

RESEARCH REPORT

THE IMPACT OF STATE ANTI-PREDATORY LENDING LAWS ON THE FORECLOSURE CRISIS

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The Impact of State Anti-Predatory Lending Laws on the Foreclosure Crisis

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Abstract

By the end of 2007, thirty states and the District of Colombia had passed some sort of subprime mortgage regulation statute, while the remaining states left the subprime mortgage market unregulated. Were these state mortgage laws effective in restraining risky mortgage lending and mitigating the surge in foreclosures? Our study takes advantage of this natural experiment and compares loan terms, mortgage foreclosures and defaults in states with and without anti-predatory lending laws (“APLs”), using a sample of 1.2 million mortgage loans originated during the subprime boom and observed monthly through the end of 2008. Using these loan level data, we find that State APLs are associated with a significant reduction in prepayment penalties and appear also to reduce the incidence of option ARM loans. APL’s also clearly affected the risk of default and foreclosure: they reduced the likelihood of a loan becoming 90+ days delinquent by 15 percent. These results prove to be remarkably consistent, even after testing for different samples and law specifications. This analysis, combined with other research, suggests that strong state APLs are an important tool for consumer protection and that state APLs should not be overridden by federal preemption.

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I. Introduction

The unprecedented levels of mortgage defaults that led to the subprime crisis of 2007-2009 have been attributed in part to inadequate regulation of mortgage lending (Bernanke; McCoy). At the Federal level, Congress fostered the growth of subprime and exotic mortgages by displacing state consumer protection and usury laws through federal preemption in the early 1980s (Mansfield). However, a number of states, beginning with North Carolina in 1999, passed laws intended to restrain subprime mortgage abuses, within the legal space left outside of Congressional preemption. By the end of 2007, thirty states and the District of Columbia had passed some sort of mortgage regulation statute, while the remaining states left the mortgage market unregulated. Were these state mortgage laws effective in restraining risky mortgage lending and mitigating the surge in foreclosures? Our study takes advantage of this natural experiment and compares foreclosures and defaults in states with and without anti-predatory mortgage laws (“APLs”), using a sample of 1.2 million mortgage loans originated during the subprime boom and observed monthly through the end of 2008.

Using these loan level data, we find that State APLs are associated with a 13 percent reduction in prepayment penalties and appear also to reduce the incidence of option ARM loans. APL’s also clearly affected the risk of default and foreclosure: they reduced the likelihood of a loan becoming 90+ days delinquent by 15 percent. The degree of coverage and restrictions matter, with more stringent APLs having a stronger dampening effect on default rates.

The results demonstrate the importance of strong state law consumer protections in the mortgage market. Unfortunately, federal regulators excused some mortgage lenders from state oversight immediately preceding the boom in subprime lending. In 2004, the Office of the Comptroller of the Currency (OCC) joined the Office of Thrift Supervision (OTS) in ruling that nationally chartered banks (like the OTS-regulated thrifts) were not subject to these state regulations (McCoy). Consequently, preemption deprived some borrowers of additional protections that would have encouraged better underwriting and likely reduced the level of foreclosures. (Ding 2009a).

The proven record of success of state APLs should encourage additional states to adopt stricter mortgage regulations appropriate to their markets. However, more state legislation will only be marginally effective if federal regulators preempt it. The results of this study support the argument that consumer protections should not be reduced to the least common denominator. Instead, reasonable federal regulation should act as a floor for consumer protection from which states may build more protective legislation if desired based on local market conditions.

II. Literature Review

A. Legal Environment: State High-Cost Mortgage Laws and Federal Preemption Before the Crisis

Subprime mortgage lending was impossible before 1980 because of state usury laws that banned higher-rate mortgages. Then in 1980 Congress preempted all state restrictions on first mortgage interest rates and fees (DIDMCA, Mansfield). In addition, adjustable rate mortgages (ARMs) grew significantly in market share in the 1975-1980 period as interest rates and inflation rose to double-digit levels. Many states had imposed legal restrictions on ARMs, such as requiring annual and lifetime caps on upwards rate adjustments, and prohibiting negative amortization. Congress responded to these ARM restrictions with the Alternative Mortgage Transactions Parity Act of 1982 (AMTPA), which essentially overrode state laws restricting many mortgage terms, including terms that came to be regarded as problematic after the subprime foreclosure crisis, such as balloon payments and negative amortization (McCoy:1333). AMTPA preempted state laws only as to nontraditional mortgages, such as ARMs, and did not preempt state laws as applied to standard, fixed-rate mortgages.

Many state laws adopted before and during this period also banned or restricted prepayment penalties for mortgage loans. AMTPA preempted state restrictions on prepayment penalties. However, OTS, exercising its power to issue and revise AMTPA regulations, lifted the federal AMTPA preemption of prepayment penalty restrictions effective July 1, 2003. During the period covered by our study (2004-2008), states could not restrict most nontraditional mortgage loan terms on adjustable-rate and balloon mortgages, but could restrict prepayment penalties.

On the other hand, lenders with federal bank charters could continue to include prepayment penalties in mortgages despite state laws, because of the separate preemption regulations adopted by the Office of the Comptroller of the Currency (OCC) and OTS for federally chartered banks and thrifts. In fact, beginning in 1996 for federal thrifts regulated by OTS, and in 2004 for federal banks regulated by OCC, federal lenders were exempted completely from coverage by APLs (McCoy: 1348). Federal preemption of APLs thus operated on two dimensions: the type of lender being regulated and the nature of mortgage terms to be regulated.

Congress did not replace state mortgage regulations with federal safeguards until 1994, when it enacted the Homeownership Equity Protection Act (HOEPA), in response to reported abuses by high-cost home equity and mortgage lenders. The primary abuses HOEPA sought to regulate were excessive fees (rent-seeking) and equity stripping. The latter practice consisted of repeated refinancings, together with inclusion in new loans of loan fees, credit insurance premiums and other closing costs, as well as additional cash advances to the homeowner. Because the problem to be addressed was excessive loan rates and fees, HOEPA covered only mortgages with very

high annual percentage rates (8% to 10% above Treasury rates) or very high prepaid points and fees (8% of the loan amount.) Although HOEPA also gave the Federal Reserve broad power to regulate mortgages below these price levels, the Federal Reserve did not exercise that authority until 2008 (Federal Reserve Regulation Z Amendments 2008).

The effect of HOEPA was not so much to constrain terms of expensive mortgages as to simply drive them out of the market. By 2005, while about one-quarter of all mortgages were subprime based on the Federal Reserve's high-rate threshold, less than 1% of refinancing and home improvement mortgage loans had rates high enough to be covered by HOEPA (Avery et. al. 2006).

In 1999 North Carolina enacted the first of the modern state anti-predatory lending laws. The North Carolina Predatory Lending Act, for the most part, followed the HOEPA approach of restricting mortgage terms for loans above a price threshold, but the price levels were set below those in HOEPA. The North Carolina law covered loans with points and fees exceeding 5%, rather than 8%. Because the North Carolina law prohibited the financing of points and fees for covered loans, i.e. the inclusion of points and fees in the loan amount, the result became a de facto usury cap. Most lenders complied with the North Carolina statute, and similar "mini-HOEPA" statutes, by keeping all their loans under the points/fees and APR triggers.

North Carolina's APL had a few restrictions applicable to loans below the triggers. It prohibited prepayment penalties for all mortgages of less than \$150,000, prohibited certain repeated refinancings characterized as "flipping" and banned the financing of single-premium credit insurance. The Massachusetts, New Jersey and New Mexico APLs followed this pattern, prohibiting refinancing that did not provide a net tangible benefit to the homeowner under certain circumstances, for all mortgages, and prohibited financing of single-premium credit insurance. The complex architecture of these state laws was driven partly by the limited regulatory space left to the states after the Depository Institutions Deregulation and Monetary Control Act's (DIDMCA) preemption of direct interest and fee regulation, and AMPA's preemption of most restrictions on adjustable-rate and balloon loan mortgages.

A number of other states followed the North Carolina model, but usually varied the coverage and nature of the restrictions, so that no truly uniform state APL model emerged. At the same time, some cities and counties attempted to regulate subprime mortgages, such as Philadelphia, Cleveland and Oakland. In all three cases, the lending industry sought protection from local regulation at the state level, and all three states enacted statutes that were primarily intended to preempt city and county regulation efforts. The Pennsylvania and Ohio statutes transposed the coverage and restrictions of HOEPA to state law, and unlike North Carolina, did not reduce the high-cost coverage triggers or expand consumer protections beyond federal law. Thus, their primary, if not sole, purpose was to prevent regulation of subprime lending at the local

government level.¹ California, on the other hand, preempted local ordinances with an APL that did extend beyond HOEPA coverage and restrictions.

Although abusive refinancing of mortgages, high loan fees and credit insurance premiums were the focus of the North Carolina statute, it also included provisions aimed at excessive foreclosure risk. Like HOEPA, the North Carolina APL prohibits making high-cost loans without regard to the borrower's repayment ability. It adds a presumption that a payment exceeding 50% of the borrower's income is unaffordable, and also requires counseling before a borrower obtains a high-cost loan. Repayment ability and counseling requirements were included in many states' APLs. In that regard the laws were intended to reduce default and foreclosure risk directly, as well as through restrictions on pricing and terms.

B. Prior Research: Impact of State Anti-Predatory Lending Laws on Mortgage Markets

Since North Carolina passed the first state anti-predatory lending law in 1999, researchers have tried to understand how APLs affect the mortgage market, including their impact on lending volume, the price of credit, and mortgage product substitution. Recent research has started to examine how APLs affect the use of more exotic loan types and how state laws have impacted mortgage foreclosure rates across states and neighborhoods.

State APLs were intended to curb so-called predatory practices while permitting non-abusive subprime lending to develop (Li & Ernst 2007). As a result, most empirical studies on the impact of APLs have focused on the effect of state laws on lending volume and loan prices. Some of these studies focus on one jurisdiction's law; others analyze outcomes nationally. One group of studies that focused on the first state anti-predatory lending law, in North Carolina, found that the subprime market in the state diminished in size as a result of the passage of the law (Ernst et. al. 2002; Quercia et. al. 2004; Elliehausen & Staten 2004; Harvey & Nigro 2004). This is consistent with other studies that have looked at APLs and subprime lending in Chicago and Philadelphia (Harvey & Nigro 2003). However, taken as a whole, the national data show a lack of a consistent relationship between state laws and lending volume. Studies using state-level law indices find that APLs appear to have little impact on subprime originations, applications, or rejections at the aggregate level. But APLs with stronger restrictions are associated with a decrease in subprime lending (Ho & Pennington-Cross 2006; Elliehausen et. al. 2006; Bostic et. al. 2008b; Wachter 2008).

