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Strategic Pricing of Payday Loans: Evidence from Colorado, 2000-2005

Robert DeYoung, Ronnie J. Phillips

Abstract: We examine the pricing patterns of payday lenders in Colorado between 2000 and 2005, using Tobit estimation techniques to account for legislated price ceilings, and a Heckman correction procedure to correct for locational choices made by payday lenders. Our preliminary results contain evidence that payday lenders practice several types of strategic pricing. Consistent with Knittel and Stango (2003), we find evidence consistent with focal point pricing: over time, payday loan prices in Colorado have gravitated toward the legislated price ceiling. Moreover, prices moved toward the ceiling more quickly in markets containing large numbers of payday lenders, where explicit collusion may be more difficult and the existence of a focal point can facilitate implicit price collusion. Consistent with Petersen and Rajan (1994), we find evidence consistent with potentially exploitative relationship pricing: prices were lower for initial loans than for refinanced loans, and this inter-temporal pricing pattern was more pronounced when payday lenders faced fewer local rivals, i.e., when switching costs were high for borrowers. We also find a positive association between payday loan prices and the presence of commercial bank branches in the local market—because payday borrowers must have a bank account on which to write a check, this suggests that commercial bank branches act as a complement to payday lending that increase the demand for payday lending services. Indeed, we find that payday lenders are more likely to locate in well-branched areas.

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1. Introduction

In recent years U.S. households have gained increased access to credit, due largely to improved information systems (e.g., credit scoring), more efficient loan production processes (e.g., securitization), and new credit instruments (e.g., adjustable rate and other "exotic" mortgage products). Payday lending is arguably another step in this line of innovations in consumer finance: credit is delivered immediately, with little if any credit check, and is collateralized only by a post-dated personal check to be drawn on the borrower's bank account 7, 14, or 30 days in the future. There is little debate about whether payday lending has expanded the availability of credit to more households—the question is, at what price? When expressed as a fixed charge as preferred by payday lenders, or as an annual percentage interest rate as preferred by consumer advocates, payday loans are expensive. For example, it is not unusual for a $300 loan for two weeks to have a $50 charge, which translates into a 435% annual percentage rate (APR) of interest.[1]

While proponents of payday lending are likely to characterize this innovation as "a democratization of credit," critics of payday lending are likely to characterize this innovation as "a legitimization of loan sharking." Critics point not just to high payday loan prices, but argue further that payday loans are marketed disproportionately to unsophisticated and economically disadvantaged consumers, and that chronic use of payday loans creates or contributes to a "cycle of poverty" among these borrowers. These tensions have raised

* The views expressed in this paper are those of the authors, and do not necessarily those of the Federal Deposit Insurance Corporation or the Colorado Attorney General's Office. We thank John Caskey, Paul Pfenning, Katherine Samolyk, and Jack Tatom for their help and suggestions.

[1] The calculation is as follows: APR = $50 * (365 days / 14 days) / $300 = 4.3452, or 434.52%.

public concern, and placed pressure on government to regulate payday lending. The federal bank regulators have issued guidelines for payday lending operations and affiliations, strengthened regulatory capital requirements, and taken enforcement actions on both consumer protection and safety and soundness grounds. These actions have raised the costs of payday lending; and as a result, very few commercial banks, thrifts, or credit unions offer payday loans themselves or partner with payday lenders (Bair 2005).

Unlike the federal bank regulators, state lawmakers have taken actions to limit the prices charged for payday loans. These individual state actions have implications beyond state borders, because under federal law, it is permissible for financial institutions to "export" the usury ceilings of their home states to out-of-state borrowers. According to the National Consumer Law Center (2006), twenty states apply their existing usury ceilings on in-state payday lenders—since these rate ceilings are below the rates that payday lenders typically charge, payday lending in these states is effectively outside the law. Twenty-three states (including Colorado) and the District of Columbia have passed legislation explicitly authorizing payday lending, with restrictions on payday lending practices that vary across these states. The remaining seven states either place no explicit limits on payday lending or have small loan laws that apply to payday lending.

In 2000, the Colorado state legislature authorized payday lending, with limitations on the size of payday loans, the frequency with which individual consumers can borrow, and the prices that payday lenders can charge for these loans. During the five years since the law was enacted, approximately 90% of payday loans written in Colorado have carried the maximum allowable price. Chessin (2005) reports explosive growth in payday lending since this legislation was enacted. There were 177 licensed payday loan lenders in Colorado in 1997, and just 212 when the payday lending laws were enacted on July 1, 2000. However, as of January 1, 2005, the industry had grown to include 616 payday lender licenses. The volume of lending has increased accordingly, from $34 million in payday loans in 1996, to

$368 million by the end of 2004. Clearly, the Colorado law has not made payday lending unprofitable, nor limited consumer access to this credit product.

Regulations that interfere with market prices can have unanticipated effects that often run counter to the intended regulatory remedy. The most obvious example: because binding price ceilings make payday loans more affordable, they naturally increase the number of consumers demanding these loans (or the number of loans demanded by a given consumer), encouraging rather than discouraging chronic borrowing.[2] Less obvious are the effects that price ceilings have in segments of the payday loan market that clear at prices below the regulated ceiling. For instance, there is evidence that legislated ceilings on credit card interest rates can act as "focal points," facilitating implicit price collusion in markets in which the ceiling would not otherwise be binding (Knittel and Stango, 2003). Price ceilings may also increase the incentives for individual lenders to practice strategic pricing, such as using low prices to attract new payday borrowers in the short-run, and then exploiting captured borrowers in the long-run by charging high (focal point) prices on repeated purchases (Petersen and Rajan 1994).

In this paper, we search for evidence consistent with strategic pricing behavior by payday lenders confronted with regulatory price ceilings, using unique data on payday loans made in Colorado between 2000 and 2005. To our knowledge, we are the first to study whether and how payday lenders price strategically. We also test whether payday loan prices are influenced by (a) local market demographics, e.g., race and income, (b) the frequency and intensity with which individual borrowers purchase payday loans, and (c) the presence of commercial banking alternatives. We use Tobit estimation in these tests, to control for the

[2] To the extent that demand for payday loans is highly inelastic, this effect will be minimal in the short-run. However, since market demand for all goods and services tends to grow more elastic over time, binding price ceilings are likely to create expanded demand in the long-run, along with the supply shortages that naturally arise under such conditions. We note that the borrower quantity limits contained in the Colorado legislation may provide an (unintended) mechanism for rationing the short supply.

truncation of payday loan prices caused by binding price ceilings. Additionally, we employ a Heckman correction procedure to control for potential selection bias in the data, i.e., Colorado payday lenders were located in only about a quarter of the 476 postal zip code markets in Colorado, and market demographics can vary substantially across zip code areas.

Our results suggest that payday lenders do practice strategic pricing. Consistent with focal point pricing, we find that payday loan prices gravitated toward the price ceiling over time, and that this happened more quickly in markets where the number of payday lenders was large (i.e., where *explicit* collusion would be more difficult). In addition, we find evidence that payday lenders vary their prices systematically across borrowers. On average, our results imply that payday lenders charge higher prices in the presence of switching costs (i.e., to customers that have borrowed repeatedly in the past, or in markets where there are few rival payday lenders), and charge lower prices when there is the prospect of developing new customer relationships. Mirroring recent findings in the corporate finance literature, payday lenders charge lower prices to customers that have multiple payday lending relationships (e.g., Montoriol-Garriga 2005). Finally, we find evidence that payday loan prices are slightly higher in local markets with disproportionate minority populations, although the size of the pricing difference is so small (only a few cents on average) that we cannot rule out the possibility that it caused by unobserved factors that are missing from our model. We stress that these results are preliminary, and may change in future versions of this paper as we further refine our tests.

