Does Regulatory Disclosure Affect Lending Practices?

A Study of Subprime Lending to Minority Neighborhoods

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Abstract

The 2002 amendment to Regulation C, which implements the Home Mortgage Disclosure Act (HMDA), requires most lenders to disclose information about the relative cost at which they provide mortgage credit. We use this regulatory change as a natural experiment to study the effect of increased disclosure of loan pricing information on subprime loan origination in minority neighborhoods by two broad types of lenders, depository and nondepository institutions. We find that depository institutions approved relatively fewer subprime loans to minority neighborhoods after the new pricing disclosure requirement than what they were expected to approve without the pricing information disclosure requirement. However, our analysis does not show a similar effect for nondepository institutions. We also find that those depository institutions that received good reviews from regulators in terms of effectively serving the neighborhoods financing needs are less likely to issue higher-priced subprime loans.

Keywords: depository institutions, nondepository institutions, fair lending practices, information disclosure, HMDA, subprime mortgage lending.

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1. Introduction

The current turmoil in the subprime mortgage market has attracted significant research interest in the factors that contributed to the high default and delinquency rates of subprime mortgage loans. Recent papers (Doms et al. 2007; Mian and Sufi 2008) show that credit expansion and relaxation of lending standards are partly responsible for the large increases in mortgage defaults. A *Wall Street Journal* (WSJ, October 11, 2007) article states: "The relaxation of credit standards by home lenders has been years in the making." Blaming this trend at least partially on government policy, the article continues: "The Community Reinvestment Act, a 1977 federal law, prodded banks to extend more credit in communities where they operated. That warmed many of them to lower-income and minority borrowers. … These commercial lenders usually charged higher interest rates but promised less paperwork, faster approval and no-money-down loans that seemed more affordable to many borrowers." A number of academic studies (e.g., Staten 2006, and Hill and Kozup 2007) also imply that increased lending to low-income and minority borrowers may have been propelled by large expected returns.

For years, the extent of subprime loan issuance to low-income and minority borrowers was partially shielded from public scrutiny by a lack of transparency. As long as lenders stayed below the HOEPA threshold, they were not required to disclose pricing information to the public before 2004, and thus could charge minority borrowers high interest rates or fees without being identified.[3] However, for loans originated after January 1, 2004, a 2002

[3] The Home Ownership and Equity Protection Act (HOEPA), enacted in 1994 as an amendment to the Truth in Lending Act, requires lenders to disclose pricing information when the APR on a newly issued loan is above 8 percentage points for first-lien loans or 10 percentage points for subordinate-lien loans, and to provide borrowers of such loans certain added protections, such as additional rescission rights. Certain practices, such as negative amortization, are also prohibited with HOEPA loans. Lenders have been careful to structure most

amendment by the Federal Reserve Board to Regulation C, the implementing regulation of the Home Mortgage Disclosure Act (HMDA), requires lenders to disclose pricing information for loans with rate spreads above a certain threshold. The amendment falls short of requiring lenders to disclose the actual cost (interest rate and loan fees, or even the APR as a summary cost measure). Instead, it requires lenders to report rate spreads on loans for which the difference between the loan's estimated APR and a comparable maturity US Treasury is equal to or greater than 3 percentage points for first-lien loans or 5 percentage points for subordinate-lien loans (McCoy 2007; The Federal Reserve Bank of St. Louis 2007). These spread-reportable loans are often called higher-priced loans (Avery et al. 2007), and they are used as a crude proxy for subprime loans (LaCour-Little 2007).

This study has two main objectives. One is to examine whether increased regulatory disclosure following the implementation of the 2002 amendment to Regulation C beginning on January 1, 2004 altered the extent to which lenders in general approved higher-priced subprime loans in neighborhoods with high concentrations of minority borrowers.[4] The second objective is to examine whether the lending practices of all lenders responded to the expanded disclosure requirement in the same way, or whether the lending practices of depository and nondepository institutions responded differently to the regulatory change. We focus on lending practices towards minority borrowers because of the large increase in subprime mortgage lending to minority borrowers with low credit quality in the period

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of their loans so that they do not fall under the more stringent requirements of HOEPA (Federal Reserve, 2007).

[4] Borrowers in high minority concentration neighborhoods are expected to be minorities and/or low-income borrowers who are classified as protected borrowers under the Fair Housing Act (Federal Reserve, 2006).

leading up to the subprime mortgage crisis.[5] The change in HMDA's reporting requirements offers an opportunity to examine the general issue of whether the disclosure of pricing information can change the behavior of lenders, specifically in this case if the disclosure can influence them to reduce higher-priced subprime lending in minority neighborhoods.

Though originally designed to measure the volume and distribution of subprime lending activity (Avery et al. 2005), the pricing disclosure rule may also affect lender behavior because this regulatory change makes it possible to identify lenders that approve a large volume of higher-priced loans, which in turn facilitates closer public and regulatory scrutiny of their lending practices. Furthermore, disclosure of the pricing information required by the amendment can affect the reputation of lenders who are perceived to be targeting minority neighborhoods with higher-priced loans. Additional damage to a lender's reputation can occur if the institution is sued for "abusive" lending to minorities.[6] As pointed out by William Poole (2007), the President of the Federal Reserve Bank of St. Louis, "… the fundamental problems in the non-prime mortgage market amenable to improvement stem from inadequate incentives among some of the parties operating in the market to create and maintain strong reputations for quality and fair-dealing." The lack of incentives is partly due to the lack of disclosure. The inadequate incentives among lenders to maintain strong reputations for quality and fair-dealing may be strengthened with increased disclosure.

The enactment of the Sarbones Oxley Act of 2002 after the Enron crises, clearly shows that the financial market participants realized that improved disclosure leads to more

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[5] Based on the HMDA data, the number of subprime loan approvals to minorities steadily increased from 2001 to 2006. While the number of subprime loan approvals to minorities was 357,960 in 2001, it increased to 1,478,959 in 2006.

[6] For example, in 2007, the National Association for the Advancement of Colored People sued 11 major mortgage lenders for steering African-Americans into high-priced subprime loans (New York Times, October 15, 2007).

transparency and more effective market discipline (Leuz, Triantis and Wang, 2008; Deumes and Knechel, 2008). This transparency could be especially important for financial institutions because the assets of these institutions, such as loans, are informationally opaque assets (Flannery, 1998; Rafferty and Tomljanovich 2002).

2. Background: Home Mortgage Disclosure Act and Subprime Lending Practices

2.1 Home Mortgage Disclosure Act and the 2002 Amendment to Regulation C

The Home Mortgage Disclosure Act (HMDA) was enacted in 1975 as a reporting statute and an information gathering mechanism to monitor whether lenders are making sufficient efforts to meet the mortgage lending needs of historically underserved communities, and "to facilitate enforcement of the nation's fair housing laws,"[7] such as the 1968 Fair Housing Act (Title VIII of the Civil Rights Act of 1968) and the 1974 Equal Credit Opportunity Act (ECOA). Originally, HMDA only required depository institutions, such as commercial banks, savings associations, credit unions, and their affiliates, to report limited information on loan originations at the aggregate census tract level.

In 1989 the Federal Reserve Board revised Regulation C to incorporate amendments to HMDA contained in the Financial Institutions Reform, Recovery and Enforcement Act (FIRREA) of 1989. These amendments expanded HMDA coverage to require not only depository institutions and their affiliates but also nondepository institutions that originated home mortgage loans to disclose information about their lending practices. Second, these amendments required lenders to report individual loan level data for all loan applications, including those applications that were denied. More importantly, for the first time lenders had

[7] For a detailed discussion on the history and purpose of the 1975 Home Mortgage Disclosure Act, refer to McCoy (2007).

to disclose borrower specific information, such as income, race and ethnicity, and gender. Though the 1989 amendments greatly improved the transparency of borrower specific information, the loan specific information was still opaque. For example, the HMDA data disclosed whether the loan application was approved or denied, but did not disclose at what price the loan was provided.

The 2002 amendment to Regulation C extends the HMDA reporting coverage to most home loan issuers by expanding the coverage of nondepository lenders. It also expands the information lenders must disclose in order to assist the Fed in its examination of fair lending. Some of the additional information required to be disclosed are: (1) a clear definition of loan purpose (e.g., refinancing, home improvement); (2) lien status; (3) property code (site built or manufactured); (4) more refined information about the race and ethnicity of the borrower; (5 how the loan application was acquired (such as by mail, phone, or internet, or office visit); (6) HOEPA status of the loan, (7) additional information about the secondary market purchaser of a loan, and (8) most importantly for our purposes, loan pricing data, specifically, rate spreads on higher-priced loans.[8]

2.2 Development of the Subprime Mortgage

By the end of the 1980s, loosening of regulatory constraints, innovations in the primary mortgage market (especially the development of a vast array of mortgage products), innovations in the secondary mortgage market (especially securitization), technological developments (such as the advent of credit scoring and innovations in information technology that gave lenders confidence that they could measure and price loan risk), and the efforts of

[8] For a review of the recent legislative history of HMDA see McCoy (2007) and FFIEC (2007). For an examination of some major issues with HMDA reporting see Staten (2006); Avery et al. (2005, 2006, 2007); FFIEC (2007); LaCour-Little (2007), and Do and Paley (2007).

both the Administration and Congress to increase homeownership among underprivileged groups prepared the institutional platform for the subprime mortgage market.[9] As the Congress increased pressure on lenders to provide more financing in underserved areas and to lower-income and minority households, lenders were increasingly willing to comply principally because regulatory changes and the technological innovations mentioned above allowed them to charge higher interest rates and other fees on subprime loans, and innovations in the secondary market (especially securitization) enabled them to quickly sell off these loans in the secondary market to further reduce their risk.[10] Moreover, subprime lending provided high returns to the lending and securities' industries.