There are some possible explanations for these results. First, there is a fundamental difference between the states that extended restrictions on subprime mortgages beyond federal requirements

¹ See *American Financial Services Association vs. City of Cleveland*, 112 Ohio St.3d 170, 858 N. E. 2d. 776 (Ohio 2006) (holding that the Cleveland predatory lending ordinance was expressly preempted by the Ohio APL.)

and states that simply copied federal HOEPA restrictions into their state statutes. Some state laws did not extend coverage beyond mortgages covered by federal law. In several instances, the intent of these laws was to preempt local laws and ordinances that imposed greater restrictions than federal law. So it is important to distinguish between these two types of state laws when evaluating results.

Second, in addition to examining overall lending volume, it is also important to examine which segment of the subprime market declined, which remained stable, and which increased. Since APLs were intended to reduce the number of predatory or abusive subprime loans, a decline in subprime lending, especially of loans with these traits, is not surprising. If anti-predatory lending laws have curbed so-called predatory practices while permitting non-abusive subprime lending to develop, the laws have done what they were intended to do. Except for Ernst et al (2002), Quercia et al. (2004), and Pennington-Cross et. al. (2009), current research has not examined this issue closely.

Another group of studies focuses on the impact of APLs on the cost of credit. If there are costs in complying with regulatory requirements, then these costs might be, at least in part, passed on to the consumer through higher interest rates or higher points and fees. However, the evidence suggests that APLs generally do not drive up loan prices. Although more restrictive laws may drive up the cost of borrowing through higher interest rates, this effect is limited to fixed-rate loans and its magnitude is typically fairly small (Li & Ernst 2007; Pennington-Cross & Ho 2008).

C. Prior Research: Impact of State Anti-Predatory Lending Laws on Foreclosure Risk

Another line of research has started to investigate whether differences in regulatory environment, including state APLs, contribute to differences in the quality of loans originated and subsequent rates of foreclosure. Many of the features restricted by APLs, such as prepayment penalties, balloon payments, lack of verification of borrowers' repayment capacity, and very high interest rates and fees, have been associated with higher default risk. Calhoun & Deng (2002) and Quercia et. al. (2007) found that subprime ARMs have a higher risk of foreclosure because of the interest-rate risk, the underwriting using teaser rates, and other such practices. At the aggregate level, the share of ARMs appears to be positively associated with market risk, as measured by house price declines (Immergluck 2008). Subprime hybrid ARMs, which usually have prepayment penalties, bear particularly high risk of default at the time the interest rate is reset (Ambrose et. al. 2005; Pennington-Cross & Ho 2010).

As to prepayment penalties and balloons, Quercia et al. (2007) found that compared to loans without these features, refinance loans with prepayment penalties are 20 percent more likely to

experience a foreclosure, while loans with balloon payments are about 50 percent more likely to do so. Prepayment penalties also tend to reduce prepayments and increase the likelihood of delinquency and default among subprime loans (Danis & Pennington-Cross 2005). Ding, et. al. (2008) found that ARMs, prepayment penalties, and broker originations all contribute significantly to subprime loans' increased risk of default.

One study examined the impact of state APLs on mortgage product mix. Pennington-Cross et. al. (2009) found that state APLs significantly reduced the use of mortgage features thought to increase foreclosure risk, including prepayment penalties, balloon payments, non-amortizing loans, investor loans and reduced income documentation loans. In other words, APLs resulted in less risky mortgage products. They also found insignificant differences in borrower credit quality, tending to rule out the hypothesis that lenders in APL states systematically sought better borrowers. This study supports our hypothesis that state APLs would be associated with lower foreclosure rates.

Although the literature does document a clear link between risky mortgage product features and foreclosures, very few studies have explicitly examined the link between state APLs and local- or state-level foreclosure rates. In a working paper, Goodman & Smith (2009) suggest that the laws governing mortgage underwriting, mortgage foreclosures, and the potential costs to the lender differ substantially across states. They found some evidence that mini-HOEPA laws – i.e. APLs – reduce the level of foreclosure, which suggests that higher lender costs for foreclosure and stringent controls on predatory lending are connected to lower foreclosure rates. However, since Goodman and Smith are only able to use a cross-sectional dataset for one particular month, their paper's applicability may be limited. As regulations are being proposed and amended to address the current mortgage crisis, further research in the area of laws and regulations and the measurement of their effectiveness is needed (Richter 2008).

III. Analysis of the Impact of Anti-Predatory Lending Laws during the Subprime Foreclosure Crisis: Data and Methodology

APLs were designed to protect consumers by restricting the origination of loans with predatory features. Some of the restricted loan terms are known to be associated with increased risk of default and foreclosure (Quercia 2007). In addition, APLs, by putting some outer limits on subprime mortgage pricing, may restrict the origination of the riskiest loans. If APLs work, for example, by improving the quality of loans originated and by reducing the likelihood of default, then they can help to inform the regulatory landscape going forward. But do they work in this fashion? And what features of APLs are the most important in ensuring consumer protection in the mortgage market?

In this article, we contribute to this discussion by first answering the question of whether or not APLs are associated with lower rates of originations of loans with risky features, and whether or not certain aspects of APLs are more important than others in ensuring responsible lending. Using a national, loan level database of mortgages originated between 2002 and 2006, we examine differences in loan terms and outcomes in states with and without APLs, controlling for a wide range of borrower, neighborhood and economic characteristics that might influence underwriting practices and loan performance. We also examine the effect of different components of the APL by testing whether certain restrictions—such as banning prepayment penalties or requiring the lender to verify a borrower’s ability to repay—influence the outcomes of originated loans.

Then, we look explicitly at the question of whether or not APLs served to mitigate the foreclosure crisis. Again, using loan level data, we examine whether or not loans in states with APLs were less likely to be 90+ days delinquent than loans made in non-APL states. This effect of APLs is hypothesized to work in two ways. First, APLs may reduce the incidence of foreclosure by limiting the number of loans with risky loan features, such as prepayment penalties or option ARM features. Second, by improving overall underwriting quality, APLs may help to ensure that lenders are more attuned to the borrower risk profile and their ability to pay for the loan over the long term.

Because there is significant variation in the coverage and strength of APLs across different states, most researchers have developed a set of indices to quantify the substantial variation in the laws. This paper relies on a state law coding system that includes measures that not only test for the presence of a state law, but also its strength and the nature of its restrictions (See Appendix).

The binary variable *ineffect*, modeled on Pennington-Cross et al. (2009) and Bostic et al. (2008a), in combination with the effective date variable for the same state and law, is intended to identify states with mortgage statutes that could plausibly have an impact on high-cost or subprime mortgage lending. In a departure from some prior studies, states that simply copied the federal HOEPA restrictions without additional restrictions are not identified as having an anti-predatory lending statute by the *ineffect* variable. In several instances, the intent of these laws was to preempt local laws and ordinances that imposed greater restrictions than federal law. However, these states are included in an alternative specification, *ineffectb*, which allows us to test this coding approach.

In addition to the presence of a state law, this study also identifies the nature of its restrictions. The variable *pointstrigger* quantifies the coverage of state APLs below the federal HOEPA thresholds. The variable *prepaymentpenalty* captures the scope and extent of prepayment penalty restrictions on a scale of 0 to 4. Finally, the binary variable *repaymentability* identifies states in which a significant portion of the mortgage market was subject to a requirement that repayment ability be determined and/or verified, or that borrowers receive counseling as a precondition to

obtaining a mortgage loan, and that these requirements be subject to some enforcement or sanction. (For more details on the coding system used for state laws, see Appendix.)

The quantitative analysis used in this paper relies on a proprietary dataset on loan performance collected by Lender Processing Services Applied Analytics, Inc. (LPS). (For more details on the LPS dataset, see Appendix). We selected a random 10 percent sample of the 14.6 million loans in the LPS dataset, limiting the sample to owner occupied, conventional, and first lien loans in this analysis. The data were cleaned to account for missing information (FICO score, LTV) and to remove data with clear reporting errors (e.g. reported zip code not in property state, LTV less than 10). The final study sample used in the analysis consists of approximately 1.2 million loans that were originated between January 1, 2002 and December 31, 2006. Performance is observed from origination through December 2008; after 2008, the combination of the recession, sharp increase in unemployment, and the rapidly changing policy environment make it difficult to isolate the impact of APLs on loan performance. Each loan is repeatedly observed from the month it is originated until the loan was 1) paid off, 2) became 90 days delinquent, or 3) was still active and never experienced 90+day delinquency in December 2008 (right censored). We focus on 90 days delinquency as opposed to foreclosure since state laws governing foreclosure can have strong impacts on the length or duration of the foreclosure spell, thus clouding the analysis of the effect of state anti-predatory lending laws (Cutts & Merrill, 2008).

We tested the representativeness of the study sample against the overall mortgage market. One drawback of the LPS data is that it under-represents the subprime market, and that it does not include either combined loan-to-value ratio (LTV) or debt-to-income (DTI) information. However, its broad geographic coverage and inclusion of both securitized and portfolio loans allows for an examination of a wider swath of the mortgage market than other available loan performance data. In terms of the geographic coverage at the state level, the sample is not significantly different from the geographic distribution of loans in the full LPS database, or for originations as reported in the Home Mortgage Disclosure Act (HMDA) data (See Table 1). The one exception is a light overrepresentation of loans originated in California. The performance of the loans in the sample parallels national delinquency rates for all loans. Of the loans in the sample, 32.08 percent were paid off, 4.23 percent became 90 days delinquent, and the remaining 63.69 percent were still active as of December 2008. The relatively strong performance of loans in the sample attests to the distribution of loans in LPS and its underrepresentation of the subprime market.

