans, vehicle loans and mortgage loans) between 1995 and 2008.

The results for unemployment rates and aggregate credit card delinquency, displayed in Table 7, show no sign that borrower default risk correlates with our measures of payday loan availability; neither unemployment rates nor credit card delinquency rates are significantly related with our measures of payday loan availability. In models examining *Access*, the point estimates suggest lower county-level unemployment rates and delinquency rates where payday

loans are available, though these differences are not statistically significant. In models with *Allowed*, the estimates suggest that delinquency rates decrease when loans are available and unemployment rates rise, though again neither difference is significant. The results for delinquency are fairly precise. The 95% confidence interval rules out increases of more than 30 basis points or so due to payday lending (29 basis points for *Allowed* and 36 basis points for *Access_0_10*). On the other hand, the tests examining unemployment rates have less power; the 95 percent confidence interval for the coefficient on *Allowed*, in particular, includes differences as large as 1 percentage point, a substantial difference relative to the mean unemployment rate of roughly 5%.

Regarding aggregate loan balances, there is some evidence that credit card balances increase when payday loans are available (Table 7). In particular, we estimate an *Allowed* coefficient of 0.043, significant at the 5% level, which implies that loan balances are roughly 4% higher when payday loans are available. By contrast, we find no relationship between credit card loan balances and *Access_0_10*; in fact, the point estimate on *Access_0_10* is slightly negative. This result suggests that differences in loan demand do not account for the correlation we estimate between *Access* and overdraft fees. On the other hand, the positive correlation between *Allowed* and credit card balances raises some concern that demand for credit and credit prices are elevated when payday loans are allowed.

We evaluate the latter possibility more directly below by testing whether prices for nonoverdraft loans also vary with payday loan availability. For reasons of data availability, we study interest rates on consumer loans issued by credit unions. While credit unions are only a subset of lending institutions, this analysis is still informative; having documented that credit unions change their overdraft bounce protection programs in response to payday loan prohibitions, we would expect loan prices to change as well if consumer loan demand were the omitted variable driving our earlier finding. Focusing first on the results for *Allowed*, shown in the top panel of Table 8, we find no significant relationship between payday loan availability and interest rates. For each major category of consumer credit – credit cards, consumer loans, vehicle loans and mortgage loans – we estimate small and statistically insignificant coefficients on *Allowed*. These estimates place a fairly tight bound on the effect of payday lending, with 95% confidence intervals that range between -20 basis points and +20 basis points. Turning to the results for *Access_0_10*, which are reported in the bottom panel of Table 8, we again find no relationship between payday loan availability and interest rates. The point estimates on *Access_0_10* are small, insignificant and quite precisely estimated. Though there is some variation across loan categories, these results rule out differences in interest rates larger than 20 basis points or so.

In general, if not uniformly, the falsification tests support the conclusion that overdraft prices and credit limits vary because of payday loan competition as opposed to a confounding effect of economic or credit market conditions. While credit card loan balances are higher before payday loan prohibitions, we do not observe a similar difference in areas facing cross-border competition from payday lenders, nor do we see broad evidence of other credit prices increasing along with overdraft prices,

7. Discussion

We conjecture that overdraft prices decline when payday loans are prohibited because overdraft providers choose to reduce overdraft coverage and sustain lower credit losses as they do so. The ancillary findings using credit union regulatory data agree with this interpretation – overdraft credit losses fall along with credit limits when payday loans are prohibited. The pattern in overdraft pricing across institutions also agrees with this interpretation, as credit unions with bounce protection programs charge higher overdraft prices (\$2.28, or 10%, more per overdraft) than credit unions that do not offer bounce protection.¹⁹

Relative to existing theories of competition in consumer credit markets, our results are partially consistent with models such as Ausubel (1991) and Brito and Hartley (1995) that highlight adverse selection. In these models, adverse selection prevents firms from competing by lowering prices and pushes them instead to compete in non-price dimensions, for example by issuing larger or riskier loans. Our main finding – that firms choose to expand overdraft coverage rather than lowering prices as competition intensifies – fits with these theories. Yet the fact that lenders raise prices, rather than leaving them fixed, runs contrary to those models.

