

RESEARCH REPORT

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

August 27, 2010

Center for Community Capital
Research and analysis on the transformative power of capital



UNC
COLLEGE OF
ARTS & SCIENCES

The Center for Community Capital at the University of North Carolina at Chapel Hill is the leading center for research and policy analysis on the transformative power of capital on households and communities in the United States.

The Center's in-depth analysis help policymakers, advocates and the private sector find Sustainable ways to expand economic opportunity to more people, more effectively.

Roberto G. Quercia
Director

Janneke Ratcliffe
Associate Director



Download the report at www.ccc.unc.edu

*For printed copies contact:
UNC Center for Community Capital, (919) 843-2140, communitycapital@unc.edu*

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

August 27, 2010

Lei Ding, Wayne State University

Roberto G. Quercia, University of North Carolina, Chapel Hill

Carolina K. Reid, Federal Reserve Bank of San Francisco

Alan M. White, Valparaiso University School of Law

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

Abstract

This paper examines whether or not the 2004 preemption of state laws by the Office of the Comptroller of the Currency (OCC) led to deterioration in the quality and performance of loans originated by the lenders it regulates. Using a large sample of privately securitized nonprime mortgages and a difference-in-differences approach, this study investigates changes in the quality and performance of loans originated by OCC lenders in states with and without anti-predatory lending laws, before and after the 2004 OCC preemption. The results provide evidence that preemption resulted in an increased default risk for mortgages originated by OCC-regulated lenders in states with anti-predatory lending laws. In the refinance market in particular, the increase in default risk among OCC lenders outpaced that of independent mortgage companies, which remained subject to APLs after 2004. Overall the results suggest the 2004 OCC ruling did contribute to deterioration in lending standards and a rollback in consumer protection during the subprime crisis.

1. Introduction

Federal preemption of state anti-predatory lending laws (APLs) has received significant attention in recent debates over the subprime crisis, since state laws generally offer greater consumer protection in the residential mortgage market and preempted lenders account for a significant share of the market. As early as in 1996, the Office of Thrift Supervision (OTS) exempted federally chartered thrifts and their operating subsidiaries from state APLs (and broadly from many credit regulations). In February 2004, the Office of the Comptroller of the Currency (OCC) officially preempted national banks and their operating subsidiaries from most state laws regulating mortgage credit, including APLs, arguing that they should only be subject to federal laws regulating mortgage credit. As a result, mortgage lenders regulated by the OCC and the

OTS were free to disregard state laws and were subject to fewer restrictions on loan terms or requirements to verify a borrower's ability to repay.

Considering the ever-growing share of subprime mortgages originated by national banks, thrifts, and their subsidiaries¹—all preempted by federal laws—there has been some debate whether such preemption is to blame, at least in part, for the foreclosure crisis (Belsky & Essene, 2008; Bostic, Engel, McCoy, Pennington-Cross, & Wachter, 2008b). As policy makers revisit the regulatory landscape in the wake of the foreclosure crisis, it is important to understand the role that federal preemption may have had in reducing consumer protections during the subprime boom. Of particular concern was the OCC preemption in 2004 which had coincided with the beginning of the explosive growth in that industry when underwriting standards overall were declining (Demyanyk & van Hemert, 2008). The purpose of this study is to examine empirically the impact of the 2004 OCC preemption of state laws on the quality and performance of loans originated by OCC lenders.

Federal preemption of state APLs may lead to riskier underwriting standards and undermine the consumer protections states have put into place through different channels. Preemption, by overriding the state APL restrictions, could lead to an increase in risky loan originations because preempted lenders were no longer required to abide by more stringent state regulations.

Preemption could also result in institutional shifts in the mortgage market if subprime lenders moved to national charters to take advantage of federal preemption. Preemption may have had subtle effects as well. For example, preemption may have pushed the market towards looser

¹ In APL states, the share of “high-cost” loans identified in HMDA data that were originated by preempted lenders increased from 16 percent in 2004 to 46 percent in 2007. Many researchers use the terms of “high-cost” and “subprime” interchangeably though the former is not strictly analogous to the latter.

underwriting standards overall since regulators may have been unwilling to impose stricter standards and to risk losing their lenders to another regulator. Especially, the OCC preemption occurred right as subprime lending took off, and may have been seen by many lenders as a tacit endorsement of loosened underwriting guidelines and regulations. While it is unclear by which mechanism federal preemption would have the most effect, we would expect that federal preemption would result in more originations of risky loans as well changes in the product mix of preempted lenders. In turn, this is likely to lead to changes in patterns in mortgage performance. Our *a priori* expectation was that after the OCC preemption, the quality of mortgages originated by preempted lenders would become worse in states with strong APLs, and that this deterioration in underwriting standards would increase default risk in these states. Put it another way, we surmise that federal preemption affected the behavior of preempted lenders during the subprime boom and thereby contributed to the foreclosure crisis.

There is ample reason to believe that federal preemption of state APLs is cause for concern. Research has shown that many loan features and mortgage underwriting practices restricted by state anti-predatory lending laws have been associated with higher default risks (Ambrose, LaCour-Little, & Huszar, 2005; Quercia, Stegman, & Davis, 2007; Pennington-Cross & Ho, 2010; Ding, Quercia, Li, & Ratcliffe, *forthcoming*). These include features such as prepayment penalties, balloon payments, lack of verification of borrowers' repayment capacity, and very high interest rates and fees. There is empirical evidence that riskier loan features tend to be used less in states with APLs and that restrictive laws can reduce the flow of subprime credit (Bostic, Chomsisengphet, Engel, McCoy, Pennington-Cross, & Wachter, 2009). Research has also demonstrated that an effective APL improves the quality of loans originated by giving lenders an

incentive to tighten underwriting standards, thereby reducing default and foreclosure rates (Goodman & Smith, 2009). However, there has been almost no empirical research and only minimal discussion on the impact of federal preemption in the literature.

Focusing on a large sample of privately securitized nonprime mortgages, we investigated the impact of OCC preemption by examining the performance of mortgages originated by lenders in states with and without APLs, before and after the 2004 OCC preemption. Using a difference-in-differences approach, we compared changes in the quality and performance of loans originated by OCC lenders to changes in the performance of loans originated by independent mortgage companies (IND), which also originated a large share of subprime loans but remained subject to state laws. The results generally support our *a priori* expectations and suggest that preemption resulted in an increased default risk for mortgages originated by OCC lenders in states with strong anti-predatory lending laws. Notably, the increase in default risk of loans originated by OCC-regulated lenders outpaced that of independent mortgage companies by 14 to 31 percent for different cohorts in the refinance market. We believe that these results provide strong support for policy proposals that would have Federal law provide a regulatory floor while allowing states to adopt stronger regulations based on local conditions.

The remainder of the study is divided into five sections. In Section 2, we review the recent studies on the impact of state anti-predatory lending laws and the impact of federal preemption. In Section 3, we describe the dataset used for this study, including the unique dataset created by merging private securitizations and the Home Mortgage Disclosure Act (HMDA) data. In Section 4, we describe the method used to identify the impact of federal preemption. Section 5

presents our regression results and the final section concludes by summarizing the results and deriving policy implications.

2. Literature Review

To provide the background and context to the present study, we begin by reviewing the literature on federal preemption of APLs, the impact of APLs, and the impact of federal preemption.

2.1 Federal Preemption of State Anti-Predatory Lending Laws

In the United States, residential mortgage lenders had been regulated by a complex web of national and local regulatory bodies before the foreclosure crisis. National banks, Federal thrifts, and their subsidiaries were supervised by the OCC or the OTS, respectively. Before federal preemption, they were also subject to many of the laws of the states in which they, and their subsidiaries, operated. In contrast, state banks and thrifts (those chartered at the state level) are supervised by either the Federal Reserve System (FRS) or the Federal Deposit Insurance Corporation (FDIC) or by their chartering state. The National Credit Union Administration (NCUA) supervises credit unions. Finally, non-depository independent mortgage companies were regulated by the Department of Housing and Urban Development (HUD) and the Federal Trade Commission and they were subject to state regulations too.

In response to the dramatically increasing abusive and predatory lending practices in the mortgage lending market, Congress passed the Home Ownership and Equity Protection Act

(HOEPA) in 1994.² Predatory lending involves different forms of unfair and deceptive practices such as lenders steering borrowers into a higher priced loan than they could qualify for, stripping equity by charging borrower exorbitant fees or pushing borrowers to refinance the same mortgages without any tangible benefit, and other practices that increase the risk of foreclosure, such as making a loan without considering the borrower's repayment ability or adding abusive subprime prepayment penalties. The federal HOEPA statute imposes substantive restrictions on lending terms and practices for mortgages with high prices, based on either the APR or the total points and fees imposed.³ However, the coverage of HOEPA law was quite limited and virtually no mortgages were originated that were covered by HOEPA's high-cost threshold (Avery, Brevoort, & Canner, 2007), likely because the HOEPA threshold was quite high and also because subprime lenders learned how to avoid it.

Concerned about the mounting abusive practices in the mortgage lending market and the insufficient regulation at the federal level, many states adopted stronger anti-predatory lending regulations than federal law requires. North Carolina passed the first comprehensive state law in 1999 aimed at preventing predatory mortgage lending in the subprime mortgage market. Li and Ernst (2007) identified 28 states that had adopted substantive APLs as of December 2004. Bostic et al. (2008a) found that 29 states and the District of Columbia had mini-HOEPA laws in effect as of January 2007 and another 14 states had some types of older anti-predatory lending laws that were still in effect. Most of these state laws were modeled after the federal HOEPA adopted in

² Home Ownership and Equity Protection Act, Pub. L. No. 103-325, subtit. B of tit. I, §§151-158, 108 Stat. 2160 (1994).