2. Definition and Evolution of Payday Lending

Payday lending is a simple idea that has been around at least since the early 1900s, when some lenders would "buy" a worker's next salary at a discount (Caskey 2005, p. 23). In a typical modern-day payday lending transaction, a customer writes a personal check made out to a lender and the lender agrees to hold the check for some period of time, often

less than two weeks, in exchange for a fee. In the example of the $300 payday loan in the Introduction, the customer gives the payday lender a check for $350 and in exchange receives $300 in cash. Essentially, the payday lender is buying the customer's check at a discount. The transaction ends in one of several ways: the customer redeems the check at or before maturity by paying the lender $350 in cash; the payday lender deposits the check after two weeks; or the customer pays another $50 to extend (i.e., rollover, or re-finance) the loan for another two weeks.

The $50 charge for this transaction can be viewed as either the collection of a fee-for-service or, alternatively, as an up-front payment of interest for a very short-term loan. How this charge is characterized is the source of some controversy. Fees-for-service have long been common in the payments system. For example, non-par banking was a common practice in the U.S. during the 18th century, when banks charged fees for clearing checks written on other banks. Today, banks charge fees for ATM transactions in which cash is withdrawn from other banks, an activity that is functionally equivalent to check clearing. One could make a similar argument about payday lending, i.e., customers are charged a fee for gaining access to the payments system, in a transaction that bears more than a slight resemblance to check clearing. A crucial distinction is that the payday lending services are being used because the customer's current spending needs exceed their current bank balance, and therefore credit must be extended.

The dual nature of the transaction is evidenced by the fact that proponents of payday lending emphasize the payments services function and characterize the charge as a fee-for-service, while critics of payday lending emphasize the lending function and characterize the charge in terms of a potentially excessive interest rate.[3] Figure 1 depicts these two parts of a

[3] A similar public policy debate took place in the U.S. as checks became the dominant medium in the payments system. The issue at hand was the potential abolishment of exchange fees. As late as the 1940s, the Board of Governors of the Federal Reserve (Fed) took the position that exchange fees were a payment of interest and therefore prohibited on the basis on Section 19 of the Federal Reserve Act

payday lending transaction, where the payments function (customer with merchant) is illustrated in the top half of the diagram, and the credit function is embedded in the bottom half of the diagram. Further complicating the issue is that users of payday lending services are clearly aware of the dollar amount of fee being charged—the cash they receive is only a portion of the check they write—and are seemingly unconcerned about the magnitude of the annual percentage rate (APR). This disconnect poses a concern to policymakers because payday loans are often rolled over, in which case the customer repeatedly pays the high fixed charge. This disconnect also poses a puzzle for economists, who would view this behavior as irrational borrowing behavior since other alternatives (such as credit cards) would presumably be available to most consumers who have bank accounts.

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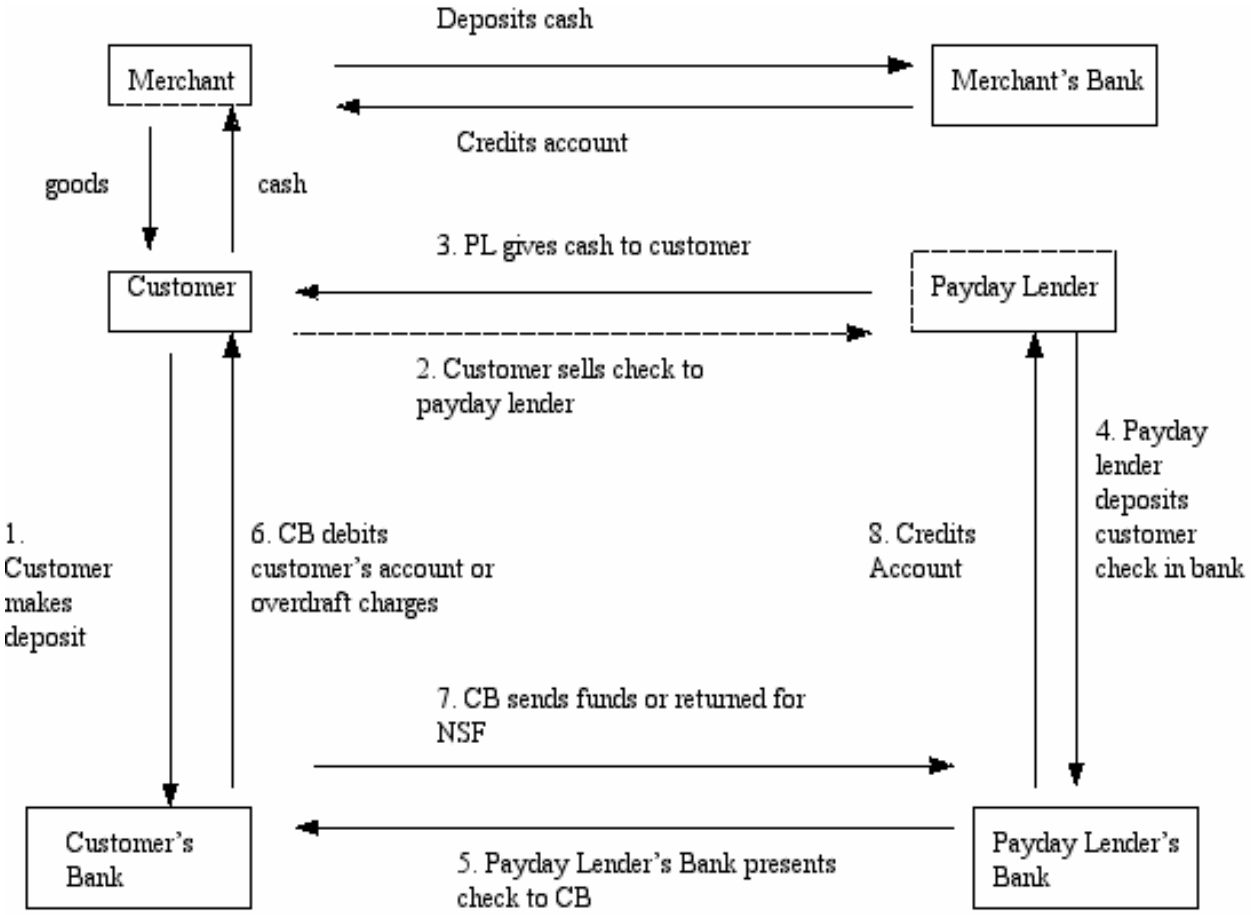
and the Fed's Regulation Q (Jessup 1967, p. 16). In contrast, the Federal Deposit Insurance Corporation (FDIC) took the opposite position on exchange charges, "in the absence of facts or circumstances establishing that the practice is resorted to as a device for payment of interest" (Jessup 1967, pp. 16-17). The FDIC based its position on the fact that historically in the U.S. the practice of exchange charges had never been considered a payment of interest.

Figure 1



The payday lending operation

Although buying checks at a discount has been around for a long time, the industry structure that currently supports this financial product is relatively new. Payday lenders began to emerge in the early 1990s as an alternative to customers using check-cashing outlets and pawnshops. Growth of payday lending accelerated at the end of the decade, supported by three phenomena: (a) an increasing number of states passed legislation explicitly authorizing payday lending, (b) improvements in check-clearing technologies,

which made the payday lending production process more efficient, and (c) banks began charging higher and more systematic prices for checking account overdrafts and non-sufficient funds (NSF). Faced with the possibility of bouncing several checks—and paying multiple NSF or overdraft charges—a depositor might rationally decide instead to incur just one charge on a single large check presented to a payday lender. Viewing a checking account overdraft as an extension of credit, it is quite possible that the effective APR calculated for an overdraft charge could be at or above typical APRs for payday loans. Caskey (2005, p. 26) gives the example of a customer writing an NSF check for $100 that the bank honors while charging a $20 overdraft fee. Assuming the customer returns the checking account balance to positive in two weeks, this fee equates to a 520 percent APR. Not surprisingly, these high fees and/or interest rates have led to the development of both for-profit and non-profit institutions that provide alternative services (see Ortiz 2006 and Bergquist 2006).