Leaving aside adverse selection as the friction that prevents price competition, we offer two possible interpretations. First, competition from payday lenders may motivate depositories to supply more overdraft credit by raising the opportunity cost of *not* covering an overdraft. While offering overdraft coverage may not be optimal in the absence of payday lending, it may become so once borrowers can use payday loans to avoid bounced checks. Another interpretation is that depositories face a different pool of borrowers when payday loans are available, as depositors who previously used overdraft credit seek payday credit instead. If the remaining overdraft borrowers demand more credit (as Calem and Mester (1995) find for credit card borrowers), then overdraft providers may find it optimal to increase borrowing limits and prices.²⁰ With depositoror transaction-level information on overdrafts, one could distinguish between those two interpretations. That would be a worthwhile pursuit for future research.

¹⁹ We merge the Moebs data on overdraft prices and the credit union regulatory data to estimate the price difference by type of overdraft offering, controlling for local market characteristics, institution type and institution size (regression results are not reported in the tables, but are available by request).

²⁰ Our referee suggested another alternative: if the remaining overdraft credit users are less risky than those who switch to payday credit, then depositories may find it optimal to cater to those customers by increasing credit limits. While this explanation can account for the rise in overdraft limits where payday loans are available, the change in overdraft fees in this interpretation is ambiguous, as a less risky pool of borrowers would warrant lower prices absent the increase in credit limit.

We acknowledge that there are alternative explanations for the decline in overdraft prices, but argue that the most likely of these explanations fail to account for the full set of facts. One hypothesis is that the marginal overdraft borrower is more price elastic when payday loans are unavailable, which causes overdraft providers to reduce mark-ups (Chen and Riordan 2008). While an increase in demand elasticity might explain the price decrease, it cannot explain the depository's choice to supply less credit. Another hypothesis is that denying borrowers access to expensive payday debt causes depositors' financial position to improve. If so, falling overdraft prices may reflect reduced demand for overdraft credit or decreased risk of default. Yet we find no evidence for decreases in the quantity and profitability of overdraft credit, as one would expect with a decline in demand. Finally, the explanation citing decreased risk of overdraft credit begs the question of why depositories supply less credit to safer borrowers by decreasing bounce protection and overdraft credit limits. While we cannot rule out the possibility that some combination of these alternatives plays a role in the price decrease, we focus on the two interpretations discussed above as the most parsimonious explanations.

8. Conclusion

Our introduction posed two questions: do payday lenders compete with mainstream financial intermediaries in the small-dollar loan market, and if so, how is the competition manifest? We answered those questions by studying whether payday loan prohibitions affect the terms on overdraft credit, an apparent substitute for payday credit supplied by depository institutions.

Consistent with the notion that payday lenders and mainstream depositories compete for borrowers, we find that payday loan prohibitions affect overdraft credit terms. Surprisingly, and contrary to a simple model of price competition, depositories reduce overdraft prices by roughly 5% when payday loans are prohibited. Because we find similar results using models with different, if not orthogonal, identifying assumptions, we are confident that this finding does not reflect an omitted economic or political variable. The decline in overdraft fees, though surprising when viewed in isolation, is reasonable given that depositories also reduce overdraft credit supply quite dramatically and incur lower credit losses following payday loan prohibitions; we estimate a 12% reduction in overdraft credit limits and an 8% reduction in propensity to offer overdraft protection. Taken together, these results imply that the price *per* unit of credit limit increases when payday lenders are forced to exit, as credit limits fall by more than prices.

Beyond characterizing the effects of payday loan prohibitions on the market for shortterm loans, our analysis highlights the importance of considering non-price characteristics of credit offers when modeling lenders' competitive responses. An interesting extension for future theoretical work on short-term lending is to explore why and in what cases firms choose to compete on price as opposed to other contract terms.

References

Adams, Robert, Kenneth P. Brevoort and Elisabeth Kiser. 2007. Who Competes with Whom? The Case of Depository Institutions. *The Journal of Industrial Economics*, 55(1): 141–167

Ausubel, Lawrence. 1991. The Failure of Competition in the Credit Card Market. *American Economic Review*, 81(1): 50-81.

Ausubel, Lawrence. 1999. Adverse Selection in the Credit Card Market. Working Paper.

Advance America Cash Advance Centers, Inc. December 18, 2007. "Advance America Announces Decision to Close 66 Remaining Centers in Pennsylvania." Press release. Retrieved on 2009-09-01 from: http://investors.advanceamerica.net/releasedetail.cfm?ReleaseID=282418.