³ To be covered, the loan need to be a refinance or home-improvement loan that charge an interest rate more than 8% (10%) for first liens (subordinate liens) above the yield on comparable Treasury securities or that charge points or fees that exceed 8 percent of the loan amount or \$400 (subject to annual indexing). The former can be regarded as the rate threshold while the latter as the points and fees threshold.

1994, although there are several states that took various different approaches. But a number of other states had laws adopted prior to 2000 that restricted prepayment penalties, balloon payments, or negative amortization for all mortgages. The mini-HOEPA laws, in turn, can be divided between those that replicated the federal coverage and restrictions, and those that extended HOEPA to either cover more loans, or restrict more contract terms, or both.

However, federal regulators have aggressively used their preemption power to avoid having state anti-predatory lending laws apply to the lenders they supervise. The OTS issued a regulation in 1996 that broadly exempted federally chartered savings and loan institutions (thrifts) and their operating subsidiaries from state laws regulating credit. OTS-regulated institutions were therefore free to disregard the state laws discussed above. On August 5, 2003, the OCC issued a Preemption Determination and Order stating that the Georgia mini-HOEPA statute would not apply to National City Bank, a national bank, or to its operating subsidiaries, including the non-bank subprime mortgage lender First Franklin Financial Company. The OCC then issued a broad preemption regulation, effective February 12, 2004, that exempted national banks and their operating subsidiaries from most state laws regulating mortgage credit.⁴ The OCC maintained that its regulations override a number of state laws that conflict with a national bank's exercise of its banking powers. So prior to August 5, 2003, national banks and their subsidiaries were likely subject to state mortgage laws, while after February 12, 2004, they clearly were not. During the same period, independent non-depository lenders, along with many state-chartered depository institutions and their subsidiaries were governed by state anti-predatory lending laws.⁵

⁴ 12 C.F.R. 34.4(a)(4), 69 Federal Register 1904 (Jan. 13, 2004).

⁵ Some states made provisions in their anti-predatory mortgage laws that permitted state-regulated banks to avoid the laws to the same extent that OCC- and OTS-regulated federal banks could. Thus, loans made by such lenders may have been unaffected by state APLs.

Consequently, during the subprime boom period from 2004 to 2006, national banks, federal thrifts, and their subsidiaries were subject to very few restrictions on the terms in their mortgage loans. Of course, federal regulators employed other regulatory techniques during the housing bubble to address concerns about lax loan underwriting, but these were less restrictive than strong state APLs. For example, federal regulators addressed the repayment ability issue through non-binding guidelines, bank examinations, supervisory orders, and sanctions. Thus, preemption did not entirely eliminate oversight of loan terms, but it displaced binding state laws with the less stringent and more opaque federal regulatory structure. We estimate that in 2006 alone at least 26 percent of high-priced loans in APL states were originated by national banks and federal thrifts and their subsidiaries covered by federal preemption. Because of the collapse of the subprime sector starting late 2006, it is now important to understand how state anti-predatory lending laws and federal preemption influenced both the change in lending standards and ultimately mortgage performance, and consequently impacted the foreclosure crisis.

2.2 Impact of State Anti-Predatory Lending Laws

Since 1999, when North Carolina passed the first mini-HOEPA law, researchers have tried to understand how APLs impact the mortgage market, including cost of credit, credit flows, and mortgage product substitution. Most empirical studies on the impact of APLs have focused on the effect of state laws on credit flows and loan prices, while recent research has started to

examine the relationship between state APLs and mortgage foreclosure rates across states and neighborhoods.

The first group of studies focuses on the impact of APLs on the cost of credit. Researchers hypothesized that if there are costs in complying with regulatory requirements, then these costs are likely to 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).

Most studies focus on the APLs' impact on credit flows: whether the introduction of APLs lowered the credit flow to APL states or not. Some of the studies focus on the first state anti-predatory lending law, in North Carolina; others analyze outcomes nationally. Several studies focused on North Carolina found that the subprime market in the state diminished in size as a result of the passage of the law (Ernst, Farris, & Stein, 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 overall relationship between state laws and credit flows. Studies using state-level law indices find that APLs appear to have little impact on subprime originations, applications, or rejections at the aggregate level (Bostic et al. 2008a). But APLs with stronger restrictions are associated with a decrease in subprime lending (Ho & Pennington-Cross, 2006; Elliehausen, Staten, & Steinbuks, 2006; Bostic et al. 2008a).

Of course, in addition to examining overall credit flows, 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. In a study examining the impact of state APLs on mortgage product mix, Bostic 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 better quality of mortgage originated. They also found insignificant differences in borrower credit quality, tending to rule out the hypothesis that lenders in APL states systematically sought better borrowers. Li and Ernst (2007) and Quercia et al. (2004) also found similar results, namely that borrowers in APL states get fewer loans with abusive terms. These studies provide indirect support to our hypothesis that state APLs would be associated with lower foreclosure rates.

Another line of research started to investigate whether differences in regulatory environment, including state anti-predatory lending laws, contribute to differences in the quality of loans originated and subsequent rates of foreclosure. In a working paper, Goodman and Smith (2009) found some evidence that mini-HOEPA laws reduce the level of foreclosure, based on the foreclosure rate data constructed from Lender Processing Services Applied Analytics, Inc. (LPS) data. The results based on the hierarchical linear model suggest that stringent controls on predatory lending are connected to lower neighborhood foreclosure rates. However, since

Goodman and Smith are only able to use a dataset for one particular month and a law index which did not cover years after 2005, their paper's applicability may be limited.

Finally, several studies, though not directly focusing on the impact of APLs, have documented a clear link between many loan features covered under APLs, such as the use of prepayment penalties, balloon payments, lack of verification of borrowers' repayment capacity, and very high interest rates and fees and the increased default risk. 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. 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. (*forthcoming*) identified that ARMs, prepayment penalties, and broker originations all contribute significantly to subprime loans' increased risk of default. 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).

Of course, one challenge in the APL studies is the coding of state laws. 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. Ho and Pennington-Cross (2006) created a two-component index of state laws. The first component, "coverage," reflects the extent to which a law extends market coverage beyond HOEPA; the second component, "restriction," reflects the extent to which a law restricts or requires specific practices on covered loans. Bostic et al. (2008a) further added the enforcement index, which

includes measures of assignee liability and enforcement against originators. Li and Ernst (2007) rank state laws according to the type of loans covered, points-and-fees triggers, substantive legal protections, and remedies available to borrowers. The advantage of this approach is that it is easier to derive policy implications based on these measures. But because they finished their study in 2006, many APLs that were adopted since 2005 were not considered. In a few other studies, researchers have used a simple dummy to indicate whether a state had adopted the APL at a particular time (e.g. Bostic et al. 2009).

Developing a quantitative index that measures the effect of state APLs is far from simple, however. For example, different components of the composite index used in Bostic et al. (2008a) may have “slider effects” in which the strength of the coverage component offsets the effects of the restriction component. While stronger restrictions are likely to reduce subprime loan volumes, increasing the coverage of a state law may in fact mitigate this effect since because potential applicants may feel more comfortable applying for a subprime loan if a lending law covers their application (Bostic et al. 2008a). There is also 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. 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 comparing results. In this paper, we developed a new state law coding system for state anti-predatory lending laws that seeks to overcome some of the limitations of previous coding efforts. A summary of states with strong APLs will be discussed in the Data section.

2.3 Impact of Federal Preemption

As to the role of federal preemption, national banks and federal thrifts maintain that state and local anti-predatory lending laws should not be applied to them because state laws would interfere with a federally chartered lender's right to operate. In contrast, state regulators and consumer groups have objected, maintaining that state laws pertaining to predatory lending and consumer protection should apply to all lenders operating within a state no matter which regulator regulates them (Davis & Rice, 2006). However, there have been no serious empirical studies on the impact of federal preemption on mortgage lending to support any of these claims. This is an important omission since addressing the causes of the current crisis requires understanding whether or not federal preemption in the mortgage market results in measurably lower levels of consumer protection.

In fact, the dual regulatory system in the mortgage lending market in the U.S. is particularly vulnerable to the potential negative effects of federal preemption. There are several possible negative outcomes from preemption. First, preemption may result in deterioration in the quality of mortgages originated by preempted lenders because they became immune from more stringent state predatory lending laws. If APLs have restricted the behavior of banks, we expect to see changes in the product mix and quality of originations when APLs were preempted since preemption allowed preempted lenders to do what they want to maximize profits. Furthermore, by allowing certain mortgage lenders to be exempted from complying with state mortgage laws,

preemption makes national charters more attractive, relative to state charters. Preemption could thus result in lenders abandoning one regulatory system in favor of the other that may seem more favorable to subprime lending. Finally, preemption might help push the market towards looser underwriting standards overall. Preemption could influence the behavior of different regulators, who might be unwilling to impose stricter standards on the institutions they regulate and risk losing the lender to another regulator. Thus, in addition to removing APL protections, preemption could upset the balance of the regulatory system and lead to a general decline in mortgage lending oversight.

There has been almost no empirical research and only minimal discussion on the impact of federal OCC preemption. Some researchers documented that after the passage of the North Carolina APL in 1999, some non-bank lenders were acquired by national banks, thereby avoiding anti-predatory lending laws. Burnett, Finkel, and Kaul (2004), for example, found a shift in subprime lending from non-banks to banks in North Carolina after the 1999 passage of the APL, as well as a change to a significantly higher share of originations by subprime bank lenders in North Carolina than in the control states. One driving factor, as suggested by the authors, was that bank lenders expected the state anti-predatory lending law eventually to be preempted by federal laws for federally regulated institutions. Similarly, Harvey and Nigro (2004) found that, following adoption of the APL in 1999, subprime lending by bank lenders held steady while subprime lending by non-bank lenders fell in North Carolina, in comparison with the control states. In states other than North Carolina, lenders whose business model relied on greater volumes of subprime mortgages may have also shifted to national charters to take advantage of the preemption. In fact, some banks like JP Morgan Chase and HSBC switched to

national charters after the preemption and the market share of out-of-state national banks increased much more in APL states than in non-APL states (Davis & Rice 2006). In addition, Avery, et al. (2007) documented that national banks expanded their share in the subprime market in part by acquiring existing independent mortgage companies. OCC preemption, then, would have granted the independent mortgage companies a way to become immune from the APLs that they were previously under.