Subprime loan issues steadily increased from about $100 billion in 2000, to $330 billion in 2003, peaking at about $640 billion in 2005 (CNN Money 2007).[11] Initially, the Congress, the Administration, and regulators gave at least their tacit approval to the growth of the subprime market because it seemed to be serving their shared goal of assisting families in low-income and minority areas to obtain homeownership. Subprime loans helped to make homeownership possible for households with blemished credit histories and for those households who otherwise failed to qualify for conventional prime loans (Pennington-Cross 2003). More than half of the large gain in home ownership from 1994 to 2003 was from minority households (Chinloy and MacDonald 2005, Staten 2006).

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[9] In 1980, the Depository Institutions Deregulation and Monetary Control Act (DIDMCA) preempted state interest rate caps and in 1982 the Alternative Mortgage Transaction Parity Act (AMTPA) allowed for the use of loans with variable payments and balloon payments.

[10] The Department of Housing and Urban Development (HUD) also issued regulatory directives to the Government Sponsored Enterprises (GSEs), Fannie Mae and Freddie Mac, to promote lending to underserved borrower groups, minority and low-income borrowers.

[11] These numbers are similar to those cited in a report by the majority staff of the Senate Joint Economic Committee: $190 billion in 2001 (8.6% of total mortgage originations), $540 billion in 2004 (18.5% of total), and reaching $625 billion in 2005 (20% of the total) before falling to $600 billion in 2006 (but still 20% of the total). From the Report and Recommendations of the Majority Staff of the U.S. Senate Joint Economic Committee, October 25, 2007, Figure 8, p. 20.

In recent years, however, the role of the subprime market has shifted. During the first phase of its development in the 1990s, the riskiest segment of the subprime market (B and lower grade mortgage loans) experienced significant growth, but after 2000, the least-risky segment (A-, or Alt-A, loans) grew most rapidly (Chomsisengphet and Pennington-Cross 2006). Early on subprime mortgages studies show that relatively low percentage of subprime loans were used for home purchases (only 16% of subprime loans in 1999) while during 2002-2006 subprime mortgages were increasingly issued for home purchase (peaking at roughly 49% in 2006) , the use of rather than for home purchases. Partly this shift could be attributed to the administration policy to encourage lenders to provide home financing to minorities, as 2006 home mortgage data show that there is a much higher concentration of subprime home purchase loans (approximately 15% higher) for minorities household in comparison to that of white households (Leigh and Huff, 2008). However, recently we could observe a reversal, as the subprime mortgage markets become dominated again by refinance loans.

3. Data and Research Method

3.1 Data Description

Our sample period is from January 1st, 2001 to December 31st, 2006. This sample period includes three years of data prior to the effective date of the change in HMDA reporting requirements, January 1, 2004, and three years after this date . Combining six data sources, we create a comprehensive dataset that includes a broad set of borrower, loan, property, and lender characteristics, along with selected macroeconomic information.

First, we use data in the Home Mortgage Disclosure Act (HMDA) Loan Application Register (LAR) on 204,523,725 loan applications from 2001 to 2006 to obtain measures of loan and borrower variables such as the proportion of approved loan applications, the median loan amount, the median borrower income, and the percentage of minority borrowers in the census tract.[12] We then use the LAR to develop a Herfindahl-Hirschmann Index (HHI) for each census tract.[13] Moreover, The LAR data entries are used to derive measures of lender characteristics, such as the proportion of loans in the census tract that are filed with depository institutions. Depository institutions are identified as such by their agency codes based on their filing with one of the following five regulators: (1) Office of the Comptroller of the Currency (OCC), (2) Federal Reserve System (FRS), (3) Federal Deposit Insurance Corporation (FDIC), (4) Office of Thrift Supervision (OTS), and (5) National Credit Union Administration (NCUA). Nondepository institutions are identified as independent mortgage companies filing with U.S. Department of Housing and Urban Development (HUD). The classification of depository and nondepository institutions using agency code may not be always accurate. More importantly, the institution codes do not provide a clear demarcation between depository and nondepository institutions; while some institution may engage in deposit taking as a complementary business if that is not a main cash source, then the institutions should not be considered depository in the "real word sense."

For example, if a large nondepository mortgage lender was acquired by a depository institution, the nondepository mortgage lender will be classified as a depository institution and

[12] In this study, we focus on the lenders' approval rates and not the loan issuance rates because our primary focus is on lender behavior in the context of regulatory changing environment.

[13] The Herfindahl-Hirschmann Index (HHI) is a lender concentration measure by census tract, where greater HHI index is expected to reflect lower degree of competition among lenders in the area. If lenders use their monopolistic position to "take advantage of borrowers," then higher HHI index would be linked with more high priced loan approval.

only one filing was made for the combined institution. Also the other way around – a largely nondepository institution that owns a small bank can be classified as a depository institution. To check the magnitude of this problem, we randomly pulled 100 lenders and manually checked annual lists of national and state banks, and lists of credit unions to identify each lender as being depository or nondepository. In addition to that we also checked each financial institution's website, and looked at the balance sheets of the institutions.[14] We found that only 5 percent of the lenders were misclassified.

Second, we use the Department of Housing and Urban Development's (HUD) list of subprime lenders to code each loan as being either a subprime or prime loan. The HUD's list of lenders is matched to the HMDA data using agency code and lender IDs. There is potential measurement error using the HUD list to identify subprime loans because all loans made by a subprime lender[15] will be classified as subprime loans and all loans made by a prime lender will be classified as prime loans. An alternative way is to identify subprime loans as loans that are spread-reportable under the 2002 amendment to Regulation C. However, because the rate spread information is not available prior to 2004, using the alternative identification method will cause inconsistency in identifying subprime loans in the period before the pricing disclosure rule and the period after the pricing disclosure rule. To be consistent, we use the HUD's list of subprime lenders to identify subprime loans in both periods. To test the robustness of our results, we construct a sub-sample of subprime lenders, where we identify a

[14] We identified a FI as depository institution, if it is a credit union, community bank, state bank, or national bank. For commercial banks, we looked at the balance sheets and required that the institution actively takes deposits, encourages and promotes deposit services on its website to consumers, and lastly (if information available) that at least 50% of the bank's total assets can be matched with deposits. The difficulty arises with subsidiaries. If the FI itself is a subsidiary of a bank, we looked at the subsidiary itself not the parent bank holding company.

[15] The HUD identifies a lender as subprime lender if more than 50 percent of the loans made by the lender are subprime loans.

lender subprime lender if at least 70% of the approved loans are spread-reportable loans during 2004, 2005, and 2006. Loans issued by this sub-sample of subprime lenders do not suffer from the potential identification problems mentioned above.

Third, we match our combined HMDA and HUD dataset with the Community Reinvestment Act (CRA) rating database by agency code and lender IDs to get the CRA ratings for depository institutions.[16] Fourth, we use U.S. Census data to derive census tract level demographic, property, and borrower characteristics. The Census dataset is matched to the HMDA dataset by state, county, and census tract numbers. In the absence of borrower FICO scores for the originated loans, we use a number of variables to control for average credit risk in each area.[17] Since we model aggregate census tract level loan approval rates, we use census tract level risk controls, such as median income, median home prices, the percentage of owner occupied housing units, the percentage of mobile homes in the tract, and the tract capitalization rate.[18]

Fifth, we match the House Price Index (HPI) data from the Office of Federal Housing Enterprise Oversight (OFHEO) to HMDA data by year and by state. Since OFHEO does not have tract level house price appreciation data, we match our data to the OFHEO house price appreciation rate by year and state to construct a house price appreciation rate. Also, average loan-to-value ratios (*LTVs*) for each census tract are calculated based on HPI data.

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[16] We cannot incorporate CRA ratings for nondepository institutions, as these ratings are applied only to depository institutions.

[17] FICO score, an acronym for Fair Isaac Credit Organization, is a standard credit score which is often the most important part of the credit report that credit bureaus sell to lenders so they can asses an applicant's credit risk and generally use this information in the loan approval process.

[18] Adopted from Calem et al. (2004), the capitalization rate is the ratio of the tract's annualized median rent divided by the median house value. Larger capitalization rates imply lower price appreciation and greater uncertainty about future price appreciation.

Sixth, from the Federal Reserve Bank of St. Louis's website (http://research.stlouisfed.org), macroeconomic data (such as the market interest rate on prime loans, the yield spread between the seven-year Treasury note and the three-month Treasury bill, and the default risk premium) are used to control for macroeconomic risk. Detailed definitions of the control variables and their sources are listed in Table 1.

[Table 1 about here]

3.2 Research Hypotheses and Methods

Three research hypotheses related to the impact on lender behavior of the regulatory requirement to disclose pricing information are tested in this study. These three hypotheses examine three dimensions of possible changes in subprime lending activity in minority neighborhoods as a result of the 2002 regulatory requirement to include pricing (rate spread) information in a lender's annual HMDA report.