Advance America Cash Advance Centers, Inc. 2009. Form 10-K Annual Report 2009. Retrieved on 2010-02-10 from: http://investors.advanceamerica.net/sec.cfm.

Bair, Sheila. 2005. Low-Cost Payday Loans: Opportunities and Obstacles. *Report Prepared for The Annie E. Casey Foundation*.

Benmelech, Efraim and Tobias J. Moskowitz. 2010. The Political Economy of Financial Regulation: Evidence from U.S. Usury Laws in the 19th Century. *Journal of Finance* 65(3): 1029-1073.

Berger, Allen N. and Timothy H. Hannan. 1989. The Price-Concentration Relationship in Banking. *The Review of Economic Statistics*, 71(2): 291-299

Brito, Dagobert L. and Peter R. Hartley. 1995. Consumer Rationality and Credit Cards. *Journal of Political Economy*, 103(2): 400–433.

Campbell, Dennis, Asis Martinez-Jerez and Peter Tufano. 2008. Bouncing Out of the Banking System: An Empirical Analysis of Involuntary Bank Account Closures. Presented at the Federal Reserve Bank of Boston Workshop on Consumer Behavior and Payment Choice.

Calem, Paul S. and Loretta J. Mester. 1995. Consumer Behavior and the Stickiness of Credit Card Interest Rates. *American Economic Review*, 85(5): 1327-1336.

Carrell, Scott and Jonathan Zinman. 2013. In Harm's Way? Payday Loan Access and Military Personnel Performance. Working Paper.

Cirillo, Patricia. 2004. Payday Advance Customer Satisfaction Survey. Cypress Research.

Chen, Yongmin and Michael Riordan.2008. Price Increasing Competition. *Rand Journal of Economics*, 39(4): 1042-1058.

Cohen, Andrew M. 2004. Market Structure and Market Definition: The Case of Small Market Banks and Thrifts. *Economics Letters*, 85(1): 77-83.

Cohen, Andrew M. and Michael J. Mazzeo 2007. Market Structure and Competition among Retail Depository Institutions. *Review of Economics and Statistics*, 89(1): 60-74.

Consumer Financial Protection Bureau. 2013. Payday Loans and Deposit Advance Products (April 24, 2013). Retrieved from: http://files.consumerfinance.gov/f/201304_cfpb_payday-dap-whitepaper.pdf

Core Innovation Capital and Center for Financial Services Innovation. 2011. Knowledge Brief: 2010 Underbanked Market Size (November 2011). Retrieved from: http://www.cfsinnovation.com/system/files/09-11,%20Marketscan_final.pdf

DeYoung, Robert and Ronnie J. Phillips. 2009. Payday Loan Pricing. Networks Financial Institute 2006-WP-05; FRB of Kansas City Paper No. RWP 09-07.

Edelberg, Wendy. 2004. Testing for Adverse Selection and Moral Hazard in Consumer Loan Markets. FEDS Working Paper No. 2004-09.

Einav, Liran, Mark Jenkins and Jonathan Levin. 2012. Contract Pricing in Consumer Credit Markets. *Econometrica*, 80(4): 1387–1432.

FAIR Overdraft Coverage Act of 2009, S.1799, 111th Cong., 1st Sess. (2009).

FDIC. 2008. FDIC Study of Bank Overdraft Programs.

FINRA Investor Education Foundation. 2009. Financial Capability in the United States. National Survey - Executive Summary, December 2009.

Fusaro, Marc. 2008. Hidden Consumer Loans: An Analysis of Implicit Interest Rates on Bounced Checks. *Journal of Family and Economic Issues*, 29(2): 251-263.

Fusaro, Marc. 2010. Are Bounced Check Loans Really Loans? Theory, Evidence and Policy. *Quarterly Review of Economics*, 50(4): 492-500.

GAO. 2008. Bank Fees: Federal Banking Regulators Could Better Ensure that Consumers Have Required Disclosure Documents Prior to Opening Checking or Savings Accounts. Government Accountability Office, GAO-08-281.

Hannan, Timothy H. 2003. The Impact of Credit Unions on the Rates Offered for Retail Deposits by Banks and Thrift Institutions. Finance and Economics Discussion Series 2003-06, Board of Governors of the Federal Reserve System.