Because differences in both loan originations and loan performance are driven by factors such as borrower risk profiles and local and national economic conditions, we also control for borrower, housing and labor market characteristics in our analysis. At the borrower level, we include FICO score and LTV at origination. Neither income nor race is available in the LPS data, however, FICO score and LTV are both significant and strong predictors of loan product and loan outcomes. We also control for whether or not the loan was originated without documentation of the borrower's income or assets. To control for mortgage market channel, we include information as to whether or not the loan was originated by a mortgage broker, or the

“wholesale” mortgage market channel. Studies suggest that loan origination channels play an important role in determining the types of mortgages borrower receive, the cost of credit, and consequently the foreclosure rate (Ernst, et al. 2008; Ding et al. 2008)

To account for housing market dynamics, we constructed a house price change variable for each loan. Economic analyses conducted at the Federal Reserve Bank of San Francisco and the Federal Reserve Bank of Boston have shown that house price dynamics are important predictors of foreclosure (Doms et. al. 2007; Gerardi et. al. 2007). For the models predicting loan origination, we construct a variable that measures house price changes in the Metropolitan Statistical Area (MSA)/metropolitan division in the two years *prior* to the loan origination. For the models predicting loan performance and repayment, we calculate a time-varying measure of the monthly change in house prices *from the time of origination until the time of last observation*. While not a direct measure of current LTV, this variable controls for areas in which borrowers are more likely to be underwater due to declining house values. House price changes are measured at the MSA/Metropolitan Division and are based on the Federal Housing Finance Agency (FHFA) (formerly Office of Federal Housing Enterprise Oversight (OFHEO)) house price index. We also include a yearly measure of housing affordability at the county level; areas with lower affordability scores saw a large gap between local incomes and housing prices, thus suggesting that fewer households were able to afford a home in that county and may have been more likely to rely on riskier mortgage products.

We also include time varying variables that capture general housing, mortgage market, and economic conditions. These include county unemployment rates from Bureau of Labor Statistics (BLS), the prevailing contract interest rates on commitments for conventional fixed rate mortgages from Freddie Mac, as well as the percent of college graduates and minority residents at the zip code level.

We also created a set of time dummies for loans originated in different years. Table 2 presents the variables used in the analysis, and Table 3 provides summary statistics and descriptions of the estimation data. For each step of the analysis, we present the results for all loans, and then provide additional analyses for various loan types.

To better capture the correlation between APLs and foreclosure rates, we also incorporated analysis using the cross-border approach similar to the one used in other studies (Bostic et al. 2008a; Pennington-Cross et al. 2009), which takes into account intrastate variation in economic conditions that can significantly influence mortgage performance. This sampling technique helps to control for many important unobservable characteristics by focusing on zip codes that are in the same housing and labor markets. Borrowers on either side of the border are likely to be experiencing similar housing market and economic conditions, thereby eliminating unobservable differences between different markets that we cannot control for in the model. As a result, the major remaining difference is the legal landscape between the neighboring zip codes. The approach focuses on zip codes located on state borders (with the center of the zip code within 5 miles of the state lines), where one of the two bordering states had an APL.

By presenting both the cross-border zip analysis and the analysis for all the loans in the sample, we believe that we are able to more rigorously assess the effect of state APLs on loan performance than we would be by presenting either method alone.

IV. Empirical Results

A. Effect of Anti-Predatory Lending Laws on Mortgage Originations

In the first stage of the analysis, we examine whether or not the existence of APLs influenced the characteristics of originated loans, reducing the incidence of loans with risky features such as prepayment penalties, interest only, negative amortization, balloon payments, and low-documentation (Pennington-Cross et al. 2009). We focus on two key loan types in this analysis. First, we examine whether or not state APLs influence the origination of loans with prepayment penalties. Prepayment penalties were frequently included in subprime mortgages and have been found to increase the risk of foreclosure, and were the focus of many state APLs.

Second, we examine whether or not APLs had any effect on the likelihood of the origination of option ARMs, which we define as adjustable rate mortgages with payment options, including interest only loans, loans with negative amortization, and ARM loans with balloon payments. During the subprime boom, option ARMs became widely prevalent as “affordability” products and were particularly risky given the possibility of not assessing the long-term affordability of the mortgage. In addition, option ARMs were often offered with a very low teaser rate (often as low as 1%) which translates into very low minimum payments for the first year of the ARM. There has been significant concern that during the subprime boom, lenders underwrote borrowers for the initial payments that were significantly below the fully amortizing payment level, leading to potentially severe subsequent payment shock. For these loans, we only look at the subset of adjustable rate mortgages to assess whether or not the loan was originated with a riskier payment structure. Our *a priori* expectation is that states with APLs that specifically require verification of a borrower’s ability to repay are likely to see a lower incidence in the origination of option ARMs, compared to states with no APLs or states with only minimal APL coverage.

In Table 4, we compare simple descriptive statistics on the origination rates of option ARM loans and loans with prepayment penalties in states with and without APLs. The table shows that there are significant differences in the origination of these riskier loan types, and that these loans were more common rather than less in APL states. The popularity of nontraditional mortgages in California, an APL state, may help explain much of the difference here. In addition, the table also shows that socio-economic conditions in APL states and non-APL states also varied

significantly, with APL states having higher housing costs and lower levels of housing affordability, higher rates of unemployment, and a higher percentage of minority residents.

However, once we control for borrower, housing and labor market characteristics, we see that borrowers in APL states were less likely to receive a loan product with risky features, particularly when it comes to the likelihood of receiving a prepayment penalty (Table 5). The model results are consistent with expectations. We find that borrowers with lower credit scores and LTVs above 80 percent are more likely to receive a loan with a prepayment penalty, as are loans that are originated by mortgage brokers and loans that have no documentation. Housing affordability also clearly affects the likelihood of receiving a loan with prepayment penalties. Areas that saw high price appreciation prior to origination as well as lower housing affordability (represented as the gap between local house values and income) have increased originations of loans with prepayment penalties. Consistent with other studies that have documented the geographic variation in subprime lending, we also find that neighborhoods with higher percentages of minorities are more likely to receive a loan with a prepayment penalty.

Importantly, we find that APLs significantly reduce the likelihood of the origination of loans with prepayment penalties, resulting in an odds ratio of .87. The strong effect on prepayment penalties is consistent with expectations and prior work (e.g. Pennington-Cross et al. 2009), since many state laws focus on restricting or banning prepayment penalties in their design.

In the second half of Table 5, we examine whether or not the presence of any APL had an effect on the incidence of option ARM loans. Here, we find that the *ineffect* variable is positive, but not significant. The high rate of option ARMs originations in California, which although it is an APL state, did not have any repayment ability restrictions in its APLs, could explain this finding. To test this hypothesis, we re-ran the model excluding California from the analysis. The results are presented in Table 6, and show that the *ineffect* variable now has a positive and significant effect on reducing the likelihood of option ARM originations. The full model also shows the degree to which option ARMs were offered as affordability products in ‘hot markets’; housing markets that saw rapid price appreciation and a large gap between house values and incomes saw a greater incidence of option ARM loans. Lower FICO scores, higher LTVs, and a lack of documentation also significantly increased the likelihood of receiving an option ARM, as did mortgage broker originations. This analysis suggests that the strength of the APL, in particular APLs that restrict more contract terms, can significantly influence the types of loan products that are originated. In California, which did not have repayment ability restrictions as part of its APL statutes and therefore did not require either the verification of a borrower’s ability to repay or financial counseling, had insufficient consumer protections built into its APL to limit the number of option ARM originations, particularly given its rapidly rising house prices.

In Table 7, we examine the effects of APLs by loan cohort. Here, we see a marked difference between the results for prepayment penalties and option ARMs. State APLs reduced the likelihood of prepayment penalties most strongly for loans originated in 2005 and 2006, with

some effect for loans originated in 2004. This may in part demonstrate the effect of OTS removing the federal preemption of state restrictions on prepayment penalties in 2003, as to non-federal lenders. In contrast, state APLs seemed to become less effective in reducing the likelihood of receiving an option ARM for the later cohorts. This could reflect the overall deterioration of lending standards at the height of the subprime boom, and the greater use of affordability ARMs to help borrowers in areas with very rapid house price appreciation.

Table 8 presents results using alternative specifications of the APL variable. For states with APLs that did not go beyond the federal statutes (*APL ineffectb*), there was no decrease in the likelihood of origination of either prepayment penalties or option ARMs. In contrast, stronger restrictions—such as the repaymentability requirement—greatly reduced the likelihood of both prepayment penalties and option ARMs. The *pointtrigger* specification has a stronger effect for loans with prepayment penalties than for loans with option ARMs.

Table 8 also demonstrates the importance of the scope and coverage of state APLs in influencing lender underwriting behavior. States with the strongest restrictions on prepayment penalties—coded “4”—reduced the likelihood of borrowers receiving a loan with a prepayment penalty by almost half (odds ratio = .56). (The state bans were not 100% effective because federal lenders could continue including prepayment penalties due to OCC and OTS preemption.) In contrast, states that restricted prepayment penalties for only part of the mortgage market—coded “1”—saw no such effect. States with strong prepayment penalty APLs also saw lower rates of option ARMs, however this is likely more due to the fact that there is substantial overlap between states with strong prepayment penalty laws and repaymentability requirements than it is the fact that prepayment penalty APLs have a direct effect on the incidence of option ARM originations. There is significant overlap between states that have strong prepayment penalty restrictions and those that have *repaymentability* coverage and higher *pointtrigger values* as well (see Table 12).

In the bottom half of the table, we examine the effect of APL specifications, for only those loans originated along the border zips. Overall, the results are quite consistent with the results for all loans, with APLs decreasing the likelihood of both prepayment penalties and option ARMs. Interestingly, *repaymentability* and *pointtrigger* restrictions emerge as only important for option ARMs, proving to be insignificant in the likelihood of the origination of loans with prepayment penalties. Prepayment penalty restrictions, logically, have a stronger negative effect for loans with prepayment penalties. If the border zip codes are effectively controlling unobservable differences between communities that might influence the origination of loans with these characteristics (thus clouding the interpretation of the model including all loans), these results would suggest that targeted APLs really do influence the origination of loans they are intended to: stronger prepayment penalty restrictions reduce loans with prepayment penalties but have less of an effect on option ARMs, while repayment ability restrictions may have a greater influence on the origination of option ARMs. More research into these relationships is certainly warranted, especially as policymakers struggle with finding a balance between consumer protections on the one hand and not unduly restricting access to credit on the other.