Realizing a general lack of empirical examinations of the impact of federal preemption, this study will try to fill the gap by providing an investigation of the impact of federal preemption on mortgage lending and mortgage performance during the subprime crisis. Considering the timing of the action relative to the growth of the subprime market, we focus on the impacts of the 2004 OCC preemption in the empirical analysis presented below. Primarily we try to answer the following questions: Did the OCC preemption affect the default rates of loans originated by national banks and their subsidiaries? Or did the lack of legal restrictions because of the OCC preemption lead to riskier underwriting standards and higher foreclosures for loans originated by OCC lenders?

3. Data

In this section, we describe the data sources used in the analysis. We first describe our coding system of state laws based on their coverage and strength. Then we describe the unique dataset created by merging HMDA with a large sample of private-label securitizations that allows us to examine the changes in mortgage quality over time of lenders supervised by different regulators.

3.1 State Anti-Predatory Lending Law Data

To develop a law coding system for state anti-predatory lending laws, we reviewed the existing studies, including Li and Ernst (2007), Bostic et al. (2008a), and Bostic et al. (2009). We also reviewed the description of state laws in several treatises, including Renault, Keest, Carter, Wu, and Cohen (2009) and Nelson and Whitman (2007), analyzed various rate matrices that reflect mortgage originators' understanding of state laws, particularly for prepayment penalty restrictions, and then examined that statutory language itself. We identified that mini-HOEPA laws were adopted in 25 states and the District of Columbia on or before December 31, 2007.⁶ 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], Maine [prior to 2007], Kentucky, and Florida) did not extend coverage beyond mortgages

⁶ Arkansas, California, Connecticut, District of Columbia, Florida, Georgia, Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, and Wisconsin.

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. 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 a law variable to code 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 Bostic et al. (2009), 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 (Table 1). A value of one (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. While some of the 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.

(Insert Table 1 about here)

Based on this analysis, 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. A few states (Maine, Rhode Island, and Minnesota) made significant amendments after December 31 2006 but we are not aware of other post-2004 amendments that would change the coding for any state.⁷

Finally, there are some variations of APLs in different mortgage markets and some APLs had broader coverage and more restrictions in the refinance market during the study period. The HOEPA law adopted in 1994 and the 2002 revision did not cover home purchase loans (Federal Reserve System, 2001). As a result, many mini-HOEPA laws, built upon HOEPA, have limited coverage and restrictions in the home purchase market. Five of the APL states--Arkansas, Colorado, Illinois, Maryland, and Michigan—did not cover home purchase mortgages in their state APLs. We created a new state law variable (*ineffect_p*) that codes the five states without any coverage in the home purchase market as non-APL states. We only used this variable when we examine the impact of APLs in different submarkets.

3.2 Columbia Collateral File Data

⁷ Maine made significant amendments in 2007, having enacted a copycat statute previously, so it is treated as *ineffect*=1 for originations after 2008. Minnesota made significant amendments in 2007 but they did not change the value of the *ineffect* variables. Rhode Island's statute was first effective December 31, 2006. We are not aware of other post-2004 amendments that would change the coding for any state.

To study the impact of federal preemption on loan performance, researchers require a dataset that includes information about the regulatory agency governing the lending institution, loan product characteristics, and mortgage performance. To date, no such dataset exists, greatly limiting the ability to undertake a comprehensive analysis of the effects of federal preemption. To overcome this significant data gap, we merged private-label securitization data from the Columbia Collateral file (CCF) with the HMDA data, thereby enabling us to conduct such an analysis.

The CCF data provide detailed monthly loan-level information for a national sample of nonprime mortgages that have been packaged into private-label mortgage-backed securities (Quercia & Ding, 2009; White 2009).⁸ The data consist of mortgage pools for which Wells Fargo serves as trustee; the pools are serviced by many of the leading mortgage servicing companies. The data are available through remittance reports produced by the trustee and its servicing companies on many mortgage pools, altogether representing more than four million outstanding mortgages.

The CCF dataset includes mortgages with different interest rate structures (fixed-rate, adjustable-rate, hybrid rate, interest only, or balloon), different purposes (refinance or purchase), different property types (one-to-four family or multifamily), and different lien statuses (first-lien, second-lien, and others). The data contains loan-level data including the loan interest rate, loan-to-value (LTV) ratio, borrower credit score at origination, origination date, loan amount, whether the loan was based on low- or no-documentation, whether there were prepayment penalties, and whether the loan required a balloon payment. The monthly performance reports provide loan-level details on loan characteristics, delinquency, foreclosures, bankruptcy, and losses on foreclosed homes.

⁸ These investor report files are available at www.ctslink.com, administered by the Corporate Trust Services group of Wells Fargo Bank, N.A.

To construct the CCF sample, we include all loans originated from January 1, 2002 through December 31, 2006 in the CCF dataset, which allows us to follow cohorts originated before and after the 2004 OCC preemption. We focus on the performance of these loans during the period from December 1, 2006 to December 31, 2008. This allows us to gauge their loan performance through the height of the subprime foreclosure crisis. After 2008, the combination of the economic recession, rapid rise in unemployment, and the changing policy environment make it difficult to isolate the impact of APLs and federal preemption on mortgage performance.

To obtain the information on the regulatory structure of lenders, we merged the CCF data with HMDA data using variables that are common in both datasets. HMDA data provide rich information on the lenders who originated the mortgages, demographic and other information on borrowers, the geographic location of the property securing the loan, and some characteristics of residential mortgages. We matched data using a geographic crosswalk file that sorted CCF and HMDA loans into the census tracts of the purchased property and then matched loan originations on the following variables: origination date, loan amount, lien status (for loans originated in 2004 and later), and loan purpose.⁹

By pooling all the monthly remittance reports together, we started with more than 3.5 million mortgages in the CCF data that were originated from 2002 to 2006 and were still active as of December 2006. After the match, we had a sample of 2.5 million private securitized mortgages originated from 2002 to 2006, representing about 30 percent of subprime and Alt-A mortgages,

⁹ The match rates are about 70 percent for different cohorts of mortgages in the CCF data, ranging from 57 percent for the 2002 originations to 82 percent for the 2003 originations (Table 2).

and about 5 percent of all U.S. mortgages. The top five national banks include Bank of America, Wells Fargo Bank, National City Bank, JP Morgan Chase Bank, and Countrywide Bank.

Included in the matched dataset are over 400,000 mortgages in foreclosure during the study period (December 2006 to December 2008). This compares with about 1.5 million foreclosures as of December 2008, so our sample could include over 20 percent of all mortgages in foreclosure.¹⁰

The matched dataset includes all the static loan characteristics at origination as well as added information about the borrower's income and information about which regulator oversaw the lending institution that originated the loan. Specifically, the field for agency code in the HMDA data identifies the regulating agency – whether OCC, OTS, FRS, FDIC, NCUA or HUD -- that supervises the lender in question.

Of course, it needs to be noted that the matched sample does not represent a statistically random sample of all mortgage loans or all nonprime mortgage loans. A few caveats about the CCF data need to be mentioned. First, the coverage of the CCF data is limited to securitized subprime and alt-A mortgages, which obviously do not represent the entire mortgage market. Especially, the CCF data does not include the portion of nonprime loans that are held in portfolio. Therefore, any systematic difference between loans held in portfolio and those that are securitized may limit the applicability of our results to the portfolio loan market.

¹⁰ Estimations are based on National Delinquency Survey data for the fourth quarter of 2008 (Mortgage Bankers Association 2008). The National Delinquency Survey data is estimated to cover 85 percent of the residential mortgage market but it only provides foreclosure inventory data at the end of each quarter.

Second, only seasoned loans that were still active as of December 2006 were included in this study; thus, we excluded from our analysis loans that were terminated before December 2006. For example, loans could be dropped out of the pools if they were foreclosed or prepaid, and there could be some inevitable systematic differences between the seasoned loans and those early terminations.

Finally, although our sample is national in scope, loans tended to be geographically concentrated in high-growth states. For example, there was an over-representativeness of loans in California, which had nearly a quarter of all loans, higher than California's market share of about 16 percent in the conventional mortgage market during the study period (2002-2006) based on the HMDA data.

In other respects, the mortgages in the study sample should be typical of nonprime mortgages originated between 2002 and 2006. Nevertheless, given that nonprime mortgages account for more than half of all foreclosures, and that the vast majority of nonprime loans that led to the crisis were securitized,¹¹ a study of a sample which covers about one fifth of the foreclosures should provide important insights as to the impact of government regulation in the nonprime market.

For simplicity, we focus on conventional, 30-year, first-lien mortgages and mortgages with non-missing value of origination credit scores, occupancy type, property type, or loan amount.

Because the focus of the study is the impact of the OCC preemption, loans originated by federal

¹¹ According to the National Delinquency Survey, the number of subprime mortgages that were in foreclosure accounted for about 47 percent of the two million mortgages in foreclosure in the fourth quarter of 2008 (MBA 2008). About 59 percent of subprime loans were securitized in 2003, and this rate increased to over 80 percent in 2006 (Inside Mortgage Finance, 2008). So the securitized subprime loans should account for a significant share of the total foreclosures during the study period.

thrifts and their subsidiaries, originations by state banks (regulated by FRS or FDIC) and credit unions (regulated by NCUA) were also excluded. OTS lenders were not considered because their preemption came early on in the development of the subprime market. The FRS and FDIC lenders were not considered for two primary reasons: 1) the small and likely unrepresentative sample for the pre-preemption cohort (2002-2003 originations);¹² 2) insufficient information about the changes in the regulatory environment for these lenders, especially since an unknown portion of state bank loans had been preempted. Loans originated by independent mortgage companies were kept to serve as a benchmark of the performance of OCC originations.