The first research hypothesis is that, as a result of enforced pricing disclosure requirement, lenders on average reduced the approval of higher-priced subprime loans to minority neighborhoods after 2004. For reasons discussed earlier, we expect that the percentage of higher-priced subprime loans that were approved (relative to total subprime loan applications) in minority neighborhoods was lower after 2004 than what it would have been if the pricing information were not disclosed.

The second hypothesis is that subprime loan approval rates for minorities experienced a greater decline for refinance loans than for purchase loans after the disclosure requirement. Specifically, we expect that the decline in the proportion of subprime refinance loans approved in minority neighborhoods was greater than the decline in the proportion of subprime home purchase loans approved. A long running policy objective of the U.S.

Congress has been to assist minority and low-income borrowers to purchase a home. Therefore, an increase in the approval rate of subprime loans could be justified for home purchases if the favored borrower group could not, on average, qualify for prime loans. However, lenders approving subprime loans mostly for loan refinancing cannot justify their actions by claiming that they are enabling borrowers who otherwise could not qualify for prime loans to obtain home ownership. Thus, lenders are more likely to suffer damage to their reputation for excessively issuing subprime loans to refinance existing mortgages; hence, subprime originations for refinancing are likely to decline more as a result of the pricing disclosure requirement than are subprime originations for home purchases.

Lastly, the third hypothesis is that the decrease in the approval rates after 2004 for subprime loans to minorities by depository institutions was greater than the decrease by nondepository institutions. We expect to find a greater reduction in higher-priced subprime loan approvals by depository institutions than by nondepository institutions. One reason why we expect this difference in lending behavior is that depository institutions are more heavily regulated than nondepository institutions, and thus more readily subject to regulatory scrutiny and sanctions. A second reason is that depository institutions have a stronger incentive to maintain a strong reputation for fair lending and to avoid a reputation of targeting higher-priced subprime loans to minority neighborhoods than nondepository institutions. We infer that, because of their broader business dealings within local communities, depository institutions, in comparison with nondepository institutions, are more likely to be sensitive to the public perception of their lending practices that can affect their reputation. Hence, because of a greater concern for maintaining a good reputation, we expect depository institutions to approve relatively fewer high cost loans to protected minority group borrowers

in the wake of the pricing disclosure requirement. Moreover, depository institutions have alternative ways of providing credit to low income and minority borrowers. For example, as an alternative to subprime loans, depository institutions can choose to work with local assistance programs to provide credit to these borrowers.[19] [

To test our three hypotheses, we arrange the loan application data in our base sample of 204,523,725 loan applications from 2001 to 2006 in several ways to create aggregated neighborhood (census tract) level variables. First, we create a combined all loan sample by pooling all prime and subprime loan applications together. To test the first research hypothesis we then divide this combined all loan sample into a prime loan and a subprime loan sample. To examine our second research hypothesis, we break down each of the above three samples (i.e., all loan, prime loan, and subprime loan samples) into six refinance loan and purchase loan subsamples.[20] Lastly, to test the third research hypothesis, we divide the same three samples (i.e., all loan, prime loan, and subprime loan samples) according to whether these applications were filed with depository or nondepository institutions. This results in six additional institutional subsamples.[21] Figure 1 illustrates the breakdown of our sample. After generating the fifteen samples from the raw HMDA LAR, we aggregate the individual loan data to the neighborhood (census tract) level to create variables (such as the proportion of loan applications approved) to be included in our regression analysis.

[Figure 1 about here]

[19] For example in New Jersey, the Susquehanna Patriot Bank (SPB) offers its own community development mortgage that provides flexible underwriting, low down payments (3 percent), and rate reductions (of ½ to 1 percent). SPB holds these loans in his own investment portfolio.

[20] These six refinance and purchase subsamples are: combined purchase loans, combined refinance loans, prime purchase loans, prime refinance loans, subprime purchase loans, and subprime refinance loans.

[21] These six institutional subsamples are: combined depository loans, combined nondepository loans, prime depository loans, prime nondepository loans, subprime depository loans, and subprime nondepository loans.

The basic form of the regression model estimated over each of the five combined loan samples (i.e., samples (1), (2), (3), (10) and (13) in Figure 1) is specified as follows.

$$PCTAPPROVE_{i,j} = \alpha + \omega PCTSUBPRIME_{i,j} + \beta_k \sum_{k=1}^{6} Borrower_k + \delta_l \sum_{l=1}^{5} Loan_l + \varphi_m \sum_{m=1}^{10} Property_m + \lambda_n \sum_{n=1}^{4} Lender_n + \eta_p \sum_{p=1}^{3} Macro_p + \gamma POST + \vartheta POST * PCTMINORITY + \varepsilon_{i,j} \quad (1)$$

where the dependent variable ($PCTAPPROVE_{i,j}$) is the proportion of loan applications approved in the *i*-th census tract in the *j*-th year; $PCTSUBPRIME_{i,j}$ is the proportion of subprime loan applications to total loan applications; $Borrower_k$ is a vector of borrower risk variables; $Loan_l$ is a vector of loan risk variables; $Property_m$ is a vector of property risk variables; $Lender_n$ is a vector of lender characteristics; and $Macro_p$ is a vector of macroeconomic variables. Furthermore, we include two regulation variables to capture the impact of increased regulatory information disclosure. The first variable, *POST*, is a dummy variable equal to one for years after 2004 when the HMDA requirement to report the cost of financing became effective. The second, *POST*PCTMINORITY*, is an interaction variable of the proportion of minorities in the census tract (*PCTMINORITY*) and the POST time variable. The coefficient of this interaction term is a difference-in-difference estimator[22] that captures the impact of the 2004-implemented HMDA reporting requirement on lending practices in the minority neighborhoods.[23] One potential problem with estimating the regression model (1) is that the variable $PCTSUBPRIME_{i,j}$, the proportion of total loan applications that are subprime loan applications, may be endogenous because a lender's decision of whether to approve a loan and whether to approve either a prime or subprime loan is simultaneously determined.

[22] The difference-in-difference estimator is usually used in policy analysis to assess the impact of a new policy. It separates the impact due to policy changes from a pure time trend.

[23] With lending practices, we refer how lenders' loan approval and loan pricing in line equal lending practices, non-price discriminatory lending and in general with ethical business practices.

To address this identification issue, we use the two-stage least squares (2SLS) regression method to estimate model (1). For identification purpose, we use *SOLDPRIVATE* $_{i,j}$, the percentage of loans sold to private (non-agency) loan purchasers in the secondary market, as an instrumental variable that is highly correlated with $PCTSUBPRIME_{i,j}$, but uncorrelated with the error term in model (1). We believe that *SOLDPRIVATE* $_{i,j}$ is a valid instrument because subprime loans are more likely to be sold to private secondary market loan purchasers, but the loan approval decision is likely to be dependent upon the likelihood of loan resale to a secondary market purchaser, no matter whether private or agency (GSE). In the first stage of 2SLS, we run an ordinary least squares (OLS) regression of $PCTSUBPRIME_{i,j}$ on all control variables and on the instrumental variable *SOLDPRIVATE* $_{i,j}$. Fitted values from this first stage are used as regressors in the second stage $PCTAPPROVE_{i,j}$ regression.

The regression model for prime or subprime loan subsamples (the remaining 9[24] samples in Figure 1) is specified as follows.

$$PCTAPPROVE_{i,j} = \alpha + \beta_k \sum_{k=1}^{6} Borrower_k + \delta_l \sum_{l=1}^{5} Loan_l + \varphi_m \sum_{m=1}^{10} Property_m + \lambda_n \sum_{n=1}^{4} Lender_n + \eta_p \sum_{p=1}^{3} Macro_p + \gamma\, POST + \vartheta\, POST * PCTMINORITY + C_q + \varepsilon_{i,j} \qquad (2)$$

Here, as we examine prime and subprime loans separately, we do not have an endogeneity problem as the approval decision of a prime loan application is considered only among prime loan application not including subprime loan applications, and thus, we can use ordinary least squares (OLS) to estimate model (2). Another difference of model (2) from model (1) is the addition of variable C_q, which represents unobserved fixed effects for county q. We include a

[24] The nine samples refer to samples (4), (5), (6), (7), (8), (9), (11), (12), (14) and (15) as illustrated in Figure 1.

county fixed-effect variable to account for unobserved local (i.e., county specific) factors that may influence loan demand and supply in that county.

As specified in both models (1) and (2), we use a comprehensive list of borrower, loan, property, lender and macroeconomic control variables. The vector $Borrower_k$ controls for borrower characteristics including (1) percentage of minority borrowers; (2) log of median family income; (3) percentage of households with monthly owner costs greater than 30% of monthly income; (4) percentage of population 25 years or older with a Bachelor's or higher degree; and (5) percentage of unemployment; (6) percentage of households with self-employed income. The vector $Loan_l$ controls for loan risk characteristics such as: (1) median loan-to-income (LTI) ratio in the census tract; (2) median loan-to-value (LTV) ratio; (3) proportion of conventional mortgage loan applications; (4) proportion of loan applications that are for refinance purposes; and (5) proportion of loans that were sold to secondary market loan purchasers (both agency and private loan purchasers) within 1 year of origination.