Although payday lending has been a popular topic in the industry press and general media, there have been few academic studies of payday lending. One of the problems is the lack of a systematic data set needed to answer basic questions about the industry. Most studies have used data collected during *ad hoc* surveys conducted by industry participants or consumer advocacy groups. These surveys indicate that the typical payday loan customer has a bank account (by definition), is employed, is a young adult with a high school education, and is married with children. About half are women and half carry major credit cards (Caskey 2005). Clearly, these individuals are not at the lowest level of the socioeconomic scale, and this raises issues of concern to policymakers. The most immediate question is whether financial literacy and/or improved access to other forms of short-term credit are effective policy responses to reduce the chronic use of payday lending.

In a study of North Carolina borrowers, Stegman and Faris (2003) find that the conversion of occasional borrowers to chronic borrowers is the source of very high profits of

the industry. Flannery and Samolyk (2005) also focus on the costs and profitability of payday lending operations, using proprietary, store-level data provided by two large payday lenders. They find that high loan volume, and not necessarily the total number of customers, is the key to high profitability. This suggests that repeat customers or "chronic borrowers" are a key determinant of profitability for these firms. This issue has been a primary focus of regulatory agencies and consumer groups and is an important question to be addressed by future empirical studies. Paul Chessin (2005) analyzes the Colorado data set that we use in the present study, and also finds that the bulk of the payday lenders' loan volume is from repeat customers. In addition, he raises concerns about "loan-splitting," i.e., making multiple smaller loans (just under statutory limit loan limits) in order to increase revenues per customer.

3. Payday lending in Colorado: History, legislation, and regulation

On April 18, 2000, Colorado Governor Bill Owens signed the Deferred Deposit Loan Act (DDLA). This law modified the Colorado Uniform Consumer Credit Code (CUCCC) to regulate activities commonly known as payday loans or "postdated checks." This law was enacted following an interpretation by the Administrator of the CUCCC that transactions in which a check casher advances money to a consumer in exchange for receiving a consumer's personal check to be cashed for a fee at a later date is an advance of credit and therefore governed by the CUCCC. Chessin (2005) summarizes the key features of the DDLA as follows:

1. The Act defines a "deferred deposit loan" as a consumer loan in which the lender advances money to the borrower and in return accepts from the consumer an "instrument" such as check in the amount of the advance plus a fee which is not to be cashed by the lender for a specified term of the loan.
2. The loan principal is limited to $500 for a term not to exceed forty days.

3. There is a maximum finance charge of 20% of loan principal up to $300 and 7.5% above $300.
4. The DDLA allows one renewal of the loan, but does not limit rollovers (i.e., a “new” loan).

Some other relevant specifics of the law (Colorado Statues Titles 5, Article 3.1) include:

1. Each deferred deposit loan transaction and renewal shall be documented by a written agreement signed by both the lender and consumer. The written agreement shall contain the name of the consumer; the transaction date; the amount of the instrument; the annual percentage rate charged; a statement of the total amount of finance charges charged, expressed both as a dollar amount and an annual percentage rate; and the name, address, and telephone number of any agent or arranger involved in the transaction.
2. A lender shall provide the following notice in a prominent place on each loan agreement in at least ten-point type: "A DEFERRED DEPOSIT LOAN IS NOT INTENDED TO MEET LONG-TERM FINANCIAL NEEDS. A DEFERRED DEPOSIT LOAN SHOULD BE USED ONLY TO MEET SHORT-TERM CASH NEEDS. RENEWING THE DEFERRED DEPOSIT LOAN RATHER THAN PAYING THE DEBT IN FULL WILL REQUIRE ADDITIONAL FINANCE CHARGES."
3. Any lender offering a deferred deposit loan shall post at any place of business where deferred deposit loans are made a notice of the finance charges imposed for such deferred deposit loans.

4. A lender may be examined and investigated in accordance with section 5-2-305: The administrator shall examine periodically, at intervals the administrator deems appropriate, the loans, business, and records of every licensee.

As part of its regular compliance examination, data were collected by the Administrator of the Colorado Uniform Consumer Credit Code (Attorney General's Office) beginning in July 2000. Additional demographic data began to be collected in July 2001. The data collected include:

1. The terms of the loan being written, including the amount financed, the finance charge, and the length of the loan.
2. Whether, and how often, the loans were renewed or "rolled over."
3. Individual consumer borrowing information such as how many loans a particular consumer obtained or had outstanding with a particular lender over the previous twelve month period.
4. The consumer's age, gender, martial status, monthly income, job classification (e.g., professional, managerial, laborer, and so on), and length of time at current employment.

This data is collected from a particular lender's thirty most recent loan transactions preceding compliance examination. To assure randomness, the examiner also collected information on consumers who applied for and obtained their first loan with the lender within the thirty days preceding the compliance examination. Though the payday lenders are examined regularly, the exact period of time between examinations may vary. Chessin (2005) notes that the "average" Colorado borrower is a thirty-six-year-old single woman,

making $2,370 per month, employed as a laborer or office worker for about three and one-half years.

4. Data and variables

Our data set contains 25,653 payday loans made in the state of Colorado between June 2000 and August 2005. Note that these data are from loans made after the DDLA was enacted, so the loan price ceilings and other constraints specified in that legislation are reflected in the data. Deleting a small number (588) of loans that were either very small (less than $100), very short-term (less than 5 days), reported a price of zero, or reported a price that exceeded the legal price ceiling, left us with 24,972 loans. Table 1 displays summary statistics for these data. Note that an additional 493 loans were dropped from the regression tests (see below) due to incomplete or irregular financial or market structure data merged-in from other databases.

Table 1
Summary statistics

	Mean	Std. Dev.	Minimum	Maximum
Panel A: Full Sample N=24,972				
AMOUNT	$293.25	124.22	100.00	500.00
CHARGE	$52.29	17.80	5.00	75.00
TERM (days)	16.8556	6.7603	4	40
FACE RATE	18.48%	2.34	3.33	20.00
APR	459.26%	187.11	39.25	1,825.00
LOANS IN YEAR	9.3900	7.6145	1	69
REFI	0.5517	0.4973	0	1
MULT LOANS	0.0314	0.1743	0	1
SIX MONTHS	0.1080	0.3103	0	1
BINDING	0.8987	0.3017	0	1
Panel B: Loans priced at ceiling N=22,442 BINDING=1, GAP=0				
AMOUNT	$293.53	125.68	100.00	500.00
CHARGE	$53.07	17.47	20.00	75.00
TERM (days)	17.0431	6.8191	4	40
FACE RATE	18.82%	2.00	15.00	20.00
APR	463.56%	188.81	144.08	1,825.00
LOANS IN YEAR	9.3049	7.4636	1	69
REFI	0.5580	0.4966	0	1
MULT LOANS	0.0271	0.1625	0	1
SIX MONTHS	0.1106	0.3136	0	1
Panel C: Loans priced below ceiling N=2,530 BINDING=0, GAP>0				
AMOUNT	$290.81	110.51	100.00	500.00
CHARGE	$45.38**	19.21	5.00	74.85
TERM (days)	15.1925**	5.9634	4	39
FACE RATE	15.46%**	2.96	3.33	20.00
APR	421.11%	166.54	39.25	1,460.00
GAP	$7.64**	8.03	>0.00	50.00
%GAP	0.0332**	0.0345	>0.0000	0.1667
LOANS IN YEAR	10.1451**	8.8066	1	65
REFI	0.4957**	0.5001	0	1
MULT LOANS	0.0688**	0.2531	0	1
SIX MONTHS	0.0850**	0.2789	0	1
Panel D: Sample breakdown across YEAR and QUARTER				
	Year		**Quarter**	
	2000#	3.01%	1	22.31%
	2001	13.00%	2	30.06%
	2002	17.45%	3	26.87%
	2003	26.03%	4	20.75%
	2004	26.39%		
	2005#	14.12%		

** indicates significantly different from Panel B at the 1% level of significance.
# indicates that the data sample covered only a portion of the year.

