

ESSAYS ON THE INDUSTRIAL ORGANIZATION OF THE  
PAYDAY LENDING INDUSTRY

by

Stefanie R. Ramirez



A Dissertation Submitted to the Faculty of the

DEPARTMENT OF ECONOMICS

In Partial Fulfillment of the Requirements  
For the Degree of

DOCTOR OF PHILOSOPHY

In the Graduate College

THE UNIVERSITY OF ARIZONA

2014

THE UNIVERSITY OF ARIZONA  
GRADUATE COLLEGE

As members of the Dissertation Committee, we certify that we have read the dissertation prepared by Stefanie R. Ramirez entitled Essays on the Industrial Organization of the Payday Lending Industry and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Philosophy.

\_\_\_\_\_  
Dr. Mo Xiao

Date: 14 May 2014

\_\_\_\_\_  
Dr. Gautam Gowrisankaran

Date: 14 May 2014

\_\_\_\_\_  
Dr. Ronald Oaxaca

Date: 14 May 2014

\_\_\_\_\_  
Dr. Price Fishback

Date: 14 May 2014

\_\_\_\_\_  
Date: 14 May 2014

Final approval and acceptance of this dissertation is contingent upon the candidate's submission of the final copies of the dissertation to the Graduate College. I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the dissertation requirement.

\_\_\_\_\_  
Dissertation Director: Dr. Mo Xiao

Date: 14 May 2014

## STATEMENT BY AUTHOR

This dissertation has been submitted in partial fulfillment of requirements for an advanced degree at the University of Arizona and is deposited in the University Library to be made available to borrowers under rules of the Library.

Brief quotations from this dissertation are allowable without special permission, provided that accurate acknowledgment of source is made. This work is licensed under the Creative Commons Attribution-No Derivative Works 3.0 United States License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nd/3.0/us/> or send a letter to Creative Commons, 171 Second Street, Suite 300, San Francisco, California, 94105, USA.

SIGNED: Stefanie R. Ramirez

## ACKNOWLEDGEMENTS

The author is grateful to Mo Xiao, Gautam Gowrisankaran Ronald Oaxaca, and Price Fishback for continuous guidance and support. Thanks also to Jessamyn Schaller, Ashley Langer, Taylor Jaworski, Ron Borzekowski, Mauricio Varela, Tieman Woustersen, Charles Becker, and Miguel Ramirez for valuable comments and suggestions. Research results and conclusions expressed are those of the author.

## Contents

List of Figures . . . . .	8
List of Tables . . . . .	9
ABSTRACT . . . . .	11
Chapter 1. Regulation and the Payday Lending Industry . . . . .	15
1.1. Introduction . . . . .	15
1.2. Payday Lending . . . . .	21
1.2.1. The Product . . . . .	21
1.2.2. The Industry . . . . .	22
1.2.3. Regulatory Environment . . . . .	23
1.2.4. Policy Debate . . . . .	24
1.3. Theoretical Framework . . . . .	29
1.3.1. Consumer Interest . . . . .	29
1.3.2. Producer Interest . . . . .	31
1.3.3. Application to Analysis . . . . .	33
1.4. Empirical Specification . . . . .	34
1.5. Data . . . . .	38
1.5.1. Branch Data . . . . .	39
1.5.2. Regulation Data . . . . .	42
1.5.3. Demographic Data . . . . .	45
1.6. Results and Discussion . . . . .	46
1.6.1. Operating Branches . . . . .	46
1.6.2. Opening Branches . . . . .	49
1.7. Conclusions . . . . .	51
1.8. Tables and Figures . . . . .	53
Chapter 2. The Hydra Effect: Examining the Indirect Effects of Banning Pay- day Lending . . . . .	60
2.1. Introduction . . . . .	60
2.2. Background . . . . .	63
2.2.1. Changes in Consumer Behavior . . . . .	64
2.2.2. Supply-side Response . . . . .	65
2.3. Ohio and the Short-Term Loan Law . . . . .	66
2.3.1. Alternative Industries . . . . .	67

Contents – *Continued*

2.4.	Empirical Specification . . . . .	70
2.5.	Data . . . . .	73
2.5.1.	Branch-Level Data . . . . .	73
2.5.2.	Trends in Branch Counts . . . . .	78
2.5.3.	Demographic Data . . . . .	80
2.6.	Results and Discussion . . . . .	82
2.6.1.	Dependent Variable: Number of Operating Branches . . . . .	82
2.6.2.	Dependent Variable: The Change in the Number of Operating Branches . . . . .	86
2.6.3.	Dependent Variable: The Number of Opening Branches . . . . .	89
2.7.	Including Time-Fixed Effects . . . . .	91
2.7.1.	Dependent Variable: The Number of Operating Branches . . . . .	91
2.7.2.	Dependent Variable: The Change in the Number of Operating Branches . . . . .	92
2.7.3.	Dependent Variable: The Number of Opening Branches . . . . .	93
2.7.4.	Predictive Ability . . . . .	94
2.8.	Conclusion . . . . .	95
2.9.	Tables and Figures . . . . .	98
2.9.1.	Summary Data . . . . .	98
2.9.2.	Results . . . . .	106
Chapter 3.	Credit Constraint and Payday Loan Usage . . . . .	123
3.1.	Introduction . . . . .	123
3.2.	Background . . . . .	128
3.3.	Framework . . . . .	129
3.3.1.	Becoming Credit Constrained . . . . .	130
3.3.2.	The Decision to Borrow Payday Loans . . . . .	131
3.3.3.	Estimation . . . . .	134
3.3.4.	Exclusion Restrictions . . . . .	136
3.4.	Data . . . . .	137
3.4.1.	Reasons for Exclusion from Traditional Lending Services . . . . .	138
3.4.2.	Reasons for Using Payday Loans . . . . .	142
3.4.3.	Summary Statistics: Examining Borrower Profiles . . . . .	144
3.5.	Results and Discussion . . . . .	152
3.5.1.	Estimating the Probability of Using Payday Loans . . . . .	157
3.6.	Conclusion . . . . .	161
3.7.	Tables . . . . .	164
Chapter 4.	Conclusion . . . . .	175

Contents – *Continued*

Chapter 5. References . . . . .	176
Appendix A. Regulation and the Payday Lending Industry - Robustness Checks . . . . .	183
A.0.1. Operating Branches, Including Time Trends . . . . .	183
A.0.2. Operating Branches, Including Virginia and Tennessee . . . . .	185
A.0.3. Opening Branches, Including Time Trends . . . . .	186
A.0.4. Opening Branches, Including Virginia and Tennessee . . . . .	187
Appendix B. The Hydra Effect: Measuring the Indirect Effects of Banning Pay- day Lending - Omitted Variables . . . . .	194
B.0.5. Discussion . . . . .	195

## List of Figures

1.1.	Trend in Observed Branch Counts . . . . .	53
1.2.	Distribution of Operating Branches . . . . .	54
2.1.	Trend in Branch Data: Payday Lenders . . . . .	100
2.2.	Trend in Branch Data: Pawnbrokers . . . . .	101
2.3.	Trend in Branch Data: Precious Metals Dealers . . . . .	102
2.4.	Trend in Branch Data: Small-Loan Lenders . . . . .	103
2.5.	Trend in Branch Data: Second-Mortgage Lenders . . . . .	104
2.6.	Actual vs. Predicted Operating Branch Counts: Pawnbrokers . . . .	115
2.7.	Actual vs. Predicted Operating Branch Counts: Precious-Metals Dealers . . . . .	116
2.8.	Actual vs. Predicted Operating Branch Counts: Small-Loan Lenders	117
2.9.	Actual vs. Predicted Operating Branch Counts: Second-Mortgage Lenders . . . . .	118
2.10.	Actual vs. Predicted Opening Branch Counts: Pawnbrokers . . . . .	119
2.11.	Actual vs. Predicted Opening Branch Counts: Precious-Metals Dealers	120
2.12.	Actual vs. Predicted Opening Branch Counts: Small-Loan Lenders .	121
2.13.	Actual vs. Predicted Opening Branch Counts: Second-Mortgage Lenders . . . . .	122

## List of Tables

1.1.	Data - Summary Statistics: Branch Data . . . . .	54
1.2.	Summary Statistics: Regulation Data . . . . .	55
1.3.	Regulation Data: Trend in Conditional Means . . . . .	55
1.4.	List of Demographic Variables and Definitions . . . . .	56
1.5.	Summary Statistics - Demographic Variables . . . . .	56
1.6.	OLS Regression Results - Dependent Variable: Number of Branches to Operate in a Market . . . . .	57
1.7.	OLS Regression Results - Dependent Variable: Number of Branches to Open in a Market . . . . .	58
1.8.	Average Effects of Introducing Regulations, Baseline Specification . .	59
2.1.	Summary Statistics: Dependent Variables . . . . .	99
2.2.	Summary Statistics: Demographics . . . . .	105
2.3.	Regression Results: Operating Branches in the Pawnbroker Industry .	106
2.4.	Regression Results: Operating Branches in the Precious Metals In- dustry . . . . .	107
2.5.	Regression Results: Operating Branches in the Small Loan Industry .	108
2.6.	Regression Results: Operating Branches in the Second Mortgage Lending Industry . . . . .	109
2.7.	Regression Results: Change in Operating Branches for All Industries, Including County-Fixed Effects . . . . .	110
2.8.	Regression Results: Opening Branches for All Industries, Including County-Fixed Effects . . . . .	111
2.9.	Regression Results: Operating Branches for All Industries, Including County- and Year-Fixed Effects . . . . .	112
2.10.	Regression Results: Change in Operating Branches for All Industries, Including County- and Year-Fixed Effects . . . . .	113
2.11.	Regression Results: Opening Branches for All Industries, Including County- and Year-Fixed Effects . . . . .	114
3.1.	Reasons for Rejection from Traditional Credit/Liquidity Market, Per- centage Responses . . . . .	165
3.2.	Reasons for Rejection from Traditional Credit/Liquidity Market for Payday Loan Users, Percentage Responses . . . . .	166
3.3.	Reasons for Using Payday Loans . . . . .	167
3.4.	Summary Statistics: All Borrowers, 2007 . . . . .	168

List of Tables – *Continued*

3.5. Summary Statistics: All Borrowers, 2010 . . . . .	169
3.6. Summary Statistics: Payday Loan Borrowers Only, 2007 . . . . .	170
3.7. Summary Statistics: Payday Loan Borrowers Only, 2010 . . . . .	171
3.8. Stage One Probit Regression: Dependent Variable: Constraint . . . . .	172
3.9. Stage Two Regression: Dependent Variable: Payday Loan Use, 2007 .	173
3.10. Stage Two Regression: Dependent Variable: Payday Loan Use, 2010 .	174
A.1. Robustness Exercises - Dependent Variable: Number of Operating Branches . . . . .	189
A.2. Robustness Exercises - Dependent Variable: Operating Branches, Av- erage Effects . . . . .	190
A.3. Robustness Exercises - Dependent Variable: Number of Opening Branches . . . . .	191
A.4. Robustness Exercises - Dependent Variable: Opening Branches, Av- erage Effects . . . . .	192
A.5. Data - Summary Statistics for Branch-Level Data, Including Virginia and Tennessee . . . . .	192
A.6. Summary Statistics - Regulation Data, Including Virginia and Ten- nessee . . . . .	193
B.1. Wooldridge test for autocorrelation, F-statistics . . . . .	197
B.2. SUR-Regression Results: Operating Branches, Including County- Fixed Effects . . . . .	198

## ABSTRACT

The payday lending industry has experienced incredible growth in the 2000's. In 1996, there were an estimated 2,000 branches operating nationally. However, in 2007, the number of operating branches increased exponentially to 24,000 branches; in 2010, this figure slightly declined to 20,600 estimated operating branches. Loan volume also saw incredible growth: estimated loan volume in 2004 was \$50 million and grew to an estimated \$30 billion for storefront lenders alone. Increased competition from traditional banking institutions, such as credit unions and the prevalence of direct deposit advances, changed the landscape of the industry as well.

In the same decade, states began adopting explicit policies regulating payday lenders with different levels of stringency and purpose. Some states chose to regulate lenders through enabling regulation: the practice of defining and allowing the practice of payday lenders. Some states prohibited lending explicitly or through indirect fee maximums. However varied within the state or across states, these regulations were addressing the growing debate surrounding the use of this particular product. Opponents of payday loan use argue that the high APR associated with these loans are a form of price gouging by lenders, taking advantage of a disadvantaged population. Further, critics argue that payday loans trap users in a cycle of debt that, in the end, cost borrowers more in fees than the original balance of the loan. Conversely, proponents of the product cite high costs of lending as justification for high prices. The high risk of default, security and payroll fees contribute to higher per-loan costs. Lastly, the use of payday loans is safer when compared to realistic substitutes, such as late-payment fees, overdraft fees, and implicit consequences of late utility payments.

The studies within this dissertation attempt to increase understanding of the payday lending industry by examining both sides of the market, firms and con-

sumers. The first two chapters examine how firms within the industry react to and interact with policy environments that dictate market conduct. Additionally, in the last chapter, I examine the payday loan borrowers themselves in order to better understand the mechanisms of demand for such a unique product. All of these studies serve to contribute to the commentary of the industry as to how this industry serves borrowers and, if necessary, what policy actions are best and most efficient in order to address potential issues pertaining to the payday lending industry.

In the first chapter of my dissertation, I examine the relationship between payday lending regulations and industry structure. Exploiting the growth and variation in policies across states and time, I examine how changing explicit payday lending policies affects the structure of the industry, for both entry and continued operation. I have assembled a unique data set containing detailed payday lending branch and regulation information for multiple states for the years 2001 to 2010. Results show that the industry's reactions to explicit policies are mixed. Increasing licensing fees and capital requirements leads to modest decreases in both entry and industry size. However, enacting and increasing the stringency of product defining regulations lead to a decrease in existing branches but also lead to increased entry. These opposite reactions to explicit policy highlight the need for a multidimensional approach, considering both consumer-interest and producer-interest perspectives, when examining the relationship between industry and regulation.

For the second chapter of my dissertation, I examine the indirect effect of banning payday lending. In November of 2008, the state of Ohio approved legislation capping interest rates on payday loans to a maximum of 28 percent APR, implicitly banning the industry. Using licensing records from 2006 to 2010, I examine how this ban affects the county-level structure of the pawnbroker, precious metals, small-loan, and second-mortgage lending industries to determine the indirect effects of banning payday lending. Three specific outcomes are measured: the number of operating branches, the change in the number of operating branches, and the number of new branches to enter in a given county-year. The results show that banning payday lending has the largest effects on the precious metals, small loan,

and second-mortgage lending industries. In the periods with the ban in place, the county-level number of operating precious dealers increases by 0.389, more than doubling average county levels. However, this result is likely influenced by the rising prices of precious metals more so than the ban. Further, the decrease in the number of small-loan lending branches indicates, not only an industry in decline, but an industry that is completely disappearing. Lastly, the existence of a ban increases the change in the number of operating branches by almost 3 branches per county. These results suggest that payday lenders choose to dodge enacted restrictions and continue operations by licensing as second-mortgage lenders rather than adjusting product mixes or exit the market completely. Such outcomes are a signal to policy makers that alternative financial services should not be treated in isolation when establishing new restrictions or regulations.

In the third chapter of my dissertation, I seek to answer two questions: 1) What individual characteristics contribute to the condition of credit constraint? and 2) How does being constrained affect the likelihood of payday loan use? I replicate the framework of Jappelli (1990) in predicting what factors contribute to constraint, with consideration to the effects of the 2008 financial crisis. Additionally, I model payday loan use as a two-stage process in which: 1) an individual demands liquidity from traditional financial institutions, either being rejected or extended credit, and 2) contingent upon first-stage outcomes, an individual will seek liquidity from payday lenders. I use data from the 2007 and 2010 Survey of Consumer Finances to examine differences in income, wealth, debt, and payday loan use between households that have been successful in attaining traditional credit and excluded households. Using the Heckman Selection model of estimation, findings indicate in 2007, a 1-percent increase in income decreases constraint by 11 percent while a 1-percent increase in debt increases constraint by almost 2 percent. In 2010, a 1-percent increase in total wealth decreases constraint by 5 percent while a 1-percent increase in debt increases constraint by 5 percent. In predicting payday loan use, in 2007, initial constraint has no effect on the likelihood of borrowing payday loans. In 2010, constraint *decreases* the probability of using payday loans. I suspect results are

not correct due to unobserved access restrictions imposed by state policy. Lastly, for both years, income is a significant predictor of payday loan use, increasing in magnitude from 2007 to 2010. This is a reflection of the changing composition of constrained borrowers and users of alternative financial products.

## Chapter 1

### Regulation and the Payday Lending Industry

#### 1.1. Introduction

The payday lending industry has experienced explosive growth over the past decade and provides a unique opportunity to examine industrial evolution. In the year 2000, there were an estimated 10,000 payday lending branches operating nationally; in less than 10 years, the industry is estimated to have doubled in size. The number of operating FDIC insured operating banks increased by 27.5 percent from 2000 to 2010, just over half the growth rate of the payday lending industry<sup>1</sup>. While this growth may seem sudden, payday loans existed well before the 2000's. Payday loan products were available through mainstream financial institutions and traditional banks. However, due to the deregulation of the banking industry in the 1990's, small-loan products from traditional banks became less available (Stegman (2007)). In spite of this decrease in access from traditional sources, lenders and borrowers still managed to operate out of the scope of existing financial service regulations specific to traditional credit. The payday lending industry has vigorously emerged in a short period of time, gaining the attention of policymakers, consumer advocates, and academics.

As the payday lending industry itself developed, so too did regulatory environments. State legislatures began proposing and enacting payday lending regulations with varying degrees of scope and stringency. Some states chose not regulate lenders explicitly, allowing payday lenders to operate without licenses or state-imposed requirements. Some states prohibited the practice altogether, either through direct regulation or indirectly through the application of usury laws. Some states es-

---

<sup>1</sup>Source: Historical Statistics on Banking - Commercial Banks. Federal Deposit Insurance Corporation.

established regulations that mirrored existing market practices that imposed no real restrictions. In the latter half of the 2000s, states introduced more than 500 bills related to the practice. These bills ranged from establishing electronic databases to track borrowers, establishing product restrictions, to the full prohibition of the practice. This variation in adoption and severity created a heterogeneous regulatory environment during the decade across the country. This simultaneous rise in the payday lending industry and state-level policy offers a unique opportunity to study the relationship between policy and industry. This study will attempt to answer two very important questions about the payday lending industry: 1) How is the structure of the payday lending industry affected by the adoption explicit payday lending regulations? and 2) What are the effects of changing existing regulations on the structure of the industry?

In order to answer the proposed questions, I have assembled a unique data set consisting of detailed branch-level and regulatory information for 10 states<sup>2</sup> for the years 2001 through 2010. For the industry, licensee information was collected for each individual branch to have ever operated within the state during the time of observation, information that includes company name, physical operating address and duration of operation. Such detailed information allows for a more thorough picture of the industry to be assembled and a more narrow analysis to be performed. I analyze industry structure at the Census Zip-Code Tabulated Area (ZCTA) level, the geographic level that best captures the behavior of payday lenders concentrating close to customers. Detailed information on the duration of branch operation allows for changes in market structure be analyzed over an extended period of time. Previous studies have not been able to capture variation both geographically and across time with such a narrow market focus<sup>3</sup>. State-enacted regulation data explicitly pertaining to payday loans are collected for the observed states. For each state,

---

<sup>2</sup>Observed states are: Arizona, Idaho, Iowa, Kansas, Missouri, Montana, Nevada, New Hampshire, South Dakota, and South Carolina.

<sup>3</sup>Branches analyzed at the ZCTA or zip-code levels have been analyzed for a single period of time. Conversely, examining market structure across time has been restricted to a single state. Lastly, across-state analysis has been conducted for a single period of time at the county level.

regulations are examined component by component, classifying and quantifying the different dimensions of established payday lending policy. I examine the existence and stringency of two different types of regulations: 1) Licensing requirements that establish minimum quality standards for branches and 2) Product-defining policies that impose restrictions on particular loan terms, such as fee ceilings, rollover maximums and loan-size maximums. Measuring variation in existence and stringency of regulatory components expands the scope by which regulation is measured and how policy effects are analyzed.

This study examines how state-level policies affect the payday lending industry at a smaller geographic level, specifically at the ZCTA level mentioned above. Identification of state-level policy effects on ZCTA-level measures can be difficult due to the possibility of policy endogeneity at the state level. In order to properly correct for potential biases in estimations of causal effects, my empirical specification includes both county- and year-level fixed effects. By including county-level fixed effects, I can properly control for unobserved factors that no doubt lead to biases in the estimations of policy effects on market concentration<sup>4</sup>. The inclusion of county-fixed effects controls for characteristics of the region in which the market is located in that contributes to both changes in market size and regulations, such as consistently active policy environments<sup>5</sup>. and consistent demographics. The inclusion of year-fixed effects controls for national trends and shocks that influence both market structure and regulation, such as "good" years for the industry, the impact of any federal regulations, and the beginning of the Great Recession.

Baseline results suggest that different policies have different effects for both new and incumbent branches. First, licensing fees for both new and existing branches are low and impose only a slight barrier to entry and operation. However, the extremely modest effects on both outcomes (decreasing entry and operating branches by less

---

<sup>4</sup>See Besley and Case (2000) for discussion

<sup>5</sup>Note: This is not the number of passed or unpassed bills pertaining to payday lenders. This is a relative comparison in behavior that seeks to determine if policy environments have had some policy debate throughout the decade of observation.

than 1 branch) indicate these fees are mechanisms designed to fund enforcement of policy rather than to limit the industry size. Further, increasing asset requirements leads to a slight decrease in new branches only. Second, initially enacting loan-size maximums leads to a decrease of almost 3 operating branches per market, more than the average industry size per market observed. Enacting rollover limits leads to a slight increase in the number of new branches, but no statistical effect on operating branches. Enacting fee ceilings has no statistical effect on either the number of operating branches or opening branches. Third, the effects of raising or lowering existing product-defining regulations also has mixed results for operating and opening branches. Relaxing loan-size ceilings leads to an increase in the number of operating branches, while altering fee and rollover ceilings has no effect. Conversely, relaxing the stringency of all three measured loan-term regulations leads to a *decrease* in the number of new branches, contrary to traditional theoretical predictions.

These results indicate that incumbent firms and potential entrants behave differently in the face of a changing policy environment. Existing branches, as measured by the number of branches operating within a market, react negatively to new policies that both establish explicit limits and increase the binding nature of existing regulations. This decrease in branch counts demonstrates that existing branches view any changes that increase government involvement in market activity as restrictive and costly. Conversely, the number of new branches increases when explicit policies are enacted and when existing loan-term policies become more stringent. This indicates that policy serves a different role for entrants than existing branches: new entrants view policy as a means to explicitly define the payday-loan product and increase the distinction between payday lending and other financial services. Given these two distinct, and potentially conflicting outcomes, the traditional lens by which the effects of policy are examined has to be recalibrated to acknowledge the potential that regulations serve a multidimensional purpose.

This study contributes to the discussion on the relationship between industry and regulation by differentiating between enacting new policies and altering existing policies to better understand the effects of heterogenous policy environments.

Consequently, one must revisit the standard approach related to understanding regulation and industry. The more traditional economic perspective establishes policymakers as protectors that establish regulations to limit potentially harmful firm behavior. Particular to the payday lending industry, the consequences of such regulations are clear: imposing product restrictions (such as price ceilings) to protect the consumer can affect the profitability of the payday loans and naturally leads to industry decline. Conversely, the perspective of producer-centered regulation offers an alternative explanation for the relationship between firms and regulators. According to Stigler (1976), Public Choice and producer-interest perspectives establish that firms, rather than consumers, are the demanders of policy. Regulations exist in order to protect industry incumbents from competitive forces that would lead to a decrease in market power. Related to the payday lending industry, firms are already highly involved in the development of applicable state policy. For firms, the state serves to explicitly define the product and distinguish payday loans from both traditional and other alternative financial service products, enabling the practice to exist within the state. Approaching the discussion of how the payday lending industry is affected by state-level policy from a single perspective, either traditional or producer-centric, ignores the multi-dimensional aspects of this policy, leading to an incorrect characterization of the interactions between firms and regulators.

My research contributes to the literature on payday lending by examining the mechanisms that affect access to payday loans. The majority of the current literature examines demand-side outcomes of access, while a small segment examines individual firm behavior and profitability. This study makes no claims on the effects of payday lending on borrower or firm welfare. However, it is a necessary precursor to the literature that examines the welfare outcomes of payday lending by examining how different policy mechanisms affect the availability of payday loans. The current literature is dominated by research exploring the demand-side outcomes of access to payday loans<sup>6</sup>. Most important and relevant to this particular analysis

---

<sup>6</sup>Conclusions on the effects of access are mixed. Studies (Stegman and Faris (2003), Skiba and Tobacman (2009), Melzer (2011)) have found negative welfare effects of access while others (Zinman

is the study conducted by Flannery and Samolyk (2005). This study analyzes the profitability of a single firm over multiple years and determines that profitability is most dependent on loan volume and that rollover or renewals are a large share of outstanding loans. They also find that licensing fees impose no significant limit on a firm's profitability or ability to operate, rather are relatively modest operating costs for the lender. The most important finding is that seemingly high fees charged to customers are necessary in order to cover operating costs and the high rate of loan default and loss. Huckstep (2007) and Skiba and Tobacman (2007) conduct firm level studies on payday lenders and confirm that these firms have moderate, not extraordinary, returns. Lastly, DeYoung and Phillips (2009) examine pricing behavior of firms prior to and after the establishment of fee ceilings. They find that payday lending firms engage in price competition driving market prices down prior to the ceiling; however, fees per loan increase as ceilings are imposed, becoming a focal point for lenders. Additionally, profitability of payday lenders is highly dependent upon repeat borrowers.

The paper is organized as follows. Section 2 describes the payday lending industry, regulatory environment and policy debate that surrounds the industry and usage. Section 3 introduces the theoretical framework by which explicit policy is examined, considering both traditional and producer-interest perspectives, and its application to the payday lending industry. Section 4 discusses the empirical specification and identification techniques. Section 5 discusses assembled payday lending branch and regulatory data. Section 6 presents results and discusses the implications of the findings. Finally, Section 7 concludes.

---

(2009), Morse (2011), Morgan, et. al. (2012)) have found a positive or no effect of access. Location studies (Graves (2003), Burkey and Simkins (2004), Graves and Peterson (2005), Gallmeyer, Roberts (2009), Prager (2009)) have found high market concentration in underprivileged areas and growing concentration in traditional banking markets (Damar (2009)).

## 1.2. Payday Lending

### 1.2.1. The Product

Payday loans are different from other traditional financial products as they are uncollateralized, small in denomination and extremely short term. Payday loans range from \$100 to \$500 and are extended for a period of no more than two weeks. Fees collected are based upon the size of the loan and typically amount to \$15 for every \$100 loaned. In comparison, credit cards have higher limits and are revolving sources of financing. Traditional consumer loans are also higher in value and longer in term. Costs to the borrower for these types of financing are measured by an annual percentage rate and are limited to 36 percent by state and federal regulations. When calculated as an APR, fees on payday loans can exceed 300 percent (Stegman, 2007). For a two-week, \$300 loan with \$45 dollars in fees, the calculated APR is 391 percent<sup>7</sup>, more than ten times legal usury limits. These extremely high calculated interest rates have gained the industry attention from critics that claim these fees are too high and anti-usurious.

The process to borrow a payday loan is relatively simple. To be eligible to borrow, an individual must have an active checking account and must be employed (proof of which is given in the form of a current pay stub). Unlike traditional loans, there are no minimum credit requirements and payday loans actually do not affect the credit score of the borrower<sup>8</sup>. Funds are distributed to the borrower in exchange for a post-dated check for the amount of the loan plus any applicable fees. The lender will hold the check until the date the loan is due. On the due date, the borrower returns to the branch to pay off the loan and fees. If the borrower does not come back, it is at that time that the branch will then attempt to cash the check in order to reclaim lost funds.

---

<sup>7</sup>The following formula is used to determine APR as used by DeYoung and Phillips (2009).

$$APR = \frac{Fee * \frac{365}{Term}}{LoanAmount}$$

<sup>8</sup>Borrowers can select into having payday loans reported on his or her credit report. This practice is not mandatory and is typically utilized by borrowers seeking to improve his or her credit rating.

Though attention to the industry has increased, only a small share of the population has actually borrowed a payday loan. In 2001, an estimated 2 percent of the adult population borrowed; by the end of the decade, this share increased to 5 percent of the population. Demanders of payday loans have been identified as mid-to lower income earners with limited access to other forms of credit like credit cards. For 2001, it was estimated that the majority of borrowers earned between \$25,000 and \$50,000 annually. However, by the end of the decade, the income distribution of borrowers changed with the largest percentage of borrowers earning between \$15,000 and \$25,000 annually (Elliehausen and Lawrence (2008), Pew (2012)). Elliehausen and Lawrence (2008) survey users of payday loans and find that nearly two-thirds of respondents used loans to cover unplanned and emergency expenses rather than continual short-falls in income. For borrowers at the end of the decade, Pew (2012) finds that most borrowers utilized loans to supplement low incomes to meet regular financial obligations, such as utility or phone bills, rather than emergency expenses. From these data, it appears that the demand for payday loans has shifted from a short-term financial solution to instead become a regular supplement to insufficient incomes.

### 1.2.2. The Industry

In the 1990's, the payday lending industry emerged from established check cashers that were extending small loans to customers by holding post-dates checks for a short time period. In the year 2000, there were an estimated 10,000 physical storefronts operating nationally. This estimate more than doubled to 22,000 locations in 2004 (Flannery and Samolyk (2005)). Storefront counts remained high near the end of the decade; approximately 24,000 branches in 2007 and slightly fewer (20,000) in 2010. In 2003, loan volume was an estimated \$40 billion and increased to \$45 billion in 2007. However, by the end of the decade, revenue from brick-and-mortar locations decreased to just under \$30 billion. While the number of physical locations is on the decline nationally, the number of online outlets providing payday loans has become prevalent and continues to increase (Stephens, Inc. (2011)).

While the payday lending industry has settled, other related industries have begun to offer products similar to payday loans. Traditional banks offer overdraft protection for a small fee to depositors; traditional banks impose fees (typically \$30 per overdraft) on consumers that overdraw from their accounts. Additionally, traditional banks also offer Direct Deposit advances, a product that allows consumers to borrow against their next paycheck (for a fee) and use funds that will be deducted from their next deposited paycheck. Credit unions also began offering payday loans to their members; firms discontinued this practice as the product was not profitable to maintain and too risky (Stango (2012)). In 2008, the FDIC sponsored a pilot program that encouraged banks to offer small-dollar loans to consumers in order to encourage traditional banks to services areas that were historically underbanked. These loans were longer in duration and charged a lower APR when compared to standard payday loans (FDIC, 2010).

### 1.2.3. Regulatory Environment

Payday lenders are primarily regulated at the state level. Across states, regulations can be classified into four different categories: restrictive, hybrid, permissive, or non-existent. States with restrictive regulations impose statutes that severely limit lender practices without establishing explicit payday lending policies. Instead, state and federal usury laws applicable to traditional consumer loans are imposed upon payday lenders; this effectively bans the practice of payday lending as it becomes unprofitable for firms to operate under such requirements. Hybrid laws are similar to restrictive lending regulations in that they also effectively ban payday lending. However, hybrid laws are explicit laws that impose binding fee ceilings or other restrictive requirements. States with permissive regulations also establish explicit policies, but allow for the practice to exist. Permissive regulations define loan terms to be in-line with established market practices and serve to explicitly define the product for use rather than restrict it. States with especially permissive regulations will not limit any part of the lending process. Instead, these environments only define licensing requirements for operation within the state and little

else. Lastly, in a non-existent regulatory environment, no explicit payday regulations are established, yet payday lenders operate openly within the state. Within this category, it is likely that lenders are established check cashers that expanded services to offer payday loans to customers (Mann and Hawkins (2007); Stephens, Inc. (2013)).

Of late, state policy makers have been increasingly active in establishing payday lending legislation and changing existing policies. Between the years of 2007 and 2012, over 500 bills were introduced by states, over 90 of them were passed and enacted into law. Regulations ranged from limiting the size of the loan and fees, establishing statewide databases to track borrowers, to explicitly banning the practice of payday lending all together. According to the National Conference of State Legislatures, in 2012, 38 states had some form of explicit payday lending regulation enacted allowing the practice of payday lending. Georgia and the District of Columbia explicitly ban the practice and 11 states effectively ban payday lending by applying usury laws to these lenders. At the federal level, starting in the year 2000, lenders were required by the FDIC to display fees both in dollar terms and as an APR (according to Regulation Z of the Truth In Lending Act)(Smale (2005)). In 2007, the Talent-Nelson Amendment was adopted by Congress, capping the APR of payday loans borrowed by the military and military dependents to 36 percent - effectively banning lending to individuals associated with the military. Most recently, in 2010, the Dodd-Frank established the Consumer Federal Protection Bureau, the first federal agency tasked with monitoring and potentially regulating payday lenders at the national level.

#### 1.2.4. Policy Debate

As the industry grew during the 2000's, both critics and proponents have also become more vocal on the issue of availability, product safety, and potential solutions to "the payday lending problem". Critics of payday loans argue the loans are dangerous; firms prey on unsuspecting borrowers and the practice should be completely banned altogether. Within the arguments against payday lending, there

are three characteristics of the loan that critics argue make the product harmful to consumers: the requirement of full repayment upon loan due date, the high interest rate associated with borrowing, and the ability to renew loans repeatedly. As argued by Faller (2008), since payday loans and all associated fees must be repaid in full at the end of the loan term rather than in installments. Borrowers are financially constrained to begin with and are pushed further into distress due to the obligation of paying the loan in addition to existing bills and expenses. Even though the size of the loan is small relative to other forms of credit, critics argue the short-term nature of the loan does not allow enough time for borrowers to recover the required funds to pay off the loan and fees or to meet other financial obligations they still have. As a result, the borrower is thrust into a cycle of debt with no relief in sight (Stegmen (2001)). Cited by Faller (2008), the Center for Responsible Lending conducted studies on the usage of payday loans and found that a majority of the consumers that utilized these loans felt financially trapped. Recently, the Consumer Federal Protection Bureau conducted a survey that found the majority of borrows took out more than 10 payday loans in a year, further supporting the notion of the endless debt cycle (Wang (2013)).

An extension of this argument is the critique on ease of renewability: keeping the borrower perpetually in debt with no ability to completely pay off the loan. The ability to renew the loan defers full payment. However, the borrower is still responsible for the fees for the renewed loan. Constantly renewing the loan defers the full payment, but borrowers continue to accrue additional fees that can actually exceed the original value of the loan. The CRL finds this to be true: more than half of surveyed borrowers paid more in fees than the actual value of the loan (Faller (2008)).

Lastly, the largest point of contention is the fees lenders charge for borrowing. Borrowers are charged a fee that depends upon the loan value. These fees are typically \$15 per \$100 loaned. As required by state regulation and industry practice, fees are converted to APRs and displayed alongside dollar fees. Relative to other loans, these fees equate to incredibly high interest rates (in some states, exceeding

500 percent) that are glaringly higher than established usury-fee limits of 36 percent. Critics argue that the fees charged also contribute to excessive profits for the industry: the fees charged are more than enough to cover the costs of operation and cover losses from unpaid balances. Related to consumers, charging high fees is another mechanism in which payday lenders prey on disadvantaged borrowers that either do not understand the fee structure of the loans or have no other option but to borrow from a payday lender (Stegman (2007), Faller, (2008)).

In response to the accusations of cyclical usage, proponents emphasize the loan was designed for short-term use only and not a solution to longer term credit needs. The small denominations of the loan and shorter term are meant to alleviate financial strain in between paychecks, thus the development of the moniker "payday loan". If used as a long-term credit product, simply by design, it is absolutely an expensive alternative but technically being misused. Proponents and firms note that the majority of borrowers actually use fewer than 12 payday loans per year, less than one per month. Advance America, the largest payday lending company within the United States, cites that most of their borrowers use the service only once in a calendar year; a very small percentage of customers actually originate more than 12 loans. Veritec, the firm responsible for maintaining electronic customer databases, corroborates this fact. Their data also show that the majority of consumers only ever use payday loans once. Both firms also state the majority of customers are actually satisfied with the product, that the loan met their needs, and borrowers did not experience the negative outcomes or hardships reported by critics of the loan (O'Shaughnessy (2013), Groff (2013)).

While payday lenders do acknowledge that the calculated APRs on the loans are high, they reason that the nature of the loan and operating costs justify the cost. The fact that the loan is extremely short term and small in value, any calculated interest on the loan will be high. Unlike traditional forms of credit, the payday loan is uncollateralized, thus any loss is directly incurred by the firm. Payday loan borrowers are also riskier borrowers on average and the risk of default and loss is higher with these borrowers (Stegman, 2001). Flannery and Samolyk (2005)

analyzed the balance sheets of a payday lending firm and found that the majority of the fees collected indeed went to cover employee wages, security for branches, and lost loans. Subsequent studies (Huckstep (2007), Skiba and Tobacman (2007), Prager (2009)) all confirm that "excessive" fees do not translate into excessive profits for the industry and that the costs do, in fact, justify the price<sup>9</sup>.

Lastly, proponents and firms argue that comparing payday loans to traditional credit is incorrect as these products are not necessarily substitutes. Given that consumers are already credit constrained, credit cards and other loans are not necessarily options that a distressed borrower can utilize. Rather, if choosing another option besides payday loans, one has to consider products like direct deposit advances, fees on overdrafts, and fees on late payments. Payday lenders are required to disclose fees as both APRs and in dollar terms while overdraft fees are not, therefore a borrower is actually more informed about the true costs of a loan when borrowing from a payday lender than when paying overdraft fees. If calculated, fees on overdraft and non-sufficient fund fees can exceed 1000 percent, while payday lending fees are typically regulated to be no more than 400 percent (O'Shaughnessy (2013)). Compared to actual alternatives, payday loans can be less financially harmful and less expensive to consumers than other, more likely alternatives.

### **Role of Policy: Protect Borrowers**

Critics see the role of government to be one of the protector: the government should establish limits on payday loans and lenders in order to minimize financial distress caused by usage. Some critics argue that the only true solution to the payday loan problem is complete abolition, noting the potential for the industry to continue abuses under enabling policy environments. Payday loan critics use states such as North Carolina, the New England region, and the District of Columbia as examples in which limiting access can be beneficial: these states have prohibited

---

<sup>9</sup>Prager (2009) also examined other alternative financial services in addition to payday lending companies.

payday lending yet borrowers are no worse off than before prohibition<sup>10</sup>. (Faller (2008)).

### **Role of Policy: Enable Payday Lenders**

Payday lending firms and proponents also see the government as a potential ally in the process rather than an opponent. Lenders do see the potential for danger in the product and the potential for predatory firms. An explicit regulatory environment can serve to protect both firms and consumers simultaneously by establishing strict guidelines for all agents to follow. For the industry, an explicit policy environment not only protects consumers from a harmful product, it additionally serves to protect firms from increased risk. The industry serves borrowers that do not qualify for traditional financing, therefore, firms assume a great deal of risk when lending. Establishing limits on the product does limit a firm's practices, however, it also limits a borrower's behavior<sup>11</sup>. Equally important is an explicit regulatory environment distinguishes payday lending firms from other industries that offer financial products. As mentioned previously, in many states, payday lenders must abide by established usury limits by default. When a state enacts legislation that differentiates between traditional financing and payday lending, the state is granting the firm the ability to charge the necessary fees to cover costs and potential risks. The more explicitly the product is defined, the more transparent the lending process becomes, thus predatory firms can no longer practice and are pushed out of the industry through enforcement. For firms, the policy environment not only protects borrowers, but it also serves to protect and validate the practice of payday lending.

---

<sup>10</sup>After prohibition, there occurred no decrease in consumer welfare, as measured by the regional number of bankruptcies, foreclosures, etc.

