Writing a better lending law

A panel data analysis of the effect of state-level predatory lending laws on mortgage credit markets in the Northwest region of the United States

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1. Introduction

1.1 Current events and policy implications of predatory lending research

Spiking foreclosure rates and narratives of homeowners suddenly mired in unsustainable debt have saturated the news media for months. Predictably, federal lawmakers have begun proposing legislation to address the perceived crisis. Senator Hilary Clinton, in a letter to the chairman of the Federal Reserve Board, expresses the perceived urgency of the situation, finding it "clear that prompt action is needed to protect borrowers, and to ensure that lower and moderate income families continue to have access to home ownership.[1]" Rep. Barney Frank, Chairman of the House Financial Services Committee and a leader of reform efforts, believes it is up to lawmakers "to continue to have money available for people to continue to buy homes with minimal chance of these kind of disasters."[2] Both statements highlight the apparent tradeoff between regulating lending and making loans available – a truly minimal chance of "disaster" would preclude any lending at all. Legislative attempts to address the problem must either strike a balance between the two interests or find ways to improve the quality of credit without limiting its availability. While few would not support better borrower understanding of loans or more responsible lending, enacting changes is less than costless at best and expensive or liberty-constraining at worst. Scholarship on the issue has potential to guide the process of reform by providing a critical look at the actual impact of laws on this balance in prime and subprime credit markets.

1.2 Mortgage markets in the United States

[1] Copyright 2007 States News Service, April 2, 2007 Monday
[2] James Tyson, "Mortgage Bondholders May Bear Subprime Loan Risk"Bloomberg.com, April 10, 2007

Consumer credit markets in the United States are generally divided into two distinct categories: the well-regulated and largely homogenous prime market for borrowers with good credit histories and the more heterogeneous subprime market serving riskier, higher cost consumers. In the past twenty or so years there has been a significant expansion in subprime lending in the United States, due partly to changes in the market structure (specifically the rise in securitization of mortgages) and partly to increasing real estate values encouraging borrowing against them. This expansion must largely be seen as a benefit to the consumers who now have access to credit that was previously unavailable. As a necessary result, however, with more loans to higher risk borrowers come more defaults and foreclosures. Foreclosures in particular entail very large costs, both personal to families and to the larger community and society. In a reaction to this phenomenon, many states have enacted legislation intended to limit predatory lending, beginning with North Carolina in 1999. Today, a majority of states have some degree of predatory lending law in place.

1.3 Goals of this paper

This paper studies a subset of nine states in the Northwest region of the United States. Roughly half (Minnesota, California, Nebraska, and Idaho) have some sort of law aimed at regulating predatory lending in place, and a little more than half do not (Montana, North Dakota, Oregon, South Dakota and Washington).[3]

I first sketch out a how rational behavior on the part of borrowers and lenders may result in loans that may be considered "predatory." The model hinges on the assumption that suppliers in a market where consumers bear search cost have some monopoly power

[3] To the best of my knowledge, these are the only states currently that have no predatory lending law in place, making it a particularly fitting region to study.

and helps clarify the possible effects and tradeoffs of predatory lending laws. I then describe the laws in each state and use the framework established above to make predictions of the expected effect of laws on mortgage markets. Finally, I use panel data analysis to test the effect of the laws on mortgage loan applications and originations in the prime and subprime markets, using the model to interpret the results.

I use data gathered in accordance with the Home Mortgage Disclosure Act (HMDA) to examine changes to the volume of loan applications and originations in the Northwest region of the United States. HMDA data allows me to control for a variety of borrower, loan, and geographic characteristics in addition to state and year effects to evaluate the changes that can be attributed to the passage of a law.

2. Literature Review

The first major state predatory lending law was passed in 1999 in North Carolina. The law has been the subject of several papers studying its effect in the context of the region. These studies come to divergent conclusions regarding the law's efficacy, depending largely on the data sources used and the way positive or negative outcomes are defined.

The earliest papers to examine the North Carolina law use descriptive statistics to evaluate the condition of the subprime credit market before and after the passage of the law in North Carolina as compared to control groups of other southern states and the nation as a whole. The first study was conducted by Ernst Farris and Stein in 2002 using HMDA data. The authors assert that subsequent to the passage of the law subprime home lending in North Carolina "continued to thrive," in particular continuing to offer a wide range of choices to mortgage borrowers including low-income borrowers. They further

estimate that consumers saved $100 million as a result of the law. The power of their conclusions is ambiguous, however, because they fail to clearly identify and compare the cost and benefit tradeoffs of the law.

They first find as a positive outcome that subprime credit was unconstrained, in that the volume of subprime loans in North Carolina remained large. Their conclusion that the subprime credit market was not constrained by the law rests on comparing the number of subprime home loans per capita and the ratio of subprime to prime loans to the respective values in the rest of the United States. While North Carolina does have a large subprime market compared to these other states, it says nothing about the size the North Carolina market would have been in the absence of the law. In fact, whatever the effect of the law, it is a priori unsurprising that the state which is the first to find it necessary to regulate subprime lending is a state with a relatively large volume of such loans. Further, the way they find the $100 million figure is odd, as the authors measure the benefit of the law as directly proportional (based on the percentage of loans with 'predatory' terms prior to the law) to the decline in subprime loans which they praise for its small scale. Effectively, then, a decline in the size of the subprime credit market is better both the smaller it is (for a less constrained credit market) and the larger it is (fewer loans with predatory features.)

Quercia, Stegman, and Davis (2004) extend the descriptive statistics approach using a data set prepared by a private company, Loan Performance, Inc. to examine more closely changes in the subprime market. They observe the changes to subprime volume by type (purchase or refinancing, and fixed, adjustable-rate or balloon payment), the changes to home-purchase loans by credit score to measure effects on high-risk

borrowers, change in mean interest rates. They find that there is a decline in subprime lending, but attribute it to a large fall in refinancing loans, accompanied in fact by an *increase* in home purchase loans. This seems to be an encouraging result indicative of perhaps a well-functioning law, if we assume most predatory loans are refinancing loans. The finding that post-law there was a large decrease in loans with 'predatory' features relative to the control groups offers a less clear message about the law's effects. The reported decreases they found should be unsurprising, given that the predatory features measured are specifically banned or limited by the law – it would be unusual to find no change reported in an activity after it has been declared illegal. This is then evidence for a successfully enforced law, not an effective law. It is easy to imagine that loans that without the law would have been made with balloon payment or prepayment penalty terms were made after the law in a different 'predatory' manner not regulated by the law.

