Competition in a Consumer Loan Market:

Payday Loans and Overdraft Credit

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Abstract

We find that banks and credit unions adjust the terms of overdraft credit based on the availability of payday credit, a substitute product. When payday loans are available, depositories increase overdraft credit limits and raise overdraft fees. These findings suggest that banks respond to competition by improving the quality of their product, paying checks that they would have otherwise bounced. The increase in overdraft fees is surprising when viewed in isolation but sensible given the risk involved in extending additional credit. Using Federal Reserve data on bounced checks, we find no support for the view that overdraft fees rise because payday and overdraft credit are complements. Furthermore, we show that credit unions' overdraft activities are less profitable when payday loans are available, consistent with increased competition. Our findings illuminate competition in the large, yet largely unstudied, small dollar loan market.

I.   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 $36 billion on overdraft and other deposit fees in 2006 (GAO 2008). On the other side are payday lenders who advance cash against customers' personal checks for about two weeks, providing the check-writer with $50 to $1000 of credit in the interim. An estimated 19 million households tapped the $50 billion dollar payday loan market in 2007 (Stephens 2008).

Both types of credit are controversial, and as a result, increasingly regulated. Payday lenders have long been maligned for high prices, while banks 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 credit focuses on the effect of credit access on household well-being. Our focus is different; we ask whether competition from payday lenders affects the price and availability of overdraft credit. Do banks raise overdraft fees when payday loans are no longer available? Do they extend less overdraft credit when they are no longer pushed by a competitor? In light of the regulatory flux in these markets, these are important questions.

Our analysis uses data from a national survey of banks and credit unions to measure the effect of payday lending on overdraft fees and credit limits. We estimate the effect through two different identification schemes. The first, following Morgan and Strain (2008), compares how overdraft terms change as states switch from allowing to prohibiting payday credit, or vice versa. The second, following Melzer (2011), focuses on states that prohibit payday credit, and compares terms at institutions located near the border of a state that allows payday credit with terms at institutions located further from such a border. 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 payday laws and the location of intermediaries in one state are independent of laws in neighboring states. Importantly, the identifying assumptions of these two models are independent, which strengthens the overall research design.

We find that depository institutions change their overdraft credit programs along several margins when they compete with payday lenders. Surprisingly, they raise prices: both models imply that overdraft fees are roughly 5% higher when payday loans are available. At the same time, they provide more generous overdraft coverage. Institutions that previously refused to cover any overdraft attempts initiate "bounce protection" programs under which they extend credit up to a limit, and those already offering bounce protection provide higher credit limits. These increases in overdraft credit are substantial: we estimate a 6% increase in the frequency of bounce protection and a 12% increase in overdraft credit limit.

We interpret these changes as adjustments to both price and product quality induced by competition. Depositories offer a higher quality checking product by covering more checks, but doing so involves an incremental cost – default losses on overdraft credit – for which they raise prices. Banks respond in this way because depositors can use payday credit to avoid bounced

checks. In fact, Morgan and Strain (2008) document such substitution around payday loan prohibitions in North Carolina and Georgia using Federal Reserve check processing data, and we confirm their results in a sample with four additional state law changes. Our conjecture, then, is that banks extend overdraft credit to preserve fee revenue that they would have earned from bounced check fees in the absence of payday lending.

Several ancillary findings confirm this interpretation. Using bank and credit union regulatory data, we show that the increases in overdraft coverage are costly – overdraft credit losses rise along with credit limits when payday loans are available. We also find no evidence of increased fee revenue, despite the rise in overdraft prices, which suggests that the overall quantity of overdraft activity does not rise with payday availability. Together, these two results imply that the profitability of overdraft and bounced check activities decline due to payday loan competition, a conclusion for which we offer both direct and indirect evidence. Looking at profitability directly, we find that the ratio of loan losses to fee revenue increases with payday lending; for every dollar of fee revenue earned from bounced checks and overdrafts, depositories sustain higher losses. As an indirect measure of overdraft profitability, we also consider "free" checking offers. On this point, we find robust evidence that depositories are less likely to offer "free" checking accounts when they face payday loan competition. The literature on add-on pricing uses checking accounts as a canonical example of a base good that is subsidized to earn profits through add-on services. Viewed through this lens, our results perhaps indicate that banks are less willing to subsidize accounts because overdraft activities are less profitable.

In falsification exercises, we also show that our two measures of payday credit access bear no relationship with unemployment rates, credit card loan balances and credit card loss rates. These findings are useful in ruling out the concern that our findings are driven by an

omitted variable like the demand for credit or the riskiness of credit that might correlate with payday availability.

As the first paper to study how the availability of payday credit affects the price and availability of another type of credit, our paper extends the growing literature on the consequences of payday credit access.[1] Fusaro (2008) also studies the cost of overdraft credit, but does not investigate its determinants. Hannan (2006) and Deyoung and Phillips (2009) analyze competition within the overdraft and payday credit markets, respectively, but do not look at competition across the two industries.