To better isolate the impact of preemption, we focus on the 47 states that either had adopted APLs before 2004 and or had not adopted APLs as of December 2007. Three states, Wisconsin, Indiana, and Rhode Island, adopted APLs between the OCC preemption in 2004 and December 2007 and were dropped from the analysis because it is difficult to separate the preemption effect from the APL effect in this case. Loans originated before the adoption of APLs in APL states were dropped from the analysis too.

The final sample size was reduced to about 1.1 million loans originated by either OCC lenders or independent mortgage companies. The summary statistics were calculated at the loan level in Table 3. The average loan amount was \$255,086. The combined LTV ratio at origination for all loans was around 80 percent and the average Fair Isaac or FICO credit score was a little over

¹² We found a limited coverage of this matched sample for the FRS and FDIC loans: originations by FRS and FDIC lenders accounted for less than 15 percent of all subprime loans. Compared to the 30 percent to 40 percent coverage for originations by the OCC and OTS lenders, this dataset may not allow us to conduct a meaningful analysis of the FRS and FDIC lenders. Using the HMDA data, we constructed a sample of subprime originations (based on the subprime list approach for originations before 2004) and high-cost loans (for originations after 2004) that were not sold to government sponsored enterprises (GSEs) as a proxy of the population of private securitizations.

668. A little more than half of all loans provided full documentation (54 percent). Almost half of the loans (49 percent) included prepayment penalties; the share for adjustable-rate mortgages and refinance mortgages was even higher. About 30 percent of the loans were interest-only mortgages and almost 8 percent of loans had balloon payments.

(Insert Table 2 and Table 3 about here)

As to the performance, the average serious delinquency rate was 23 percent during the period. In other words, almost one quarter of mortgages had at least one 90-day delinquency between December 2006 and December 2008. Fixed-rate mortgages had lower delinquency rates (12.3 percent for purchase loans and 12.0 percent for refinance loans) while adjustable-rate mortgages had much higher delinquency rates (29.4 percent for purchase loans and 25.9 percent for refinance loans).

4. Research Approach

To isolate the impact of the OCC preemption on the mortgage market, we employ a difference-in-differences approach that compares OCC lenders to independent mortgage companies both pre- and post-preemption. By controlling for borrower risk factors, neighborhood characteristics, time and market trends, this approach allows us to attribute the relative change in the default risk of OCC originations to the OCC preemption in 2004.

A simple comparison of the default rates of OCC originations in APL states before and after the preemption is helpful but is insufficient to estimate the preemption effect conclusively.

Concurrent with the OCC preemption, there were multiple and significant changes in national housing, mortgage and capital markets, which needs to be considered in the model. Using the difference-in-differences method, we are able to subtract out these correlated time trends using several control groups, by comparing the default risk of mortgages originated in APL states after the preemption to a) those originated before the preemption and b) to those originated in non_APL states. The regression structure can be more formally written as follows:

$$\text{Log}(\text{Odds}_i) = \beta_0 + \beta_1 * T_i + \beta_2 * \text{Ineffect}_i + \beta_3 * (T_i * \text{Ineffect}_i) + \gamma * X_i \quad (1)$$

where Odds_i represents the odds of default for mortgage i during the study period, and X_i represents the control variables. T is a time dummy which is assigned a value of one for any loans that were originated after the OCC preemption. Ineffect is the state law dummy discussed previously and represents whether a state had strong anti-predatory lending laws in place before preemption. $T * \text{Ineffect}$ is the interaction of the time dummy and the APL state dummy. Loans originated by the OCC lenders in non-APL states before the preemption serve as the reference group in the models and they reflect the baseline of loan performance for OCC lenders. We can see that β_0 is the baseline average, β_1 represents the time trend in the non_APL states, and β_2 represents the differences between the two groups of states which captures the APL effects on mortgage performance (APL_effect). Loans originated by OCC lenders in APL states would have been subject to federal regulation and state APLs before preemption but they were only subject to federal regulation after the preemption ($T * \text{Ineffect}$ is equal to one). So the coefficient β_3 represents the difference in the changes over time and here we define the trend effect as:

$$\text{Trendeffect}_{t_{ij}} = \exp(\beta_3)_{ij} \quad (2)$$

Where t identifies different cohorts originated after preemption and j identifies different submarkets. Considering the existence of unobserved heterogeneity between different markets, we stratified our analysis for different loan categories (fixed-rate home purchase, adjustable-rate home purchase, fixed-rate refinance, and adjustable-rate refinance). After the OCC preemption, we expect the effect of state laws on underwriting standards to become weaker for the preempted lenders in APL states and as a result expect to see the origination of more loans with risky features. In turn, we expect that loans originated by the preempted lenders in APL states are more likely to default and the trend effects for OCC lenders are expected to be greater than one (or $\beta_3 > 0$).

The trend effect provides very useful information on the changes in default risk of loans originated by OCC lenders, however, it is not the same as the preemption effect. One important assumption underlying the difference-in-differences approach described in equation (1) is that it assumes all other changes are identical between the treatment group and non-treated group. Such an assumption here implies that the overall conditions of the housing and mortgage markets, like differences in the prevalence of different origination channels or differences in the access to mortgage credit, in APL states and non-APL states were identical during the study period. This assumption is likely unrealistic here since subprime lending was generally more concentrated in APL states during the housing boom (2004-2006) and that these states adopted APLs to deal with the sharp growth in risky subprime lending.

To better capture the preemption effect, we introduce independent mortgage companies as another “non-treatment” group. Independent mortgage companies were subject to the same regulatory environment as OCC lenders pre-2004, however, they were not directly affected by federal preemption, meaning that loans originated by independent mortgage companies in APL states were subject to state APLs over the entire study period. In other words, the trend effect of loans originated by independent mortgage companies can be used to serve as a proxy of changes in market conditions between APL states and non_APL states because independent mortgage companies remained subject to the same regulatory environment before and after 2004.

By running the same regression for loans originated by both OCC lenders and independent mortgage companies and comparing the trend effects between these two groups of lenders, we are able to isolate the impact of the OCC preemption on the default risk of originations by OCC lenders. In other words, the preemption effect can be obtained by factoring out the market trend during the study period, as proxied by the trend effects of independent mortgage lenders

($Trend_effect^{IND}$):

$$Preemption_effect_{ij} = Trend_effect_{ij}^{OCC} / Trend_effect_{ij}^{IND} = \exp((\beta_3)_{ij}^{OCC} - (\beta_3)_{ij}^{IND}) \quad (3)$$

The significance of the preemption effect can be tested using a significance test of coefficients of the same logit model among different groups, as introduced in Allison (1999). By controlling for borrower risk factors, neighborhood characteristics, and market trends, we attribute the relative change in the default risk of OCC originations to the federal preemption in 2004. A value

significantly greater than one of the preemption effect variable indicates that preemption increases the default risk of mortgages originated by OCC lenders in APL states. In contrast, a value of one or less suggests that preemption does not increase the default risk, all other things being equal.

In addition to the time and state law variables, we also control for other factors that might influence default risk (X_i), including borrower credit risk, local economic conditions, and house price dynamics. Research has shown that these factors influence subprime lending, loan features, and loan performance (e.g. Quercia et al. 2007). To capture borrower risk, we control for borrower FICO score (in buckets), estimated current LTV ratio as of December 2006 (in buckets), property type, and owner occupancy status (owner occupied or not). We also calculated a proxy of borrower debt-to-income ratio using information available in the HMDA dataset (loan amount divided by borrower household income). To control for local housing and economic conditions, we include data on house price appreciation after December 2006 (based on Federal Housing Finance Agency (FHFA) House Price Indices complimented by the Case-Shiller House Price Indices) as well as the average unemployment rate during the observation period. Most of these data were obtained from economy.com, a division of Moody's Analytics. Borrower race information from HMDA is also considered in the model. But loan features other than loan purpose (home purchase or refinance) and loan types (fixed-rate or adjustable-rate) are not considered since they are endogenous variables.¹³ Definitions of all variables are summarized in Table 4.

¹³ Of course, the adjustable-rate feature may also be endogenous since most mini-HOEPA laws had interest rate triggers that could be gamed to some extent through use of an adjustable-rate loan. But the adjustable-rate feature alone is generally not as risky as other loan features addressed by state anti-predatory lending laws like prepayment penalties, balloon payments, lack of verification of borrowers' repayment capacity, and very high interest rates and fees.

As a first step, we generated a descriptive table based on serious delinquency rates of different lender types (OCC or IND) and different law statuses (with and without APLs) for different cohorts and different markets (Table 5). We calculated the relative default risk of mortgages originated in APL states and non-APL states (“APL effect”) ¹⁴ based on the observed delinquency rates and calculated the “trend effects” and “preemption effects” based on the changes in default risk among different cohorts. The descriptive statistics suggest, without controlling other factors, that loans originated in APL states generally had lower default rates than that of those in non_APL states (the “APL effects” were generally lower than one as shown in Table 5). After the preemption, we observed an increase in the default rate of loans originated in APL states, relative to that in non-APL states, for both OCC lenders and independent mortgage companies. This pattern is reflected by the fact that “trend effects” were greater than one for all but one loan types. We also observed that the “preemption effects” were greater than one in three out of four markets, including fixed-rate purchase, fixed-rate refinance, and adjustable-rate refinance mortgages. The only exception is the adjustable-rate purchase market where the raw data suggest the increase in the default risk was even higher for independent mortgage companies in APL states. However, since these results could be due to the significant changes in borrower credit risk, house price dynamics, and local economic conditions over this time period, we will control for these factors and draw more concrete conclusions in the next section.

