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

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Abstract

In November of 2008, the state of Ohio enacted 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-month-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 positive effects on all observed industries, with the largest effect on the small-loan and second-mortgage lending industries, nearly doubling the size of the small-loan lending industry and increasing operating second-mortgage lenders by over 3 branches per period. In periods after the ban, the second-mortgage industry exhibits a slight expansion (1.579 branches), while the pawnbroker industry exhibits a slight contraction (-0.926), as measured by the effect of the ban on the change in the number of operating branches. Likewise, the existence of the ban deters entry in the pawnbroker market and encourages entry into the second-mortgage lending industry. These results suggest that payday lenders choose to dodge enacted restrictions and continue operations by licensing under regulations that contain loopholes versus 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.

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1 Introduction

In 1996, the state of Ohio enacted the Check-Cashing Lending Law, establishing guidelines for payday lending firms and enabling operation. Over a decade, the payday lending industry in the state expanded similar to national trends. However, sentiment surrounding the industry became increasingly negative; payday lending firms were viewed with increasing criticism and concern for consumer welfare grew. In 2008, Ohio established new payday lending legislation called the Short-Term Loan Law (STLL). In addition to changing licensing requirements, this legislation limited the allowable calculated annual percentage rate (APR) to 28 percent per anum, implicitly banning the practice of payday lending statewide.

In an attempt to eliminate the hardships caused by payday loan usage through prohibition, state regulators may have inadvertently shifted the problem from one industry to another, thereby diverting the problems caused by alternative financial service use rather than eliminating them. Previous studies have shown, after access to payday loans has been restricted, consumers will seek alternatives and substitute across other financial service products, such as pawnbrokers, over-draft fees, and direct deposit advances.

In this study, I attempt to answer the question, "Does effectively banning payday lending have any indirect effects on the structures of other industries?" Research on the consequences of limiting access has shown that consumers will substitute with other alternative forms of financial services if payday loans are unavailable. It is reasonable to expect that firms should also adjust offered services in response to policy in order to extract excess profits from markets with an increased demand. For incumbent firms, if economies of scope exist, then expanding product mixes to include other services, such as pawnbroker or title loans, can increase profits for firms that choose to remain operational after an implicit ban. Additionally, excess profits could also induce new firms to enter, firms that would otherwise remain out of the market. Both cases imply the expansion of markets that are potential substitutes for payday loans. This is an economic phenomenon that I call the Hydra-Effect: when the process of eliminating one industry causes the expansion and growth of one or more potentially related industries.

Using licensing records collected by the State Division of Financial Institutions from 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 the 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 as a result of an implicit ban on payday loans. 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 (SUR) estimation procedure, including county-, year-, and county-year fixed effects to examine how capping interest rates affects the aforementioned outcomes.

Results indicate that restricting payday lending to the point of prohibition will cause slight increases in the pawnbroker and precious-metals industries but more pronounced effects in the small-loan and second-mortgage lending industries, industries that allow for payday lenders to continue operations by circumventing restrictions through existing loopholes. For the small-loan lending industry, the policy changes stimulates growth that nearly doubles the size of the industry at the country level, relative to the mean number of operating branches observed. Withing the second-mortgage industry, the effects are highly fascinating when considering the economic conditions of the market itself. Establishing tight restrictions on payday lenders will increase the number of operating second-mortgage lenders by over 3 branches in a given county-month-year. This change occurs when controlling for declining national housing prices and in spite of a national economic downturn that cause the housing industry to sharply contract during the years of observation. Additionally, in periods when the ban was enacted, there is statistically significant levels of growth, with more entrants and higher levels of operating second-mortgage lenders after the ban has been enacted. Not only are payday lenders moving to other industries, the preferred response to restrictive policies appears to be circumventing the law.

My research contributes to the existing literature on payday lending and the consequences of access, however, I turn the lens to examine changes in 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 that perpetuate the perceived hardships of alternative financial service use. Relevant to the results discussed above, while payday lending is banned, ignoring the other avenues that the service can be
offered simply allows for the industry continue to exist, 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 within a market.

The remainder of the paper is organized as follows: Section 2 describes the relevant literature and economic relevance, Section 3 discusses the Ohio Short-Term Lending Law and potential alternative industries, Section 4 discusses the empirical specification, Section 5 discusses the data and summary statistics, Section 6 presents results and interpretations, and Section 7 concludes.

2 Background

As the payday lending industry grew in the 2000’s, so too did the attention of policy makers at state and national levels. Between the years 2007 and 2012, over 500 bills were introduced by state 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 enabled payday lenders to operate within state borders. The remaining states and territories\(^1\) prohibited usage either by explicit ban or by requiring lenders to comply with interest-rate maximums applied to traditional consumer financial products.

In 2008, the state of Ohio restricted fees collected on payday loans to be no greater than 28 percent APR. For a $300 loan extended for 14 days, this amounts to fees less than $3.25 per loan\(^2\). Under these terms, the practice becomes extremely unprofitable and unsustainable, thereby driving the industry out of the state.

Changes in loan availability and industry structure have shifted the focus of existing consumer-side research on the payday lending industry. Initially, the focus of demand-side literature focused on the welfare of borrowers using payday loans, attempting to uncover the possible hardships

\(^1\) 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.

\(^2\) The following formula is used to determine APR as used by DeYoung and Phillips (2009). 

\[
APR = \frac{\text{Fee} \times \frac{365}{\text{Term}}}{\text{Loan Amount}}
\]
associated with payday-loan use. As states have been moving towards prohibition, research on usage has been shift away from the consequences of access to the outcomes caused by limited access to payday loans directly and how consumers respond to restrictions.

2.1 Demand-Side Behavior

Understanding the financial decisions of payday loan borrowers is important in understand how this market segment will potentially react when a sometimes vital source of financing becomes limited in some capacity. Lawrence and Elliehausen (2008) examine the results of a survey on payday loan customers conducted between the years 2000 and 2001. Specific to the use of other credit products, the authors find that 91.6 percent survey respondents are borrowers from other sources of credit, the majority of respondents using close-ended forms of credit rather than revolving forms of credit, like credit cards. Additionally, compared with general population statistics, the survey finds that payday loan borrowers are likely to be more burdened by credit use: monthly payments of credit payments are at least 20 percent of earned income versus less than 10 percent for the general population. This fact likely leads to payday loan users being limited in their ability to attain credit elsewhere: according to the survey, 73 percent of payday loan users reported being rejected or limited in credit extensions in the previous 5 years. This survey highlights that while payday loan borrowers do borrower from other credit sources in conjunction with payday loan use, these users rely on payday loans for their credit needs due to the limited availability of other forms of credit.