Section II compares overdraft and payday credit and makes the case, based on prices and usage patterns, that they are partial substitutes. Section III describes the exit and entry of payday lenders that constitute the "experiments" we use to study overdraft and deposit outcomes. Section IV and V presents the results on bounced check volumes and overdraft terms, respectively. Section VI considers the effect of payday lending on overdraft revenues, credit losses and profits. Section VII concludes by discussing implications for consumer welfare, policy, and future research.

II.   Overdraft and Payday Credit

This section describes the two main players in the small-dollar loan market and compares the pricing and usage of their services.

II.1.   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. Traditionally, banks made those decisions on an *ad hoc* basis, but in the mid-

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[1] See Morse (2009), Morgan and Strain (2008), Melzer (2009), Skiba and Tobacman (2008a), Carrell and Zinman (2008), Zinman (forthcoming), Stoianovici and Maloney (2008), Wilson et al. (2008), and Campbell et al. (2008).

to late-1990s financial advisory firms began marketing trade-marked, computer algorithms designed to automate and optimize these decisions. The advent of automated overdraft programs greatly increased the quantity of overdraft credit.

The FDIC's (Federal Deposit Insurance Corporation) recent study of bank overdraft programs reveals how ubiquitous overdraft credit programs have now become (FDIC 2008). Roughly 70 percent of banks with assets over $250 million have automated overdraft of one sort or another. The study shows that depository institutions offer a full "suite" of overdraft credit, ranging from lines of credit (LOC) to discretionary overdraft protection, more familiarly known as "bounce protection," the variety we study.

Depending on the amount of the overdraft, overdraft credit can be more expensive than payday credit. The median NSF (insufficient funds) fee charged by depository institutions *per* overdraft was $27 in 2007 (FDIC 2008). At that fee, the implicit annual percentage interest (APR) on a hypothetical, two week overdraft of $60 is about 1,173 percent, more than the typical APR for payday credit. According to FDIC (2008), the median overdraft amount for debit, ATM and check transactions was $20, $60 and $66 in 2006, suggesting that a substantial number of transactions can be funded more cheaply through payday credit.

While some overdraft activity is undoubtedly accidental and therefore not affected by payday loan availability, we maintain that payday loans and overdraft credit are potential substitutes for a substantial number of overdraft creditors. In fact, usage patterns of overdraft and payday credit are quite similar, with repeated borrowing common for both types of credit (Table 1). This similarity suggests overlap in the customers using these two types of credit.

Supplying overdraft credit generates substantial revenue for depository institutions by any number of measures. For the median bank studied in FDIC (2008), NSF fee income

accounted for 43 percent of noninterest income and 21 percent of net operating income. Banks and credit unions, particularly the latter, are surprisingly reliant on revenue from overdraft credit (Table 2).

Supplying overdraft credit is not without risks or costs, however. Depository institutions involuntarily closed 30 million accounts between 2001and 2005 for "recidivist" check bouncing, and the trend is upward (Campbell, Jerez-Martinez, and Tufano 2008, p.1). The average loss *per* bad account in 2007 was $310 (FDIC 2008).

II.2. Payday Credit

Payday lending also 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 $50 fee for $350 of credit in the typical transaction. At maturity, two to four weeks later, the loan is repaid either when the lender cashes the check, or the borrower gives the lender cash in person.

Payday credit underwriting is minimal; applicants must prove that they have a checking account and a job. The checking account pre-requisite 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 substitutes, implying negative correlation in their individual demand. The controversy over payday lending has led to a large literature investigating how payday credit access affects a variety of outcomes: crime and foreclosure (Morse 2011), bounced check rates and complaints against lenders and debt collectors (Morgan and Strain 2008), difficulty paying bills (Melzer 2011), bankruptcy (Skiba and Tobacman 2008a; Stoianovici and Maloney 2008), air-force reenlistment (Carrel and Zinman 2008), expected well-being (Zinman 2010), virtual well-being (Wilson et al. 2008), and

involuntary account closings (Campbell et al. 2008). The findings from that literature are mixed, with some studies concluding that payday credit ameliorates financial hardship and others concluding the opposite. None of the literature studies how payday credit access affects the price of substitute forms of credit, as we do.

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

The controversy over payday credit has also led to considerable flux in the state laws governing it. Following Melzer (2011) and Morgan and Strain (2008), we use those fluctuations as well as cross-sectional differences to identify plausibly exogenous variation in payday credit supply.

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 distinct 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 prohibiting to allowing payday credit, and vice-versa. One state, New Hamphshire, switched from prohibiting to allowing in 2000. The District of Columbia and six states switched from allowing to prohibiting payday credit between 2002 and 2008.[4]

Our identifying assumption is that political-economy decisions driving changes in *Allowed* are exogenous with respect to outcomes. We follow the literature in taking the law

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[4] These six states are Georgia, Maryland, North Carolina, Pennsylvania, Oregon and West Virginia.

changes as exogenous, but we also provide evidence for that assumption in falsification tests reported later.