Their analysis of interest rates is also inconclusive, because though the interest rates as on subprime loans as they measure them do not rise more than the average of control groups, the change in interest rates varies rather widely across states, and without controlling for the other factors that could be effecting North Carolina's interest rates it is impossible to tell if they rose more than they would have without the law.

Even in the best case, analysis by descriptive statistics is limited by its nature. Two studies sophisticate the analysis of the North Carolina law by using multivariate techniques to attempt to sort out the changes in the subprime market due to the law and those attributable to other changes. Harvey and Nigro (2004) use the HMDA data set to find a drop in loan originations, but attribute this drop to a decline in applications rather than denial rates. They conclude that this indicates decreased demand rather than

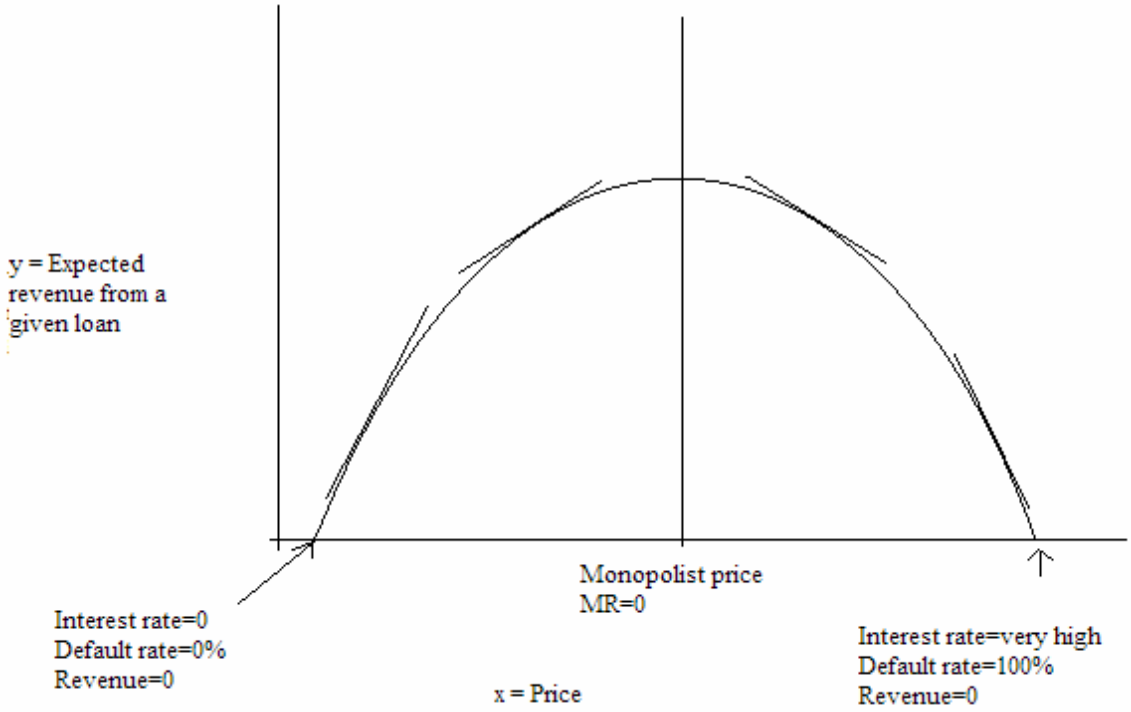
reduced credit supply. They further study denial rates controlling for loan to income value of the loan, income, and census tract characteristics and including a dummy for North Carolina and pre- and post-law.

Elliehausen and Staten (2004) use a proprietary data set from American Financial Services Association to perform a multivariate analysis comparing the volume of subprime loans in North Carolina before and after the law to a control group of Southern states, controlling for county level proxies for borrower characteristics and cost of credit. They find a significant drop in subprime originations in North Carolina post-law, relative to control states, concentrated in higher risk borrower groups (as defined by county level statistics on income and credit score.)

The results of both Harvey & Nigro 2004 and Elliehausen & Staten 2004 are called into question by mistaken assumptions about the laws in place in North Carolina and elsewhere. Both studies' observations end before the North Carolina law was fully in effect, and both use "control" states that in fact also had predatory lending laws in place.

3. Model

3.1 Search costs, monopoly power, and default rates



Despite the large number of lenders in the subprime mortgage market, the existence of search costs for borrowers gives lenders a degree of monopoly power in setting prices.[4] It is worth noting that in the mortgage market, "price" is not a single value – it is the expected sum of interest and principal payments, points, and fees. Price then varies also with the time period payments are due, as different periods will be associated with different levels of uncertainty and discounting.

The risk of default for a given loan is increasing in price. Marginal revenue from a given loan is also increasing in price. This creates a Laffer curve type relationship for expected revenue, with price on the x-axis and expected revenue on the y-axis.[5] At the leftmost point, the price of the loan is zero so repayment is certain but expected revenue is zero. At the rightmost point, the price of the loan is set so high that default is certain and expected revenue is again zero. In between the two points, expected revenue increases as price is set higher than zero. At a certain price, increased risk of default

[4] This idea was first suggested to me via correspondence with Professor Patricia McCoy, of the University of Connecticut Law School. See, for example, Diamond 1971.

[5] This relationship is also true in any case where MC is increasing. MC is only increasing for an individual loan, however, in the mortgage market, and therefore only if the lender can set price by the individual (unless there are no more low risk borrowers in the market in which case MC = default risk of next least risky borrower.)

overtakes higher price and expected revenue begins to decrease. A monopolist will set price at the point where MR=0 and expected revenue is maximized. When the monopoly price for a given loan is higher than the competitive level, then, default rates are also higher than they would be in a competitive market. This clearly represents a welfare loss for consumers in a mortgage market with monopoly power compared to a competitive market.

This effect is intensified by the presence of externalities to default. Foreclosures are costly to neighborhoods in terms of property values, and costly to society at large in terms of the costs associated with adjudicating a foreclosure, which may be a lengthy process given borrowers' understandably strong desire to retain their homes. Monopoly profits, then, in a price discriminatory market represent both a transfer in utility from borrowers to lenders and an overall welfare loss. Predatory lending laws in general can be read as seeking to revert the utility to the borrower. It is outside the scope of this paper to pronounce on whether this is desirable, but we may evaluate the effectiveness of a law given this goal.

3.2 Price discrimination

One way the subprime mortgage market behaves differently than the prime market is that greater variation in interest rates give lenders greater freedom to price discriminate. Lender can achieve fairly sophisticated third degree price discrimination due to the nature of the loan application process. First a borrower submits a detailed application including a great deal of the borrower's characteristics that can aid in dividing markets. [These characteristics also serve to evaluate expected costs, i.e. risk of default.]