The data include information on the terms of the loans as well as limited information on the borrowers' payday lending history. There are three loan term variables: AMOUNT is the dollar amount of the loan; CHARGE is the fixed finance charge, or price, of the loan; and TERM is the length of the loan. We use these three variables to calculate two interest rate variables: FACERATE is simply the loan CHARGE divided by the loan AMOUNT, and APR is the annual percentage rate calculated using the usual formula.[4] There are four payday lending history variables: REFI is a dummy equal to one if the loan is extended to cover a previous payday loan that was not paid off (i.e., rolled over); MULT LOANS is a dummy equal to one if the borrower also has a payday loan at another payday lender; LOANS IN YEAR is the number of payday loans received by the borrower during the previous twelve months; and SIX MONTHS is a dummy equal to one if the borrower has been in payday debt continuously over the previous six months.

Panel A displays statistics for the full data set. The FACERATE averages 18.48% and the APR averages 459.26%, interest rates that are roughly consistent with those reported in other studies and in the press. However, given that these rates come from a price-regulated market (as described above, the maximum allowable CHARGE is 20% of the AMOUNT up to $300, plus an additional 7.5% above $300) the distribution of these rates is severely truncated. BINDING, a dummy variable equal to one for loans priced at the binding price ceiling, indicates that 89.87% of the loans in our data carried the maximum CHARGE allowed by Colorado law. Panel B displays summary statistics for the 22,442 loans priced at the legal ceiling, and Panel C displays summary statistics for the remaining 2,530 loans that were priced below the maximum price ceiling.

We constructed two additional variables that are central to the analysis that follows: GAP measures the difference (in dollars) between the ceiling price and the actual loan

[4] APR = CHARGE * (365 days / TERM) / AMOUNT.

CHARGE, while %GAP expresses this difference as a percentage of the loan principle AMOUNT. Summary statistics for both of these variables are included in Panel C. On average, these sub-ceiling loans were priced $7.64 below the price ceiling, a substantial "discount" that reduced the FACERATE by 3.32 percentage points, that is, %GAP=0.0332. Figure 2 shows that the distribution of these sub-ceiling prices is clearly left-censored at GAP = %GAP = 0.

Figure 2

Histogram showing the distribution of %GAP.

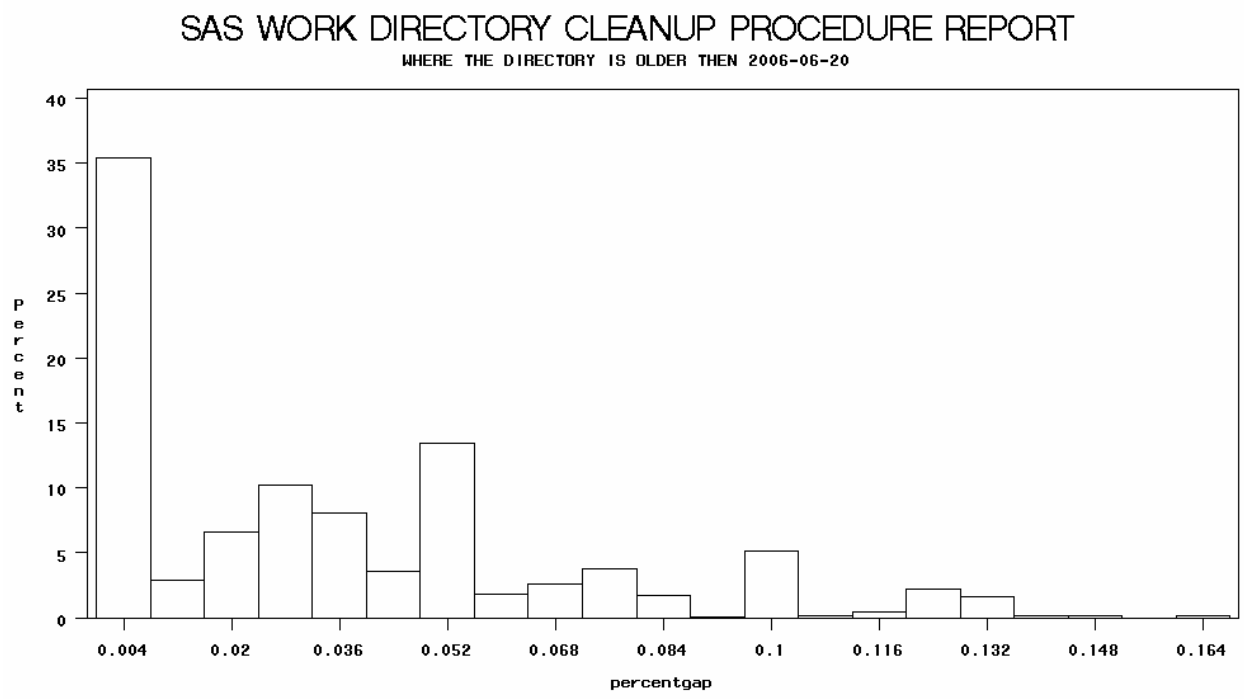
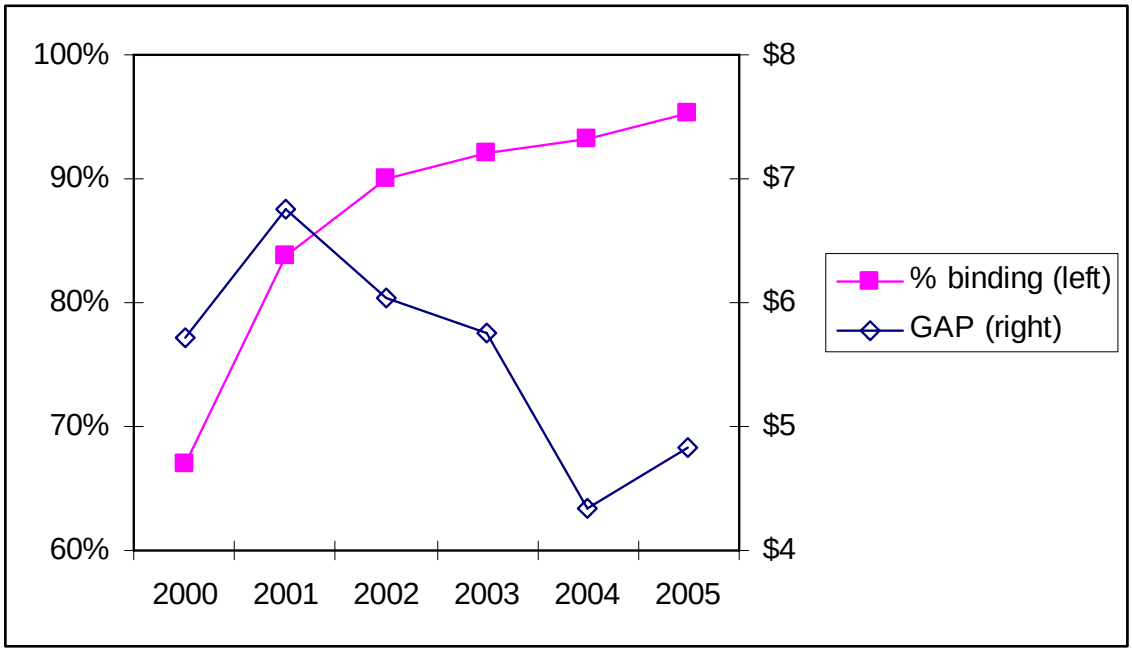


Figure 3

Annual average values of BINDING and %GAP.



We graph the annual average values of BINDING and %GAP in Figure 3. These data indicate that the incidence of sub-ceiling pricing has declined over time. Only two of every three loans written in 2000 were priced at the legal maximum, but over time the incidence of fully priced loans increased steadily, and by 2005 about 19-of-every-20 loans were priced at the legal maximum. This pattern is what we would expect to see if the price ceiling was acting as a focal point, with payday lenders gradually gravitating toward the ceiling over time. Consistent with this, the average GAP for sub-ceiling loans declined from around $6.00 to around $4.50, although this decline was not monotonic. Of course, these are just raw data, and we still must test this conjecture in controlled tests below. And in any case, while these data are consistent with focal point pricing, they do not prove that lenders

are strategically pricing in this fashion—by its very nature, focal point pricing is an implicit behavior that is not directly observable.