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 (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 $Access\_30\_plus$.

Note that *Access* varies within state, but only in states that prohibit payday lending.[5] Its effect is identified by comparing outcomes at institutions relatively near states that allow payday credit to outcomes 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*. That 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 assumption, we control for the institution type, institution size (log assets), and the concentration of the local deposit market.

The institutional and county characteristics defined by *Allowed* and *Access* differ in a few ways (Table 3). States with changes in *Allowed* have higher proportions of Hispanics and blacks, and relatively more savings banks (versus commercial banks). Savings banks are also over-represented (relative to commercial banks) in counties without access to payday credit

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[5] The 13 states that prohibited payday lending for some time during the sample period are CT, DC, GA, MA, MD, NC, NH, NJ, NY, OR, PA, VT, and WV.

(*Access_0_10 =1*). Unemployment rates are significantly lower in those counties as well. Importantly, our regression analysis controls for those differences by including institution and county-level controls.

IV.   How do Overdraft Check Volumes Vary with Payday Lending?

Our analysis begins by testing whether payday loans are used to substitute for checking account overdrafts. We use quarterly data on the volume of returned ("bounced") checks processed by Federal Reserve Check Processing Centers (Fed CPCs) between 1998:Q1 and 2008:Q3, and examine how check volumes change when payday lending is prohibited in a CPC area.

Some limitations of the data require discussion. First, we would ideally analyze all overdraft attempts, both covered and uncovered, but we observe only those that are not covered, i.e., those that are bounced.[6] Second, Fed CPCs operate regionally; a CPC might process checks drawn on depository institutions from other states (which introduces some error in variables) and some states do not have a Fed CPC (which limits the events we can study). Third, with electronic payments supplanting checks, the Federal Reserve in 2004 began consolidating its check processing operations by closing some CPCs and transferring their operations to others. To maintain continuous series for those CPCs, we follow the bank merger literature and create *pro forma* series by combining the data for those CPCs at the beginning of the observation period.[7] New Hampshire and the District of Columbia have never had a CPC within their borders so we omit their law changes from our set of "experiments." That leaves six events, all bans, with which we identify the effect of payday credit access on rates and amounts of returned checks.

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[6] To clarify, overdraft attempts can be divided into two mutually exclusive and exhaustive categories, returned (bounced) checks and covered (protected) overdrafts.
[7] Having to use *pro forma* series tends to attenuate the impact of payday lending bans on the outcomes.

To determine how returned check patterns vary with payday credit access we estimate difference-in-difference regressions:

(1) $Y_{csdt} = \alpha + a_c + a_t + \beta Allowed_{st} + \gamma Unemployment_{dt} + \delta Unemployment_{st} + \varepsilon_{csdt}.$

The dependent variable, Y_{csdt}, denotes either the rate of returned checks or the average dollar amount *per* returned check at CPC *c* in state s in Federal Reserve District *d* at time (year-quarter) *t*. The rate of returned checks is measured per number of *per* number of checks processed and *per* dollar value of checks processed. The rate *per* number processed seems more pertinent here because payday credit users, having lower than average income, are likely to write (and bounce) smaller checks with only muted effects on the dollar rate of returned checks. The regressions include a fixed effect for each CPC (a_c) and each date (a_t). *Allowed* is defined as before, except the NH and DC events are excluded. The two *Unemployment* variables denote the quarterly unemployment rate in the Federal Reserve District and state where CPC *c* is located.

Table 4 reports the returned check regressions. The results in column (1) indicate that the returned check rate *per* checks processed, the measure more closely associated with small dollar check writers, declines when payday lending is allowed. The coefficient on *Allowed* of 1.31 implies the rate of returns *per* number processed falls by 0.24 percent relative to average, a surprisingly large amount. The rate of returned checks *per* dollar processed tends downward (Column 2), but the decline is not statistically significant. The final specification indicates that the amount *per* returned check rises when payday lending is permitted (significant at the ten percent level). The average amount *per* return increases by $124 dollars when payday lending is permitted, an increase of 14 percent relative to average.

These findings – fewer, but larger bounced checks when payday loans are available – are consistent with the hypothesis that some depositors use payday loans to avoid bounced checks, particularly small checks.[8] It is also worth noting that changes to bank overdraft policies may also play a role. If banks increase overdraft limits when payday loans are available, we would also expect to observe fewer bounced checks of larger average value. We return to this point in Section VI, but first we show how overdraft terms vary with payday lending.