Given a monopolistic market with price discrimination, an increase in quantity from the state of no price discrimination is a necessary condition for welfare increase (Varian 1985). It is logically equivalent to say that in a change from a state of price discrimination to no price discrimination, decrease in quantity is a sufficient condition for welfare loss. Consequently, if we suspect a law decreases a lender's ability to price discriminate and we also see a decrease in quantity of loans originated, we could reasonably conclude a decrease in welfare.

3.3 Predicted effects on number of applications and originations

We assume the loan process to consist of roughly two steps. A consumer weighs the expected costs and expected benefits of a given loan and makes the decision to apply, (expending search costs in the process.) The lender reviews the application and chooses to accept or deny based on expected marginal revenue and expected marginal cost.

Predatory lending laws can affect the consumer's costs, the benefit to the consumer, the supplier's costs or the supplier's expected revenue through ability to set high prices or price discriminate. If search costs to the consumer is decreased or benefit to the consumer increased, we expect increased applications. If supplier's cost is increased or supplier's expected revenue decreased, we expect the number of accepted applications (originated loans) to decrease.

We expect an effective predatory lending law to decrease monopoly power. A successful law, then, would increase the expected benefit to the consumer by transferring utility from lenders to borrowers by limiting abilities to set high prices. As noted above, higher price for mortgages means higher default rates, so a decrease in price will decrease default rates. The net welfare of a transfer from monopolist lenders to borrowers is

furthermore amplified by the effect of externalities to foreclosures. An effective law may also decrease search costs. Therefore we expect a well-functioning law to increase application rates by increasing utility of a loan to borrowers and/or decreasing search costs to borrowers, i.e. the coefficient on a state dummy post-law should be positive in a regression of volume of applications.

The presence of such a transfer, though – whatever the *net* social welfare effect – will hurt lenders, and thus depress supply. On the margin, a transfer from lenders may drive price below marginal cost to lenders for some loan and thereby increase denial rates. If this second effect on lenders outdoes the first positive effect on applications, originations will decrease and we will assume a welfare loss.

A providential feature of mortgage markets distinct from other consumer goods markets is that applications allow us to a degree observe demand separately from supply.[6] If there is a benefit to borrowers, applications should increase. If this benefit overpowers the reduction in supply due to increased costs to lenders, originations will also increase and we assume a net gain to social welfare.

3.4 Predicted impact of predatory lending law provisions

Different kinds of laws will affect credit markets in different ways. We can use the above framework to predict effects of different provisions of laws.

Provisions such as disclosure requirements and any costs associated with understanding the law and ensuring compliance will increase costs to lenders. Increases in lender costs will shift the supply curve left, resulting in a higher price and lower volume of loans, ceteris paribus.

[6] This is not a perfect proxy to the degree that borrowers include anticipation of the credit supply into their decision to apply. I assume for the purposes of this paper that this effect lags significantly with the passage of a law, which seems reasonable on a six year time horizon.

Provisions that limit monopoly power and increase the utility of a loan to consumers will shift the demand curve out and increase applications. If more originations result, we assume a welfare increase as more loans are made with higher utility to each loan.

Provisions, such as limits or bans on prepayment penalties or balloon payments in contrast restrict lenders' ability to set high prices. These provisions in particular restrict the ability of lenders to time-shift payments. It is true that because the "price" of a loan has many components, lenders could maintain the same effective price in the face of restriction on some loan terms by increasing points, fees, or the interest rate. This may not be possible or desirable to all borrowers, however. We assume that any individual taking out a loan expects greater disposable income in the future. Uncertainty also plays a role. The borrower's resources for the period in which a balloon payment will be due may be uncertain, but his resources at the time of the first interest payment are known, and he may be certainly unable to pay the higher rate necessary to replace the balloon payment. Monopoly power is thus reduced.

Restrictions on loan types may also reduce lenders ability to third-degree price discriminate by charging difference prices to different borrowers based on their loan type preferences. If that is the case, it follows (from 3.2 *supra*) that if there is a decline in quantity (i.e. a decline in originations) there is a welfare loss. Because this effect works in the opposite direction of the effect of increased consumer benefit from loans to reduced monopoly power, if we suspect that this effect is present and quantity increases, we can infer that the strength of the effect on demand based on increased marginal utility of loans to consumers is greater than the observed change in loans suggests.

A final effect of these restrictions (and one intended by lawmakers) is to reduce search costs by simplifying the possible loan types that may be offered and need to be evaluated by borrowers to ensure they understand the total amount they can expect to pay. Some provisions of laws may increase costs to borrowers, education requirements for example, shifting demand in and decreasing price and volume of loans.

We also expect different effects to the prime market as opposed to the subprime market. Any kind of predatory lending law is more likely to have a negative effect on originations in the prime market because by hypothesis monopoly power is lower in this market and thus the potential gains to borrowers are smaller, bounding the effect on applications making it more likely the costs to lenders will overpower gains. The difference in the effect on the prime market as compared to the subprime market should be dependent on the coverage level of a law. If a law has lower "triggers" (if it applies to loans starting at lower interest rate or fee levels, or to all loans) it will apply to more prime loans and presumably have greater impact on the prime market than a law with high triggers. We expect the magnitude of the effect in either market to depend on the strength of the requirements of the law.

3.5 Characterization of laws of states in the sample

Nebraska and Idaho have similar laws that regulate only prepayment penalties, though both have high coverage. Minnesota's law is a mortgage lender licensing law. It has high coverage due to low triggers, but regulates only prepayment penalties and lenders fees, and has limited enforcement capacity. California's law is also strong, but along different dimensions. Coverage is lower than Minnesota with higher triggers, but it includes stronger restrictions, regulating balloon penalties in addition to prepayment

penalties and requiring counseling in some cases. It also has higher enforcement capacity as it grants borrowers the right to sue lenders not in compliance with the law.

3.6 Predatory lending and fraud

Calls to reform tend to focus on if not willful deception on the lender, at least willful opacity. As for outright deception, this type of behavior falls under the category of fraud which is already addressed by existing legal code. Further, the laws actually passed in states thus far do not mainly operate through disclosure requirements or other features meant to increase transparency (and thus decrease search costs), except as a secondary effect of limiting the types of loans that may be offered. I believe the more important effect of these limits is to affect lenders abilities to set higher prices. This paper, then, ignores abusive lending dependent on nonoptimal behavior by borrowers. This would include fraud and borrowing out of proportion to expected ability to repay. Rather, I study predatory lending only as narrowly defined as lending at prices higher than the competitive level due to monopoly rents.