We use the 5-digit zip code to identify the geographic location of each payday lending store, which allows us to merge our payday loan data with other databases containing information on local demographics (Census Department data) and commercial bank branches (FDIC Summary of Deposit data). Table 2 displays these data for the 476 zip code areas in Colorado that did, and did not, contain payday lenders. Household incomes (INCOMEPERHH) and average house values (AVGHOUSEVAL) are slightly lower in payday lender markets, although these difference (respectively, about $300 and $7,000) are not statistically significant. However, we do find statistically significant differences in the other demographic and structural variables. Payday lenders are more likely to be located in urban areas (URBAN) with larger populations (%POP), and these populations tend to be disproportionately minority (%BLACK, %HISPANIC). Payday lender markets also tend to have higher numbers of commercial bank branches per person (BRANCHPERCAP), consistent with the requirement that payday borrowers must have bank accounts to get payday loans, but inconsistent with the notion that households visit payday lenders because of lack of access to banking services. These systematic demographic differences may potentially create a selection bias in our main regression tests—which measure the impact of market demographics on payday loan pricing—and as explained below, we use a Heckman correction procedure to neutralize any potential market selection bias.

Table 2
Demographics of zip code areas with and without Payday Lenders

	Mean	Std. dev.	min	max
Panel A: N=476 All zip code areas				
%WHITE	0.8797	0.1171	0.0278	1.0000
%BLACK	0.0165	0.0482	0.0000	0.5629
%HISPANIC	0.1388	0.1555	0.0000	0.8845
INCOMEPERHH ($1000)	43.045	14.951	15.547	114.497
AVGHOUSEVAL ($1000)	155.299	106.492	0.000	1000.001
URBAN	0.4538	0.4984	0	1
%POP	0.0021	0.0030	0.0000	0.0159
BRANCHPERCAP	0.2978	0.5221	0.0000	6.6453
Panel B: N=105 Zip code areas with payday lenders				
%WHITE	0.8144	0.1242	0.2602	0.9722
%BLACK	0.0415	0.0686	0.0007	0.4449
%HISPANIC	0.1910	0.1453	0.0280	0.6667
INCOMEPERHH ($1000)	42.817	10.771	24.771	80.878
AVGHOUSEVAL ($1000)	149.629	49.292	57.900	290.600
URBAN	0.7905	0.4089	0	1
%POP	0.0061	0.0030	0.0008	0.0139
BRANCHPERCAP	0.4053	0.6964	0.0330	6.6453
Panel C: N=371 Zip code areas without payday lenders				
%WHITE	0.8981**	0.1082	0.0278	1.0000
%BLACK	0.0094**	0.0378	0.0000	0.5629
%HISPANIC	0.1240**	0.1553	0.0000	0.8845
INCOMEPERHH ($1000)	43.109	15.948	15.547	114.497
AVGHOUSEVAL ($1000)	156.903	117.747	0.000	1000.001
URBAN	0.3585**	0.4802	0	1
%POP	0.0010**	0.0019	0.0000	0.0159
BRANCHPERCAP	0.2679*	0.4589	0.0000	3.4364

** (*) indicates significantly different from Panel B at the 1% (5%) level of significance.

We use 5-digit zip codes to define "local markets" for payday lenders because this is the only geographic location data available to us in the loan-level database. On the one hand, zip code areas are geographically smaller than the city-wide, MSA-wide, or county-wide areas typically used by researchers to test for competitive effects in banking markets-but on the other hand, zip code areas are geographically larger than the Census-tract areas typically

used by researchers to test for demographic phenomena in lending markets. Hence, we are steering a middle ground. Our zip code markets are (a) large enough to test for competitive effects because these areas typically contain multiple payday lender stores as well as multiple commercial bank branches, and (b) small enough to provide us with substantial cross-sectional variation in demographic characteristics. Of the 476 zip code areas in Colorado, 105 contained payday lenders.

5. Regression methodology

Because payday loan prices in Colorado are artificially constrained by legislated price ceilings, we use a Tobit estimation framework to test our hypotheses about strategic payday loan pricing (Tobin, 1958). We use GAP, or alternatively %GAP, as the dependent variable in these regressions; as we have seen, these data are left-censored at zero. %GAP is our preferred measure because fixed loan charges will naturally be proportional to the size of the loan, but using GAP generates coefficient estimates that are more easily interpretable because they are in dollar terms. We use the following regression specification:

$$\begin{aligned} \text{GAP or \%GAP} = f(\ & \text{AMOUNT, TERM,} \\ & \text{REFI, MULT LOANS, LOANS IN YEAR, SIX MONTHS,} \\ & \text{\%BLACK, \%HISPANIC, INCOMEPERHH,} \\ & \text{LENDERS, LENDERSPERCAP, BRANCHPERCAP,} \\ & \textbf{YEAR}, \textbf{QUARTER}, \text{MILLS}) + \varepsilon \end{aligned} \qquad (1)$$

where all of the variables are defined above except: **YEAR** and **QUARTER** are vectors of dummy variables indicating, respectively, the year and calendar quarter of the loan;[5] MILLS is the inverse Mills ratio derived from a Probit model of zip code markets in which payday lenders are located (discussed below); and ε is a disturbance term assumed to follow a truncated-normal distribution.

5.1 Strategic pricing hypotheses. Although most of the right-hand side variables in equation (1) may be related to payday loan prices in interesting ways, we focus on the coefficients on the **YEAR**, LENDERS, and REFI variables as indicators of strategic payday loan pricing.

There is evidence that legislated credit card interest rate ceilings can act as "focal points" that help facilitate implicit collusion (Knittel and Stango, 2003). If the legislated price ceiling on payday loans provides a similar pricing focal point, then we would expect prices charged by payday lenders to gravitate towards the ceiling over time (i.e., declining GAP and %GAP) as lenders observe and react to each other's pricing behavior relative to the ceiling. The following coefficient values on the **YEAR** dummies would be consistent with this strategic pricing behavior, *ceteris paribus*:

- Focal Point hypothesis 1: $\beta_{YEAR2000} > \beta_{YEAR2001} > \ldots\ldots > \beta_{YEAR2004} > \beta_{YEAR2005}$.

We would expect focal point pricing to occur (and/or occur more quickly) in local markets with large numbers of payday competitors, i.e., markets in which explicit collusion is more difficult and, as a result, firms are more likely to focus on (and/or more quickly focus upon) the legislated price ceiling as an implicit collusive device. Thus, we can state a second form of the focal point hypothesis:

[5] We exclude from the regression the year 2005 dummy as well as the quarter 4 dummy.

- Focal Point hypothesis 2: ($\beta_{YEAR(t)}$ | numerous lenders) < ($\beta_{YEAR(t)}$ | few lenders), for any given t.

To test this hypothesis, we add the interaction terms **YEAR***LENDERS to the right-hand side of regression equation (1).

The borrower's need for debt financing may not disappear after just a single pay period. Thus, when payday lenders make a loan to a first-time customer, they know that this loan has some positive probability of becoming a long-run "relationship" in which the customer borrows repeatedly, paying the fixed finance charge each time. The payday lender has an incentive to help establish such relationships by charging relatively low prices to attract new borrowers, and then charging higher prices once the "relationship" has been established. The following coefficient values would be consistent with this type of strategic pricing behavior, *ceteris paribus*:

- Relationship hypothesis 1: $\beta_{REFI} < 0$.

Borrower switching costs are complementary to the relationship hypothesis. While we cannot measure these costs directly, we can draw inferences about them from several of the other right-hand side variables. For example, a payday lender has an even bigger incentive to practice "relationship pricing" if there are very few, or no, other payday lenders operating in the local market (Petersen and Rajan 1994). This reduces the chance that borrowers that need to refinance their loans will be able to do so with a different payday lender, and thus confers pricing power to the payday lender that made the initial loan. The following coefficient values would be consistent with this type of strategic pricing behavior, *ceteris paribus*:

- Relationship hypothesis 2: ($\beta_{LENDERS}$ | REFI=0) < 0.