B. Effect of Anti-Predatory Lending Laws on Loan Performance

In the next stage of the analysis, we examine whether or not state APLs have an effect on loan performance. We expect that states with stronger restrictions on predatory loan terms would have, on balance, lower foreclosure rates, once we control for borrower, housing and labor market characteristics. We theorize that APLs will affect foreclosure rates in two ways, either by limiting the origination of loans with risky loan features, or by improving the overall quality of underwriting, thereby ensuring that borrowers are not placed into a loan that they cannot afford over the long term.

To account for changes over time in macroeconomic conditions, the variables capturing interest rate changes, unemployment, house price changes, and affordability are allowed to be time-varying covariates, with the value corresponding to the conditions present at the last point of observation. As was mentioned earlier, each loan is repeatedly observed from the month it is originated until either 1) it is paid off, 2) it became 90 days delinquent, or 3) December 2008 (right censored). We also include a variable, loan age, which captures the length of time that a loan is in the sample. To capture changes in interest rates that might influence the prepayment decision, we calculate a time-varying measure of monthly changes in the prevailing contract interest rate on commitments for conventional fixed rate mortgages from Freddie Mac . We do not include loan features in the model because they are endogenous variables. We also include the mortgage origination channel. Since the wholesale mortgage origination channel was more conducive to mortgage fraud (by brokers/correspondents, appraisers, and, sometimes but not always, borrowers), we would expect to see higher levels of both serious delinquencies and prepayments in this channel.

Building on previous literature on mortgage defaults (Quercia & Spader 2008), we use option theory to develop our modeling approach for this question. Option theory posits that borrowers decide each month either to make a mortgage payment, to exercise the prepayment option (e.g. sell the home or refinance), or exercise the default option (Foster & Van Order, 1984). These options are competing risks; choosing one eliminates the possibility of the other until the next monthly payment is due. Loan performance is observed each month, and we assume that prepayment and default (as opposed to the reference group of making the mortgage payment) are distinct events that are influenced by different underlying mechanisms. We model these competing risks using the multinomial logit (MNL) framework (see Clapp et al. 2001). Although researchers often rely on the Cox proportional hazards framework to analyze prepayment and default, Clapp and his colleagues have shown that using the MNL framework allows for estimating a flexible baseline hazard, as opposed to requiring the proportional hazards assumption. The information for each loan is restructured to include one observation for each time period in which that loan is active (i.e., from origination up to and including the period of termination). Once the data are restructured, the likelihood function is identical, in discrete time, to the continuous-time likelihood function for the Cox model.

Table 9 presents the results of our competing risk model. Delinquency and prepayment are the competing risks, with loans that remained active and had never been seriously delinquent as of December 2008 serving as the reference group. We report the coefficient, standard error, as well as the "relative risk" ratio. The relative risk ratio gauges the effect of an independent variable on the two reported outcomes—delinquency and prepayment—relative to the likelihood of remaining active, given that the other variables in the model are held constant.

The model shows a strong and significant effect of state APLs on the likelihood of default. Loans originated in states with APLs are significantly less likely to be 90+ days delinquent, with a relative risk ratio of .85. APLs also have a small but significant negative effect on the likelihood of prepayment, with a relative risk ratio of .93. These results suggest that APLs, by reducing the number of loans with risky features and by ensuring prudent underwriting, reduce the number of foreclosures, and may also reduce possible forced sales or refinancings of unaffordable loans.

The full model reveals important information about the determinants of default and prepayment. First, it is clear that borrowers with riskier credit profiles—most notably captured in FICO score—are much more likely to be in default than are borrowers with higher credit scores. In addition, a high loan to value ratio significantly increases the likelihood of default. Further, borrowers that saw a drop in neighborhood house values—or a smaller increase—were more likely to be in default than those who saw continued house price appreciation after origination. As expected, we also see a strong, positive effect of wholesale origination channel on both the likelihood of delinquency and prepayment.

In contrast, borrowers who saw house price declines were much less likely to prepay. This is as we would expect. Borrowers who saw their equity erode as a result of declining house prices would have to pay a higher risk premium on a new mortgage, therefore reducing the likelihood of prepayment, all other things being equal. The model also attests to the importance of interest rates. If the prevailing interest rate at last point of observation is higher than the prevailing rate at origination, the likelihood of prepayment decreases significantly. We also see a decreased risk of delinquency, and an increased risk of prepayment for loans originated in 2002/2003 compared to those originated in 2005/2006, which likely reflects the large wave of refinances that occurred during the subprime boom. Areas with more affordable housing in relation to local incomes saw both fewer delinquencies and fewer prepayments. Borrowers living in neighborhoods with higher percentages of minorities were more likely to experience a delinquency, and less likely to prepay, than areas with lower shares of minority households.

Table 10 presents the results of the effect of state APLs using alternative samples of loans, reporting only the coefficients and relative risk ratios for the state APL variable. Here, the results are remarkably consistent. The effect of APLs appears to be relatively consistent across loan types, reducing the likelihood of serious delinquency in the purchase/refinance and fixed

interest rate/adjustable interest rate markets. We also see that APLs reduce the likelihood of prepayment in all these different specifications.

Lastly, in Table 11, we examine alternative specifications for the APL state law variable. While in all of the previous model specifications the general *ineffect* variable proved to reduce the likelihood of serious delinquency, the components of the legal framework also turn out to be important. Notably, when we include states with HOEPA copycat statutes as APL states, the significance and protective effect of APLs disappear. In fact, loans originated in states with nominal APLs (*ineffectb*) see a slightly higher serious delinquency rate than loans originated in states without APLs. This could be due to the inclusion of states such as Nevada and Florida, both states that had APLs that did not go beyond federal law, and that saw a high percentage of subprime lending during our period of observation.

In contrast, borrowers in states with more coverage and more restrictions were significantly less likely to be seriously delinquent. We find that the requirement for lenders to verify borrower's ability to repay (*repaymentability*), is associated with a significant reduction in the likelihood of delinquency. We also found that borrowers in states with laws that had a broader coverage as measured by points and fees triggers (*pointstrigger* ≥ 3) were significantly less likely to be seriously delinquent than those in states with APLs with less coverage (*pointstrigger* < 3) (a relative risk ratio of .72 compared with .84). The strength of restrictions on prepayment penalties also matters, with the states that ban prepayment penalties on some or all loans (*prepayment penalty*=3 and 4) showing a much stronger effect than the states that merely restrict them (*prepayment penalty*=1 and 2). States with APLs also saw a small but noticeable effect on the likelihood of prepayment. While some of this may be due to differing housing dynamics in those states, it could also be an indication that borrowers in appropriate loan products are less likely to seek to refinance, either to get out of a risky "affordability" product or to sell their home if they are no longer able to make their mortgage payments.

In the bottom panel, we examine the effects of APLs for loans originated in border zip codes. Interestingly, here we see a reduction in delinquencies not only for APL states (relative risk ratio .86), but also for the alternative specification of APL which includes states that did not go beyond federal law (relative risk ratio .88). The only main difference in the border zip analysis is that states that banned prepayment penalties for only a subset of mortgages (*prepayment penalty*=3), based on loan amount or price, saw a greater effect than states with the strongest prepayment penalty restrictions. Nevertheless, the results of the border analysis suggest that the effects of APLs are quite robust, and that with few exceptions, strong APLs reduce the likelihood of borrowers becoming seriously delinquent on their mortgage.

Linking these results with the product choice models presented earlier, it becomes clear that directly restricting certain predatory loan terms does have an influence both on the products offered to consumers as well as on loan performance. Future research is necessary to further tease out the various elements of state APLs that would have the greatest effects in terms of

consumer protection. Expanding the sample of border state loans, for example, or looking specifically at some case study states with similar housing and mortgage markets, could further illuminate how state APLs can be designed to best protect consumers from predatory loan terms. In addition, similar analyses on other datasets—including national datasets such as Loan Performance that has better coverage of the subprime market—are warranted. Nevertheless, this study provides important new evidence on the effectiveness of state APLs that should help policy-makers as they re-examine the regulatory landscape for financial products.

V. Conclusion

In this study, we used a nationally representative loan level dataset to examine whether or not state anti-predatory lending laws a) reduce the likelihood of origination of loans with riskier loan terms, and b) reduce the likelihood of serious delinquency.

In the loan-level analysis, we found strong evidence that APLs affected the mix of mortgage products by, *inter alia*, reducing the incidence of prepayment penalties. The story for negative amortizing loans or option ARMs is more mixed, in that APLs do not have a significant effect on reducing the origination of loans with option ARMs for the full sample. However, once we consider alternate samples, such as loans originated in border states or all loans originated in all states except for California, APLs did significantly reduce the likelihood of option ARMs. In addition, states with broader restrictions in their APLs, such as repayment ability requirements, did see a significant and positive decline in the origination of option ARMs during the subprime boom. This, coupled with the cohort analysis presented in Table 7, leads us to hypothesize that more general APLs without specific restrictions on repayment ability requirements were not strong enough to counteract the deterioration of underwriting standards that occurred during the latter half of the subprime boom, particularly in high-cost states such as California.

Importantly, we also found that APLs significantly reduce the likelihood of default, even after controlling for a wide range of borrower, housing, and mortgage market characteristics. The strength of the APL coverage matters: there was a reduced likelihood of serious delinquency among borrowers in states with laws that extend HOEPA coverage and/or restrict more contract terms, that provide broader coverage of loans with high points and fees, and that impose more restrictive regulation on prepayment penalties. The results are robust enough that we find an effect regardless of loan purpose/interest rate mix, and whether or not we examine all loans or only those made in zip codes along state borders.

Generally, the goal of anti-predatory lending laws is to ban or restrict the origination of loans with unfair or abusive terms. By reducing the origination of loans with exotic features, such as prepayment penalties, balloon payments, equity-stripping fees, interest only, and lack of verification of borrowers' repayment capacity, the overall mortgage default risk can be

significantly reduced. In fact, strong APLs may have even broader impact on the mortgage market. Many studies have demonstrated that the loose underwriting and the increased availability of nontraditional non-prime mortgages was one primary reason for the run-up in house prices in the first half of the last decade and the subsequent collapse (Mian & Sufi 2008). With a strong APL in place, lenders should be less likely to adopt risky underwriting standards that allow loan applicants to borrow more than they could afford, thereby limiting loan loss risk when house prices decline, interest rates change, or mortgage payments become unsustainable.