4. Data and Methodology

4.1 Home Mortgage Disclosure Act data

HMDA data is a very rich data source, primarily due to its extremely broad coverage. Most mortgage lenders are required under the act to report data on every loan they make. HMDA was originally conceived to aid in evaluating lenders' service to communities, particularly in identifying discriminatory practices. For the years I study, the HMDA data set contains nearly 200 million loans gathered from thousands of lenders. The data set also provides fairly detailed information on characteristics of the loans, borrowers, and lenders.

Table 2.1 HMDA reporting

Year	Number of loans	Number of lenders
2005	36.4 million	8,848
2004	33.6 million	8,853
2003	41.6 million	8,121
2002	31 million	7,771
2001	28 million	7,631
2000	19 million	7,713

Data gathered from http://www.ffiec.gov/hmda/history.htm

A major limitation is that the data set does not include the credit score of the loan applicant, so the only variables available to proxy for risk of the loan are income and the loan-to-income ratio. Price information is also unavailable for the time period studied. I believe, however, that the change in number of loan application and originations is perhaps a better instrument for observing welfare changes. While we would expect in general for a decrease in monopoly power to reduce price, a negative change in price due to greater competitiveness is observationally indistinguishable from a negative change in price due to an underlying shift in borrower characteristics. Specifically, in a state with a law that made it effectively more expensive to lend to high risk (and therefore high cost) borrowers would such that only low risk, low cost borrowers remained the average price of a loan would decrease even if monopoly power did not.

A final major limitation is the available mechanisms for identifying subprime loans. For lack of a better system, by convention, lenders in the HMDA data set are designated prime or subprime by the majority of their loans, and all loans by that lender

are then labeled either prime or subprime. Thus if 51% of a lenders loans are subprime, all of its loans will be denoted subprime. It is also then possible for pairs of identical lenders to take out identical loans in sequential years, but if the composition of the lenders loans shifted one percent to majority prime to majority subprime, the data would show an increase in subprime lending unexplained by any control variables. It is in fact possible that there is systematic error in classifying loans this way that would explain their results. Perhaps, for example, minority/low-income borrowers – whether taking out prime or subprime loans - tend to got to lenders that make mostly subprime loans and non-minority/higher-income borrowers tend to go to mostly prime-lending institutions, etc. A change from minority borrowers substituting prime for subprime looks the same as using the lender who lends a bit more prime and is reclassified.

4.2 Methodology

I treat the passage of laws in different states in different years as a natural experiment creating, in effect, "control" states and years with no law in effect. I use number of applications, number of rejections, and total amount of loaned funds as dependent variables. [7]

I collapse the data into means by census tract, so that there is one observation per census tract for loans designated subprime and one observation for loans designated prime. Collapsing by means makes the large number of individual loan observations tractable, but preserves much of the detail. I divide my results into prime and subprime loans. The regressors include sex, race/ethnicity, income, loan-to-income ratio, state and year dummies, and of most interest for this paper, law dummies. Sex and race represent percentages of loan applicants in a census tract who are identified female or belonging to

a minority group respectively. Income and loan-to-income ratio are expressed as means by census tract. Law dummies are defined as 1 in census tracts in states with a law in effect in the given year and 0 in census tracts in states with no law in effect in the given year. Errors are robust to clustering by state.

The basic regressions, then, have the following form:

$$\text{Number of subprime applications} = \beta_0 + \alpha_1 * \text{state} + \alpha_2 * \text{year} + \beta_1 * \text{pctminority} + \beta_2 * \text{pctfemale} + \beta_3 * \text{income} + \gamma * \text{law} + \varepsilon$$

$$\text{Number of prime applications} = \beta_0 + \alpha_1 * \text{state} + \alpha_2 * \text{year} + \beta_1 * \text{pctminority} + \beta_2 * \text{pctfemale} + \beta_3 * \text{income} + \gamma * \text{law} + \varepsilon$$

$$\text{Number of subprime originations} = \beta_0 + \alpha_1 * \text{state} + \alpha_2 * \text{year} + \beta_1 * \text{pctminority} + \beta_2 * \text{pctfemale} + \beta_3 * \text{income} + \beta_4 \text{loan2income} + \gamma * \text{law} + \varepsilon$$

$$\text{Number of prime originations} = \beta_0 + \alpha_1 * \text{state} + \alpha_2 * \text{year} + \beta_1 * \text{pctminority} + \beta_2 * \text{pctfemale} + \beta_3 * \text{income} + \beta_4 \text{loan2income} + \gamma * \text{law} + \varepsilon$$

I use the natural log of each dependent variable, which makes the large variation in the market size of different states more comparable. I also run regressions using several variations on the law dummy and regressions with interaction variables to estimate differential effects on different types of borrowers and lenders.

The expected coefficients for percent female and percent minority in the prime market are negative. The expectation for the subprime market is less clear, as studies of subprime markets often find they disproportionately include minority borrowers. The expected coefficient on income is similarly unclear. Income acts as a proxy for risk here, which both increases the applicant's expectation of a loan application being successful in either market, making it more worthwhile to expend the cost of application so increasing application rates, and the lender's likelihood of accepting the application, increasing origination rates. On the other hand, the higher the borrower's income the lower his risk

and the greater his chance of being able to get a low-price prime loan instead of a subprime loan, so the coefficient on income in the subprime market is ambiguous. It is further possible that higher income makes it less necessary to apply for a loan.

Finally, it should be noted that this style of analysis is limited by its nature – the law dummies can be no more than dummies for the relevant states in the relevant years. They are as a result necessarily sensitive to external circumstances unrelated to the laws but specific to the state and time. The contiguity of the states studied implies by hypothesis that they share credit and labor markets, which substantially mitigates the problem and allows greater if qualified confidence in the interpretation of results.

5. Results

5.1 Descriptive statistics

Simple statistics do not a reveal differential performance by states with laws compared to states without. Mortgage markets performed similarly across all states during the period studied. (See Appendix B.) Econometric analysis is necessary to identify any changes that can be attributed to passage of laws.

5.2 Initial regressions

5.2.1 Single law dummy

The initial regressions yield results that are not immediately clear. (See Table 5.1) The coefficients on the basic explanatory variables have the expected signs and are significant. Coefficient on percent female for all dependent variables and markets is negative and significant. Coefficient on percent minority is negative and significant for all dependent variables in the prime market and positive and significant for all dependent

variables in the subprime market, supporting the hypothesis that minority borrowers are disproportionately steered to the subprime market.

The coefficient on income is positive and insignificant for all dependent variables in the prime market, but negative and significant at the 1% level for all dependent variables in the subprime market. This result supports the hypothesis that rising income has conflicting effects for lower risk borrowers, as it makes them more eligible for loans but also may raise them out of the borrowing market altogether, whereas for higher risk borrowers, the primary effect of rising income is to make them less likely to borrow in the subprime market in favor of the prime market.