V.   How Overdraft Terms Vary With Payday Lending?

V.1.   Data

The data on overdraft prices, overdraft limits and free checking are from Moebs $ervices (sic), a research and consulting firm focused on financial services. For their overdraft pricing survey, 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.[9]

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 three variables of interest: *Fee,* the fee charged per overdraft event; *OD Limit*, the maximum overdraft balance allowed under overdraft protection; and *Free Checking*, a binary variable indicating whether the institution offers free checking accounts. *Fee*, measured in constant (2008) dollars, is

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[8] The finding of fewer, but larger returned checks is also consistent with an adverse selection stemming from the lump sum pricing of overdraft credit. That lump sum pricing means that for sufficiently large overdrafts, overdraft credit is cheaper than payday credit. Thus, when payday credit is available, depositors prone to small overdrafts may switch to payday credit to avoid overdrawing while depositors prone to large overdrafts may stick with overdraft credit. That sorting implies fewer, but larger returned checks, as observed. That sorting is adverse because the large overdrafters that stick with overdraft credit cost more to serve because they borrow more and if they default, depositories lose more. While this adverse selection could help explain why overdraft prices increase when payday credit is available, we do not test that hypothesis formally because we do not have the requisite data on *all* overdraft attempts, including those that were covered.

[9] 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.

observed at banks from 1995 to 2008, and at credit unions from 1999 to 2008. Average and

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. *Free*

Checking is observed from 2003 to 2008. Free checking is common; about 75 percent of

depository institutions offer it.

We match the Moebs survey data with balance sheet data filed by each institution with

the FDIC and NCUA (National Credit Union Administration). We also use the FDIC's Summary

of Deposits database to calculate the HHI (Hirshman-Herfindahl index) of bank deposit market

concentration for each county and year.[10] 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.

V.2.   Findings with *Allowed*

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

regressions of the form:

$$(2)\ Y_{icsy} = \alpha + a_s + a_y + \beta Allowed_{sy} + \theta HHI_{cy} + \vec{\gamma} \boldsymbol{Cnty}_{cy} + \vec{\pi} \boldsymbol{Inst}_{iy} + \varepsilon_{icsy}.$$

Y_{icsy} represents *Fee, OD Limit* or *Free checking* 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.

Some versions of (1) include a Census division-year effect to control for region-specific trends.

HHI (Herfindahl-Hirschman Index) measures bank deposit market concentration in each county-

year. *Cnty* is a vector of eight county-level control variables, including the unemployment rate,

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[10] NCUA does not collect the equivalent data for credit unions so credit union market shares cannot be calculated.

which varies across years.[11] *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 regressions are estimated by ordinary least squares, but we report probit estimates of *Free Checking* in robustness tests. Observations are clustered by state in calculating Huber-White robust standard errors.

Table 5 reports the regression estimates. The results indicate that access to payday credit is associated with higher overdraft fees and credit limits, and reduced availability of free checking. The coefficient on *Allowed* is positive and significantly different from zero in both *Fee* regressions. The baseline difference-in-difference model, without county and institution controls, implies overdraft fees increase by $1.09 when payday credit is available. Adding county and institution controls raises the estimated effect to $1.31, a 5 percent increase relative to the average overdraft fee of $25.[12] *Allowed* also has a positive and significant coefficient in both *OD Limit* regressions. In the second model, the coefficient on *Allowed* of 63.1 implies that depositories increase their overdraft limits by 12% relative to average when payday credit is available. Lastly, the *Free Checking* regressions indicate depository institutions are less likely to offer free checking when payday credit is allowed. *Allowed* is negative and significant in both specifications. Both models imply that depositories in states that allow payday lending are five percentage points less likely to supply free checking.

Before discussing the results, we document very similar findings using an entirely different measure of payday credit availability.

V.3. Findings with Access

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[11] The county-level Census controls are cubics in median income, population and percent urban population; percent black, white, Hispanic and Asian; percent home hownership and percent foreign born.

[12] The estimated coefficient on *Allowed* is also stable when county dummy variables are used in place of the *Cnty* vector (results not reported).

A potential concern with *Allowed* is that states endogenously liberalize their payday lending laws as overdraft fees increase, leading to a biased estimate of β. Using *Access* reduces those concerns, as the identifying variation in *Access* does not depend on law changes in the institution's home state.

The regression model using *Access* is:

$$(3)\ Y_{icsy} = \alpha + a_{sy} + \vec{\beta}\boldsymbol{Access}_{cy} + \vec{\gamma}\boldsymbol{Cnty}_{cy} + \delta BORDER_c + \theta HHI_{cy} + \vec{\pi}\boldsymbol{Inst}_{icsy} + \varepsilon_{icsy}.$$

Apart from replacing *Allowed* with *Access,* model (3) differs from (2) in two ways. First, model (3) includes a state-year effect (instead of state and year effects) to exclude variation in *Access* created by the state-level changes in payday availability captured by (2). Second, some specifications of (3) 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 of the estimates we include all observations in the regression sample, but the identifying variation in *Access* comes from institutions in the thirteen states that prohibit payday lending at some time during the sample.

Table 6 reports the regression estimates. We observe the same significant differences across types of institutions and size of institution as with regression model (2). The effect of market concentration (HHI) is insignificant, as before.