A number of census tract level property related risk variables are also included such as: (1) median age of the property in the census tract; (2) proportion of owner-occupied housing units (as opposed to renter-occupied housing units); (3) census tract level house price changes;[25] (4) percentage of housing units with values above $300,000; (5) percentage of housing units that are boarded up; (6) capitalization rate; (7) percentage of housing units that are detached; (8) percentage of mobile homes; (9) percentage of one-to-four family housing; and (10) percentage of owner-occupied housing units with a second mortgage or home equity line of credit.[26]

[25] Since at the census tract level the information is available only for 1990 and 2000, we use the percentage change calculated based on those two observations as an indicator of the housing market in each census tract.
[26] Complete definition of all control variables and their data sources are presented in Table 1.

A number of lender characteristic measures and macroeconomic variables are included to control for financial market and macroeconomic factors. For lender characteristics, we include: (1) the proportion of loan applications filed with depository institutions to loan applications filed with all lenders in the census tract; and (2) the Herfindahl-Hirshmann index as a measure of lender concentration. For depository institutions, we also include a reputation measure, the proportion of loans approved by good-rating lenders (i.e., lenders with outstanding CRA ratings), as well as the interaction of this variable with a minority borrower concentration measure. For macroeconomic variables, we include (1) the market interest rate on prime loans; (2) the yield spread between the seven-year Treasury note and the three-month Treasury bill; and (3) a default risk premium, which is the corporate yield spread calculated as the difference between the average yield of Aaa and Baa corporate bonds.

As we are especially interested in the growth of the subprime mortgage market relative to the growth of the prime mortgage market, we model subprime and prime mortgage approvals at each census tract separately. To test our second research hypothesis we reestimate regression models (1) and (2) with refinance and purchase loans separately for the combined, the prime and subprime loan samples. Lastly, we reestimate (model 1 and 2) the loan approval rates for depository and nondepository institutions separately to test our third research hypothesis – that the changes in the HMDA reporting requirement had a different impact on depository and nondepository institutions.

4. Empirical Results

4. 1 Descriptive analysis of HMDA data from 2001 to 2006

Table 2 reports summary statistics for our dependent and key control variables. We report summary descriptive statistics for all financial institutions in aggregate and for depository institutions and nondepository institutions separately in panels A, B, and C, respectively. In each panel, furthermore, we report descriptive statistics for the combined all loan sample and for the prime and subprime loan samples.

[Table 2 about here]

The proportion of loans approved (*PCTAPPROVE*), is calculated by aggregating the original 204,523,725 HMDA loan applications from 2001 to 2006 by census tract and year. To minimize data bias, census tracts with fewer than 10 loan applications in a particular year are excluded from the calculation for that year.[27] In Panel A of Table 2, the combined all loan sample includes 292,809 tract-year observations. The prime loan sample includes 291,946 and the subprime sample includes 277,345 tract-year observations.[28] Examining the combined all loan sample, we find that the average proportion of loans approved over the 2001-2006 time period is much higher for prime loans (81.92%) than for subprime loans (52.90%). This difference in loan approval is probably because subprime borrowers are much riskier (in terms of the likelihood of default) than prime borrowers. Examining the time trends of prime and subprime loan approvals in Figure 2, we find that prime loan approval rates dropped slightly after 2003, but subprime approval rates increased slightly over almost the entire 2001-2006 time period, the exception being the last year (i.e., 2006).

[27] For example, if there are only two loan applications for a census tract and both loans are approved, the approval rate will be 100%. This may cause biases in the data.

[28] In the original loan-level sample, the number of prime loans and the number of subprime loans add up to the number of all loan applications. Here, however, the samples are aggregated census tract samples. Therefore, the number of observations from the prime and the subprime loan samples do not add up to the number of observations from the combined all loan sample.

[Figure 2 about here]

Further examining Table 2, we also find that some borrower, loan, property, and lender characteristics are very different for prime than for subprime loans. For example, the proportion of subprime loans applications that are minority borrowers (20.28%) is higher than the proportion of prime loans that are minority borrowers (18.37%); the median income of subprime borrowers (natural logarithm of median borrower income in thousands is 4.16, corresponding to $64,071) is lower than that of prime borrowers (natural logarithm of median prime borrower income in thousands is 4.30, corresponding to $73,699); and the proportion of loan applications whose purpose was to refinance is much higher for subprime loans (71.21%) than for prime loans (53.65%).

[Figure 3 about here]

In Figure 3, we review the loan resale activities for prime and subprime loans during our sample period. The proportion of loans sold to any loan purchaser in the secondary market within the calendar year of origination (*PCTSOLD*) is higher for prime loans (58.81%) than for subprime loans (45.11%), but the proportion sold to private (non-agency) loan purchasers is much higher for subprime loans (43.96%) than for prime loans (27.30%). The proportion of loans sold to any secondary market purchasers significantly dropped for prime loans after 2003, while it tends to increase for subprime loans in all but the last year of the period. Figure 4 shows that for both prime loans and subprime loans the proportion of loans sold to private loan purchasers trended upwards over the time period. But, the proportion remains much higher for subprime loans.

[Figure 4 about here]

Interestingly, the summary statistics in Panel A of Table 2 also show that the proportion of loans approved by depository institutions is much lower for subprime loans (35.16%) than for prime loans (76.51%). Figure 5 further shows that nondepository institutions significantly increased the proportion of higher-priced subprime loans in 2005. This increase is consistent with Do and Paley (2007) and LaCour-Little (2007), who argue that this increase is likely to be driven by the flattening of the yield curve which resulted in an increased number of subprime ARMs exceeding the HMDA rate spread threshold as the rates of long-term treasuries decreased relative to short-term rates in 2005. Thus, in 2005, about 45% of all subprime loans hit the HMDA reporting requirement threshold.

[Figure 5 about here]

Comparing the descriptive statistics for the depository institutions and nondepository institutions in Panel B and C of Table 2, we find that the proportion of loans approved by depository institutions (79.83%) is higher than nondepository institutions (67.27%) during the 2001-2006 period. We also note that nondepository institutions have a much greater subprime loan concentration, as 43.76 % of all applications for nondepository institutions are for subprime loans, while only 10.72% of the loan applications for depository institutions are for subprime loans. There is also a big difference in the proportion of loans sold to secondary market loan purchasers between depository and nondepository institutions. For depository institutions, 52.16% of all loans (prime and subprime) and 28.02% of all subprime loans were sold within one year of origination during the 2001-2006 period. For nondepository institutions during the same period, the proportions are much larger, 70.74% of all loans and 56.74% of all subprime loans were sold within one year of origination. A more important difference from the perspective of this study is that nondepository institutions sold more loans

to private (non-agency) loan purchasers (52.58% of the loans they sold) than did depository institutions (21.41%). We also examine the strength of correlation among our dependent and key control variables. The correlation matrix in Table 3 shows that the proportion of loans approved is negatively correlated with the proportion of subprime loan applications and the proportion of minority borrowers to all borrowers in the census tract. The loan approval rate is positively correlated with the proportion of loans sold to the secondary market (including both agency and nonagency loan purchasers), the proportion of owner-occupied housing units in the tract, and the average home value appreciation rate of the census tract. More importantly, the proportion of loans approved is negatively correlated with our regulation interaction variable *POST*MINORITY*.

[Table 3 about here]

4.2 Empirical results on the impact of increased disclosure and lending practices

In Table 4, our regression results with the combined all loan sample are consistent with the results of prior studies (Calem et al. 2004 and Lax et al. 2004). We find that the average loan approval rates are lower for neighborhoods with high concentrations of subprime loan applications. Examining the approval rates for prime loan applications, we find that applicants from minority areas are less likely to get approved for prime loans, as indicated by the negative and statistically significant coefficient estimate on the *PCTMINORITY* variable. Looking at other borrower characteristics in the prime loan sample, we find that higher borrower risk neighborhoods (i.e., areas with high *DTI30,* high *PCTUNEMPLOY*, and high *PCTSELFEMPLOY*) are associated with significantly lower approval rates, while low borrower risk neighborhoods (i.e., areas with high *LOGINCOME*, and high *PCTCOLLEGE*) are associated with higher approval rates.

The subprime loan sample shows a different loan approval picture for minority neighborhoods in Table 4. The positive coefficient estimate on *PCTMINORITY* shows that a higher proportion of subprime loans are approved in minority concentrated neighborhoods than in non-minority neighborhoods, which is consistent with the previous literature that subprime loans are concentrated in minority and low-income neighborhoods (Calem et al. 2004 and Apgar et al. 2007). Examining loan and property risk characteristics, we find that neighborhoods with higher loan and property risks are generally associated with lower approval rates, for both the prime and subprime loans. For example, neighborhoods that have higher loan-to-value ratio (*LTV*) loans and a higher proportion of conventional loans (*PCTCONVENTION*)[29] are viewed as having higher loan risks,[30] and thus have lower approval rates. Neighborhoods with greater property risks, such as areas with high concentration of older houses (*MEDAGE*), boarded houses (*PCTBOARD*), and mobile homes (*PCTMOBILE*), are also associated with lower loan approval rates. Whereas neighborhoods with higher values on lower property risk variables, such as higher house values (*PCTVALUE300*), have higher approval rates.