<sup>11</sup>For instance, limiting the size of a loan or the number of loans outstanding per borrower decreases the default risk per borrower.

### 1.3. Theoretical Framework

Since both critics and supporters of the payday lending industry see the need for regulation, the traditional framework of how regulation affects firms and an industry needs to be revisited. Both sides essentially demand policy, however, for very different reasons. Traditional consumer-interest perspectives examine policies through the lens that assume policies are enacted in order to protect consumers. However, producer-interest perspectives allow for the possibility that industry benefits from explicit policy environments, sometime at the expense of market efficiency. In order to accurately measure the effectiveness and effects of explicit policy, both perspectives must be considered. The discussion below elaborates on the purposes of regulation from the different perspectives and potential supply-side effects of policy.

#### 1.3.1. Consumer Interest

In a general sense, regulations enacted to protect consumers are aimed to decrease the occurrence of market failures caused by significant asymmetries in information between firm and consumer, negative externalities caused by the usage of particular goods, and, especially for financial products, anticipating consumer behaviors that affect the rationality of a borrower's decision making process (Faller (2008), Fishback (2008)). The political mechanisms that the government can use to monitor and protect against the particular negative outcomes just described are: 1) Minimum quality standards (such as licensing and minimum capital requirements) on firms and products that ensure a level of safety and transparency and 2) Product-defining regulations that impose limitations on market behavior in order to prevent negative outcomes on consumer welfare.

Licensing ensures a minimum quality among firms operating within an industry. This decreases asymmetric information between the consumer and firm, information that will likely help the consumer make a more informed decision regarding the type of firm the borrower is engaging with. Particular to payday lenders are requirements such as a minimum level of assets, a disclosure of all officers of the firm or branch, and

the required licensing with a state and payment of fees in order to operate within the state. For payday lenders, minimum asset requirements are analogous to minimum capital requirements for traditional banks; they ensure that the firm is financially stable, and can sustain losses and still operate. Unlike traditional institutions that are responsible for a customer's deposits, ensuring financial stability for a payday lender reinforces the image of the firm as a reputable lender. Filing an operating license requires the disclosure of all officers and organizations associated with the branch, making the branch and firm more transparent and safer to engage in business with. Economically, these requirements increase the fixed operating costs for each branch a firm opens within the state. Additionally, and unlike other industries that require licensing, payday lenders are not "grandfathered" into licensing or minimum quality requirements. Any branches operating prior to the passage of any regulation are also subject to the newly adopted guidelines. Licensing requirements and fees increase the operating costs for all branches operating within the state. From an empirical perspective, this is likely to diminish the number of operating branches and the number of branches to open in a market as the entire industry is being affected (Kleiner (2000), Carmichael and Pomerleano (2002)).

Policies that regulate loan terms are aimed to protect borrowers from the harms of excess usage. States may choose to establish ceilings on fees charged, the size of the loan, the number of loans outstanding in a given period of time, and the number of renewals per borrower. States establish price ceilings in order to prevent predatory pricing behavior on an inelastic market segment. Limiting the size of the loan itself, for consumers, decreases the level of indebtedness to the lender. At the time of repayment, this makes repaying the loan easier for the borrower and decreases the likelihood of default. Behavioral limitations of the borrower, such as a lack of financial education or extreme hyperbolic discounting, are cited motivations for establishing policies that limit the size and number of outstanding loans per borrower (Den Hertog (1999)).

For firms, these limitations all negatively affect potential earnings. Loan maximums affect total revenue by indirectly decreasing the fees generated by the loan,

therefore revenues and profitability are likely to be lower in states with an explicit loan maximum. Establishing ceilings on the number of outstanding loans or the number or renewals per borrower is intended to curb dependence upon payday loans and prevent the aforementioned "cycle of debt." For the industry, this limits the market quantity (the number of loans provided), also decreasing potential revenues and profits in states with established limits. While these regulations are aimed to create a safe product and prevent financial strain for borrowers, all policies directly affect the profitability of lending by diminishing the revenue collected per loan. Any such regulations on the payday loan product are predicted to cause negative effects on the industry, prompting the decrease in the number of branches overall and discouraging entry into markets in which these policies exist.

### 1.3.2. Producer Interest

In some instances, while policy is enacted in order to protect consumers, the industry can benefit from explicit policy, as is the case with licensing requirements for blocking entry. There is an alternative perspective in which firms not only benefit from explicit policy, but also demand explicit policy themselves. Stigler (1971) discusses the Public Choice perspective, which states that firms will demand explicit regulation and assist with the development of such policy. Imposing operating restrictions, requiring minimum quality standards and the granting of subsidies are cited mechanisms that incumbent firms may petition for in order to maintain the status quo of the industry and deter entry of new competitors. Firms coordinate among themselves in order to establish a relationship with government to ensure the most beneficial (most important, the least costly) regulatory environment<sup>12</sup> (Stigler (1971), Becker (1983)).

Subsequent work examines particular instances in which established policy is beneficial for industry. Jordan (1972) examines multiple industries<sup>13</sup> and finds that

---

<sup>12</sup>Stigler discusses the rise in political and industrial corruption as a result of such an environment. While this is testable, this effect is outside of the scope of this particular study.

<sup>13</sup>Jordan (1972) examines the airline industry in California operating under the Civil Aeronautics

industries operating under explicit policy environments, in the form of price ceilings, engaged in anti-competitive pricing behavior and extracted higher profits relative to unregulated areas. Libecap (1992) examines the factors contributing to the development and establishment of federal regulations on the meat packing industry in the United States in the 1890s, specifically the Sherman Act of 1890 and the Meat Inspection Act of 1891. While under the guise of consumer protection, Libecap finds that the smaller firms within the meat packing industry were heavily involved in the development of policies explicitly targeting the newer, larger firms<sup>14</sup> Specific to the payday lending industry, DeYoung and Phillips (2007) observe the following behavior: when price ceilings are enacted, firms used the ceilings as a focal point and tended to increase prices until the limit was reached. Additionally, firms abandoned competitive pricing behavior and adopted more strategic pricing strategies after the adoption of a price ceiling.

Additionally, explicit policy can be beneficial to industry if explicit policies are passed that maintain the current practices of firms. Fishback (2008) cites the adoption of child- and female-labor protection laws as instances in which social opinion and technological advances decreased the demand for these particular worker types. Therefore, switching away from child-labor was relatively costless as many firms had already done so. Empirically, this would imply explicit regulation would have no effect on industry as the supply-side has preemptively adopted the prescribed requirements outlined by policymakers.

In the context of the payday lending industry, the Community Financial Services Association (CFSA (2013)) is a self-regulating organization with member firms that establishes best practices for the industry, from maximum fees on loans to the number of loans per individual. The CFSA is also involved in the state and federal Board (CAB), railroads, and Canadian motor carriers

---

<sup>14</sup>Within this industry, smaller meat packers were losing significant market share to firms adopting newer refrigeration technologies that lowered the cost of production, thereby lowering the market price of beef. These smaller firms targeted the new technology on the basis that it was used to hide lower quality beef; therefore, it was necessary to impose inspection requirements on dressed beef.

legislative process that establishes and alters payday lending regulation. Particularly, the CFSA works to establish policy that enacts the accepted industry practices already followed by member firms. Enacting such regulations would not necessarily be harmful to incumbents as these firms have already adopted such "restrictions". Additionally, enacting policy specific to payday lenders differentiates the industry from other financial services providers, such as traditional banks and revolving-credit providers. If payday lenders are not explicitly regulated within a state, in many cases, the firms are subject to traditional lending laws that impose restrictions so stringent that the industry is prohibited by default. While this industry does not benefit traditionally from any incumbent advantages to quality-focused regulations, the industry itself is well served by explicit policies as it defines the payday lending product and establishes a distinct lending category for firms to operate under. Along the same lines, any deviations from such regulation dissolve the distinguishing characteristics of the loan, for instance, the short duration and small denomination of the product.

### 1.3.3. Application to Analysis

In order to understand the empirical implications of explicit regulation, first and foremost, the distinction between enacting policy and changing existing policies needs of be made. From a public choice perspective, the benefit for firms is in establishing an explicit policy environment. Payday lenders often cooperate with lawmakers in many states to establish such policy. Technically speaking, the industry is advocating for the enactment of price and quality controls, and an increase in operating costs when regulations are established. However, these proposed "restrictions" are typically in line with industry practices and are not likely to bind the industry, generally speaking. Therefore, to simply interpret the existence of such regulation as automatically more restrictive is potentially incorrect given the purpose behind *enacting* the regulations. Conversely, and more in line with consumer-interest views of regulation, changing the stringency is a mechanism in which regulation can have a negative impact on industry but potentially a more beneficial effect for borrow-

ers. In the presence of explicit regulations, officials can alter price ceilings, loan maximums, and other components of regulations in order to ensure a less-harmful lending product. However, this does alter the original purpose of payday lending regulation as a mechanism to distinguish the product from potential substitutes. Therefore, the empirical implications of marginal changes to existing regulations become unclear.

Additionally, states may pick and choose which components of a loan to regulate. There exists a high level of variation across states that do regulate and allow for payday lending. Therefore, while regulations may be established from state to state, this does not imply that states are imposing identical policy environments. The same holds true for the stringency of regulations. Explicit regulations across states can be extremely varied. For instance, states can adopt regulations that are already in line with established practices established by the CFSA, they can adopt regulations that are especially lax that impose no real limit or may enact especially binding limitations. These sources of variation necessitate a different method of measuring how industry responds to regulation, one that can simultaneously measure variation across a policy environment and within a policy environment as well.

#### 1.4. Empirical Specification

This study examines differences in market structure under two different regulatory situations: 1) when states have explicit regulations versus states where no payday lending regulations exist and 2) differences in established regulations, conditional on the regulation itself existing. An empirical specification where one can measure both the average effects and marginal effects of regulations is necessary to properly gauge industry outcomes<sup>15</sup>.

To determine how regulations affect payday lenders, I employ a reduced-form regression approach to measure the effect of different regulations on the predicted

---

<sup>15</sup>For development and discussion of calculation of average treatment effects, see Heckman and Vytlacil (2005) and Blundell and Dias (2009). For application of this empirical method, see Hotz and Xiao (2011) on their analysis of regulatory effects on the child-care industry.

number of payday lending branches to open or operate in the market. The empirical model is as follows:

$$Y_{smt} = \alpha_0 + \mathbf{NoReg}_{ist}\alpha_{1i} + \mathbf{Reg}_{ist}\alpha_{2i} + X_{mt}\alpha_3 + \xi_c + \eta_t + \varepsilon_{mt} \quad (1.1)$$

The level of observation is market-period, defined as a ZCTA-year.  $Y_{smt}$  is the number of branches to open or the number of branches to have ever operated in market  $m$  in a given year  $t$ .  $NoReg_{ist}$  is an indicator variable that designates a value of one if a state  $s$  does not regulate loan characteristic  $i$  in year  $t$  and zero if it does.  $i$  is a vector of loan characteristics, such as maximum value of the loan, maximum fees, licensing fee, etc. This component of the regression will later be used to calculate the effects of enacting particular aspects of payday lending legislation and will control for varied regulatory environments across states and time.

$Reg_{ist}$  measures the value of a particular loan term regulation, conditional upon the state actually regulating the specific characteristics (when  $NoReg_{ist}$  is equal to zero). For example, if a state requires branches to be licensed, this measures the licensing fee per branch (renewal fee for existing branches and initial licensing fee for new branches). These particular values are for regulations that have not only been proposed, but have been enacted by the state and are enforceable. In some cases, a state may pass regulations that change loan-term conditions; however these policies are not in effect until a year or two after passage. This is not what  $Reg_{ist}$  measures; these variables control for the current, enforceable policy environment that payday lenders face.  $\alpha_{2i}$  is the marginal effect of changing existing regulation  $i$  on the number of branches to open or operate.

$X_{mt}$  is a vector of demographic and socioeconomic characteristics of market  $m$  in year  $t$ , as well as a measure of competitiveness for the market. The characteristics chosen represent the characteristics of an individual that are most likely to contribute to the demand for alternative financial services<sup>16</sup>. The competitiveness of the market

---

<sup>16</sup>See Jappelli (1990) and Calem and Mester (1995) for a discussion of consumer characteristics that determine credit-worthiness, thus indirectly, determine demand for alternative financial services.

is measured by the number of traditional banking branches in zip code  $m$  in year  $t$ . Damar (2008), as previously mentioned, finds that while also complementary, there is a growing competitive relationship between payday lenders and traditional banks.

Lastly,  $\xi_c$  and  $\eta_t$  represent county and year fixed effects, respectively. County fixed effects are included in order to control regional level variation, both at the state and county levels. Both at the state and in-state regional levels, payday lenders are involved with the regulatory process. Including such fixed effects minimizes the potential endogeneity bias caused by the participation in the legislative process from payday lenders. Further, both at the state and county level, any time-invariant geographic characteristics that would affect the decision to continue operation or enter a market are controlled for using  $\xi_c$ .  $\eta_t$  represents year fixed effects that are included in order to control for any effects that alter all states in a given year. Such events include the passage of federal legislation, nation-wide economic events (such as the Great Recession), etc.  $\varepsilon_{mt}$  is the market-year level idiosyncratic error term, i.i.d across county-year combinations. I allow correlation of this error term within a market-year combination, and for this I cluster standard errors at the state-year level.

In order to calculate the average effect of adopting a particular piece of regulation (switching from no regulation to regulation) the following calculation is made (according to the difference-in-differences approach):

$$E(Y_1 - Y_0 | REG = \tilde{Reg}_i) = \alpha_{2i} \tilde{Reg}_i - \alpha_{1i} \quad (1.2)$$

For this study, a state has been "treated" with policy  $i$  if regulation on loan characteristic  $i$  has been adopted and is enforced within the state. Calculating the average treatment effect will calculate the average effect of adopting regulations (i.e. switching the regulatory environment "on").

## Identification

This study uses the variations across states and time to identify the marginal and average effects on the market-level structure of the payday lending industry. Two issues must be addressed: 1) the potential for "policy endogeneity", that policy is correlated with observed market characteristics and unobserved factors that also affect the number of payday lending branches, and 2) the difference in geographic scope between the regulatory controls and the market definition used.

First, I include county- and year-level fixed effects in order to control for potential endogeneity bias caused by unobserved factors that can affect both my observed policies and outcome variables. For instance, a state may be particularly active in proposing explicit legislation, however unsuccessful actually enacting it in the same period. Only examining enacted regulations alone ignores the volatility in the "potential" legislative environment. This can have an effect on the number of opening branches observed, as new entrants are likely discouraged from entering a particular market in a state with uncertain policy outcomes. Additionally, there is also the possibility that legislation has passed, however is not yet in effect. In this case, new and existing branches would be responding to policy that has been passed, yet is not enforced until a later period, biasing the observed, enforceable policy recorded. Payday lending firms are also highly involved with the legislative process. Including county-level fixed effects controls for states where lenders are more involved<sup>17</sup>, whether they are demanding or preventing legislation, relative to states where political activity is quiet over the course of the observed period. Including year-level fixed effects controls for national-level shocks that effect all states observed. Such shocks include the national trend in industry growth, federal legislation enacted during the period of observation, and the effects of the Great Recession.

Another source of potential bias comes from the correlation between market factors and state-level policy variables. Market conditions, such as unemployment and poverty rates, influence payday lending policy. While policy is inextricably linked

---

<sup>17</sup>The county-level fixed effect is only effective when a particular region has been *consistently* active, that is, the region has had some political activity during the entire scope of the study

with the economics and demographics of a state, community, or market, such conditions directly affect when a particular policy or legislation is *introduced* for debate. *Reg<sub>ist</sub>* measures policies that have been officially implemented within the state and are enforceable. Due to the nature of the legislative process, the time between when a piece of policy is introduced in the legislature and when it is signed into an enforceable law can span multiple periods. Therefore, while official regulations in year  $t$  were likely introduced in direct response to market characteristics, these regulations were introduced in response to demographics of previous periods<sup>18</sup>.

Lastly, to understand how state regulations affect the market structure of this industry, the correct definition of "market" must be used. When choosing branch locations within a state, the state's regulatory environment is taken into consideration by the firm. However, branch location decisions are not made at the state level. Firms choose locations based on a very narrow geographic scope with emphasis on convenience for existing and potential borrowers. Lenders intentionally locate close to customers, clustering within very small geographic areas, such as zip-codes (Advance America, 2008). If instead analysis was done at the state level, this would not capture important fluctuations within the state. Firms may decide to exit particular markets completely while increasing concentration in other areas within the state. Empirically, at the state level, these occurrences have the potential to net each other out and create a misleading, stable picture of the industry's structure.

## 1.5. Data

This study expands the existing research on payday lenders by analyzing the most comprehensive dataset to date containing branch location information for all payday lenders in multiple states across multiple years. Previous studies have utilized detailed information, but this information was restricted to a single firm, single region, or single period of time. With respect to the regulatory environments, this study also categorizes policy at greater level of detail than previous studies. Rather

---

<sup>18</sup>See Besley and Case (2000) and Hotz and Xiao (2011) for discussion.

than equating policy environments based on existence (using a binary classification), the constructed data set deconstructs implemented regulations: each component of payday lending regulation is classified and quantified in order to identify variation across states and across time. The dataset utilized includes data for 10 states for the period spanning 2001 to 2010. As stated previously, this period represents a dynamic era for the industry as well as for policy environments across the country. Within this decade, the industry experienced large growth, saturation, and maturation. Also within this period, states began to adopt and update explicit regulations specific to the payday lending industry.

#### 1.5.1. Branch Data

To construct branch counts, payday lending licensee data were collected from the state agency tasked with regulating payday lenders, typically a state's Department of Financial Institutions. For each branch, company name, physical operating address, initial licensing date, and status date were collected. If a branch still operated at the time of data collection, status date represents the date when a branch's license is required to be renewed. If a branch closed within the duration of data collection, the date represents the date the licensing ceased to be valid, thus a branch is classified as having exited in the market in that year. A branch opens within a market-year if the branch is issued an initial license during that year. A branch operates within a market-year if the branch has opened within the current or previous years of observation. Lastly, a branch exits if the branch license expires within the given year. In some cases, a single address was issued multiple licenses to operate, sometimes overlapping. In the case of an overlapping license, the earliest issue date is used as the initial date of license and the most recent status date is used to determine if the branch is still in operating or not. If the licenses were not overlapping, the date between license expiration and reissue was examined. If a new license was issued to a branch within one year (365 days), the license is considered to be continuously valid. The initial license date in this case is the date in which the first license was issued and the status date for the branch is the status date for the latest license used. Branches

were then designated indicators for whether or not the branch opened, exited, or operated for any duration within the year. These indicators were then aggregated by zip-code year to generate a market-level branch count for each category. Branch data for 10 states are analyzed: Arizona, Idaho, Iowa, Kansas, Missouri, Montana, Nevada, New Hampshire, South Dakota, and South Carolina<sup>19</sup>.

Once branches were aggregated to the postal zip-code level, a cross-walk was used to map postal zip-codes to the 2010 ZCTA definition as determined by the United States Census.<sup>20</sup> All branch counts are aggregated to the 2010 ZCTA level. For this analysis, 4,681 unique ZCTAs are examined.

Figure 1.1 displays the trends in total operating, new and closing branches per year. The observed sample mimics the general observed and predicted trends of the market discussed earlier: within my sample, intense growth is observed in the earlier half of the decade. Growth begins to slow in 2005 until 2007, when then number of operating branches begins to decline (notice it is in 2007 as well that the number of branches closing per year begins to outpace the number of new branches.) Though the observed industry begins to decline, the decline is slight as there are still almost 4,000 branches operating in 2010<sup>21</sup>.

Table 1.1 displays the summary statistics for the number of operating branches, new branches, and closing branches at different levels. Section 1.1A examines the entire sample (4,681 ZCTAs for all ten years observed). Within the set as a whole, on average, there are just under 3 branches operating per ZCTA<sup>22</sup>. The low average relative to the high maximum number of operating branches (41 in a market in a given period) implies that there are a large number of markets in which there exists

---

<sup>19</sup>Data for Virginia and Tennessee are available for a subset of the panel and will be used for robustness exercises.

<sup>20</sup>Similar to studies in the medical literature that examine care access and economic conditions at a microscopic level. See <http://www.udsmapper.org/> for more details.

<sup>21</sup>The rate of decline seems to be greater within the observed states, at the number of branches nationally fell by a smaller percentage overall.

<sup>22</sup>The median area for observed ZCTAs is 67.23 square miles. This is roughly just under a four-mile radius which coincides with the location practices of payday lending firms; firms will locate close to customers.

no payday lending branches. Indeed, over the course of the sample the number of unpopulated ZCTAs remains well above 3,000 - over 80 percent of the sample. Conditional on there being at least one branch having ever operated, the average number of operating branches within a ZCTA increases to just over 4 branches, implying that if markets are hosting these branches, they are likely to be somewhat concentrated.

Figure 1.2 displays the distribution of the number of ZCTAs with operating branches, conditional on the area having at least one operating branch, for the years 2001, 2004, 2007, and 2010. The highest percentage of markets contain only one branch for all four years identified. However, the percentage of markets with a single operating branch falls by 10 percent from 2001 to 2007. The same trend applies to markets with only two operating branches - the share of these markets also declines during the decade. During the same period, the percentage of markets with 5 or more branches increases. These trends indicate that as the industry grew over the observed period, this growth was more due to an increase in concentration within existing markets versus an industry expansion into new markets. Between 2007 and 2010, as the number of overall operating branches falls, markets still stay relatively concentrated. The share of markets with a single or two branches does not return to 2001 levels. However, the share of markets with 5 or more branches (up to 10 branches) continues to trend upward.

Referring back to Figure 1.1, the number of new branches over the course of the observed decade peaks in 2005, and steadily declines thereafter. Within the dataset, it appears that the average is heavily skewed by unpopulated markets, as there are less than 0.5 new branches per market. When conditioning on at least one branch opening, the average number of new branches increases to almost two branches. Also of note, when conditioning on at least one opening branch, the number of market year observations declines significantly. Given the differences in means and the decline in observations, there is a large set of markets that are never breached and remain uninhabited. Lastly, for the entire set, the average number of branches to close is also close to zero. Conditioning on at least one branch closing in the

market, the mean increases to just over 1.5 branches, similar to the mean for new branches. Given the conditional means of new and closing branches, the growth and decline of the observed portion of the industry appear to be steady, rather than sharp decline in concentration.

### 1.5.2. Regulation Data

For each observed state, payday lending regulations have been categorized into distinct components according to the different loan terms and requirements for licensing<sup>23</sup>. For each characteristic, existence and value of each component are recorded. For comparability among different state regulations and previous studies, maximum fees are converted into APRs<sup>24</sup>.

While states do impose a number of different requirements on firms, for this study, five components of payday lending regulation are explicitly controlled for: minimum asset requirements, licensing fees per branch, maximum loan amount, maximum fees on loans, and the maximum number of rollovers or renewals per borrower. The inclusion of minimum asset requirements and branch licensing fees control for the costs associated with operating in a particular state that establishes explicit regulations on payday lending. These components directly affect the operating costs of a firm and act as potential barriers to entry, thus affecting the number of branches to enter or continue operations within the state. Again, licensing requirements apply to new and incumbent firms. Therefore, for payday lending branches, the decision to renew a license is analogous to making the decision to reenter the market as far as the state is concerned. As a result, the set of potential entrants includes not only new branches, but branches that are already operating and are required to renew year after year. Further, these three loan components have been

---

<sup>23</sup>Note: Some states refer to payday lending firms as deferred deposit lenders or small lenders. If states did not specifically classify these firms as "payday lenders", regulations applicable to alternative titles were used. By the definition, all regulations apply to the same product.

<sup>24</sup>The following formula is used to determine APR as used by DeYoung and Phillips (2009).

$$APR = \frac{Fee * \frac{365}{Term}}{LoanAmount}$$

chosen as they reflect direct means by which regulators can affect the profitability of payday lending branches (as analyzed by Flannery and Samolyk (2005), Skiba and Tobacman (2007)). More important, these are the three components that critics are most vocal about as these are seen as mechanisms that lenders use to prey on borrowers. Additionally, as stated in the CFSA Best Practices, these three loan characteristics are of the utmost importance to establishing goodwill with customers and legitimacy within the financial services industry (CFSA 2012).

Referring to Table 1.2A, for the entire observed sample, the majority of state-year observations have some type of existing regulation. Very few state-year observations have a minimum per-branch asset requirement, a large distinction between AFS regulations and traditional bank regulations. The most commonly regulated loan component is the regulation of the size of the loan, with 79 percent of state-year observations indicating regulation existence. Though it is a major point of contention, and important to the payday loan debate, only half of the state-year observations have explicit regulations on maximum fees. Surprising also is the high share of observations that indicate the existence of rollover or renewal regulation, roughly the same percentage as fee regulation. Most important to observe is that the participation rate for regulation is not 100 percent for any component. During the observed decade, there are states that have never regulated payday lenders. Further, existence of regulation does not imply consistency across regulations. For all components, there exist differences across geography and time.

Examining Section B of Table 1.2, conditional on regulations existing, there exist large variations in each of the measured components. The wide range in license fees allows for the possibility that states impose fees in order to ensure a minimum level of quality. However, the low average for both types of licensing fees (\$445.95 for new branch licenses and \$285.81 for renewed licenses) are a signal that fees are a mechanism for funding enforcement rather than an attempt to deter operation. Once again, given the low observation count, very few states require that branches hold a minimum level of assets. The range of required assets per branch is similar to the range in licensing fees and suggests that some states do not impose these fees

in order to deter operations, but given the magnitudes of both the mean and the maximum asset requirement, these minimum requirement could in fact deter firms from operating<sup>25</sup>.

All ceilings for measured loan components exhibit large variation as well. Beginning with loan-amount ceiling, the mean ceiling imposed is just over \$500, similar to a "typical" payday loan. It is unclear whether or not a minimum loan amount of \$300 is binding in any way, however, a maximum loan amount of \$1,000 does reasonably represent a lax environment. As previous studies have noted, what is borrowed by the consumer tends to be below \$1,000. The ceilings on fees charged on loans represents the greatest variation within observed states. The mean fee ceiling, calculated as an APR of just under 600 percent, translates to a mean of \$22 per \$100 loaned (this assumes a two-week, \$300 loan). This is slightly larger than \$15 per \$100 loaned, which is the standard ceiling of the member firms of the CFSA. More interesting is the range in the fee ceilings observed. Notice, that during the period of observation, there are states that do impose a binding fee ceiling that is equal to the traditional usury limit. However, Missouri, for all years observed, has an established ceiling that limits fees to no more than 75 percent of the face value of the loan value. When calculating the allowable fee for the aforementioned typical payday loan, this is a ceiling of almost 2,000 percent APR - hardly a ceiling at all. Lastly, for states that explicitly regulate rollovers, there exists a large range in limits as well. The mean rollover ceiling is just under three rollovers; this is again in line with the established industry practice. Noting the range on the limits, observed states impose completely binding ceilings (outlawing rollovers or renewals completely), or establish ceilings that impose no realistic limit relative to standard practices. Table 2 highlights the variation that exists in regulation adoption and in the stringency in adopted regulation across state-years. The data show what is true for all states with payday lending regulations: not all regulatory environments are equal.

---

<sup>25</sup>As noted by Flannery and Samolyk, these particular regulatory component are not significant to the costs of operation for the observed firm.

Table 1.3 shows trends in regulation adoption and stringency for the years 2001, 2004, 2007, and 2010. In 2001, only five states had explicit payday lending regulations. All states with explicit regulations regulated loan size, however not all states regulated fees, rollovers or required a renewal fee for licensing. In 2004, all states but one have explicit regulations of some form. During this year, only one additional state established fee-ceiling regulations that was relatively less stringent than previously observed. More states adopted loan-size regulation and rollover regulation. All newly implemented limits were relatively less stringent than in 2001, as the means of all ceilings measured increased. However, averages for both new and renewal license fees increased, indicating increased costs for payday lending branches. In 2007, all of the observed states had some form of explicit regulation. Licensing costs continued to increase across all states. In 2007, though all states adopted some form of regulation, states did not add to existing regulations on loan terms. All changes to the regulatory environment observed came within existing regulations, specifically to loan size limits and fees. States relaxed existing regulations on fees, as the mean calculated APR ceiling increased from 2004 to 2007<sup>26</sup>. Loan limits became only slightly more stringent, but more stringent nonetheless. In 2010, once again, on average, the cost of licensing increased. No changes were made to loan term regulations, except for the limit on loan fees, which decreased dramatically from 2007 to 2010. At a national level, states began adopting binding fee regulations in hopes of driving out payday lenders. Within my sample, I observe the same phenomenon of creating binding regulations.

### 1.5.3. Demographic Data

Demographic data were collected from the 2000 Decennial Census. At the ZCTA-level, community characteristics were chosen that have been determined by previous literature as characteristics that determine creditworthiness (thus drive demand) and are likely to attract payday lenders to particular markets. Table 1.4 lists the

---

<sup>26</sup>This increase from 683 percent to 721 percent is roughly equivalent to an increase of \$5 on a \$300, 14-day loan

characteristics included in baseline empirical tests and Table 5A displays summary statistics for the 2000 demographic and economic data included.

In order to control for a potentially competitive environment (and in line with Damar 2008), traditional bank branch counts have been included as well. Bank branch data have been collected from the Summary of Deposit Data available through the Federal Deposit Insurance Corporation.

## 1.6. Results and Discussion

Tables 1.6 through 1.8 display the empirical results of this study. The controls for asset/bond requirements per branch and renewal fees per branch have both been scaled by \$10,000. The controls for calculated APRs and loan maximums have been scaled by 1,000<sup>27</sup>. Results indicate that existing branches and potential entrants react differently to changes in policy environments: existing branches discontinue operations when policies are initially adopted and when existing policies become more stringent. However, entry increases under environments that are relatively more stringent, both in terms of what regulations exist and how restrictive enacted regulations are.

### 1.6.1. Operating Branches

Table 1.6 displays the regression results for the dependent variable measuring the number of operating branches. Column 1 includes all regressors and no fixed effects and Column 2 includes only year fixed effects. Given the similarity between results in these specifications, the unobserved variation for specific years alone (such as federal legislation or national growth and economic conditions) have very little effect on the industry's market response to state-level regulation.<sup>28</sup> Controlling for local, county-level variation (Column 3) drastically changes coefficient results in sign and in magnitude. Such drastic changes in estimations under this specification

---

<sup>27</sup>Standard errors have been clustered at the state-year level as this is the source of variation for the regulations examined. See Moulton (1986) for discussion.

<sup>28</sup>2002 is the comparison year for year-fixed effects.

suggest that local area conditions are extremely important to branches in determining whether or not to continue operations versus the presence and stringency of regulations. Column 4 includes both county- and year-fixed effects, and once again, coefficient results drastically change for all but one policy control. From Column 3 to 4, including year dummies controls for "good" years for the industry in terms of overall growth. Recall, as the decade progressed, so did the growth of the industry across the country. Excluding the controls for this positive national trend appears to bias results upwards, i.e the national growth trend incorrectly imposes a more positive relationship with particular state policies. In other words, the industry was growing in conjunction with the increase in explicit regulation for states; without these controls, a more positive correlation exists between industry growth and regulation where it should not. The results in Column 4 correctly control for local and annual factors that contribute to changes in the industry and will be the focus of the following discussion.

Beginning with licensing requirements, the coefficient of -1.4349 implies that increasing the required renewal licensing fee for existing branches by two standard deviations (or just over \$4,700) will decrease the number of operating branches by 0.675 branches. This modest effect of increasing renewal fees indicates that, rather than attempting to control for the quality of branches, these fees act as a mechanism to finance governing departments and not to limit the size of the industry.

Among the different marginal effects, both the value of state-level loan ceilings and rollover ceilings are statistically significant. In line with traditional theoretical predictions, easing the stringency of the loan ceiling will increase the number of branches operating within a market. Specifically, the coefficient on the loan-size ceiling (-0.4632) implies that increasing the ceiling by two standard deviations leads to an increase of 1.40 branches operating within a given market. The value of the loan is directly related to the profitability of a branch. If loan ceilings are eased, this allows firms to extend larger loans, thereby collecting larger fees. These results also coincide with the importance of loan size as found by Flannery and Samomlyk (2005). Further, they coincide with the perspective of consumer-interest more

so than producer-interest. Recall that establishing a loan ceiling limits how payday lenders conduct transactions. Changing these limits to become more stringent severely limits the ability of the firm to practice lending, therefore any increase in stringency will negatively affect firms, thereby negatively affecting the market as well. From the alternative perspective, changing established ceilings, for instance, increasing loan-size ceilings, will decrease the binding nature of the policy, however, it also undermines the motivation for establishing such policy to distinguish payday loans from other financial products. Given the negative reaction by operating firms to more stringent regulations, the consumer-interest perspective appears to be the overriding reason.

Using Equation (2) and the estimated coefficients from Table 1.6, Column 4, I calculate the average effects of enacting explicit regulations for each regulatory component measured. Table 1.8A displays the calculations for the average effects of enacting policy on operating branches<sup>29</sup>. Among the four components measured, enacting minimum asset requirements and enacting loan maximums both have a statistically significant and negative effect on the number of operating branches while enacting fee or rollover maximums have no effect at all. Enacting policy that establishes restrictions on loan size will decrease the number of operating branches in a market by almost 3 branches. The conditional average number of branches within a market was just over 4 branches and the majority of observed markets had one or two operating branches. Initially enacting a loan-size ceiling has the effect of not only causing a significant contraction, but can cause complete markets to disappear. Again, loan size is essential to a firm's profitability as the fees charged borrowers are based upon the size of the loan. Any explicit limitation on the size of the loan therefore limits the profitability of lending. Just as it was for the marginal effect of changing existing loan-size maximums, it appears that the industry's reaction to loan-size policy is in line with the public-interest perspective. Lastly, the imposition of an asset requirement has a modest effect on existing firms, leading to a decrease of 0.58 branches per market. Given such a small effect on the industry, enacting

---

<sup>29</sup>Standard errors having been calculated using the Delta Method.

minimum capital requirements does not act as a deterrent for annual renewal for operating branches.

### 1.6.2. Opening Branches

Table 1.7 displays the results for estimations for the dependent variable opening branches. Focusing on Column 4, both minimum asset requirements and licensing fees are negative and statistically significant. With an estimate of -0.3386, increasing the minimum asset requirements in a state by two standard deviations (or \$9,770) leads to a decrease of 0.33 opening branches. Additionally for the coefficient estimate of -1.7952 for licensing fees, increasing the initial licensing fees by just over \$400 will have a very small effect - a decrease of under 0.10 opening branches. Similar to the results for operating branches, these fees and minimum requirements per branch appear to be mechanisms to finance enforcement rather than to block entry. Relative to the results for operating branches, these particular coefficients are higher in absolute value and significance. Unlike branches that are already operating within a market, branches that are choosing to enter have not incurred any costs related to operating. More important, there are no explicit costs to a potential entrant not to enter. Firms that are already operating, who have established a market presence, must decide if the cost of exiting is less than the increased costs of operating within the market. Therefore, it is understandable as to why these particular components of regulation have a larger and more significant effect on new entrants.

All three measured payday loan policy components have statistically significant effects. Additionally, all three components imply that decreasing the stringency of the policy, increasing allowable fees, increasing the loan ceiling, or increasing the rollover limit, will lead to a *decrease* in entry. Increasing the fee maximum by two standard deviations<sup>30</sup> decreases the number of market entrants by 0.30 branches. Increasing the rollover maximum by two standard deviations, or 4.5 renewals, decreases the number of market entrants by 0.41 branches. Changes to existing loan

---

<sup>30</sup>As a calculated APR, this is equivalent to over 1,300 percent. In terms of dollar fees, this is equivalent to increasing fees by less than a dollar (\$0.80) on a two-week, \$300 loan.

maximums have a larger effect on the number of entrants: increasing the loan maximum by two standard deviations (or \$2,980) will decrease entry by 1.40 branches<sup>31</sup>. Decreasing the stringency of fee ceilings, loan maximums and rollover maximums all lead to potentially higher profits for all firms extending these loans. However, if we examine regulations as a mechanism to define payday loans and distinguish them from other forms of credit, increasing these limits act against the purposes of this regulation and blurs the lines that define this product. For instance, increasing the limit on the size of the loan, say from \$500 to \$1,000, increases the size of payday loans closer to lower limits on credit cards. Increasing it further makes payday loans even more comparable to credit cards as well as to other consumer loans. Additionally, increasing the limit on loans increases the potential risk of loss to payday lenders. Rather than many small loans, default on larger loans can severely cripple a branch's ability to operate. For fee and the rollover ceilings, the ability to constantly renew and the high-fees were two very important characteristics to critics regarding the safety of the product. Therefore, states with higher limits relative to established market practices are an unsavory environment for potential entrants that view payday lending as a legitimate financial product. These deviations send a signal to potential entrants that the payday lending industry no longer provides a distinct, and safe, financial service; it is logical that entry would decrease in markets with state-regulations that blur these regulatory lines.

Once again, using the estimates in Column 4 of Table 1.7 and Equation (2), I calculate the average effects of initially enacting regulations on the number of opening branches. Table 1.8B displays these calculations. The only significant effects are establishing asset requirements and enacting rollover limits, both of which lead to modest increases in the size of the industry when enacted. Similar to the previous argument, establishing regulations increases the transparency of the industry and serves as a signal to potential entrants that the state is not only allowing the industry to operate, but it is ensuring a minimum level of safety and legitimacy.

---

<sup>31</sup>This is an extreme increase in the ceiling considering that the observed mean of loan maximums is just under \$500 for the entire sample.

## 1.7. Conclusions

This study analyzes the effects of changing state-policy environments on the structure of the payday lending industry at the market level. This study expands the analysis of the industry by observing industry dynamics across multiple states for an extended period of time. Further, state-level policy variation creates microcosm environments for payday lending firms to operate under. This variation in regulations across states and time requires an expanded definition of policy environments; no longer is a general binary classification of existence sufficient. Results indicate that different components of payday lending policy lead to different outcomes on operating branch counts and the number of new branches. For both new and existing branches, licensing requirements lead to decreases in branch counts, however, the magnitude of increasing licensing costs leads to very modest decreases for both branch types. Interestingly, results indicate incumbent firms and potential entrants do not view changes in product-defining policy in the same manner. For operating branches, enacting loan-size maximums leads to a decrease of almost 3 branches, potentially causing whole markets to disappear. Further, increasing the stringency of loan-size ceilings will also lead to a modest decline in the number of operating branches per market. This is consistent with consumer-interest theory; regulations established to protect borrowers will have negative effects on market structure, in this case, causing existing markets to contract and/or disappear. Conversely, relaxing existing restrictions on product-defining policies will lead to decreases in the number of opening branches within a market. This result is in line with producer-interest perspectives: changing regulations that serve to explicitly define a product undermines the original motivation of the regulation. Potential entrants may interpret this easing of regulations as a deviation away from strict payday lending guidelines and increased substitutability with other forms of credit.