For overdraft fees and free checking, the results with *Access* are very similar to those with *Allowed.* Overdraft fees are significantly higher when payday credit is accessible. These estimates are very close to the earlier estimates; given the type and size of institutions and other controls, overdraft fees are $1.48 higher when payday credit is available within 10 miles. Access

beyond ten miles does not significantly affect overdraft prices.[13] Depository institutions are also

5 to 9 percentage points less likely to offer free checking if payday credit is accessible within 10

miles, with no discernible effect at greater distances. 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 for both *Fee* and *Free Checking*. The results for *OD Limit* reveal little about the

relationship between payday credit and overdraft limits due to large standard errors on the *Access*

coefficients.[15]

V.4.   Robustness

Table 7 shows that the findings above are robust to alternative functional forms, a

continuous analog of *Access* and sample restrictions that exclude geographically dispersed banks.

The log-linear model with *Log(Fee)* as the dependent variable yields an estimated effect

of *Allowed* and *Access* of between four percent and six percent, as shown in Columns 1 and 2 of

Panel A. This analysis confirms that the nominal to real price adjustment does not change the

results. Estimating a probit model for *Free Checking* (Panel B, Columns 1 and 2) yields marginal

effects very similar to the linear probability estimates in the main results.

Column 3 in each panel confirms the results of model (3) using a continuous measure,

LogDistance, instead of *Access*. A one log point increase in the distance to a state that allows

payday credit increases the probability that *Free Checking* is available by four percentage points

and decreases overdraft fees about 50 cents.

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[13] F-tests reject equality between the coefficients on *Access_0_10* and *Access_10_20* (p-value 0.08), and between the coefficients on *Access_0_10* and *Access_20_30* (p-value 0.02).

[15] 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 sample, but the identifying variation in *Access* comes from all sample years.

Finally, Columns 4 and 5 of each panel show that the main findings are stable when the sample is restricted to institutions that have a large proportion of deposits, at least 50 percent, 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 often set uniformly across the entire branch network.

V.5.   Findings with Credit Union Regulatory Data

In this section we validate the findings on overdraft limits using additional data on overdraft activities reported by credit unions in regulatory filings (Call Reports). The National Credit Union Administration (NCUA) mandates detailed disclosure on overdraft programs; credit unions must report whether they offer bounce protection or overdraft lines of credit, and if so, they must report the aggregate amount of unused commitments under each program. Banks are not required to report such data.

Consistent with the findings in the Moebs data, the results in Table 8 show that credit unions increase overdraft coverage when they compete with payday lenders. They do so along two dimensions. First, a credit union is more likely to offer bounce protection when payday lending is allowed. The coefficients on *Allowed* and *Access_0_10* are similar, at roughly two and a half percentage points, with the coefficient on *Allowed* significant at the 5 percent level. Overall, 37% of credit unions offer bounce protection during the sample period, implying payday credit access is associated with a 6 percent to 7 percent increase in the proportion of institutions offering bounce protection. Second, credit unions report higher unused overdraft protection commitments when payday loans are available. Again, specifications using *Allowed* and

Access_0_10 suggest similar increases, with the effect of *Allowed* significant at the 5 percent level. Unused commitments increase by roughly 20 percent over, or $200,000 over the $1 million average level of unused commitments. These results indicate that when they compete with payday lenders, credit unions increase overdraft coverage on both the extensive margin – more offer coverage – and the intensive margin – among those offering overdraft, credit limits increase.

These changes appear to be specific to the bounce protection program, with which payday loans compete most directly; as shown in columns 3 and 5, changes in the availability and unused commitments of overdraft lines of credit are small and statistically insignificant. This insignificant finding for overdraft lines of credit helps rule out the possibility that some unobserved change is driving up both overdraft credit supply and payday loan availability.

VI.   Fee Income, 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 overdraft attempts, whether covered or not. They also report overdraft credit losses in a residual loan loss category (*Loan Losses Other*), as well as pre-tax profits (*Operating Income*). These data are observed semi-annually from June 1995 through December 2008 for credit unions and from June 2001 through December 2008 for banks.

We use *Fee Income* as a proxy for overdraft revenue and test whether revenue increases with payday availability. Given that the average price per overdraft attempt is 5% higher when payday loans are available, we would expect overdraft revenues to be higher as well if the number of attempts also increases. As in model (2), we use a difference-in-difference approach,

with aggregate *Fee Income* at the state level regressed on *Allowed*, state fixed effects, time fixed effects and two time-varying controls, personal income and the unemployment rate. Estimation results are reported in the first column of each panel in Table 9. In neither case is fee income significantly related to *Allowed*. For banks, the coefficient on *Allowed* of 2.5 suggests a modest increase of $2.5 billion or 2.5% relative to average fee income of $100 billion. For credit unions, *Allowed* is associated with a $3.3 million increase in fee income, roughly 10% relative to the average of $38.2 million. In both cases, but particularly for banks, there are wide confidence intervals around these estimates.

Next, we consider loan losses. 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. Among banks, we find no relationship between losses and *Allowed*, perhaps because of 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 payday availability. This suggests lower profitability in overdraft activities; for every dollar of fee income earned, credit unions give up a larger share to defaults. Based on point estimates, *Operating Income* also declines with *Allowed*, very modestly at banks and more significantly credit unions. However, these findings are not statistically significant.