A subset of the existing demand-side literature on the payday lending industry examines the changes in consumer behavior when access to payday loans is limited or completely restricted. Zinman (2009) compares substitution behavior between consumers in Washington and Oregon after Oregon banned lending through interest-rate caps. He finds that consumers will substitute to using late-fee payments and overdrafts, products with higher calculated interest rates, when payday loan access is limited or eliminated. Of studies that examine simultaneous use across financial service products, Bhutta, et.al. (2012) find payday loan applicants simultaneously apply for credit cards, mixing traditional and alternative sources of financing. Carter (2012) also finds that borrowers sought financing from pawnbrokers, a similar alternative financial service product, in states where

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3The current research gives no consensus to the absolute effects of payday-loan utilization. Studies have found usage to give rise to negative welfare outcomes (Stegman and Faris (2003), Skiba and Tobacman (2009), Melzer (2011)), but also positive or no effects from access and usage (Zinman (2010), Morse (2011))
access to payday loans was restricted through limitations placed upon the ability to rollover or 
renew payday loans. Additionally, where rollovers were explicitly restricted, she finds a higher 
concentration of licensed pawnshop branches, suggesting that firms in related industries respond 
in-kind to restrictive payday lending regulations. Goldin and Homonoff (2013) find users with 
limited access to traditional credit will substitute with the use of pawnshop loans when payday 
loans are no longer available. McKernan et.al. (2013), find payday-loan 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.

These studies highlight two important facts: 1) Payday loan customers do use other alternative 
financial products. If limited in choice, 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 applicable to separate, however, related industries. Carter (2012) finds that pawnshop 
locations are in close proximity to states where restrictions for payday loans are lax. This is an 
indication operating pawnbrokers are aware of payday lending policy and the consumption behavior 
of borrowers.

2.2 Supply-Side Response

Literature on demand-side responses indicate the possibility that related AFS industries could 
stand to benefit (and grow) from the prohibition of payday loans. There are two potential sources 
for this growth: adjustments made by incumbent firms and entry by new firms. In both cases, the 
matter is simply a cost-benefit analysis.

Existing payday lenders will adopt new practices if increased revenues from the shift in demand 
are greater than the costs of switching practices. Possible sources of increased revenue include 
increased usage of substitute products from new and former payday loan borrowers searching for 
AFS loans in the absence of payday lending. Sources of increased costs include the new costs of 
licensing, new training, equipment, etc. If so, then payday lenders faced with looming restrictions 
are likely to switch industries and remain operational, albeit as a different AFS provider. Note, it 
may be the case that potential revenues are greater because of the ban and the subsequent increase 
in demand. This is analogous to the transition from check-cashing and payday lending at the
beginning of the 2000’s; shared resources made both practices profitable, the same could be true in this context of banning payday lending.

Focusing on licensing switching alone ignores the response by potential entrants. 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 previously discussed, excess profits may result because of the shift in demand for substitute products. 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 inter-state response of different industries to increased restrictions in payday-loan policy. By observing areas prior to and after the enactment of restrictive policies, I can determine if alternative industries are affected by payday lending prohibition. In the special case that a related industry expands from the banning of payday lending, I classify this economic phenomenon as the “Hydra Effect”\(^4\): 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, using the state of Ohio as a case study.

\section{Ohio and the Short-Term Loan Law}

Like many other states, the payday lending industry in Ohio grew out of the established check-cashing industry. Under the Check-Cashing Loan Law in 1996, check-cashers extending payday loans were required to apply for a second ”check-cashing loan” license. Under the policy, 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 legis-

\(^4\)The Hydra is a creature from Greek mythology. An attempt to cut off one of the heads of this creature would result in two growing in its place. (Taken from http://www.mythweb.com/)

\(^5\)Faller (2008) refers to the payday lending industry as the Hydra that has to be slain, citing the industries ability to rapidly adjust to policy environments
lation 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 31 days. Further, and most important, the calculated APR for all loans could not exceed 28 percent APR. This new law implicitly banned payday lending as duration and fee restrictions made extending these loans unprofitable, 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)). The law was passed by state officials in September of 2008. However, it did not become effective until November of that year.

3.1 Alternative Industries

While payday lending had been implicitly restricted, opponents of the product still worried that lenders continued operations within the state under the guise of other forms of lending. 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.

3.1.1 Pawnbrokers

As previously discussed, the most common substitute for the use of payday loans is the use of pawnbrokers. Pawnbrokers are regulated under the Ohio Revised Code (ORC), Chapter 4272, as financial service 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. Both financial services offer small, short-term loans with very few conditions. Also, unlike payday loans, pawnshop loans do not require proof of employment or a checking account, thus making the pawnshop transaction somewhat easier relative to the transaction requirements of a payday loan.
3.1.2 Precious Metals Dealers

Precious-metals dealers are licensed occupations rather than financial service providers. By definition, precious-metals dealers purchase items made of gold, silver, platinum, 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 or need to surrender the exchanged good. These 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 hands; there are no required credit checks, proof of employment, or proof of being banked.

Pawnbrokers and precious metals dealers are likely substitutes for consumers that use payday loans for small and short-term expenses. Pawnbrokers and precious-metals dealers provide a transaction and service similar to the payday lending process due to the minimal requirements for acquiring financing. In addition to substitutes, one must identify which industries allow for payday lenders to circumvent restricting policies. The industries discussed below have established regulations such that loopholes exist that allow for payday lenders to continue operations.

3.1.3 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, but are not required to be. Unlike payday or short-term loans, there are no duration limits defined by the regulation. Allowable interest charges are based upon the amount loaned and 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, the 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/or any other charges authorized by the lender. If extending a loan under the Small Loan Law, it is entirely plausible for a lender to still offer payday loan-like products while licensed as a small-loan lender\(^6\) with calculated interest rates approaching the typical APRs for payday loans (Parker (2013)).