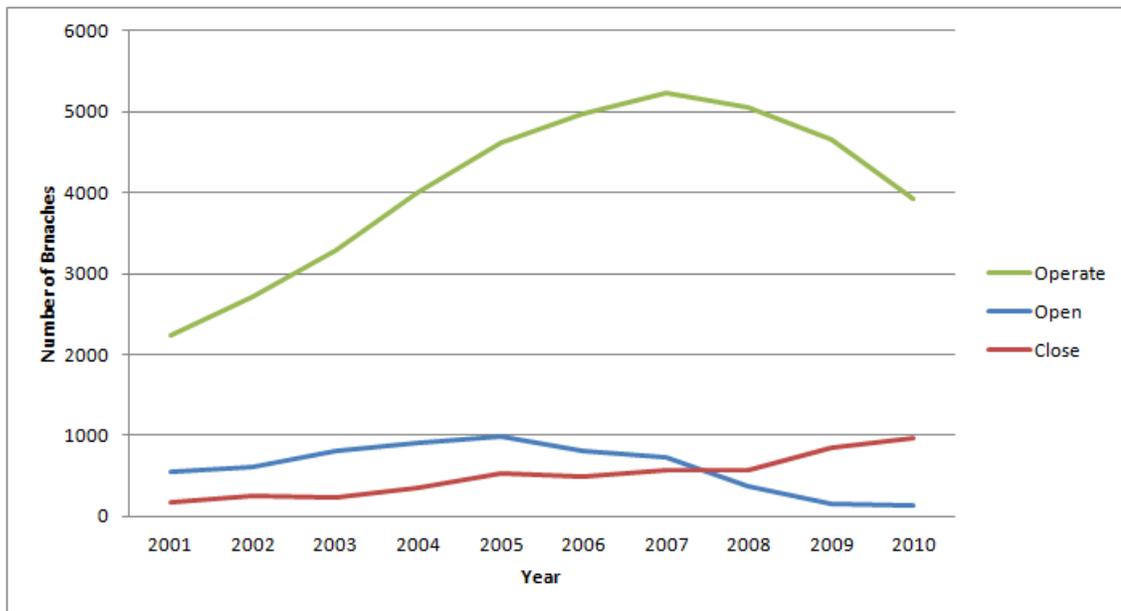
It is clear that the payday lending industry's relationship with its policy environment is multi-dimensional and a single perspective is not sufficient to explain how this industry reacts to regulatory attention. Using only consumer-interest per-

spectives ignores the industry's participation in establishing explicit policy and the potential benefits of explicit policy. Evaluating these effects from a producer-interest perspective ignores the ways in which policy enacted for protection can lead to negative effects for operating firms. Therefore, both perspectives must be considered simultaneously when attempting to explain and understand how the payday lending industry reacts to state-level policy changes. In a more general sense, expanding the perspective by which industry and policy are analyzed allows for the broader possibility that policy can both help and hinder an industry. Any effects of policy on industry pivot on the specific motivations and the execution of regulations. In order for enforced policy to be effective, whether the intention is consumer protection, industry protection, or both, understanding all possible outcomes, even if counter-intuitive, will only serve to make policy more effective in the long run. This study seeks to improve the manner in which government interaction with market agents is analyzed by allowing for both perspectives, public-interest and producer-interest, to concurrently explain market outcomes.

The payday lending industry offers a unique opportunity to understand a truly dynamic industry and regulatory environment. As states continue to adopt and adjust policies, it is important to understand how different aspects of payday lending policy may or may not affect the industry. Further, as federal attention to the industry grows, accurately comprehending how different components of explicit policy affects firms is paramount, as both producer and consumer welfare are affected if and when the industry responds.

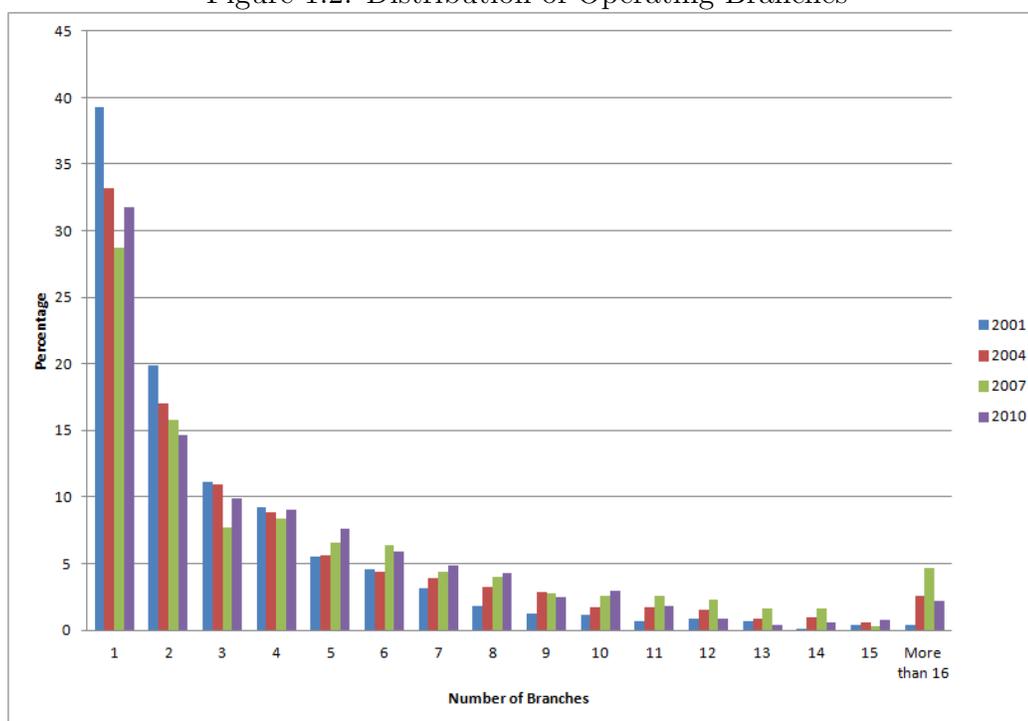
## 1.8. Tables and Figures

Figure 1.1: Trend in Observed Branch Counts



This figure displays the trend in branch counts for the number of observed, new, and closing branches for the years 2001 through 2010 for the following states: Arizona, Idaho, Iowa, Kansas, Missouri, Montana, Nevada, New Hampshire, South Dakota, and South Carolina. Branch level data have been collected from state agencies responsible for licensing payday lending firms. A branch is classified as operating if the state license is active for any duration within the year of observation. A branch has opened during the year if an initial license was granted during the year of observation. A branch closed if the license expired or was terminated during the year of observation.

Figure 1.2: Distribution of Operating Branches



This figure displays the distribution of market-level operating branch counts, conditional on the the existence of at least on operating branch, for the years 2001, 2004, 2007, and 2010. Branch level data have been collected from state agencies responsible for licensing payday lending firms.

Table 1.1: Data - Summary Statistics: Branch Data

	N	Mean	Std. Dev.	Min	Max
A: Unconditional					
Operating Branches	46810	0.870	2.588	0	41
New Branches	46810	0.130	0.543	0	14
Closing Branches	46810	0.107	0.515	0	16
B: Conditional					
Operating Branches	9592	4.245	4.285	1	41
New Branches	3710	1.642	1.110	1	14
Closing Branches	3119	1.600	1.23	1	16

Level of observation is ZCTA-year. Years observed are 2001 through 2010. Branch level data have been collected from state agencies responsible for licensing payday lending firms. Panel A displays summary statistics for all observed ZCTA-years. Panel B displays statistics for observed ZCTA-years with at least one operating branch, new branch, or closing branch.

Table 1.2: Summary Statistics: Regulation Data

	N	Mean	Std. Dev.	Min	Max
A: Indicators for Regulation					
Licensing Requirements					
Regulation Exists	100	0.87	0.338		
Requires Minimum Asset/Bond per Branch	100	0.16	0.368		
Terms of the Loan					
Regulation of Loan Maximum	100	0.79	0.409		
Regulation of Fees	100	0.51	0.502		
Regulation of Rollovers	100	0.50	0.503		
B: Values of Regulation Conditional on Regulation					
Licensing Requirements					
New License Fees	74	445.95	234.230	150	1000
Renewal License Fees	74	285.81	272.202	0	1000
Minimum Assets/Bonds Per Branch	16	15000.00	10327.960	5000	25000
Terms of the Loan					
Loan Amount - Ceiling	73	519.73	213.762	300	1000
Fee/APR Amount - Ceiling	51	593.41	618.243	36	1955.36
Number of Rollovers - Ceiling	50	2.48	2.112	0	6

Level of observation is state-year. Years observed are 2001 through 2010. Regulation data collected from current and historical policy. Conditional means calculated for states with observed explicit policy relevant to the component measured.

Table 1.3: Regulation Data: Trend in Conditional Means

	Number of States	2001 Mean	Number of States	2004 Mean	Number of States	2007 Mean	Number of States	2010 Mean
Explicit Regulations	5	-	9	-	10	-	10	
Licensing Requirements								
Original Licensing Fee	5	335	8	428.125	10	450	10	515
Renewal Licensing Fee	4	118.75	7	317.86	9	322.22	9	344.44
Loan Terms								
Maximum Calc. APR	4	364.97	5	683.04	5	721.24	6	504.41
Maximum Loan Amount	5	492.00	8	557.50	8	512.50	8	512.50
Maximum Number of Rollovers	2	1.50	6	2.67	6	2.67	6	2.67

Level of observation is state-year. Regulation data collected from current and historical policy. Conditional means calculated for states with observed explicit policy relevant to the component measured.

Table 1.4: List of Demographic Variables and Definitions

Demographic Variables
Total Population
Percentage of Blacks
Percentage of Hispanics
Percentage Male
Percentage of Population with a High School Diploma
Economic Variables
Median Household Income
Unemployment Rate
Percentage of Population in Military
Percentage of Population at or below Poverty Rate
Number of Traditional Bank Branches

Demographic and Economic controls source: 2000 Decennial Census. Bank branch data collected for the years 2001 through 2010 from Summary of Deposit Data, FDIC.

Table 1.5: Summary Statistics - Demographic Variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
Total Population	4681	5625.386	9898.859	0	81839
Percentage Black	4681	0.045	0.132	0	0.981
Percentage Hispanic	4681	0.037	0.084	0	0.986
Percentage Male	4681	0.381	0.208	0	0.824

Source: 2000 Decennial Census. Level of observation: Zip-Code Tabulated Area (ZCTA).

Table 1.6: OLS Regression Results - Dependent Variable: Number of Branches to Operate in a Market

	(1)	(2)	(3)	(4)
Asset/Bond Requirement - Scaled	0.8643*** (0.1540)	0.8242*** (0.1603)	0.2104* (0.1034)	-0.0535 (0.1499)
Renewal Fee - Scaled	0.5150*** (0.1391)	0.3821* (0.1573)	-0.1482 (0.4062)	-1.4349** (0.4585)
Calculated APR Ceiling - Scaled	0.0711 (0.1881)	0.0098 (0.2358)	0.0195 (0.1891)	-0.4408 (0.2411)
Loan Amount Ceiling - Scaled	0.0366 (0.0313)	0.0255 (0.0347)	0.0012 (0.0213)	0.4691*** (0.0635)
Rollover Ceiling	0.5207*** (0.0816)	0.4792*** (0.0817)	0.1038 (0.0995)	-0.3062* (0.1370)
Indicator: No Minimum Asset Requirement	-0.1680 (0.1016)	-0.0774 (0.1293)	0.2454*** (0.0512)	0.5742*** (0.1236)
Indicator: No Loan Amount Ceiling	-0.3871 (0.3341)	-0.2583 (0.4015)	0.6402 (0.6770)	3.0200*** (0.7794)
Indicator: No Fee Ceiling	0.3686* (0.1482)	0.3572* (0.1638)	0.0760 (0.0720)	0.0945 (0.0711)
Indicator: No Rollover Ceiling	2.7301*** (0.4287)	2.5868*** (0.4186)	0.3605 (0.5878)	-1.7823* (0.7708)
Constant	-2.0417*** (0.3996)	-2.2999*** (0.4529)	-0.3287 (0.4679)	0.1250 (0.5588)
<i>N</i>	34505	34505	34505	34505
<i>R</i> <sup>2</sup>	0.571	0.573	0.617	0.620
Including Year Fixed Effects	No	Yes	No	Yes
Including County Fixed Effects	No	No	Yes	Yes

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

This table reports estimations using the specification in Equation (1). Observations are at the ZCTA-year level. Standard errors are reported in parenthesis and have been clustered at the the state-year level. The first five rows report marginal-effect estimates of the policy components controlled for. Indicator results are used to calculate average-effect estimations presented in Table 8. Demographic controls included in the specification, but not reported, are: total population, median household income, percentage black, percentage Hispanic, percentage male, education level, percentage military, poverty rate, unemployment rate, and number of traditional bank branches. Demographic and economic data source: 2000 Decennial Census. Bank branch data source: Summary of Deposit Data, FDIC.

Table 1.7: OLS Regression Results - Dependent Variable: Number of Branches to Open in a Market

	(1)	(2)	(3)	(4)
Asset/Bond Requirement - Scaled	0.0198 (0.0208)	-0.0083 (0.0196)	-0.2199** (0.0664)	-0.3386*** (0.0639)
New License Fee - Scaled	-1.2058 (0.8564)	-0.0385 (0.7331)	-4.0283*** (0.8271)	-1.7952* (0.8169)
Calculated APR Ceiling - Scaled	0.1006* (0.0395)	0.0095 (0.0566)	-0.0066 (0.0191)	-0.2217*** (0.0535)
Loan Amount Ceiling - Scaled	0.0094 (0.0138)	0.0154 (0.0127)	-0.0783 (0.1279)	-0.4632*** (0.1150)
Rollover Ceiling	0.0031 (0.0094)	0.0137 (0.0086)	-0.1205*** (0.0328)	-0.0921** (0.0343)
Indicator: No Minimum Asset Requirement	0.0822 (0.0543)	-0.0230 (0.0452)	-0.0198 (0.0933)	-0.3590*** (0.0977)
Indicator: No Loan Amount Ceiling	-0.0926 (0.0852)	0.0135 (0.1113)	0.3760** (0.1336)	0.4144* (0.1587)
Indicator: No Fee Ceiling	0.0553 (0.0472)	-0.0559 (0.0447)	0.0005 (0.0007)	-0.1645*** (0.0310)
Indicator: No Rollover Ceiling	-0.0148 (0.0264)	-0.0041 (0.0243)	-0.7126*** (0.1731)	-0.6179** (0.1891)
Constant	0.0082 (0.0508)	0.1078 (0.0669)	0.6522** (0.2239)	1.1893*** (0.2246)
$N$	41355	41355	41355	41355
$R^2$	0.247	0.262	0.278	0.293
Including Year Fixed Effects	No	Yes	No	Yes
Including County Fixed Effects	No	No	Yes	Yes

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

This table reports estimations using the specification in Equation (1). Observations are at the ZCTA-year level. Standard errors are reported in parenthesis and have been clustered at the the state-year level. The first five rows report marginal-effect estimates of the policy components controlled for. Indicator results are used to calculate average-effect estimations presented in Table 8. Demographic controls included in the specification, but not reported, are: total population, median household income, percentage black, percentage Hispanic, percentage male, education level, percentage military, poverty rate, unemployment rate, and number of traditional bank branches. Demographic and economic data source: 2000 Decennial Census. Bank branch data source: Summary of Deposit Data, FDIC.

Table 1.8: Average Effects of Introducing Regulations, Baseline Specification

A: Number of Branches to Operate	
Asset Requirement	-0.580 *** (0.026)
Loan Maximum	-2.750 *** (0.699)
Fee Maximum	-0.313 (0.303)
Maximum Rollovers	1.33 (0.695)
B: Number of Branches to Open	
Asset Requirement	0.318 * (0.165)
Loan Maximum	-0.681 (0.690)
Fee Maximum	0.055 (0.152)
Maximum Rollovers	0.483 *** ( 0.209)

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

This table reports estimations using the specification in Equation (2). Coefficient estimates from Tables 6 and 7 and scaled-mean values have been used to calculate average effects of enacting the above policy components on operating branches and opening branches, respectively. Observations are at the ZCTA-year level. Standard errors are reported in parenthesis and have been calculated using the Delta Method.

## Chapter 2

### The Hydra Effect: Examining the Indirect Effects of Banning Payday Lending

#### 2.1. Introduction

In 1996, the state of Ohio enacted the Check-cashing Lending Law which established guidelines for firms providing payday loan services, allowing the industry to operate. Over the course of the decade, the industry grew, following the national trend in the expansion of the payday lending industry. However, in addition to industry growth, the sentiment surrounding the payday lending industry turned, viewing the product as harmful to financially constrained borrowers and firms as greedy. In 2008, the state of Ohio enacted new payday lending legislation, the Short-Term Loan Law, which limited the allowable APR to 28 percent, thus implicitly banning the practice within the state.

In an attempt to eliminate the hardships that existed due to payday loan usage, state regulators may have inadvertently shifted the problem from one industry to another. Previous studies have examined changes in consumer behavior when access to payday loans is limited. After access to payday loans has been restricted, consumers will seek alternatives and substitute across products. Pawnbrokers, overdraft fees, and direct deposit advances have been identified as the likely substitutes for consumers that cannot utilize payday loan services. Therefore, the problems associated with using alternative financial services products have not been actually solved as consumers adjust and find other ways to borrow.

In this study, I attempt to answer the question: Does banning payday lending have indirect effects on the structure of other industries? Research on the consequences of limiting access have shown that consumers will substitute to other alternative forms of financial services if payday loans are unavailable. It is reasonable to expect that firms should also adjust in order to extract profits from markets

with increased demand. If economies of scope exist for payday lenders, then expanding product mixes to include other services, such as pawnbroker or title loans, can increase profits for firms that choose to remain in the market. Additionally, excess profits could also induce entry by potential entrants that would otherwise remain out of the market. Both decisions imply an expansion of a different market as the result of banning payday lending. This is an economic phenomenon that I call the hydra-effect: when the process of eliminating one industry causes the expansion and growth of another industry or even multiple industries.

Using licensing records collected by the State Division of Financial Institutions of the state of Ohio, I measure the effect of banning payday lending on four industries: pawnbrokers, precious metals dealers, small-loan lenders, and second-mortgage lenders. I measure the impact of a ban on the number of operating branches, the change in the number of operating branches, and the number of new branches to determine if these industries expand or contract in reaction to the binding APR ceiling imposed on payday lenders. Pawnbrokers and precious metals dealers offer financial services that are most similar to the payday loan and have been found to be likely substitutes for consumers who demand funding in the absence of payday lending. Small-loan and second-mortgage lending laws, as written, allow for the possibility for payday lending to side-step any enacted payday lending ban. As these industries are related, I use a seemingly unrelated regression estimation procedure, including county-fixed effects to examine how enacting the payday loan ban affects the aforementioned outcomes.

Results show the effects of the ban are most pronounced for outcomes in the precious metals, small loan, and second-mortgage lending industries. For precious-metals dealers, in periods when the fee ceiling is enacted, observed county-level branch counts are larger by 0.389 branches. The mean observed number of licensed precious-metals dealers per county-year for the observed sample is 0.356 branches. Therefore, the estimated effect of banning payday lending is the doubling of the number of operating precious-metals dealers. While it is possible that payday lenders are switching practices after the ban, it is highly likely that this of the size of

the precious metals.<sup>1</sup> For small-loan lenders, the effect of banning payday loans has a significantly negative impact on the industry. According to results, the ban causes a decrease in the number of operating branches to the extent the industry contracts to the point of becoming nonexistent within the state. Changing policy to ban payday loans increases the change in the number branches licensed as second-mortgage lenders industry by almost 3 branches in a given county. This effect on the change in second-mortgage licensees increases to almost 9 branches when controlling for time trends. This implies that the declines in the number of second-mortgage industry are slowed and the industry stabilizes in response to the payday loan ban despite downward economic pressures caused by the housing and financial crises. This indicates that payday lenders choose to circumvent the ban by licensing as second-mortgage lenders rather small-loan lenders.

My research contributes to the existing literature on payday lending and the consequences of access, however, I turn the lens to examine changes on the supply-side of the alternative financial services industry. Just as consumers substitute across different products when access is limited, economic theory predicts that firms can and will substitute as well, expanding product mixes to meet the newly increased demand for alternative products. Therefore, rather than simply eliminating payday lending, legislative bodies could be catalysts for the growth of other industries. Relevant to the results discussed above, while payday lending is officially banned, ignoring the other avenues that the service can be offered simply allows for the industry to remain, thus defeating the purpose of the original policy. From a general policy perspective, examining indirect policy effects identifies the unforeseen, and unintended, consequences of limiting regulations. In order ensure that policy be effective, both direct and indirect effects of legislation have to be identified. An explicit ban of payday lending does not necessarily lead to the decline of the practice altogether. When attempting to restrict certain market practices, policymakers should consider the direct and indirect methods by which payday lenders can operate

---

<sup>1</sup>During the period of observation, the market price of gold increased to record setting levels year after year, likely inducing entry and new licenses.

within a market.

The remainder of the paper is structured as follows: Section 2 discusses the relevant background literature, section 3 discusses the case of Ohio and its policy environment, section 4 discusses the empirical specification used, section 5 discusses d, section 6 discusses results, and section 7 concludes.

## 2.2. Background

As the payday lending industry grew in the over the decade in the 2000's, so too did the attention of policy makers at the state and national levels. Between the years 2007 and 2012, over 500 bills were introduced by states legislatures ranging from explicitly enabling payday lending to banning the practice completely. According to the National Conference of State Legislatures, in 2013, 38 states explicitly allowed payday lenders to operate within state borders. The remaining states and territories<sup>2</sup> prohibit usage either explicitly or by requiring payday lenders to comply with interest-rate maximums for traditional consumer products.

Of the 38 states that do explicitly regulate payday lending, some states enact fee maximums that are binding to the point of being restrictive. The state of Ohio, starting in 2008, restricts fees collected on loans to be no greater than 28 percent APR. This calculates to be no more than a few dollars in fees for the typical payday loan, extremely unprofitable and unsustainable, thereby driving the industry out. As states have been implicitly prohibiting payday loans, research on usage has been shift away from the consequences of access to the consequences of limited access and how consumers respond when payday loans become unavailable.

---

<sup>2</sup>Connecticut, Guam, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, Puerto Rico, Vermont, Virgin Islands and West Virginia. Arizona and North Carolina allowed pre-existing statutes to expire. Arkansas repealed payday lending laws in 2011.

### 2.2.1. Changes in Consumer Behavior

A subset of the literature of payday lenders examines the changes in behavior when access to payday loans is limited. Zinman (2009) compares substitution behavior between borrowers in Washington and Oregon after Oregon banned lending through interest-rate caps. He finds that consumers in areas where payday loan access is limited substitute by using bank overdrafts and late-bill payments at a higher rate. Bhutta, et.al. (2012) find payday loan applicants simultaneously apply for credit cards, mixing the means by which borrowers attain funds. Carter (2012) also finds that borrowers use funds from payday loan in conjunction with other sources. In states where access to payday loans was restricted by limiting the number of rollovers, payday loan borrowers also sought financing from pawnbrokers. Additionally, in these states where rollovers were explicitly restricted, she finds a higher concentration of licensed pawnshop branches operating within a state, suggesting that firms in substitute industries respond in kind restrictive payday lending regulations. Goldin and Homonoff (2013) find that users substitute towards using pawnshop loans when payday lending has been banned because initial access to small, traditional loans is limited. Finally, McKernan et.al. (2013), finds that payday lending usage decreases when price limitations are imposed, likely from a decrease in access. However, they find no substitution behavior among consumers in areas where payday lending access has been limited. Specifically, the authors found no significant impact of access on the usage of pawnbroker loans, title loans, and refund anticipation loans.

Most of these studies highlight two important facts: 1) Payday loan customers use other alternative financial products. If limited in choice, these consumers are likely to increase their use of available AFS products in order to meet their credit needs. 2) Other firms in the AFS industry respond to regulations meant for other products. In her results, Carter (2012) finds that pawn shops locate themselves in close proximity to states where restrictions for payday loans are lax. Given the aforementioned results, the pawnshop industry is also aware that consumers use

these two products in conjunction, therefore have responded accordingly to payday lending regulations by increasing their concentrations in beneficial markets.

### 2.2.2. Supply-side Response

There are two potential sources of industry growth as a result of banning payday lending. One must consider the behavior of both existing payday lending firms as well as potential entrants in the alternative industries. For firms already operating as payday lenders, the question these firms face is one of benefits versus costs: are the new benefits (profits) of product switching greater than the new costs associated in offering multiple financial service products (for instance, payday loans and pawnshop services). If so, then payday lenders faced with looming restrictions are likely to switch industries. Note, it may be the case that benefits are greater *because* of the ban and the subsequent increase in demand. This is somewhat analogous to the transition from check-cashing and payday lending earlier in the decade. Shared resources made both practices profitable in that case, the same could be true in the context of banning payday lending.

Focusing on licensing switching alone ignores the response by potential entrants with their focus on the industry and regulatory changes. For firms not yet operating, this is a simple entry decision: are there excess profits to be extracted from the industry upon entry. Just as it was for the case above, excess profits may result because of the shift in demand. Therefore, banning payday lending can also induce entry of firms that are participating in neither industry.

This study contributes to the literature examining the effects of banning access to payday loans by shifting focus to the supply side of the alternative financial services industry. Carter (2012) examines firms operating pawnshops in relation to surrounding policy environments. However, I extend this analysis by measuring the response of different industries to the changes in payday loan policy. By observing areas prior to and after the enactment of restrictive payday lending policies, I can determine if alternative industries benefit from payday lending prohibition. I classify

this economic phenomenon as the “Hydra-effect”<sup>34</sup>?: the expansion of one industry as an indirect effect of banning another, taking its place and fulfilling demand that is no longer met. In the context of the payday lending industry, this occurs with the expansion of potentially substitute industries, such as pawnshops and title lending, as payday lending is restricted to the point of prohibition. This study examines to what extent the Hydra effect exists after payday lending is restricted in the state of Ohio.

### 2.3. Ohio and the Short-Term Loan Law

Like in many other states, the payday lending industry in the state of Ohio grew out of the established check-cashing industry. Since 1996, check-cashers extending payday loans were required to apply for a second “check-cashing loan” license with the enactment of the Check-Cashing Loan Law. Under the Check-Cashing loan law, loan sizes were limited to \$800 with duration limit of 14 days. Origination fees and interest charges were limited depending upon the size of the loan (\$10 per \$100 for origination fees and 5 percent in interest charges), however, there was no established limit on the final APR of the loan. This legislation was cited as the “least consumer friendly payday lenders laws” as charged APRs approached 400 percent on the average loans (Parker 2013). In 2007, over 1,400 branches were licensed as check-cash lenders in the state, offering payday loans to the general public.

In 2008, the Ohio General Assembly and state voters approved the passage of H.B. 545, an act that repealed the Check-Cashing Loan Law and enacted the Short-Term Loan Law. Under the new law, loan sizes were limited to \$500 with a duration minimum of no less than 31 days. Further, and most important, the calculated APR for all loans could not exceed 28 percent APR. The new law was an implicit ban on payday lending as duration and fee restrictions made extending these loans

---

<sup>3</sup>The Hydra is a creature from Greek mythology. An attempt to cut of one of the heads of this creature would result in two growing in its place. (Taken from <http://www.mythweb.com/>)

<sup>4</sup>Faller (2008) refers to the payday lending industry as the Hydra that has to be slayed, citing the industries ability to rapidly adjust to policy environments

unprofitable, thus forcing firms to exit the industry. On a \$200 loan extended under the new guidelines, lenders could only collect fees in the amount of \$2.15 (Parker (2013)).

### 2.3.1. Alternative Industries

While payday lending has been officially restricted, opponents of the product still worry that lenders are still operating within the state under the guise of other forms of lending. There is the economic possibility that lenders will shift operations to industries that are likely substitutes in order to remain in business. Additionally, and within the state of Ohio, instances of payday lenders dodging the established regulations have been identified. This section discusses the possible industries that are affected by the banning of payday lending, identifying potential substitutes and technicalities that allow lenders to remain operating.

#### **Pawnbrokers**

Pawnshops are regulated under the Ohio Revised Code, Chapter 4272, as financial services providers. Pawnbrokers extend loans to individuals in exchange for possession of an item of value for an agreed upon duration of time. At the expiration of the contract, an individual must repay the loan and any charged fees in order to regain possession of the exchanged item. If the loan (plus fees) is not repaid, the exchanged item is made available for sale by the pawnbroker for a higher price than what was originally paid. As previous research shows, the most common substitute for the use of payday loans is the use of pawnbrokers. Both financial services offer small, short-term loans with very little requirements on the borrower's behalf. Also, unlike payday loans, pawnshop loans do not require proof of employment or a checking account, thus making the transaction somewhat easier.

## **Precious Metals Dealers**

Precious metals dealers are licensed occupations, rather than financial service providers, within the state of Ohio. By definition, precious metals dealers purchase items made of gold, silver, platinum, or other precious metals or jewelry, from the public. Unlike pawnbrokers, there is no loan contract; precious metals dealers explicitly purchase items with no expectation to be repaid and then having to surrender the exchanged good. Precious metals dealers offer an ideal substitute for payday loan borrowers because of how rapid the transaction is. Once the objects in question have been valued, money exchanges hand. There are no required credit checks, proof of employment, or proof of being banked.

Pawnbrokers and precious metals dealers are likely substitutes for consumers in search of quick loans. Each service provides a similar transaction to the payday lending process due to the minimal requirements for acquiring money. In addition to substitutes, one must identify which industries allow for payday lenders to circumvent restricting policies and continue to practice as payday lenders. The industries discussed below are regulated in such a manner that loopholes exist that allow for payday lenders to continue operations.

## **Small-Loan Companies**

Small-loan lenders are regulated by the ORC sections 1321.01 to 1321.19. Small loans are defined as loans of \$5,000 or less and can be secured by personal property or not. Unlike payday or short-term loans, there is no duration minimum or maximum defined by the regulation. Allowable interest charges are based upon the amount loaned: interest charges cannot exceed 28 percent interest per year for loans less than \$1,000, 22 percent interest per year for loans over \$1,000, or 25 percent APR in total. The calculated APR includes all fee charges as a condition of the loan. However, and very important, these fees used to calculate the APR do not include loan origination fees, charges for default, deferment, insurance charges, court costs, credit line charges, credit report charges, and any other charges authorized by the

lender. If extending a loan under the Small Loan Law, it is entirely possible for a lender to still offer payday loan-like products under the guise of another service when payday loans have been explicitly banned <sup>5</sup> with calculated interest rates approaching the typical APRs for payday loans (Parker (2013)).

### **Second-Mortgage Lenders**

Second mortgage lenders are licensed by the ORC sections 1321.51 to 1321.60. As regulated, mortgage lenders can extend secured or unsecured loans to consumers of varying amounts. There are no stipulated loan limits, no required duration, and different provision if the loan is unsecured and/or open ended. For all loans extended under the second-mortgage lending law, interest charges are limited to 21 percent per year or 25 percent APR. However, just as with small loans, these calculated interest rates do not include loan origination fees, charges for default, deferment, insurance charges, court costs, credit line charges, credit report charges, and any other charges authorized by the lender. For unsecured loans, lenders are allowed to charge additional origination charges that vary with the size of the principle amount, check collection charges, late charges, and insurance premiums, among other charges. These fees allow actual APRs to exceed the regulated maximum and approach 400 percent APR (depending upon the size of the loan and included fees) (Parker (2013)).

These four industries allow for payday lenders to adjust product services and enter a new market or continue operations under the license of a different type of lender. Therefore, in the presence of a payday loan ban, firms can either adjust or circumvent the existing law. The question is still one of cost: does it cost less to continue operations and bypass legal restrictions, engage in providing substitute services, or exit the market completely? While licensing fees for all four identified industries are rather low<sup>6</sup>, the implicit costs are the highest for second-mortgage

---

<sup>5</sup>To quote the Bard, "By any other name would smell as sweet." So too is the case for payday loans.

<sup>6</sup>As stated by ORC 1321.20, licensing fees for pawnbrokers, precious metals dealers and small-

lenders, as licensees have to complete both state and national level training and certification. However, of all the possibilities, while demand shifts and lower costs of licensing make entry into substitute markets appealing, licensing and operating as a second-mortgage lender offers the opportunity for higher profits if continuing to offer payday-like loans given the fee structure associated with origination fees. Therefore, there is no obvious answer to what industry will be most affected after banning payday lending.

Lastly, with respect to direct regulations, for all four of these industries examined, there occurred no direct regulatory changes from 2006 to 2010. Licensing fees and asset requirements remained unchanged. No new regulations affecting loan products or conditions were established. The only major change in regulation with respect to any financial service provider occurred in 2008 with the passage of the Short-Term Loan Law that banned payday lending in the state of Ohio. This provides an exceptional opportunity to identify indirect policy effect given there are no changes in the central policy environment for these industry. The next section discusses the empirical specification used to identify the indirect effects of banning payday lending.

#### 2.4. Empirical Specification

The research question this study seeks to answer is: How does a payday lending ban impact the structure of alternative, potentially related industries? In order to answer this question, I use the following specification for each industry, using an Ordinary-Least Squares Regression (OLS) estimation.<sup>7</sup> The reduced-form empirical specification is as follows:

---

loan lenders cannot exceed \$300. Second-mortgage lender fees cannot exceed \$150.

<sup>7</sup>The regressions errors may be correlated across different industries, however, given each industry uses identical covariates for estimation, there are no efficiency gains in using the Seemingly-Unrelated Regression (SUR) estimation process and predicted coefficients are identical for each method.

$$Y_{ct}^a = \alpha_0 + \alpha_1 Ban_t + X_{ct}\beta + \mu_c + \epsilon_{ct}^a \quad (2.1)$$

$Y_{ct}^a$  measures the aggregate county-level branch counts licensed to operate in industry  $a$  in county  $c$  in year  $t$ .  $Ban_t$  is a state-level indicator variable that is equal to 1 if payday lending has been banned in year  $t$  or 0 if otherwise. This measures the indirect effect of banning payday lending on the county-level concentration of branches in alternative industries. If the coefficient  $\alpha > 0$ , then the hydra-effect is present and industry  $a$  expands as more firms enter. If, however,  $\alpha < 0$ , the industry is still affected indirectly by the ban and will contract. In this particular scenario, rather than being a potential substitute, firms within industry  $j$  view higher restrictions on the payday lending industry as a signal of a legislative trend with respect to their own industry, with the expectation that strict regulations for industry  $a$  will soon follow.

$X_{ct}$  is a vector of demographic characteristics for county  $c$  in year  $t$ . Demographics included are total population, median household income, sex, race, education, military population, unemployment rate, and poverty rate for each county observed.  $\mu_c$  is a county-level fixed effect.

$\epsilon_{ct}^a$  is the industry-county-year level idiosyncratic error term. The assumption of independence across industries likely does not hold as the industries analyzed in this study can all be broadly defined as financial service industries and will be affected by the same shocks and unobserved factors. The SUR-estimation procedure corrects for the correlation between  $\epsilon_{ct}^a$  and  $\epsilon_{ct}^{-a}$ .

### Alternate Dependent Variables

In addition to the number of operating branches, the above specification will also be used to estimate the effects of a payday lending ban on the flow of branches in industry  $a$  with two additional dependent variables: the change in the number of operating branches and the number of opening branches. The number of operating branches, as well as the change in operating branches, offer insight into how a

particular industry responds by capturing both entry and exit behavior. Examining the effects on the number of branches to open explicitly offers insight to whether branches are drawn to particular industries as a result of the ban.

### **Identification**

This study uses variation in state-level payday lending policy to identify the effects of banning payday lending on the concentration of other alternative financial service industries to identify substitution or regulation-dodging behaviors of firms. This assumes independence between firms operating in examined alternative industries and the policy outcomes with respect to the payday lending industry, i.e. legislation prohibiting payday loans, is not initiated or affected by potential competitors.

The Short-term Loan Law, HB 545, was initially passed by the Ohio legislature in the summer of 2008, however it was not enacted until November of the same year. Even though this act was approved by state officials and signed into law, industry proponents pushed to overturn the law through the veto referendum process, by having the citizens of the state vote on whether or not to enact HB 545. The referendum was unsuccessful and the Short-Term Lending Law was enacted. The process by which the law passed involved several players and ultimately, the general public. Though the bill was sponsored by state representatives that could have been influenced by special interest groups, the law was approved by the general population. Given the atmosphere surrounding supporters of the interest rate maximum vilified the payday lending industry, it is unlikely that other alternative financial service providers would be involved in the referendum process. Therefore, I believe that the policy change enacted in 2008 is exogenous to influence by the industries that I examine.

## Omitted Variables

The above specification does not include explicit regulatory controls for any of the industries analyzed due to the fact that, while these regulations do exist, no change was made to any direct regulations pertaining to pawnbrokers, precious metals dealers, small-loan lenders, or second-mortgage lenders during the period of observation. If included, these controls would simply be omitted from estimation due to the lack of variation over time.

Also excluded from the above specification are variables that measure the lagged number of operating branches in industry  $a$  as well as the payday lending industry. Including lagged operating branch counts for industry  $a$  controls for the concentration of the industry in the previous period. Controlling for the lagged number of operating payday lending branches controls for high-demand areas for short-term liquidity that are more likely to have excess demand once a payday loan ban has been enacted. However, both terms are highly endogenous, biasing estimates. A more in depth discussion of this is included in the appendix.

### 2.5. Data

The state of Ohio is specifically chosen as a case study because of the relevant policy switch from enabling regulation to implicit prohibition by implementing a 28 percent APR maximum. Further, the availability of licensing data for not just short-term lenders, but the aforementioned industries, allows for the cross-industry analysis as a result of the ban. In total, I observe 410 county-years, 82 counties over a 5-year period. As described below, the ability to examine individual branches over time, geography, and most relevant, across industry, allows for the identification of the indirect effects of payday loan prohibition.

#### 2.5.1. Branch-Level Data

Branch-level data have been collected from the Ohio Division of Financial Institutions, operating under the Department of Commerce. Financial service organiza-

tions operating within the state must license each operating branch on an annual basis as instructed by the ORC and OAC for an annual fee, depending upon type of financial service provided. Records that are publicly available for each operating branch include: company name, branch license number, branch operating address, initial date of licensure, expiration date, and status. If the branch is currently active during the period of observation, the branch had an "ACTIVE" status and the expiration date reflected the expiration date of the current license. For all other cases, the status of the branch reflects the reason for closure and the date reflects the last day the branch was active. For each year of observation, a branch was designated as having initially opened and having operated. A branch is designated as "open" if the initial license year is the same as the observation year. A branch is designated as "operating" if the branch opened in the same year or prior to the year of observation and the license is active for any duration during the year. Branch counts are aggregated to the county-year level for analysis.

Data are only observed starting in the year 2006 through the year 2010. Table 1 displays the summary statistics for all three dependent variables measured. For all outcome variables, in addition to the standard deviation for the overall sample, the source of variation has also been segmented across observed counties (between) and over the observed time period (within).

## **Operating Branches**

Table 2.1A displays the summary statistics for the number of operating branches for each observed sample. Beginning with licensed pawnbrokers, there are just over 2 licensed pawnbrokers per county over the entire sample, with an observed minimum and maximum of 0 and 43 branches, respectively. As this range suggests, there are a number of observed county-years in which there are zero or a single licensed pawnbroker operating.<sup>8</sup> Unlike the payday lending industry, pawnshops are not highly clustered around one another; the industry is not characterized by its highly

---

<sup>8</sup>Indeed, 185 county-years have zero licensed pawnbrokers present, 105 have a single licensed pawnbroker. This represents 71 percent of the sample.

concentrated markets. Examining the sources of variation, most of the differences in count occur across counties (with a standard deviation of 5.06 branches) rather than across time (with a s.d. of 0.907 branches), suggesting that the industry is stable over the period observed. A similar story can be told for licensed precious metals dealers. A county-year mean of 0.356 strongly indicates the majority of county-years observed have no licensed precious metals dealers operating (a standard deviation of 1.1 suggests most observed county-years have no more than three licensed dealers operating). This industry is less prevalent than payday lending and even less prevalent than the pawnbroking industry. Again, the major source of variation in operating branch counts indicates variation occurs mostly across observed counties versus over the course of time.

Small-loan originators are not as scarce as precious metals dealers, however the industry is not as concentrated as with pawnbrokers. Again, there are many county-year observation without a single operating small-loan dealer, indicated by such a small sample mean (0.629 branches). And, just as with the previous industries, the source of variation comes from the cross-county variation rather than across time. Data for second-mortgage lenders tell a glaringly different story in all respects. First, of all industries observed, this is the most concentrated by far, with an average of 10.73 licensed second-mortgage lenders per county-year. Given the nature of the type of lending (i.e. it being a mainstream source of funding), the higher concentration is not quite a surprise; these lenders are likely to be located in more areas that alternative financial services would not enter (such as higher-income areas). Much of the variation observed comes from differences in county-level counts. However, unlike the previously discussed industries, there exists a fair amount of variation over time (13.789 branches), suggesting that the second-mortgage industry has been very active in terms of structural change.