Our analysis of overdraft revenue, losses and profits shows no evidence that demand for overdraft increases with payday availability, though it does confirm that credit unions bear additional credit losses as they expand overdraft coverage.

VI. Falsification

How do we explain our finding of price-increasing competition? Perhaps it is the result of an omitted variable in each model, whereby payday availability coincides with greater demand

for credit or greater default risk among borrowers; overdraft prices are higher in the presence of payday lending, but not *because of* payday lending. Notably, these conditions would have to change over time to confound the effect of *Allowed*, and spill across state borders to confound the effect of *Access*. To examine this concern we run three falsification exercises that test whether payday availability correlates with county unemployment rates, demand for credit card loans, and loss rates on credit card loans. The results, shown in Table 10, show no statistically significant relationship between these variables and either measure of payday loan availability.

VII. Conclusion

Quite a lot has been written about whether access to payday credit raises or lowers welfare of users, but nothing has been written about the competitive implications of payday credit access. Our findings suggest that competition from payday lenders leads depositories to improve the quality of their deposit services by increasing overdraft limits and increasing the supply of bounce protection. Depositories do that not out of altruism, of course, but to preserve some of the revenue they lose on bounced checks fees when erstwhile overdrawers switch to payday credit. The increased extension of overdraft credit is not a free lunch, however, as it entails credit risk to depositories. As a result of the extra risk, depositories charge more for overdraft credit. Were it not for the increase in overdraft prices, the welfare implications would be obvious; competition from payday lenders would be welfare improving. Given the price increase, the implications are ambiguous.

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Table 1: The Distribution of Deposit Overdrafts and Payday Loans in 2006

Overdrafts

# of overdrafts per year	% of depositors	% of overdrawers	Annual fees incurred ($)
0	75.0	-	0
1 – 4	12.0	48.0	64
5 – 9	5.0	20.0	215
10 – 19	4.0	16.0	451
20 or more	4.9	19.6	1610

Source: FDIC (2008, p. IV, Executive Summary points 2,3,4). "Annual fees incurred" is the average amount of fees incurred by the customers in each borrowing range.

Payday Loans

# of payday loans per year	% of borrowers	Annual fees incurred ($)
1 – 4	39.8	109
5 – 9	24.0	306
10 – 19	26.8	634
20 or more	9.3	1049

Source: Veritec Solutions, Inc. Based on data for payday borrowers in Florida and Oklahoma from September 2005 through August 2006. "Annual fees incurred" is calculated by multiplying average fee per loan ($43.70) by the midpoint of each borrowing range (or 24 loans in the final category).

Table 2: Importance of Overdraft Revenues to Depository Institutions

	Overdraft (OD) Revenue ($ billions)	Net Operating Income (NOI) ($ billions)	OD Revenue/NOI (percent)
Banks	26.1	$145.8	17.9
Savings Banks	3.5	21.9	16.0
Credit Unions	3.5	5.8	60.4
Total	33.1	173.7	19.1

Source: Moebs $ervices (http://www.moebs.com/Default.aspx?tabid=125) using FDIC and NCUA 2003 Call Reports and 5300 Reports

Table 3: Average Institution and County Characteristics, by Change in *Allowed* and *Access_0_10*.

Reported are means and number of observations (N). *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 only for observations in states that prohibit payday loans.

	No Change in *Allowed*	Change in *Allowed*	Diff. significant at 5%	*Access_0_10 = 0*	*Access_0_10 = 1*	Diff. significant at 5%
Institution	(N = 17,837)	(N = 2375)		(N = 2,830)	(N = 391)	
Credit Union	0.41	0.41		0.44	0.49	
Commercial Bank	0.47	0.45	*	0.30	0.36	*
Savings Bank	0.12	0.14	*	0.26	0.15	*
Total Assets†	2,409,000	2,739,000		3,874,000	1,824,000	
County	(N = 1,750)	(N = 264)		(N = 199)	(N = 38)	
Median Income	36,900	37,400		42,800	42,700	
Population	126,500	132,600		283,400	198,700	
Percent urban	0.49	0.51		0.64	0.60	
Home ownership	0.73	0.72		0.69	0.71	
Percent white	0.82	0.81		0.83	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 = 931)	(N = 155)	
Unemployment Rate‡	0.052	0.052		0.050	0.046	*
HHI	0.21	0.21		0.17	0.18	

† N = 17,762 for No Change in *Allowed*, N= 2,373 for Change in Allowed, N = 2802 for *PaydayAccess_0_10 = 0*.

‡ N = 7, 764 for No Change in *Allowed*.

Table 4: Fewer, but Larger, Returned Checks When Payday Credit is Permitted

Reported are OLS estimates using check processing data from Federal Reserve Regional Check Processing Centers (CPC) over 1998Q1-2008Q3. *Allowed* equals one if state permitted payday lending, zero if not. *Allowed* is identified by bans in six states: GA, NC, MD, WV, OR and PA. Regressions include CPC and date fixed effects. Standard errors, given in parentheses, are clustered by CPC .