\(^6\)To quote the Bard, “By any other name would smell as sweet.” So too is the case for payday loans.
3.1.4 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 duration limits, and distinct provisions 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)).

In the presence of a payday-loan ban, firms can adjust and adopt new product services or circumvent the ban through existing laws. These four industries allow for payday lenders to do either. There is still a question of cost: is it less costly to bypass legal restrictions, adopt substitute services, or exit the market completely? While licensing fees for all four identified industries are rather low\(^7\), the implicit costs are the highest for second-mortgage lenders. Licensees have to complete both state and national-level training to receive certification. However, of all the possibilities, while demand shifts and lower costs of licensing make entry into substitute markets a seemingly obvious choice, licensing and operating as a second-mortgage lender offers the opportunity for higher profits given the fee structure of the established policy. Therefore, there is no obvious answer as to which industry will be most affected after banning payday lending and what these effects will be.

For all four of these industries examined, no new regulations affecting loan products or conditions were established. The only major change in alternative financial service regulation occurred in 2008 with the passage of the Short-Term Loan Law. This provides a natural experiment to examine the effects of policy changes and an exceptional opportunity to identify indirect policy effects. The next section discusses the empirical specification used to identify the indirect effects of implicit prohibition.

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\(^7\)As stated by ORC 1321.20, licensing fees for pawnbrokers, precious metals dealers and small-loan lenders cannot exceed $300. Second-mortgage lender fees cannot exceed $150.
4 Empirical Specification

The research question this study seeks to answer is, "How does an implicit ban on payday lending impact the structure of alternative, potentially related industries?" In order to answer this question, I use a Seemingly-Unrelated Regression (SUR) estimation specification. The reduced-form empirical specification is as follows:

\[ Y_{ct}^a = \alpha_0 + \alpha_1 Ban_t + X_{ct}\beta + E_t^a\delta + \mu_c + \gamma_y + \epsilon_{ct}^a \]  

(1)

\( Y_{ct}^a \) measures the aggregate county-level branch counts licensed to operate in industry \( a \) in county \( c \) in period \( t \). \( Ban_t \) is a state-level indicator variable that is equal to 1 if payday lending has been banned in period \( t \) or 0 if otherwise.\(^8\) 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 branches open. If, however, \( \alpha < 0 \), the industry is still indirectly affected by the ban and contracts in response. In this particular scenario, rather than being a potential substitute, firms within industry \( a \) view higher restrictions on the payday lending industry as a signal of a legislative trend and could expect that strict regulations for industry \( a \) will soon follow.

\( X_{ct} \) is a vector of demographic characteristics for county \( c \) in period \( t \). Demographics included are total population, median household income, sex, race, education, military population, unemployment rate, and poverty rate for each county observed. \( E_t^a \) is a vector of industry-specific, supply-side market factors that likely influence the outcome variable measured. \( \mu_c \) is a county-level fixed effect. \( \gamma_y \) is a year-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 economic shocks and unobservable factors. The SUR-estimation procedure corrects for the correlation between \( \epsilon_{ct}^a \) and \( \epsilon_{ct}^{-a} \).

4.0.5 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

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\(^8\)For the purposes of this study, November 2008 is the first period where the ban becomes effective, thus the first period for which \( t \) is equal to 1.
additional dependent variables: the change in the number of operating branches and the number of new branches. Measuring the effect on the change in operating branches offers insight into how a particular industry responds by capturing both entry and exit behavior and the trends in industry dynamics over the observed period. 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.

4.0.6 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. Given the events leading up to the enactment of the law, this is a logical assumption.

The Short-Term Loan Law, HB 545, was initially passed by the Ohio legislature in the September 2008, however it was not enacted until November of the same year. After its passage, industry proponents pushed to overturn the law through the veto referendum process by having the electorate vote on the issue. The referendum was unsuccessful and the Short-Term Lending Law was enacted, thus enforceable. 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, its efficacy and enforceability were not achieved in this initial stage. The law itself only became effective after it was approved by Ohio voters months later. Therefore, the ability of the industry to explicitly influence the outcome of the election is quite low. Additionally, supporters of the law vilified the payday lending industry. It is unlikely that other alternative financial service providers offering similar products and operating under similar regulatory structures would draw attention to themselves by being involved in the referendum process. I believe that the policy change enacted in 2008 is exogenous to influence by the industries that I examine.
4.0.7 Omitted Variables

The above specification does not include explicit regulatory controls for any of the industries analyzed. 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 $a$ and the payday lending industry in a given county-period. 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 highly endogenous, biasing estimates.

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. Further, the availability of licensing data for short-term lenders and the aforementioned industries allows for the cross-industry analysis response as a result of the ban. In total, I observe 410 county-month-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.

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 organizations 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 license, expiration date, and status. If the branch is currently active during the period of observation, the branch has an ”ACTIVE” status and 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 observation, a branch is designated as having initially opened and having operated. A branch is designated as "OPEN" if the initial license period is the same as the observation period. 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 period. Branch counts are aggregated to the county-year level for analysis.

Data are observed for all months starting in the year 2006 through the year 2010. Table 1 displays the summary statistics for all three dependent variables measured. Table 2 expands summary statistics for these measured outcome to pre- and post-ban values.

5.1.1 Operating Branches

Table 1.A displays the summary statistics for the number of operating branches for each observed industry. Beginning with licensed payday lenders, overall values suggest a concentrated industry within the state, with an average number of operating branches equal to 4.745 branches. This concentration appears to vary widely across the sample with the standard deviation of 12.457 branches; this is likely caused not only by the effects of the ban, but also regional differences in concentration. Indeed, observed in Table 2.A, the payday lending industry was demonstrably concentrated and active within the state prior to the ban. On average, there were 7.58 operating branches per county between January 2006 and November 2008. The effects of the ban can most definitely be seen: the average number of operating payday lenders after the enactment in November 2008 decreases to 1.038 branches per county in a period, indicating a dramatic contraction of the industry.