To test this hypothesis, we add the interaction term LENDERS*REFI to the right-hand side of regression equation (1), then evaluate the derivative with respect to LENDERS at REFI=0.

We might also draw inferences about switching costs from the payday loan histories of individual borrowers. A value of 1 for the dummy variable SIX MONTHS (i.e., borrower has been indebted to the same payday lender continuously for the past six months) implies that the borrower has relatively high switching costs, while a value of 1 for the dummy variable MULT LOANS (i.e., borrower currently has payday debt outstanding at a different payday lender) implies that the borrower has lower switching costs. Because switching costs allow lenders to charge higher prices, we expect a negative coefficient on SIX MONTHS and a positive coefficient on MULT LOANS.

5.2 Additional right-hand side variables. The remaining right-hand side variables serve as controls for cross-sectional differences in market structure, market demographics, borrower payday-loan history, and loan terms that may "non-strategically" affect payday loan prices.

We include LOANS IN YEAR (the number of payday loans the borrower has had during the past twelve months) to separate the variation in price due to borrowers who are simply heavy users of payday lending, from the variation in price associated with repeat borrowers (SIX MONTHS) or borrowers with multiple payday loan relationships (MULT LOANS). We have no *a priori* expectation about the sign of the coefficient on this variable.

We include the variables %BLACK, %HISPANIC, and INCOMEPERHH to control for the possibility that market-clearing prices for payday loans are affected by local area demographics. Since payday lending could arguably be considered an inferior good (i.e., demand positively associated with lower income), we might expect the coefficient on INCOMEPERHH to be positive. Controlling for income levels, the coefficients on

%BLACK and %HISPANIC will capture the joint impact of (a) intrinsic demand-side differences in preferences for payday lending in these neighborhoods, (b) differences in access to non-payday credit in these neighborhoods, and/or (c) supply-side pricing differences meant to capture credit risk but which may also reflect non-economic based discrimination.

As discussed above, LENDERS is included to test for strategic pricing, namely, the possibility that oligopolistic market structures affect the likelihood of focal point pricing. In addition, we include LENDERSPERCAP (the number of payday lenders operating per capita in the local zip code area) on the right-hand side of (1) to test for lender size effects.[6] A negative coefficient on LENDERSPERCAP would imply that scale economies are important and are reflected in price, while a positive coefficient would suggest (non-strategic) price competition—holding the absolute number of lenders constant.

We include BRANCHPERCAP to control for potential competition from commercial banks. Payday borrowers must have bank accounts, and because of this it is natural to presume that these borrowers turn to payday lenders either because (a) they cannot get credit at their banks (e.g., personal lines of credit, overdraft protection, credit cards) or (b) they do have access to bank credit but they consider it be either too expensive or too inconvenient. The latter should be less true if the local market is well-populated by bank branches that compete with payday lenders for this market segment. We expect a positive coefficient on BRANCHPERCAP if this is the case. Alternatively, given that a payday loan customer must have a checking account, easier access to commercial banks may actually increase the demand for payday lending—if so, we would expect a negative coefficient on BRANCHPERCAP.

[6] LENDERSPERCAP measures the relative size of the average payday lender in the market. We acknowledge that this is a very crude measure of firm size. However, we do not have access to payday lender financial statements, and as such we cannot observe the absolute size of these firms.

We also control for the effects of loan size (AMOUNT) and loan length (TERM) on payday loan pricing. When the dependent variable in (1) is GAP, we expect a positive coefficient on AMOUNT because of scaling effects. If the impact of AMOUNT on loan pricing is limited only to scaling effects, then we expect this coefficient to be zero when the dependent variable in (1) is %GAP. We expect the coefficient on TERM to be negative: For two otherwise identical loans, a loan with a longer term *must* carry a higher price to earn an equivalent rate of return because (a) the payday lender's funds are invested longer, and (b) there is a lower frequency of refinancing (i.e., the CHARGE gets paid less often).

We include the vector of **QUARTER** dummies to control for potential seasonality in loan pricing. Because payday loan production costs are unlikely to be affected by time of year, any seasonal pricing differences will likely be due to either demand-side phenomena (i.e., weaker or stronger demand) or strategic considerations.

5.3 Correction for selection bias. The final right-hand side variable is the inverse Mills ratio (MILLS), which we include to control for potential sample selection bias. The bias potentially arises because payday lenders operate in only 105 of the 476 zip code areas in Colorado, and this locational choice is likely to be related to the variables on the right-hand side of equation (1). Arguably, a payday lender is more likely to locate in places with strong demand for payday loans, for example, where incomes are relatively high (INCOMEPERHH), where the minority population is relatively high (%BLACK, %HISPANIC), or where there is little competition from other financial institutions (BRANCHPERCAP). Consequently, the decision by payday lenders to operate in these markets will not be random, the unexplained variation in loan prices ε will be systematically correlated with these right-hand side variables, and hence the coefficient estimates will be biased.

We employ a standard Heckman correction procedure to control for this potential selection bias.[7] We estimate that following binomial probit equation:

$$\text{Prob(payday market)} = \Phi(\%\text{POP}, \%\text{BLACK}, \%\text{HISPANIC}, \text{INCOMEPERHH}, \text{AVGHOUSEVAL}, \text{URBAN}, \text{BRANCHPERCAP}) + \eta \quad (2)$$

where %POP is the percentage of the total population of Colorado that live in the local market, AVGHOUSEVAL is the value of the mean home in the local market, URBAN is a dummy equal to one if the local market lies within a Metropolitan Statistical Area (MSA), and η is a normally distributed disturbance term. Our sample-selection correction is identified by %POP, AVGHOUSEVAL, and URBAN, which do not appear in the second-stage Tobit regression. The inverse-Mills ratio is derived from the estimated results of (2), using the standard methods (Heckman 1979).

Table 3 displays the results of the first-stage probit estimation of equation (2). The signs and statistical significance of the estimated coefficients are consistent with the bivariate tests displayed in Table 2, with the following interesting difference: Payday lenders are not attracted to areas with high levels of minority population (%BLACK, %HISPANIC), but holding minority constant, payday lenders are attracted to areas with lower household incomes (INCOMEPERHH). In other words, after controlling for local income levels, local racial makeup has no statistical influence on where payday lenders do and do not locate.

[7] The second stage in a Heckman model is typically estimated using OLS, while our second stage estimation procedure is Tobit. We note that both OLS and Tobit estimation assume normal distributions for the dependent variables and error terms—the only difference is that a portion of these distributions is unobservable in the Tobit regression. The coefficient on the MILLS variable in equation (1) needs to be interpreted as such.

Table 3
First-stage Probit Estimation

Probit estimation based on 476 Zip-code level observations. Dependent variable = 1 if at least one payday lender operated in the zip code during the 2000-2005 sample period. Log-Likelihood ratio = -113.298.

	coefficient	Std err	Chi-square	p-value
Intercept	-0.4257	0.3983	1.14	0.2852
%POP	435.9591	43.7142	99.46	<.0001
%BLACK	0.4763	1.6557	0.08	0.7736
%HISPANIC	-0.0900	0.6526	0.02	0.8903
INCOMEPERHH	-0.0498	0.0099	25.25	<.0001
AVGHOUSEVAL	0.0005	0.0012	0.19	0.6615
URBAN	0.4383	0.2385	3.38	0.0661
BRANCHPERCAP	0.6017	0.1937	9.66	0.0019

6. Preliminary results

Results of the second-stage Tobit estimation of equation (1) are displayed in Table 5. Summary statistics for all variables used in these regressions are displayed in Table 4. The coefficient on MILLS is statistically significant in all the regressions, which indicates that the first-stage correction for market selectivity was a necessary step. The negative sign of this coefficient implies a negative correlation between unobservable conditions that determine payday lender market presence and unobservable conditions that determine GAP. This makes intuitive sense: All else equal, payday lenders will prefer to locate in markets where they do not have to set loan prices below the legal maximum.