The different and significant coefficients from the prime to the subprime market on minority and income coefficients is a particularly valuable result, because it implies that the markets are accurately distinguished, i.e. the use of the HUD subprime lender list tends to accurately identify subprime loans.

The coefficient on the law dummy variable is more problematic to interpret. It is always negative for all dependent variables in both the prime and subprime market, but not always significant. This could initially be read as a simple depression of all credit markets by predatory lending laws, consistent with a situation where the costs to lenders created by any kind of law overpower any benefits to borrowers, although the story behind the negative effect on application rates is more difficult to explain. In particular, it is surprisingly more significant and larger in the prime market than in the subprime market. In particular, the law dummy is insignificant for subprime originations, which, if the law were restricting supply by making high cost loans more expensive to lenders, ought to be the variable most affected. It is hard to resolve with any reasonable theory

an increase in subprime applications and originations coupled with a decrease in prime applications and originations due to a law regulating high cost loans.

5.2.2 Regressions with interaction variables

Regressions with interaction variables do not yield much extra insight, except to counter any hypothesis that laws differentially impact women or minorities. The only interaction variable that is consistently significant is an occupancy dummy, which is consistently negative and significant at the 1% level. The occupancy dummy has the value 1 when the property mortgaged is not owner occupied, so this implies that predatory lending laws differentially discourage mortgages on investment properties. Available theory does not provide a ready explanation for this phenomenon.

5.3 Extensions

The opaque results for the law dummy variable in addition to the wide variation in the substance of the laws, suggest it worthwhile to test a model with different dummy variables for the different laws.

5.3.1 Weak and strong law dummies

The first additional model I test has one dummy variable for strong laws, defined as 1 when there is a law in effect in Minnesota or in California, and weak laws, defined as 1 when there is a law in effect in Idaho or in Nebraska.

The weak law dummy is always positive and significant at the 1% level, for all dependent variables and all markets.[8] The strong law dummy is positive and significant at the 10% level for both applications and originations in the subprime market, which seems to be mildly indicative of good effects of the laws – it implies the presence of the

[8] This is likely to be driven by multicollinearity issues due to interactions with year dummies as Idaho's law is in place for the full period studied.

law increases subprime applications and originations by about 1%. In the prime market, however, the strong law dummy is negative and significant at the 10% level for applications and positive but insignificant for originations. This is a particularly unexpected effect since the laws do not even apply to prime market loans in most cases, going counter our intuition similarly to the case with a single law variable.

5.3.2 Minnesota and California law dummies

Finally, to test whether the ambiguous results from the previous regression were caused by different effects of the two strong laws implemented in Minnesota and California, I divide the strong law dummy into a separate dummy for the Minnesota law and the California law. This regression produces perhaps the most compelling set of results.

The Minnesota law dummy takes on insignificant coefficients for both dependent variables in the subprime market, but significant negative coefficients in the prime market. These coefficients have a rather large magnitude; the results imply the presence of the Minnesota law decrease prime applications and originations about 20% each, at the 5% and 1% confidence levels respectively. The California law dummy is positive and significant at the 10% level for originations and applications in the subprime market, and implies a 10% increase in subprime applications and a 16% increase in subprime originations as a result of the law. The California law dummy is negative and not significant for applications in the prime market, but negative and significant at the 1% level for prime originations.

The different signs and significance levels on the California law dummy and the Minnesota law dummy in the subprime markets explain the earlier results. The positive

coefficients on the strong law dummy in the subprime market in the initial regression were driven by the California law, but were attenuated in significance by the opposite but weaker signs on the Minnesota dummy. The negative coefficients on applications in the prime market were similarly driven by the negative signs on the Minnesota dummy, but attenuated by the less significant coefficients on the California dummy.

We are able to explain these very distinct apparent effects of the California and Minnesota laws by looking at the provisions of each law. The Minnesota law is characterized by high coverage, lower restrictions and lower enforcement capacity. The California law, on the other hand, is characterized by lower coverage, higher restrictions and higher enforcement capacity. It makes sense, then, that there is less difference in impact on the prime and subprime markets in Minnesota because more loans are covered due to lower interest rate and fees triggers. It seems that the cost of compliance for this large number of loans has depressed the mortgage market as a whole. It seems plausible that the apparent lack of effect on the subprime market could be explained by the limited restrictions of the law, which do not seem here to be strong enough to help consumers, or, on the other hand, to harm lenders.[9]

California's law, on the other hand seems not to have affected prime market applications, while actually causing growth in the subprime market. This is in line with the hypothesis that an effective predatory lending law could increase the expected utility to borrowers of loans and increase both application and origination rates. It also potentially supports the hypothesis that applications in the prime market are less likely to

[9] It seems unlikely that an alternative explanation that the two effects in opposite directions are present but cancelling out because applications do not increase.

increase in response to restrictions on monopoly power than applications in the prime market because of bounded possible gains.

The only remaining puzzle that is unsatisfactorily addressed by available theory is the significant (at the 1% level) negative coefficients on both the California and Minnesota dummies on prime originations. It is particularly surprising because in the previous regression the strong law dummy is insignificant and has the opposite sign.

6. Conclusion

This paper set out to set the empirically evaluated impact of predatory lending laws on prime and subprime credit markets against the laws' welfare enhancing goals. The theoretical costs and benefits of laws were weighed and compared to lay groundwork for interpretation of the empirical results. Initial regressions gave unclear results, but more detailed specifications allowed some insight into the differential effects of different laws.

California's law was shown to increase both applications and originations in the subprime market in accord with theory of an effective predatory lending law as increasing utility of loans to borrowers. Minnesota's law, in contrast, was shown to restrict credit in the prime market, possibly reflecting excess costs to lenders in the state. Effects of both laws on prime market originations are to undesirably reduce applications and originations through a mechanism that remains unexplained.

The significantly different effects of the Minnesota and California laws underline the importance of law design in lending regulation policy. The evidence presented in this paper suggests that predatory lending laws are very likely to have substantive effects on credit markets. Further, the results indicate that certain dimensions of the goals of the

laws are achievable, including greater availability of better quality credit to high cost borrowers, but also that differently specified predatory lending laws can create distinctly divergent results.

There are certainly many extensions to be done on the foregoing analysis, especially as better quality data becomes available. The results presented above do, however, provide a preliminary framework for evaluating policy proposals. They would have us regard with skepticism, for example, laws with broad coverage that pay lip-service to predatory lending reduction but whose weak measures may create compliance costs without being strong enough to benefit borrowers. Importantly, though, the empirical analysis gives support to the hypothesis that it is possible for some forms of regulation of predatory loans to create net social gains without severely limiting the availability of subprime credit.