¹⁴ The “APL effect” can be calculated by dividing the odds of default (default rate divided by the non-default rate) in APL states by the odds of default of its reference group in non_APL states. For example, the default rate of the 2002-2003 cohort of fixed-rate purchase loans by OCC lenders was 6.25 percent in APL states (an odds of default of 0.067) and 9.51 percent in non_APL states (an odds of default of 0.105), then the “APL effect” was 0.634 (0.067/0.105).

(Insert Table 4 and Table 5 about here)

5. Empirical Results

We ran the regression in four different markets (fixed-rate home purchase, adjustable-rate home purchase, fixed-rate refinance, and adjustable-rate refinance) for two groups of lenders, OCC lenders and independent mortgage companies. We also ran the regression for two loan cohorts originated after the preemption separately (the 2004 cohort and the 2005-2006 cohort) to capture unobserved heterogeneity for the different vintages.¹⁵ Regression results for OCC lenders are summarized in Table 6 for the 2004 cohort and in Table 7 for the 2005-2006 cohort. Table 8 provides a summary of the results of the trend effects of OCC lenders and independent mortgage companies and the preemption effects for OCC lenders.

(Insert Table 6-10 about here)

Several important trends stand out from the results in Table 8. First, we find that the performance of both OCC and independent mortgage company loans in APL states became worse over time, with the exception of fixed-rate purchase loans, as reflected by the trend effects that are greater than one for all but one loan types for different cohorts (see the *Trend Effects* column in Table 8). This is not surprising, given the relationship between the booming of the subprime sector after

¹⁵ Loans originated in 2004 but before the OCC preemption on February 12 were put into the 2002-2003 cohort.

2004 and the following collapse of the housing market, and the finding is consistent with our contention that market conditions changed radically during our period of observation. The lack of a significant difference for purchase FRM loans is likely due to the fact that this market segment saw fewer problems with relaxed underwriting criteria and/or exotic product features.

Yet the fact that the performance of OCC originations became relatively worse in APL states post-preemption, compared to those in non-APL states, is significant. For example, a typical adjustable-rate purchase loan originated by an OCC lender in an APL state became 22.5 percent more likely to default (with a trend effect of 1.225) in 2004, compared to that in non-APL states. A typical adjustable-rate refinance loan originated by an OCC lender in an APL state in 2004 became 52.7 percent more likely to default. For a typical fixed-rate refinance loan, the increase was 48.6 percent for the 2004 cohort. The pattern is quite similar for the 2005-2006 cohort and the increases were even higher.

More importantly, we find that in the refinance market, the loans originated by OCC lenders not only had a higher default rate, but did so at a rate significantly greater than that of independent mortgage companies, which remained subject to state APLs. As the *Preemption Effect* column in Table 8 shows, even after accounting for market trends by factoring out the change in default risk observed in independent mortgage company loans, the default risk of originations in APL states by OCC lenders increased significantly, ranging from a 14 percent increase for the 2005-2006 adjustable-rate cohort to a 31 percent increase for the 2004 fixed-rate cohort. The results also suggest the preemption effects were larger in 2004 than in 2005 and 2006, which needs further examination.

In the home purchase market, the results are more mixed. The preemption effect was greater than one (1.183) and significant for the 2004 fixed-rate purchase cohort but it was close to one and insignificant for the 2005-2006 cohort. For the adjustable-rate loans, the preemption effects were significantly less than one (0.889 for the 2004 cohort and 0.794 for the 2005-2006 cohort). The results suggest that while there was an increase in default risk of OCC originations in APL states after preemption, the increase was significantly lower than that of independent mortgage companies in the adjustable-rate purchase market. In other words, the performance of OCC lenders was slightly better than the market trend in the adjustable-rate purchase market, as proxied by the changes in the performance of mortgages originated by independent mortgage companies in APL states.

We conducted additional analysis to better understand the somewhat counterintuitive results in the home purchase market. One possible explanation is the fact that many mini-HOEPA laws also had limited coverage and restrictions in the home purchase market since the HOEPA law did not cover home purchase loans. The better performance of OCC lenders could therefore be due to an even worse deterioration in the lending by independent mortgage companies, since they were likely subject to fewer restrictions in this market too. To test this contention, we used an alternative state law variable (*ineffect_p*) that codes the five states without any coverage in the home purchase market, namely Arkansas, Colorado, Illinois, Maryland, and Michigan, as non-APL states. We re-ran the purchase models using the new state law variable (*ineffect_p*). The results, along with the results for refinance originations using original state law variable (*ineffect*), are summarized in Table 9.

In this analysis, the preemption effects become either significantly greater than one (1.069 for the 2004 cohort) or only slightly less than one (0.956 for the 2005-2006 cohort) in the adjustable-rate purchase market, when using the state law variable that more accurately reflects the coverage of state laws in the purchase market. The preemption effects are insignificant in the fixed-rate market. The results provide support to our hypothesis that the better performance of OCC lenders in the adjustable-rate purchase market is due to the fact that originations by other non-preempted lenders were also subject to fewer or no restrictions in some APL states. We would not observe a significant impact of preemption unless it actually preempted *effective* state laws in the mortgage lending market. Of course, the preemption effects are still more pronounced in the refinance market even after we take into account the differences in coverage of APLs in different markets. Further studies are needed to better understand the differences in the magnitude of the OCC preemption impact in different markets.

Overall, the results suggest that within this study sample, even after accounting for borrower risk factors, neighborhood characteristics, and the general market trends, preemption increased the default risk of mortgages originated by lenders regulated by the OCC, particularly in the refinance market. We attribute the more pronounced effects in the refinance market to the fact that state APLs offered more protections for refinance loans.

As to the control variables, the results are generally consistent across the different models, so the discussion of other control variables is based primarily on the model focusing on OCC originations, as summarized in Table 7 and Table 8. The results for the *ineffect* variable suggest

loans originated by OCC lenders performed relatively better in APL states than those in non-APL states. The odds ratios of the *ineffect* variable are significant and less than one in all cases. For example, compared to those made in non-APL states, loans originated in APL states by OCC lenders were about 30 to over 40 percent less likely to default when the impact of federal preemption is not considered. Consistent with our expectations, we find that borrowers with lower credit score, higher LTVs, and higher debt ratios are more likely to default. Properties that are not occupied by owners are also more likely to default. Mortgages originated in a market with a lower house price appreciation rate or with a higher unemployment rate are more likely to default too. There is some evidence that borrowers who are African American are more likely to default than others, while the results for Hispanic borrowers are mixed.

Understanding the Preemption Effect

As described in the introduction, preemption could influence loan outcomes through a number of different mechanisms. We conducted an additional descriptive analysis to explore whether or not OCC lenders changed their product mix before and after preemption by originating more loans with “risky” product features.

Using a similar method to that used in our default analysis, we compare the odds of origination of a loan with at least one exotic feature in APL states with those in non-APL states and track the change of the APL effects over time (Table 10). We consider loans with prepayment penalties, balloon payments, interest only mortgages, and/or negative amortization mortgages as exotic loan products, since these features have been associated with increased levels of mortgage default, as discussed in the literature review.

The descriptive table shows an obvious pattern in the refinance market: after preemption, the origination of loans with risky features increased more quickly in APL states for OCC lenders than for independent mortgage companies. For example, before preemption, OCC lenders in non-APL states were about 33 percent more likely to originate a loan with risky features in the fixed-rate refinance market than those in APL states (an odds ratio of 0.329). However, after preemption, they were only 42 percent more likely to originate such loans in 2004 and 50 percent less likely in 2005 and 2006. In contrast, the relative increase in the probability of originating risky loans for independent mortgage companies is more modest during the same period: the “APL effect” increased from 0.424 before the preemption to 0.459 in 2004 and to 0.408 in 2005 and 2006). Accordingly, the “preemption effects” were between 1.171 and 1.564 in the refinance market for different cohorts, suggesting OCC lenders had an even greater increase in the probability of originating risky loans than independent mortgage companies after preemption. In the home purchase market, the probability of originating loans with exotic features increased more quickly for OCC lenders too, with one exception of a slight lower increase in the fixed-rate purchase market for one cohort (the 2005-2006 cohort).

Overall, after the OCC preemption, OCC lenders increased their share of loans with risky features and outpaced independent mortgage companies in most markets. This sharp increase in risky lending helps explain the increased default risk of OCC originations. We contend that even if overall market conditions had not fueled the foreclosure crisis, this analysis shows that the OCC preemption may have removed an important layer of consumer protection in the mortgage market and led to the origination of loan products that may not have been in borrower’s best interests.

Although our results are strongly suggestive of a link between federal preemption and risky lending, we should note that, due to data limitations, the focus of this study is on conventional, 30-year, first-lien, and private securitized mortgages only. Additional research is needed to examine the relationships between anti-predatory lending laws, federal preemption, and loan performance for the overall market; this will require additional data with broader market and geographic coverage and more efforts to make that data transparent and accessible to researchers. Future studies are also needed to help us understand the dynamics of lenders' behavior, and will be dependent on researchers having access to reliable data on both loan performance and on individual lenders and their lending practices.

In addition, we did not examine other possible impacts of the OCC preemption, for example the implications of preemption for equity stripping or its effects on the safety and soundness of the banking or mortgage lending industries. The loss of equity could occur if borrowers are trapped in high-cost loans or forced into expensive refinancing, even if they do not default on their mortgages. Again, reliable data that would allow examination of this issue is, to our knowledge, unavailable. Future comprehensive analyses of the impacts of federal preemption should consider these issues.

6. Conclusion

Prompted by concerns over the growing subprime market, many states enacted state anti-predatory lending laws to expand legal protections for consumers in the mortgage market and deter the origination of loans with characteristics considered detrimental to consumers. By filling

a regulatory gap in the residential mortgage lending market, state anti-predatory lending laws were expected to improve the quality and to reduce the risk of default of nonprime loans. However national banks and their operating subsidiaries were exempted by the OCC from complying with the state mortgage laws. In this way, due to the weaker federal law, the OCC preemption fundamentally changed the regulatory structure for national banks, potentially weakening consumer protections. Most unfortunately, the OCC preemption coincided with the beginning of the explosive growth in subprime lending and preemption allowed traditional OCC lenders and lenders who migrated to national charters to originate more of the riskier loans at the core of the current foreclosure crisis.