Hannan, Timothy H. 2006. Retail Deposit Fees and Multimarket Banking. *Journal of Banking and Finance*, 30: 2561-78.

Joint Guidance on Overdraft Protection Programs; Final Guidance. 70 *Federal Register* 36 (February 24, 2005): 9127–9132.

Karlan, Dean and Jonathan Zinman. 2009. Observing Unobservables: Identifying Information Asymmetries with a Consumer Credit Field Experiment. *Econometrica*, 77(6): 1993–2008.

Melzer, Brian T. 2011. The Real Costs of Credit Access: Evidence from the Payday Lending Market. *Quarterly Journal of Economics*, 126(1): 517-555.

Morgan, Donald P., Michael Strain and Ihab Seblani. 2012. How Payday Credit Access Affects Overdrafts and Other Outcomes. *Journal of Money, Credit and Banking*, 44(2-3): 519–531.

Morse, Adair. 2011. Payday Lenders: Heroes or Villains? *Journal of Financial Economics*, 102(1): 28-44.

North Carolina Department of Justice (March 1, 2006). "Payday lending on the way out in NC." Press release. Retrieved on 2009-08-27 from: http://www.ncdoj.gov/News-and-Alerts/News-Releases-and-Advisories/Press-Releases/Payday-lending-on-the-way-out-in-NC.aspx

Parrish, Leslie. 2009. Overdraft Explosion: Bank fees for overdrafts increase 35% in two years (October 6, 2009). Center for Responsible Lending. Retrieved from: http://www.responsiblelending.org/overdraft-loans/research-analysis/crl-overdraft-explosion.pdf

Sabatini, Patricia. "Days May Be Numbered for State's Payday Lenders." Pittsburgh Post-Gazette. 26 Mar. 2006.

Skiba, Paige and Jeremy Tobacman. 2008. Do Payday Loans Cause Bankruptcy? Working Paper.

Stango, Victor and Jonathan Zinman. 2011. Limited and Varying Consumer Attention: Evidence from Shocks to the Salience of Bank Overdraft Fees. NBER Working Paper 17028.

Stegman, Michael A. 2007. Payday Lending. *Journal of Economic Perspectives*, 21(1): 169-190.

Stegman, Michael A., and Robert Faris. 2003. Payday Lending: A Business Model that Encourages Chronic Borrowing. *Economic Development Quarterly*, 17 (1): 8–32.

Stiglitz, Joseph E. and Andrew Weiss. 1981. *The American Economic Review*, 71(3): 393–410.

Stephens, Inc. 2008. Payday Loan Industry Report.

Stephens, Inc. 2011. Payday Loan Industry Report.

Stoianovici, Petru Stelian and Michael T. Maloney. 2008. Restrictions on Credit: A Public Policy Analysis of Payday Lending. Working Paper.

Veritec Solutions, Inc. August, 2006. Florida Trends in Deferred Presentment.

Veritec Solutions, Inc. August, 2006. Oklahoma Trends in Deferred Deposit Lending.

West Virginia Office of the Attorney General (May 9, 2007). "Attorney General McGraw Reaches Agreement with WV's Last Payday Lender, First American Cash Advance." Press release. Retrieved on 2009-09-01 from: http://www.wvago.gov/press.cfm?ID=337&fx=more

Wilson, Bart J., Findlay, David W., Meehan, James W., Wellford, Charissa P. and Karl Schurter. 2008. An Experimental Analysis of the Demand for Payday Loans. Working Paper.

Zinman, Jonathan. 2010. Restricting consumer credit access: Household survey evidence on effects around the Oregon rate cap. *Journal of Banking and Finance*, 34(3): 546-556.

Table 1: Summary Statistics

Reported are sample means and number of observations (N) for the Moebs survey data on depository institutions, merged with county-level data from the 2000 Census, unemployment data from the BLS and bank deposit market data from the FDIC's Summary of Deposits database. For county and county-year variables, means and N are reported for the counties or county-years that appear in the institution-level database. *Allowed* = 1 for institutions in states allowing payday lending, 0 otherwise. *Access* $_0$ 10 indicates whether payday loans are available within ten miles of center of county where the institution is located. For stratification by *Access* 0 10, means are given for observations within states that prohibit payday loans.