The number of operating pawnbrokers, precious-metals dealers, and small-loan originators have been relatively stable over time, suggesting that, if there is any response to payday lending regulations, the reactions are minimal. However, the variation over time seen in the number of operating second-mortgage lenders suggests

existing firms choose to find means in order to continue practicing as payday lenders rather than entering substitute industries. Therefore, rather than adopting new business, firms find ways to technically bypass existing prohibitions.

### **Change in Operating Branches**

Table 2.1B displays the summary statistics for the change in the number of actively licensed pawnbrokers, precious-metals dealers, small-loan companies, and second mortgage lenders in a county-year. These statistics are informative of the dynamics of an industry, not just the size in a particular county and year, but how the industry itself changes from period to period. Starting with pawnbrokers, the average change observed from period  $t - 1$  to  $t$  of active branches is 0.258 branches. The largest source of variation in the pawnbroker industry is attributed to changes over time rather than changes across counties, with a within-standard deviation of 0.734 branches and a between-standard deviation of 0.423. Statistics for the change in the number of active precious-metals licensees signal somewhat of a stable industry over the course of the sample, however, one that experiences a slight expansion. A mean of 0.132 confirms this assessment of the industry as stable. Some counties experienced a contraction of active precious metals dealers, however, only a single dealer at the most, thus markets never actually disappeared over the course of the sample. Just as with pawnbrokers, changes in the industry over time contribute the most to overall variation in the sample.

The statistics for the change in the number of small-loan lenders shows an industry that is in decline over the period of observation. The mean in the change in operating small-loan lenders, -0.065, shows that the industry is in a slow state of decline. However, this is not the overall trend for the state over the entire sample period. The standard deviation across time, 0.971, is the major source of variation for this particular industry. Given these statistics, there are markets that saw a sharp decline in the change in operating small-loan lenders, however, there are also counties in which there existed positive growth. The second-mortgage industry is especially dynamic within the state during this period. The statistics for the change

in operating second-mortgage lenders also indicate an industry in decline. The average change in operating branches is -2.443 branches, with a majority of county-year experiencing a contraction of the this industry. Variation in this industry is equally attributed to cross-county variation and variation over time. The period of observation for this study corresponds to the beginning of the housing-crisis nationwide. It appears that, at least on the supply side, the housing crisis had an effect on the availability of mortgage providers in Ohio.

### **Opening Branches**

Table 2.1C displays the summary statistics for the number of newly licensed pawnbrokers, precious-metals dealers, small-loan companies, and second mortgage lenders. For pawnbrokers, just as for operating branches, there exists a large amount of county-years in which no new pawnshops open within the sample. This is indicated by the extremely small sample mean of 0.243 branches in a county-year as well as the small standard deviation (0.792 branches) for the overall sample. What is interesting to note is that the majority of the variation in the number of new branches comes from changes over time (0.678 branches) versus between observed counties (0.411). This is a signal that the event of banning payday loans could affect the number of pawnbrokers to entering the market in a given year. Once again, there is very little activity in the number of newly licensed precious-metals dealers: on average, 0.160 new precious-metals dealers were granted a new license in a county-year. The overall standard deviation of the sample (0.633 branches) suggests that most of the county-years observed saw no more than 2 new branches over the course of the sample. Just as was the case with the number of operating branches, the precious-metals industry appears to be relatively stable across the sample.

The number of small-loan originators entering each county-year is also extremely low. Over the course of the sample, there were an average of 0.093 new branches licensed in a county-year, with a standard deviation of 0.492 for the overall sample. Of the four industries examined, the small-loan licensees are the most stable, with very little entry occurring across time and across the state. However, what changes

occurring in the number of new licensees is largely due to variation over time, with a within standard deviation of 0.441, rather than across counties. Once again, the second-mortgage industry is the most active in the state from 2006 to 2010. On average, each county-year had almost 3 new entrants, with the majority of county-years having between 0 and 20 new licensees in a county year. As previously discussed, the implicit costs of acquiring a second mortgage license are high. An applicant has to fulfill state and national-level requirements, such as extra licenses and certifications. This higher cost of entry would likely deter entry into this particular industry. Additionally, the time frame this study examines encompasses the housing-market crash and financial crisis, thus entrants are further deterred from entering a rapidly declining and volatile market. However, the data tell another story: statistics on new second-mortgage licenses indicate a growing industry despite economic conditions.

These statistics indicate that the industries that are likely substitutes for payday lenders, are relatively stable across time and see very little changes in the number of new entrants. However, this does not mean that the former payday lenders are not responding and affecting other industries. Rather, it appears that former payday lenders are choosing to work around existing regulations in order to continue to offer small, short-term loans. While there are higher costs associated with acquiring a second-mortgage lending license, the profits associated with making unsecured loans (observationally) are high enough to encourage entry, affecting the structure of the industry.

### 2.5.2. Trends in Branch Counts

Figures 2.1 through 2.5 display the trends in observed operating, opening, and closing branches for payday lenders, pawnbrokers, precious-metals dealers, small-loan lenders, and second-mortgage lenders at the state-level. For each figure, the vertical grey line indicates the timing of when the fee restriction became active and enforceable. In Figure 2.1 for the payday lending industry, the number of operating branches increases from 2006 to 2007 only slightly, however, it is obvious from this figure when the ban in payday lending takes effect. The number of branches to close

sharply peaks in 2008, the year of the ban. Starting in 2009, there are no operating branches as all licensed payday lenders have exited due to the ban.

In Figure 2.2, the number of operating pawnbrokers increases for the entire period of observation. The sharpest increase in the number of operating branches occurs between 2007 and 2008. Indeed, the number of newly licensed pawnbrokers is highest in 2008, with approximately 75 new licensees in the state. After 2008, very little entry or exit activity occurs in this industry, however, it appears that the industry begins to slightly contract starting in 2009. Observationally, it appears that the ban on payday lenders does cause the number of pawnbrokers to expand, however this expansion appears to be preemptive rather in reaction to the ban once it has been enacted.

Figure 2.3 displays the trends in branch counts for the precious metals industry. It is important to note the scaling difference here: for any of the categories, there are no more than 60 branches at the center of discussion, a small fraction of the number of formerly operating payday lenders. From the figure, it appears that this industry is rather active in terms of entry and exit. Like pawnbrokers, the number of operating precious metals dealers increases throughout the period of observation. However, there is a noticeably sharp increase in the number of operating branches after 2008. Contrary to pawnbrokers, it seems that precious metals dealers are reacting to the established ban than acting preemptively. However, the period of observation corresponds also to the period of the financial crisis when the prices of precious metals were reaching record levels. This is likely contributing to the expansion of this industry.

Figure 2.4 displays trends in branch counts for the small-loan lending industry. This particular industry sharply expands prior to 2008 and then sharply contracts afterwards to operating branch levels below initially observed. Observationally, there is a strong effect of the ban on the small-loan lending industry: both the number of operating branches and newly licensed lenders peaks in 2008. However, the number of branches to exit is highest in 2009. If payday lenders are circumventing binding APR ceilings by licensing as small-loan lenders, the change in status does not appear

to be long term given the sharp contraction in the industry.

Lastly, Figure 2.5 displays the trends in the market for second-mortgage lenders and these trends are dynamic to say the least. Starting in 2006, the industry is in decline at the state level, decreasing from 1,400 operating branches to just over 800. This decline continues from 2007 to 2008, with approximately 700 licensed mortgage lenders operating in the year of the ban. However, after 2008, the number of operating branch counts slightly increases then declines after 2009, however these changes are relatively stable relative to the initial decline. Further, the number of new licensees decreases from 2006 to 2007, however, increases from 2007 to 2008, but begins to decrease once again. Finally, and incredibly interesting, while the number of branches to close peaks in 2007, this is a declining trend. This means, that after 2007, more and more branches are remaining licensed as second-mortgage lenders. What makes this figure especially interesting is the fact that the period of observation for this study corresponds almost perfectly with the timing of the housing and financial crises. The downward trend in operating branches from 2006 to 2007 and the peak of exiting branches indicates this impending crash. However, in the middle of the worst of economic times, the industry begins to expand. It appears, that former payday lenders are choosing to re-license as second-mortgage lenders in order to work around payday lending regulations.

### 2.5.3. Demographic Data

Demographic data are collected from the US Census American Community Survey 3-year estimates.<sup>9</sup> Table 2.2 displays summary statistics for the observed demographic control variables. As per the standard of the ACS data, populations observed are equal to or larger than 20,000 people. The average observed total population observed is 139,133 people in a given county-year. Variation across counties, with a standard deviation of 217,737 people, indicate a large variation in populations across counties. Further, within sources of variation indicate that there is

---

<sup>9</sup>1-year estimates are used for robustness checks due to the small number of counties explicitly observed.

some migration in and out of counties, however, relative to the variation across geographies, this is a very mild source of change in population. The mean observed median income is \$48,023, and income statistics indicate a large variation in earned income across the state. Again, the largest source of variation in income levels comes from variation across counties, and a large variation in income exists (there exist very poor and very wealthy counties). Variation over time indicates relatively stable income levels, even during the recession.

The proportion of males living in a given county-year is also relatively stable, close to 50 percent of the population in all counties observed. However, the percentages of white and black populations vary widely across the state. The mean proportion of whites living in a county year is extremely high, 80.52 percent. However, the standard deviation overall suggests a wide variety in this concentration (31.06), mostly coming from variation across counties within the state, with a between standard deviation of 27.545. However, the within level of variation suggests changing racial compositions in observed counties over the observed period of time. Conversely, the proportion of the blacks in a population is far smaller, with an average of 4.032 percent of the population of a county identifying as black in a given year. Again, this variation is largely due to differences across counties, with 5.868 percent standard deviation associated with cross-county variation. Finally, percentages of blacks within populations remained very stable across the observed period, with a standard deviation of 0.347 percent attributed to change over time.

The unemployment rate averages almost 9 percent for the overall sample, relatively high but not unexpected considering the period which is observed. Just as the case with income, unemployment levels are widely varied across counties, as the between standard deviation (2.141 percent) is nearly equivalent to the overall standard deviation of the sample (2.704 percent). The military population across counties and across time is extremely low, averaging less than 1 percent, with the majority of the sample having a share of less than one-percent military in the working population. Average poverty across the overall sample (13.735 percent) in addition to the standard deviation indicate that there are very poor counties within the state for various

years. The maximum observed poverty rate for a given county-year is an observed 31 percent, which is the maximum for the majority of the sample as well. Lastly, the percentage of the population with at least a high-school diploma averages 85.84 percent over the entire sample.

These statistics indicate that, even at the county level, there exists a large amount of variation in the populations across counties, however, not so much variation attributed to changing years. As a result, identifying indirect policy effects becomes easier.

## 2.6. Results and Discussion

This section presents the regression results for the following industries: pawnbrokers, precious metals dealers, small-loan companies, and second-mortgage lenders. For each industry, OLS-estimations were conducted for each dependent variable discussed: the number of operating branches, the change in operating branches, and the change in the number of opening branches. Tables 3 through 6 present results for the dependent variable measuring the number of operating branches in a market for each industry. The extent to which the hydra-effect exists for these industries is discussed in the sections below. For each industry, two estimations were conducted. Column 1 does not include any county-fixed effects and Column 2 includes the county-fixed effects.

### 2.6.1. Dependent Variable: Number of Operating Branches

#### **Pawnbrokers**

Table 2.3 presents the results for the pawnbroker industry. In Column 1, county-years with a payday lending ban in place have 0.205 more operating pawnbroker branches than prior, however, with no statistical significance. When correcting for county-level effects in Column 2, this effect decreases in magnitude, banning payday lending increases operating pawnbroker branches by only 0.166 branches. This is still statistically insignificant. This decrease in magnitude signals that county-level,

phenomena are more direct influences on the structure of the pawnbroker industry versus and indirect effect that may exist from payday lending policy.

While the magnitude of the effect is quite small, these results indicate that there is a slight swell in the number of operating pawnbrokers in a county when access to payday lending has been banned. However, I would not necessarily say that the hydra-effect occurs in the pawnbroker industry. While consumers may be substitute payday loans with loans from pawnbrokers, it appears that the supply-side is not responding in kind.

### **Precious Metals Dealers**

Table 2.4 presents the estimation results for the dependent variable measuring the number of operating precious metals dealers in a county, another potential product substitute for payday loans. In Column 1, with no fixed effects or lagged controls, a ban on payday lending increases the number of observed precious metals dealers by 0.403 branches, significant at the 0.1-percent level. When controlling for county trends, this effect slightly decreases in magnitude, increasing observed precious metals dealers by 0.392 branches, still highly significant.

While small in magnitude, this is actually quite a large effect. Recall that the mean precious-metals dealers over the entire sample is 0.356 branches. Therefore, the precious metals industry is twice the size when a ban exists relative to the size of the industry when the ban was not enacted. Further, it is interesting to note, that between the two potential substitutes, the effect of banning payday lending has a larger effect on the number of operating precious-metals dealers than on the number of operating pawnbrokers. Of the two transactions, loans from pawnbrokers are most similar to payday loans than a precious-metals transaction: there are very different market segments being serviced. Payday loan borrowers are individuals that are employed and have an established relationship with the traditional banking system. However, no such requirements exist for using precious metals dealers, only the possession of gold or silver to sell. Further, the transactions themselves are different: A payday loan is a loan that is required to be paid back after a

set period of time while a precious metals transaction is the sale of goods from one party to another. Given these fundamental differences, it is surprising that a stronger relationship exists between payday lending regulations and the effects on the number of operating precious-metals dealers.

What then can explain this such a large effect and this difference in magnitude? Perhaps it is because pawnbrokers and payday lenders are so similar, not only in transaction type and customer base, but also with respect to public image and policy environments. The APR restriction imposed on payday lenders was motivated by the public's image that payday lenders are predatory in nature. Given the similarity between the two industries, it is possible that pawnbrokers are hesitant to completely fill the void left by payday lenders that have exited the industry to prevent explicit restrictions, thus the very slight positive effect. Since precious-metals dealers engage in fundamentally different transactions, the policy repercussions of expansion do not exist, hence the larger magnitude.

Additionally, it is possible that the estimate of the effect of the ban on precious-metals dealers contains an upward bias due to correlation of unobserved events later in the decade. The economic crisis between 2007 and 2010 saw, not only a decrease in the demand for liquidity, but also a significant increase the market price of gold to record setting values. The timing of the ban in payday lending in Ohio almost perfectly corresponds to this increased value in precious metals. Therefore, it is likely that banning payday lending has, in actuality, an even smaller effect, closer to the effect on pawnbrokers, on the number of operating precious-metals dealers.

While the demand-side adjusts in the wake of restricted access to payday lending, the results discussed above indicate that the supply-side of potential substitute products do not respond to the same degree. Given the very small estimated changes, there appears to be no real economic effect of banning payday lending on the growth of pawnbrokers or precious metals dealers. This does not mean that other industries are not affected. The discussion below focuses on industries that allow for payday lenders to circumvent enacted restrictions.

### **Small-Loan Lenders**

Table 2.5 presents the estimation results for the dependent variable measuring the number of operating small-loan branches in a county. In Column 1, an explicit ban on payday lending decreases the observed small-loan licensees operating in market by 0.536 branches. The magnitude of this effect increases after controlling for county trends to a decrease of 0.585 branches, with significance at the 0.1-percent level.

Unlike previous estimates, the indirect effects of banning payday lending on small-loan lenders is negative: the industry contracts in response to a state-level ban on payday loans. Further, relative to the average number of small-loan branches observed per county (0.629 branches), this decrease is incredibly substantial. The effect of banning payday lending not only causes the industry to contract, but essentially disappear. Therefore, no hydra-effect is present in the small-loan lending industry. In fact, the small-loan lending industry is reacting to increased restrictions on payday lending as if the restrictions were imposed on the small-loan lending industry directly. Similar to the intuition regarding pawnbrokers, events in policy directed towards the payday lending industry can be seen as signals of how the policy environment for small-loan lenders could potentially change. Therefore, it appears that small-loan lenders are preemptively exiting the industry in anticipation of tighter regulations.

### **Second-Mortgage Lenders**

Table 2.6 presents estimation results for the number of active second-mortgage licensees. Recall from previous discussion, licensing as a second-mortgage lender and offering unsecured loans offers the highest potential profit relative to small-loan lenders. However, the costs associated with such a switch in licenses is by far the greatest of all industries considered, therefore it is not clear how banning payday loans would affect this industry in particular. In Column 1, though negative, the existence of a payday loan ban does not significantly affect the number of second-

mortgage licensees operating in a county. The same holds true when controlling for county-level variation: in Column 2, the existence of a payday loan ban has no statistically significant effect on the number of operating second-mortgage license lenders.

Recall from the discussion of summary data, the second-mortgage lending industry was the most dynamic industry observed of the four industries examined in the periods of observation. Further, anecdotal evidence from the state of Ohio suggests that payday lenders may be circumventing APR bans by applying for second-mortgage licenses. It is my hypothesis that the economic events between 2007 and 2010, with the housing-market crash in particular, are likely causing a downward bias in the estimated effects of banning payday loans. In the mortgage industry at the end of the decade, economic pressure from both sides, from fewer consumers demanding mortgages to the tightening of financing from traditional banks, caused a nationwide contraction in the number of firms offering mortgages. The same was true for the state of Ohio. Being unable to separate year-fixed effects from those of the ban, I believe, are resulting in a negative and insignificant estimation of the effects of a payday loan ban on the number of operating second-mortgage licensees.

These results indicate that imposing APR restrictions on payday lenders has little to no effect on related industries, both industries that can provide substitute products or industries that allow for payday lenders to dodge fee limits. However, the potential for omitted variable bias is strong given the timing of ban relative to economic trends occurring during the period of observation.

The next section discusses the effects of a ban on variables measuring the flow of branches in the respective industries, isolating the effects of banning payday lenders on entry behavior.

### 2.6.2. Dependent Variable: The Change in the Number of Operating Branches

Table 2.7 presents OLS-results for the dependent variable measuring the change in the number of operating branches rather than level-effects. Column 1 applies to effects on pawnbrokers, Column 2 for precious-metals dealers, Column 3 for small-

loan lenders, and Column 4 on second-mortgage lenders. Examining the change in operating branches, rather than counts, allows for examination of the dynamics of each industry and changes associated with a payday lending ban, effects that could appear to be nonexistent if entry and exit net out actual industrial change. In particular, the following estimations can indicate how banning payday lending affects the rates of change in the industry, not just simply if industries grow or contract.

In Column 1, the effect of banning payday lending has a negative and highly significant effect on the change in the number of operating pawnbrokers from one period to the next. For years in which the ban exists, the change in the number of operating pawnbrokers decreases by -0.860 branches, with significance at the 0.1-percent level. Given the results in Table 2.3, this result implies that the pawn industry's growth stalls in response to a payday loan ban. Just as previously discussed, and with respect to the similarities between payday lenders and pawnbrokers, the pawn industry is reacting to restrictive payday lending policy rather cautiously. Given that industry growth is slowed, the hydra-effect does not exist in the pawn industry as a result of a payday loan ban.

In Column 2, for precious-metals dealers, banning payday lending increases the change in the number of operating licensees by 0.175 branches, significant at the 1-percent level. Contrary to the effect on pawnbrokers, enacting a binding APR limit on payday lenders contributes to the expansion of the number of operating precious-metals dealers. Once again, relative to periods with no ban in place, the precious metals industry grows at an increasing rate. This is not quite a doubling of the industry from one period to the next, however, relative to the observed mean, this is a significant increase in growth. Like the previous results, however, I believe the estimated result of the payday lending ban is influenced by unobserved conditions caused by economic fluctuations occurring during the period of observation rather than the ban itself. The increase in the market prices of precious metals from 2007 to 2010 is likely driving the positive effect of the ban. Recall, the ban existed in 2009 and 2010, when market prices of gold and silver were at their highest in the

observed period. Therefore, it is likely that banning payday lending has little to no actual effect on the precious metals industry.

In Column 3, the ban on payday lenders causes the change in the number of operating branches to decrease by 0.740 branches, significant at the 0.1 percent level. With the estimates presented in Table 5, the small-loan industry most certainly contracts in response to a payday loan ban to such an extreme that the industry barely exists in periods in which the fee ceiling has been enacted. Not only are payday lenders choosing not to circumvent imposed restrictions by licensing as small-loan lenders, active small-loan lenders themselves are choosing to exit the industry in response to the ban. It appears that the proposed relationship between the two industries is opposite of what was originally predicted: rather than payday lenders switching license types and becoming small-loan lenders, small-loan lenders behave as payday lender would in response to increased restrictions by exiting the industry completely.

Last, in Column 4, the results for the effect of a ban on the change in the number of second-mortgage lenders is strikingly different than predicted in Table 2.6. In response to a payday-loan ban, the change in the number of active second-mortgage lenders *increases* by 2.867 branches, with significance at the 5-percent level. In conjunction with the results in Table 6 and Figure 4, it appears that this result is being driven not by an expansion, but slowed a slowed decline. Recall from Figure 4, even in the midst of the worst years of the housing crisis, entry into the second-mortgage still occurred, though at a decreasing rate. Further, the number of branches to close year after year declined, therefore, branches that entered were electing to remain in the market. Therefore, given the predicted result, it appears that in periods when the ban is in effect, the second-mortgage lending industry becomes more stable, just short of reversing trend. In the context of payday lender behavior, it is possible this stability is caused by payday lenders relicensing as second-mortgage lenders in order to circumvent the ban, however the industry itself has not expanded to the pre-ban levels. These results indicate that firms have found and exploited loopholes in existing second-mortgage lender

regulations, allowing firms to continue operating as payday lenders. Not only does the second-mortgage industry not contract, the industry stabilizes in response to the payday loan ban, contrary to the national trends in the housing and mortgage-lending markets. Therefore, the hydra-effect not only exists in the second-mortgage industry, but is incredibly strong as well.

### 2.6.3. Dependent Variable: The Number of Opening Branches

Finally, in Table 2.8, estimation results are presented for the dependent variable counting the number of newly licensed branches in a county year for each of the four industries. Once again, Column 1 pertains to the pawn industry, Column 2 to precious metals dealers, Column 3 to second-mortgage lenders, and Column 4 to second mortgage lenders. All specifications include county-level fixed effects. While the dependent variable measures the number of branches to open, there is a difference between what is being measured in this estimation compared to the previous estimation, in which the change in the number of operating branches was measured. By construction, the change in the number of operating branches accounts for changes in entry, operating branches, and exit from one period to another. In this section, only the changes in the number of entrants is examined.

In Column 1, the effect if banning payday lending decreases the number of newly licensed pawnbrokers by -0.832 branches, significant at the 0.1-percent level. These results are consistent with the estimations for the effect on the change in operating branches and further reinforces the possibility that, while growing, the growth in the pawn industry is slowing. Why would this slow in growth be attributed to a payday loan ban rather than market equilibrium? The payday loan ban causes a market distortion on the demand-side as limited access shifts demand for short-term financing away from payday loans to other industries providing similar products. Theoretically, this excess demand should be met with increases in the supply of alternative financing, possibly from an increase in the number of firms in these markets. However, this is not what is occurring here: while the pawn industry is expanding in the presence of the ban, this expansion is slowing. I believe this is

again attributed to the similarities between the two industries and the possibility that changes in the payday-lending policy environment signal potential changes in regulations directly applicable to pawnbrokers.

In Column 2, the estimated effect of the ban on payday lenders causes the number of newly licensed precious-metals dealers to increase by 0.223 branches, significant at the 0.1-percent level. These results are consistent with predictions for both previously discussed variables: the existence of a payday loan ban leads to a relative dramatic expansion of the industry. However, as stated previously, I believe this result is overstating the effects of a ban as it likely measures how the economic shocks caused by the recession affected the value of precious metals.

In Column 3, a ban on payday loans is estimated to decrease the number of small-loan lenders to enter by 0.345 branches per county year, with significance at the 0.1-percent level. This is consistent with the estimated negative effects presented in Table 6 and 8 that also showed a negative relationship between the payday-loan ban and operators in the small-loan lending industry. Just as with the previous results, this supports the hypothesis that small-loan lenders are preemptively exiting markets in anticipation of increased restrictions directly imposed on these firms and the industry all but disappears. Small-loan lenders view changes in the payday lending policy environment as a signal of what is likely to change in policy applicable to small-loan lenders. Most important, payday lenders are *not* relicensing as small-loan lenders in order to circumvent binding fee restrictions.

Lastly, in Column 4, the ban on payday loans decreases the number of newly licensed second-mortgage lenders by -1.899 branches, with significance at the 1-percent level. This negative effect seems to be contrary to the predicted effect on the change in the number of operating second-mortgage lenders, however, there is an explanation for this. First, while changes in the number of operating second-mortgage lenders increases from one period to the next when the ban exists, this implies that the *net* change in operating branches (the difference between new and closing branches) is greater from one period to the next. This could be caused by an increase in the rate of entry or a decrease in the rate of exit. This estimation,

however, refers to only the number of new entrants. Here, the actual number of entrants into the second-mortgage lending industry is lower in periods when the ban is enacted, thus the negative correlation. Further, I believe this estimate also suffers from a downward bias caused by the declining housing market. Therefore, it is possible that the ban itself has a less-negative effect, likely a positive effect, on the number of new entrants.

## 2.7. Including Time-Fixed Effects

The previous discussion noted the possibility that the true effect of the ban was unidentified due to other economic events in the period of observation. In particular, it is likely that the estimated effects of the payday lending ban are unidentified for precious metals dealers and second-mortgage lenders. Tables 2.9 through 2.11 display regression results when including year-level fixed effects for the number of operating branches, the change in operating branches, and the number of opening branches, respectively. Column 1 refers to the pawnbroker industry, column 2 the precious-metals industry, column 3 for small-loan lenders and column 4 refers to second-mortgage lenders. All estimations include county-level fixed effects as well.

### 2.7.1. Dependent Variable: The Number of Operating Branches

Starting with Table 2.9 and Column 1, there is a striking difference between results excluding and including time-fixed effects. From Table 2.9, the presence of the payday lending ban has a positive and statistically significant effect on the number of licensed pawnbrokers: in periods when the ban is in place, there are 1.204 more operating branches (statistically significant at the 0.1-percent level) relative to periods when the ban was not in place. This is an increase by just about half of the mean-observed number of operating branches within the observed sample. This changes the underlying story regarding the relationship between pawnbrokers and payday lenders. In this particular instance, it appears that there is a slight expansion within the pawn industry in response to the ban, in line with evidence

that pawn-loan demand also increases in response to limited payday loan access.

In Column 2, the changed effects are just as striking for precious-metals dealers. After including time-level fixed effects, the presence of the payday-loan ban causes the number of operating precious-metals dealers to increase by 0.725 branches, with statistical significance at 0.1 percent. This is more than twice the observed mean (0.356 branches) of operating precious-metals dealers. This result implies that, even when controlling for yearly-economic trends such as the increase in the market price for precious metals, the effect of the ban is still extremely high. Therefore, above and beyond any unobserved economic effects, it appears that payday lenders are actually relicensing as precious-metals dealers after all.

In Column 3, the effect of the ban on small-loan lenders becomes statistically insignificant. This implies that unobserved county-year economic trends are influencing the structure of the small-loan lender industry. More important, this result implies that former payday lenders are not licensing as small-loan lenders in order to circumvent the enacted ban, though positive profits are possible in this market.

Lastly, in Column 4, after controlling for county-year level trends, the estimated effect of the ban on the number of operating second-mortgage lenders becomes extremely negative and statistically significant. In the presence of the ban, there are just over 14 fewer operating second-mortgage licensees operating per county. Even with holding time and county fixed, the number of operating second-mortgage licensees is lower by a large margin in the presence of the ban. This indicates that, even if payday lenders are circumventing the law, the increase in licensees is still not large enough to reverse the effects of the housing crash.

### 2.7.2. Dependent Variable: The Change in the Number of Operating Branches

Table 2.10 presents results for the dependent variable measuring the change in the number of operating branches, again with county- and year-level fixed effects. For Columns 1 through 3, all statistical significance is lost on the estimated effects of the payday lending ban. Therefore, for the pawn, precious metals, and small-loan lending industry, the ban has no real effect on the change in the number of operating

branches. In conjunction with the previous table, this implies that while the levels themselves are higher, the ban has no statistically significant effect on entry or exit of these particular licensee types.

However, in Column 4, there is a stark difference between estimates without and with time-level fixed effects. Recall from Table 2.7, the estimated effect with only county-level fixed effects on the change in the number of operating second-mortgage lenders is an increase of almost three branches. However, when including year-level fixed effects, the effect of the ban on the change in the number of operating branches increases to 8.754 branches, statistically significant at the 5-percent level. As hypothesized before, it was likely that the effects of the housing crisis was causing a downward bias on this result in particular. It still holds that this is a story of exit: licensed second-mortgage licensees are choosing to stay within markets rather than exit. In light of the events at the end of the decade with respect to the housing and mortgage markets, the push from the ban is enough slow the decline of the number of second-mortgage lenders in the state of Ohio. Without a doubt, these results signal that payday lenders are choosing to relicense as second-mortgage lenders in order to circumvent the enacted ban.

### 2.7.3. Dependent Variable: The Number of Opening Branches

In Table 2.11, the estimates for the dependent variable measuring the number of opening branches are presented, including both county- and year-level fixed effects. Once again, the predicted effects of the ban become statistically insignificant for the number of newly licensed pawnbrokers and small-loan lenders. However, the estimated effects on the number of newly licensed precious-metals dealers and second-mortgage lenders change a great deal.

In Column 2, when including year-level fixed effects, the number of newly licensed precious-metals dealers increases by 0.485 branches in the presence of the ban, statistically significant at the 1-percent level. This is more than double the predicted effect from Table 2.8 (0.223 branches) when controlling only for county-level trends. Once again, the effect of the ban is greater after controlling for time

trends. Therefore, the hydra effect is present in the precious-metals industry as a result of the payday loan ban.

In Column 4, after controlling for time trends, the magnitude of the estimated coefficient for second mortgage lenders increases: in periods where the ban is present, the number of new licensees decreases by 4.171 branches, with statistical significance at the 5-percent level. In conjunction with the previous tables, the effects of the payday loan ban on the second-mortgage lending industry is most definitely an exit story. Rather than causing an expansion of this industry, the ban on payday loans slows the national trend of decline in the second-mortgage industry. Therefore, it is still likely that payday lenders are circumventing the ban by relicensing as second-mortgage lenders.

#### 2.7.4. Predictive Ability

Figures 2.6 through 2.13 display figures that compare the actual number of operating branches aggregated to the year level with both aggregated predicted values for specifications that exclude and include year-level fixed effects. For all industries, the blue line is the actual number of operating or opening branches. The red line is the predicted branch count including only county-level fixed effects. The green line is the predicted branch count when including all fixed effects.

### **Operating Branches**

Figures 2.6 through 2.9 display the actual versus the predicted values for the dependent variable measuring the number of operating branches for all industries. With the exception of the second-mortgage lending industry, the specification that includes both county- and year-level fixed effects nearly perfectly predicts the number of operating branches for each industry as the green line is overlapping the blue line completely. With respect the specification that only includes county-level fixed effects, there is no consistency as to whether or not the model over- or underestimates actual branch counts; however, the general trend in counts is correct.

For second-mortgage lenders, including year fixed effects does not perfectly predict the number of operating licensees. However, notice without including time trends, the trend on operating branches is incorrectly predicted year by year. Including time trends corrects this, however the number of branch counts is overestimated for every single year. Therefore, there is still an unobserved component that is driving the estimation of results upward that needs to be corrected.

### Opening Branches

Figures 2.10 through 2.13 display the actual versus predicted values for the dependent variable measuring the number of opening branches for all industries. Just as it was for the previous figures, with the exception of second-mortgage lending licensees, the specification that includes both county-level and time trends nearly predicts the number of opening branches per county perfectly. Further, without time trends, the specification both overestimates and underestimates license counts for each industry over the observation period.

In Figure 2.13, the predicted number of opening branches when including both county and time trends is closer to the actual value than was the case with the number of operating branches. Additionally, in the specification that only includes county-level fixed effects, the trend in the number of opening branches over time is too smooth relative to the other specification and what is actually occurring over time. Including year-level fixed effects corrects this smoothness.

From these figures, it is clear that including time-level fixed effects in addition to county fixed effects improves the predicative ability of the specification.

## 2.8. Conclusion

I use the state of Ohio as a case study to examine the indirect economic effects of banning payday lending. Using Seemingly Unrelated Regression estimation, I examine how enacting a binding fee maximum affects the structures of the pawnbroker, precious metals, small-loan, and second-mortgage lending industries, specifically

measuring the effect of the ban on the number of operating branches, the change in the number of operating branches, and the number of new licensee in a county-year within each industry. Results indicate that the indirect effects of a payday lending ban depend upon what outcome is being measured. If examining level changes with the dependent variable measuring the count of operating branches, a ban on the payday lending industry has a very minuscule effect on the pawn and second-mortgage lending industries, either being statistically equivalent to zero or close to zero in magnitude. However, the results for precious-metals dealers and small-loan lenders are quite pronounced. Conversely, in periods with the enacted ban, the small-loan lending industry contracted to the point of no existence, suggesting a preemptive exit in anticipation on stricter, direct regulations.

When examining the effects of the ban on flow variables changes perspective dramatically. The indirect effects of a payday loan ban are most pronounced on the changes in the number of second-mortgage lenders operating in a county-year. Examining this flow in operating branches corrects for existing trends and shocks occurring during the period of observation, mainly those caused by the housing and financial crisis. In this respect, the ban on payday loan increases the change in the number of operating second-mortgage lenders by almost 3 branches in a county. This suggests that movement within the second-mortgage lending industry in periods when the ban is enforceable are such to reverse the decline in the industry caused by the national housing crisis. Additionally, in presence of the ban, the precious metals industry still exhibits strong expansion, however, this may be caused by increased, record-setting market prices for gold and other precious metals in the wake of the crisis. Also, once again, imposing the ban on payday lenders negatively affects the small-loan lending industry to the extent that the industry seems to disappear. This implies that when faced with binding fee regulations, payday lenders will choose to find means in order to bypass the existing ban and continue offering payday loans, in this case by licensing as second-mortgage lenders, rather than changing product mixes and entering new markets.

These results show that legislation on one industry can have very pronounced

effects on seemingly unrelated industries. In an effort to eliminate payday lending and protect consumers from a potentially harmful product, policymakers simply shifted operating firms from one industry to another, having no real effect on market conduct. In developing restrictions on payday lenders in isolation, policymakers ignored the extent to which firms offering financial services are related and the manners in which payday lenders can adjust to enacted policies. From a general policy perspective, these results highlight the importance of acknowledging all potential impacts, direct and indirect, as the result of implementing new regulations. In doing so, policies in themselves can be more efficient in achieving desired outcomes and, most important, there will be no surprises when policies are put into place.

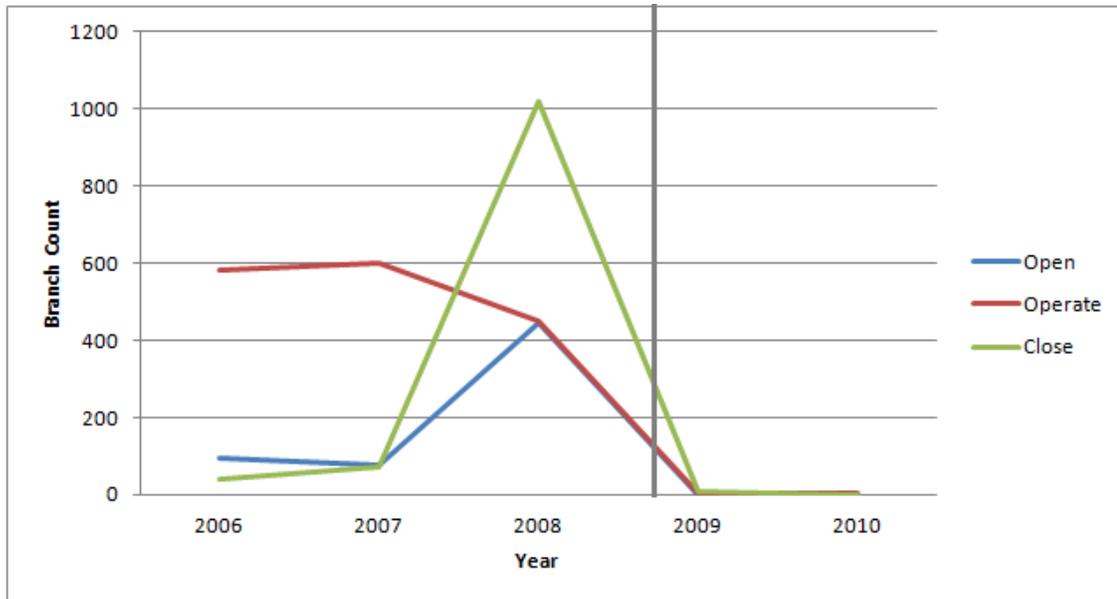
## 2.9. Tables and Figures

### 2.9.1. Summary Data

Table 2.1: Summary Statistics: Dependent Variables

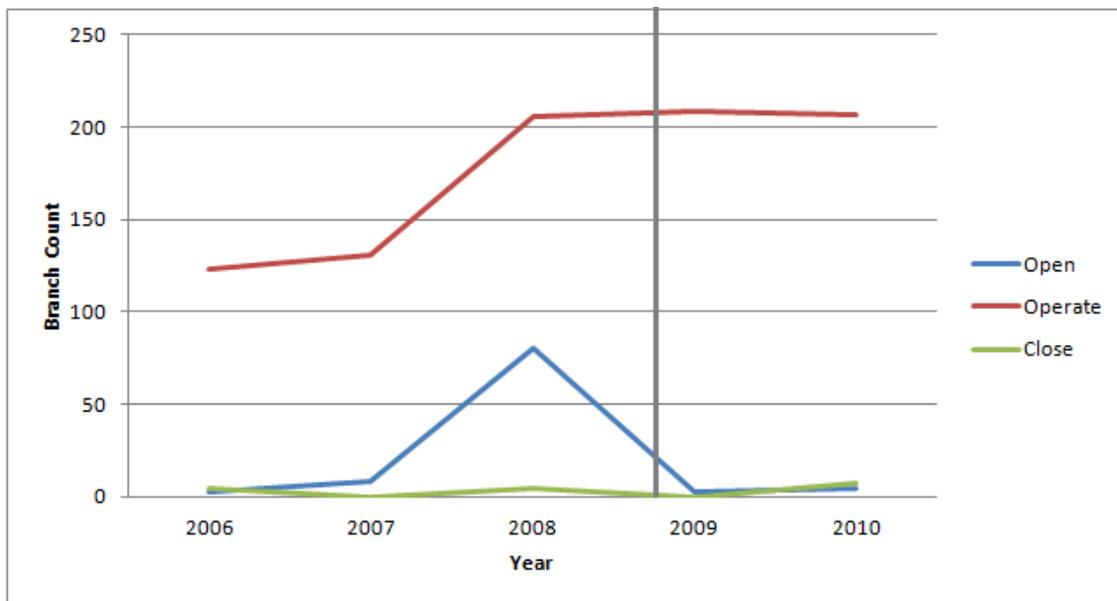
Variable		N	Mean	Std. Dev.	Min	Max
<b>Table 1A: Operating Branches</b>						
Payday Lenders	overall	407	4.017	10.918	0	86
	between			7.949		
	within			7.499		
Pawnbrokers	overall	407	2.152	5.131	0	43
	between			5.060		
	within			0.907		
Precious Metals Dealers	overall	407	0.356	1.098	0	10
	between			0.907		
	within			0.621		
Small Loan Originators	overall	407	0.629	1.561	0	15
	between			1.403		
	within			0.688		
Second Mortgage Lenders	overall	407	10.730	29.759	0	329
	between			26.421		
	within			13.789		
<b>Table 1B: Change in Operating Branches</b>						
Pawnbroker	overall	325	0.258	0.847	-2	7
	between			0.423		
	within			0.734		
Precious Metals	overall	325	0.132	0.548	-1	4
	between			0.354		
	within			0.419		
Small Loan Originator	overall	325	-0.065	0.996	-10	7
	between			0.222		
	within			0.971		
Second Mortgage Lender	overall	325	-2.443	12.826	-132	15
	between			9.052		
	within			9.087		
<b>Table 1C: Opening Branches</b>						
Payday Lenders	overall	407	1.526	5.263	0	63
	between			2.902		
	within			4.395		
Pawnbroker	overall	407	0.243	0.792	0	8
	between			0.411		
	within			0.678		
Precious Metals Dealers	overall	407	0.160	0.633	0	7
	between			0.403		
	within			0.488		
Small Loan Originator	overall	407	0.093	0.492	0	7
	between			0.220		
	within			0.441		
Second-Mortgage Lender	overall	407	2.877	8.214	0	75
	between			6.840		
	within			4.566		

Figure 2.1: Trend in Branch Data: Payday Lenders



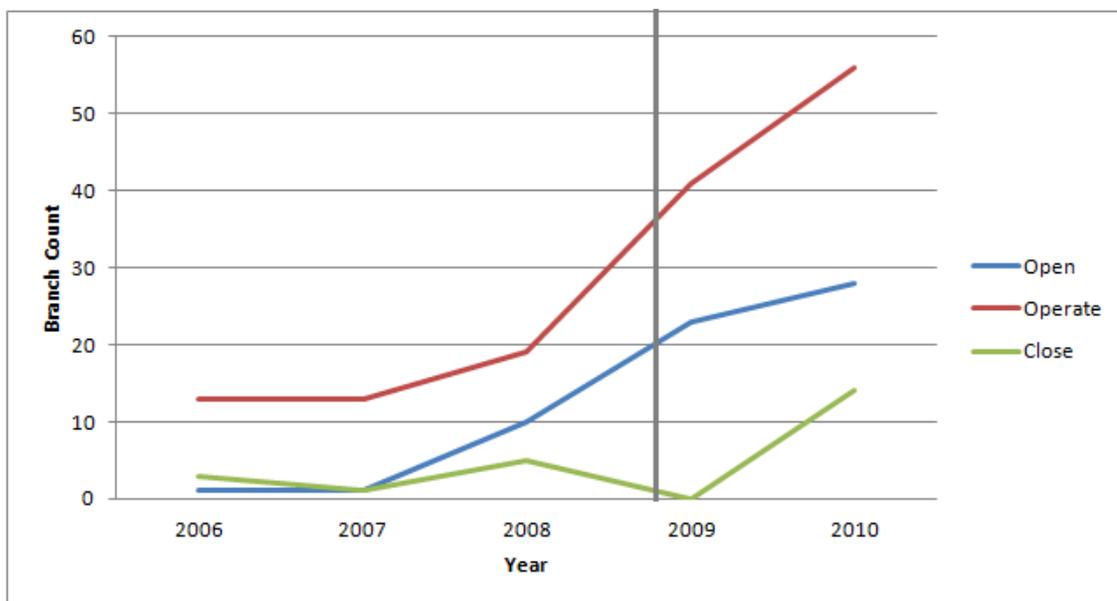
This figure displays the trend in branch counts for the number of observed, new, and closing payday lending branches for the years 2006 through 2010 for the following state of Ohio. A branch is classified as operating if the state license is active for any duration within the year of observation. A branch has opened during the year if an initial license was granted during the year of observation. A branch closed if the license expired or was terminated during the year of observation.