This study provides strong evidence that state regulation of subprime mortgages can serve as an important tool in the landscape of mortgage market regulation and consumer protection. To the extent that APLs improve underwriting standards and limit riskier loan products, they also decrease the likelihood of serious delinquencies and foreclosures. Given the dire consequences of foreclosure on individual households, as well as the negative spillover effects on neighborhoods and even regional economies, there is a strong case to be made for allowing states to implement and enforce effective APLs without federal preemption.

Tables

Table 1: Geographic Distribution of Sample

State	LPS Sample	LPS Full Data	HMDA	State	LPS Sample	LPS Full Data	HMDA
Alabama	0.79	0.91	1.08	Missouri	1.89	0.31	1.94
Alaska	0.15	0.15	0.17	Montana	0.27	0.31	0.24
Arizona	2.91	2.84	2.90	Nebraska	0.31	0.44	0.46
Arkansas	0.46	0.54	0.60	Nevada	1.33	1.41	1.30
California	19.28	18.03	15.67	New Hampshire	0.47	0.51	0.50
Colorado	2.51	2.47	2.34	New Jersey	3.39	3.56	3.14
Connecticut	1.39	1.35	1.29	New Mexico	0.55	0.55	0.52
Delaware	0.3	0.31	0.33	New York	5.02	4.56	3.63
District of Columbia	0.32	0.27	0.21	North Carolina	2.28	2.33	2.56
Florida	6.77	6.9	7.26	North Dakota	0.12	0.16	0.13
Georgia	2.79	2.85	2.96	Ohio	2.39	2.53	3.50
Hawaii	0.42	0.47	0.38	Oklahoma	0.62	0.68	0.82
Idaho	0.61	0.59	0.52	Oregon	1.71	1.57	1.33
Illinois	4.14	4.58	4.61	Pennsylvania	3.15	3.38	3.73
Indiana	1.52	1.53	1.95	Rhode Island	0.37	0.35	0.45
Iowa	0.69	0.82	0.75	South Carolina	1.05	1.07	1.20
Kansas	0.73	0.79	0.74	South Dakota	0.15	0.2	0.19
Kentucky	0.8	0.87	1.03	Tennessee	1.34	1.44	1.62
Louisiana	0.63	0.68	1.00	Texas	5.32	5.36	5.38
Maine	0.29	0.29	0.39	Utah	0.99	0.95	0.98
Maryland	2.82	2.72	2.62	Vermont	0.15	0.14	0.18
Massachusetts	2.44	2.35	2.56	Virginia	3.36	3.21	3.19
Michigan	3.06	3.27	3.80	Washington	3.56	3.16	2.66
Minnesota	2.4	2.48	2.03	West Virginia	0.19	0.22	0.37
Mississippi	0.28	0.3	0.56	Wisconsin	1.32	1.37	2.11
				Wyoming	0.15	0.17	0.13

*Percent of originations between 2002-2006.

Table 2: Variable Definitions

Variable	Definition
FICO	Borrower FICO Score measured at origination FICO < 580 580 <= FICO < 620 620 <= FICO < 660 660 <= FICO < 720 FICO > 720 (Reference category)
LTV	Borrower LTV measured at origination LTV < 60 (Reference category) 60 <= LTV < 70 70 <= LTV < 80 80 <= LTV < 90 LTV >= 90
No Documentation	Loan was originated with no or limited documentation
Broker/Wholesale Origination	Loan was originated by a broker or wholesale channel
FHFA 2 Years Prior to Origination	Change in FHFA House Price Index 2 years prior to loan origination HPI Change < 10 10 <= HPI Change < 25 HPI Change >25 (Reference category)
FHFA Post Purchase	Change in FHFA House Price Index from origination to last observation HPI Change < 10 10 <= HPI Change < 25 HPI Change >25 (Reference category)
Affordability	County affordability index in the observation month (a higher score translates into greater affordability) Affordability < 87 (Reference category) 87 <= Affordability < 133 133 <= Affordability < 174 Affordability >=174
Unemployment	County unemployment rate in the observation month from the BLS Unemp Rate < 4.4 (Reference category) 4.4 <= Unemp Rate < 5.2 5.2 <= Unemp Rate < 6.2 Unemp Rate > 6.2
Neighborhood Racial Composition (Minority)	Percent of non-whites in the zip code from 2000 Census Minority < 9 percent (Reference category) 9.0 <= Minority < 19 19 <= Minority < 37 Minority >= 37

Neighborhood Education Level (College)	Percent of population with bachelor degree or higher in the zip code from 2000 Census
	College < 24
	24 <= College < 34
	34 <= College < 48
	College > 48 (Reference category)
Loan Age	Number of days from origination to last observation
Interest Rate	The prevailing contract interest rates on commitments for conventional fixed rate mortgages from Freddie Mac at last period of observation minus the prevailing rate at origination
Year of Origination	Year loan was originated
	Originated in 2002/2003
	Originated in 2004
	Originated in 2005/2006
APL Coding	
State APL in Effect	State APL variable
State APL in Effect B	Alternative specification of state APL variable (including laws with substantial protection and those with marginal protection)
Repaymentability	Repaymentability requirement in APLs
Prepaymentpenalty	A complete or partial ban on prepayment penalties in APLs
Pointstrigger	Extent of APL coverage, measured by difference between state law points and fees trigger and the federal HOEPA thresholds.

Table 3: Sample Means

	Sample Means All Loans	Sample Means Border Zips
Sample Size	1,200,735	158,486
Legal Framework		
APL In Effect	49.7	36.72
APL In Effect B	63.6	48.51
Repaymentability	20.6	42.43
Pointstrigger	45.1	35.45
Prepayment Penalty		
	0	37.7
	1	8.1
	2	26.9
	3	17.6
	4	9.7
Loan Terms		
Purchase	32.52	35.01
ARM	24.04	21.84
Option ARM	8.05	6.05
Prepayment Penalty Loan	13.65	10.76
No Documentation	11.11	10.23
Loan to Value	68.17	69.05
FICO at Origination	720.37	718.39
Loan Performance		
90+ Days Delinquent	4.23	3.48
Prepayment	32.08	32.21
Housing and Socio-economic Conditions		
FHFA House Price Change (2 years prior to origination)	19.39	19.67
County Unemployment Rate	5.42	5.27
Percent Minority in Zip Code	26.79	24.11
Percent College in Zip Code	37.21	36.70
County Housing Affordability	134.02	141.38
Median House Values in Zip Code	181,891	183,709
Median Household Income in Zip Code	54,074	53,566
Interest Rate	5.35	5.36

Table 4: Differences Between APL and Non-APL States

	Sample Means All Loans			Sample Means Border Zips		
	Non-APL States	APL States		Non-APL States	APL States	
<u>Loan Terms</u>						
Purchase	32.65	32.39		33.32	37.92	***
ARM	20.35	27.77	***	19.41	26.02	***
Option ARM (as share of ARMs)	30.78	41.50	***	26.18	34.88	***
Prepayment Penalty Loan	12.63	14.68	***	10.74	10.79	***
No Documentation	8.19	14.05	***	7.97	14.13	***
Loan to Value	69.83	66.49	***	69.96	67.48	***
FICO at Origination	720.60	720.20	***	719.50	716.50	***
<u>Loan Performance</u>						
90+ Days Delinquent	4.11	4.34	***	4.07	3.87	***
Prepayment	33.84	30.30	***	33.35	30.23	***
<u>Housing and Socio-economic Conditions</u>						
FHFA House Price Change (2 years prior to origination)	17.79	21.26	***	17.96	23.08	***
County Unemployment Rate	5.20	5.65	***	5.30	5.22	***
Percent Minority in Zip Code	20.55	33.09	***	19.58	31.92	***
Percent College in Zip Code	35.99	38.45	***	35.14	39.38	***
County Housing Affordability	149.70	118.10	***	157.20	114.10	***
Median House Values in Zip Code	53,499	47	***	155,079	44	***
Median Household Income in Zip Code	51,336	56.8	***	51,848	56.5	***
Interest Rate	5.3	5.4	***	5.33	5.40	***

*** p < .0001, ** p < .001, * p < .01

Table 5: Model Predicting the Effect of State APLs on Mortgage Product Origination

		All Loans				Adjustable Rate Loans			
		Likelihood of Receiving a Prepayment Penalty				Likelihood of Receiving an Option ARM			
		Coefficient	Standard Error		Odds Ratio	Coefficient	Standard Error		Odds Ratio
Intercept		-2.136	0.013	***		-1.952	0.024	***	
FICO	FICO < 580	1.788	0.016	***	5.98	2.075	0.027	***	7.97
	580 <= FICO < 620	0.826	0.013	***	2.29	1.688	0.025	***	5.41
	620 <= FICO < 660	0.310	0.009	***	1.36	0.948	0.016	***	2.58
	660 <= FICO < 720	0.000	0.007		1.00	0.276	0.012	***	1.32
LTV	60 <= LTV < 70	-0.120	0.009	***	0.89	-0.048	0.019	*	0.95
	70 <= LTV < 80	-0.082	0.007	***	0.92	-0.024	0.015		0.98
	80 <= LTV < 90	0.116	0.008	***	1.12	0.337	0.016	***	1.40
	LTV >= 90	0.327	0.015	***	1.38	0.203	0.029	***	1.23
No Documentation		0.598	0.008	***	1.82	2.075	0.012	***	7.97
Broker/Wholesale Channel FHFA 2 Years Prior to Origination		0.154	0.007	***	1.17	1.560	0.010	***	4.76
Housing Affordability	HPI Change < 10	-0.212	0.007	***	0.81	0.023	0.012		1.02
	10 <= HPI Change < 25	-0.098	0.009	***	0.91	-0.133	0.020	***	0.88
	87 <= Affordability < 133	-0.364	0.008	***	0.70	-0.492	0.014	***	0.61
	133 <= Affordability < 174	-0.320	0.009	***	0.73	-0.981	0.017	***	0.38
Unemployment Rate	Affordability > =174	-0.345	0.009	***	0.71	-1.234	0.020	***	0.29
	4.4 <= Unemp Rate < 5.2	0.159	0.009	***	1.17	0.089	0.014	***	1.09
	5.2 <= Unemp Rate < 6.2	0.403	0.008	***	1.50	0.047	0.015	**	1.05
	Unemp Rate > 6.2	0.370	0.009	***	1.45	-0.040	0.015	*	0.96
Percent Minority	9.0 <= Minority < 19	0.229	0.009	***	1.26	0.103	0.016	***	1.11
	19 <= Minority < 37	0.418	0.009	***	1.52	0.061	0.016	***	1.06
	Minority >= 37	0.578	0.009	***	1.78	-0.002	0.017		1.00
Percent with College Degree	College < 24	-0.012	0.008		0.99	0.489	0.016	***	1.63
	24 <= College < 34	-0.114	0.008	***	0.89	0.338	0.015	***	1.40
	34 <= College < 48	-0.046	0.008	***	0.96	0.179	0.014	***	1.20
APL in Effect	Ineffect = 1	-0.137	0.006	***	0.87	0.003	0.012		1.00
Model Wald Chi-Square		43,395				64,277			
N		1,184,277				260,686			

*** p < .0001, ** p < .001, * p < .01

Table 6: Analysis of the Effect of State APLs on Mortgage Product Origination - Excluding California

	All Loans				Adjustable Rate Loans			
	Likelihood of Receiving Prepayment Penalty				Likelihood of Receiving an Option ARM			
	Coefficient	Standard Error		Odds Ratio	Coefficient	Standard Error		Odds Ratio
All Loans (Excluding California)	-0.303	0.007	***	0.74	-0.151	0.013	***	0.86

*** p < .0001, ** p < .001, * p < .01

Note: These models include all the predictors shown in Table 5.