References

Diamond, P. A. (1971). "A model of price adjustment." Journal of Economic Theory **3**(2): 156-168.

Elliehausen, G. and M. E. Staten (2004). "Regulation of Subprime Mortgage Products: An Analysis of North Carolina's Predatory Lending Law." Journal of Real Estate Finance and Economics **29**(4): 411-433.

Engel, K. C. and P. A. McCoy (2002). "A Tale of Three Markets: The Law and Economics of Predatory Lending." Texas Law Review **80**(6): 1255.

Frank, R. B. (2007). "Dear Colleague"

Harvey, K. D. and P. J. Nigro (2004). "Do Predatory Lending Laws Influence Mortgage Lending? An Analysis of the North Carolina Predatory Lending Law." Journal of Real Estate Finance and Economics **29**(4): 435-456.

Hirsch, E.D. Jr., Joseph F. Kett, James Trefil: The New Dictionary of Cultural Literacy. Boston: Houghton Mifflin Company, 2002. "From the sublime t

Ho, G. and A. Pennington-Cross (2006). "The Impact of Local Predatory Lending Laws on the Flow of Subprime Credit." Journal of Urban Economics **60**(2): 210-228.

Quercia, R. G., M. A. Stegman, et al. (2004). "Assessing the Impact of North Carolina's Predatory Lending Law." Housing Policy Debate **15**(3): 573-601.

Service, S. N. (2007). "Statement of Senator Hillary Rodham Clinton on Bankruptcy of New Century Financial."

Tyson, J. (2007). "U.S. Senate weighs aid program for 2.2 million subprime borrowers: Lawmaker says loss of so many homes exceeds cost of relief." Bloomberg News.

Varian, H. R. (1985). "Price Discrimination and Social Welfare." American Economic Review **75**(4): 870-875.

Statutes and regulations

Cal Fin Code § 4970, (2007), Financial Code, Division 1.6. Covered Loans, Chapter 1. General Provisions and Definitions, § 4970. Definitions, Deering's California Codes Annotated

Idaho Code § 28-42-306 (2007) Right to prepay

Banking: Chapter 58 Mortgage Originator and Service Licensing Minn. Stat. § 58.02 (2006)

R.R.S. Neb. § 45-701 (2007), Chapter 45. Interest, Loans, and Debt, Article 7. Mortgage Bankers Registration and Licensing , § 45-701

Home Ownership Equity Protection Act (HOEPA), 15 U.S.C. §§ 1601, 1602(aa),1639(a)-(b)

Table 5.1

Single law dummy

Prime	Applications(log)	Originations(log)		Subprime	Applications(log)	Originations(log)
	logapps	*logorig*			*logapps*	*logorig*
pctfemale	-0.444	-0.713		pctfemale	-0.652	-0.704
	(0.104)***	(0.085)***			(0.121)***	(0.132)***
pctminority	-0.404	-0.682		pctminority	0.422	0.475
	(0.117)***	(0.095)***			(0.102)***	(0.144)**
income	0.001	0.001		income	-0.006	-0.007
	(0.001)	(0.001)			(0.001)***	(0.001)***
dummy2000	-1.004	-0.739		dummy2000	-0.690	-1.106
	(0.081)***	(0.108)***			(0.091)***	(0.196)***
dummy2001	-0.505	-0.238		dummy2001	-0.535	-0.901
	(0.095)***	(0.087)**			(0.059)***	(0.119)***
dummy2002	-0.360	-0.123		dummy2002	-0.482	-0.621
	(0.077)***	(0.064)*			(0.051)***	(0.066)***
dummy2003	0.219	0.422		dummy2003	-0.201	-0.255
	(0.031)***	(0.032)***			(0.027)***	(0.069)***
dummy2004	-0.382	-0.270		dummy2004	-0.246	-0.325
	(0.137)**	(0.122)*			(0.118)*	(0.129)**
MN	0.092	0.102		MN	0.132	0.170
	(0.040)*	(0.042)**			(0.038)***	(0.083)*
MT	-1.134	-1.184		MT	-0.713	-0.578
	(0.066)***	(0.050)***			(0.046)***	(0.092)***
NE	-0.769	-0.567		NE	-0.353	-0.466
	(0.039)***	(0.041)***			(0.032)***	(0.042)***
ND	-1.651	-1.513		ND	-1.337	-1.215
	(0.060)***	(0.053)***			(0.045)***	(0.074)***
SD	-1.297	-1.136		SD	-0.893	-0.712
	(0.068)***	(0.046)***			(0.046)***	(0.082)***
OR	0.323	0.143		OR	0.362	0.490
	(0.080)***	(0.097)			(0.061)***	(0.131)***
WA	0.362	0.265		WA	0.473	0.596
	(0.087)***	(0.104)**			(0.070)***	(0.151)***
CA	0.521	0.413		CA	0.520	0.800
	(0.107)***	(0.167)**			(0.103)***	(0.207)***
law	-0.131	-0.235		law	0.097	0.124
	(0.069)*	(0.061)***			(0.046)*	(0.096)
loan2inc		0.214		loan2inc		-0.042
		(0.113)*				(0.053)
Constant	5.739	4.734		Constant	4.877	3.703
	(0.114)***	(0.299)***			(0.119)***	(0.255)***
Observations	61827	61204		Observations	59167	57295
R-squared	0.18	0.21		R-squared	0.2	0.27