Figure 2.2: Trend in Branch Data: Pawnbrokers



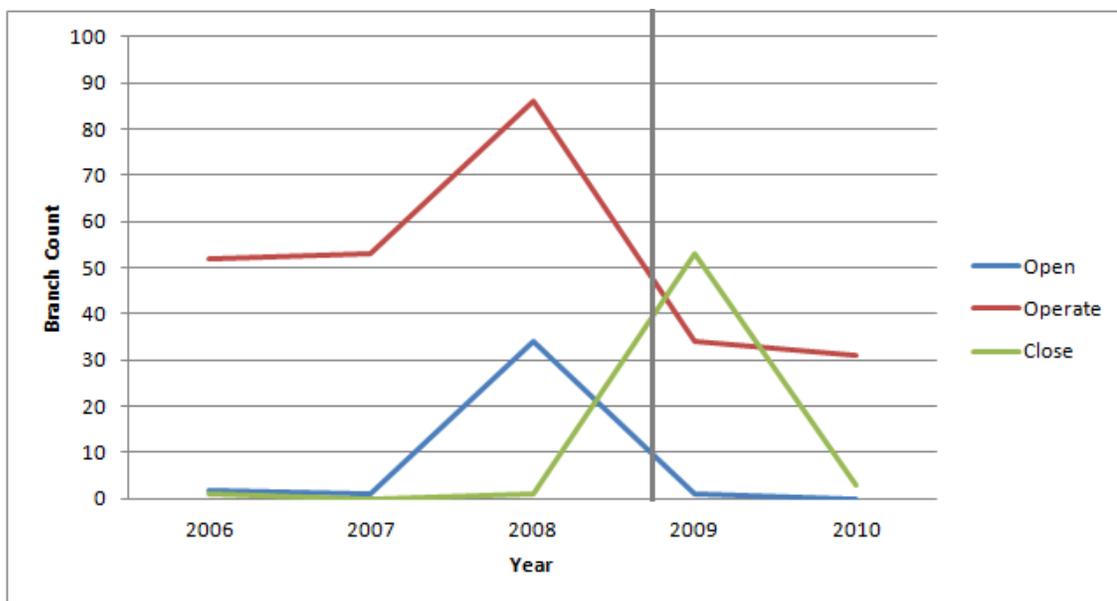
This figure displays the trend in branch counts for the number of observed, new, and closing pawnbroker branches for the years 2006 through 2010 for the following state of Ohio. A branch is classified as operating if the state license is active for any duration within the year of observation. A branch has opened during the year if an initial license was granted during the year of observation. A branch closed if the license expired or was terminated during the year of observation.

Figure 2.3: Trend in Branch Data: Precious Metals Dealers



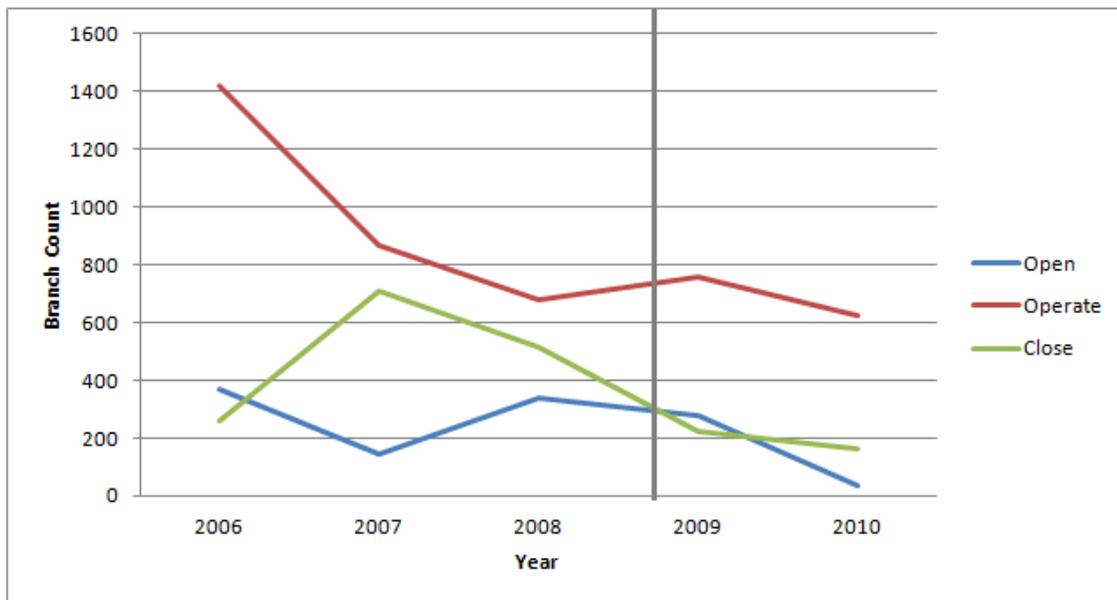
This figure displays the trend in branch counts for the number of observed, new, and closing precious metals dealers for the years 2006 through 2010 for the following state of Ohio. A branch is classified as operating if the state license is active for any duration within the year of observation. A branch has opened during the year if an initial license was granted during the year of observation. A branch closed if the license expired or was terminated during the year of observation.

Figure 2.4: Trend in Branch Data: Small-Loan Lenders



This figure displays the trend in branch counts for the number of observed, new, and closing small-loan lending for the years 2006 through 2010 for the following state of Ohio. A branch is classified as operating if the state license is active for any duration within the year of observation. A branch has opened during the year if an initial license was granted during the year of observation. A branch closed if the license expired or was terminated during the year of observation.

Figure 2.5: Trend in Branch Data: Second-Mortgage Lenders



This figure displays the trend in branch counts for the number of observed, new, and closing second-mortgage lending branches for the years 2006 through 2010 for the following state of Ohio. A branch is classified as operating if the state license is active for any duration within the year of observation. A branch has opened during the year if an initial license was granted during the year of observation. A branch closed if the license expired or was terminated during the year of observation.

Table 2.2: Summary Statistics: Demographics

Variable		N	Mean	Std.	Min	Max
			Dev.			
Total Population	overall	410	139,133	21,6708.4	22,571	1,310,905
	between			217,737.8		
	within			4,054.66		
Median Household Income (\$)	overall	410	48,023.290	9,306.901	30,354	95,245.7
	between			9,137.952		
	within			1,983.151		
Percent Male	overall	410	48.710	1.432	45.87	56.546
	between			1.412		
	within			0.274		
Percent White	overall	410	80.520	31.06	0	98.072
	between			27.454		
	within			14.782		
Percent Black	overall	410	4.032	5.850	0	29.614
	between			5.868		
	within			0.347		
Unemployment Rate	overall	410	8.703	2.704	2.355	20.431
	between			2.141		
	within			1.664		
Percent Military	overall	410	0.110	0.245	0	2.312
	between			0.240		
	within			0.055		
Percent Poverty	overall	410	13.735	4.748	4.1	31.6
	between			4.546		
	within			1.444		
Percent with HS Diploma or Above	overall	410	85.840	5.269	49.5	95.7
	between			5.133		
	within			1.291		

## 2.9.2. Results

Table 2.3: Regression Results: Operating Branches in the Pawnbroker Industry

	(1) No County Fixed Effects	(2) County Fixed Effects
ban	0.205 (0.111)	0.166 (0.106)
tot_pop	0.0951*** (0.0262)	0.0878 (0.102)
median_income	0.660** (0.250)	0.587* (0.290)
perc_male	-0.0381 (0.141)	0.00270 (0.165)
perc_white	-0.00557 (0.00323)	-0.0144*** (0.00345)
perc_black	0.406*** (0.0911)	1.108*** (0.141)
umemp_rate	0.102* (0.0407)	0.0961* (0.0424)
military	1.039 (0.703)	1.226 (0.779)
perc_ppl_pov	0.0885* (0.0364)	0.0530 (0.0372)
ed_pct_hsdip	0.00718 (0.0380)	0.0413 (0.0451)
_cons	-4.597 (7.602)	-10.67 (9.061)
<i>N</i>	407	407
<i>R</i> <sup>2</sup>	0.334	0.380

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table 2.4: Regression Results: Operating Branches in the Precious Metals Industry

	(1)	(2)
	No County Fixed Effects	County Fixed Effects
ban	0.403*** (0.0764)	0.392*** (0.0809)
tot_pop	0.00913 (0.00576)	-0.130 (0.0772)
median_income	-0.0536 (0.0890)	-0.0169 (0.220)
perc_male	-0.0676 (0.0401)	-0.151 (0.125)
perc_white	-0.00145 (0.00165)	-0.00755** (0.00262)
perc_black	0.0923*** (0.0209)	0.539*** (0.107)
umemp_rate	0.0279 (0.0219)	0.0210 (0.0322)
military	0.290 (0.224)	0.0360 (0.592)
perc_ppl_pov	-0.0255 (0.0177)	-0.00136 (0.0283)
ed_pct_hsdip	-0.00640 (0.0128)	-0.0210 (0.0343)
_cons	3.978 (2.323)	9.526 (6.890)
<i>N</i>	407	407
<i>R</i> <sup>2</sup>	0.134	0.193

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table 2.5: Regression Results: Operating Branches in the Small Loan Industry

	(1)	(2)
	No County Fixed Effects	County Fixed Effects
ban	-0.536*** (0.0908)	-0.585*** (0.0949)
tot_pop	0.0446*** (0.00857)	-0.190* (0.0905)
median_income	-0.144 (0.124)	-0.00726 (0.258)
perc_male	-0.0355 (0.0586)	0.0544 (0.147)
perc_white	-0.000607 (0.00215)	0.00343 (0.00308)
perc_black	0.0376 (0.0310)	-0.265* (0.126)
umemp_rate	0.0955*** (0.0279)	0.117** (0.0378)
military	-0.218 (0.323)	0.971 (0.694)
perc_ppl_pov	-0.0210 (0.0235)	0.00271 (0.0332)
ed_pct_hsdip	0.0137 (0.0180)	-0.0157 (0.0402)
_cons	0.838 (3.327)	1.896 (8.075)
<i>N</i>	407	407
<i>R</i> <sup>2</sup>	0.102	0.145

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table 2.6: Regression Results: Operating Branches in the Second Mortgage Lending Industry

	(1) No County Fixed Effects	(2) County Fixed Effects
ban	-2.016 (1.734)	-0.700 (1.782)
tot_pop	1.399*** (0.0927)	-5.157** (1.699)
median_income	-4.606** (1.541)	-8.054 (4.852)
perc_male	0.684 (0.657)	5.072 (2.761)
perc_white	-0.00635 (0.0311)	0.251*** (0.0578)
perc_black	-0.877** (0.337)	-19.31*** (2.365)
umemp_rate	-0.488 (0.428)	0.0368 (0.709)
military	-3.576 (3.703)	15.70 (13.04)
perc_ppl_pov	-0.0486 (0.321)	-0.562 (0.623)
ed_pct_hsdip	0.158 (0.221)	-0.0976 (0.756)
_cons	-23.47 (39.13)	-53.11 (151.7)
<i>N</i>	407	407
<i>R</i> <sup>2</sup>	0.037	0.243

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table 2.7: Regression Results: Change in Operating Branches for All Industries, Including County-Fixed Effects

	Pawnbroker (1)	Precious Metals (2)	Small Loan (3)	Second Mortgage (4)
ban	-0.860*** (0.0984)	0.175** (0.0625)	-0.740*** (0.145)	2.867* (1.250)
tot_pop	-0.276* (0.117)	-0.113 (0.0741)	0.0188 (0.171)	-1.345 (1.482)
median_income	0.536 (0.367)	-0.0846 (0.233)	0.602 (0.538)	0.362 (4.656)
perc_male	0.263 (0.192)	-0.0658 (0.122)	0.0405 (0.282)	-2.263 (2.442)
perc_white	0.00159 (0.00414)	-0.00440 (0.00263)	0.00355 (0.00608)	-0.189*** (0.0526)
perc_black	-0.0358 (0.163)	0.308** (0.104)	-0.278 (0.239)	14.35*** (2.070)
umemp_rate	0.135** (0.0479)	0.0192 (0.0304)	0.0659 (0.0703)	0.343 (0.608)
military	1.290 (0.894)	0.0176 (0.568)	0.222 (1.314)	-1.131 (11.36)
perc_ppl_pov	0.0430 (0.0445)	0.00110 (0.0282)	0.0340 (0.0653)	0.221 (0.565)
ed_pct_hsdip	0.0322 (0.0521)	-0.00840 (0.0331)	0.00312 (0.0765)	0.241 (0.661)
_cons	-15.59 (10.37)	4.880 (6.587)	-5.386 (15.23)	53.34 (131.7)
<i>N</i>	325	325	325	325
<i>R</i> <sup>2</sup>	0.275	0.101	0.108	0.238

Standard errors in parentheses

All columns include county- and year-level fixed effects

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table 2.8: Regression Results: Opening Branches for All Industries, Including County-Fixed Effects

	Pawnbroker	Precious Metals	Small Loan	Second Mortgage
	(1)	(2)	(3)	(4)
ban	-0.832*** (0.0867)	0.223*** (0.0654)	-0.345*** (0.0614)	-1.899** (0.650)
tot_pop	-0.0950 (0.0826)	-0.0765 (0.0623)	-0.110 (0.0585)	-0.847 (0.619)
median_income	0.632** (0.236)	0.0676 (0.178)	0.192 (0.167)	-2.602 (1.768)
perc_male	0.172 (0.134)	-0.125 (0.101)	0.0196 (0.0951)	1.626 (1.007)
perc_white	-0.00174 (0.00281)	-0.00541* (0.00212)	-0.00135 (0.00199)	0.0405 (0.0211)
perc_black	0.220 (0.115)	0.398*** (0.0867)	0.179* (0.0814)	-2.702** (0.862)
umemp_rate	0.126*** (0.0345)	0.0148 (0.0260)	0.0661** (0.0244)	0.396 (0.259)
military	0.909 (0.634)	0.0137 (0.478)	0.449 (0.449)	5.011 (4.753)
perc_ppl_pov	0.0479 (0.0303)	0.00805 (0.0228)	0.0198 (0.0214)	-0.102 (0.227)
ed_pct_hsdip	0.0315 (0.0367)	-0.0121 (0.0277)	-0.00291 (0.0260)	0.0840 (0.275)
_cons	-14.81* (7.375)	6.522 (5.563)	-1.374 (5.224)	-53.35 (55.30)
<i>N</i>	407	407	407	407
<i>R</i> <sup>2</sup>	0.266	0.148	0.127	0.089

Standard errors in parentheses

All columns include county- and year-level fixed effects

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table 2.9: Regression Results: Operating Branches for All Industries, Including County- and Year-Fixed Effects

	Pawnbroker	Precious Metals	Small Loan	Second Mortgage
	(1)	(2)	(3)	(4)
ban	1.204*** (0.277)	0.725*** (0.215)	-0.0355 (0.252)	-14.27** (4.673)
tot_pop	0.0950 (0.0990)	-0.123 (0.0771)	-0.187* (0.0901)	-5.530** (1.673)
median_income	-0.273 (0.357)	-0.288 (0.278)	-0.461 (0.325)	4.337 (6.027)
perc_male	-0.185 (0.166)	-0.176 (0.130)	-0.0462 (0.151)	5.990* (2.813)
perc_white	-0.0152*** (0.00336)	-0.00772** (0.00262)	0.00301 (0.00306)	0.261*** (0.0569)
perc_black	1.057*** (0.138)	0.534*** (0.108)	-0.292* (0.126)	-19.24*** (2.334)
umemp_rate	-0.0469 (0.0522)	-0.00402 (0.0407)	0.0403 (0.0475)	1.047 (0.883)
military	0.811 (0.767)	0.0164 (0.597)	0.748 (0.698)	15.86 (12.96)
perc_ppl_pov	-0.00958 (0.0391)	-0.0189 (0.0305)	-0.0304 (0.0356)	0.210 (0.661)
ed_pct_hsdip	-0.000894 (0.0450)	-0.0279 (0.0350)	-0.0383 (0.0409)	0.158 (0.760)
_cons	7.885 (9.751)	12.86 (7.591)	11.79 (8.873)	-185.3 (164.8)
<i>N</i>	407	407	407	407
<i>R</i> <sup>2</sup>	0.418	0.207	0.164	0.277

Standard errors in parentheses

All columns include county- and year-level fixed effects

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table 2.10: Regression Results: Change in Operating Branches for All Industries, Including County- and Year-Fixed Effects

	Pawnbroker	Precious Metals	Small Loan	Second Mortgage
	(1)	(2)	(3)	(4)
ban	-0.228 (0.276)	0.290 (0.178)	-0.0513 (0.401)	8.754* (3.500)
tot_pop	-0.284* (0.115)	-0.118 (0.0741)	0.0454 (0.168)	-1.499 (1.462)
median_income	0.0943 (0.420)	-0.140 (0.270)	-0.153 (0.611)	-3.069 (5.327)
perc_male	0.0986 (0.198)	-0.112 (0.127)	0.0386 (0.288)	-4.233 (2.509)
perc_white	0.000739 (0.00409)	-0.00462 (0.00264)	0.00333 (0.00596)	-0.199*** (0.0520)
perc_black	-0.0797 (0.161)	0.295** (0.104)	-0.272 (0.235)	13.81*** (2.049)
umemp_rate	0.0211 (0.0617)	-0.00938 (0.0397)	0.0290 (0.0898)	-0.931 (0.783)
military	0.843 (0.895)	-0.117 (0.576)	0.326 (1.303)	-6.769 (11.36)
perc_ppl_pov	0.00719 (0.0465)	-0.00473 (0.0299)	-0.0128 (0.0677)	-0.0933 (0.590)
ed_pct_hsdip	0.0000320 (0.0526)	-0.0166 (0.0338)	-0.00603 (0.0765)	-0.124 (0.667)
_cons	-1.240 (11.40)	8.468 (7.337)	-0.516 (16.59)	213.7 (144.7)
<i>N</i>	325	325	325	325
<i>R</i> <sup>2</sup>	0.301	0.110	0.155	0.266

Standard errors in parentheses

All columns include county- and year-level fixed effects

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table 2.11: Regression Results: Opening Branches for All Industries, Including County- and Year-Fixed Effects

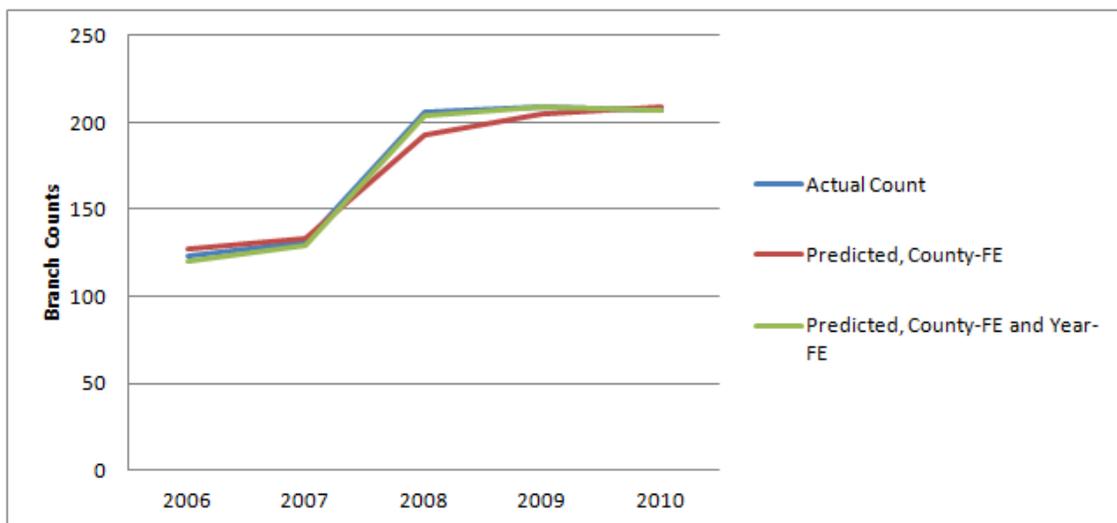
	Pawnbroker (1)	Precious Metals (2)	Small Loan (3)	Second Mortgage (4)
ban	-0.00620 (0.225)	0.485** (0.174)	0.119 (0.161)	-4.171* (1.671)
tot_pop	-0.0903 (0.0807)	-0.0734 (0.0625)	-0.109 (0.0577)	-1.035 (0.598)
median_income	-0.0411 (0.291)	-0.145 (0.225)	-0.182 (0.208)	-0.253 (2.155)
perc_male	0.0181 (0.136)	-0.162 (0.105)	-0.0749 (0.0970)	1.006 (1.006)
perc_white	-0.00235 (0.00274)	-0.00558** (0.00212)	-0.00171 (0.00196)	0.0411* (0.0203)
perc_black	0.178 (0.113)	0.388*** (0.0871)	0.153 (0.0804)	-2.968*** (0.835)
umemp_rate	0.00985 (0.0426)	-0.0154 (0.0330)	-0.00356 (0.0304)	0.125 (0.316)
military	0.563 (0.625)	-0.0600 (0.484)	0.228 (0.447)	2.484 (4.633)
perc_ppl_pov	-0.00172 (0.0319)	-0.00687 (0.0247)	-0.00835 (0.0228)	-0.0108 (0.236)
ed_pct_hsdip	-0.00288 (0.0366)	-0.0209 (0.0284)	-0.0238 (0.0262)	-0.0194 (0.272)
_cons	0.225 (7.947)	10.46 (6.152)	7.656 (5.679)	-19.52 (58.92)
<i>N</i>	407	407	407	407
<i>R</i> <sup>2</sup>	0.309	0.156	0.164	0.162

Standard errors in parentheses

All columns include county- and year-level fixed effects

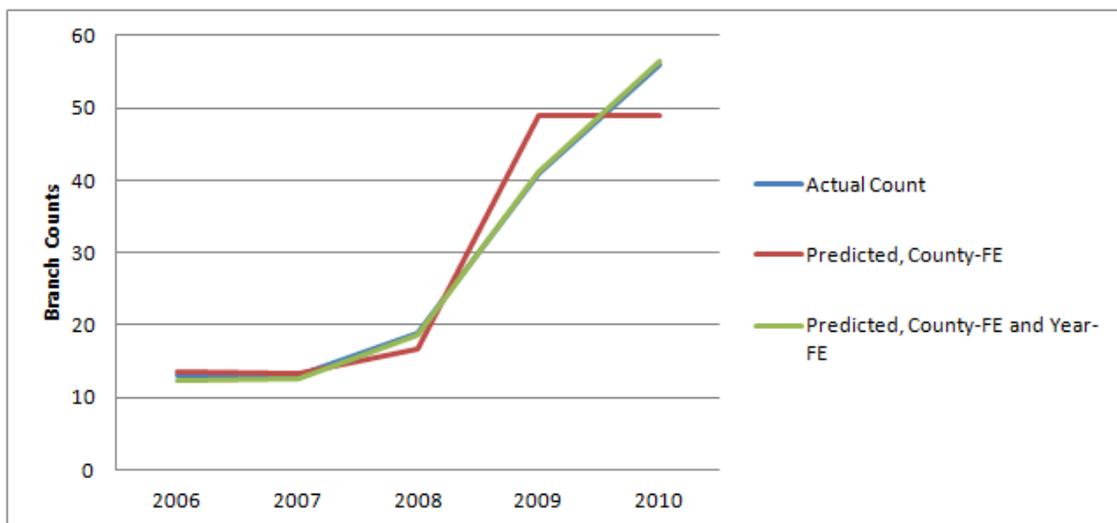
\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Figure 2.6: Actual vs. Predicted Operating Branch Counts: Pawnbrokers



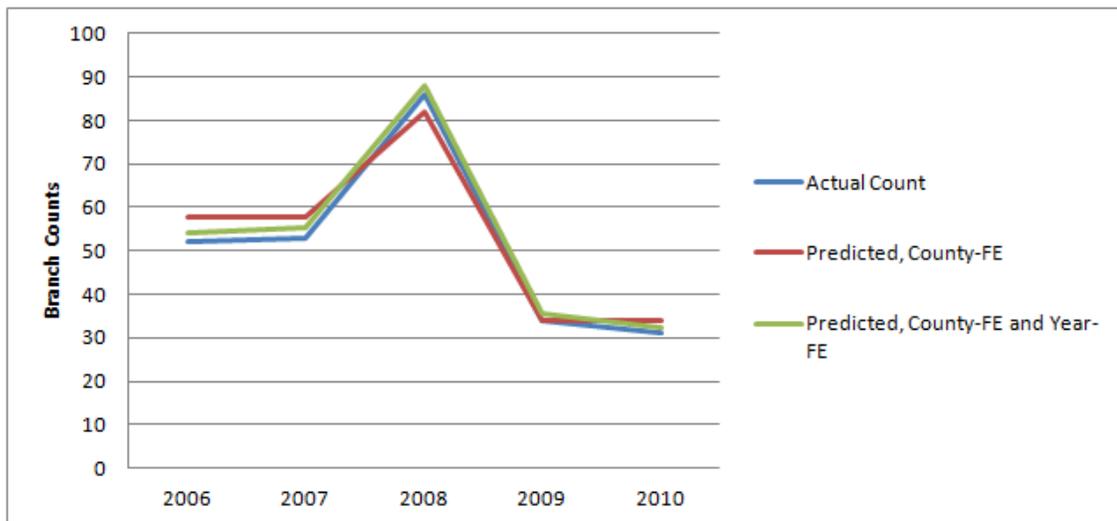
This figure displays the actual and predicted number of operating branches per year. The blue line is the observed count. The red line is the predicted county-level count of operating branches aggregated to the year-level estimated with county-level fixed effects. The green line is the predicted county-level count of operating branches aggregated to the year-level estimated with county- and year-level fixed effects.

Figure 2.7: Actual vs. Predicted Operating Branch Counts: Precious-Metals Dealers



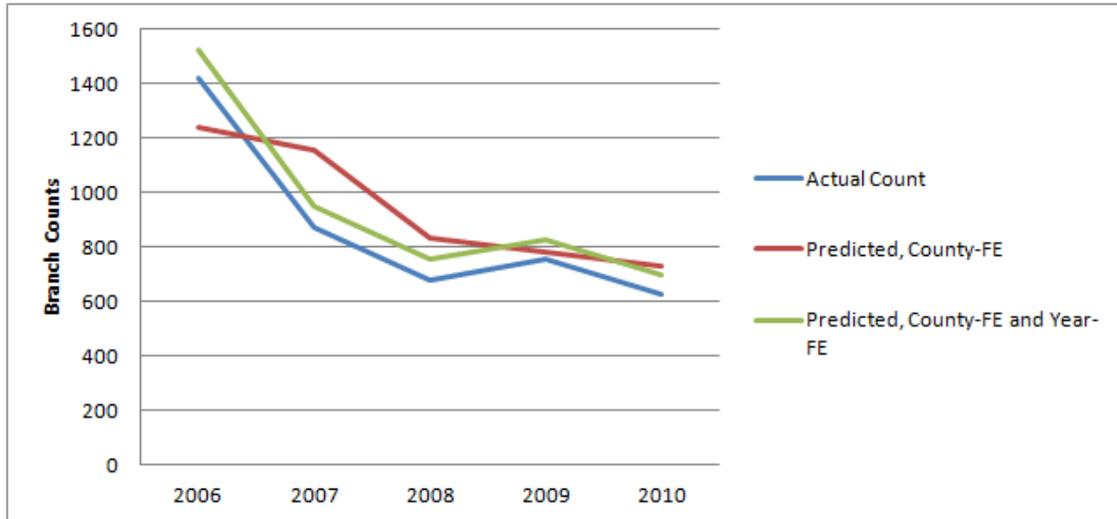
This figure displays the actual and predicted number of operating branches per year. The blue line is the observed count. The red line is the predicted county-level count of operating branches aggregated to the year-level estimated with county-level fixed effects. The green line is the predicted county-level count of operating branches aggregated to the year-level estimated with county- and year-level fixed effects.

Figure 2.8: Actual vs. Predicted Operating Branch Counts: Small-Loan Lenders



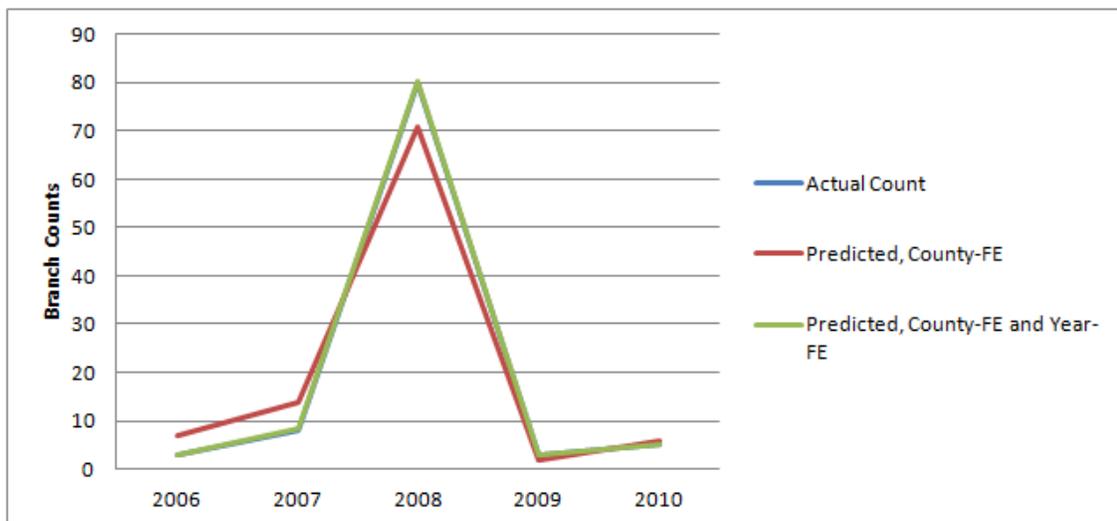
This figure displays the actual and predicted number of operating branches per year. The blue line is the observed count. The red line is the predicted county-level count of operating branches aggregated to the year-level estimated with county-level fixed effects. The green line is the predicted county-level count of operating branches aggregated to the year-level estimated with county- and year-level fixed effects.

Figure 2.9: Actual vs. Predicted Operating Branch Counts: Second-Mortgage Lenders



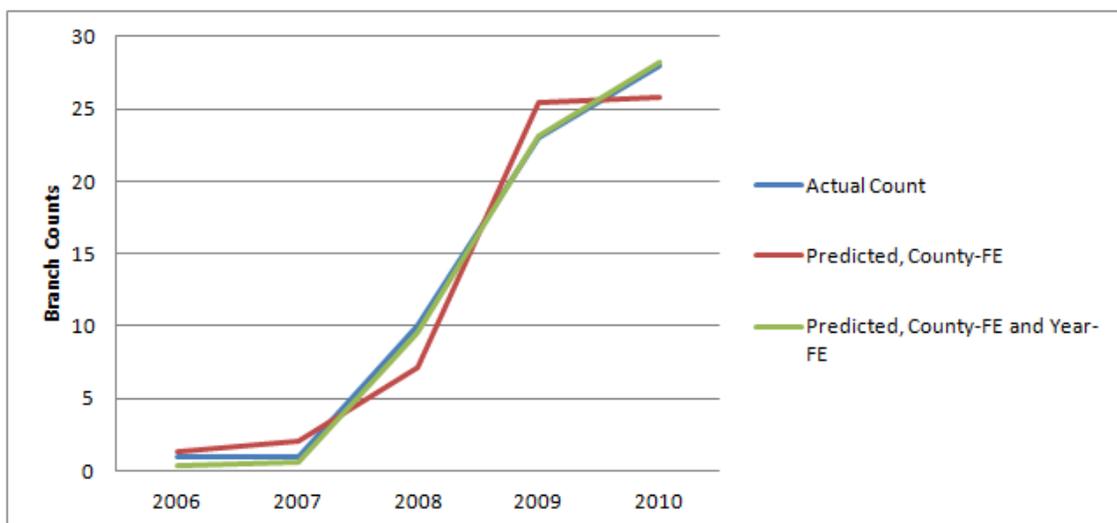
This figure displays the actual and predicted number of operating branches per year. The blue line is the observed count. The red line is the predicted county-level count of operating branches aggregated to the year-level estimated with county-level fixed effects. The green line is the predicted county-level count of operating branches aggregated to the year-level estimated with county- and year-level fixed effects.

Figure 2.10: Actual vs. Predicted Opening Branch Counts: Pawnbrokers



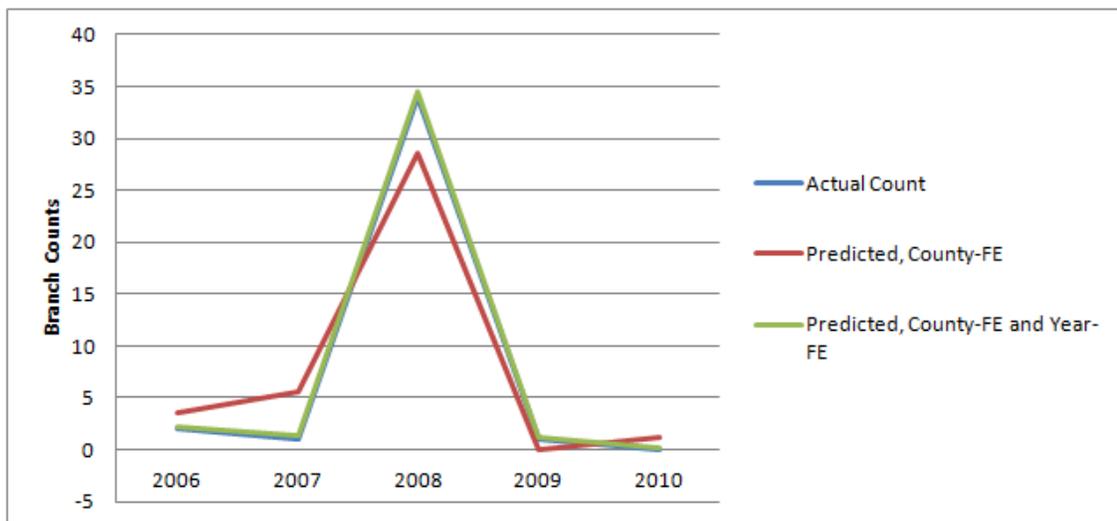
This figure displays the actual and predicted number of opening branches per year. The blue line is the observed count. The red line is the predicted county-level count of opening branches aggregated to the year-level estimated with county-level fixed effects. The green line is the predicted county-level count of opening branches aggregated to the year-level estimated with county- and year-level fixed effects.

Figure 2.11: Actual vs. Predicted Opening Branch Counts: Precious-Metals Dealers



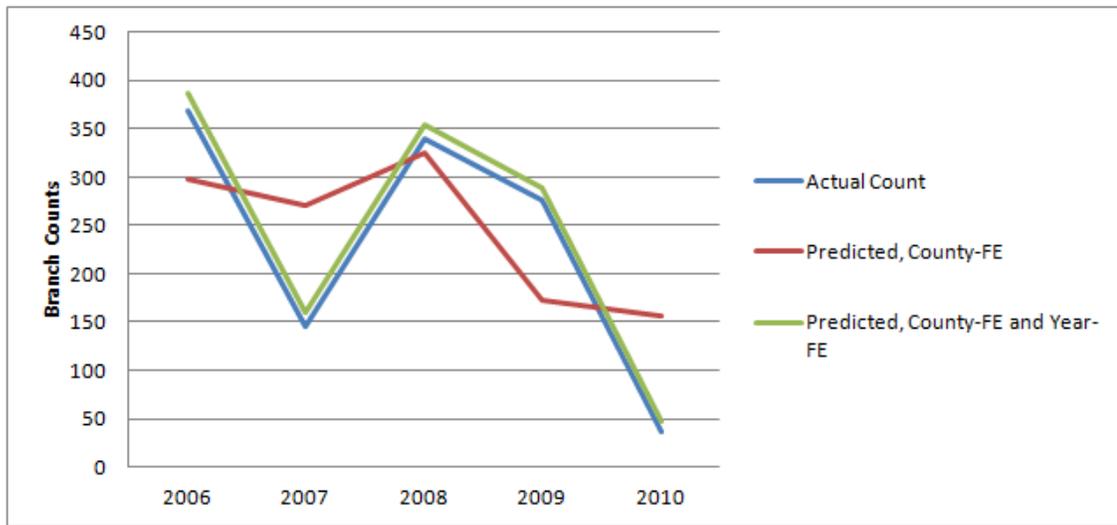
This figure displays the actual and predicted number of opening branches per year. The blue line is the observed count. The red line is the predicted county-level count of opening branches aggregated to the year-level estimated with county-level fixed effects. The green line is the predicted county-level count of opening branches aggregated to the year-level estimated with county- and year-level fixed effects.