	No Change in <u>Allowed</u> $(N = 17.762)$	Change in <u>Allowed</u> $(N = 2.373)$	Diff. significant at 5%	$\frac{Access_0_{10} = 0}{(N = 2.926)}$	$\frac{Access_0_10=1}{(N=389)}$	Diff. significant at 5%
Credit Union	0.41	0.41			0.40	
Creat Union	0.41	0.41	*	0.44	0.49	*
Commercial Bank	0.47	0.45	44 -tr	0.30	0.35	
Savings Bank	0.12	0.14	*	0.25	0.15	*
Total Assets	2,409,000	2,739,000		3,754,000	1,820,000	
County	(N = 1,750)	(N = 264)		(N = 210)	(N = 38)	
Median Income	36,900	37,400		42,500	42,700	
Population	126,500	132,600		276,300	198,700	
Percent urban	0.49	0.51		0.63	0.60	
Home ownership	0.73	0.72		0.69	0.71	
Percent white	0.82	0.81		0.84	0.84	
Percent black	0.07	0.13	*	0.08	0.09	
Percent hispanic	0.07	0.03	*	0.05	0.03	
Percent foreign born	0.04	0.03		0.06	0.05	
County-Year	(N = 7,675)	(N = 1, 114)		(N = 972)	(N = 152)	
Unemployment Rate	0.052	0.052		0.050	0.046	*
HHI	0.21	0.21		0.17	0.18	

The models below test whether the terms of overdraft protection at depository institutions vary with payday loan availability as measured by *Allowed*, an indicator for whether payday lending is allowed in the institution's state. Each specification includes state and year fixed effects, and is estimated using OLS. Robust standard errors, with observations clustered by state, are reported in parentheses.

Dependent Variable (mean):	Overdraft Fee (24.98)		Overdraft I	Limit (514.2)
	(1)	(2)	(3)	(4)
Allowed	1.73* (0.88)	1.84*** (0.67)	73.1**	59.2** (25.1)
ННІ	(0.00)	-0.30	(29.0)	4.5
CreditUnion		-2.38***		41.4*
SavingsBank		(0.38) -1.21***		-95.2**
LogAssets		(0.24) 0.96*** (0.08)		(44.7) 36.3*** (9.5)
County Controls?	Ν	Y	N	Y
Observations R ²	15,072 0.19	15,040 0.33	2,751 0.04	2,749 0.07

The models below test whether the terms of overdraft protection at depository institutions vary with payday loan availability as measured by *Access*, a vector of indicator variables measuring the distance to the nearest payday loan-allowing state. *Access*_X_Y equals 1 if the institution is located in a county whose center is within X and Y miles of a state that allows payday lending. *Access*_30+ is the excluded category. Each specification includes state-year fixed effects, and is estimated using OLS. Robust standard errors, with observations clustered by county, are reported in parentheses.

Dependent Variable (Mean):	Overdraft Fee (24.98)		Overdraft Limit (514.2)		
	(1)	(2)	(3)	(4)	
Access_0_10	1.15**	1.38***	29.7	-10.2	
Access_10_20	(0.56) -0.03 (0.71)	(0.53) -0.05 (0.71)	(101.4) 91.1 (208.0)	(100.1) 48.0 (180.7)	
Access_20_30	(0.71) -0.24 (0.73)	(0.71) -0.26 (0.60)	(208.9) -125.3 (135.2)	(189.7) -157.9 (138.2)	
HHI	(0.75)	-0.02	(135.2)	35.7	
CreditUnion		(0.07) -2.39*** (0.21)		47.8	
SavingsBank		(0.21) -1.09*** (0.21)		-91.6	
LogAssets		(0.21) 0.94***		(57.2) 38.1***	
Border		(0.05) -0.32* (0.18)		(10.8) -16.8 (21.0)	
County Controls?	N	Y	N	Y	
Observations R ²	15,072 0.24	15,040 0.37	2,751 0.06	2,749 0.09	

Table 4: Robustness

This table provides estimation results for several variations of the basic empirical models from Tables 2 and 3. The first two models estimate the coefficient on $Access_0_10$ for observations in payday prohibiting states, first without and then with county fixed effects. Regressions in Panel B vary functional form, using logs of the dependent variable. Columns 7 and 10 use LogDistance, log of the distance to the nearest payday-allowing state, in place of $Access_0_10$. Finally, the last two columns in Panels C and D report estimates within a sample that excludes geographically dispersed banks (those with less than 100% of deposits in the state or county of the surveyed branch). All specifications with *Allowed* include the full set of controls as in Table 2 regressions. Models with $Access_0_10$ and LogDistance include the full set of controls as in Table 3 regressions. Robust standard errors are reported in parentheses, with observations clustered by state in *Allowed* regressions and by county $Access_0_10$ and LogDistance in regressions.