Table 7: Analysis of the Effect of State APLs on Mortgage Product Origination by Cohort

	All Loans				Adjustable Rate Loans			
	Likelihood of Receiving Prepayment Penalty				Likelihood of Receiving an Option ARM			
	Coefficient	Standard Error		Odds Ratio	Coefficient	Standard Error		Odds Ratio
Originated in 2002/2003	0.173	0.008	***	1.19	-0.189	0.024	***	0.83
Originated in 2004	-0.149	0.018	***	0.86	-0.040	0.022		0.96
Originated in 2005/2006	-0.351	0.015	***	0.70	-0.043	0.020		0.96

*** p < .0001, ** p < .001, * p < .01

Note: These models include all the predictors shown in Table 5.

Table 8: Analysis of the Effect of State APLs on Mortgage Product Origination for Alternative Law Specifications

	All Loans				Adjustable Rate Loans			
	Likelihood of Receiving Prepayment Penalty				Likelihood of Receiving an Option ARM			
	Coefficient	Standard Error		Odds Ratio	Coefficient	Standard Error		Odds Ratio
All Loans								
APL In Effect	-0.131	0.006	***	0.88	0.0013	0.0117		1.00
APL in Effect B (includes 8 additional states whose restrictions do not go beyond federal law)	0.0277	0.00638	***	1.03	0.0989	0.0127	***	1.10
Repaymentability	-0.432	0.00774	***	0.65	-0.318	0.0129	***	0.73
Pointstrigger (reference group: no pointstrigger)								
Pointstrigger 2.5 or lower	0.296	0.008	***	1.34	0.124	0.015	***	1.13
Pointstrigger 3 or higher	-0.334	.008	***	0.72	-0.128	0.015	***	0.88
Prepayment Penalty (reference group: no restrictions)								
1	0.0692	0.00787	***	1.07	0.0648	0.0153	***	1.07
2	-0.4592	0.0124	***	0.63	0.0242	0.0196		1.02
3	-0.3408	0.0088	***	0.71	-0.1088	0.0184	***	0.90
4	-0.5733	0.0117	***	0.56	-0.384	0.019	***	0.68
Border Loans Only								
APL In Effect	-0.126	0.018	***	0.88	-0.116	0.036	**	0.89
APL in Effect B (includes 8 additional states whose restrictions do not go beyond federal law)	-0.022	0.019		0.98	0.081	0.035		1.09
Repaymentability	-0.006	0.020		0.99	-0.229	0.035	***	0.80
Pointstrigger (reference group: no pointstrigger)								
Pointstrigger 2.5 or lower	0.182	0.030		1.20	-0.129	0.056		0.88
Pointstrigger 3 or higher	-.082	0.023	**	0.92	-.0114	0.042	*	0.89
Prepayment Penalty (reference group: no restrictions)								
1	0.255	0.027	***	1.29	-0.384	0.062		0.68
2	-0.145	0.035	***	0.87	0.334	0.058	***	1.40
3	-0.145	0.026	***	0.87	-0.034	0.049		0.97
4	-0.184	0.025	***	0.83	-0.139	0.046	*	0.87

*** p < .0001, ** p < .001, * p < .01

Note: These models include all the predictors shown in Table 5.

Table 9: The Effect of APLs on Loan Performance

		90+ Delinquency				Prepayment			
		Coefficient	Standard Error		Relative Risk Ratio	Coefficient	Standard Error		Relative Risk Ratio
	Intercept	Intercept	-4.811	*		Intercept	0.639	**	***
FHA Post Purchase	HPI Change < 10	0.164	0.016	***	1.18	-0.656	0.006	***	0.52
	10 <= HPI Change < 25	0.077	0.018	***	1.08	-0.340	0.007	***	0.71
Interest Rate Difference		-0.522	0.011	***	0.59	-0.966	0.005	***	0.38
FICO	FICO < 580	3.435	0.023	***	31.03	1.027	0.018	***	2.79
	580 <= FICO < 620	2.591	0.019	***	13.34	0.564	0.012	***	1.76
	620 <= FICO < 660	2.012	0.015	***	7.48	0.326	0.007	***	1.39
	660 <= FICO < 720	1.216	0.014	***	3.38	0.208	0.005	***	1.23
LTV	60 <= LTV < 70	0.706	0.023	***	2.03	0.144	0.007	***	1.16
	70 <= LTV < 80	1.234	0.019	***	3.44	0.276	0.006	***	1.32
	80 <= LTV < 90	1.733	0.019	***	5.66	0.357	0.006	***	1.43
	LTV >= 90	1.900	0.023	***	6.68	0.350	0.010	***	1.42
No Documentation		0.636	0.013	***	1.89	0.325	0.007	***	1.39
Loan Age		-0.005	0.001	***	1.00	-0.021	0.000	***	0.98
Wholesale Channel		0.587	0.010	***	1.80	0.157	0.005	***	1.17
Unemployment Rate	4.4 <= Unemp Rate < 5.2	0.029	0.014		1.03	0.124	0.006	***	1.13
	5.2 <= Unemp Rate < 6.2	0.089	0.014	***	1.09	0.166	0.006	***	1.18
	Unemp Rate > 6.2	0.090	0.015	***	1.09	0.170	0.007	***	1.19
Minority	9.0 <= Minority < 19	-0.079	0.014	***	0.92	0.007	0.006		1.01
	19 <= Minority < 37	0.019	0.014		1.02	-0.044	0.006	***	0.96
	Minority >= 37	0.216	0.014	***	1.24	-0.079	0.007	***	0.92
Affordability	87 <= Affordability < 133	-0.266	0.015	***	0.77	-0.102	0.006	***	0.90
	133 <= Affordability < 174	-0.222	0.016	***	0.80	-0.374	0.007	***	0.69
	Affordability >= 174	-0.095	0.016	***	0.91	-0.463	0.007	***	0.63
Origination Year	Originated in 2002/2003	-0.012	0.016	*	0.99	1.357	0.008	***	3.88
	Originated in 2004	0.104	0.015	***	1.11	1.409	0.007	***	4.09
APL in Effect	ineffect = 1	-0.164	0.011	***	0.85	-0.069	0.005	***	0.93
Model Wald Chi-Square		1							
		52,320							
			1,20						
N		0,547							

* Competing risk outcomes are measured against loans still active in December 2008.

*** p < .0001, ** p < .001, * p < .01

Table 10: Analysis of Effect of State APLs on Loan Performance for Different Loan Samples

	90+ Delinquency			Prepayment				
	Coefficient	Standard Error	Relative Risk Ratio	Coefficient	Standard Error	Relative Risk Ratio		
Purchase FRM Loans Only	-0.204	0.022	***	0.82	-0.179	0.010	**	0.84
Purchase ARM Loans Only	-0.266	0.026	***	0.77	-0.133	0.014	*	0.88
Refinance FRM Loans Only	-0.139	0.017	***	0.87	-0.027	0.007	*	0.97
Refinance ARM Loans Only	-0.182	0.025	***	0.83	-0.079	0.013	*	0.92

*** p < .0001, ** p < .001, * p < .01

Note: These models include all the predictors shown in Table 9.

Table 11: Analysis of the Effect of State APLs on Loan Performance for Alternative Law Specifications

	90+ Delinquency			Prepayment				
	Coefficient	Standard Error	Relative Risk Ratio	Coefficient	Standard Error	Relative Risk Ratio		
APL In Effect	-0.164	0.011	***	0.85	-0.069	0.005	***	0.93
APL in Effect B (includes 8 additional states whose restrictions do not go beyond federal law)	-0.022	0.011		0.98	-0.082	0.005	***	0.92
Repaymentability	-0.131	0.012	***	0.88	-0.057	0.005	***	0.95
Pointstrigger:								
Pointstrigger < 3	-0.171	0.015	***	0.84	0.052	0.006	***	1.05
Pointstrigger > = 3	-0.330	0.012	***	0.72	-0.163	0.006	***	0.85
Prepayment Penalty (reference group: no restrictions)								
1	-0.059	0.014	***	0.94	0.027	0.006	***	1.03
2	-0.153	0.018	***	0.86	-0.036	0.009	***	0.97
3	-0.393	0.015	***	0.68	-0.216	0.007	***	0.81
4	-0.325	0.018	***	0.72	0.037	0.008	***	1.04
Border Loans	90+ Delinquency			Prepayment				

	Coefficient	Standard Error		Relative Risk Ratio	Coefficient	Standard Error		Relative Risk Ratio
APL In Effect	-0.152	0.032	***	0.86	-0.062	0.013	***	0.94
APL in Effect B (includes 8 additional states whose restrictions do not go beyond federal law)	-0.132	0.029	***	0.88	-0.035	0.012	*	0.97
Repaymentability	-0.103	0.032	**	0.90	-0.079	0.014	***	0.92
Pointstrigger <3	-0.211	0.956	**	0.81	0.018	0.022		1.02
Pointstrigger >= 3	-0.170	0.035	***	0.84	-0.089	0.015	***	0.92
Prepayment Penalty (reference group: no restrictions)								
1	-0.062	0.046		0.94	0.022	0.020		1.02
2	-0.060	0.050		0.94	-0.001	0.023		1.00
3	-0.291	0.040	***	0.75	-0.084	0.017	***	0.92
4	-0.088	0.040	*	0.92	0.041	0.017	*	1.04

*** p < .0001, ** p < .001, * p < .01

Note: These models include all the predictors shown in Table 9.