Figure 2.12: Actual vs. Predicted Opening Branch Counts: Small-Loan Lenders



This figure displays the actual and predicted number of opening branches per year. The blue line is the observed count. The red line is the predicted county-level count of opening branches aggregated to the year-level estimated with county-level fixed effects. The green line is the predicted county-level count of opening branches aggregated to the year-level estimated with county- and year-level fixed effects.

Figure 2.13: Actual vs. Predicted Opening Branch Counts: Second-Mortgage Lenders



This figure displays the actual and predicted number of opening branches per year. The blue line is the observed count. The red line is the predicted county-level count of opening branches aggregated to the year-level estimated with county-level fixed effects. The green line is the predicted county-level count of opening branches aggregated to the year-level estimated with county- and year-level fixed effects.

## Chapter 3

### Credit Constraint and Payday Loan Usage

#### 3.1. Introduction

Credit rationing creates excess demand in the market for liquidity and results in segments of the population completely excluded from the financial services market and their demand for credit remains unmet. Jappelli (1990) finds that roughly 20 percent of the population in the 1980s were credit constrained: households with limited access to liquidity to meet their consumption needs. He examines what characteristics are significant predictors of constraint and finds income, wealth, and savings are important on the outcome of financial exclusion. A great deal, economically speaking, has changed since the Jappelli (1990) study, in particular, one of the most severe recessions in United States history. One of the direct consequences of the 2008 financial crisis was the tightening of traditional credit markets, further increasing the stringency of credit rationing and worsening the condition of constraint.

In response to this increased stringency, households shut out of traditional markets began relying on alternative products that became widely available at the end of the decade to meet their financial needs. One such product that has gained an increased amount of attention is the payday-loan product. Research conducted on the payday-lending industry has been extensive, particularly for the demand-side of the industry and the consequences of usage. Results are mixed, with no consensus on whether payday loans are harmful or beneficial.<sup>1</sup> Analysis on the supply-side of the industry has been conducted in order to identify predatory behavior and target populations, identifying highly-concentrated areas as lower-income with limited

---

<sup>1</sup>Stegman and Faris (2003), Skiba and Tobacman (2009), Melzer (2011), Zinman (2009), and Morse (2011)

access to traditional banks and high in minority populations.<sup>2</sup> The most direct analysis of payday loan users have been surveys of actual borrowers.<sup>3</sup> Respondents report using payday loans to cover emergency expenses or to supplement shortfalls in income, indicating that economic factors and limited liquidity drive payday loan use. However, these existing surveys fall short in investigating these underlying factors and tend to focus only on demographic characteristics.

In this study, I seek to answer two questions: 1) What individual characteristics contribute to the condition of constraint? and 2) How does being constrained affect the likelihood of payday loan use? I replicate the work of Jappelli (1990) by using data from the Survey of Consumer Finances for the years 2007 and 2010 to examine if and how the importance of credit-applicant characteristics have changed since the original study. Further, I examine how institutional changes in the financial services industry as a result of the 2008 financial crisis affect who is rejected from traditional credit markets by examining applicant characteristics as well as reasons for financial exclusion. I expand the literature on the demand for payday loans by examining the borrowing process as two stages. In the first stage, a borrower demands liquidity from traditional financial institutions and is either extended credit or rejected in their application. In the second stage, conditional on the outcomes of the first-stage, a borrower decides whether or not to borrow a payday loan. In the first stage, if a consumer is denied credit, they will have excess demand for liquidity. Therefore, in an effort to satiate this excess demand for credit, an individual is likely to seek alternative sources of financing, i.e. payday loans. The key mechanism in this decision process is the exclusion from traditional credit markets and the existence of excess demand for liquidity. This pushes individuals with a non-zero demand for credit into markets where borrowing requirements are less stringent and funds are easier to attain, such as the payday lending market.

---

<sup>2</sup>Graves (2003) analyzes proximity to military bases, Burkey and Simkins (2004), Graves and Peterson (2005), Gallmeyer, Roberts (2009), Prager (2009) analyze proximity with emphasis on minority neighborhoods.

<sup>3</sup>Lawrence and Elliehausen (2008) and Pew (2012) are the most cited surveys of payday loan users

Using data from the Survey of Consumer Finances for the years 2007 and 2010, I examine the differences in characteristics among rejected, discouraged, and unconstrained borrowers, including economic factors, reasons for rejection when applying for credit, and the frequency of payday loan usage. In 2007 and 2010, debt levels and having bad credit are the most common reasons for rejection (versus having no credit at all), indicating a shift in emphasis away from a lack of credit to the importance of credit quality. The percentage of individuals denied credit from 2007 to 2010 increases from 22 percent to 34, reflecting a tightening of credit markets as a result of the financial crisis. Discouraged borrowers<sup>4</sup> exhibited the lowest levels of income and net worth relative to rejected and unconstrained borrowers in both survey years. Further, payday loan usage, in percentage terms, is highest among discouraged borrowers compared to rejected and unconstrained borrowers. Additionally, payday loan usage increases for all users to almost 5 percent in 2010. Discouraged households still have the highest percentage of payday loan usage (13.4 percent), while 8 percent of rejected borrowers used payday loans in the previous year.

The trends in the SCF data indicate that payday loan usage is positively correlated with being initially constrained. However, in the process of borrowing payday loans, financial exclusion is not a given condition but an outcome determined by separate market mechanisms. Using payday loans is therefore dependent upon the expectation of selection into the initial condition of being credit constrained. Further, due to the nature of the survey data, I observe the explicit choice of using payday loans rather than the hypothetical choice for each potential first-stage outcome. Given this selection issue within the data, I use the Heckman Selection Model to estimate how the condition of being constrained affects the likelihood of borrowing a payday loan. In the first stage, I estimate the probability of rejection from the traditional credit market. In the second stage I estimate the probability of payday loan usage conditional on the outcomes estimated in the first-stage.

Initial results from the first stage change from 2007 to 2010. In 2007, household

---

<sup>4</sup>Discouraged borrowers are defined as individuals that have selected out of applying for traditional credit for fear of rejection.

income, debt, education, marital status, race, household size and owning a home all significantly affect the probability of being constrained. Specifically, increasing household income levels by 1 percent decreases the probability of constraint by 11 percent. Further, increasing total debt by 1 percent increases the probability of constraint by almost 2 percent. The increasing significance of total debt relative to previous studies is consistent with the increased emphasis on credit quality when applying credit in the traditional credit market. In 2010, significance shifts away from the level of household income and wealth becomes a significant factor in predicting constraint. This shift in significance is in-line with the tightening credit requirements as a result of the financial crisis. Banks, rather than examining earnings, instead value the overall wealth profile of an applicant. In total, the level of wealth, total debt, age, education, work status, marriage status, race, household size, and owning a home are all significant in predicting the probability of being credit constrained. In 2010, increasing the level of wealth by 1 percent decreases the probability of constraint by 5 percent. Debt, still having a positive effect on constraint, has a larger effect in 2010, increasing the probability of constraint by 3 percent.

Second-stage results predicting the probability of payday loan usage yield interesting insights: In 2007, initial constraint has no statistically significant on the outcome of borrowing payday loans. Total income and age increase the likelihood of borrowing payday loans. Increasing income by 1 percent increase the probability of using loans by 0.35 percent. In 2010, being constrained, the level of income, age, and employment status are the only significant factors in predicting payday loan usage. Surprisingly, being credit constrained decreases the probability of using payday loans by almost 64 percent, while increasing total income increases the probability of payday loan use by 3.7 percent. These results on constraint for 2010 are likely due to bias caused by missing location data. Specifically, if an individual responds that they have not borrowed a payday loan, I cannot identify if an individual actively chooses not to borrow or if state policy has restricted access by prohibiting payday lending. If households with higher likelihoods of constraint are

located in areas where access to payday loans is restricted, then the negative estimated effect is due an unidentified selection issue rather than explicit consumer choice.<sup>5</sup> Lastly, the increase in the magnitude of the effect of income on payday day loan use is a reflection of the changing composition of constrained borrowers and users of alternative financial products. From 2007 to 2010, payday loan use became more prevalent economy wide, moving this product from the fringe to a mainstream type of financing.

Examining the process of borrowing payday loans as two stages includes information about borrowers that has largely been ignored, mainly the economic mechanisms that drive particular individuals to demand this particular type of loan. While the previous literature has noted the economic differences between borrowers and non-borrowers, it has not been investigated to understand the extent to which factors as income, wealth, and debt drive the demand for payday loans. Additionally, as a two-stage process, payday loan use is no longer an isolated decision, rather it is dependent upon outcomes and conditions in the traditional financial services market. Once again, while noted in the previous literature, this study examines the extent to which being excluded from accessing traditional alternatives affects borrowing. In the policy context, this contributes to the discussion of how to best approach payday lending use: should borrowers be treated as naive or as rational decision makers given their circumstances? The results of this study suggest the latter.

The paper is organized as follows: Section 2 discusses the relevant literature, Section 3 discusses the underlying framework, Section 4 discusses the empirical model employed, Section 5 discusses the data used, Section 6 discusses empirical results, and Section 7 concludes.

---

<sup>5</sup>Georgia and Washington D.C. are two of the top five unbanked states where payday lending access has been prohibited. Additionally, five of the top ten unbanked large cities are located in states (Florida, Ohio, New York, Pennsylvania, and Maryland) where access has been limited by state regulations. For these states, constraint is falsely correlated with low payday loan usage because access has been restricted; no borrowing decision is actually made by households (Source: "The Most Unbanked Places in American" CFED.org, Pew Charitable Trusts.)

### 3.2. Background

The existence of excess demand in the traditional financial services market is not a signal of market failure. Stiglitz and Weiss (1981) show that in equilibrium, credit rationing will occur and demand for loans will be greater than the supply. Therefore, even if a borrower is willing to pay a higher interest rate or provide more collateral, they will be excluded from the market for credit. This credit rationing becomes more severe as banks increase the equilibrium interest rate and collateral requirements in order to minimize risk, especially during times of economic turbulence. Jappelli (1990), using 1983 SCF data, finds that roughly 20 percent of surveyed households have been excluded from the traditional credit market, consistent with estimates from similar studies in the same period. Given that credit constrained is a natural market occurrence, he examines what borrower characteristics are significant in being credit constrained. He finds that income, age, wealth, home ownership, marriage, and savings decrease the probability of being credit constrained while household size and being a non-white borrower increase this outcome.

A small but growing literature has been devoted to continuing the understanding of the mechanisms behind financial exclusion: when a borrower is completely excluded or highly restricted in accessing traditional financial services. Additionally, the literature examines the possibility that excluded borrowers seek credit from fringe markets, such as pawnshops, check cashers, and payday lenders. Simpson and Buckland (2009) find that decreasing income and wealth levels for Canadian households are consistently significant in predicting higher probabilities of financial exclusion. Byrne, et.al. (2007) find that borrowers in Ireland that use money lenders also borrow from mainstream sources and have (limited) access to other forms of credit. Reasons for borrowing payday loans included convenience, the speed of financing, and the tradition of borrowing from an alternative source. In analyzing how account ownership changes over time, Hogarth, et.al. (2005), using five years of SCF data, find that the largest gains in bank account ownership occurred in

the lowest 10 percent of the income distribution of surveyed houses<sup>6</sup>, however account balances remained low for this and the next lowest segment of income. In predicting exclusion, income, the level of assets, spending patterns, education, race, employment, credit history, and age all matter, with income and net worth having the largest effects (both exhibiting a negative relationship). These studies show that while access to banking services has expanded to the lowest end of the income distribution, financial exclusion still occurs in the traditional services market.

Payday loan borrowers fit the profile of a credit constrained borrower. Individuals that use payday loans are not unbanked.<sup>7</sup> Rather, these borrowers have been restricted in accessing traditional services and are therefore underbanked. Pew (2012) examines the characteristics of payday loan borrowers in the United States and finds that 5.5 percent of adults in the United States used payday loans from 2005 to 2010. Among the those surveyed, borrowing was concentrated among younger individuals earning “low to moderate” income, females, renters, and individuals with less than a college degree. Survey data also indicate that borrowers continuously use the product throughout the year; 76 percent of payday loans borrowed are borrowed within two weeks following the completion of an existing payday loan transaction. High frequency payday loan usage is a signal that an individual is liquidity constrained without these loans. According to the survey, borrowers’ initial reasons for using payday loans stem from an ongoing need for income rather than a short-term, fast-cash fix. According to the survey, 69 percent of respondents use loans for recurring expenses rather than unexpected transactions (16 percent). Again, this indicates a severe lack of available liquidity from other sources.

### 3.3. Framework

Understanding the underlying mechanisms of payday loan usage requires an understanding of what excludes a borrower from the traditional credit market in the first place. This study follows the framework of Jappelli (1990) closely; however

---

<sup>6</sup>Account ownership increased from 43 percent in 1989 to 60 percent in 2001.

<sup>7</sup>It is necessary to have an active checking account in order to borrow a payday loan.

the study extends this analysis to also examine what factors also contribute to the usage of payday loans: in particular, how being initially credit constrained affects the likelihood of choosing to borrow from a payday lender.

### 3.3.1. Becoming Credit Constrained

Jeppelli (1990) defines credit constraint when a consumer's consumption over their life-cycle satisfies the following inequality:

$$C_i - Y_i - A_i(1 + r) - D_i > 0 \quad (3.1)$$

$C_i$  is the level of optimal consumption for consumer  $i$ ,  $Y_i$  the level of income,  $A_i$  the level of assets earning interest at exogenous interest rate  $r$ , with debt limit  $D_i$  (i.e. the supply of liquidity). If the above inequality is true, the consumer is consuming more than what he or she is earning in income, asset growth, and extended liquidity by banks. Consumers become more credit constrained as  $D_i$  approaches zero, i.e. as banks and/or financial institutions extend decreased amounts of credit to the consumer.

Further, though the optimal level of consumption  $C_i$  and the imposed debt ceiling  $D_i$  are unobservable, other observables, such as income, wealth, age, race, etc., affect both the demand and supply for liquidity. Therefore, both  $C_i$  and  $D_i$  can be written as functions of these characteristics,  $X_i$ :

$$C_i = X_i\alpha + \epsilon_i \quad (3.2)$$

$$D_i = X_i\delta + \eta_i \quad (3.3)$$

Therefore, equations (1) and (2) can be rewritten as follows:

$$X_i'\alpha + \epsilon_i - Y_i - A_i(1 + r) - X_i\delta - \eta_i = V_i\beta + \mu_i > 0 \quad (3.4)$$

where  $\beta = \alpha - \delta$ ,  $\mu_i = \epsilon_i - \eta_i$ , and  $V_i$  is a vector that includes  $Y_i$ ,  $A_i(1 + r)$  and  $X_i$ . Since  $C_i$  and  $D_i$  cannot actually be observed, the latent variable  $Z_i$  identifies

the condition of being credit constrained as follows:

$$Z_i = \begin{cases} 1(\text{Credit Constrained}) & \text{if } V_i\beta + \mu_i \geq 0 \\ 0(\text{Unconstrained}) & \text{if } V_i\beta + \mu_i < 0 \end{cases}$$

### 3.3.2. The Decision to Borrow Payday Loans

What the above framework fails to do is distinguish between the demand and supply for liquidity from traditional financial services  $T$  and alternative financial services  $A$ . First, rather than examining optimal consumption level  $C_i$ , I will examine the demand for liquidity, which is the difference between consumption and an individual's available liquidity:

$$F_i = C_i - Y_i - A_i(1 + r) \quad (3.5)$$

Let  $F_i$  be the total demand for liquidity for individual  $i$ . If  $F_i \leq 0$  then the available level liquidity for individual  $i$  from earned income  $Y_i$  and assets  $A_i(1 + r)$  is sufficient to cover optimal consumption level  $C_i$ . However, if  $F_i > 0$ , then additional liquidity will be demanded from outside sources. An individual has the option of applying for liquidity from traditional sources (such as banks and/or credit card companies), from alternative sources (such as payday lenders), or both.<sup>8</sup> Therefore:

$$F_i = F_{iT} + F_{iA} \quad (3.6)$$

Where  $F_{iT}$  is the amount of liquidity demanded by individual  $i$  from traditional sources  $T$  and  $F_{iA}$  is the amount of liquidity demanded by individual  $i$  from alternative sources  $A$ . The supply of liquidity,  $D_i$ , can be expanded to include both types of sources as follows:

$$D_i = D_{iT} + D_{iA} \quad (3.7)$$

where  $D_{iT}$  is the debt ceiling, or supply, of liquidity from traditional financial outlets for borrower  $i$  and  $D_{iA}$  is the debt ceiling imposed by alternative financial

---

<sup>8</sup>I will assume in this analysis that a consumer will either use traditional loans or payday loans, not both.

outlets. The demand and supply for each liquidity source can be written as follows:

$$F_{iT} = V_i\theta + \nu_i \quad (3.8)$$

$$D_{iT} = V_i\tau + \phi_i \quad (3.9)$$

$V_i$ , as previously defined, is a vector of observable characteristics for individual  $i$ , including income,  $Y_i$ , assets,  $A_i(1+r)$  and other observable characteristics  $X_i$  that affect both the demand and the supply for liquidity.<sup>9</sup> For  $F_{iT}$  and  $D_{iT}$ , these equations are analogous to Jappelli (1990) as his analysis is limited to traditional financial institutions only. From Equations 9 and 10, the excess demand equation for  $i$  can be written:

$$E_{iT} = F_{iT} - D_{iT} \quad (3.10)$$

$E_{iT}$  is the excess demand for credit from traditional sources  $T$  for individual  $i$ . If  $E_{iT} \leq 0$ , then applicant  $i$  has applied for and been successful in attaining credit from traditional financial institutions to at least the level of credit demanded,  $F_{iT}$ . However if  $E_{iT} > 0$ , individual  $i$  does not have access to the amount of traditional credit necessary to meet demand  $F_{iT}$ . Analogous to Jappelli (1990), if  $E_{iT} > 0$ , this means that a credit-seeking individual is credit constrained. Given that both  $F_{iT}$  and  $D_{iT}$  cannot be observed, Equation (5) can be rewritten specifically for market  $T$  as follows:

$$L_i = \begin{cases} 1(\text{Credit Constrained}) & \text{if } E_{iT} > 0 \\ 0(\text{Unconstrained}) & \text{if } E_{iT} \leq 0 \end{cases}$$

$L_i$  is an indicator variable that is equal to 1 if an individual is credit constrained in the traditional credit market  $T$  and 0 otherwise. If an individual is credit constrained in the traditional market, then they will demand liquidity from alternative sources  $A$ . Below is the demand equation for liquidity from alternative sources:

---

<sup>9</sup>These are characteristics that banks would examine to determine creditworthiness of an individual applicant.

$$F_{iA} = J_i\gamma + \sigma E_{iT} + \zeta_i \quad (3.11)$$

where  $J_i$  is a set of observable characteristics for applicant  $i$ . As written, the demand for liquidity from alternative types  $A$  is dependent upon the level of excess demand for liquidity from  $T$ . This implicitly assumes that individuals will demand liquidity and attempt to access funds from traditional institutions prior to demanding funds from alternative sources. This is a reasonable assumption when specifically discussing payday loan borrowers as all applicants must have an active checking account to be eligible borrow. Therefore, an individual that borrows payday loans has a primary financial institution in the traditional market. Further, as the literature on financial exclusion and surveys have revealed, payday loan borrowers are bound in their ability to access traditional forms of credit and substitute with credit from alternative sources, so these borrowers have attempted to access liquidity through traditional means prior to demanding alternative financial services. If an individual chooses not to apply for liquidity from a traditional financial institution (yet still demands liquidity), this implies that  $D_{iT} = 0$  and the amount of liquidity demanded from traditional institutions increases the demand from alternative sources.

From Equation (11), as an individual's excess demand for liquidity in the traditional market  $T$  increases, the demand for liquidity from alternative sources will increase, therefore  $\sigma > 0$ . This occurs in two ways: 1) excess demand increases as the level of liquidity from traditional sources,  $F_{iT}$ , increases (holding  $D_{iT}$  fixed) or 2) the debt ceiling imposed on individual  $i$  by traditional financial institutions,  $D_{iT}$ , decreases. In both cases, the available level of liquidity from traditional financial institutions is not enough to meet the demand for liquidity, and it is this existence of excess demand for liquidity that acts as the mechanism that increases the demand for liquidity from alternative financial institutions.

Just as a  $C_i$  and  $D_i$  cannot be observed from Jappelli (1990), the true effect of  $E_{iT}$  on  $F_{iA}$  cannot be observed either. However, what can be observed is if an individual has been excluded from the traditional liquidity market  $T$  and is therefore

constrained, i.e. if  $L_i = 1$ . Equation (13) can be rewritten as follows:

$$F_{iA} = J_i\gamma + \pi E[L_{iT} = 1|V_i] + \zeta_i \quad (3.12)$$

As written,  $\pi$  measures the extent to which being constrained effects the demand for liquidity from payday lenders. Similar to  $\sigma$ ,  $\pi > 0$ : the demand for liquidity from payday lenders increases when an individual becomes more excluded from the traditional credit market. Finally, I can write the decision process for using payday loans as follows:

$$PD_i = \begin{cases} 1(\text{Borrow}) & \text{if } J_i\gamma + \pi E[L_i = 1|V_i] > 0 \\ 0(\text{Do Not Borrow}) & \text{if } J_i\gamma + \pi E[L_i = 1|V_i] = 0 \end{cases}$$

Individuals will use payday loans if the demand for credit from alternative sources (specifically, payday loans) is greater than zero. I expect the probability of payday loan usage is increasing in the condition of expected constraint. When examining the characteristics of payday loan users and what contributes to the demand for these loans, an in-depth analysis of how constrained they are from the traditional credit market has largely been ignored. From the above discussion, borrowing a payday loan is a two-step process: 1) What causes borrowers to be constrained in the market for liquidity from traditional financial sources? and 2) What encourages those constrained borrowers to utilize payday loans?

### 3.3.3. Estimation

I use the Heckman Selection model in order to estimate the probability of using a payday loan conditional upon the economic characteristics of the borrower and, most important, the condition of being credit constrained.

In the first stage of estimation, I estimate the probability of being credit constrained (either having been explicitly rejected or discouraged from entering the consumer loan market) conditional on the characteristics used in Jappelli (1990), those that are likely to influence the probability of attaining credit from a traditional

financial institution with the following:

$$Prob[L_i = 1|W_i] = \Phi(W_i\beta) \quad (3.13)$$

$L_i$ , is equal to 1 if borrower  $i$  reports having been denied credit or has self-selected out of applying for credit with the expectation of being rejected and 0 otherwise.  $W_i$  is a vector of observable characteristics for household  $i$ , including the previously discussed vector  $V_i$  and two exclusion terms,  $IV_1$  and  $IV_2$ . These will be discussed further in the section.

In the second stage of estimation, I will estimate the probability of using a payday loan, conditional on the expected value of constraint estimated in stage 1 with a linear probability model of estimation:

$$Prob[PD_i = 1|L_i = 1, V_i] = J_i\gamma + \pi E[L_i = 1|W_i] = J_i\gamma + \pi\lambda(\alpha_u) \quad (3.14)$$

where  $PD_i$  is an indicator for household  $i$  which is equal to 1 if a household uses a payday loan in the previous year and 0 otherwise.  $J_i$  is a vector of observable characteristics for household  $i$ , and  $\lambda(\alpha_u)$  is the Inverse Mills Ratio calculated from the coefficient estimates from the first stage, equation 15. The coefficient  $\pi$  is the coefficient of interest. Based upon previous discussion, I expect  $\pi > 0$ : the more excluded (or constrained) an individual is likely to be in the traditional credit market, the more likely they are to borrow a payday loan. It is still important to include other economic controls in the second stage of estimation as well as the level of constraint. Simply estimating the effects of income, debt, and wealth will not capture the initial event of being excluded from the traditional services market nor does it distinguish between the economic profiles of those that are constrained. Excluding this condition will overestimate the impact of income, debt, and wealth on using payday loans. As such, coefficient estimates for income, wealth, and debt should decrease in magnitude when conditioning on being constrained versus a specification that does not include such a control, however, I do expect these factors to remain significant in the decision to borrower a payday loan.

#### 3.3.4. Exclusion Restrictions

An ideal control is one that affects the probability of being credit constrained but has no effect on the probability of using payday loans, i.e. factors that affect access to the traditional lending market but not payday lenders. For this particular analysis, the number of banking branches in the geography of the observation would capture such a relationship. Individuals living in areas that lack traditional banking branches have limited access to traditional financial services, therefore are likely to be credit constrained due to geographic restriction. However, this scarcity in bank branches is independent of the number of payday lending branches in the area. Unfortunately, given the nature of the survey data, specific geography data are unavailable and cannot be included.

To proxy for the available supply of traditional financial services, I use two instruments: 1) I control for the number of commercial banks, savings banks, credit unions, and finance/loan companies a household explicitly maintains business with and 2) I control for the physical proximity of these financial institutions to the borrower. For the first instrument, if an individual has established business relationships with multiple financial institutions, this implies that the market supply of traditional financial services is plentiful enough to provide this variety. Rather than being constrained to a single financial institution, a borrower can spread the use of financial services across multiple institutions, therefore it stands to reason that the borrower has access to a larger number of institutions than not. Close proximity to a branch is defined as access to a branch either from the place of work or less than a mile from the household versus accessing an institution in a foreign location, over 50 miles away, over the phone, online, or at the local post office. Physical proximity to branches is also an indicator of how easily households can access traditional banking services and serves to proxy of the potentially underbanked areas.

### 3.4. Data

Household data have been collected from the Survey of Consumer Finances (SCF) for the years 2007 and 2010. The SCF is a cross-sectional, nationwide survey that collects data on various household financial characteristics such as income, pensions, assets, liabilities and various demographic characteristics. Relevant to this study, the SCF allows households to report if a household applied for credit in the previous year, if these applications were successful, and, if not, the reasons for rejection. Also, starting in the year 2007, the SCF began asking households questions pertaining to payday loan products: whether or not the household utilized payday lending services, and, if so, the reasons for such a transaction. Exploring payday usage in conjunction with being credit constrained is necessary in order to understand what drives demand for alternative financial service products (specifically payday lending) and the potential consequences if access to these products is limited.

The unit of observation within the SCF is a household, therefore, all income and wealth calculations are done for all primary earners within the household. Identifying factors, such as age, gender, and race, are that of the head of the household, or the primary economic unit (PEU). In 2007, 4,417 total households were surveyed (6,482 in 2010). Households that did not report an annual income were dropped from the observed sample. I also exclude households that did not demand credit in the previous year<sup>10</sup> and households that reported having no checking account in the previous year. These exclusions were made in order to observe differences in demanders of credit that were also eligible to use payday loans.<sup>11</sup>

---

<sup>10</sup>Within the data, there are households that did not apply for credit due to the expectation of being rejected. Households that did not apply for credit because they did not demand it were excluded from observation while discouraged borrowers were retained in the data set.

<sup>11</sup>1,163 (1,723) households were excluded for not reporting an annual income for the previous year in 2007 (2010). 239 (371) were excluded for not having a checking account. 633 (1,041) were excluded for not having applied for loans or credit of any kind in the previous period. 14 households were excluded for inconsistencies in reporting across the above criteria.

### 3.4.1. Reasons for Exclusion from Traditional Lending Services

Tables 3.1 and 3.2 present survey responses from rejected and discouraged borrowers<sup>12</sup> to the question "On the most recent occasion, what reasons were you given for being turned down for credit or being unable to get as much credit as you applied for?"<sup>13</sup> These reasons include the credit profile of the applicant, ranging from the lack of credit, too much debt, or a history of bad credit. They are directly related to the type of relationship an applicant has with their financial institution (or lack thereof). Individuals with too much debt or a bad credit history pose a risk to lending institutions for having difficulties with financial liabilities and are likely to continue having these issues meeting financial obligations. Individuals with a lack of credit are just as risky as their creditworthiness is unknown. Levels of income and assets also signal to the lending institution if applicants are likely to be able to repay loans. An applicant's tenure at their current job, the type of employment, and/or a lack of employment are signal of stability. Just as was the case for credit history, an established record of stability diminishes uncertainty and perceived risk is likely to be viewed by the lending institution as positive. Lastly, the possibility of demographic profiling is included (and sometimes cited) for institutional biases in the lending process.

#### **All Excluded Applicants**

Table 3.1 displays responses for all excluded applicants. Columns 1 and 2 display the responses from Jappelli (1990), using 1983 SCF survey data. The remaining columns display responses (both the count and share) for the 2007 and 2010 SCF. In 1982, the most stated reason for rejection, with 22.8 percent of respondents citing, was due to a lack of credit history or age. Second most stated, with 19.7

---

<sup>12</sup>Rejected borrowers have been defined as borrowers that have either been denied credit or extended less credit than what was applied for. Discouraged borrowers are borrowers that have selected not to apply for credit specifically because they anticipate they will be denied credit.

<sup>13</sup>For discouraged borrowers, these are the reasons in which they believe they will be turned down.

percent of respondents, was rejection due to an applicant's existing credit history and the presence of bankruptcy on their credit record. The third most common reason for rejection is a lack of income by the applicant (13.5 percent). A similar picture appears for discouraged borrowers and their reasons for self-exclusion. For discouraged borrowers, 21.2 percent of households did not apply for liquidity because they felt they earned too little in annual income. 18.6 percent of households feared rejection due to a lack of credit or being too young. Finally, 15 percent of households did not apply because of their existing credit history and/or bankruptcy. What is most interesting is that reasons for exclusion were the same for each borrower type, whether they were formally denied credit or if a household chose not to apply. As Jappelli (1990) notes, the level of uncertainty associated with having no credit history, institutionally speaking, is perceived as greater credit risk than having bad credit.

From 1982 to 2007, as financial services became widely used and more and more of the population established a credit history, the quality of the credit profile became more important to financial institutions in assessing the risk of a borrower. The number of households with checking accounts increased, especially among lower income households (Hogarth, et.al, (2005)). Therefore, a higher number of households were eligible to access services offered by their financial institutions, including loans and credit cards, that otherwise would have been unavailable. From the 2007 survey, it appears that households did, in fact, utilize these services to such an extent that risk assessment shifted. For rejected applicants, the most common reason for rejection cited is the established credit history and the presence of bankruptcy (21.43 percent of respondents). Second most reported by is the amount of existing debt, with 16.67 percent of respondents citing this reason. Lastly, the third most reported reason is the credit rating of the applicant (14.76 percent of rejected applicants). Reasons cited by discouraged borrowers reflect the same shift in risk perception: 32 percent of households reported that their credit history would lead to rejection, 18.24 percent stated their credit report would lead to rejection, and 11 percent of households felt that bad credit would lead to rejection.

Compared to the 1983 survey responses, the changes from 1982 to 2007 demonstrate the institutional shift in the way applicants are deemed "creditworthy". In 2007, simply having an established credit history is no longer a guarantee for being approved for a loan as it is no longer an efficient screening mechanism to determine borrower types. Such emphasis on credit history and the presence of bankruptcy (21.43 percent of rejected borrowers and 32.08 percent of discouraged borrowers) is an indicator of a more stringent approval process by financial institutions. In 2007, an applicant must absolutely have good credit rather than simply having credit at all.

A direct consequence of financial crisis in 2008 was the tightening of credit markets as banks restricted access to loanable funds. This can be seen in the rise in the number of rejected and discouraged borrowers between survey years (The increase in the percentage of constrained borrowers will be discussed in the next section.). Additionally, there also occurred a change in the distribution of responses. From the 2010 survey, 18.51 percent of rejected households cited "Amount of debt; Size of Other Payments" as the reason for exclusion. Next, 17.79 percent of households stated their credit rating as the reason for rejection. Finally, 13.70 of households were rejected for their credit history and/or bankruptcy. Unlike previous surveys, rejected borrowers and discouraged borrowers no longer completely overlap in their reasons for exclusion. In 2010, 21.53 percent of discouraged borrowers feared rejection for their credit rating, 20 percent because of their credit history and/or bankruptcy, and 11.85 percent for having bad credit.

As it was in 2007, responses in 2010 indicate that the credit profile of the applicant is still very important and simply having an established relationship with a financial institution is no longer sufficient for being approved for a loan. However, the effects of the financial crisis can be seen in the change in distribution in responses. In 2010, there is no overwhelming reason for rejection; rather, it appears that banks are evaluating the risk of a potential borrower across a greater number characteristics, thus the stringency and the likelihood for rejection both increase as a result of the financial crisis.

## Payday Loan Borrowers

Table 3.2 presents responses to the same question pertaining to rejection, however only for payday loan users for each year. Responses from payday loan users tell a similar story as previously discussed: the quality of the credit profile, rather than having credit at all, are determining factors of exclusion. In 2007, 57 percent of borrowers were rejected due to their credit history and 27 percent of applicants chose not to apply for this very same reason. Additionally, 27 percent of discouraged applicants stated that their own credit rating prevented them from applying. Similar to the previous table, reasons for exclusion were highly concentrated among three main reasons: the borrower's credit history, their credit rating, and explicitly having bad credit. In 2010, 42 percent of rejected applicants and 33 percent of discouraged applicants stated their credit rating as the primary reason for exclusion. Contrary to the previous discussion, there is no smoothing in the distribution in responses from 2007 to 2010; in 2010 applicants that go on to use payday loans are still rejected based primarily on their credit profile. However, institutional changes due to the financial crisis can be seen in the increased variety of reasons of exclusion cited in 2010 relative to 2007.

Examining these responses gives insight into to how underlying institutional changes affects what determines creditworthiness. For both survey years, the credit profile of the applicant is extremely important. This implies that wealth and debt, more so than income, should become significant predictors in the likelihood of being constrained. For both years, increasing the levels of wealth and decreasing levels of debt decrease the perceived risk associated with a credit applicant. In 2010, while credit stability is important, overall economic stability (income, employment, etc.) becomes more important to lending institutions. For payday loan users especially, it is important to identify factors that increase the likelihood of exclusion as payday loan users are commonly categorized as "credit constrained". However, this is only the first step in the process of borrowing: In addition to understand the mechanisms that drive applicants out of the traditional market, the mechanisms

that drive applicants to use payday loans must also be identified.

### 3.4.2. Reasons for Using Payday Loans

In 2007, the SCF began asking households if they used payday loan products in the previous year and the particular reasons behind usage. The reasons are: Buy food, buy gas, buy medicine, pay utilities, pay rent, vehicle expenses, “Christmas”, help family, “Emergency/Needed Quick Money”, convenience, and “Only Option”. Having to borrow a payday loan to buy food, gas, medicine, pay for emergency expenses, or to pay other bills is a signal that a household’s current level of income and wealth are insufficient to cover day-to-day living expenses, thus borrowing is a rational decision. Paying for “Christmas” or borrowing for convenience, are reasons more rooted in behavior rather than being driven by economic need. An individual using payday loans to purchase gifts at Christmas is not using the loan to meet required financial obligations or to simply live. Rather, these individuals are likely living outside of their means and should adjust consumption according to their available liquidity. Convenience is a possible signal of a borrower’s attitudes towards banks and the lending process. As stated in Byrne, et.al. (2012) payday loans were chosen over traditional loans because of the speed with which funds could be attained and the absence of a credit check. Finally, and extremely important, is the possibility that users had no other option other than payday loans. Prior to borrowing, payday loan borrowers citing “Only Option” as the primary reason for borrowing exhausted all other possibilities. This is explicit credit constraint.

## 2007

Table 3.3 displays the reasons for using payday loans by borrower type for the both survey years and all borrower types. In 2007, of the 2,363 households observed, only 42 households reported using payday loans in the previous year: 7 of these households were explicitly denied credit, 22 households chose not to apply, and 13 households were approved for credit in the traditional market. It is no sur-

prise that the majority of payday loan users are discouraged borrowers, however, it is interesting that unconstrained borrowers account for the second-highest level of usage as these borrowers have access to other forms of credit. This suggests that in 2007, payday loans were not highly strict substitutes for traditional financing. Examining the most cited reason for borrowing, 43 percent of rejected borrowers and 38 percent of unconstrained borrowers chose “Emergency/Needed Quick Money” as the primary reason for using payday loans. However, 31 percent of discouraged borrowers used payday loans for convenience. While the majority of restricted and unconstrained borrowers cite the same reason for usage, the underlying drivers could be different. I believe that rejected borrowers use payday loans due to economic constraint. These borrowers have been restricted in their credit supply because of their established credit history. In the event of an emergency that requires liquidity, these users are unlikely to attain traditional financing (in fact, they have been previously rejected). However, unlike rejected borrowers, unconstrained borrowers have been screened and by traditional institutions. Unconstrained borrowers likely do not see payday loans as a substitute, but instead as a different financial product. Additionally, these particular users may be risk-averse in depleting their own checking and savings accounts and use payday loans to maintain their own liquidity. Discouraged borrowers have self-selected out of the lending market specifically because of their credit history. An appealing feature of the payday loan transaction for these users in particular is the lack of a credit check as an applicant’s credit rating has no bearing on being able to borrow payday loans. Therefore, for discouraged borrowers, the payday loan is a convenient option to access liquidity because it eliminates the possibility of rejection .

## **2010**

In 2010, 164 households of the 3,317 observed used payday loans: 33 of these households were denied credit, 97 households chose not to apply, and 34 were approved for credit in the traditional market. This increase in observed payday loan users is no doubt an effect of the financial crisis: as traditional credit became scarce,

more and more households elected to use alternative financial service providers. Just as it was in 2007, the majority of rejected and unconstrained borrowers cited “Emergency/Needed Quick Money” as the primary reason for borrowing payday loans, 27 and 29 percent, respectively. The majority of discouraged borrowers, 27.8 percent, again chose payday loans for the convenience of the process. Unlike 2007, respondents in 2010 did not overwhelmingly choose a single reason for borrowing payday loans and the distribution of responses is smoother. This is an indication that industry wide payday loan use has become more mainstream, likely due to the decrease in supply of traditional financing. In this case, payday loans are being used as a substitute to traditional financing when traditional credit is unavailable. This notion is reinforced in the observed increase in the number of borrowers of all type citing that borrowing a payday loan was the only option. In 2007, only 1 household cited this reason for borrowing versus 18 households in 2010. As financial exclusion increased economy wide, so too did the usage of payday loans and the relationship between constraint and payday loan usage becomes stronger at the end of the decade.

### 3.4.3. Summary Statistics: Examining Borrower Profiles

In the previous tables, responses from constrained households give some indication to the economic profile of those that have been financially excluded. In the next section, I examine different demographic and economic characteristics of each borrower type across the survey years. What characteristics distinguish borrowers that were granted credit versus denied credit? Given the similarities in responses from rejected and discouraged applicants, are there any distinguishing characteristics between households these two types of constrained households?

Tables 3.4 and 3.5 display summary statistics for 2007 and 2010, respectively.

For each household, total earned income, net wealth<sup>14</sup>, age, years of education<sup>15</sup>, employment, military status, marital status, race, sex, family size, home-ownership are examined. All monetary amounts are in ten-thousands and in 2007 dollars.

### **Borrower Profile: All Loan Applicants, 2007**

Referring to Table 3.4, in 2007, of the 2,363 households observed, only 1.8 percent used payday loans in the previous year (42 households). While the payday lending industry was growing rapidly during this time, usage was not as wide-spread, as the payday lending industry was considered a type of "fringe-banking". Average household income averaged \$800,000 annually and net wealth averaged \$3.2 million in the previous year. These figures show that the surveyed households skew to be relatively wealthy, a downside of the SCF in general. On average, respondents are older (46 years old), have completed some college (14.4 years of schooling), overwhelmingly employed (95 percent employed), and married (67 percent married). 80 percent of respondents are white, 8 percent black and 9 percent Hispanic. Almost 20 percent of respondents are active duty military, 84 percent of respondents are male, and almost 73 percent own their homes.