[Table 4 about here]

Table 4 also presents the regression results for testing the first hypothesis whether lenders approved fewer higher-priced subprime loans to minority neighborhoods after the regulatory requirement to disclose loan pricing information took effect in 2004 than what they would have approved if the pricing information was not disclosed. The significant positive coefficient on the *POST* variable for subprime loan applications in Table 4 shows that even

[29] Using HMDA data, we identify conventional loans as loans that are not government insured or guaranteed, i.e., loans other than FHA, VA, FSA or RHS loans.

[30] Government insured or guaranteed loans are found to require more documentation than conventional loans and less risky (Delgadillo and Green-Pimentel 2007).

after the loan pricing disclosure requirement went into effect in 2004, lenders on average still increased subprime loan approvals in non-minority neighborhoods. However, the significant negative coefficient estimate on the interaction term of the time dummy (*POST*) and the minority concentration (*PCTMINORITY*) variable implies that all lenders on average approved fewer higher-priced subprime loans than they would have approved for borrowers from minority neighborhoods in the absence of this requirement, which provides support for our first hypothesis. The difference-in-difference estimator (the coefficient of the interaction term) for the subprime loan sample is -0.015, suggesting that on average, lenders reduced subprime loans by 0.75% in neighborhoods with 50% minority borrowers beginning in 2004 when the pricing information was required to be disclosed, compared to what they would have approved if the pricing information was not disclosed. Given that the average approval rate for subprime loans is 52.90%, our results imply a relative 1.4% (0.75%/52.90%) drop in subprime approval rates in minority neighborhoods after 2004.

When we examine subprime lending for both depository and nondepository lenders, we find that lenders in general reduce the approval of higher-priced subprime loans, but this reversal is not economically significant. On the other hand, looking at subprime lending separately for depository lenders, the change is both statistically and economically significant, as we report a 7.7% relative drop in subprime lending by depositories.[31]

Interestingly, in the regression analysis of approval rates for prime loan applications, we also find that lenders in general curtail overall mortgage lending to minority neighborhoods (the coefficient of the interaction term being -0.006) after 2004, but this effect is much weaker than that for subprime loans. More importantly, since subprime loans are

[31] This result will be discussed later in Table 5.

often viewed as high cost loans, the different results in prime and subprime regressions show that lenders in general curtailed high-cost lending more than low-cost lending to minority neighborhoods following implementation of the stricter reporting requirements, although the economic magnitude is small.[32] This is consistent with our hypothesis that increased information disclosure to the public reduced the approval of higher-priced subprime loans to minority neighborhoods for lenders overall (i.e., depository and nondepository institutions together). The small magnitude of the reduction is probably driven by nondepository institutions, because nondepository institutions have a much higher proportion of subprime loan applications to total loan applications than depository institutions, and did not curtail higher-priced subprime lending as much as depository institutions did.[33]

Comparing purchase loans with refinance loans within the subprime sample, we find that the reduction in higher-priced subprime lending to minority neighborhoods is more pronounced for refinance loans than for purchase loans. For reasons discussed earlier, higher-priced subprime loans can be more easily justified for home purchase than for refinance loans. The significant reduction of subprime refinance loans by lenders overall to minority neighborhoods (the coefficient on the interaction term is -0.011) further suggests that lenders concerned about their reputation curtailed the approval of these higher-priced subprime loans that are more difficult to justify.

We next examine in greater detail whether depository institutions behave differently from nondepository institutions. With the Financial Services Modernization Act of 1999 (FSMA), depository institutions are becoming increasingly diversified businesses offering a

[32] Avery et al. (2005) show that with the HMDA definition of high cost loans, roughly 98 percent of prime first-lien loans are excluded while roughly 98 percent of the first-lien and 95 percent of the junior-lien subprime loans are included. Therefore, subprime loans, not prime loans, are generally viewed as high-costs loans.

[33] The separate results for depository and nondepository institutions are presented in Table 5.

wide range of saving and lending services and other unrelated products (Laeven and Levine 2007). Building and maintaining customer relationships is increasingly crucial for their business success as they now provide a wide range of financial services, ranging from household lending services where lenders often do not maintain personal contact with the client once the loan is signed to very customer intensive services such as commercial lending, bill paying services, underwriting services, and offering a variety of savings plans as well as investment and risk management products (Saunders and Cornett 2007). On the other hand, nondepository lenders are much more focused firms relying almost exclusively on the income from household lending. There are number of differences in the household and commercial lending practices of depository versus nondepository lenders in terms of relying on interest rate information, balancing cap-rate and LTVs, concern for stock price, stockholders opinion (Ambrose et al. 2003), and consideration for the development and economic growth of the community.

The results of equation (2) displayed in Table 5 imply that depository institutions and nondepository institutions act very differently. After disclosure of pricing information beginning in 2004, depository institutions cut high-cost lending to minority neighborhoods (the coefficient on the interaction term *POST*PCTMINORITY* being negative and both statistically and economically significant), while we find no evidence that nondepository institutions cut aggressive lending to minority neighborhoods (the coefficient being insignificant). The economic magnitude of the coefficient on the interaction term is also economically significant for the depository institution subprime loan sample (the coefficient being -0.081). This suggests that depository lenders cut back on the approval of subprime loans on average by 4.05% for neighborhoods with at least 50% minority borrowers after

2004 when the pricing information was required to be disclosed. Given that the average approval rate for subprime loans is 52.23%[34] before 2004, this is an economically significant 7.7% (4.05%/52.23%) drop.

These results suggest that depository institutions are more responsive to regulatory changes (e.g., enforced reporting requirement) than are nondepository institutions. In our view, there are two potential reasons for this difference. First, more extensive regulations for the depository institutions subject them to greater scrutiny and sanctions. Second, depository institutions are more likely to be concerned for their reputations, as these institutions are engaged in a wider range of business activities and are planning to stay active in their business communities for a long period of time.

[Table 5 about here]

To further disentangle the reputation issue, we examine the proportion of higher-priced loans originated by depository and nondepository institutions. In Table 6, the coefficient estimate on the *PCTBANK* variable in the all-institution sample is negative and both statistically and economically significant, indicating neighborhoods with higher ratio nondepository loan applications to depository loan applications tend to receive more higher-priced subprime loans. This effect is stronger for minority neighborhoods, as the coefficient on the interaction term between *PCTBANK* and *PCTMINORITY* is statistically and economically significant and negative. To more directly see how depository and nondepository institutions differ in approving higher-priced subprime loans, we establish subsamples for the loan applications based on whether the lender is a depository or a nondepository institution. We find that depository institutions with high CRA ratings tend to

[34] The average approval rate for subprime loans is 52.90% for the whole sample period (2001-2006) in Table 2. The average approval rate for subprime loans before 2004 is 52.23%.

approve fewer higher-priced subprime loans, especially to minority neighborhoods, as evidenced by the negative coefficient on *GOODRATING* and *GOODRATING*PCTMINORITY*.

[Table 6 about here]

Overall, our results from Table 4 supports our first hypothesis that the increased public disclosure of lending practices, especially the required pricing disclosure that took effect beginning in 2004, resulted in a significant reduction in higher-priced subprime lending to minority neighborhoods. The results also lend support to our second hypothesis that this reduction is particularly pronounced for refinance loans. Furthermore, results displayed in Tables 5 and 6 provide support for our third hypothesis that in the aftermath of increased regulatory information disclosure, depository institutions reduced higher-priced subprime loans more than did nondepository institutions, especially to minority neighborhoods. Compared to nondepository institutions, depository institutions, especially those with high CRA ratings, approved a much lower proportion of higher-priced subprime loans to minority neighborhoods. One possible explanation for these results is that depository lenders care more about their reputation for fair lending than do nondepository lenders. An alternative explanation is that depository lenders are subject to a greater degree of regulation and held to a higher level of accountability for their actions than are nondepository lenders.

4.3 Robustness Checks

Using the HUD's subprime lender list to identify subprime loans may suffer from a potential measurement error problem. With the HUD list, if a lender issues more than 50% of subprime loans as identified by HUD, then the lender is categorized as a subprime lender and all loans issued by this lender are treated as subprime loans. To check the robustness of our results, we construct a subsample of subprime loans that do not use the HUD list of subprime

lender, but effectively considers the lending activity, the concentration of high cost loans. Based on this revised list of subprime lender we replicate the testing of our second and third research hypothesis (replicate Tables 5 and 6). Specifically we examine whether our results that subprime lending has been curtailed to minorities after 2004, and whether depository and nondepository institutions have changed their lending practices in a similar way.

5. Conclusion

Although the results of this study are far from conclusive, they nonetheless suggest that improved disclosure on relative opaque assets, such as mortgage loans, can be effective tool to influence lending practices because lenders behavior is better aligned with their business incentives, such as a concern for reputation, under more efficient market discipline. Thus, our results (as many other current subprime studies) call fur further regulation in the subprime mortgage market to ensure transparency and to promote market efficiency. More importantly, we are the first to show that increased regulatory requirements designed to strengthen the government's efforts to promote fair lending practices had an asymmetrical behavioral result, primarily effecting only depository institutions.