Table 4
Summary Statistics for Variables in Second-stage Tobit Estimation
N=24,253.

Variable	Mean	Std	Minimum	Maximum
GAP	0.53	2.31	0.00	17.50
%GAP	0.0024	0.0112	0.0000	0.1500
BINDING	0.9067	0.2909	0	1
MILLS	0.3194	0.4272	0.0000	2.4663
AMOUNT	293.2376	124.7444	100.0000	500.0000
TERM	16.8334	6.7101	4	40
REFI	0.5521	0.4973	0	1
MULT LOANS	0.0301	0.1708	0	1
SIX MONTHS	0.1072	0.3094	0	1
LOANS THIS YEAR	9.4135	7.6145	1.0000	69.0000
%BLACK	0.0537	0.0694	0.0007	0.4449
%HISPANIC	0.2152	0.1395	0.0280	0.6667
INCOMEPERHH	40.8207	8.6276	24.7710	80.8780
LENDERS	3.6506	2.3397	1	10
LENDERS*REFI	2.0509	2.5459	0	10
LENDERSPERCAP	0.1342	0.1203	0.0167	0.9166
BRANCHPERCAP	0.4307	0.8709	0.0330	7.7910
YEAR00	0.0288	0.1672	0	1
YEAR01	0.1319	0.3384	0	1
YEAR02	0.1778	0.3824	0	1
YEAR03	0.2613	0.4394	0	1
YEAR04	0.2640	0.4408	0	1
Q1	0.2227	0.4161	0	1
Q2	0.2999	0.4582	0	1
Q3	0.2733	0.4457	0	1

Table 5
Second-stage Tobit Estimation

	[1]			[2]		
dependent variable	**GAP**			**GAP**		
N	24,253			24,253		
left-censored	21,989			21,989		
log likelihood ratio	-13153.1			-13124.4		
	coefficient	**Std err**	**p-value**	**coefficient**	**Std err**	**p-value**
Intercept	-12.0262	1.3889	<.0001	-15.2176	1.6696	<.0001
MILLS	-4.8975	0.565	<.0001	-4.6373	0.5652	<.0001
AMOUNT	0.0027	0.0012	0.0193	0.0030	0.0012	0.0108
TERM	-0.2383	0.0228	<.0001	-0.2362	0.0228	<.0001
REFI	-0.8443	0.5147	0.1009	-0.9205	0.5192	0.0762
MULT LOANS	6.0015	0.6941	<.0001	6.1425	0.6932	<.0001
SIX MONTHS	-1.4781	0.5299	0.0053	-1.4865	0.5297	0.0050
LOANS THIS YEAR	0.0480	0.0197	0.0147	0.0488	0.0196	0.0129
%BLACK	-8.8639	2.1056	<.0001	-9.0077	2.1224	<.0001
%HISPANIC	-7.5079	1.1794	<.0001	-7.2031	1.1825	<.0001
INCOMEPERHH	-0.0501	0.0196	0.0104	-0.0404	0.0197	0.0408
LENDERS	-0.5705	0.1239	<.0001	0.2730	0.3124	0.3821
LENDERS*REFI	0.0452	0.1184	0.7026	0.0563	0.1205	0.6401
LENDERSPERCAP	16.9291	2.6847	<.0001	17.3416	2.6897	<.0001
BRANCHPERCAP	-3.4465	0.3551	<.0001	-3.6612	0.3667	<.0001
YEAR00	15.2849	0.8192	<.0001	21.5000	1.7885	<.0001
YEAR00*LENDERS				-3.1207	0.8891	0.0004
YEAR01	9.3761	0.6173	<.0001	10.0025	1.1758	<.0001
YEAR01*LENDERS				-0.1422	0.3443	0.6796
YEAR02	5.0398	0.5644	<.0001	5.7195	1.1661	<.0001
YEAR02*LENDERS				-0.3313	0.3275	0.3117
YEAR03	3.7509	0.5546	<.0001	7.9566	1.1239	<.0001
YEAR03*LENDERS				-1.2255	0.3094	<.0001
YEAR04	2.1670	0.5513	<.0001	5.3660	1.1437	<.0001
YEAR04*LENDERS				-1.0217	0.3159	0.0012
Q1	4.1249	0.4307	<.0001	4.3045	0.4344	<.0001
Q2	0.9881	0.4275	0.0208	1.2025	0.4296	0.0051
Q3	0.8607	0.3847	0.0253	1.0071	0.3868	0.0092
Scale	11.6474	0.21		11.6052	0.2091	

Table 5 -- continued

	[3]			[4]		
dependent variable	**%GAP**			**%GAP**		
N	24,253			24,253		
left-censored	21,989			21,989		
log likelihood ratio	-1401.68			-1370.47		
	coefficient	**std err**	**p-value**	**coefficient**	**std err**	**p-value**
Intercept	-0.0646	0.0077	<.0001	-0.0808	0.0092	<.0001
MILLS	-0.0273	0.0031	<.0001	-0.0263	0.0031	<.0001
AMOUNT	0.0000	0.0000	0.5689	0.0000	0.0000	0.4390
TERM	-0.0016	0.0001	<.0001	-0.0016	0.0001	<.0001
REFI	-0.0106	0.0029	0.0002	-0.0109	0.0029	0.0001
MULT LOANS	0.0500	0.0036	<.0001	0.0507	0.0036	<.0001
SIX MONTHS	-0.0056	0.0030	0.0577	-0.0057	0.0030	0.0534
LOANS THIS YEAR	0.0003	0.0001	0.0062	0.0003	0.0001	0.0043
%BLACK	-0.0573	0.0118	<.0001	-0.0580	0.0119	<.0001
%HISPANIC	-0.0349	0.0065	<.0001	-0.0339	0.0066	<.0001
INCOMEPERHH	-0.0001	0.0001	0.5924	0.0000	0.0001	0.8145
LENDERS	-0.0034	0.0007	<.0001	0.0012	0.0017	0.4722
LENDERS*REFI	0.0004	0.0007	0.5256	0.0005	0.0007	0.4887
LENDERSPERCAP	0.0910	0.0147	<.0001	0.0945	0.0148	<.0001
BRANCHPERCAP	-0.0175	0.0019	<.0001	-0.0186	0.0020	<.0001
YEAR00	0.0886	0.0045	<.0001	0.1321	0.0098	<.0001
YEAR00*LENDERS				-0.0238	0.0050	<.0001
YEAR01	0.0501	0.0034	<.0001	0.0543	0.0065	<.0001
YEAR01*LENDERS				-0.0012	0.0019	0.5325
YEAR02	0.0285	0.0031	<.0001	0.0314	0.0064	<.0001
YEAR02*LENDERS				-0.0016	0.0018	0.3721
YEAR03	0.0204	0.0031	<.0001	0.0421	0.0062	<.0001
YEAR03*LENDERS				-0.0064	0.0017	0.0002
YEAR04	0.0137	0.0031	<.0001	0.0321	0.0063	<.0001
YEAR04*LENDERS				-0.0059	0.0018	0.0008
Q1	0.0197	0.0024	<.0001	0.0207	0.0024	<.0001
Q2	0.0047	0.0023	0.0463	0.0056	0.0024	0.0165
Q3	0.0014	0.0021	0.5229	0.0023	0.0021	0.2835
Scale	0.0666	0.0011		0.0663	0.0011	

We find evidence consistent with both of our Focal Point hypotheses. In regressions [1] and [3], the coefficients on the **YEAR** dummies indicate a monotonic decline in GAP and %GAP every year between 2000 through 2005, implying a gradual gravitation to the price ceiling over time. Based on the estimates in [1], the average GAP in 2000 was about

$1.43 larger than in 2005.[8] In regressions [2] and [4], where we interact **YEAR** with the number of payday lenders in the local zip code area (LENDERS), the coefficients on YEAR*LENDERS are always negative and usually statistically significant. This implies that focal point pricing occurs more quickly in markets with large numbers of payday loans competitors, consistent with oligopoly theory. Based on the estimates in [2], the average GAP in 2000 was about $1.71 larger than in 2005 for markets with just a single payday lender; but only $0.94 larger than in 2005 for markets with the average number of payday lenders (3.6506).[9]

We also find evidence consistent with both of our Relationship hypotheses. The coefficient on REFI is negative and significant in all four regressions, and this effect is much more precise in regressions [3] and [4] which use our preferred dependent variable %GAP. These results imply that payday lenders systematically charge lower prices (higher GAP) to first-time borrowers, or equivalently, higher prices to repeat borrowers. Based on the estimates in regression [1], GAP is $0.68 smaller for refinancing borrowers relative to new (i.e., non-refinancing) borrowers.[10] Moreover, our estimates suggest that payday lenders have stronger incentives to offer "relationship prices" to new borrowers when they face fewer rival payday lenders in the local area. Setting REFI=0, the derivative of GAP with respect to LENDERS is negative and significant in all regressions—evidently, this particular relationship-pricing strategy is less profitable as the probability that a new borrower will switch to a rival payday lender increases.