Segmenting across borrower types, unconstrained borrowers, on average, are most similar in profile to the "average" overall household, though wealthier both in terms of annual household income and net wealth. Unconstrained borrowers earn a mean income of \$990,000 annually and hold \$3.9 million in net wealth. Unconstrained borrowers have the lowest observed usage of payday loans: 0.8 percent of unconstrained borrowers that are observed use payday loans. Unconstrained borrowers are slightly older on average (48 years) and there are fewer observed unconstrained minorities: only 4.9 percent of observed applicants are black and 7.9 percent

---

<sup>14</sup>Wealth includes the value of all liquid assets (checking accounts, savings accounts, money market accounts, certificates of deposits, IRA, Keogh Accounts, and savings bonds, financial assets (stocks, bonds, nontaxable holdings, mutual funds, and insurance) property, and business as reported in the survey, minus total household debt (credit cards, mortgages, owed on cars and consumer debt).

<sup>15</sup>From 0 to 17 years.

are Hispanic. Relative to the remaining demographics, unconstrained borrowers are pretty much the same.

Of households observed, 22.1 percent classify as constrained in the year 2007, 8.8 percent as rejected and 13.3 percent as discouraged.<sup>16</sup> Rejected borrowers earn substantially less income than unconstrained borrowers, earning \$260,000 in the previous year. Net wealth is noticeably lower as well. Rejected applicants held a mean net wealth of \$1.8 million in the previous calendar year. Rejected applicants are younger (41.06 years old), have one year less of education (though this is still more than high school), higher share of members of the military (22.1 percent observed active duty), and larger household sizes (average 3 members). Not as many rejected households are married (55.8 percent) and fewer rejected applicants own their home than unconstrained borrowers: 55.3 percent of rejected applicants own their home versus 80.4 percent of unconstrained borrowers. Next to the differences in wealth and income, the second-most notable difference is the racial composition of rejected households relative to unconstrained households: 70 percent of rejected applicants identify as white, 14.4 percent as black, and 12 percent Hispanic.

In 2007, 7 percent of discouraged households used payday loans in the previous year, the most out of all observed applicant types. Discouraged households earn the lowest amount of income of all borrower types, earning \$52,870, and hold the least amount of net wealth, \$88,830. On average, discouraged applicants are youngest, least educated, and mostly single. Average household size is similar to reject borrowers, however, only 37.1 percent of discouraged borrowers own a home. Finally, the racial composition within observed discouraged borrowers is most diverse relative to reject and unconstrained borrowers: 60 percent of discourage applicants identified as white, 23 percent as black and 17 percent as Hispanic.

There are striking differences among the different borrower types. The most obvious differences are in income and in net wealth. It is no surprise that unconstrained borrowers earn more and have a higher net worth relative to restricted and

---

<sup>16</sup>This is consistent with an estimated 20 percent of constrained observed households in Jappelli (1990).

unconstrained borrowers. Further, 80 percent of unconstrained borrowers own their homes, this too is a signal of wealth. Rejected borrowers, however, not only earn less than half of unconstrained borrowers, they also hold less than half the value in net wealth. As this measurement of net wealth includes total wealth net of debt it is highly likely that rejected borrowers not only hold less total wealth, but more total debt than unconstrained borrowers. Discouraged borrowers are the most economically constrained, with the lowest average income and net wealth. It is also likely that discouraged borrowers are not only holding less wealth, but higher levels of total debt. Even within constrained borrowers, it is interesting how different the economic profiles are between rejected and discouraged borrowers. If discouraged borrowers actually applied for credit, they would most certainly be denied and would remain excluded from the traditional financial services market. Lastly, there appears to be a positive correlation with payday loan usage and the level of constraint. Discouraged borrowers, arguably the most constrained, used payday loans the most of all households observed.

### **Borrower Profile: All Loan Applicants, 2010**

Table 3.5 presents summary data for all households observed for the year 2010. In 2010, the number of observed households increases to 3,317. 2,174 households are unconstrained, 416 were explicitly denied credit and 727 chose not to apply for credit at all. Already, the share of constrained households observed increases from 21 percent in 2007 to almost 35 percent. The effects of the financial crisis are clear here: more households were excluded from the traditional credit markets due to the contraction in the supply of credit and liquidity. Payday loan usage sample wide has also increased: 4 percent of all households, no matter what borrower type, used payday loans in 2010. Therefore, in addition to more households being excluded from the traditional financial market, a higher share of households are also using payday loans. Relative to 2007, average income and net wealth decrease to \$557,820 and \$2.3 million, respectively. Additionally, fewer observed households own a home: in 2010, only 64 percent of households surveyed own a home relative to 72 percent

in 2007. This is yet another signal of the negative effects of the financial crisis on the economic profiles, regardless of borrower type.

For unconstrained borrowers, observed demographics are relatively stable across time and the largest observed changes occur in the economic characteristics of the household. Unconstrained borrowers in 2010, just as the case was in 2007, earned higher incomes than the average household and the highest level of income relative to rejected and discouraged borrowers, reporting an average income of \$789,620 annually. The same is true for net wealth, with unconstrained households holding net wealth levels valued at \$3.2 million. Even with the observed decreases in wealth and income, these households have been extended in the traditional credit markets. However, payday loan usage among these households increases to 1 percent of observed unconstrained borrowers. While these households do have access to traditional financial service, more and more unconstrained households choose to borrow from payday loans.

The decreasing trend in net wealth continues when examining statistics for rejected borrowers, however, average income for rejected borrowers *increases* from 2007 to 2010. In 2010, rejected borrowers reported earning an average of \$480,532 annually and held an average of \$995,720 in net wealth. This decrease in net wealth is likely due to both a decrease in total wealth (for instance, decreasing values of assets) and an increase in total debt. The increase in average income for rejected applicants is another byproduct of the tightening credit markets. Individuals that would have been approved prior to the financial crisis, those earning more income, are now rejected as stringency increases. There is a distinct shift in eligible borrowers after 2008, and the pool of viable candidates decreases as banks aim to reduce risks in lending. Lastly, 8 percent of observed rejected households used payday loans in 2010, up from 3.4 percent in 2007.

Discouraged borrowers still earn the least in household income and hold the least in net wealth among the different borrower types. In 2010, the average income earned by discouraged borrowers was \$65,250; discouraged borrowers held \$179,540 in net wealth. Discouraged borrowers earned higher average incomes and held more

net wealth in 2010 relative to 2007. This again is a byproduct of the financial crisis. Just as it was for rejected borrowers discussed above, the composition of discouraged households changes after 2008. What is occurring here is that constrained borrowers, specifically discouraged borrowers, have become *wealthier* on average as the threshold for liquidity approval increases. Many that would have been approved for credit are rejected due to tightening requirements. Observing these tighter requirements, many that would have applied (and still rejected) chose not to apply at all predicting that their application for credit would be denied. Demand for payday loans increased among discouraged borrowers in 2010: 13.4 percent of discouraged borrowers used payday loans in the previous year, almost twice that in 2007.

As predicted, there are distinct economic differences between constrained and unconstrained borrowers in both observed survey years. However, what is somewhat surprising is different rejected and discouraged borrowers are from one another, especially given the similarities in survey responses related to financial exclusion. Discouraged borrowers are significantly less wealthy and earn less than rejected borrowers; it seems as though they correctly predicted they would have been rejected anyway, hence choosing not to apply. In general, income, but more importantly, net wealth, are factors that appear to determine credit constraint. The next step is to examine the characteristics of payday loan borrowers to identify potential factors that drive these households to use payday loans.

### **Borrower Profile: Payday Loan Borrowers Only, 2007**

Table 3.6 presents the same characteristics across borrowers for the year 2007, restricting analysis to payday loan borrowers only. In 2007, only 43 observed households used payday loans. As previously mentioned, use of this product was not as mainstream. For all households, a very clear picture of the payday loan borrower is revealed. Payday loan users highly resemble discouraged borrowers, however are worse off. The average reported income of a payday loan borrower is \$36,200 and the average net wealth is \$22,240. Payday loan borrowers are typically younger relative to the full sample, the average age of a payday loan borrower reported as 36 years

old. Only 30 percent of respondents are married, 9.3 percent active duty military, and only 30 percent of borrowers own their home (this again is a signal of wealth, or a lack thereof). Racial composition among borrowers is more varied relative to the average household in 2007: Only 58 percent of payday loan borrowers in 2007 identify as white, 26 percent identify as black, and 16 percent identify as Hispanic. This confirms that at the peak of industry growth, a large share of payday loans user were minorities borrowers, however, the majority of borrowers were actually white.

While the average payday loan borrower is significantly different than the average household in 2007, there appear to be no significant differences in payday loan users across borrower types. Unconstrained, rejected, and discouraged borrowers that used payday loans in 2007 are very similar in profile across many characteristics. For all three borrower types, income levels are not that different than the average payday loan borrower; no borrower type reported earning more than \$40,000 in the previous year. While income is relatively consistent, net wealth widely varies across borrower type. Rejected applicants held an average of \$58,000 in net wealth, discouraged borrowers held \$10,440, and unconstrained borrowers held \$22,560 in net wealth. Among payday loan borrowers, rejected borrowers hold the highest level of wealth, more than twice the amount held by unconstrained borrowers. For unconstrained borrowers, this is likely a selection issue as these borrowers have been extended credit. It is possible that unconstrained payday loan users are supplementing traditional credit when borrowing payday loans for consumption purposes, as discussed previously. This would explain why usage is higher for unconstrained borrowers (14 households) versus rejected borrowers (7 households). This is not the case with discouraged borrowers, as they hold the least in net wealth. Analogous to the full sample, among payday loan users, discouraged borrowers are again extremely constrained in income and wealth when compared to other types. Not surprising, payday loan use is highest among discouraged borrowers relative to other borrower types.

### **Borrower Profile: Payday Loan Borrowers Only, 2010**

Table 3.7 presents summary data for payday loan users by borrower type for the year 2010. In 2010, 164 households reported using payday loans in the previous year: 33 households having been rejected from the traditional credit market, 97 discouraged from applying, and 34 households having access to traditional financing. Relative to 2007, reported payday loan use increased for all borrower types. Just as it was in 2007, the average payday loan borrower (not conditioning on constraint) has a very different economic profile than the full survey. On average, users reported earning \$48,710 and held less than \$11,000 in net wealth. Observation of homeownership also decreased from 2007 to 2010 among payday loan borrowers: in 2010, only 25 percent of households owned a home, another indication of a loss in wealth. Payday loan users are slightly older than in 2007, however, still younger than the full survey.

Conditioning on borrower type once again reveals very few differences among payday loans users. Income is consistent across all borrower types, as is age, years of education, military status, employment status, and household size. Net wealth, however, varies across borrower types in a similar pattern seen from the 2007 survey data. Restricted borrowers hold the highest level of net wealth with a mean value of \$23,140. Unconstrained borrowers hold, on average, \$11,470 in net wealth, and discouraged borrowers hold less than \$10,000. It is still possible in 2010 that unconstrained borrowers are using payday loans to supplement, rather than substitute for, traditional financing, thus the lower level of net wealth than rejected borrowers. Also noticeably different across borrower types is racial composition of each subsample with an increased observed proportion of black and Hispanic payday loan borrowers, the majority of black payday loan users being discouraged borrowers and Hispanic users being rejected borrowers.

Institutional changes previously discussed are not as prevalent here as they were when examining the full sample of all households, with the exception of the increased use of payday loans over time. For all borrower types, mean income for payday loan

users increased from 2007 to 2010, however net wealth slightly decreased between the two survey years. The increase in observed income and the increased use of payday loans is a signal that income alone is not necessarily a sufficient predictor in the decision to borrow. Recalling the discussed framework, increasing income decreases the demand for outside liquidity, including payday loans. As the framework discussed, and the summary data have shown thus far, wealth, debt, and most important, constraint are seemingly highly related payday loan usage. From the full survey data, net wealth and its effect on the creditworthiness are more important factors in determining constraint. Further, observed payday loan usage increases as constraint increases, likely due to the tightening of credit markets. However, using payday loans is not solely associated with constraint. Just as differences in income and net wealth distinguished borrower types, these factors also are distinguishing characteristics between payday loans users and non-users, regardless of borrower type. What is absolutely clear is that wealth, debt, income, and constraint, are factors in using payday loans and should always be considered when analyzing the decision to borrow.

### 3.5. Results and Discussion

This section discusses estimation results for each stage of the payday loan borrowing process: first identifying what factors are significant in the likelihood of being excluded from the traditional financial service market, then identifying factors that increase the likelihood of borrowing a payday loan conditioning on being initial exclusion. Marginal effects have been calculated for each control at the sample mean for each year. With these results, I hope to extend the dialogue related to payday loan users by drawing attention to the economic factors that contribute to payday loan usage. The next section discusses the results for each stage of the payday lending process, beginning with the estimations for credit constraint.

### Stage One Probit Estimation: 2007

Table 3.9 presents first-stage probit regression results for 2007 and 2010 for the dependent variable  $L_i$ , an indicator that equals 1 if the household is constrained and 0 otherwise. In 2007, income, total debt, education, marriage, identifying as black, being active duty military, household size and owning a home are all statistically significant in determining the probability of constrained. Marginally increasing total income decreases the probability of constraint by 12.9 percent and is significant at the 1-percent level. As the observed sample includes only households that have a positive demand for credit, this effect is supply-side driven. For traditional financial institutions, higher levels of income decrease the risk associated with ability to repay; higher earners are more likely to be extended credit than low-income earners. Marginal increases in total debt increase the probability of constraint by 1.8 percent. Again, this is in direct relation in the ability to repay. For financial institutions, rather than risk a loan defaulting, total debt is used as a screening mechanism for borrower quality. While wealth itself is not significant, owning a home is. Owning a home decreases the probability of constraint by 6.9 percent. Individuals that own their home (versus renting) are associated with higher levels of stability and are less transitory, characteristics that decrease risk and uncertainty associated with the applicants.

In addition to economic factors, most of the measured demographic characteristics of loan applicants have significant effects on the likelihood of being credit constrained. Increasing the number of years of education attained decreases constraint by 1 percent. Higher levels of educations are associated with an increased understanding of the financial system, in the home and outside. Individuals with higher levels of education, thus considered more responsible and more desirable, therefore less likely to be financially excluded. Being married decreases constraint by 5.4 percent; married couples can take advantage of economies of scale within the home sharing the burden of debt and the ability to repay loans. Identifying as black increases the probability of financial exclusion by 10 percent, the second largest

effect on the predicted outcome. Legally, one cannot be denied financial services because of race. However, if access to financial services is limited, individuals will likely not apply for credit due to increased search costs. This coefficient is in line with the fact that areas with higher minority populations tend to be limited in access to financial services. Being active duty military increases constraint by 7.9 percent, the third largest effect on the predicted outcome. Just as it was the case with the effect of race on constraint, it is possible that this indicator is being affected by the influence of location, specifically living on a military base, as these areas tend to be underbanked as well (Burkey and Simkins (2004)). Lastly, marginal increase in household size increases the probability of constraint by 2.7 percent. Larger households have higher demands on financial resources, thus increasing the risk of default if credit is extended.

The coefficient estimates for the included exclusion variables are not what was expected: Financial access (the number of financial institutions an observed household actually conducts business with) and close proximity to bank branches were predicted to decrease the probability of being credit constrained. Instead, the probability of constraint increases by 1.5 percent with each increase in the number of financial institutions a household conducts business, with statistical significance at the 1-percent level (physical proximity to a household's bank has no significant effect on the outcome). It is entirely possible that accessing more than one institution is a signal of an unsavory borrower. Rather than being able to conduct financial transactions at a single institution, the applicant is forced to shop at many venues in order to obtain credit, either having been denied or exhausting all possible credit at other institutions.

### **Stage One Probit Estimation: 2010**

Coefficient estimates for the year 2010 reflect the institutional changes as a result of the financial crisis. Total wealth, debt, age, education, employment status, marriage, identifying as Hispanic or black, household size, and owning a home are all significant in predicting constraint in 2010. The increase in the number of significant

observed characteristics signals the increased level of sensitivity banks have towards all aspects of a loan applicant after 2008. Income no longer is a significant predictor of constraint, rather the level of total wealth now has a significant effect on the observed outcome of constraint. Increasing total wealth by 1 percent decreases the probability of financial exclusion by 5.6 percent. This is an interesting result considering net wealth decreased for all borrower types, except for discouraged borrowers. However, the differences in wealth remained extremely high between excluded and non-excluded borrowers. The effect of total debt increases from 2007 to 2010, and increases the probability of being constrained by 2.7 percent. Lastly, owning a home decreases the probability of constraint by 7.3 percent. In 2010, owning a home is still a signal of financial stability but for different reasons. With the crash of the housing market having its most negative effects starting in 2008, homes were foreclosed on or simply abandoned. Being able to retain ownership in such a turbulent time is a signal to the financial capability to do so.

In addition to economic indicators, the number of significant demographic effects increased as well. The probability of being constrained increases by 2 percent with each year of age, significant at the 1 percent level. Traditionally, younger loan applicants are associated with a higher level of uncertainty due to a lack of experience with credit. The opposite is true here: the older one is the more likely they are to be financially excluded. Another consequence of the financial crisis was a retired individuals re-entered the workforce. Age could be measuring the type of employment older, formerly retired individuals were forced to take, such as multiple part-time positions or low-skilled jobs. Regardless of age, this kind of employment is not a signal of financial stability in any year and especially so during the financial crisis. Therefore, older individuals forced to reenter the workforce have entered into relatively riskier industries. The effects of education in 2010 are consistent with the effects in 2007, as are the effects of household size. Being employed decreases the outcome of constraint by 8 percent. Given the rise in unemployment during this period, being employed means having consistent income, decreasing the uncertainty in being able to repay extended credit. The effect of being married has a larger effect, decreasing

constraint by 6.6 percent. Again, married couples can take advantage of economies of scale, sharing incomes and the burden of debt within a household. Identifying as Hispanic is now significant and increases the likelihood of constraint by 6.4 percent. Additionally, identifying as black has a larger effect in 2010, increasing the probability of constraint by 14.2 percent. In 2007, during more prosperous times, areas with high concentrations of black and Hispanic populations were already underbanked. After 2008, access to financial services decreased as banks became more stringent, but also as a result of bank failures. So, limited access to financial services becomes a larger issue for areas that were already underserved prior to the financial crisis.

Finally, the effect of the number of banks an individual access has a larger effect in 2010, increasing the likelihood of constraint by 2.5 percent with significant at 1-percent. The previous hypothesis regarding sign still applies here: individuals accessing more financial institutions do so, not because they can, but because restrictions from previous financial relationships force borrowers to find the "next" financial service provider. As banks increase stringency in lending and are more sensitive to risk and uncertainty, an applicant that must use a higher number of financial institutions to meet their demand become increasingly undesirable. It is logical that this effect increases in magnitude from 2007 to 2010.

The above discussion analyzes the characteristics that contribute to exclusion from the traditional credit market, the first step in the payday lending process. Recall from summary data, the observed cases of payday loan usage increased across borrower type and time, therefore constraint and payday loan usage are no doubt related. Further, when holding borrower-type constant, there exist noticeable differences in income and net wealth, thus additional economic factors contribute to use. The next section examines how these, with special attention paid to constraint, affect the decision to borrow payday loans.

### 3.5.1. Estimating the Probability of Using Payday Loans

#### **Stage Two Estimation: 2007**

Table 3.9 presents second stage OLS estimation results for 2007 and Table 3.10 presents results for 2010 for the dependent variable  $PD_i$ , which is equal to 1 if households used payday loans in the previous year and 0 otherwise. For each year, the specification was run with and without the calculated inverse Mills Ratio from the first stage in order to examine how the exclusion of credit constraint affects the estimations of income, total wealth, and total debt. For income, wealth, and age, marginal effects were calculated at the sample mean, otherwise coefficient estimates represent the marginal effects for each covariate. In 2007, when not conditioning on constraint, neither total income nor total wealth are significant in the probability of using a payday loan. However, when including constraint as estimated in the first stage, the magnitude and the significance of the effect of income both increase while the significance of total wealth remains unchanged and statistically insignificant. This suggests that excluding constraint leads to incorrectly underestimating in the effect of income on the probability of payday lending.

Focusing on the full specification including credit constraint, total income and total age are the only significant predictors of payday loan usage. Initial credit constraint has no statistically significant effect on the predicted likelihood of using payday loans. However, total income increases the probability of using payday loans: increasing total income by 1 percent increases the probability of using payday loans by 0.35 percent, statistically significant at the 5-percent level. This is likely a supply-driven effect; payday lending firms tend to concentrate branches, not in the poorest areas, rather in low- to middle-income earning neighborhoods. From the demand side, there is the possibility that individuals earning higher incomes are likely to experience situations that require emergency use of payday loans versus poorer households, for instance, owning a car that has to be repaired or other credit debts that have to be repaid. These personal expenditures that exist for households with higher level of income are likely drivers of payday loan usage that do not exist

for lower-income households.

As age increases, so too does the likelihood of borrowing a payday loan: an additional year in age increases the probability of borrowing by 8.61 percent, statistically significant at the 0.1-percent level. Just as was the case with the estimated effect of constraint on payday loan usage, I suspect that a misspecified empirical specification likely affecting the estimation of the effect of age on the likelihood of borrowing.

The results for 2007 suggest that, while observationally true, credit constraint does not necessarily lead to an increased likelihood of payday loan usage. Rather, total income and age are still the best predictors borrowing. However, it is likely that a misspecified estimation method (using a linear probability model) and omitted variables are likely driving results. This will be discussed later in the paper.

### **Stage Two Estimation: 2010**

Examining the results presented in Table 3.10, 2010 is very different from 2007. In 2010, if a borrower has been previously excluded from the traditional financial services market, the likelihood of borrowing a payday loan decreases by 64.4 percent, with statistical significance at the 0.1-percent level, contrary to predictions. Further, increasing total income by 1 percent increases the probability of borrowing a payday loan by 3.72 percent with statistical significance at the 5-percent level. I believe that the effect of constraint is being affected by omitted variables; this will be discussed later in the section. However, I do believe there is an economic explanation for the change in the effect of total income that differs from 2007. Rather than being a supply-side effect, these results are reflective of changes in the traditional financial services market and of the recession. Recall from the discussion of survey data, observed payday loan usage increased from 2007 to 2010, reaching populations that previously had not accessed the product before. Additionally, in 2010 across all borrower types, mean income increased in 2010 relative to 2007. Individuals with higher levels of income are being excluded from accessing funds from the traditional credit market and are therefore turning to the payday lending market as an alter-

native. Not only is payday lending becoming more mainstream, the composition of payday loan borrowers is changing to include higher income earners.

Age and employment status are the only two demographic variables with any significant effect on the observed outcome. Unlike in 2007, older borrowers are less likely to borrow payday loans relative to younger users: increasing age by one year decreases the probability of using payday loans by almost 43 percent, with statistical significance at the 1-percent level. Being employed increases payday loan usage by 5.5 percent. In order to be eligible to borrow, an applicant for payday loans must have an active checking account and be actively employed. This result follows the requirements set by the industry.

Overall, the results for 2010 indicate a shift for the payday lending industry: the industry itself is becoming more mainstream and less of a fringe practice. Race, household size, owning a home, military service, marriage, wealth and debt, all characteristics that distinguished constrained borrowers from unconstrained borrowers in both years are no longer identifying characteristics for payday loan usage in 2010. The contraction in the supply of traditional credit forced all households, regardless of borrower type, to search for liquidity elsewhere. As observed, many turned to the payday lending industry to meet their credit needs. This changes the typical borrower from an individual with limited access to traditional credit to simply a liquidity-seeking individual.

As mentioned above, it is likely that using a linear probability model to estimate payday loan usage is possibly affecting the estimation of results in the second stage for both years. Given that the outcome of borrowing is measured as a binary variable (to use payday loans or not to use), exploring future estimation methods that account for these limits will likely correct incorrect estimation of effects, both in sign and magnitude.

### **Omitted Variables**

As previously mentioned, I believe the estimated effect of constraint is negatively biased in 2010 because I cannot identify the explicit decision to refrain from bor-

rowing apart from restricted access. For both years, the dependent variable  $PD_i$  is equal to 0 if households did not borrow a payday loan. This outcome does not distinguish between deciding not to borrow and being prohibited from borrowing. Why would this be an issue in 2010 and not in 2007? The answer lies in the trends in the supply-side growth of the payday lending industry and the trends in state policy environments. First, in 2007, the payday lending industry reached its peak with an estimated 24,000 operating branches across the country. Additionally, while states were enacting policies specific to the industry, the trend was in establishing policies that explicitly allowed firms to operate. Therefore, when examining the decision to borrow payday loans in 2007, access is not necessarily an issue (this is likely due to the estimation method). However, in 2010, this is not the case. Once again, the financial crisis in 2008 changed the trajectory of both industry growth and state policies. After 2007, the payday lending industry began to contract, for “natural” economic reasons, but also because states began prohibiting the practice altogether. Starting in 2008, states began explicitly banning the practice of payday lending or allowed enabling legislation to expire. As a result, the industry stopped operating in states where this occurred and access to payday loans was restricted. In 2010, the decision to borrower is eliminated because access to payday loans has been eliminated, which is observed as choosing not to borrow. This issue can be solved when including regional data to control for the explicit payday lending policy environment and restricted access.

Additionally, I believe that omitted location data have a positive bias on the results for race and military when predicting constraint. Recall, identifying as black increased the probability of financial exclusion by 10 percent in 2007 and 14 percent in 2010. Additionally, identifying as Hispanic increased the probability of constraint by 6.4 percent in 2010. Being active duty military increased the probability of constraint by almost 8 percent in 2007. As previously discussed, physical access to traditional financial institutions is limited in areas with a high percentage of minorities and/or with the presence of a military base. The estimated coefficients are therefore not only controlling for identification with the specific group, but

proximity to areas that are underbanked and underserved by traditional financial institutions.

### 3.6. Conclusion

In this study, I examine the decision to borrow payday loans as a two-stage process and develop a framework that shows that payday loan usage is dependent upon access to traditional financial services. In stage one of the borrowing process, an individual has been financially excluded, having been denied credit or discouraged from applying, from the traditional credit market. As a result, available credit from traditional sources approaches zero, yet demand for liquidity is unaffected and unfulfilled. In stage two, a credit-seeking individual restricted in accessing traditional financing is driven to borrow from alternative financial sources, such as payday lenders. Using data from the Survey of Consumer Finances for the years 2007 and 2010, I estimate the probability of payday loan usage conditioning on initially being credit constrained for each year.

In 2007, contrary to predictions, constraint does not significantly affect the decision to borrow payday loans. Increasing household income increases the likelihood of borrowing by 0.3 percent. Wealth and debt have no significant effect on borrowing payday loans. Age also significantly affects the outcome of borrowing payday loans. In 2010, results are strikingly different. Being credit constrained decreases predicted payday loan use by 64 percent while marginal changes in total income increase payday loan usage by 3.7 percent. Further, age and employment status are the only significant demographic predictors of payday loan usage. While institutional changes caused by the 2008 financial crisis can explain these results to some extent, the true effect of constraint cannot be identified as it is likely being confounded by state policies that restrict access to payday loans. By the year 2010, many states enacted policies explicitly prohibiting payday loan use. Therefore, without location data, not borrowing by choice and being prohibited from accessing loans are treated as the same outcome, thus causing the effect of being credit constrained to

be extremely negative.

This research contributes to the existing literature on payday loan usage and financial exclusion in two key ways. First, with respect to the payday lending literature, I expand the profile of the payday loan borrower to include household wealth and debt. Previous demand studies have focused primarily on income and demographic characteristics of borrowers, ignoring the full economic profile and the influence of wealth, debt, and accessibility. In relation to the literature on financial exclusion, I do not assume that exclusion from the traditional credit market and payday loan usage are independent outcomes. Rather, I show that financial exclusion is a necessary precursor in the decision to borrow a payday loan.

The results of this study signal that wealth and constraint are mechanisms that significantly affect payday loan usage, thus should no longer be ignored when attempting to understand the "typical" payday loan borrower. If using payday loans is perceived to be problematic, increasing financial education among users is an inefficient policy solution as it does not address the financial mechanisms that drive individuals to borrow. To date, the standard policy approach related to payday lending has primarily been motivated to limit access or decrease usage. Programs that promote financial literacy assume that behavior and/or limited rationality contribute to increased usage of payday loans. Indeed, Bertrand and Morse (2011) examined different methods specifically designed to curb payday loan usage. Their results indicate that payday loan usage decreased in only a single treatment, when the dollar charges of payday loans were compared to the dollar charges of other, traditional credit products.<sup>17</sup> The study implicitly assumes that borrowers can access the traditional credit products that payday loans are compared to. Additionally, payday loan usage *increased* in their treatment where consumers were required to track expenses with the use of a savings planner. By outlining consumption explicitly, households became explicitly aware that current income and liquid assets would

---

<sup>17</sup>The three remaining treatments were comparing the calculated APR to other credit products, revealing the high frequency with which payday loans were rolled over or renewed and having borrowers use a savings planner in order to decrease consumption.

not be sufficient to meet their basic consumption needs and would therefore have to secure additional credit. Further, establishing policy that prohibits access to payday loans completely ignores the fact that the payday lending industry, like other alternative financial services, have become the primary source of credit for households that have been excluded from the traditional credit market (Stoesz (2012)).

Perhaps what is problematic is the manner in which the payday lending industry and borrowers are viewed. As detailed by the 2007 and 2010 SCF surveys, households that were excluded from traditional markets, with the lowest levels of income and wealth, used payday loans the most. Usage increased for all borrowers types during especially turbulent economic times. Throughout the decade payday loan usage has become less fringe and more mainstream. The results of this study confirm that economic differences and differences in access to traditional markets are, in fact, significant demand drivers for payday loans. Therefore, the frame of the payday loan debate must shift away from focusing on the rationality and financial intelligence of borrowers to the context under which payday loans are borrowed, as it may be the case that borrowing payday loans is the rational choice. In terms of effective policy, rather than limiting access, policy should focus on ensuring a safe product for both consumer and lender.

### 3.7. Tables

Table 3.1: Reasons for Rejection from Traditional Credit/Liquidity Market, Percentage Responses

Reasons	1982, Jappelli (1990)		2007		2010	
	Rejected	Discouraged	Rejected	Discouraged	Rejected	Discouraged
Have not established a credit history/age	22.8	18.6	10.00	10.69	11.06	10.76
Credit records' history from other institutions; bankruptcy	19.7	15	21.43	32.08	13.70	20.30
Not enough Income	13.5	21.2	9.05	5.66	6.97	8.99
Not enough assets	8.6	10.9	2.86	0.00	8.89	1.23
Amount of debt; size of other payments	6.2	11.4	16.67	10.06	18.51	9.54
lack of job	6.8	12.9	0.95	1.26	0.96	3.54
Time on current job	4.9	1	0.95	0.00	0.96	0.68
Time at current address	4.3	0.5	0.95	0.94	1.44	0.00
Job; Type of Work	2	3.6	0.48	1.26	0.24	1.23
Family Size/sex/race	2.7	6.2	0.00	0.63	0.00	0.41
No reason given	7.6	0.5	2.86	0.00	6.49	0.00
Other	17.8	17.7				
Credit Rating Service / Credit Bureau Reports			14.76	18.24	17.79	21.53
Bad Credit, NEC			5.71	11.01	4.09	11.85
Institutions are more strict in lending requirements			0.48	0.00	2.64	1.91
Other			11.90	7.23	6.25	7.08

In 2007, there were 208 rejected and 315 discouraged households observed. In 2010, there are 416 rejected and 727 discouraged households observed.

Table 3.2: Reasons for Rejection from Traditional Credit/Liquidity Market for Payday Loan Users, Percentage Responses

Reasons	2007		2010	
	Rejected	Discouraged	Rejected	Discouraged
Credit records' history from other institutions; bankruptcy	57.143	27.273	21.212	27.835
Have not established a credit history/age	14.286	9.091	6.061	8.247
Amount of debt; size of other payments		4.545	12.121	7.216
Not enough Income		4.545	3.030	5.155
Time on current job			3.030	2.062
Not enough assets				1.031
Lack of job				2.062
No reason given			3.030	
Other				
Credit Rating Service / Credit Bureau Reports		27.273	42.424	32.990
Bad Credit, NEC	14.286	18.182	6.061	8.247
Other		9.091	3.030	5.155

In 2007, there are 7 rejected and 22 discouraged households observed. In 2010, there are 35 rejected and 97 discouraged households observed. Excluded categories from list received zero responses from either borrower type across both years.

Table 3.3: Reasons for Using Payday Loans

A: 2007						
Reason	Rejected		Discouraged		Unconstrained	
	Count	Percentage	Count	Percentage	Count	Percentage
"Emergency"/"needed quick money"	3	42.857	6	27.273	5	38.462
"Convenient"	2	28.571	7	31.818	2	15.385
Pay other bills/loans	1	14.286	3	13.636	1	7.692
"Only option"	-	-	1	4.545	-	-
Other	1	14.286	5	22.727	5	38.462
Total	7	100	22	100	13	100
B: 2010						
Reason	Rejected		Discouraged		Unconstrained	
	Count	Percentage	Count	Percentage	Count	Percentage
"Emergency"/"needed quick money"	9	27.273	26	26.804	10	29.412
"Convenient"	8	24.242	27	27.835	8	23.529
Pay other bills/loans	2	6.061	18	18.557	7	20.588
"Only option"	4	12.121	11	11.340	3	8.824
Other	10	30.303	15	15.464	6	17.647
Total	33	100	97	100	34	100

Table 3.4: Summary Statistics: All Borrowers, 2007

Variable	Total		Rejected Applicants		Discouraged Borrowers		Unconstrained Borrowers	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Use Payday Loans	0.018	0.134	0.034	0.583	0.070	0.207	0.008	0.087
Income	80.237	495.305	26.729	618.231	5.287	5.359	99.128	556.187
Net Wealth	319.921	1551.136	180.747	6209.525	8.883	42.211	388.940	1627.626
Age	46.351	12.660	41.063	39.488	38.584	8.832	48.222	12.318
Education	14.425	2.329	13.625	8.104	13.152	1.689	14.725	2.253
Employed	0.954	0.210	0.962	0.622	0.933	0.203	0.956	0.204
Military	0.196	0.398	0.221	1.342	0.197	0.323	0.195	0.397
Marital Status	0.673	0.470	0.558	1.606	0.425	0.402	0.728	0.445
White	0.801	0.400	0.707	1.472	0.606	0.397	0.844	0.363
Black	0.082	0.275	0.144	1.136	0.235	0.345	0.049	0.217
Hispanic	0.094	0.293	0.120	1.051	0.171	0.306	0.079	0.270
Sex	0.840	0.367	0.827	1.223	0.663	0.384	0.871	0.335
Family Size	2.911	1.414	3.096	4.963	3.032	1.211	2.874	1.383
Homeownership	0.725	0.447	0.553	1.608	0.371	0.393	0.804	0.397
Observations	2363		208		315		1840	
Percent of Cases	100		8.802		13.331		77.867	

Standard Deviations have been corrected for sample weighting.

All dollar figures are in ten thousands, 2007 dollars

Table 3.5: Summary Statistics: All Borrowers, 2010

Variable	Total		Rejected Applicants		Discouraged Borrowers		Unconstrained Borrowers	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Use Payday Loans	0.049	0.217	0.080	0.236	0.134	0.341	0.016	0.054
Income	55.782	723.089	48.532	572.725	6.525	13.890	78.962	369.458
Net Wealth	227.517	1731.383	99.572	830.777	17.954	239.831	316.729	912.515
Age	45.642	12.977	43.014	10.930	42.040	11.653	47.220	5.756
Education	14.216	2.416	14.019	2.032	13.106	2.537	14.611	0.991
Employed	0.931	0.253	0.944	0.200	0.882	0.323	0.946	0.099
Military	0.164	0.370	0.150	0.311	0.131	0.338	0.176	0.167
Marital Status	0.626	0.484	0.568	0.432	0.437	0.496	0.700	0.201
White	0.753	0.433	0.684	0.406	0.550	0.498	0.831	0.164
Black	0.104	0.307	0.121	0.284	0.233	0.423	0.059	0.103
Hispanic	0.119	0.325	0.176	0.332	0.198	0.399	0.082	0.120
Sex	0.822	0.383	0.829	0.329	0.690	0.463	0.864	0.150
Family Size	2.938	1.504	3.031	1.394	3.025	1.615	2.901	0.631
Homeownership	0.647	0.479	0.565	0.432	0.373	0.484	0.751	0.189
Observations	3317		416		727		2174	
Percent of Cases	100		12.463		21.780		65.129	

Standard Deviations have been corrected for sample weighting.

All dollar figures are in ten thousands, 2007 dollars

Table 3.6: Summary Statistics: Payday Loan Borrowers Only, 2007

Variable	Total		Rejected Applicants		Discouraged Borrowers		Unconstrained Borrowers	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Income	3.620	1.376	3.714	10.872	3.395	1.299	3.926	1.562
Net Wealth	2.224	5.215	5.873	82.087	1.044	3.156	2.256	5.525
Age	35.814	9.649	39.571	10.737	33.182	8.016	38.071	10.608
Education	12.953	1.964	13.143	2.340	12.773	2.066	13.143	1.641
Employed	0.930	0.255	1.000	0.000	0.909	0.288	0.929	0.258
Military	0.093	0.290	0.000	0.000	0.136	0.343	0.071	0.258
Marital Status	0.302	0.459	0.143	0.378	0.273	0.445	0.429	0.495
White	0.581	0.493	0.571	0.535	0.545	0.498	0.643	0.479
Black	0.256	0.436	0.429	0.535	0.227	0.419	0.214	0.410
Hispanic	0.163	0.369	0.000	0.000	0.182	0.386	0.214	0.410
Sex	0.581	0.493	0.714	0.488	0.500	0.500	0.643	0.479
Family Size	2.884	1.351	2.000	1.291	2.909	1.125	3.286	1.532
Homeownership	0.302	0.459	0.143	0.378	0.273	0.445	0.429	0.495
Observations	43		7		22		14	

Standard Deviations have been corrected for sample weighting.

All dollar figures are in ten thousands, 2007 dollars

Table 3.7: Summary Statistics: Payday Loan Borrowers Only, 2010

Variable	Total		Rejected Applicants		Discouraged Borrowers		Unconstrained Borrowers	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Income	4.871	34.696	4.910	2.834	4.589	3.477	4.847	3.423
Net Wealth	1.094	45.492	2.314	5.198	0.764	4.663	1.147	4.664
Age	40.970	12.366	41.364	10.627	40.536	12.482	40.970	12.330
Education	12.933	1.877	13.121	1.365	12.804	1.972	12.933	1.871
Employed	0.921	0.271	0.909	0.288	0.897	0.304	0.921	0.270
Military	0.116	0.321	0.121	0.326	0.103	0.304	0.116	0.320
Marital Status	0.384	0.488	0.515	0.500	0.340	0.474	0.384	0.486
White	0.566	0.496	0.636	0.481	0.505	0.500	0.567	0.496
Black	0.282	0.450	0.152	0.359	0.351	0.477	0.280	0.449
Hispanic	0.146	0.355	0.212	0.409	0.144	0.351	0.146	0.353
Sex	0.683	0.467	0.788	0.409	0.639	0.480	0.683	0.465
Family Size	3.055	1.571	3.091	1.443	3.103	1.589	3.055	1.567
Homeownership	0.250	0.434	0.333	0.471	0.206	0.405	0.250	0.433
Observations	164		33		97		34	

Standard Deviations have been corrected for sample weighting.