Using the 2002 amendment to Regulation C that took effect on January 1, 2004 as a natural experiment, we find that lenders on average (including both depository and nondepository lenders) approved a slightly lower proportion of higher-priced subprime lending to minority neighborhoods than what they were expected to approve without the pricing information disclosure requirement, and this reduction was mainly driven by the decline in home refinance loans. Furthermore, we find that this response to the regulatory change was not homogenous across lenders. While depository lenders significantly reduced the approval of subprime loans to minorities by a statistically and economically significant

7.7%, nondepository institutions have continued approving the same high volume of subprime loans, seemingly showing little concern whether the public will learn of their practice or not. Therefore, we find that the increased regulatory information disclosure was effective only for depository lenders as they adjusted their lending practices to be more in line with fair lending practices.

One rather obvious reason for this difference in lending behavior between depository and nondepository institutions is that depository institutions are more heavily regulated than nondepository institutions, and thus subject to greater regulatory scrutiny and sanctions. In this case, we recommend implementation of stricter regulations on nondepository institutions to improve fair lending practices, especially for groups of relatively uninformed and disadvantaged borrowers. However, we also view the greater response to enforced reporting by depository institutions as indirect evidence that these institutions are more likely to care about long-term relationships with borrowers, the public, and regulators, and hence are more sensitive to matters that can adversely affect their reputation for fair lending. This interpretation is consistent with Poole's 2007 statement that reputation is the cornerstone of success in the lending industry, at least for depository institutions. Our results imply that depository lenders do care about their reputation and are less likely to use aggressive lending practices, such as excessive approval of higher-priced loans to disadvantaged borrowers, once these practices can be easily exposed.

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Figure 1: Illustration of Data Samples Used in Regression Analysis

This figure shows the data samples used in regression models (1) and (2). The five combined samples, samples (1), (2), (3), (10) and (13) are used in regression model (1). The remaining nine samples are used in regression model (2).

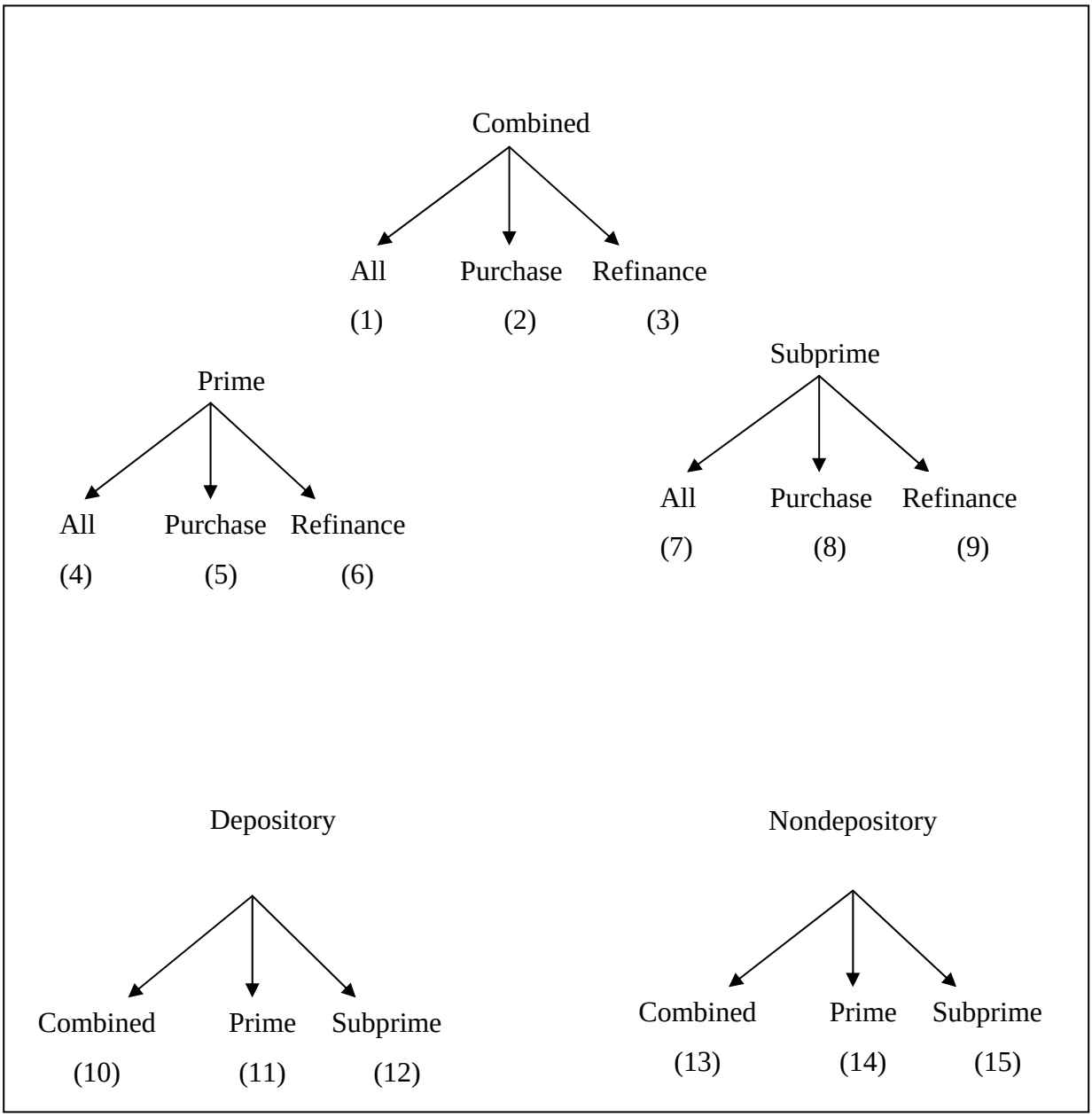

Figure 2: Proportion of Loans Approved

This figure shows the average proportion of loan application approved in the census tract for all loans, prime loans, and subprime loans from 2001-2006.

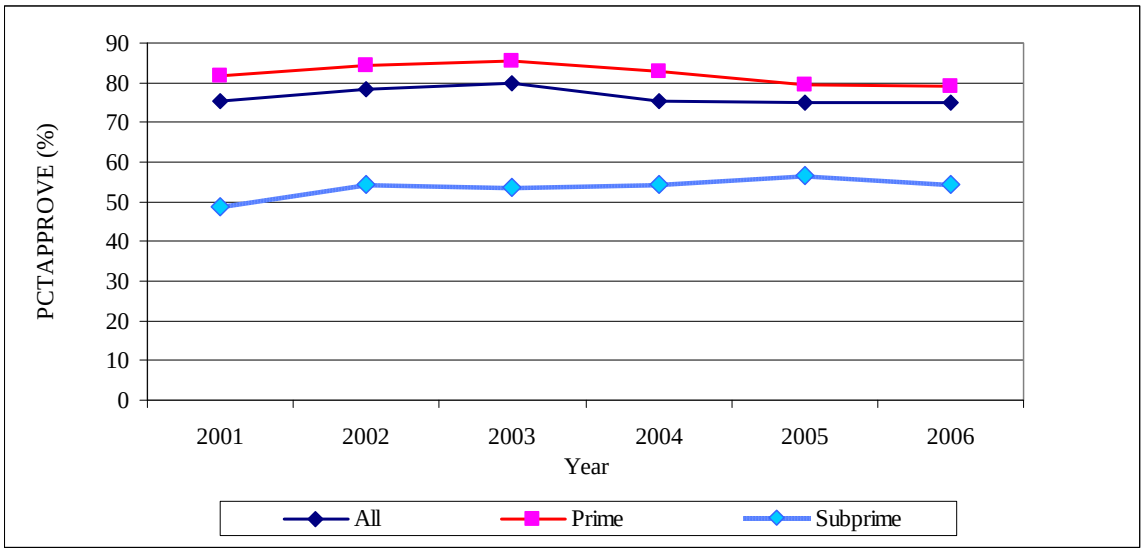

Figure 3: Proportion of Loans Sold

This figure shows the average proportion of loans that are sold within one year of origination, either to agency-type loan purchasers, such as Fannie Mae, Freddie Mac, Ginnie Mae, and Farmer Mac, or non-agency purchasers, from 2001-2006.