The estimated coefficients on MULT LOANS and SIX MONTHS are consistent with the existence of switching costs—the former is consistently positive and significant,

[8] The calculation is as follows: 15.2849*0.0933 = 1.4261, where 0.0933 is the percentage of the observations used in the Tobit regression that were not left-censored. See Greene (1997).

[9] The calculations are as follows: (21.5000 -3.1207*1)*0.0933 = 1.7148, and (21.5000 - 3.1207*3.6506)*0.0933 = 0.9430, where 3.6506 is the mean value of LENDERS from Table 4.

[10] The calculation is as follows: -0.8443 + 0.0452*3.6506 = -0.6793, where 3.6506 is the mean value of LENDERS from Table 4.

while the latter is consistently negative and significant. Based on the estimates in regression [1], payday lenders charged customers with multiple lending relationships about $.56 less (larger GAP), but charged customers that had been in-house for six months in a row about $.14 more (smaller GAP), *ceteris paribus*.[11]

The estimated relationships between loan prices and loan terms are consistent with our priors. The coefficient on AMOUNT is statistically positive when the dependent variable was GAP, but is statistically non-significant when the dependent variable is %GAP. The coefficient on TERM is negative and significant in all four regressions.

Recall that the first-stage probit estimations (Table 3) indicated that payday lenders do not take into account the racial composition of local markets when choosing where to locate. However, we do find a strong statistical association between the racial composition of the local market and the prices that payday lenders charge in those markets-although the economic effect is very small. Based on the estimates in equation [1], a one standard deviation increase in %BLACK (0.0694, or about a 130% increase) is associated with only about a $0.06 reduction in GAP, while a one standard deviation increase in %HISPANIC (0.1395, or about a 65% increase) is associated with only about a $0.10 reduction in GAP.[12] We stress that these tests indicate slightly higher loan prices in markets where the minority population is disproportionate, *not* slightly higher prices to individual minority borrowers. The effect of household income on payday loan pricing is also relatively weak: while GAP (but not %GAP) is negatively associated with household income, a $1,000 reduction in INCOMEPERHH is associated with just a 1 cent increase in GAP.[13]

We find interesting associations between the structure of local financial markets and payday loan pricing. The coefficient on LENDERSPERCAP is positive and significant

[11] The calculations are as follows: 6.0015*0.0933 = 0.5599 and -1.4781*0.0933 = -0.1379.
[12] The calculations are as follows: -8.8639*0.0694*0.0933 = -0.0574 and -7.5079*0.1395*0.0933 = 0.0977.
[13] The calculation is as follows: -0.0501*0.0933 = -0.0047.

throughout: holding constant the raw number of lenders (i.e., the ease of oligopolistic coordination), this implies competitive price reductions in markets where the population is more thoroughly served by payday lenders. The coefficient on BRANCHPERCAP is negative and significant throughout, which implies that easy access to commercial banking services is not a substitute for payday lending. Indeed, as discussed above, this result may indicate that access to commercial banks actually increases demand for payday lending, because checking accounts are a necessary input to the payday lending process.

Finally, we find evidence of seasonality in payday loan prices. Payday lenders apparently charge lower prices during the first half of the year, especially during the first quarter during which GAP was about $0.38 larger on average.[14] Perhaps payday lenders use post-holiday discounts to establish new relationships? Ho Ho Ho!

[14] The calculation is as follows: 4.1249*0.0933 = 0.3848.

7. Conclusions

In recent years, payday lending has become a substantially more important source of credit and alternative payment services vehicle for many American households, and payday lenders have been increasingly criticized for charging high prices for these services to financially unsophisticated and vulnerable consumers. While a number of academic, regulatory, and industry studies have documented the absolute levels of payday loan prices, little attention has been paid to the manner in which payday lenders arrive at these prices—whether their prices are based primarily on regulatory guidelines, influenced by competitive rivalry (or the lack thereof) in local markets, or strategically determined based on consumer characteristics and other local conditions. In this study, we examine the pricing patterns of payday lenders in Colorado between 2000 and 2005, using Tobit estimation techniques to account for legislated price ceilings on the distribution of payday loan prices, and a Heckman correction procedure to correct for potential estimation biases stemming from the locational choices made by payday lenders.

We believe this to be the first study of strategic behavior between and among payday lenders. While our results are preliminary at this point, they do contain evidence suggestive of strategic payday loan pricing. We find evidence consistent with focal point pricing: over time, payday loan prices in Colorado have gravitated toward the legislated price ceiling. Moreover, prices moved toward the ceiling more quickly in markets containing large numbers of payday lenders, where explicit collusion will be more difficult and the existence of a focal point can facilitate implicit price collusion. We also find evidence consistent with relationship pricing: prices were lower for initial loans than for refinanced loans, and this inter-temporal pricing pattern was more pronounced when payday lenders faced fewer local rivals (i.e., when switching costs were high for borrowers). Our findings are consistent with seminal studies of strategic pricing of other financial services by Petersen and Rajan (1994) and Knittel and Stango (2003).

The data yield a number of other interesting results. For example, the presence of more commercial bank branches in the local market was associated with higher, not lower, payday loan prices. Because payday borrowers must have a bank account on which to write a check, this suggests that commercial bank branches act as a *complement* to payday lending that increase the demand for payday lending services. Indeed, we find that payday lenders are more likely to locate in well-branched areas. We also find that payday lenders are more likely to locate in markets with relatively low household incomes, but after controlling for income, payday lenders are *not* more likely to locate in markets with disproportionate minority populations. Although we find statistical evidence that payday lenders charge higher prices on average in both minority and low-income neighborhoods, in economic terms these pricing differences are very small—only a few cents on an average price of around $50—and may be attributable to phenomena that we are unable to specify in our model. (While the database provides us with a substantial amount of unique information about payday lending, it nevertheless was not designed with these kinds of tests in mind, and as a result we are somewhat constrained in our ability to test our hypotheses as thoroughly and as cleanly as we would like.)

We stress that strategic pricing is practiced to some extent by firms in many other industries (see Scherer 1980), and by definition strategic pricing is necessarily neither illegal nor unethical. For example, focal point pricing that facilitates implicit collusion may or may not violate U.S. antitrust laws (see Scherer and Ross, 1990), but in any case this behavior has been difficult to prosecute given that its implicit nature precludes the existence of a "smoking gun." In the case of payday lending, it is ironic that focal points that potentially facilitate price collusion have been provided by state legislatures. Relationship pricing also has a long and varied history (e.g., discounts for repeat customers in some cases, and discounts for new customers in other cases) and, depending on the circumstances, can enhance economic efficiency and social welfare. Whether or not our results have

implications for further regulation of payday lending markets will likely depend on more normative judgments and arguments about consumer protection, an area into which Congress has ventured in the past (e.g., the Community Reinvestment and Truth-in-Lending statutes) and for which the federal regulatory agencies are charged with policing.

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