Appendix

State Anti-Predatory Lending Law Data

To develop a state law coding system for high-cost or predatory mortgage laws, we reviewed the existing studies, including Pennington-Cross et al. (2009), Bostic et al. (2008a), and Li & Ernst (2007). We also reviewed the description of state laws in several treatises, including Renault et al. (2009) and Nelson & Whitman (2007), reviewed various rate matrices that reflect mortgage originators' understanding of state laws, particularly for prepayment penalty restrictions, and then reviewed statutory language itself.

We determined that mini-HOEPA laws were adopted in 25 states and the District of Columbia on or before December 31, 2007. In addition, five states (Michigan, Minnesota, Nevada, Texas, and West Virginia) passed significant subprime mortgage regulation statutes that were not HOEPA extension statutes and not based on rate-and-fee triggers. Of the mini-HOEPA laws, eight (Utah, Pennsylvania, Nevada, Oklahoma, Ohio [prior to 2007 amendments], Maine [prior to 2007 amendments], Kentucky, and Florida) did not extend coverage beyond mortgages covered by federal law. In several instances, the intent of these laws was to preempt local laws and ordinances that imposed greater restrictions than federal law. Since there is thus a fundamental difference between the states that extended restrictions on subprime mortgages beyond federal requirements, and states that simply copied federal HOEPA restrictions into their state statutes, we developed and coded a set of law variables to describe state laws that could affect the type of subprime mortgages made and the default and foreclosure rates of mortgages in a given state.

The binary variable *ineffect*, modeled on Pennington-Cross et al. (2009) and Bostic et al. (2008a), in combination with the effective date variable for the same state and law, is intended to identify states with mortgage statutes that could plausibly have an impact on high-cost or subprime mortgage lending. A value of 1 was assigned for the *ineffect* variable to the states with any restrictions on charging or financing points and fees, credit insurance, prepayment penalties, balloon payments, negative amortization, determination or documentation of income or repayment ability, and/or significant counseling requirements, so long as the state law covers any share of the subprime (or the entire) mortgage market below the HOEPA rate and/or fee triggers. A value of zero (0) was assigned to the *ineffect* variable for the eight states with HOEPA copycat statutes, which is a departure from some prior studies. This is a departure from some prior studies. While some of these eight statutes imposed minor additional restrictions not found in federal law on high-cost loans above the HOEPA triggers, it is doubtful that a difference in regulation of a negligible slice of the mortgage market would affect the outcome variables. So, based on our definition, states with strong APLs prior to 2007 include Arkansas, California, Connecticut, Georgia, Illinois, Indiana, Maryland, Massachusetts, Michigan, Minnesota, New Jersey, New Mexico, New York, North Carolina, Rhode Island, South Carolina, Tennessee,

Texas, West Virginia, and Wisconsin, as well as the District of Columbia. In this analysis, unless otherwise noted, we classify APL states and non-APL states based on the more stringent *ineffect* definition for this analysis.

In order to further measure the reach of state laws, an additional variable was created, *pointstrigger*. Most states laws that do not cover all mortgages use HOEPA-like price triggers in an attempt to cover only subprime, or higher-cost, loans. The *pointstrigger* variable is calculated as the numeric difference between the federal HOEPA threshold for points and fees, and the corresponding state law trigger. For example, the North Carolina APL covers loans with points and fees exceeding 5%, compared with the HOEPA trigger of 8%. The value for the *pointstrigger* variable for North Carolina is therefore 3. A state law that prohibits points and fees above a certain threshold is treated as having a *pointstrigger* at that price level. West Virginia, for example, prohibits points and fees in excess of 3 percent for most mortgages and so is assigned a *pointstrigger* value of 5. For states without a mini-HOEPA law, a value of zero is assigned to the *pointstrigger* variable.

Prepayment penalties were frequently included in subprime mortgages and have been found to increase the risk of foreclosure. Many state laws limit the ability of lenders to impose prepayment penalties. The *prepaymentpenalty* variable captures both the scope and extent of prepayment penalty restrictions on a scale of 0 to 4. A statute banning all prepayment penalties for all, or nearly all, residential mortgages is coded as 4. Statutes banning prepayment penalties but only for a subset of mortgages, based on loan amount or price are coded as 3. Statutes restricting but not banning prepayment penalties for all, or nearly all, mortgages are coded as 2, and statutes banning prepayment penalties only beyond 24 months and covering only a subset of mortgages are coded as 1. Statutes without any restriction on prepayment penalties or only restricting but not banning prepayment penalties are coded as 0 for this analysis.

The *repaymentability* variable is binary, and identifies states in which a significant portion of the mortgage market was subject to a requirement that repayment ability be determined and/or verified, or that borrowers receive counseling as a precondition to obtaining a mortgage loan, and that these requirements be subject to some enforcement or sanction. This variable necessarily includes some judgmental assessment of various state law provisions. State laws that impose repayment ability standards, but only on loans above the federal HOEPA triggers, or that do not regulate mortgage repayment ability, are assigned a value of 0. See the following table for a summary of all these state law variables described above.

Table 12: State Law Variables

State	Pennington -Cross et al. (2009)	Li and Ernst	Bostic et al. (2008a)	Effective Date	Ineffect	Ineffect b	Prepayment- penalty	Repaymen t-ability	Points- trigger
Alabama	0	NA	0	5/20/1996	0	0	0	0	0
Alaska	0	8	0	12/31/1968	0	0	4	0	0
Arizona	0	NA	0	.	0	0	0	0	0
Arkansas	0	10	6.56	7/16/2003	1	1	3	1	2
California	1	NA	4.93	7/1/2002	1	1	3	0	2
Colorado	1	NA	4.18	7/1/2003	1	1	1	1	2
Connecticut	1	NA	4.88	1/1/2002	1	1	1	0	3
Delaware	0	NA	0	.	0	0	0	0	0
D.C.	1	11	7.75	5/7/2002	1	1	3	1	3
Florida	1	8	3.75	10/2/2002	0	1	0	0	0
Georgia	1	12	6.83	3/7/2003	1	1	2	1	3
Hawaii	0	NA		1/1/1967	0	0	4	0	0
Idaho	0	7	0	7/1/1996	0	0	3	0	0
Illinois	1	12	8.11	1/1/2004	1	1	4	1	3
Indiana	1	NA	6.76	1/1/2005	1	1	2	1	3
Iowa	0	8	0	4/13/1979	0	0	4	0	0
Kansas	0	7	0	1/1/1994	0	0	4	0	0
Kentucky	1	7	5.86	6/24/2003	0	1	1	0	0
Louisiana	0	NA		.	0	0	0	0	0
Maine	1	8	3.01	12/31/1995	0	1	1	0	0
Maryland	1	8	3.39	10/1/2002	1	1	0	1	1
Massachusetts	1	16	8.44	11/7/2004	1	1	2	1	3
Michigan	1	8	5.99	12/23/2002	1	1	3	0	0
Minnesota	1	10	7.01	1/1/2003	1	1	3	1	0
Mississippi	0	NA		.	0	0	3	0	0
Missouri	0	NA		.	0	0	3	0	0
Montana	0	NA		.	0	0	0	0	0
Nebraska	0	NA	0	3/20/2003	0	0	0	0	0
Nevada	1	NA	2.81	10/1/2003	0	1	1	1	0
New	0	NA	0	1/1/2004	0	0	0	0	0
New Jersey	1	15	7.34	11/27/2003	1	1	4	0	3.5
New Mexico	1	18	9.9	1/1/2004	1	1	2	1	3
New York	1	15	5.82	4/1/2003	1	1	2	1	3
North Carolina	1	17	6.4	7/1/2000	1	1	2	1	3
North Dakota	0	NA	0	.	0	0	0	0	0
Ohio	1	7	3.47	5/24/2002	0	1	1	0	0
Oklahoma	1	NA	4.29	1/1/2004	0	1	4	0	0
Oregon	0	NA	0	.	0	0	0	0	0
Pennsylvania	1	NA	3.47	6/25/2002	0	1	2	0	0
Rhode Island	0	NA	0	12/31/2006	1	1	2	1	3
South Carolina	1	13	4.8	1/1/2004	1	1	4	1	3
South Dakota	0	NA	0	.	0	0	0	0	0
Tennessee	0	NA	0	1/1/2007	0	0	1	0	0
Texas	1	10	4.34	9/1/2001	1	1	2	0	5
Utah	1	NA	3.91	5/3/2004	0	1	1	0	0
Vermont	0	8	0	1/1/1997	0	0	4	0	0
Virginia	0	8	0	6/26/2003	0	0	4	0	0
Washington	0	NA	0	.	0	0	0	0	0

West Virginia	1	17	9	6/8/2000	1	1	4	1	3
Wisconsin	0	7	0	2/1/2005	1	1	1	1	2
Wyoming	0	NA	0	.	0	0	0	0	0

Note: *ineffect*: states with APL laws (not including those with marginal protection); *Ineffectb*: alternative specification of *APL laws* by including those laws with marginal protection.

Lender Processing Services (LPS) Applied Analytics, Inc. Data

In conducting this mortgage default analysis, we rely on proprietary loan performance information compiled by Lender Processing Services Applied Analytics, Inc. (LPS) and aggregated the data to the zip code level. The dataset is sometimes still called the McDash data, although LPS acquired McDash in July 2008.

The LPS data is rich in detail, including over 70 variables related to loan characteristics and performance, such as FICO score, debt-to-income ratio (DTI), loan amount, property value, contract rate type (fixed or adjustable), loan purpose (purchase or refinance), loan type (conventional, FHA, VA, or subprime), occupancy status (owner-occupied or not), documentation status (full documentation or not), existence of a prepayment penalty, loan term to maturity, origination channel (wholesale or retail), and delinquency and foreclosure status in each month—as well as each property’s zip code. Additionally, the performance of each loan can be monitored over time. For each month in which a given loan is in the dataset, we know its outstanding balance, the current interest rate, and the borrower’s payment status (that is, current; 30-, 60-, or 90-days delinquent; in foreclosure, etc.). We also know whether a loan ended in prepayment or foreclosure.