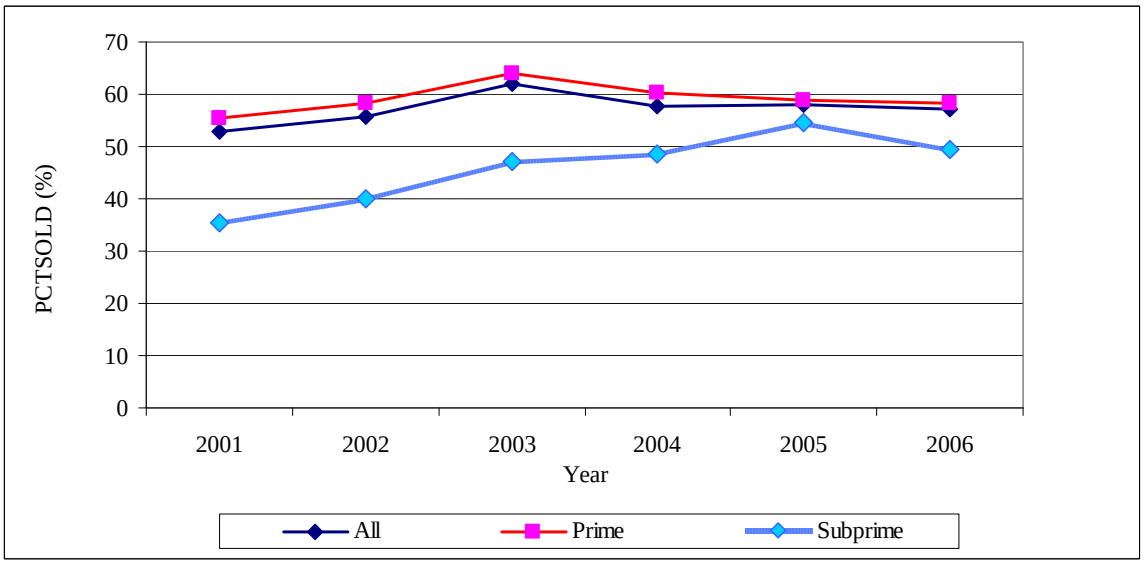

Figure 4: Proportion of Loans Sold to Private Loan Purchasers

This figure shows the annual average proportion of loans that are sold to private (non-agency) loan purchasers within one year of origination during 2001-2006. Non-agency purchasers include any secondary market loan purchaser other than Fannie Mae, Freddie Mac, Ginnie Mae and Farmer Mac.

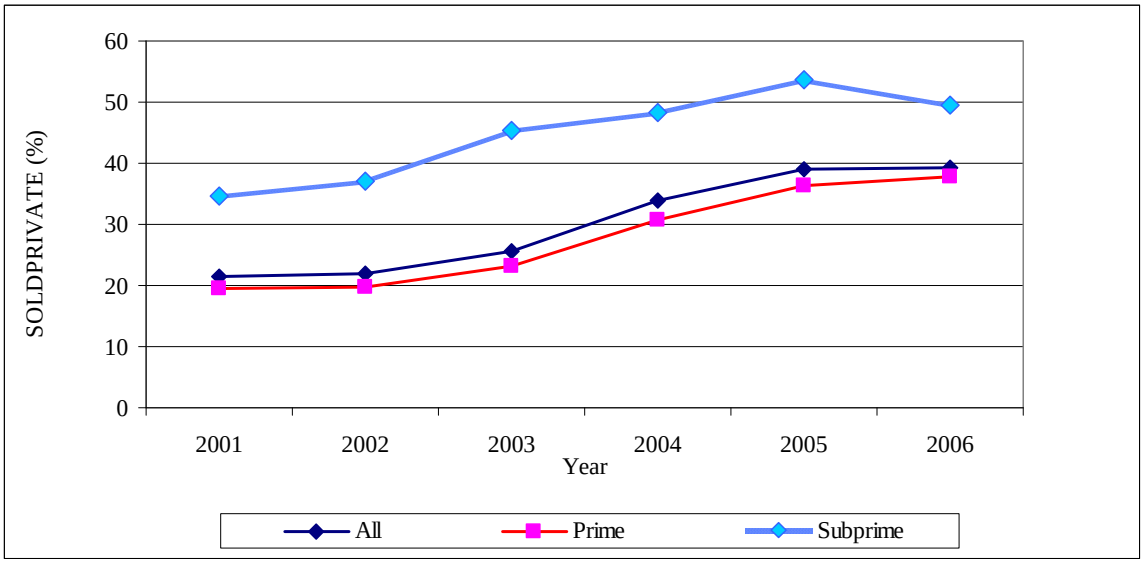

Figure 5: Proportion of Higher-Priced Loans Approved

This figure shows the proportion of higher-priced loans originated by all financial institutions, depository institutions and nondepository institutions from 2001 to 2006.

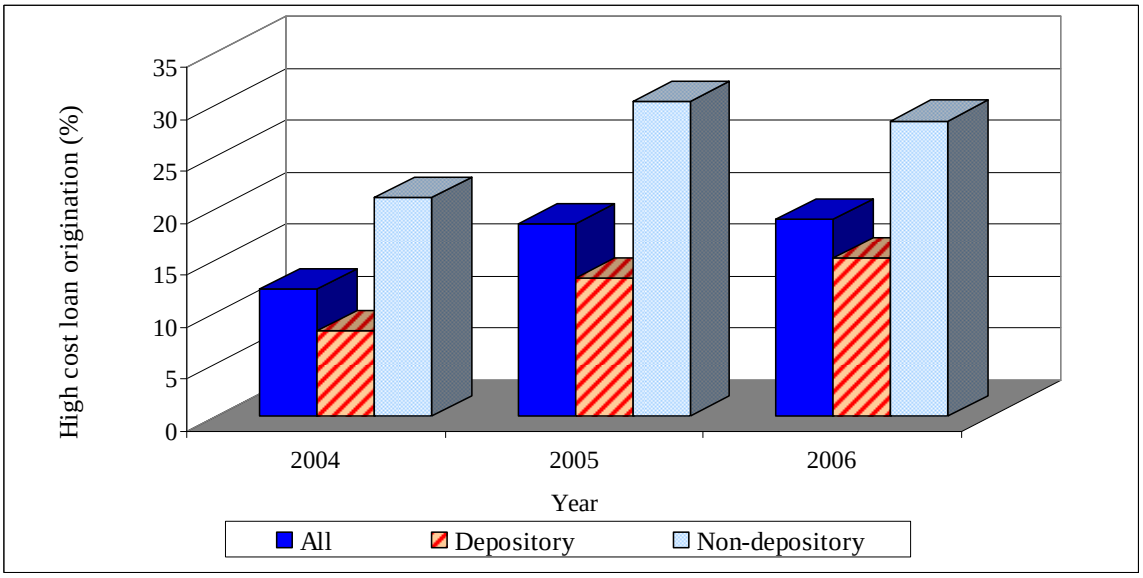

Table 1: Definition of Variables

This table lists all variables for the census tract level *PCTPPROVE* and *PCTSUBPRIME* regressions. The first column shows the names of each variable, the second column provides the relevant definitions, and the third column shows the data sources.

Variables	Definition	Data Source
1. Dependent variable:		
PCTAPPROVE	The annual number of loan applications approved relative to the total number of loan applications in a census tract	HMDA
2. Endogenous variable:		
PCTSUBPRIME	The proportion of subprime loan application to all loan application	HMDA
3. Instrumental variable:		
SOLDPRIVATE	The proportion of loans that were originated and sold to any loan purchaser except for Fannie Mae, Freddie Mac, Ginnie Mae and Farmer Mac within 1 year of origination.	HMDA
3. Control variables:		
Borrower characteristics:		
PCTMINORITY	Percentage of minority borrowers in the census tract	Census
LOGINCOME	Log of tract median income (in thousands)	Census
DTI30	Percentage of households with monthly ownership costs greater than 30% of monthly income	Census
PCTCOLLEGE	Percentage of tract population 25+ age with a Bachelor's Degree or higher	Census
PCTUNEMPLOY	Unemployed civilian/(Unemployed civilian + Employed civilian)	Census
PCTSELFEMPLOY	Percentage of households with self-employed income	Census
Loan characteristics:		
LTI	Median loan amount/Median income	HMDA
LTV	Median loan amount/(Median house value in 2000*(1+House price appreciation rate))	Census, HMDA and OFHEO
PCTCONVENTION	Percentage of conventional loan applications	HMDA
PCTREFINANCE	Percentage of loan applications that are for refinance purposes	HMDA
PCTSOLD	Percentage of new loans that were sold within 1 year of origination	HMDA
Property characteristics:		
MEDAGE	Median age of residential property in the tract	Census
PCTOWNER	Owner-occupied housing units/total housing units	Census
HVCHG	Percentage change in house value between 1990 and 2000	Census
PCTVALUE300	Percentage of housing units with value above $300,000	Census
PCTBOARD	Percentage of tract housing units boarded up	Census
CAPRATE	Tract median rent / tract median house value	Census
PCTDETACH	Percentage of housing units detached in the tract	Census
PCTMOBILE	Percentage of mobile homes in the tract	Census
PCT1to4	Percentage of one-to-four family housing	Census
PCTSECOND	Percentage of owner-occupied housing units with a second mortgage or home equity line of credit	Census
Lender Characteristics:		
PCTBANK	Percentage of loans filed with lenders that are depository institutions, such as commercial banks, thrift institutions or credit unions, in the tract	HMDA
HERF	Sum of squared market shares of lenders in the tract	HMDA
GOODRATING (Depository Institutions only)	Proportion of loans filed with depository institutions with outstanding rating (by CRA)	HMDA &CRA
*GOODRATING*PCTMINORITY*	Interaction between *GOODRATING* and *PCTMINORITY*	HMDA &CRA
Macroeconomic Variables:		
PRIMERATE	Prime rate	St. Louis Fed
TERM	Yield spread between the seven-year Treasury note and the three-month Treasury bill	St. Louis Fed
DEFAULT	Difference between the yield of a Baa bond and an Aaa bond	St. Louis Fed
Regulation Variables:		
POST	A dummy variable that equals one for years after 2004, and zero otherwise	HMDA
*POST*PCTMINORITY*	Interaction term between *POST* and *PCTMINORITY*	HMDA

Table 2: Descriptive Statistics

This table summarizes the descriptive statistics for all variables defined in Table 1. The descriptive statistics for the combined all loan sample, the prime and subprime loan samples are presented separately. Panel A, B and C report the descriptive statistics for depository institutions, and nondepository institutions respectively.