Robust standard errors in parentheses

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

Table 5.3

California law, Minnesota law, and weak law dummies

Prime	Applications(log)	Originations(log)		Subprime	Applications(log)	Originations(log)
	logapps	*logorig*			*logapps*	*logorig*
pctfemale	-0.464	-0.710		pctfemale	-0.656	-0.735
	(0.102)***	(0.094)***			(0.127)***	(0.127)***
pctminority	-0.402	-0.682		pctminority	0.422	0.478
	(0.119)***	(0.094)***			(0.102)***	(0.145)**
income	0.001	0.001		income	-0.006	-0.007
	(0.001)	(0.001)			(0.001)***	(0.001)***
dummy2000	-0.998	-0.740		dummy2000	-0.688	-1.098
	(0.078)***	(0.107)***			(0.089)***	(0.191)***
dummy2001	-0.513	-0.237		dummy2001	-0.537	-0.912
	(0.095)***	(0.089)**			(0.061)***	(0.121)***
dummy2002	-0.354	-0.124		dummy2002	-0.481	-0.611
	(0.075)***	(0.062)*			(0.049)***	(0.066)***
dummy2003	0.217	0.422		dummy2003	-0.201	-0.257
	(0.031)***	(0.032)***			(0.027)***	(0.069)***
dummy2004	-0.375	-0.271		dummy2004	-0.245	-0.314
	(0.135)**	(0.121)*			(0.116)*	(0.123)**
MN	1.777	1.610		MN	1.033	1.434
	(0.035)***	(0.082)***			(0.028)***	(0.066)***
MT	0.517	0.328		MT	0.179	0.638
	(0.010)***	(0.067)***			(0.002)***	(0.024)***
NE	-0.770	-0.567		NE	-0.353	-0.468
	(0.039)***	(0.041)***			(0.032)***	(0.042)***
ND	0.000	0.000		ND	-0.445	0.000
	(0.000)	(0.000)			(0.005)***	(0.000)
SD	0.354	0.376		SD	0.000	0.504
	(0.011)***	(0.020)***			(0.000)	(0.011)***
OR	1.976	1.655		OR	1.255	1.707
	(0.026)***	(0.124)***			(0.017)***	(0.066)***
WA	2.014	1.777		WA	1.366	1.813
	(0.034)***	(0.130)***			(0.026)***	(0.087)***
CA	2.157	1.927		CA	1.409	1.994
	(0.074)***	(0.192)***			(0.065)***	(0.162)***
lawca	-0.104	-0.239		lawca	0.103	0.163
	(0.060)	(0.068)***			(0.048)*	(0.079)*
lawmn	-0.195	-0.228		lawmn	0.083	0.033
	(0.066)**	(0.055)***			(0.045)	(0.067)
weaklaw	1.520	1.277		weaklaw	0.990	1.340
	(0.013)***	(0.082)***			(0.003)***	(0.027)***
loan2inc		0.214		loan2inc		-0.043
		(0.113)*				(0.053)
Constant	4.090	3.221		Constant	3.985	2.495
	(0.114)***	(0.261)***			(0.143)***	(0.291)***
Observations	61827	61204		Observations	59167	57295
R-squared	0.18	0.21		R-squared	0.20	0.27

Robust standard errors in parentheses
** significant at 10%; ** significant at 5%; *** significant at 1%*

Table 5.2

Strong law and weak law dummies

Prime	Applications(log)	Originations(log)		Subprime	Applications(log)	Originations(log)
	logapps	*logorig*			*logapps*	*logorig*
pctfemale	-0.444	-0.023		pctfemale	-0.652	-0.022
	(0.104)***	(0.019)			(0.121)***	(0.042)
pctminority	-0.404	-0.054		pctminority	0.422	-0.074
	(0.117)***	(0.033)			(0.102)***	(0.014)***
income	0.001	0.000		income	-0.006	0.000
	(0.001)	(0.000)*			(0.001)***	(0.000)
dummy2000	-1.004	0.042		dummy2000	-0.690	-0.114
	(0.081)***	(0.130)			(0.091)***	(0.096)
dummy2001	-0.505	0.062		dummy2001	-0.535	-0.174
	(0.095)***	(0.222)			(0.059)***	(0.148)
dummy2002	-0.360	0.090		dummy2002	-0.482	-0.049
	(0.077)***	(0.155)			(0.051)***	(0.115)
dummy2003	0.219	0.122		dummy2003	-0.201	-0.121
	(0.031)***	(0.111)			(0.027)***	(0.109)
dummy2004	-0.382	0.199		dummy2004	-0.246	-0.151
	(0.137)**	(0.136)			(0.118)*	(0.109)
MN	1.742	0.268		MN	1.025	0.300
	(0.024)***	(0.080)***			(0.017)***	(0.092)**
MT	0.517	0.149		MT	0.179	0.233
	(0.010)***	(0.025)***			(0.002)***	(0.153)
NE	-0.769	0.148		NE	-0.353	-0.126
	(0.039)***	(0.072)*			(0.032)***	(0.047)**
ND	0.000	0.446		ND	-0.445	0.222
	(0.000)	(0.020)***			(0.004)***	(0.135)
SD	0.353	0.167		SD	0.000	0.371
	(0.011)***	(0.020)***			(0.000)	(0.147)**
OR	1.974	0.049		OR	1.255	0.256
	(0.027)***	(0.053)			(0.017)***	(0.068)***
WA	2.013	-0.108		WA	1.366	0.000
	(0.034)***	(0.064)			(0.026)***	(0.000)
CA	2.172	-0.090		CA	1.413	0.324
	(0.065)***	(0.052)			(0.069)***	(0.040)***
weaklaw	1.520	0.000		weaklaw	0.990	0.247
	(0.013)***	(0.000)			(0.003)***	(0.160)
stronglaw	-0.131	0.140		stronglaw	0.097	0.095
	(0.069)*	(0.181)			(0.046)*	(0.116)
loan2inc		-0.018		loan2inc		0.001
		(0.010)				(0.015)
Constant	4.088	0.268		Constant	3.984	-0.032
	(0.116)***	(0.098)**			(0.142)***	(0.174)
Observations	61827	1080		Observations	59167	244
R-squared	0.18	0.13		R-squared	0.20	0.05

Robust standard errors in parentheses

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

Appendix A
Description of laws by state

California
- In effect 2003
- Regulates prepayment penalties and balloon payments
- Has some counseling requirements
- Borrowers have ability to sue
- High triggers

Idaho
- In effect 1996
- Only regulates prepayment penalties
- Applies to all junior liens
- Borrowers can sue lender or secondary buyer

Minnesota
- In effect 2003
- Licensing law for mortgage originators
- Limits lender fees
- Restricts prepayment penalties on resale
- Borrowers have no right to sue
- Low triggers