Dependent variable:	#Returned/#Processed	$Returned/$Processed	$Returned/#Returned
(mean)	(1.29%)	(1.21%)	(0.869 thousand)
	(1)	(2)	(3)
Allowed	-0.31*	-0.16	0.124*
	(0.16)	(0.12)	(0.07)
State Unemployment	0.017	-0.012	0.015
	(0.06)	(0.05)	(0.02)
District Unemployment	-0.060	-0.020	-0.070**
	(0.10)	(0.10)	(0.03)
Constant	1.67***	1.78***	1.42***
	(0.35)	(0.35)	(0.15)
Observations	1325	1325	1325
R^2	0.68	0.68	0.82

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

Table 5: How Payday Credit Access Affect Overdraft Fees and Limits, and Free Checking

Reported are OLS regression estimates (robust standard errors clustered by state). *Allowed* = 1 for institutions located allowing payday credit, zero otherwise.

	Dependent Variable (mean):					
	Overdraft Fee (24.98)		*Overdraft Limit (514.2)*		*Free Checking (0.73)*	
	(1)	(2)	(3)	(4)	(5)	(6)
Allowed	1.09*	1.31**	57.1**	63.1**	-0.051**	-0.049**
	(0.62)	(0.52)	(25.8)	(0.0)	(0.0)	(0.022)
HHI		-0.29		4.33		0.04
		(0.99)		(89.700)		(0.1)
CreditUnion		-2.38***		41.5*		0.24***
		(0.38)		(21.800)		(0.0)
SavingsBank		-1.22***		-96.8**		0.08**
		(0.24)		(44.700)		(0.0)
LogAssets		0.96***		36.4***		0.04***
		(0.09)		(9.500)		(0.0)
State and Year FEs?	Y	Y	Y	Y	Y	Y
County Controls?	N	Y	N	Y	N	Y
Division-Year FEs?	N	N	N	N	N	N
Observations	15,072	15,040	2,751	2,749	10,524	10,504
R^2	0.19	0.32	0.04	0.07	0.04	0.10

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

Table 6: Effects of Local Payday Credit Access on Overdraft Fees and Limits, and Free Checking

Reported are OLS estimates (robust standard errors clustered by county). *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.

Dependent Variable (Mean):	*Overdraft Fee (24.98)*		*Overdraft Limit (514.2)*		*Free Checking (0.73)*	
	(1)	(2)	(3)	(4)	(5)	(6)
Access_0_10	1.20**	1.48***	-4.80	-41.1	-0.051	-0.088**
	(0.56)	(0.55)	(98.0)	(94.3)	(0.04)	(0.04)
Access_10_20	0.14	0.23	67.3	20.4	-0.05	-0.05
	(0.60)	(0.66)	(236.2)	(217.1)	(0.04)	(0.04)
Access_20_30	-0.18	-0.09	-147.5	-176.6	0.01	0.02
	(0.70)	(0.58)	(132.3)	(133.0)	(0.03)	(0.03)
HHI		-0.02		37.7		0.06
		(0.67)		(80.7)		(0.06)
CreditUnion		-2.39***		46.5		0.24***
		(0.21)		(36.2)		(0.02)
SavingsBank		-1.10***		-96.1*		0.09***
		(0.21)		(57.8)		(0.02)
LogAssets		0.95***		38.0***		0.04***
		(0.05)		(10.7)		(0.00)
Border		-0.32*		-14.9		0.04***
		(0.18)		(21.2)		(0.01)
State-Year FEs?	Y	Y	Y	Y	Y	Y
County Controls?	N	Y	N	Y	N	Y
Observations	15,072	14,995	2,751	2,745	10,524	10,489
R^2	0.24	0.37	0.06	0.09	0.07	0.12

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

Table 7: Robustness

Results are provided for several variations on the basic empirical models in Tables 4 and 5. Regressions in the first two columns of each panel assess robustness relative to functional form: Panel A uses the log of *Fee* as the dependent variable, while Panel B assumes a probit functional form for *Free Checking* . Column 3 of each panel uses an alternative payday access measure: *LogDistance* , the natual logarithm of the distance to the nearest allowing state, replaces the *Access_X_Y* dummies. Finally, Columns 4 and 5 report results of the baseline model estimated on a restricted sample that excludes large, geographically dispersed banks (those with less than 50% of deposits in the state or county of the surveyed branch). Robust standard errors grouped by state (Column 1 & 4 of each panel) and by county (Columns 2, 3 & 5 of each panel) are reported in parentheses.