In this study, we examined the relationship between APLs, the OCC preemption, and the foreclosure crisis. More narrowly, we compared the probability of default of mortgages originated by preempted lenders before and after the 2004 OCC preemption in markets with and without strong state APLs. We observed that preempted OCC lenders increased their share of loans originated with risky characteristics in states with strong APLs after the preemption. Similarly, we found that preemption generally increased the default risk of privately securitized mortgages originated by OCC lenders in APL states. The increase in default risk among OCC lenders outpaced that of independent mortgage companies in the refinance market in particular, which remained subject to APLs after preemption. The findings suggest that preemption resulted in deterioration in the quality of, and an increase in the default risk for, mortgages originated by OCC lenders in states with strong anti-predatory lending laws.

Though this study sample has limitations, the empirical results have important implications for the debate surrounding federal preemption and consumer protection. We demonstrated that the 2004 OCC preemption weakened lending restrictions for national banks and their subsidiaries by displacing binding state consumer protection laws with the less stringent federal regulatory structure. Preemption resulted in more risky mortgages being originated, thus likely playing a significant role in the ensuing foreclosure crisis. Finally, the findings are consistent with initiatives that propose having the Federal government provide a regulatory floor while allowing states to enact stronger consumer protections based on local conditions.

References

- Allison, P. D. (1999). Comparing Logit and Probit Coefficients Across Groups. *Sociological Methods & Research*, 28(2), 186-208.
- Ambrose, B. W., LaCour-Little, M., & Z. R. Huszar. (2005). A Note on Hybrid Mortgages. *Real Estate Economics* 33(4), 765-782.
- Avery, R.B., Brevoort, K. P., & Canner, G.B. (2007). The 2006 HMDA. *Federal Reserve Bulletin* December, A73-A109.
- Belsky, E. S. & Essene, R. S. (2008). Consumer and Mortgage Credit at a Crossroads: Preserving Expanded Access While Informing Choices and Protecting Consumers. N. P. Retsinas and E. S. Belsky, editors. *Borrowing to Live: Consumer and Mortgage Credit Revisited*. Brookings Institution Press: Washington, DC.
- Bostic, R., Chomsisengphet, S., Engel, K. C., McCoy, P. A., Pennington-Cross, A., & Wachter, S. M. (2009). Mortgage Product Substitution and State Anti-Predatory Lending Laws: Better Loans and Better Borrowers? Working Paper Series. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1460871.
- Bostic, R. W., Engel, K. C., McCoy, P. A., Pennington-Cross, A., & Wachter, S. M. (2008a). State and Local Anti-predatory Lending Laws: The Effect of Legal Enforcement Mechanisms. *Journal of Economics and Business* 60, 47–66.
- Bostic, R. W., Engel, K. C., McCoy, P. A., Pennington-Cross, A., & Wachter, S. M. (2008b). The Impact of State and Local Anti-predatory Lending Laws: Policy Implications and Insights. N. P. Retsinas & E. S. Belsky, editors. *Borrowing to Live: Consumer and Mortgage Credit Revisited*. Brookings Institution Press: Washington, DC.
- Burnett, K., Finkel, M., & Kaul, B. (2004). *Mortgage Lending in North Carolina After the Anti-Predatory Lending Law*. ABT Associates: Cambridge, MA.
- Danis, M. A. & Pennington-Cross, A. (2005). The Delinquency of Subprime Mortgages. Working Paper 2005-022A. Federal Reserve Bank of St. Louis: St. Louis, MO.
- Davis, E. & Rice, T. (2006). Federal Preemption of State Bank Regulation: A Conference Penal Summary. Chicago Fed Letter. September, Number 230a.
- Demyanyk, Y. & van Hemert, O. (2008). Understanding the Subprime Mortgage Crisis. Working Paper. Federal Reserve Bank of St. Louis, February 4, 2008.
- Ding, L., Quercia, R. G., Li, W., & Ratcliffe, J. (forthcoming). Risky Borrowers or Risky Mortgages: Disaggregating Effects Using Propensity Score Models. *Journal of Real Estate Research*.

- Ellehausen, G. & Staten, M. E. (2004). Regulation of Subprime Mortgage Products: An Analysis of North Carolina's Predatory Lending Law. *Journal of Real Estate Finance and Economics*, 29(4), 411-33.
- Ellehausen, G., Staten, M., & Steinbuks, J. (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., Farris, J., & Stein, E. (2002). *North Carolina's Subprime Home Loan Market after Predatory Lending Reform*. Center for Responsible Lending, Durham, NC.
- Federal Reserve System. (2001). Federal Reserve System 12 CFR Part 226: Truth in Lending. *Federal Register* 66 (245), 65604-65662.
- Goodman, A. & Smith, B. (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. & Nigro, P. J. (2003). How Do Predatory Lending Laws Influence Mortgage Lending in Urban Areas? A Tale of Two Cities. *Journal of Real Estate Research*, 25(4), 479-508.
- Harvey, K. D. & Nigro, P. J. (2004). Do Predatory Lending Laws Influence Mortgage Lending? An Analysis of the North Carolina Predatory Lending Law. *The Journal of Real Estate Finance and Economics* 29, 435-456.
- Ho, G. & Pennington-Cross, A. (2006). The Impact of Local Predatory Lending Laws on the Flow of Subprime Credit. *Journal of Urban Economics*, 60, 210-228.
- Inside Mortgage Finance. (2008). The 2008 Mortgage Market Statistical Annual. Bethesda, MD.
- Li, W. & Ernst, K. S. (2007). Do State Predatory Lending Laws Work? A Panel Analysis of Market Reforms. *Housing Policy Debate* 18(2), 347-391.
- Mortgage Bankers Association (MBA). (2008). National Delinquency Survey. Mortgage Bankers Association: Washington, DC.
- Nelson, G. S. & Whitman, D. A. (2007). *Real Estate Finance Law*, 5th edition. West Group: Eagan, MN.
- Pennington-Cross, A. & Ho, G. (2008). Predatory Lending Laws and the Cost of Credit. *Real Estate Economics*, 36(2), 175-211.
- Pennington-Cross, A. & Ho, G. (2010). The Termination of Subprime Hybrid and Fixed Rate Mortgages. *Real Estate Economics* 38(3), 399-426.

Quercia, R.G. & Ding, L. (2009). Loan Modifications and Redefault Risk: An Examination of Short-term Impacts. *Cityscape* 11(3), 171-193.

Quercia, R. G., Stegman, M. A., & Davis, W. R. (2007). The Impact of Predatory Loan Terms on Subprime Foreclosures: The Special Case of Prepayment Penalties and Balloon Payments. *Housing Policy Debate* 18(2), 311-346.

Renuart, E., Keest, K., Carter, C., Wu, C. C., & Cohen, A. I. (2009). *The Cost of Credit* (3d ed. 2005 and Supplement 2008). National Consumer Law Center: Boston, MA.

White, A. M. (2009). Rewriting Contracts, Wholesale: Data on Voluntary Mortgage Modifications from 2007 and 2008 Remittance Reports. *Fordham Urban Law Journal* (36), 509-536.

Table 1 Summary of the Coding of State Anti-Predatory Lending Laws

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

Note: Five states including Arkansas, Colorado, Illinois, Maryland, and Michigan did not cover home purchase mortgages in their state anti-predatory lending laws so the *ineffect_p* variable is coded as zero for these states.

* Bostic et al. (2008a) used three component values to create a consolidated index (an additive index or a multiplicative index) and here we only listed the additive version adds different components together.

Table 2 Matching of Columbia Collateral file data and HMDA

Origination Year	Original Sample	Matched	Match Rate
2002	78,150	44,930	57.49%
2003	287,211	236,357	82.29%
2004	638,180	466,461	73.09%
2005	1,200,929	899,590	74.91%
2006	1,447,951	889,903	61.46%
Total	3,652,421	2,537,241	69.47%

Note: Loans that were still active as of December 2006 or later in the Columbia Collateral file data (www.ctslink.com) are included. The following variables are used in the match: origination date, loan amount (in thousands), geography, lien status (for originations after 2004), and loan purpose.