Pawnbrokers and Precious-Metals Dealers are similarly concentrated to one another over the entire sample, with mean branch counts of 2.590 and 2.261, respectively. Variation in operating branches is higher for pawnbrokers, with a standard deviation of 6.13 branches per county-month-year versus 4.419 precious-metals-operators. While not to the extent of payday lending branches, it does appear there is moderate variation from regional and temporal differences. Observing statistics segmented by pre- and post-ban periods, both industries experience a slight expansion after the ban takes effect. There are an average of 2.192 operating pawnbroker branches and 2.144 operating precious-metals branches in operation prior to the ban. When segmenting by policy period, these industries bear a closer resemblance to one another prior to the ban than
after it. Post ban, the average number of operating pawnbroker branches increases by almost 1 full branch per county-month-year to an average of 3.111 operating branches per county-period. Additionally, the number of operating precious-metal dealing branches increases by slightly less than half a branch. From this preliminary analysis, there appears to be an indirect response by the supply-side of industries that provide potential substitutes in the absence of payday loans. Just as consumers switch, so do firms.

As observed, small-loan lenders, are the least concentrated industry. From Table 1.A, the mean number of small-loan lending branches measures just above a half branch. Additionally, variation across the sample indicates not only a sparsely concentrated industry (relative to the other industries observed), it also indicates somewhat of a static industry, with a standard deviation of 1.276 branches. This is reiterated in Table 2.A, after the ban is effective, there appears to be a slight contraction of the industry, however this contraction is less than 0.10 branches.

The second-mortgage industry is the most concentrated industry, with an average number of operating branches equal to 13.741. Traditionally, this industry is a separate market segment all together: borrowers of secured financing. Variation across the entire sample is indicative of intestine volatility: the observed standard deviation of operating second-mortgage lenders is 35.617 branches. This is likely due to external market factors, primarily the rise and fall of the housing market and the onset of the Great Recession, both events that occur during the observed period and correspond to the timing of the ban as well. From Table 2.A, there is a slight decline in the observed average number of operating second-mortgage lenders before and after the ban (15.867 and 10.96 branches, respectively). It appears that market forces have caused this market to contract and the ban does not encourage any expansion, meaning payday lenders appear to not be exploiting potential loopholes.

5.1.2 Change in Operating Branches

Tables 1.B and 2.B display the summary statistics for the change in the number of operating branches in each observed industry over the whole sample and separated by periods before and after the ban, respectively. These statistics are informative of the dynamics of an industry, not just the size in a particular county and period, but how the industry itself changes from one month to another. From Table 1.B, over the course of the entire sample, the average change in operating payday lending branches is -0.109 branches per county-period. Given the previous discussion, this
is indicative of the constricting effects the APR limit has imposed on payday lending firms and branches. From Table 2.B, prior to the ban the payday lending industry within the state was relatively stable (mean change of 0.189 branches). After the ban, the average change in operating branches signals a swift decline of the industry, with an average decrease of -0.487 branches per county-period.

It appears that the pawn industry is relatively stable over the course of the entire sample as well as in the separate periods separated by the ban. The observed means for the change of operating pawnbrokers are less than 0.10 branches in both contexts - this is not a dynamic industry. However, given the previous discussion, there is an observed expansion to the pawnbroker industry. This is likely a one-time shift in the supply of pawnbroker branches rather than a trending expansion of the industry. While small in magnitude, the precious-metals industry appears to be expanding in both policy periods, and this expansion increases in the post-ban periods of observation. Rather than a one-time shift, there is a slow and steady increase in the precious-metals industry.

The apparent story is different for the small-loan and second-mortgage industries. From Table 1.C, both industries, appear to be contracting with mean changes in operating branches of -0.004 and -0.137 for small-loan lenders and second-mortgage lenders, respectively. However, when examining pre- and post-ban periods separately, the data tell an intriguing story. Prior to the ban, the number of operating small-loan lending branches is stable and practically unchanging, with a mean change of 0.009. However, after the ban was enacted, the average change increases in magnitude and becomes negative, equal to an average change of -0.021 branches. It appears that the small-loan industry is responding to the ban, however, rather than expanding from entering former payday lenders, the industry is contracting as if limits had been directly imposed. In contrast, prior to the ban, the second-mortgage industry is observed to be in decline, with an average change in operating branches of -0.289. Again, these effects are likely due to national economic trends affecting the housing and financial markets. However, in periods after the ban, the decline is reversed: there is a very slight expansion observed with an average difference of 0.056 operating branches from one period to the next. While the magnitude itself is small, it has to be noted that the extreme and nationally driven decline of this industry has been completely reversed in post-ban period.
Tables 1.C and 2.C displays the summary statistics for the number of newly licensed branches. From Table 1.C, there is very little entry into the payday lending industry when observing over the entire sample: the mean number of new entrants is 0.130, well below the average number of observed operating branches. Therefore, within all years of observation, Ohio’s payday lending industry is saturated, not exploding with growth. This is the same story when observing the average number of new branches segmented by period. Before the ban, only an average of 0.229 new branches opened per month in a given county, again indicating very little growth of the industry. However, the effects of the ban are evident: not a single new payday lending branch opened after November 2008. Not only is the industry exiting the state, payday lenders are staying out of the state as well.

For the pawnbrokers and precious-metals dealers, while averages are small, figures are not consistent across pre- and post-ban periods. From Table 1.C, it appears that both of these industries are stable with very small average new branches per period. However, the magnitudes of these statistics are vastly different when segmenting by regulatory period. Prior to the ban, the mean number of new pawnbroker branches measures 0.033 branches. This figure decreases by a scale of 10 in the period after the ban was enacted, with an average of only 0.003 newly licensed pawnbrokers. Likewise, the average number of newly licensed precious metals dealers is more than 5-times larger after the ban is enacted (0.024 branches) than before (0.004 branches). For both of these industries, there is a push occurring, however, this push in relationship to the policy is completely opposite.

Finally, entry into the small-loan and second-mortgage industry appears to be stable over time. From both tables, the distinction between whole-sample and period-segmented summary statistics is very slight. For the second-mortgage industry, this is an intriguing non-event. For an industry upended by national trends, stability in entry is seemingly opposite to what one should observe when this industry has been described as “crashing”. These statistics indicate relative stability and an extremely slight expansion for both industries.

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.

5.2 Trends in Branch Counts

Figures 1 through 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 by period. January 2006 corresponds to Period 1. The APR ban was introduced in Period 33 (September 2008) and became effective in Period 35 (November 2008).