	Pan	el A		Pane	el B			Panel C			Panel D	
Sample:	Payday Prohibited	Payday Prohibited	Full Sample	Full Sample	Full Sample	Full Sample	Full Sample	100% deposits in state	100% deposits in county	Full Sample	100% deposits in state	100% deposits in county
Dep. Variable: (Mean)	Overdraft H	Fee (25.30)	Log OD F	ee (3.19)	Log OD L	Lim (6.06)	Over	draft Fee (2	24.98)	Overa	lraft Limit ((514.2)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Allowed			0.083***	¢	0.11**			1.65**			52.2***	:
			(0.031)		(0.05)			(0.71)			(15.1)	
Access_0_10	1.69***	1.46		0.047**		0.02			1.04			-90.5
	(0.55)	(1.34)		(0.021)		(0.12)			(0.67)			(108.1)
LogDistance							-0.43			-3.8		
							(0.27)			(33.6)		
County FEs?	Ν	Y	Ν	Ν	Ν	Ν	N	Ν	N	N	Ν	Ν
Observations	2,252	2,252	14,827	14,827	2,749	2,749	14,859	12,125	8,242	2,671	2,452	1,801
R ² /Pseudo-R ²	0.37	0.45	0.26	0.30	0.08	0.11	0.37	0.28	0.30	0.09	0.07	0.10

Table 5: The Effect of Payday Credit on Overdraft Credit Offerings

The models below test whether credit unions' overdraft credit offerings vary with payday loan availability. The dependent variables are indicators for whether a credit union offers overdraft bounce protection (columns 1 and 2) and overdraft lines of credit (columns 3 and 4). The sample includes semiannual observations at the credit union level. Specifications with *Allowed* include fixed effects for each credit union, state and semiannual period, along with the full set of controls as in Table 2 regressions. Specifications with *Access_0_10* include state-by-semiannual period fixed effects along with the full set of controls as in Table 3 regressions. Reported are OLS estimation results with robust standard errors in parentheses. In calculating standard errors, observations are clustered by state in *Allowed* regressions and by county in *Access_0_10* regressions.

Dependent Variable:	OD Bounce Offe	OD Bounce Protection Offered?		redit Offered?
(Mean)	(0	37)	(0	37)
	(1)	(2)	(3)	(4)
Allowed	0.031**		0.009	
	(0.013)		(0.008)	
Access_0_10		0.019		0.006
		(0.025)		(0.029)
Credit Union FEs?	Y	Ν	Y	N
Observations	49,764	49,764	85,847	85,847
\mathbb{R}^2	0.75	0.33	0.81	0.34

The models below explore the relationship between payday loan prohibitions and aggregate (state-level) income and losses at depository institutions. All specifications include as controls the state-level unemployment rate and personal income, the log of total assets for depositories in the state, and state and year fixed effects. Robust standard errors are reported in parentheses, with observations clustered by state.

		Panel A:	Credit Unions			
Dependent Variable: (Mean)	Log Fee Income (3.0)	Log Loan Losses Other (2.2)	Loan Losses Other/ Fee Income (0.42)	Log Operating Income (3.2)	Log OD Protection Commitments (4.3)	Log OD LOC Commitments (4.1)
	(1)	(2)	(3)	(4)	(5)	(6)
Allowed	0.002 (0.064)	0.21*** (0.07)	0.08 (0.05)	-0.02 (0.11)	0.220 (0.160)	-0.030 (0.060)
Observations R ²	1,428 0.99	1,122 0.97	1,122 0.64	1,391 0.93	408 0.92	1,428 0.97
		Pan	el B: Banks			
Dependent Variable: (Mean)	Log Fee Income (3.90)	Log Loan Lo (0.0	osses Other 1)	Loan Losses Other/ Fee Income (0.04)	Log Operat (5	ting Income .5)

(2)