Table 3 Descriptive Statistics of the Study Sample

Mortgage Information	All Loans (OCC&IND)	OCC Loans only										
		OCC Loans	Purchase _FRM	Purchase _ARM	Refi_FR M	Refi_AR M	Before preemption (2002-2003)		Post-preemption (2004)		Post-preemption (2005-2006)	
non_APL	APL						non_APL	APL	non_APL	APL		
Purchase (%)	51.37%	55.27%	100.00%	100.00%	0.00%	0.00%	40.41%	32.59%	62.82%	55.61%	58.86%	55.16%
ARM (%)	69.56%	63.06%	0.00%	100.00%	0.00%	100.00%	38.91%	38.32%	59.90%	65.64%	64.48%	66.33%
Loan Amount (\$s)	\$255,086	286827	229133	304228	259345	322458	170960	321287	191039	297373	230988	341572
Initial Interest Rate	6.74	6.54	6.71	6.49	6.69	6.40	6.65	5.99	6.21	5.87	6.88	6.56
FICO @ Origination	668	687	716	687	691	663	671	703	684	696	676	692
LTV @ Origination (%)	80.46%	78.50%	84.51%	83.19%	70.38%	73.35%	78.43%	71.68%	82.58%	78.66%	79.80%	77.71%
1-4 Family	86.16%	84.52%	72.76%	87.83%	79.76%	91.54%	84.90%	89.69%	79.24%	85.85%	81.30%	86.62%
Owner Occupied (%)	85.53%	83.71%	71.66%	87.23%	78.52%	90.93%	83.52%	87.82%	77.98%	84.67%	80.67%	85.98%
Full Doc (%)	53.76%	51.61%	42.90%	55.95%	48.79%	53.73%	70.83%	62.43%	62.94%	57.31%	52.77%	45.34%
Prepay Penalty (%)	49.37%	36.15%	16.67%	43.46%	25.72%	46.98%	42.21%	20.57%	48.89%	32.03%	47.54%	28.59%
Balloon (%)	7.72%	6.66%	4.00%	8.56%	4.01%	7.75%	1.37%	1.12%	3.18%	2.52%	8.67%	7.69%
IO (% of loans)	30.49%	30.98%	6.96%	49.84%	5.91%	39.17%	7.15%	12.39%	26.06%	34.51%	28.36%	36.42%
Neg Amortization (%)	4.34%	3.68%	0.00%	3.74%	0.00%	8.71%	0.13%	0.12%	0.56%	0.44%	4.57%	4.87%
Del90 (%)	23.06%	16.01%	8.13%	21.49%	8.63%	19.10%	17.60%	9.84%	13.79%	12.87%	18.82%	15.63%
APL States	59.45%	59.50%	56.18%	58.25%	59.85%	63.34%	0.00%	100%	0.00%	100%	0.00%	100%
Number of Loans	1,067,471	428,624	80,214	156,703	78,109	113,598	14,275	20,095	26,269	44,246	133,039	190,700

Note: Conventional, 30-year, first-lien mortgages only; loans originated in states that adopted APLs after February 12, 2004 and before December 31 2007 were excluded (Wisconsin, Indiana, and Rhode Island).

Table 4 Variable Definition

Variable	Definition
cred580	credit score <580
cred620	credit score 580-619
cred660	credit score 620-659
cred720	credit score 660-719
	credit score ≥ 720 as the reference group
cltv60*	current loan-to-value ratio 60-69.9%
cltv70*	current loan-to-value ratio 70-79.9%
cltv80*	current loan-to-value ratio 80-89.9%
cltv90*	current loan-to-value ratio 90-94.9%
cltv95*	current loan-to-value ratio 95% and higher
	current loan-to-value ratio <60% as the reference group
debt_ratio	loan amount divided by household income
black	black borrower as identified in HMDA
hisp	Hispanic borrower as identified in HMDA
race_miss	race/ethnicity information missing in HMDA
prop_type1	1-4 family property
owner_occ	owner-occupied property
apre_af07	metropolitan area house price appreciation from the fourth quarter of 2006 to the fourth quarter of 2008, calculated based on Case-Shiller HPI and FHFA HPI (where Case-Shiller HPI is unavailable)
unemployment	average county unemployment rate during the period of Q12007 to Q42008
T	time dummy for originations after the OCC preemption
ineffect	state dummy for states with the presence of a state APL
T*ineffect	Interaction of time dummy T and state law dummy
ineffect_p	alternative state law dummy based on the coverage in the purchase market

Note: *The current loan-to-value (CLTV) ratio is calculated using the unpaid mortgage balance as of December 2006 and the estimated house price using the Case-Shiller HPI and FHFA HPI. If the property is located in the 20 major MSAs, we used the Case-Shiller HPI. Otherwise we used the FHFA's MSA level HPI. If the property is located in an area outside an MSA, we used the state-level HPI. When the property has multiple liens, we estimated the CLTV by assuming the second or higher liens had been paid at the same speed as the first lien.

Table 5 Mortgage Default (90+day) by Lender Type and State Laws in Different Markets (Descriptive)

	Before preemption (2002-2003)			Post-preemption (2004)			Post-preemption (2005-2006)			"Trend effect"		"Preemption effect"	
	non_AP L	APL	"APL effect"	non_AP L	APL	"APL effect"	non_AP L	APL	"APL effect"	2004/pre	2005- 2006/pre	2004	2005- 2006
OCC lenders													
purchase_frm	9.51%	6.25%	0.634	6.85%	6.11%	0.886	10.44%	7.11%	0.657	1.397	1.036	1.525	1.092
purchase_arm	33.55%	25.23%	0.668	17.35%	17.01%	0.976	23.75%	20.86%	0.847	1.460	1.267	0.925	0.776
refi_frm	8.21%	2.79%	0.322	9.32%	6.44%	0.669	11.80%	8.70%	0.712	2.082	2.213	1.778	1.654
refi_arm	29.77%	15.56%	0.435	18.52%	15.34%	0.797	22.09%	17.92%	0.770	1.835	1.773	1.400	1.291
IND lenders													
purchase_frm	14.78%	12.60%	0.831	19.91%	15.92%	0.762	21.22%	17.53%	0.789	0.916	0.949		
purchase_arm	37.04%	28.06%	0.663	28.09%	29.02%	1.047	34.85%	36.66%	1.082	1.579	1.632		
refi_frm	13.64%	8.71%	0.604	17.14%	12.76%	0.707	17.27%	14.44%	0.808	1.171	1.338		
refi_arm	37.37%	30.32%	0.729	30.63%	29.69%	0.956	28.80%	28.82%	1.001	1.311	1.373		

Note: Mortgage default is measured by whether the loan had ever experienced any 90 or 90 plus days of delinquency from December 1 2006 to December 31 2008.

The "APL effect" = (odds of default of loans in APL states)/(odds of default of loans in non-APL states), where odds of default= (default rate (p))/(non-default rate ($1-p$)); "trend effect"=("APL effect" for the post-preemption cohort)/("APL effect" for the pre-preemption cohort (2002-2003)). "Preemption effect"= ("trend effect" for OCC lenders)/("trend effect" for independent mortgage companies). A value greater than one for the "preemption effect" suggests, though inconclusively, the default risk increased after the preemption. The "APL effect", "trend effect", and "preemption effect" are calculated based on raw data without controlling for other factors so they are in quotes.

Conventional, 30-year, first-lien mortgages only; loans originated in three states that adopted APLs after February 12, 2004 and before December 31 2007 were excluded (Wisconsin, Indiana, and Rhode Island).

Table 6 Logit Regression Results based on the 2002-2003 Cohort and the 2004 Cohort of OCC Originations

Parameter	Purchase_FRM			Purchase_ARM			Refi_FRM			Refi_ARM		
	Estimate	Std Error	Odds Ratio	Estimate	Std Error	Odds Ratio	Estimate	Std Error	Odds Ratio	Estimate	Std Error	Odds Ratio
Intercept	-4.581***	0.285		-3.575***	0.153		-5.227***	0.270		-3.862***	0.202	
cred580	3.003***	0.114	20.152	2.572***	0.070	13.089	2.908***	0.109	18.327	2.773***	0.084	16.013
cred620	2.266***	0.113	9.644	2.107***	0.057	8.226	2.245***	0.115	9.437	2.235***	0.087	9.348
cred660	1.835***	0.099	6.265	1.705***	0.053	5.501	1.948***	0.105	7.014	1.989***	0.084	7.306
cred720	1.050***	0.091	2.857	0.978***	0.051	2.660	1.217***	0.102	3.376	1.241***	0.083	3.461
cltv60	0.420***	0.097	1.522	0.273***	0.048	1.313	0.753***	0.074	2.124	0.683***	0.055	1.980
cltv70	0.677***	0.100	1.968	0.572***	0.049	1.772	1.029***	0.081	2.799	1.084***	0.055	2.957
cltv80	0.966***	0.105	2.627	0.854***	0.054	2.348	1.258***	0.101	3.520	1.428***	0.065	4.169
cltv90	0.957***	0.161	2.604	1.106***	0.074	3.022	1.283***	0.211	3.607	1.662***	0.106	5.267
cltv95	1.142***	0.302	3.133	1.110***	0.112	3.035	2.090***	0.452	8.088	1.895***	0.151	6.654
debt_ratio	0.077***	0.029	1.081	0.064***	0.012	1.066	-0.003	0.025	0.997	0.088***	0.015	1.092
black	0.556***	0.098	1.744	0.602***	0.047	1.826	0.174*	0.096	1.190	0.010	0.065	1.010
hisp	0.035	0.098	1.035	0.080	0.051	1.083	-0.009	0.109	0.991	0.054	0.073	1.056
race_miss	0.093	0.082	1.097	0.114***	0.038	1.121	0.093	0.068	1.098	0.075*	0.046	1.078
prop_type1	0.581***	0.195	1.787	-0.059	0.103	0.942	0.171	0.147	1.186	-0.026	0.112	0.974
owner_occ	-0.563***	0.186	0.569	-0.083	0.098	0.921	-0.500	0.140	0.606	-0.404***	0.101	0.668
apre_af07	-0.214	0.243	0.807	-0.184*	0.112	0.832	0.516**	0.218	1.675	-0.105	0.146	0.900
unemployment	0.101***	0.022	1.107	0.191***	0.011	1.211	0.114***	0.019	1.121	0.129***	0.013	1.138
T	-0.195**	0.091	0.823	-0.607***	0.054	0.545	-0.128*	0.078	0.880	-0.643***	0.062	0.526
ineffect	-0.334***	0.105	0.716	-0.336***	0.064	0.715	-0.550***	0.087	0.577	-0.463***	0.068	0.629
T*Ineffect	0.136	0.127	1.145	0.203***	0.072	1.225	0.396***	0.112	1.486	0.423***	0.081	1.527
Likelihood Ratio	1666.3(20)			5399.4(20)			2230.7(20)			4552.6(20)		
N	19,962			33,465			26,889			24,569		

Note: * significant at 0.1 level; ** significant at 0.05 level; *** significant at 0.01 level. Conventional, 30-year, first-lien mortgages only; loans originated in states that adopted APLs after February 12, 2004 and before December 31 2007 were excluded.