From Figure 1, the number of operating payday lending branches is on a slow and steady incline from periods 1 to 31; this echoes observations from summary statistics that this industry in particular was in a period of relative stability prior to when the policy change took effect. As a stipulation of the proposed policy, operators not yet licensed as "short-term" lenders were required to register with the state, this is observed with the spike in the new and operating payday lenders and signals when the policy was initially passed. However, shortly after there is a very sharp decline in the industry, signalling the effectiveness of the policy in reducing the number of operating payday lenders to zero.

In Figure 2, the growth in operating pawnbrokers is flat when examining the pre- and post-ban periods independently. However, in periods before the policy change, there is an upward shift in the entire population of operating pawnbrokers by approximately 75 new branches. Indeed, there is a spike in the number of new branches corresponding to the period when the ban was initially passed and no real exit in the industry of the entire period. This is a large shift for the industry considering the observed summary statistics previously discussed. From preliminary observation, there is strong evidence that the pawnbroking industry is responsive to payday lending regulation and there is new service adoption occurring.

Figure 3 displays the trends in branch counts for the precious metals industry. The number of operating precious metals dealers is stable prior to the ban. Starting in period 43 (September 2009) there is noticeable growth. This is not an immediate reaction to the policy - if there is reaction from this industry at all. It is likely that external market forces are driving this growth, mainly the increasing prices of precious metals during the same period. Recall, 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 4 displays trends in branch counts for the small-loan lending industry. The trends here are nothing short of fascinating. This particular industry is stable prior to the ban, sharply expands starting in period 31 (June 2008) then sharply contracts approximately one year after. It is entirely possible, in periods starting just before the ban, former payday loan operators were entering the small-loan industry as a means to circumvent the impending restrictions. This industrial shift occurred for almost a full year until the observed contraction. What would cause such a sharp decline in opposition to a steady trend? This switching activity was likely observed by policy makers and consumer advocates looking to prohibit payday lending, therefore the hidden loopholes in existing small-loan lending legislation were revealed, eliminating the benefit of circumventing through the small-loan industry.

Lastly, Figure 5 displays branch trends in the market for second-mortgage lenders and these trends are equally as fascinating. Starting in 2006, the industry is in decline, decreasing from 1,400 operating branches to just over 800. This decline continues to just before period 31 - a mere two months before the ban was initially approved by policy makers. After this period, the downward trend reverses and the number of operating second-mortgage branches increases then stabilizes after period 41. In the middle of the worst of economic times - particularly for the housing industry, the second-mortgage industry in the state of Ohio begins to expand contrary to economic predictions. It appears that former payday lenders are also choosing to re-license as second-mortgage lenders in order to work around payday lending regulations.

5.3 Additional Data

Demographic data are collected from the US Census American Community Survey 3-year estimates. Gold prices are measured using the observed market price per Troy Ounce from the London Bullion Market Association, adjusted for inflation, using 2006 as the base year. Figure 6 displays the trend in the real price of gold per ounce over the observational period. From the figure, the price of gold steadily increases over the course of the entire sample. Notice in periods surrounding the enactment of the STLL, there is a slight decline in the price of gold, then a sharp recovery and continued increase. This can likely explain the trend in the observed number of operating precious-metal dealer branches: these firm were reacting to the stable increase in the price of gold that occurs after the policy change.

Housing prices are measured using the S&P/Case-Shiller 20-City Composite Home Price Index.
The trend in housing prices is displayed in Figure 7. Just as described, there is a noticeable decline in the national level of housing prices from 2006 to 2010. However, what is most interesting to note is that the sharpest decline in housing prices occurs in periods surrounding the ban and stabilizes almost a year after the policy change has been implemented. By this figure, what should be observed is a decline in the number of operating small-mortgage lenders in the same periods - however, the direct opposite trend in observed, as discussed in the previous section. Again, the trends observed in the second-mortgage industry are a direct contradiction to what should be happening in response to the national trend.

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, SUR-estimations were conducted for each dependent variable discussed: the number of operating branches, the change in operating branches, and 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, four estimations were conducted. Column 1 does not include any fixed effects, Column 2 includes only county-fixed effects, Column 3 includes only year-fixed effects and Column 4 includes both county- and year-fixed effects.

6.1 Dependent Variable: Number of Operating Branches

6.1.1 Pawnbrokers

Table 3 presents the results for the pawnbroker industry. In Column 1, period-years with a payday lending ban in place have 1.079 more operating pawnbroker branches than prior, with significance at the 0.1-percent level. When not controlling for county- or year-level factors the results indicate industrial expansion and the existence of the Hydra Effect. When correcting for county-level effects in Column 2, this effect decreases in magnitude: banning payday lending increases operating pawnbroker branches by only 0.741 branches, with statistical significance unchanged. Controlling for year and year-county level effects (observed in Columns 3 and 4) decrease the magnitude of the effect of the ban even further, however significance is maintained. Imposing a restrictive APR on
the payday lending industry will cause an increase in the number of operating pawnbroker branches by 0.651 branches. 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.

6.1.2 Precious Metals Dealers

Table 4 presents the estimation results for the dependent variable measuring the number of operating precious metals dealers in a county for a given month-year, another potential product substitute for payday loans. In Column 1, with no fixed effects, a ban on payday lending increases the number of observed precious metals dealers by 0.125 branches, significant at the 0.1-percent level. When controlling for county trends, this effect slightly increases in magnitude, increasing observed precious metals dealers by 0.150 branches, still highly significant. Significance is lost when controlling for only year effects, however, returns in Column 4 when controlling for both county and year fixed effects. From Column 4, imposing an implicit ban on payday lenders will lead to a subsequent increase in the number of operating precious-metals dealers by 0.0925 branches, with statistical significance at the 0.1-percent level. Relative to pawnbrokers, this is a very modest effect on the size of the industry.

Additionally, the real price of gold remains consistently significant and positive throughout the four specifications. In Column 4, increasing the real price of gold by $600 an ounce will increase observed operating precious-metal dealers by 0.274 branches.9

While small in magnitude, the predicted coefficient of the ban signals a slight response by the precious metals industry in response to a restrictive payday loan policy. However, given the increasing prices of gold over the same period, the observed growth of the industry discussed in the previous sections indicates that more and more lenders enter the precious-metals industry to benefit from the increasing price of gold.