-0.23

(0.18)

769

0.75

(3)

0.002

(0.01)

816

0.19

(4)

0.11

(0.22)

776

0.91

* significant at 10%; ** significant at 5%; *** significant at 1%

Allowed

 \mathbb{R}^2

Observations

(1)

0.04

(0.09)

809

0.96

Table 7: Economic and Credit Market Conditions and Payday Loan Availability

The models below test whether economic and credit market conditions vary with payday loan availability using data on unemployment rates from the BLS and credit card balances and delinquency rates from the FRBNY/Equifax Consumer Credit Panel. Specifications with *Allowed* use state-level data, and include state and year fixed effects. Specifications with *Access* use county-level data, and include state-year fixed effects. Reported are OLS estimation results with robust standard errors in parentheses. In calculating standard errors, observations are grouped by state in *Allowed* regressions and by county in *Access* regressions.

Dependent Variable:	Unemploy (p	oloyment Rate Log Loans (pct) Credit Card		oans Card	Delinquent Loans Credit Cards (pct of loans)	
(Mean)	(4.79)	(5.59)	(8.0)	(8.0) (7.8)		(8.78)
-	(1)	(2)	(3)	(4)	(5)	(6)
Allowed	0.30 (0.30)		0.043** (0.02)		-0.29 (0.29)	
Access_0_10		-0.23 (0.15)		-0.003 (0.02)	、 ,	-0.12 (0.24)
Unemployment rate?	-	-	Y	Y	Y	Y
Personal income?	-	-	Y	Y	Y	Y
Observations	714	44,676	510	21,429	510	21,429
\mathbb{R}^2	0.73	0.48	0.96	0.76	0.94	0.64

Table 8: Consumer Loan Interest Rates and Payday Loan Availability

The models below test whether consumer loan interest rates at credit unions vary with payday loan availability using data at the credit union level at semi-annual frequency. Specifications with *Allowed* include fixed effects for each credit union, state and semi-annual period, along with the full set of controls as in Table 2 regressions. Specifications with *Access_0_10* include state-by-semiannual period fixed effects, along with the full set of controls as in Table 3 regressions. Robust standard errors are reported in parentheses, with observations clustered by state in *Allowed* regressions and by county in *Access_0_10* regressions.

	Panel A: Payday Loan Availability Measured by Allowed							
		Depe	endent variable:	Interest rate (pe	rcent)			
(Mean)	Credit Card	Consumer	New Vehicle	Used Vehicle	Ist Mortgage	2nd Mortgage		
	Loan	Loan	Loan	Loan	Loan	Loan		
	(12.23)	(12.78)	(7.15)	(8.32)	(7.34)	(7.87)		
	(1)	(2)	(3)	(4)	(5)	(6)		
Allowed	0.017	-0.055	0.002	0.014	-0.048	-0.025		
	(0.094)	(0.092)	(0.062)	(0.113)	(0.037)	(0.043)		
Observations	66,749	132,841	129,183	129,835	67,531	80,747		
R ²	0.65	0.68	0.73	0.74	0.79	0.72		

Panel B: Payday Loan Availabiolity Measured by Access_0_10

	Dependent variable: Interest rate (percent)							
(Mean)	Credit Card	Consumer	New Vehicle	Used Vehicle	lst Mortgage	2nd Mortgage		
	Loan	Loan	Loan	Loan	Loan	Loan		
	(12.23)	(12.78)	(7.15)	(8.32)	(7.34)	(8.32)		
Access_0_10	(1)	(2)	(3)	(4)	(5)	(6)		
	0.024	-0.067	0.053	-0.002	0.053	-0.079		
	(0.159)	(0.120)	(0.081)	(0.135)	(0.076)	(0.062)		
Observations	66,749	132,841	129,183	129,835	67,531	80,747		
R ²	0.21	0.18	0.48	0.44	0.51	0.55		



Figure 1: Overdraft Fees Around Payday Lending Prohibitions

Note: This plot shows coefficient point estimates for the event-time indicator variables in a regression of overdraft fees on event-time indicators, state and year fixed effects, and the full set of institution and county controls.