All dollar figures are in ten thousands, 2007 dollars

Table 3.8: Stage One Probit Regression: Dependent Variable: Constraint

Variable	2007			2010		
	Coefficient	t-statistic	Marginal Effect	Coefficient	t-statistic	Marginal Effect
Log Income	-0.585***	-2.900	-0.129***	-0.231	-1.310	-0.068
Log Income Squared	0.059**	2.020		0.103***	3.810	
Log Wealth	-0.029	-0.300	-0.006	-0.189**	-2.530	-0.056**
Log Wealth Squared	-0.008	-1.090		-0.004	-0.780	
Wealth * Income	-0.013	-0.370		-0.052*	-1.940	
Log Debt	0.080***	2.650	0.018***	0.092***	3.900	0.027***
Age	0.029	1.110	0.006	0.067***	3.830	0.020***
Age Squared	-0.001*	-1.650		-0.001***	-3.520	
Age*Income	0.003	0.820		-0.006*	-1.710	
Age*Wealth	-0.002	-0.900		0.003**	2.180	
Education	-0.044**	-2.580	-0.010***	-0.038***	-2.890	-0.011***
Work Status	0.009	0.050	0.002	-0.269**	-2.180	-0.080**
Married	-0.245**	-2.260	-0.054**	-0.221***	-2.630	-0.066***
Hispanic	0.066	0.420	0.015	0.217*	1.770	0.064*
White	-0.060	-0.410	-0.013	-0.160	-1.390	-0.047
Black	0.453**	2.460	0.100**	0.479***	3.410	0.142***
Sex	-0.146	-1.170	-0.032	0.059	0.610	0.017
Military	0.358***	3.660	0.079***	0.000	0.000	0.000
Household Size	0.122***	4.110	0.027***	0.087***	4.130	0.026***
Own Home	-0.311***	-2.510	-0.069**	-0.247***	-2.570	-0.073***
Total Financial Access	0.067***	2.240	0.015***	0.085***	4.240	0.025***
Close Proximity to Branches	0.031	0.750	0.007	0.033	0.980	0.010
Constant	-0.392	-0.590		-1.493	-2.83	
Observations	1937			2559		
F-statistic	12.960			18.780		

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 3.9: Stage Two Regression: Dependent Variable: Payday Loan Use, 2007

Variable	Without Conditioning on Constraint		Conditioning on Constraint	
	Coefficient	t-statistic	Coefficient	t-statistic
Inverse Mills Ratio			-0.0654	(0.1270)
Log Income	0.00380	(0.0136)	0.00963	(0.0151)
Log Income Squared	-0.000861	(0.00148)	-0.00107	(0.0016)
Log Wealth	-0.0227**	(0.00845)	-0.0217*	(0.0091)
Log Wealth Squared	-0.000511	(0.000614)	-0.000486	(0.0006)
Wealth * Income	0.00203	(0.00254)	0.00187	(0.0025)
Log Debt	-0.00170	(0.00257)	-0.00225	(0.0024)
Age	0.00183	(0.00167)	0.00181	(0.0017)
Age Squared	-0.0000355*	(0.0000172)	-0.0000329	(0.0000)
Age*Income	-0.000145	(0.000209)	-0.000202	(0.0002)
Age*Wealth	0.000380*	(0.000165)	0.000388*	(0.0002)
Education	-0.00266	(0.00143)	-0.00225	(0.0017)
Work Status	-0.00694	(0.0215)	-0.00726	(0.0215)
Married	-0.00400	(0.0101)	-0.00184	(0.0098)
Hispanic	0.000532	(0.0135)	-0.000555	(0.0135)
White	-0.00143	(0.0102)	-0.000933	(0.0101)
Black	0.0173	(0.0221)	0.0119	(0.0240)
Sex	-0.00631	(0.0147)	-0.00496	(0.0147)
Military	0.00258	(0.00687)	-0.000211	(0.0057)
Household Size	-0.00204	(0.00209)	-0.00317	(0.0024)
Own Home	-0.00168	(0.00977)	0.00149	(0.0123)
Constant	0.105	(0.0574)	0.135	(0.0818)
Observations	1937		1937	
R <sup>2</sup>	0.042		0.042	

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Marginal effects calculated at the sample means for income, age, and wealth)

t-statistics for marginal effects calculated using Delta Method)

Table 3.10: Stage Two Regression: Dependent Variable: Payday Loan Use, 2010

Variable	Without Conditioning on Constraint		Conditioning on Constraint	
	Coefficient	t-statistic	Coefficient	t-statistic
Inverse Mills Ratio				
Log Income	-0.0243	(0.02320)	-0.644***	(0.1720)
Log Income Squared	0.00546	(0.00313)	0.00951	(0.0249)
Log Wealth	0.00746	(0.01500)	-0.00457	(0.0039)
Log Wealth Squared	0.000485	(0.00089)	0.0288	(0.0164)
Wealth * Income	-0.00578	(0.00383)	0.000786	(0.0009)
Log Debt	0.00263	(0.00329)	-0.00115	(0.0039)
Age	-0.00261	(0.00232)	-0.00663	(0.0040)
Age Squared	0.0000291	(0.00003)	-0.00923**	(0.0029)
Age*Income	0.000525	(0.00043)	0.0000986**	(0.0000)
Age*Wealth	-0.000266	(0.00032)	0.000886*	(0.0004)
Education	-0.00399*	(0.00169)	-0.000604	(0.0003)
Work Status	0.0283*	(0.01420)	-0.0000994	(0.0021)
Married	-0.0108	(0.01410)	0.0559***	(0.0164)
Hispanic	-0.0165	(0.01820)	0.0127	(0.0146)
White	0.00715	(0.01610)	-0.0437*	(0.0197)
Black	0.0656**	(0.02540)	0.0228	(0.0160)
Sex	0.00297	(0.01670)	0.00252	(0.0312)
Military	-0.00891	(0.01020)	-0.00424	(0.0166)
Household Size	0.00394	(0.00302)	-0.00967	(0.0101)
Own Home	-0.0229	(0.01450)	-0.00587	(0.0035)
Constant	0.115	(0.06800)	0.00995	(0.0158)
Observations	2559	2559	0.565***	(0.1310)
R <sup>2</sup>	0.054	0.061		

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ 

Marginal effects calculated at the sample means for income, age, and wealth)

t-statistics for marginal effects calculated using Delta Method)

## Chapter 4

### Conclusion

The payday lending industry has changed dramatically in the first decade of the new millennium with no signs of slowing down. The industry grew seemingly out of nowhere in the early 2000's and has shown the ability to rapidly adjust to ever-changing policy environments. The results presented in this collection of studies highlight the growing importance of understanding such a dynamic industry. From the demand side, understanding the mechanisms that drive payday loan use increases the understanding of the payday loan product itself, broadens the profile of those that do use payday loans, and increases the possibilities of potential benefits of increased access. From the supply side, these studies show how firms within this industry interact with policymakers, both directly and indirectly. Within the payday lending industry, firms, consumers, and policymakers are inextricably linked. Continuing to examine these participants increases the transparency of an industry that has been shrouded with a particular level of mystery and only serves to benefit all those involved.

## Chapter 5

## References

1. Advance America Cash Advance America. 2008 Annual Report.
2. Advance America Cash Advance. 2010 Annual Report.
3. Becker, G. "A theory of competition among pressure groups for political influence." *The Quarterly Journal of Economics* 98, no. 3 (1983): 371-400.
4. Bertrand, M., and A. Morse. "Information disclosure, cognitive biases, and payday borrowing." *The Journal of Finance* 66, no. 6 (2011): 1865-1893.
5. Besley, T. and A. Case. "Unnatural experiments? Estimating the incidence of endogenous policies." *The Economic Journal* 110, no. 467 (2000): 672-694.
6. Bhutta, N., P. Skiba, and J. Tobacman. "Payday Loan Choices and Consequences." *Vanderbilt Law and Economics Research Paper* 12-30 (2012).
7. Blundell, R. and M. Dias. "Alternative approaches to evaluation in empirical microeconomics." *Journal of Human Resources* 44, no. 3 (2009): 565-640.
8. Burkey, M. and Simkins. "Factors Affecting the Location of Payday Lending and Traditional Banking Services in North Carolina." *Review of Regional Studies*. 2004. vol. 34.2, pp 191-205.
9. Byrne, N., O. McCarthy, and M. Ward. "Money-lending and financial exclusion." *Public Money and Management* 27, no. 1 (2007): 45-52.
10. Carmichael, J. and Pomerleano M. *The Development and Regulation of Non-Bank Financial Institutions*. World Bank. 2002.

11. Carter, S. "Essays in Consumer Finance: Bankruptcy and Fringe Banking." PhD diss., 2012.
12. Community Financial Services Association of America. "CFSA Member Best Practices" <http://cfsaa.com/cfsa-member-best-practices.aspx>
13. Consumer Federation of America. "Payday Lending in Ohio Fact Sheet." Consumer Federation of America. <http://www.paydayloaninfo.org>.
14. Damar, H.E. "Why Do Payday Lenders Enter Local Markets? Evidence from Oregon." November 2008.
15. DeYoung, R. and Phillips, R., Payday Loan Pricing (January 14, 2009). Networks Financial Institute 2006-WP-05 (revised version); FRB of Kansas City Paper No. RWP 09-07.
16. Faller, B. "Payday Loan Solutions: Slaying the Hydra (and Keeping it Dead)." Case W. Res. L. Rev. 59 (2008): 125.
17. Federal Deposit Insurance Corporation. "A Template for Success: The FDIC's Small-Dollar Loan Pilot Program." FDIC Quarterly, Volume 4, no. 2 (2010): 28-41.
18. FDIC Center for Financial Research Working Paper No. 2005/09. June 2005.
19. Fishback, Price V. Government and the American economy: A new history. University of Chicago Press, 2008.
20. Flannery, M. and Samolyk, K., "Payday Lending: Do the Costs Justify the Price?"
21. Gallmeyer, A. and W. Roberts. "Payday lenders and economically distressed communities: A spatial analysis of financial predation." The Social Science Journal 46, no. 3 (2009): 521-538.

22. Goldin, J. and T. Homonoff. "Consumer Borrowing After Payday Loan Bans." Working Paper. 2013.
23. Graves, S and C. Peterson. "Predatory Lending and the Military: The Law and Geography of 'Payday' Loans in Military Towns." *Ohio State Law Journal*. 2005. vol. 66.4.
24. Greene, William H. "Econometric analysis, 6th." Ed.. Upper Saddle River, NJ (2008).
25. Groff, N. "By the Numbers: What State data can tell us about Payday Loan Consumers." Veritec. Presented at Small-Dollar Credit: Products, Economics, and Regulation. Federal Reserve Bank of Philadelphia, Philadelphia, PA. July 2013.
26. Heckman, J., and E. Vytlacil. "Structural Equations, Treatment Effects, and Econometric Policy Evaluation<sup>1</sup>." *Econometrica* 73, no. 3 (2005): 669-738.
27. Hogarth, J., C. Anguelov, and J. Lee. "Who has a bank account? Exploring changes over time, 1989-2001." *Journal of Family and Economic Issues* 26, no. 1 (2005): 7-30.
28. Hotz, V. Joseph, and Mo Xiao. "The impact of regulations on the supply and quality of care in child care markets." *The American Economic Review* 101, no. 5 (2011): 1775-1805.
29. Huckstep, A. "Payday lending: Do outrageous prices necessarily mean outrageous profits." *Fordham J. Corp.*
30. Idaho Credit Code.
31. Iowa Code.
32. Iowa State Statutes.

33. Jappelli, T. "Who is credit constrained in the US economy?." *The Quarterly Journal of Economics* 105, no. 1 (1990): 219-234.
34. Jordan, W. "Producer protection, prior market structure and the effects of government regulation." *Journal of Law and Economics* 15, no. 1 (1972): 151-176.
35. Kansas. *Kansas Legislator Briefing Book* 2012.
36. Kennickell, A. *Weighting design for the 1992 Survey of Consumer Finances*. Board of Governors of the Federal Reserve System, 1996.
37. Kleiner, M. "Occupational licensing." *The Journal of Economic Perspectives* 14, no. 4 (2000): 189-202.
38. Lawrence, E. and Elliehausen, G. "A Comparative Analysis of Payday Loan Customers." *Contemporary Economic Policy*. April 2008. vol. 26.2. pp 299-316.
39. Libecap, Gary D. "The rise of the Chicago packers and the origins of meat inspection and antitrust." *Economic inquiry* 30, no. 2 (1992): 242-262.
40. Mann, R. and J. Hawkins. "Just until payday." *UCLA Law Review* 54 (2007).
41. McKernan, S., C. Ratcliffe, and D. Kuehn. "Prohibitions, price caps, and disclosures: A look at state policies and alternative financial product use." *Journal of Economic Behavior*
42. Melzer, B. "The Real Costs of Credit Access: Evidence from the Payday Lending Market." *Quarterly Journal of Economics*. 2011. pp 517 - 555.
43. *Montana Annotated Code*
44. *Montana Secretary of State. 2008 Ballot Issues.*

45. Morgan, D., M. Strain, and I. Seblani. "How payday credit access affects overdrafts and other outcomes." *Journal of Money, Credit and Banking* 44, no. 2-3 (2012): 519-531.
46. Morse, A. "Payday Lenders: Heroes or Villains?" *Journal of Financial Economics*. October 2011.
47. National Conference of State Legislatures. "Payday Lending Statutes." Updated July 2013. <http://www.ncsl.org/issues-research/banking/payday-lending-state-statutes.aspx>
48. Nebraska 93rd Legislature, Second Session. Banking, Commerce, and Insurance Committee Bill Summary: LB 967. Hearing Date: 24 January 1994. Introduced by Senator David Landis.
49. Nevada Revised Statutes.
50. Ohio Administrative Code
51. Ohio Revised Statutes
52. Oregon Revised Statutes
53. O'Shaughnessy, P. "Advance America and the Evolution of Short-Term Credit." Advance America, Inc. Presented at Small-Dollar Credit: Products, Economics, and Regulation. Federal Reserve Bank of Philadelphia, Philadelphia, PA. July 2013.
54. Parker, J. "Payday Lending in Ohio." *Members Only Brief*, Vol. 130, no. 1 January (2013).
55. Prager, R. "Alternative Financial Service Providers: Payday Lenders, Pawnshops and Check-Cashing Outlets." April 2008.
56. Prager, R. "Determinants of the Locations of Payday Lenders, Pawnshops and Check-Cashing Outlets." 2009.

57. Sherman, Matthew. "A short history of financial deregulation in the United States." CEPR Report, July (2009).
58. Simpson, W., and J. Buckland. "Examining evidence of financial and credit exclusion in Canada from 1999 to 2005." *The Journal of Socio-Economics* 38, no. 6 (2009): 966-976.
59. Skiba, P. and Tobacman, J. "Do Payday Loans Cause Bankruptcy?" Vanderbilt Law and Economics Research Paper No. 11-13.
60. Smale, P. "Payday Loans: Federal Regulatory Initiatives." CRS Report for Congress. 2005.
61. South Carolina Annotated Code.
62. South Dakota Codified Laws.
63. Stango, V. "Some New Evidence on Competition in Payday Lending Markets." *Contemporary Economic Policy* 30, no. 2 (2012): 149-161.
64. Stegman, M. "Payday Lending." *The Journal of Economic Perspectives*. Winter 2007. Vol 21.1. pp 169-190.
65. Stegman, M. "The public policy challenges of payday lending." *Popular Government* 66, no. 3 (2001): 16-22.
66. Stephens, Inc. "Forging Ahead: Growth Opportunity and the Direction of the Alternative Financial Services Sector." Presented by John Hecht. 7 March 2013
67. Stephens, Inc. "Industry Report: Payday Lending Industry." 6 June 2011.
68. Stigler, G. "Economic competition and political competition." *Public Choice* 13, no. 1 (1972): 91-106.
69. Stiglitz, J., and A. Weiss. "Credit rationing in markets with imperfect information." *The American economic review* (1981): 393-410.

70. Stoesz, D., Payday Loans and the Secondary Financial Market (March 26, 2012). Available at SSRN: <http://ssrn.com/abstract=2029146> or <http://dx.doi.org/10.2139/ssrn.2029146>
71. The Pew Charitable Trusts. "Who Borrows, Where They Borrow, and Why." Safe Small-Dollar Loans Research Project. June 2012.
72. United States Security and Exchange Commission. Form 10-K, Advance America, Cash Advance Centers, Inc. 17 May 2011.
73. Wang, J. "Small Dollar Economics: The CFPB White Papers." Consumer Financial Protection Bureau. Presented at Small-Dollar Credit: Products, Economics, and Regulation. Federal Reserve Bank of Philadelphia, Philadelphia, PA. July 2013.
74. Zinman, J. "Restricting Consumer Credit Access: Household Survey Evidence on Effect of the Oregon Consumer Rate Cap." *Journal of Banking and Finance*. 2009.

## Appendix A

### Regulation and the Payday Lending Industry - Robustness Checks

This section presents results and discussion for robustness exercises for Chapter 1. A limitation of the analysis is the unavailability of updated demographic and economic data. As stated previously, baseline results use data from the 2000 Decennial Census. The first robustness exercise includes linear-year trends interacted with demographic controls to allow for changing market conditions during the decade. The second robustness exercise, in addition to year trends, includes a recession-era indicator and interactions with demographic controls from Robustness Exercise 1. While the first exercise will control somewhat for market dynamics, a concern is that particular markets (for instance, the southwest region) where especially dynamic due to the events of the financial crisis. Including both interactions controls for "natural" growth and change over the course of time and change hastened by the events of the Great Recession.

The last robustness exercise expands the number of states observed, however this is at the expense of time. For Virginia and Tennessee, detailed branch data are available, but only after these states established an explicit policy environment. These states still experienced changes within established regulations, however, what is unobserved is the switch from no policy environment to an explicit policy environment. As a result, I expect the predicted effects and significance of the average effects of explicit regulations to decrease for all measured components.

#### A.0.1. Operating Branches, Including Time Trends

Table 9 displays results for all robustness exercises. All specifications include year and county fixed effects. Standard errors are displayed in parentheses below coefficient estimates and are clustered at the state-year level. Baseline results are

from Column 4 of Table 6. Column (1) includes only year-trend interactions. Column (2) includes both year and recession-era interactions. Column (3) includes Virginia and Tennessee, but excludes the year 2001.

Referring to Column (1), the most notable change is the change in sign and increase in significance on the effects of increasing branch capital requirements. When market dynamics are controlled for, increasing branch-level capital requirements leads to an increase in the number of operating branches. All remaining marginal effects decrease in magnitude and significance, but remain consistent in sign. When adding recession interactions, in Column (2), the trend continues. The marginal effect of increasing capital requirements becomes more positive and significant while other marginal effects decrease in magnitude, however, significance remains unchanged. These changes in marginal estimates suggest that the industry is highly sensitive to market-level changes over time and economics shocks more so to adjustments in existing policies.

Table 10 presents calculations for average effects of adopting policy for each component measured. The columns coincide with the columns in the previous table. Standard errors are displayed below calculations and have been calculated using the Delta Method. Focusing on Column (1), again the most notable change comes to the estimation of adopting minimum capital requirements for branches. Establishing any new capital requirements per branch leads to a decrease of almost 2 branches, this calculation being statistically significant. The effects of adopting loan-size ceilings falls slightly, but is relatively unchanged from baseline predictions. Lastly, enacting rollover restrictions becomes significant, leading to an increase of just over 1 branch per market. Predicted effects are similar when including recession-era interactions. These effects, relative to the changes in marginal effects, suggest that operating branches are more sensitive enacting polices rather than changing existing regulations. States that adopt explicit policies are imposing the cost of adoption (in terms of altered market practices) on to existing firms that operated with no established restriction previously.

### A.0.2. Operating Branches, Including Virginia and Tennessee

Table 13 displays summary statistics for branch-count data. Relative to Table 1A, adding the new states increases the average number of branches per market to approximately 1 branch, larger than the original set. This is a signal that the number of observed branches with some concentration has increased, though, given the extremely low mean, there are still a number of markets in which no entry or operating activity exists. Both the average number of branches to open and close have increase only slightly, signaling that entry and exit activity are similar in the newly added states relative to baseline data.

Table 14 presents summary statistics of the new sample data for the regulatory controls. Once again, within the sample, there are state-year observations in which no explicit regulations exist, however, a smaller proportion given that 2001 has been omitted from the sample. Asset or bond requirements are still the least observed requirement and loan size is the most observed regulation. Surprisingly, fee regulation is the least regulated of the loan terms, with only half of the state-year observations having some form of explicit regulation. When conditioning on the existence of regulation, average initial fees license and asset requirements have decreased, indicating that, in terms of financial requirements, financial quality regulations are somewhat less restrictive in the new sample. However, the increase in average renewal fees signals continued operations within the new sample becomes more expensive, and potentially more effective on the structure of the market. Within the new sample, loan and fee maximums remain relatively unchanged, however, rollover ceilings become more restrictive on average. Given these statistics, I expect the average effects of enacting regulations to remain relatively unchanged, given the similarity in "regulatory coverage" between the baseline data set and the newly observed states.

Returning to Table 10, Column (3), robustness among the marginal effects is mixed. The marginal effect of asset and bond requirements becomes more negative and is now statistically significant relative to baseline predictions. Increasing the asset requirement per branch by two standard deviations decreases the number

of operating branches by 0.44 branches, still a very small amount. The marginal effects of increase renewal fees is slightly less negative relative to baseline predictions, however, still consistent in significance. Similar to baseline predictions, these effects impose only slight barriers to entry and are modest. Consistent in magnitude but not significance is the prediction for the marginal effect of increasing the fee ceiling. Increasing the fee ceiling (as calculated as an APR) will decrease the number of branches by just over half a branch. Though this effect is small, important to note is that, with the inclusion of these two states, increasing the fee ceiling (in other words, making the regulation less stringent) leads to a decrease in the number of operating branches and a slight market contracting. Predictions for the effects of increasing the loan maximum are somewhat consistent as well, though slightly smaller in magnitude. The effect of changing rollover maximums decreases by more than half and loses all statistical significance.

Returning to Table 11 and relative to baseline predictions, predictions are highly inconsistent with respect to magnitude and significance. The average effects of enacting asset requirements increases in magnitude, however, the effects of enacting ceilings on loan size becomes substantially smaller and decreases by almost 90 percent of the original effect. Newly significant is the effect on enacting rollover regulation. States that enact rollover regulation, according to these particular results, will have a slight expansion of the industry. However, these results must be taken with some skepticism as Virginia and Tennessee are only observed when explicit regulations exist.

### A.0.3. Opening Branches, Including Time Trends

Table 11 displays robustness results for the dependent variable opening branches. All specifications include year and county fixed effects. Standard errors are displayed in parentheses below coefficient estimates and are clustered at the state-year level. Baseline results are from Column 4 of Table 7. Column (1) includes only year-trend interactions. Column (2) includes both year and recession-era interactions. Column (3) includes Virginia and Tennessee, but excludes the year 2001.

Relative to baseline predictions, including time-trend interactions and recession-era interactions decreases the magnitude of all predicted marginal effects, however, signs are consistent across tests. Licensing fees lose significance across Columns (1) and (2), as does the marginal effects of changing rollover ceilings. As was the case in the previous tests on operating branches, controlling for market dynamics dampens the impact of changing preexisting regulations. However, consistent with baseline predictions is the seemingly contradictory response of potential entrants to stringent regulations; even when controlling for market changes across the decade, increasing the stringency of product-defining regulations leads to an increase in the number of new branches.

Table 12 presents calculations for average effects of adopting policy for each component measured. The columns coincide with the columns in the previous table. Standard errors are displayed below calculations and have been calculated using the Delta Method. Including year and recession-era trends eliminates all statistical significance of enacting branch capital requirements. The effects of enacting loan-size maximums and fee ceilings still remain insignificant; the effect of enacting rollover maximums remains highly significant, however the magnitude decreases as market-level controls are added. Interestingly, as market changes are controlled for, the differences in explicit versus nonexistent policy disappear. For potential entrants, whether or not policy exists is of no concern. Rather, it appears that the intensity of regulations, how strict or relaxed existing policy is, is most important.

#### A.0.4. Opening Branches, Including Virginia and Tennessee

Table 12, Column (3) displays results when including Virginia and Tennessee. With the exception of the marginal effect of loan maximums, all predicted coefficients decrease in magnitude. All three marginal effects of decreasing the stringency on loan terms have a negative effect on the number of entrants, in essence, a more relaxed regulatory environment (conditional on regulations existing) will deter entry into the market. This is consistent with baseline predictions and further supports the explanation that established regulations that deviate away from preestablished

industry practices can have negatively affect the industry.

Examining Table 13, Column (3), the average effects on enacting regulations on the number of opening branches, is only slightly different from baseline predictions. Still insignificant are fee and loan maximums, indicating that there is no statistical difference in entry between states with established fee and loan size ceiling and those without. Surprising, but consistent with baseline predictions, is the positive effect on entry of enacting rollover ceilings, however the effect is slightly smaller. Though these results are somewhat consistent with baseline predictions, results must be taken with caution due to the scope of the data.

Table A.1: Robustness Exercises - Dependent Variable: Number of Operating Branches

	Baseline	(1)	(2)	(3)
Asset/Bond Requirement - Scaled	-0.0535 (0.1499)	0.4280** (0.1325)	0.4823*** (0.1191)	-0.4049** (0.1505)
Renewal Fee - Scaled	-1.4349** (0.4585)	-1.0048* (0.4568)	-0.9768* (0.4086)	-1.1139** (0.3937)
Calculated APR Ceiling - Scaled	-0.4408 (0.2411)	-0.3835 (0.2329)	-0.3429 (0.2167)	-0.4286* (0.1936)
Loan Amount Ceiling - Scaled	0.4691*** (0.0635)	0.0575* (0.0248)	0.0519* (0.023)	0.4102*** (0.0652)
Rollover Ceiling	-0.3062* (0.137)	-0.2702* (0.1311)	-0.2413* (0.1172)	-0.1497 (0.1152)
Indicator: No Minimum Asset Requirement	0.5742*** (0.1236)	1.7955*** (0.1773)	1.8142*** (0.1672)	0.7891*** (0.1159)
Indicator: No Loan Amount Ceiling	3.0200*** (0.7794)	2.4482** (0.7508)	2.3387** (0.6865)	-0.0998 (0.0914)
Indicator: No Fee Ceiling	0.0945 (0.0711)	-0.0439 (0.0803)	0.0144 (0.0803)	0.0636 (0.0552)
Indicator: No Rollover Ceiling	-1.7823* (0.7708)	-1.6087* (0.739)1	-1.4339* (0.6658)	-0.9055 (0.6634)
Constant	0.125 (0.5588)	-0.7796 (0.5299)	-1.1979* (0.5813)	0.139 (0.5069)
$N$	34505	34505	34505	45685
$R^2$	0.62	0.624	0.628	0.61

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table displays results for all robustness exercises for the dependent variable operating branches. All specifications include year and county fixed effects. Standard errors are displayed in parentheses below coefficient estimates and are clustered at the state-year level. Baseline results are from Column 4 of Table 6. Not displayed but included are the following market-level variables: total population, median household income, percentage black, percentage Hispanic, percentage male, education level, percentage military, poverty rate, unemployment rate, and number of traditional bank branches. Column (1) includes only year-trend interactions. Column (2) includes both year and recession-era interactions. Column (3) includes Virginia and Tennessee, but excludes the year 2001. Demographic data source: 2000 Decennial Census. Bank data source: Summary of Deposit Data, FDIC

Table A.2: Robustness Exercises - Dependent Variable: Operating Branches, Average Effects

	Baseline	(1)	(2)	(3)
Asset Requirement	-0.580 *** (0.026)	-1.744 *** (0.209)	-1.757*** (0.236)	-0.887*** (0.220)
Loan Maximum	-2.750 *** (0.699)	-2.415 *** (0.085)	-2.309 *** (0.077)	-0.331*** (0.562)
Fee Maximum	-0.313 (0.303)	-0.146 (0.263)	-0.184 (0.235)	-0.267 (0.275)
Maximum Rollovers	1.33 ( 0.695)	1.213 * (0.613)	1.080 * (0.548)	0.722*** (0.322)

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table presents calculations for average effects of adopting policy for each regulatory component measured. Effects are measured for the dependent variable operating branches. Baseline results are from Column 4 of Table 6. Column (1) includes only year-trend interactions. Column (2) includes both year and recession-era interactions. Column (3) includes Virginia and Tennessee, but excludes the year 2001. Standard errors are displayed below calculations and have been calculated using the Delta Method.

Table A.3: Robustness Exercises - Dependent Variable: Number of Opening Branches

	Baseline	(1)	(2)	(3)
Asset/Bond Requirement - Scaled	-0.3386*** (0.0639)	-0.2354*** (0.0562)	-0.2319*** (0.0518)	-0.3278*** (0.0725)
New License Fee - Scaled	-1.7952* (0.8169)	-0.8763 (0.6111)	-0.5914 (0.5372)	-1.4396 (0.8726)
Calculated APR Ceiling - Scaled	-0.2217*** (0.0535)	-0.1151** (0.0391)	-0.1058** (0.0339)	-0.2184*** (0.0531)
Loan Amount Ceiling - Scaled	-0.4632*** (0.115)	-0.3049** (0.0956)	-0.3384*** (0.0901)	-0.5293*** (0.1313)
Rollover Ceiling	-0.0921** (0.0343)	-0.0556 (0.0282)	-0.0475 (0.0251)	-0.0763* (0.0367)
Indicator: No Minimum Asset Requirement	-0.3590*** (0.0977)	-0.2072* (0.0806)	-0.2289** (0.0759)	-0.3665*** (0.1043)
Indicator: No Loan Amount Ceiling	0.4144* (0.1587)	0.2153 (0.1384)	0.1721 (0.1298)	-0.2542*** (0.0738)
Indicator: No Fee Ceiling	-0.1645*** (0.031)	-0.1246*** (0.0246)	-0.1140*** (0.0236)	-0.1596*** (0.0301)
Indicator: No Rollover Ceiling	-0.6179** (0.1891)	-0.3938* (0.1532)	-0.3470* (0.134)	-0.5404* (0.2094)
Constant	1.1893*** (0.2246)	0.7745*** (0.1814)	0.7511*** (0.1847)	1.2848*** (0.2653)
<i>N</i>	41355	41355	41355	51850
<i>R</i> <sup>2</sup>	0.293	0.329	0.343	0.29

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table displays results for all robustness exercises for the dependent variable opening branches. All specifications include year and county fixed effects. Standard errors are displayed in parentheses below coefficient estimates and are clustered at the state-year level. Baseline results are from Column 4 of Table 7. Not displayed but included are the following market-level variables: total population, median household income, percentage black, percentage Hispanic, percentage male, education level, percentage military, poverty rate, unemployment rate, and number of traditional bank branches. Column (1) includes only year-trend interactions. Column (2) includes both year and recession-era interactions. Column (3) includes Virginia and Tennessee, but excludes the year 2001. Demographic data source: 2000 Decennial Census. Bank data source: Summary of Deposit Data, FDIC

Table A.4: Robustness Exercises - Dependent Variable: Opening Branches, Average Effects

	Baseline	(1)	(2)	(3)
Asset Requirement	0.318 *	0.179	0.201	0.287
	(0.165)	(0.115)	(0.113)	(0.178)
Loan Maximum	-0.681	-0.391	-0.367	-0.045
	(0.690)	(0.454)	(0.504)	(0.725)
Fee Maximum	0.055	0.068	0.062	0.056
	(0.152)	(0.079)	(0.073)	(0.140)
Maximum Rollovers	0.483***	0.312***	0.277 ***	0.447 ***
	(0.209)	(0.126)	(0.108)	(0.164)

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table presents calculations for average effects of adopting policy for each regulatory component measured. Effects are measured for the dependent variable operating branches. Baseline results are from Column 4 of Table 7. Not displayed but included are the following market-level variables: total population, median household income, percentage black, percentage Hispanic, percentage male, education level, percentage military, poverty rate, unemployment rate, and number of traditional bank branches. Column (1) includes only year-trend interactions. Column (2) includes both year and recession-era interactions. Column (3) includes Virginia and Tennessee, but excludes the year 2001. Standard errors are displayed below calculations and have been calculated using the Delta Method.

Table A.5: Data - Summary Statistics for Branch-Level Data, Including Virginia and Tennessee

	N	Mean	Std. Dev.	Min	Max
Operating Branches	55305	1.037	2.901	0	41
New Branches	55305	0.149	0.592	0	14
Closing Branches	55305	0.127	0.552	0	16

Level of observation is ZCTA-year. Years observed are 2002 through 2010. Branch level data have been collected from state agencies responsible for licensing payday lending firms.

Table A.6: Summary Statistics - Regulation Data, Including Virginia and Tennessee

	N	Mean	Std. Dev.	Min	Max
A: Indicators for Regulation					
Licensing Requirements					
Regulation Exists	108	0.926	0.263	0	1
Requires Minimum Asset/Bond per Branch	108	0.231	0.424	0	1
Terms of the Loan					
Regulation of Loan Size	108	0.833	0.374	0	1
Regulation of Fees	108	0.519	0.502	0	1
Regulation of Rollovers	108	0.611	0.490	0	1
B: Values of Regulation Conditional on Regulation					
Licensing Requirements					
New License Fees	97	421.392	221.353	150	1000
Renewal License Fees	88	301.421	259.153	0	1000
Minimum Assets/Bonds Per Branch	100	3300.000	7114.504	0	25000
Terms of the Loan					
Loan Amount - Ceiling	84	517.619	192.721	300	1000
Fee/APR Amount - Ceiling	56	591.554	588.274	36	1955.36
Number of Rollovers - Ceiling	66	1.833	2.131	0	6

Level of observation is state-year. Years of observation are 2002 through 2010. Regulation data collected from current and historical policy. Conditional means calculated for states with observed explicit policy relevant to the component measured.

## Appendix B

The Hydra Effect: Measuring the Indirect Effects of Banning Payday Lending -  
Omitted Variables

As discussed in the Section 4 of Chapter 2, terms measuring the number of same-industry and payday-lending branches operating in the previous period are omitted in order to minimize serial correlation in the measured error. Table 10 displays the F-statistics for the Wooldridge test for autocorrelation in panel data. The specifications tested are for the dependent variables measuring the number of operating branches operating in industry  $a$  in a given county-year that include same-industry lagged operating branch counts, lagged payday lending branch counts, and both. The null hypotheses,  $H_0$ , states that the specification tested has no first-order autocorrelation present. Therefore, including controls that are lagged by one period does not introduce unnecessary endogeneity. If rejected, then serial autocorrelation exists, thus omitting one-period lagged variables is appropriate.

For operating pawnbrokers and all specifications, the null hypothesis is strongly rejected and autocorrelation exists. Therefore, the previously discussed specification controlling only for county-level trends is most appropriate for the analysis. For operating precious metals dealers, for a probability threshold of 5-percent, F-statistics for all specifications indicate a rejection of the null hypothesis. Therefore, it is appropriate to exclude lagged operating branch counts for both precious-metals dealers and payday lenders.

For small-loan lenders, the null hypothesis cannot be reject for the specification that includes only the lagged value of operating payday lending branches. Additionally, for second-mortgage lenders, failure to reject the null-hypothesis exists for specifications that include only lagged same-industry operating branches and both lagged variables. Table 13 presents coefficient estimates with these variables included in the speciation.

### B.0.5. Discussion

Column 1 presents the updated coefficient estimates for the dependent variables measuring the number of operating small-loan licensees in a county-year now including the previous period's operating payday lender branch count. Column 2 presents updated coefficient estimates for the dependent variable measuring the number of operating second-mortgage licensees, including only the previous period's operating same-industry branch county. Column 3 presents the updated estimation results for second-mortgage licensees, including both same-industry and payday lending lagged branch counts. Results were estimated still using the SUR-estimation procedure, with the original specifications for pawnbrokers and precious-metals dealers, including county-fixed effects.

#### **Small-Loan Lenders**

When including the lagged number of operating payday lenders in the estimation specification, the magnitude of the effect of banning payday lending on the number of operating small-loan lenders decreases. Referring to Column 1, the existence of a payday loan ban decreases the number of operating small-loan lenders by 0.01 branches, significant at the 0.1-percent level. Relative to a previous coefficient estimate of -0.527, the effect of the ban is weaker, implying that the relationship between the two industries is tenuous at best. What is clear in these results is that payday lenders are not licensing as small-loan lenders in order to work-around imposed fee bans.

#### **Second-Mortgage Lenders**

There is a marked change in the effect of banning payday lending on the number of operating second-mortgage licenses when including previously omitted variables. In Column 2, after including the lagged number of operating second-mortgage licensees, the estimated effect of banning payday loans becomes positive, yet remains statistically insignificant. From Column 3, a ban on payday loans increases the ob-

served number of operating branches by 0.572 branches, however, the effect is statistically equivalent to zero. There also exists a positive relationship between same-industry branch concentrations across periods: increasing the number of lagged, active second-mortgage licensees by 1-standard deviation, or by 32 branches, increases the observed number of current-period active second-mortgage licensees by over 7 branches.

In the full specification in Column 3, the results do change, however not still not statistically significant. When a payday loan ban exists, the number of operating second-mortgage lenders increases by 1.614 branches, significant at the 0.1-percent level. The number of second-mortgage licensees operating in the previous period has a positive and significant effect on current period operating second-mortgage licensees: a 1-standard deviation increase in the number of lagged operating second-mortgage lenders increases the current period's operating second-mortgage lenders by over 5 branches. Additionally, the concentration of payday lenders in the previous period also increases the number of licensed operating second-mortgage lenders: the number of operating second-mortgage licensees increases by 2.80 branches with a 1-standard deviation increase of payday-lending branches operating in the previous period.

These updated results indicate that a ban in payday loan most certainly has an affect on the structure of the second-mortgage industry. While not a one-for-one relationship, second-mortgage licensees appear to be replacing payday lending branches that have exited concentrated markets. These effect signals the payday lending industry is choosing to circumvent established restrictions by licensing as second-mortgage lenders that offer unsecured loans versus exiting the market or changing product mixes.

Table B.1: Wooldridge test for autocorrelation, F-statistics

Industry:	Same Industry		Payday Lending Industry		Both	
	F( 1, 80)	Prob > F	F( 1, 80)	Prob > F	F( 1, 80)	Prob > F
Pawnbrokers	206.311	0.000	207.043	0.000	134.437	0.000
Precious Metals Dealers	3.850	0.053	7.046	0.010	4.399	0.039
Small-Loan Lenders	70.322	0.000	0.999	0.321	13.562	0.000
Second-Mortgage Lenders	2.896	0.093	7.695	0.007	0.000	0.987

Table B.2: SUR-Regression Results: Operating Branches, Including County-Fixed Effects

	(1)	(2)	(3)
ban	-0.301*** (0.0791)	0.572 (0.835)	1.418 (0.852)
sameindustry_operate_lag		0.229*** (0.0282)	0.176*** (0.0322)
pd_operate_lag	0.0579*** (0.00516)		0.234*** (0.0624)
tot_pop	-0.291*** (0.0880)	-4.508*** (0.960)	-5.201*** (0.967)
median_income	0.352 (0.261)	-0.867 (2.848)	-0.212 (2.816)
perc_male	0.00687 (0.143)	2.810 (1.570)	2.656 (1.550)
perc_white	-0.00185 (0.00299)	0.105** (0.0335)	0.105** (0.0331)
perc_black	-0.00276 (0.124)	-7.967*** (1.471)	-8.054*** (1.453)
unemp_rate	0.0145 (0.0136)	-0.0904 (0.149)	-0.111 (0.147)
military	0.688 (0.663)	8.237 (7.261)	8.404 (7.168)
perc_ppl_pov	0.0395 (0.0306)	-0.0566 (0.335)	-0.0646 (0.331)
ed_pct_hsdip	0.0181 (0.0357)	0.125 (0.391)	0.0422 (0.387)
_cons	-0.140 (0.125)	-0.813 (1.365)	-0.708 (1.348)
<i>N</i>	325	325	325

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$