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 also respond to some slight degree. However, there appears to be no real economic effect of banning payday lending on the growth of pawnbrokers or precious metals dealers.10 This does not mean that other industries

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9 The observed standard deviation of the real price of gold over the sample is $193. The change represents approximately a change in three standard deviations.

10 These effects are measuring the response to the ban after the ban is in effect. Further analysis will be conducted on preemptive actions by the observed industries.
are not affected. The discussion below focuses on industries that allow for payday lenders to circumvent enacted restrictions.

6.1.3 Small-Loan Lenders

Table 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 -0.0790 branches. The magnitude of this effect increases after controlling for county trends to a decrease of -0.0913 branches, with significance at the 1-percent and 0.1-percent level, respectively.

After controlling for both year and county-year fixed effects, the effect of the ban on the number of operating small-loan lenders becomes positive, increasing the number of operating branches by 0.301 per county-period.

Like the previous estimates, the policy change has a significant and positive effect: the small-loan lending industry expands in response to a state-level interest rate restriction on payday loans. Additionally, with an observed sample mean of 0.524 operating branches per county-period, this increase is substantial. Consequently, the Hydra Effect is very much present in the small-loan lending industry as the industry nearly doubles in size in response to payday-lending policy changes.

6.1.4 Second-Mortgage Lenders

Table 6 presents estimation results for the number of operating second-mortgage licensees. Recall from previous discussion, licensing as a second-mortgage lender and offering unsecured loans allows former payday lenders to earn the highest potential profit relative to small-loan lenders. However, the costs associated with this particular license is by far the greatest of all industries considered, therefore it is unclear how banning payday loans will affect the second-mortgage lending industry in particular.

For all specifications tested for this analysis, the effect of the ban is both highly positive and highly significant. The following discussion focuses on the full specification in Column 4. After controlling for county- and year-fixed effects, enacting the interest rate restrictions on payday lending leads to an increase of 3.076 operating second-mortgage lending, with statistical significance at 0.1 percent. As with small-loan lenders, this increase in the number of operating branches indicates that payday lenders choose to circumvent bans rather than change operations completely.
What makes this result particularly interesting is these positive changes are occurring during the worst economic downturn in recent history, when observed housing prices are in a steady decline over the course of the observed period. However, even during economic periods that should suppress the second-mortgage lending industry in the state, in periods after the ban, the industry experience a growth and stabilization.

The next section discussion 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.

6.2 Dependent Variable: The Change in the Number of Operating Branches

Table 7 presents SUR-results for the dependent variable measuring the change in the number of operating branches, examining a change in trend 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. All specifications include county- and year-level fixed effects. Specifications for precious-metals dealers and second-mortgage lenders include the related market factors as specified in the table. 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 of entry and exit net out actual industrial change. In particular, the following estimations can indicate how banning payday lending affects the rate of change in the industry, not 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 -0.0926 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.

There is no significant effect on the change in the number of precious-metals dealers nor the change in small loan lenders, observed in Columns 2 and 3.

Last, in Column 4, the results for the effect of a ban on the change in the number of second-mortgage lenders is similar to those predicted in Table 6. In response to a payday-loan ban, the change in the number of active second-mortgage lenders increases by 1.579 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.

6.3 Dependent Variable: The Number of Opening Branches

In Table 8, estimation results are presented for the dependent variable counting the number of newly licensed branches in a county-month-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-year-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 and exit from one period to another. In this section, only the number of entrants is examined.

In Column 1, the effect if banning payday lending decreases the number of newly licensed pawnbrokers by -0.0988 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; 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.

There is no significant effect on precious-metals dealers.

In Column 3, a ban on payday loans is estimated to increase the number of small-loan lenders to enter by 0.0321 branches per county year, with significance at the 0.1-percent level. This is consistent with the estimated positive effects presented in Table 5 that also showed a positive 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 payday lenders are choosing to circumvent restrictions and continue practicing as payday lenders under a different license type.

Lastly, in Column 4, the ban on payday loans increases the number of newly licensed second-mortgage lenders by 0.540 branches, with significance at the 0.1-percent level. This positive effect reinforces the hypothesis that payday lenders are choosing to circumvent existing regulations and take advantage of loopholes in existing second-mortgage lending regulations as well.

7 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 APR restriction on the number of operating branches, the change in the number of operating branches, and the number of new licensees in a county-month-year within each industry. Results indicate that the indirect effects of a payday lending ban depend upon what outcome is being measured. When examining level changes on the number of operating branches, a ban on the payday lending industry has a very slight effects on the pawn and precious metals industries, indicating only a slight preference of firms to adopt new practices in industries that offer substitutes for payday loans. However, there are very pronounced effects on the number of operating small-loan and second-mortgage lenders. In response to the
policy change, the number of operating small-loan lenders nearly doubles in each county-period examined. Additionally, and most striking, the change in the policy on payday lenders has the effect of increasing operating branch counts of second-mortgage lenders by 3 branches, sparking modest growth in an industry that should be in rapid decline. All of the observed industries have exhibited an expansion to the implicit ban on payday lending. Where slight or large, this is evidence that there are in fact indirect effects of restrictive legislation and market mechanisms that allow payday lenders to continue to operate under different guises.

Examining the effects of the ban on flow variables changes perspectives 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-period. 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 2 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 pawnbroker industry exhibits a slight slow in the rate of growth, possibly in anticipation of direct regulations that are also limiting to the industry. In conclusion, when faced with binding fee regulations, payday lenders prefer to find means that allow firms to bypass the existing ban and continue offering payday loans rather than change product mixes and enter new markets with increased demand.