The LPS dataset is one of the few loan-level databases that provide excellent coverage in both the conventional mortgage market and the FHA market, and for both securitized loans and those that are held in portfolio. For the 2004-2006 cohorts, LPS data covered roughly 40 percent of that of the Home Mortgage Disclosure Act (HMDA) data, while its coverage in the conventional market varies from year to year (Ernst et. al. 2008). The LPS dataset has grown over time as new servicers have been added, with a substantial increase in coverage of the market in 2005 and in late 2008. Based on our estimation using Mortgage Bankers Association (MBA) data of active loans, the LPS covered about 50 percent of active mortgages in the United States during the period from June 2006 to June 2008 (48 percent in 2006 and 53 percent in 2008).²

Of course, one major concern with the LPS is its coverage in the subprime market: Nationally, as of June 2006, the share of subprime loans among all active loans in the LPS was about 2.8 percent, lower than the 13.4 percent of subprime reported by MBA (2008). But LPS only counts B&C loans as subprime, which inevitably underestimates the size of the subprime market. As Ding et al. (2008) documented, the LPS coverage in the subprime market by volume increased from 14 percent for the 2004 cohort to over 30 percent for the 2006 cohort. While any empirical

² The LPS dataset has grown over time as new servicers have been added, with a substantial spread in coverage of the market in 2005. As of December 2008, the coverage of LPS further increased to nearly 60 percent of active residential mortgages in the United States, representing about 29 million loans with a total outstanding balance of nearly \$6.5 trillion (Foote et. al. 2009).

approach needs to consider the changing nature of the LPS data, it should not be a serious problem here since we focus on active loans in recent years in this study, when the coverage of LPS had been significantly expanded.

Works Cited

Ambrose, B. W. et al. (2005) "A Note on Hybrid Mortgages," 33 *Real Estate Economics* 765-782.

Avery, Robert B. et al. (2006) "Higher-Priced Home Lending and the 2005 HMDA Data," *Fed. Res. Bull.* 8 Sept., A123, A146-47.

Bernanke, Benjamin (2010) "Monetary Policy and the Housing Bubble," speech at American Economics Association meeting, <http://federalreserve.gov/newsevents/speech/bernanke20100103a.htm> (Jan. 3, 2010).

Bostic, R. W. et al. (2008a) "State and Local Anti-Predatory Lending Laws: The Effect of Legal Enforcement Mechanisms" 60 *J. of Economics and Business* 47–66.

Bostic, R. W. et al. (2008b) *The Impact of State and Local Anti-Predatory Lending Laws: Policy Implications and Insights*. Washington, DC. Brookings Institution Press.

Calhoun, C. A. & Y. Deng (2002) "A Dynamic Analysis of Fixed- and Adjustable-Rate Mortgage Terminations," 24 *J. of Real Estate Finance and Economics* (1/2):9-33.

Clapp, J.M. et. al. (2001) "Movers and Shuckers: Interdependent Prepayment Decisions," 29 *Real Estate Economics* 411-450.

Cutts, A. C. & W. A. Merrill (2008) *Interventions in Mortgage Default: Policies and Practices to Prevent Home Loss and Lower Costs*. Washington, DC: Brookings Institution Press.

Danis, M. A. & A. Pennington-Cross (2005) "The Delinquency of Subprime Mortgages." Working Paper 2005-022A. Federal Reserve Bank of St. Louis: St. Louis, MO.

Ding, L. et al. (2008) "Risky Borrowers or Risky Mortgages: Disaggregating Effects Using Propensity Score Models." Working Paper. Center for Community Capital, University of North Carolina: Chapel Hill, NC.

Ding, L. et al. (2009a) "State Anti-Predatory Lending Laws: Impact and Federal Preemption." Research Report. Center for Community Capital, University of North Carolina: Chapel Hill, NC.

---- (2009b) “The Impact of Federal Preemption of State Anti-Predatory Lending Laws on the Foreclosure Crisis.” Research Report. Center for Community Capital, University of North Carolina: Chapel Hill, NC.

----- (2009c) “State Anti-Predatory Lending Laws and Neighborhood Foreclosure Rates.” Research Report. 2009. Center for Community Capital, University of North Carolina: Chapel Hill, NC.

Doms, M. et al. (2007) “Subprime Mortgage Delinquency Rates.” Working Paper 2007-33, Federal Reserve Bank of San Francisco: San Francisco, CA.

Elliehausen, G. & M. E. Staten (2004) “Regulation of Subprime Mortgage Products: An Analysis of North Carolina’s Predatory Lending Law,” 29 *J. of Real Estate Finance and Economics* 411-33.

Elliehausen, G. et al. (2006) “The Effects of State Predatory Lending Laws on the Availability of Subprime Mortgage Credit,” Monograph 38. Credit Research Center, Georgetown University: Washington, DC.

Ernst, K. S. et al. (2002) “North Carolina’s Subprime Home Loan Market after Predatory Lending Reform.” Center for Responsible Lending: Durham, NC.

Ernst, K. S. et al. (2008) “Steered Wrong: Brokers, Borrowers, and Subprime Loans.” Center for Responsible Lending: Durham, NC.

Foote, C. L. et al. (2009) “Reducing Foreclosures, Federal Reserve Bank of Boston Public Policy,” Discussion Paper, No. 09-2, April 8, 2009.

Foster, C. & R. Van Order (1984) “An option-based model of mortgage default,” 3 *Housing Finance Review* 351-372.

Gerardi K., et al. (2007) “Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures,” Working Paper 07-15, Federal Reserve Bank of Boston: Boston, MA.

Goodman, A. & B. Smith (2009) “Hierarchical Modeling of Residential Default: Does State Level Foreclosure and Predatory Lending Legislation Limit ‘Bad’ Loans?,” Presented at the AREUEA Mid-Year Meeting, Washington DC.

Harvey, K. D. & P. J. Nigro (2003) “How Do Predatory Lending Laws Influence Mortgage Lending in Urban Areas? A Tale of Two Cities,” 25 *J. of Real Estate Research* 479-508.

Harvey, K. D. & P. J. Nigro (2004) “Do Predatory Lending Laws Influence Mortgage Lending? An Analysis of the North Carolina Predatory Lending Law.” 29 *J. of Real Estate Finance and Economics* 435–456.

- Ho, G. & A. Pennington-Cross (2006) "The Impact of Local Predatory Lending Laws on the Flow of Subprime Credit." 60 *J. of Urban Economics* 210–228.
- Immergluck, D. (2008) "From the Subprime to the Exotic: Excessive Mortgage Market Risk and Foreclosures." 74 *J. of the American Planning Association* (1):59-76.
- Li, W. & Keith S. Ernst (2007) "Do State Predatory Lending Laws Work? A Panel Analysis of Market Reforms." 18 *Housing Policy Debate* 347-391.
- Mansfield, Cathy Lesser (2000) "The Road to Subprime HEL was Paved with Good Congressional Intentions," 51 *South Carolina Law Rev.* 473.
- McCoy, Patricia A. (2009) "Systemic Risk Through Securitization: The Result of Deregulation and Regulatory Failure," 41 *Conn. Law Rev.* 1327.
- Mian, A. & A. Sufi (2008) "The Consequences of Mortgage Credit Expansion: Evidence from the 2007 Mortgage Default Crisis," <http://ssrn.com/abstract=1072304>.
- Nelson, G. S. & D. A. Whitman (2007) *Real Estate Finance Law*, 5th edition. Eagan, MN: West Group.
- Pennington-Cross, A. (2006) "The Value of Foreclosed Property," 28 *J. of Real Estate Research* 193-214.
- Pennington-Cross, A. & G. Ho. (2008) "Predatory Lending Laws and the Cost of Credit," 36 *Real Estate Economics* 175–211.
- Pennington-Cross, A. et al. (2009) "Mortgage Product Substitution and State Anti-Predatory Lending Laws: Better Loans and Better Borrowers?" Working Paper Series. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1460871.
- Pennington-Cross, A. & G. Ho (2010) "The Termination of Subprime Hybrid and Fixed Rate Mortgages," *Real Estate Economics*, 38(1).
- Quercia, R. G. et al. (2004) "The Impact of North Carolina's Anti-Predatory Lending Law: A Descriptive Assessment," 15 *Housing Policy Debate* 573-601.
- Quercia, R. G. et al. (2007) "The Impact of Predatory Loan Terms on Subprime Foreclosures: The Special Case of Prepayment Penalties and Balloon Payments," 18 *Housing Policy Debate* 311-346.
- Quercia, R. & J. Spader (2008) "Does Homeownership Counseling Affect the Prepayment and Default Behavior of Affordable Mortgage Borrowers," 27 *Journal of Policy Analysis and Management* 304-325.

Renuart, E. et al. (2009) *The Cost of Credit* (3d ed. 2005 and Supplement 2008). National Consumer Law Center: Boston, MA.

Richter, F. (2008) "An Analysis of Foreclosure Rate Differentials in Soft Markets." Working Paper 08-11. Federal Reserve Bank of Cleveland: Cleveland, OH.

Laws and Regulations Cited

Alternative Mortgage Transactions Parity Act, Pub. L. 97-320, 96 Stat. 1469 §§801-07, 1545-48 (1982).

Depository Institutions Deregulation and Monetary Control Act, Pub. L. 96-221, §§101-08, 94 Stat. 132-41 (1980).

Federal Reserve Board Regulation Z Amendments 2008, 73 Fed. Reg. 44521 (July 30, 2008).

Homeownership and Equity Protection Act (HOEPA) Pub. L. No. 103-325, subtit. B of tit. I, §§151-158, 108 Stat. 2160 (1994).

Massachusetts Predatory Home Loan Practices Act, 2004 Sess. Law Ch. 268, Mass. Gen. L. Ch 183C (2004).

New Jersey Home Ownership Security Act of 2002, N.J. Stat. Ann. § 46:10B-23 to 46:10B-34 (2002).

New Mexico Home Loan Protection Act, N.M. Stat. 58-21A-1 to 21A-14 (2003).

North Carolina Predatory Lending Act, N.C. Gen. Stat 24-1.1E (2000).

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