Table 7 Logit Regression Results based on the 2002-2003 Cohort and the 2005-2006 Cohort of OCC Originations

Parameter	Purchase_FRM			Purchase_ARM			Refi_FRM			Refi_ARM		
	Estimate	Std Error	Odds Ratio	Estimate	Std Error	Odds Ratio	Estimate	Std Error	Odds Ratio	Estimate	Std Error	Odds Ratio
Intercept	-3.059***	0.142		-1.495***	0.079		-3.451***	0.134		-1.576***	0.089	
cred580	2.981***	0.073	19.703	2.257***	0.035	9.553	2.633***	0.061	13.912	2.207***	0.035	9.086
cred620	2.630***	0.057	13.872	2.105***	0.026	8.208	2.084***	0.061	8.038	1.868***	0.036	6.477
cred660	1.996***	0.046	7.360	1.813***	0.024	6.125	1.807***	0.054	6.092	1.623***	0.035	5.067
cred720	1.182***	0.041	3.262	1.206***	0.022	3.341	1.137***	0.053	3.118	1.113***	0.034	3.043
cltv60	0.624***	0.079	1.866	0.195***	0.037	1.215	0.689***	0.050	1.993	0.468***	0.033	1.596
cltv70	1.099***	0.068	3.000	0.790***	0.029	2.203	1.235***	0.046	3.437	1.026***	0.028	2.789
cltv80	1.290***	0.071	3.633	0.815***	0.030	2.258	1.499***	0.052	4.475	1.380***	0.030	3.974
cltv90	1.144***	0.083	3.139	0.601***	0.039	1.823	1.754***	0.074	5.778	1.432***	0.045	4.185
cltv95	1.205***	0.085	3.337	0.631***	0.039	1.879	1.819***	0.105	6.166	1.678***	0.060	5.355
debt_ratio	0.070***	0.014	1.073	0.024***	0.007	1.024	0.031*	0.012	1.032	0.033***	0.007	1.034
black	0.640***	0.044	1.895	0.511***	0.022	1.667	0.076*	0.043	1.078	0.038	0.028	1.039
hisp	0.315***	0.042	1.370	0.672***	0.020	1.959	0.081*	0.046	1.084	0.279***	0.026	1.322
race_miss	0.164***	0.048	1.178	0.098***	0.021	1.103	0.039	0.042	1.040	0.010	0.024	1.010
prop_type1	0.425***	0.078	1.529	0.059	0.038	1.060	0.162**	0.073	1.176	-0.085*	0.045	0.918
owner_occ	-0.745***	0.074	0.475	0.002	0.037	1.002	-0.668***	0.071	0.513	-0.445***	0.043	0.641
apre_af07	-1.954***	0.098	0.142	-2.234***	0.050	0.107	-1.017***	0.097	0.362	-1.508***	0.058	0.221
unemployment	0.112***	0.011	1.119	0.138***	0.005	1.148	0.086***	0.010	1.090	0.082***	0.006	1.086
T	-0.191**	0.077	0.827	-0.762***	0.046	0.467	-0.277***	0.059	0.758	-0.942***	0.048	0.390
ineffect	-0.442***	0.103	0.643	-0.513***	0.061	0.599	-0.742***	0.084	0.476	-0.675***	0.064	0.509
T*ineffectT	0.110	0.108	1.116	0.280***	0.063	1.323	0.497***	0.089	1.644	0.504***	0.066	1.655
Likelihood Ratio	6081.5(20)			18678.7(20)			5685.3(20)			11367.8(20)		
N	66,490			129,318			66,097			96,204		

Note: * significant at 0.1 level; ** significant at 0.05 level; *** significant at 0.01 level. Conventional, 30-year, first-lien mortgages only; loans originated in states that adopted APLs after February 12, 2004 and before December 31 2007 were excluded.

Table 8 Impact of the OCC Preemption on Mortgage Performance (90+day)

		Trend Effect						Preemption Effect	
		Post-preemption (2004)			Post-preemption (2005-2006)			Post-preemption (2004)	Post-preemption (2005-2006)
		Coefficient	error	Odds Ratio	Coefficient	error	Odds Ratio	Odds Ratio	Odds Ratio
OCC	Purchase_FRM	0.136	0.127	1.145	0.11	0.108	1.116	1.183***	1.006
	Purchase_ARM	0.203***	0.072	1.225	0.280***	0.063	1.323	0.886***	0.794***
	Refi_FRM	0.396***	0.112	1.486	0.497***	0.089	1.644	1.313***	1.230***
	Refi_ARM	0.423***	0.081	1.527	0.504***	0.066	1.655	1.273***	1.143***
IND	Purchase_FRM	-0.032	0.088	0.968	0.104	0.076	1.109		
	Purchase_ARM	0.323***	0.05	1.382	0.511***	0.046	1.667		
	Refi_FRM	0.124***	0.059	1.132	0.291***	0.0536	1.337		
	Refi_ARM	0.182***	0.041	1.2	0.370***	0.037	1.448		

Note: * significant at 0.1 level; ** significant at 0.05 level; *** significant at 0.01 level.

Based on a set of logit regression models in different markets for OCC lenders and for independent mortgage companies; Preemption effect= (trend effect of OCC lenders)/(trend effect of independent mortgage companies). For OCC lenders, more detailed information of the regression can be found in Table 6 and Table 7.

Table 9 Impact of the OCC Preemption on Mortgage Performance (90+day) Using Law Coding Reflecting the Differences in the Coverage of APLs in Different Markets

		Trend Effect						Preemption Effect	
		Post-preemption (2004)			Post-preemption (2005-2006)			Post-preemption (2004)	Post-preemption (2005-2006)
		Coefficient	error	Odds Ratio	Coefficient	error	Odds Ratio	Odds Ratio	Odds Ratio
OCC	Purchase_FRM	0.043	0.129	1.044	0.091	0.110	1.095	1.037	0.970
	Purchase_ARM	0.267***	0.073	1.306	0.483**	0.065	1.621	1.069***	0.956***
	Refi_FRM	0.396***	0.112	1.486	0.497***	0.089	1.644	1.313***	1.230***
	Refi_ARM	0.423***	0.081	1.527	0.504***	0.066	1.655	1.273***	1.143***
IND	Purchase_FRM	0.007	0.089	1.007	0.122	0.076	1.129		
	Purchase_ARM	0.201***	0.051	1.222	0.528***	0.046	1.695		
	Refi_FRM	0.124***	0.060	1.132	0.291***	0.053	1.337		
	Refi_ARM	0.182***	0.041	1.200	0.370***	0.037	1.448		

Note: * significant at 0.1 level; ** significant at 0.05 level; *** significant at 0.01 level.

Law coding in the purchase and refinance market differs in that five states including Arkansas, Colorado, Illinois, Maryland, and Michigan which exclude home purchase mortgages in their state anti-predatory lending laws are treated as non-APL states in the purchase market. Preemption effect= (trend effect of OCC lenders)/(trend effect of independent mortgage companies).

Table 10 Mortgages with at Least One Exotic Feature by Lender Type and State Laws in Different Markets (Descriptive, Using Law Coding Reflecting the Differences in the Coverage of APLs in Different Markets)

	Before Preemption (2002-2003)			Post-preemption (2004)			Post-preemption (2005-2006)			"Trend Effect"		"Preemption Effect"	
	non_APL	APL	"APL effect"	non_APL	APL	"APL effect"	non_APL	APL	"APL effect"	2004/pre	2005-2006/pre	2004/pre	2005-2006/pre
OCC lenders													
purchase_frm	23.88%	17.61%	0.681	25.19%	23.77%	0.926	26.78%	22.63%	0.799	1.359	1.173	1.035	0.896
purchase_arm	78.99%	62.19%	0.437	81.66%	75.05%	0.676	86.70%	81.52%	0.676	1.545	1.546	1.189	1.139
refi_frm	27.63%	11.17%	0.329	44.35%	24.98%	0.418	45.34%	29.15%	0.496	1.269	1.507	1.171	1.564
refi_arm	74.06%	50.25%	0.354	83.29%	67.20%	0.411	89.34%	80.34%	0.488	1.162	1.378	1.468	1.464
IND lenders													
purchase_frm	46.69%	39.93%	0.759	50.62%	50.55%	0.997	63.52%	63.39%	0.995	1.314	1.310		
purchase_arm	77.40%	68.19%	0.626	82.09%	78.85%	0.814	89.15%	87.47%	0.850	1.300	1.357		
refi_frm	58.80%	37.70%	0.424	74.91%	57.83%	0.459	79.21%	60.88%	0.408	1.083	0.963		
refi_arm	74.66%	53.11%	0.384	85.77%	64.72%	0.304	91.26%	79.07%	0.362	0.792	0.941		

Note: Exotic loan features include prepayment penalties, balloon payments, interest only, and negative amortization.

The "APL effect" = (odds of the existence of exotic loan features of loans in APL states)/(odds of the existence of exotic loan features of loans in non-APL states), where odds of the existence of exotic loan features = (the share of loans with exotic features (p))/(the share of loans without such features ($1-p$)); "trend effect"=("APL effect" for the post-preemption cohort)/("APL effect" for the pre-preemption cohort (2002-2003)). "Preemption effect"= ("trend effect" for OCC lenders)/("trend effect" for independent mortgage companies). A value greater than one for the "preemption effect" suggests, though inconclusively, the probability or originating of risky loans increased after the preemption. The "APL effect", "trend effect", and "preemption effect" are calculated based on raw data without controlling for other factors so they are in quotes.

Conventional, 30-year, first-lien mortgages only; loans originated in states that adopted APLs after February 12, 2004 and before December 31 2007 were excluded.

*Center for Community Capital
The University of North Carolina at Chapel Hill
1700 Martin Luther King Blvd
Campus Box 3452, Suite 129
Chapel Hill NC 27599-3452
(877) 783-2359
(919) 843-2140
communitycapital@unc.edu
www.ccc.unc.edu*



UNC
COLLEGE OF
ARTS & SCIENCES