These results show that legislative action directed toward one industry can have very pronounced effects on other, seemingly independent 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 methods by which payday lenders can and will adjust to enacted policies. From a general policy perspective, these results highlight the importance of acknowledging all potential impacts of implementing new regulations, both direct and indirect. In doing so, such changes in the policies themselves can be more efficient in achieving the desired outcomes.
8 Works Cited


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13. Ohio Revised Statutes

14. Ohio Administrative Code


16. S&P Dow Jones Indices LLC, S&P/Case-Shiller 20-City Composite Home Price Index [SPCS20RSA], retrieved from FRED, Federal Reserve Bank of St. Louis


9 Tables and Figures

9.1 Summary Data

Table 1: Summary Statistics: Dependent Variables, Entire Sample

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<td>Precious-Metals Dealers</td>
<td>2754</td>
<td>0.0043573</td>
<td>2106</td>
<td>0.0242165</td>
</tr>
<tr>
<td>Small-Loan Lenders</td>
<td>2754</td>
<td>0.0098039</td>
<td>2106</td>
<td>0.0052232</td>
</tr>
<tr>
<td>Second-Mortgage Lenders</td>
<td>2754</td>
<td>0.2632534</td>
<td>2106</td>
<td>0.2094017</td>
</tr>
</tbody>
</table>
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 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. The APR cap was passed on September 2008 and enacted in November 2008; this corresponds to periods 33 and 35, respectively.
This figure displays the trend in branch counts for the number of observed, new, and closing pawnbroker branches for the months between the years 2006 through 2010 for the 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. The APR cap was passed on September 2008 and enacted in November 2008; this corresponds to periods 33 and 35, respectively.
This figure displays the trend in branch counts for the number of observed, new, and closing precious metals dealers for the months between the years 2006 through 2010 for the 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. The APR cap was passed on September 2008 and enacted in November 2008; this corresponds to periods 33 and 35, respectively.
This figure displays the trend in branch counts for the number of observed, new, and closing small-loan lending for the months between the years 2006 through 2010 for the 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. The APR cap was passed on September 2008 and enacted in November 2008; this corresponds to periods 33 and 35, respectively.
Figure 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 months between the years 2006 through 2010 for the 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. The APR cap was passed on September 2008 and enacted in November 2008; this corresponds to periods 33 and 35, respectively.
Figure 6: Trend in the Real Price of Gold

This figure displays the trend in the real price of gold, per Troy ounce using 2006 as the base year. Source of data: London Bullion Market Association, as collected from the Federal Reserve Bank of St. Louis, FRED.

Figure 7: Trend in Housing Prices

This figure displays the trend in the SP/Case Shiller 20-City Composite Home Price Index. Source of data: London Bullion Market Association, as collected from the Federal Reserve Bank of St. Louis, FRED.
### 9.2 Results

Table 3: Regression Results: Operating Branches in the Pawnbroker Industry

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ban</td>
<td>1.079***</td>
<td>0.741***</td>
<td>0.651**</td>
<td>0.651***</td>
</tr>
<tr>
<td></td>
<td>(13.28)</td>
<td>(24.16)</td>
<td>(3.11)</td>
<td>(20.41)</td>
</tr>
<tr>
<td>Constant</td>
<td>-7.870***</td>
<td>8.68E-09</td>
<td>-0.000647</td>
<td>3.04E-09</td>
</tr>
<tr>
<td></td>
<td>(-4.90)</td>
<td>(0.00)</td>
<td>(-0.02)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Obs.</td>
<td>4860</td>
<td>4860</td>
<td>4860</td>
<td>4860</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.841</td>
<td>0.348</td>
<td>0.842</td>
<td>0.079</td>
</tr>
<tr>
<td>Chi-squared</td>
<td>25789.6</td>
<td>2593.4</td>
<td>25900.8</td>
<td>416.6</td>
</tr>
<tr>
<td>p</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7.71E-88</td>
</tr>
</tbody>
</table>

Includes:
- County-Fixed Effects: No, Yes, No, Yes
- Year-Fixed Effects: No, No, Yes, Yes

Note: * t statistics in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

Included in calculations but omitted from reporting are the following variables:
- Total population, Median Real Household Income, Percent Male, Percent White,
- Percent Black, Unemployment Rate, Percent Military, Poverty Rate, Percentage of Population with a HS Diploma
<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ban</td>
<td>0.125*</td>
<td>0.150***</td>
<td>0.12</td>
<td>0.0925***</td>
</tr>
<tr>
<td></td>
<td>(2.31)</td>
<td>(6.9)</td>
<td>(1.12)</td>
<td>(4.78)</td>
</tr>
<tr>
<td>Gold</td>
<td>0.000955***</td>
<td>0.000587****</td>
<td>0.000731**</td>
<td>0.000457***</td>
</tr>
<tr>
<td></td>
<td>(6.86)</td>
<td>(11.17)</td>
<td>(3.06)</td>
<td>(10.01)</td>
</tr>
<tr>
<td>Constant</td>
<td>4.688***</td>
<td>2.98E-08</td>
<td>0.000188</td>
<td>6.42E-09</td>
</tr>
<tr>
<td></td>
<td>(5.88)</td>
<td>(0)</td>
<td>(0.01)</td>
<td>(0)</td>
</tr>
<tr>
<td>Obs.</td>
<td>4860</td>
<td>4860</td>
<td>4860</td>
<td>4860</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.925</td>
<td>0.146</td>
<td>0.925</td>
<td>0.0228</td>
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<tr>
<td>Chi-squared</td>
<td>59846.9</td>
<td>788.7</td>
<td>59846.1</td>
<td>106.4</td>
</tr>
<tr>
<td>p</td>
<td>0</td>
<td>5.05E-162</td>
<td>0</td>
<td>1.14E-20</td>
</tr>
</tbody>
</table>

Includes:
- County-Fixed Effects: No, Yes, No, Yes
- Year-Fixed Effects: No, Yes

t statistics in parentheses
* p < 0.05, ** p < 0.01, *** p < 0.001

Included in calculations but omitted from reporting are the following variables:
- Total population, Median Real Household Income, Percent Male, Percent White,
- Percent Black, Unemployment Rate, Percent Military, Poverty Rate, Percentage of Population with a HS Diploma
<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ban</td>
<td>-0.0790***</td>
<td>-0.0913***</td>
<td>0.301***</td>
<td>0.301***</td>
</tr>
<tr>
<td></td>
<td>(-2.78)</td>
<td>(-3.77)</td>
<td>(4.16)</td>
<td>(8.28)</td>
</tr>
<tr>
<td>Constant</td>
<td>3.563***</td>
<td>-6.80E-09</td>
<td>-0.000249</td>
<td>5.98E-10</td>
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<tr>
<td></td>
<td>(6.34)</td>
<td>(-0.00)</td>
<td>(-0.02)</td>
<td>(0)</td>
</tr>
<tr>
<td>Obs.</td>
<td>4860</td>
<td>4860</td>
<td>4860</td>
<td>4860</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.553</td>
<td>0.0372</td>
<td>0.559</td>
<td>0.0139</td>
</tr>
<tr>
<td>Chi-Squared</td>
<td>6002.7</td>
<td>188</td>
<td>6165.9</td>
<td>68.57</td>
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<tr>
<td>p</td>
<td>0</td>
<td>5.03E-35</td>
<td>0</td>
<td>2.03E-13</td>
</tr>
</tbody>
</table>