	Panel A					Panel B				
Sample:	Full Sample	Full Sample	Full Sample	> 50% deposits in state	> 50% deposits in county	Full Sample	Full Sample	Full Sample	> 50% deposits in state	> 50% deposits in county
Model Type:	OLS	OLS	OLS	OLS	OLS	Probit	Probit	OLS	OLS	OLS
Dependent Variable (Mean):	-----Log Fee (3.19)-----		--------Overdraft Fee (24.98)--------			----------------------Free Checking (0.73)----------------------				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Allowed	0.061**			1.29**		-0.063**			-0.039*	
	(0.026)			(0.55)		(0.030)			(0.023)	
Access_0_10		0.044**			1.23**		-0.088**			-0.094**
		(0.021)			(0.56)		(0.034)			(0.042)
LogDistance			-0.48*					0.036*		
			(0.26)					(0.02)		
State-Year FEs?	N	Y	Y	N	Y	N	Y	Y	N	Y
State and Year FEs?	Y	-	-	Y	-	Y	-	-	Y	-
County Controls?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Institution Controls?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
HHI ?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Border ?	N	Y	Y	N	Y	N	Y	Y	N	Y
Observations	14,827	14,783	14,902	13,509	11,137	10,483	10,268	10,389	10,014	8,959
R^2/Pseudo-R^2	0.25	0.30	0.37	0.31	0.32	0.09	0.10	0.12	0.10	0.13

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

Table 8: Bounce Protection and OD Line of Credit, Offers and Unused Commitments

Reported are OLS estimates for regressions of overdraft credit supply on *Allowed* and *Access*. The regression sample covers credit unions, who are required to disclose this information in their regulatory filings.

Dependent Variable: (Mean)	*ODBP offered* (0.37)		*OD LOC offered* (0.37)		*OD Commitments (unused)* (1032.7)		*OD LOC Commitments (unused)* (899.9)	
Allowed	0.024**		0.011		213.3**		40.9	
	(0.012)		(0.009)		(82.0)		(102.7)	
Access_0_10		0.026		0.014		286.1		-3.9
		(0.030)		(0.034)		(330.8)		(203.6)
State-Year FEs?	N		N		N		N	
State and Year FEs?	Y		Y		Y		Y	
State unemployment rate?	Y		Y		Y		Y	
State personal income?	Y		Y		Y		Y	
Observations	49,834	49,140	85,917	84,795	67,472	66,634	279,701	276,513
R^2	0.75	0.11	0.81	0.16	0.81	0.15	0.80	0.47

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

Table 9: *Allowed* and Fee Income, Losses and Profits

Reported are results examining the relationship between *Allowed* and income, losses and profits on overdraft activities at banks and credit unions.

Panel A: Credit Unions

Dependent Variable: (Mean)	Fee Income (38.2)	Loan Losses Other (17.8)	Loan Losses Other/ Fee Income (0.42)	Operating Income (42.4)
Allowed	3.3	6.4***	0.09*	-10.2
	(3.5)	(1.9)	(0.05)	(6.5)
State-Year FEs?	N	N	N	N
State and Year FEs?	Y	Y	Y	Y
State unemployment rate?	Y	Y	Y	Y
State personal income?	Y	Y	Y	Y
Observations	1,428	1,122	1,122	1,428
R^2	0.98	0.94	0.63	0.66

Panel B: Banks

Dependent Variable: (Mean)	Fee Income (100.9)	Loan Losses Other (2.99)	Loan Losses Other/ Fee Income (0.04)	Operating Income (536.6)
Allowed	2.5	-0.24	0.004	-21.0
	(15.2)	(0.56)	(0.01)	(135.7)
State-Year FEs?	N	N	N	N
State and Year FEs?	Y	Y	Y	Y
State unemployment rate?	Y	Y	Y	Y
State personal income?	Y	Y	Y	Y
Observations	816	816	816	816
R^2	0.91	0.52	0.19	0.82

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

Table 10: Falsification

Reported are results for falisification exercises examining the relationship between payday access measures and unemployment rates, credit card loans and credit card loss rates.

Dependent Variable: (Mean)	Unemployment rate		Loans Credit Card		Loss Rate Credit Cards (pct of loans)	
	(4.79)	(5.59)	(427.5)	(12.7)	(1.07)	(1.03)
Allowed	0.41		-8.8		-0.08	
	(0.42)		(55.4)		(0.09)	
Access_0_10		-0.25		2.2		0.17
		(0.15)		(2.7)		(0.11)
State-Year FEs?	N	Y	N	Y	N	Y
State and Year FEs?	Y	-	Y	-	Y	-
Unemployment rate?	-	-	Y	Y	Y	Y
Personal income?	-	-	Y	Y	Y	Y
Observations	1,428	89,407	1,428	42,406	1,122	21,124
R^2	0.72	0.48	0.94	0.82	0.61	0.09

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

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), DC (2008), OR (2008) and PA (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 experienced a change in payday loan availability between 1995 and 2008[19]

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).

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).

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). Some lenders ceased operations in the state in mid-2006, after the FDIC placed restrictions on their bank lenders (Sabatini, 2006). However, Advance America, the largest national payday lender, did not stop lending and close its Pennsylvania stores until December, 2007 (See Advance America 9/07 press release).

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.

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[19] 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*.