APPENDIX A: PAYDAY LOAN REGULATIONS

Summary of Coding for Allowed:

The Moebs survey of checking account fees and services was conducted in December of 2006, and in June for every other year. Five states prohibited loans throughout the sample period (*Allowed* = 0): CT, MA, NJ, NY and VT. Seven states changed from allowing to prohibiting payday lending between 1995 and 2008 (*Allowed* = 0 beginning in the year given in parentheses): MD (2002), GA(2004), NC (2006), WV (2006), PA(2007), DC (2008) and OR (2008). One state changed from prohibiting to allowing payday lending between 1995 and 2008 (*Allowed* = 1 beginning in the year given in parentheses): NH (2000). The remaining states allowed loans throughout the sample period (*Allowed* = 1).

States that prohibited payday lending throughout 1995-2008

New Jersey and New York forbid payday loans *via* check cashing laws that prohibit advancing money on post-dated checks (N.J. Stat. 17:15A-47 and NY CLS Bank 373) and usury limits (N.J. Stat. 2C:21-19 and NY CLS Penal 190.42). Massachusetts banned payday loans through a usury limit on small loans made or brokered in the state (ALM G.L.c.140 §96 and CMR 209 26.01). Connecticut prohibited lending *via* a cap on check cashing fees (Conn. Agencies Reg. § 36a-585-1) and small loan interest rates (Conn. Gen. Stat. 36a-563). Vermont prohibited payday lending through a usury limit (8 V.S.A. § 2230 and 9 V.S.A. § 41a).

We confirmed by reading 10-K filings and company websites that the largest multistate payday store operators – Ace Cash Express, Advanced America, Cash America, Check into Cash, Check 'N Go, Money Mart and Valued Services – did not operate payday loan stores in these five states.

States that prohibited payday lending between 1995 and 2008²¹

New Hampshire's small loan interest rate ceiling acted as a *de facto* ban on payday loans until it was removed in January 2000 (1999 NH ALS 248), and payday lenders entered thereafter.

Maryland banned payday lending through restrictions on fees charged by check cashers (MD Financial Institutions Code § 12-120) and small loan interest rates (MD Commercial Law Code § 12-306), and finally passed anti-loan brokering legislation (MD Commercial Law Code § 14-1902), effective June 2002 to eliminate the agency payday lending model, whereby payday lenders operated as agents, arranging loans for out-of-state banks.

Georgia banned payday lending with a law that took effect in May 2004 (O.C.G.A. § 16-17-1).

Payday lenders operated under the agent model in North Carolina and West Virginia until 2006. All remaining lenders agreed to exit North Carolina in March 2006, after facing a series of suits filed by the state Attorney General (see NC Department of Justice press release). First American Cash Advance, the last payday lender in West Virginia, operated under the agent model until July 2006 (see press release from WV Attorney General). North Carolina prohibits payday lending through a 36% interest rate cap on small loans (N.C. Gen. Stat. § 53-173). West Virginia prohibits payday lending by limiting fees on check cashing, prohibiting payday check cashing (W. Va. Code § 32A-3-1) and imposing a usury limit on small loans (W. Va. Code § 47-6-5b).

Payday lending was ostensibly banned throughout the sample period in Pennsylvania via a cap on small loan interest rates (P.A. 7 P.S. § 6201-6219), but the agent model was permitted through a law that sanctioned loan brokering (P.A. 73 P.S. § 2181-2192). Lenders ceased making payday loans in the state in mid-2006, after the FDIC placed restrictions on their bank lenders (Sabatini, 2006). The vast majority of lenders exited immediately, but Advance America, the largest national payday lender, continued to offer an alternative line of credit product until receiving an adverse court ruling in mid-2007 (see Advance America 9/07 press release).

The District of Columbia prohibited payday lending in November 2007, by limiting fees on check cashing and prohibiting post-dated check cashing (D.C. Code § 26-317 and 26-319).

Oregon placed a *de facto* ban on payday lending in July 2007 by imposing a 36% interest rate cap as well as restrictions on loan renewals (ORS § 725.622).

²¹ We have not captured every law change with *Allowed*. We include those that were binding, as confirmed through press releases, news stories and the public filings of the largest payday loan operators. In the case of one law sanctioning payday credit in Rhode Island (R.I. P.L. 2001, Ch. 371, § 4), we could not confirm the date payday lenders entered; according to a supervisor in the Division of Banking, check cashers began offering payday on transactions prior to the July 2001 law change. We do not count Rhode Island as a state with a change in *Allowed*.