Includes:
- County-Fixed Effects: No, Yes, No, Yes
- Year-Fixed Effects: No, No, Yes, Yes

*t statistics in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

Included in calculations but omitted from reporting are the following variables:
- Total population, Median Real Household Income, Percent Male, Percent White
- Percent Black, Unemployment Rate, Percent Military, Poverty Rate, Percentage of Population with a HS Diploma
<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ban</td>
<td>7.545***</td>
<td>3.752***</td>
<td>5.912***</td>
<td>3.076***</td>
</tr>
<tr>
<td></td>
<td>(7.30)</td>
<td>(4.87)</td>
<td>(3.51)</td>
<td>(4.57)</td>
</tr>
<tr>
<td>House Index</td>
<td>0.275***</td>
<td>0.191***</td>
<td>0.381***</td>
<td>0.210***</td>
</tr>
<tr>
<td></td>
<td>(12.37)</td>
<td>(9.09)</td>
<td>(7.35)</td>
<td>(10.27)</td>
</tr>
<tr>
<td>Constant</td>
<td>-94.43***</td>
<td>-0.0000146</td>
<td>-0.00455</td>
<td>-0.00000682</td>
</tr>
<tr>
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<td>(-7.39)</td>
<td>(-0.00)</td>
<td>(-0.02)</td>
<td>(-0.00)</td>
</tr>
<tr>
<td>Obs.</td>
<td>4860</td>
<td>4860</td>
<td>4860</td>
<td>4860</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.777</td>
<td>0.267</td>
<td>0.775</td>
<td>0.0401</td>
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<td>16963.0</td>
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<td>p</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.36E-20</td>
</tr>
</tbody>
</table>

Includes:
- County-Fixed Effects: No, Yes, No, Yes
- Year-Fixed Effects: No, No, Yes, Yes

*t statistics in parentheses
* p < 0.05, ** p < 0.01, *** p < 0.001

Included in calculations but omitted from reporting are the following variables:
- Total population, Median Real Household Income, Percent Male, Percent White,
- Percent Black, Unemployment Rate, Percent Military, Poverty Rate, Percentage of Population with a HS Diploma
Table 7: Regression Results: Change in Operating Branches for All Industries, Including County- and Year-Fixed Effects

<table>
<thead>
<tr>
<th></th>
<th>Pawnbroker</th>
<th>Precious Metals</th>
<th>Small-Loan</th>
<th>Second-Mortgage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ban</td>
<td>-0.0926***</td>
<td>-0.00222</td>
<td>0.0333</td>
<td>1.579***</td>
</tr>
<tr>
<td></td>
<td>(-5.06)</td>
<td>(-0.17)</td>
<td>(1.68)</td>
<td>(3.35)</td>
</tr>
<tr>
<td>Gold</td>
<td></td>
<td>0.0000519</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.63)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>House Index</td>
<td></td>
<td></td>
<td></td>
<td>0.0253</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1.73)</td>
</tr>
<tr>
<td>Constant</td>
<td>-6.00e-11</td>
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<td>(-0.00)</td>
<td>(-0.02)</td>
<td>(-0.00)</td>
<td>(-0.01)</td>
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<tr>
<td>Obs</td>
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<tr>
<td>R-squared</td>
<td>0.00532</td>
<td>0.000468</td>
<td>0.000593</td>
<td>0.00181</td>
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<tr>
<td>Chi-squared</td>
<td>25.56</td>
<td>2.974</td>
<td>2.837</td>
<td>11.24</td>
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<tr>
<td>p</td>
<td>0.000109</td>
<td>0.812</td>
<td>0.725</td>
<td>0.0814</td>
</tr>
</tbody>
</table>

$t$ statistics in parentheses

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

Included in calculations but omitted from reporting are the following variables:

Total population, Median Real Household Income, Percent Male, Percent White,
Percent Black, Unemployment Rate, Percent Military, Poverty Rate, Percentage of Population with a HS Diploma
Table 8: Regression Results: Opening Branches for All Industries, Including County- and Year-Fixed Effects

<table>
<thead>
<tr>
<th></th>
<th>Pawnbroker</th>
<th>Precious Metals</th>
<th>Small-Loan</th>
<th>Second-Mortgage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ban</td>
<td>-0.0988***</td>
<td>-0.00844</td>
<td>0.0321***</td>
<td>0.540***</td>
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<tr>
<td></td>
<td>(-5.77)</td>
<td>(-0.80)</td>
<td>(3.78)</td>
<td>(5.37)</td>
</tr>
<tr>
<td>Gold</td>
<td></td>
<td>0.0000515*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.06)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>House Index</td>
<td></td>
<td></td>
<td></td>
<td>0.000725</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.25)</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.56e-10</td>
<td>1.29e-10</td>
<td>4.60e-11</td>
<td>-2.43e-09</td>
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<td>(-0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(-0.00)</td>
</tr>
<tr>
<td>Obs</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
<td>0.00680</td>
<td>0.000778</td>
<td>0.00293</td>
<td>0.00700</td>
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<tr>
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<td>33.26</td>
<td>5.998</td>
<td>14.27</td>
<td>36.01</td>
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<td>p</td>
<td>0.00000334</td>
<td>0.423</td>
<td>0.0140</td>
<td>0.00000274</td>
</tr>
</tbody>
</table>

$t$ statistics in parentheses

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

Included in calculations but omitted from reporting are the following variables:

Total population, Median Real Household Income, Percent Male, Percent White,
Percent Black, Unemployment Rate, Percent Military, Poverty Rate, Percentage of Population with a HS Diploma.