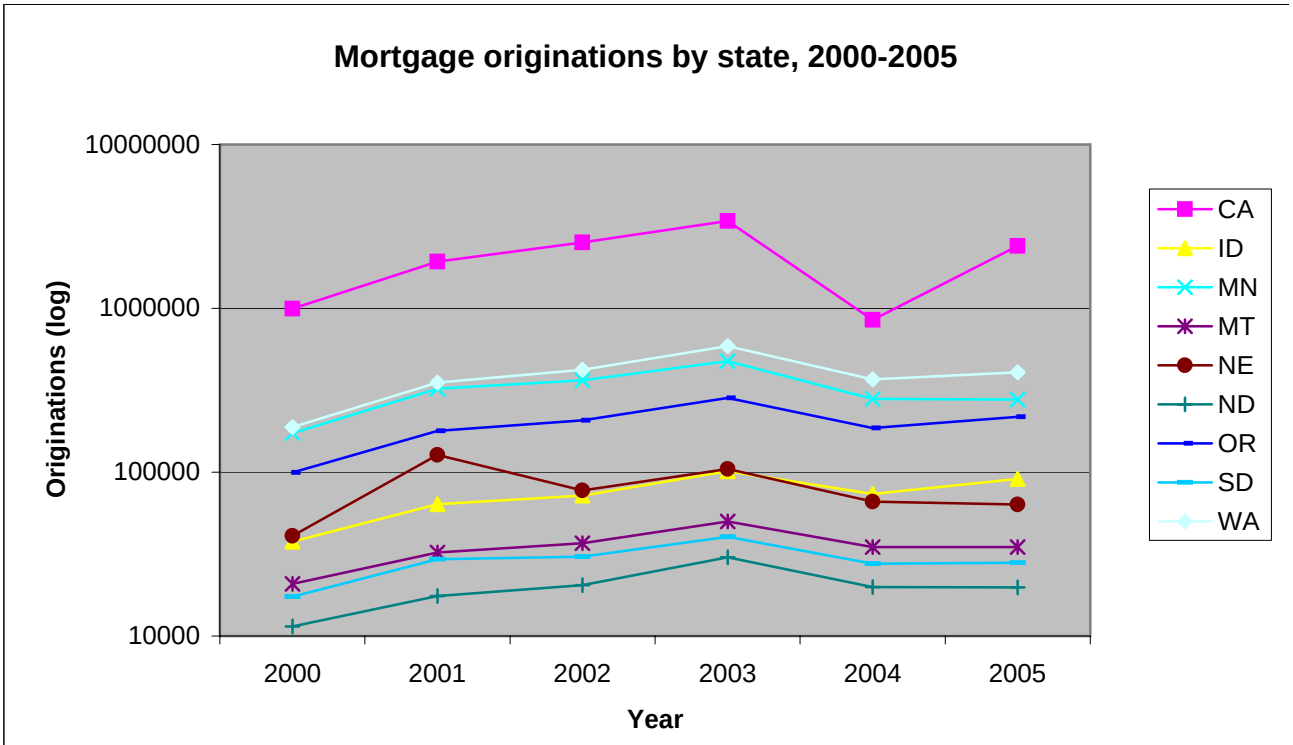
Nebraska
- In effect 2004
- Prohibits "unreasonable" prepayment penalties
- No prepayment penalties have been found "unreasonable" in court

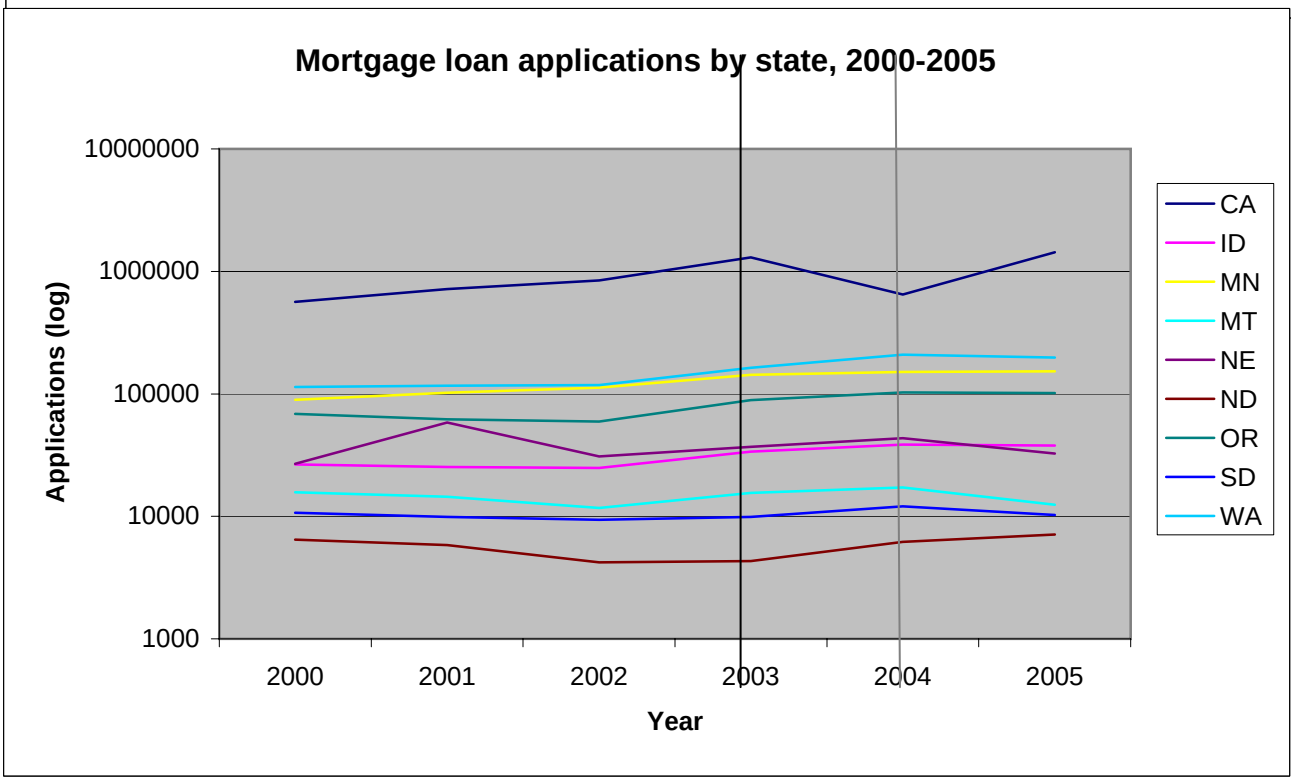
Montana, North Dakota, Oregon, South Dakota and Washington had no predatory lending laws in effect during the time period studied.

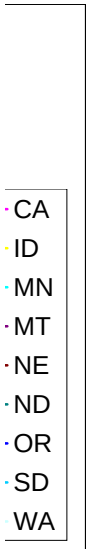
	2000	2001	2002	2003	2004	2005
California				*Law*	*Law*	*Law*
Idaho	*Law*	*Law*	*Law*	*Law*	*Law*	*Law*
Minnesota				*Law*	*Law*	*Law*
Montana						
Nebraska					*Law*	*Law*
North Dakota						
Oregon						
South Dakota						

Appendix B

Overall mortgage market behavior in Northwestern states 2000-2005






CA
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MN
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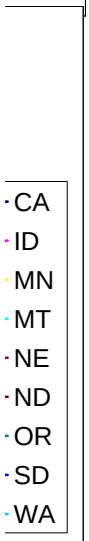
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