Panel A: All Institutions

	Combined			Prime			Subprime		
Variables	Mean	Median	Std_Dev	Mean	Median	Std_Dev	Mean	Median	Std_Dev
1. Dependent variables:									
PCTAPPROVE	76.05	77.54	11.29	81.92	83.88	9.99	52.90	53.19	12.87
2. Endogenous variable									
PCTSUBPRIME	21.09	19.35	11.19	---	---	---	---	---	---
3. Instrumental variable									
SOLDPRIVATE	29.57	28.47	11.75	27.30	26.05	11.74	43.96	44.44	16.58
4. Control variables:									
Borrower characteristics:									
PCTMINORITY	18.62	9.93	19.74	18.37	9.38	20.12	20.28	12.50	20.58
LOGINCOME	4.28	4.20	0.42	4.30	4.23	0.42	4.16	4.09	0.42
DTI30	19.97	18.07	10.43	19.96	18.07	10.34	19.89	18.09	9.71
PCTCOLLEGE	22.30	16.89	16.61	22.33	16.91	16.61	21.91	16.79	16.03
PCTUNEMPLOY	6.72	5.28	5.26	6.70	5.27	5.20	6.64	5.25	5.01
PCTSELFEMPLOY	12.63	11.30	7.18	12.63	11.31	7.15	12.49	11.27	6.81
Loan characteristics:									
LTI	2.01	1.92	0.65	1.95	1.87	0.72	2.23	2.13	0.82
LTV	84.67	78.19	50.74	85.36	77.88	60.93	80.13	76.23	30.74
PCTCONVENTION	93.30	95.27	6.98	91.30	93.90	9.00	99.58	100.00	1.37
PCTREFINANCE	57.46	57.94	12.44	53.65	53.64	13.92	71.21	72.88	13.31
PCTSOLD	56.79	58.82	11.58	58.81	60.82	11.93	45.11	46.01	16.64
Property characteristics:									
MEDAGE	36.57	35.00	14.57	36.56	35.00	14.57	36.29	35.00	14.48
PCTOWNER	80.31	89.47	20.62	80.38	89.51	20.54	80.87	89.72	19.88
HVCHG	44.94	39.07	52.43	44.85	39.08	51.34	44.37	39.09	46.18
PCTVALUE300	63.83	69.26	23.69	63.88	69.29	23.64	64.87	69.93	22.77
PCTBOARD	0.43	0.10	1.36	0.43	0.10	1.34	0.42	0.10	1.26
CAPRATE	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00
PCTDETACH	61.40	67.94	25.84	61.47	67.97	25.79	62.46	68.45	24.91
PCTMOBILE	6.93	0.61	11.12	6.93	0.61	11.12	6.93	0.64	11.05
PCT1to4	85.24	93.10	19.36	85.29	93.11	19.28	86.12	93.24	17.91
PCTSECOND	7.73	6.75	5.59	7.74	6.77	5.58	7.98	7.04	5.52
Lender Characteristics:									
PCTBANK	69.88	70.49	9.55	79.21	79.77	7.79	35.16	33.33	15.92
HERF	502.05	384.55	399.77	496.97	383.91	381.69	468.88	374.55	321.84
Macroeconomic Variables:									
PRIMERATE	5.72	6.19	1.43	5.72	6.19	1.43	5.71	6.19	1.42
TERM	1.69	1.49	0.97	1.69	1.49	0.97	1.70	1.49	0.97
DEFAULT	0.96	0.89	0.19	0.96	0.89	0.19	0.96	0.89	0.19
Regulation Variables:									
POST	0.49	0.00	0.50	0.49	0.00	0.50	0.49	0.00	0.50
*POST*PCTMINORITY*	10.02	0.00	17.66	9.53	0.00	17.16	11.83	0.00	19.86

Panel B: Depository Institutions

	Combined			Prime			Subprime		
Variables	Mean	Median	Std_Dev	Mean	Median	Std_Dev	Mean	Median	Std_Dev
1. Dependent variables:									
PCTAPPROVE	79.83	81.82	10.65	82.33	84.40	10.02	59.47	60.00	15.12
2. Endogenous variable									
PCTSUBPRIME	10.72	8.90	7.92	---	---	---	---	---	---
3. Instrumental variable									
SOLDPRIVATE	21.41	19.61	11.03	21.03	19.12	11.43	26.80	25.00	18.22
3. Control variables:									
Borrower characteristics:									
PCTMINORITY	18.81	9.60	20.64	18.81	9.38	20.96	20.33	11.11	22.79
LOGINCOME	4.29	4.21	0.42	4.31	4.23	0.42	4.07	4.01	0.42
DTI30	19.96	18.07	10.31	19.95	18.07	10.26	19.73	18.06	8.85
PCTCOLLEGE	22.33	16.91	16.60	22.36	16.94	16.61	20.68	16.29	14.56
PCTUNEMPLOY	6.69	5.27	5.19	6.67	5.26	5.14	6.51	5.27	4.62
PCTSELFEMPLOY	12.63	11.31	7.14	12.63	11.31	7.10	12.23	11.11	6.41
Loan characteristics:									
LTI	1.91	1.83	0.64	1.90	1.81	0.69	2.03	1.92	0.73
LTV	82.27	76.25	44.67	83.30	76.79	47.96	71.30	68.16	29.22
PCTCONVENTION	93.01	95.15	7.39	91.98	94.50	8.53	99.83	100.00	0.98
PCTREFINANCE	56.12	56.39	13.00	54.12	54.05	13.98	71.48	72.73	14.62
PCTSOLD	52.16	54.05	12.45	54.28	56.16	12.47	28.02	26.09	18.75
Property characteristics:									
MEDAGE	36.56	35.00	14.57	36.55	35.00	14.57	35.10	33.00	14.25
PCTOWNER	80.39	89.51	20.53	80.46	89.55	20.45	80.75	89.59	19.43
HVCHG	44.80	39.08	49.91	44.75	39.08	49.58	43.27	39.02	40.46
PCTVALUE300	63.90	69.30	23.61	63.92	69.33	23.59	67.72	71.77	20.58
PCTBOARD	0.43	0.10	1.34	0.42	0.10	1.32	0.37	0.10	1.05
CAPRATE	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00
PCTDETACH	61.50	67.98	25.77	61.54	68.00	25.73	64.32	69.41	23.27
PCTMOBILE	6.92	0.61	11.11	6.92	0.61	11.10	7.18	0.80	11.12
PCT1to4	85.31	93.11	19.24	85.34	93.10	19.20	87.66	93.68	15.61
PCTSECOND	7.75	6.78	5.58	7.77	6.80	5.58	8.49	7.62	5.41
Lender Characteristics:									
HERF	495.34	383.67	377.05	492.21	383.03	368.27	435.44	353.54	284.10
GOODRATING	54.04	55.95	16.18	53.80	56.22	17.23	54.09	57.14	30.79
Macroeconomic Variables:									
PRIMERATE	5.72	6.19	1.43	5.72	6.19	1.43	5.69	6.19	1.40
TERM	1.69	1.49	0.97	1.69	1.49	0.97	1.73	1.49	0.94
DEFAULT	0.96	0.89	0.19	0.96	0.89	0.19	0.97	0.87	0.19
Regulation Variables:									
POST	0.49	0.00	0.50	0.49	0.00	0.50	0.46	0.00	0.50
*POST*PCTMINORITY*	10.08	0.00	18.20	9.78	0.00	17.80	12.20	0.00	22.12

Panel C: Nondepository Institutions

	Combined			Prime			Subprime		
Variables	Mean	Median	Std_Dev	Mean	Median	Std_Dev	Mean	Median	Std_Dev
1. Dependent variables:									
PCTAPPROVE	67.27	68.89	15.16	81.06	84.62	13.64	49.74	50.00	14.57
2. Endogenous variable									
PCTSUBPRIME	43.76	43.38	18.12	---	---	---	---	---	---
3. Instrumental variable									
SOLDPRIVATE	52.58	54.44	15.28	52.45	54.38	17.44	55.63	57.14	17.93
3. Control variables:									
Borrower characteristics:									
PCTMINORITY	18.28	10.53	18.91	16.24	8.97	18.08	20.78	13.33	20.65
LOGINCOME	4.23	4.16	0.44	4.26	4.20	0.47	4.18	4.11	0.41
DTI30	19.94	18.10	10.02	19.85	18.10	9.57	19.93	18.15	9.51
PCTCOLLEGE	22.39	17.01	16.57	22.93	17.56	16.68	21.63	16.80	15.53
PCTUNEMPLOY	6.62	5.24	5.04	6.36	5.12	4.66	6.58	5.23	4.92
PCTSELFEMPLOY	12.56	11.32	6.88	12.62	11.44	6.62	12.23	11.16	6.41
Loan characteristics									
LTI	2.27	2.16	1.11	2.22	2.11	1.77	2.35	2.24	0.92
LTV	88.92	80.47	91.65	91.16	78.96	202.83	84.26	79.99	30.89
PCTCONVENTION	93.60	96.00	7.55	88.44	92.31	12.42	99.43	100.00	1.95
PCTREFINANCE	61.18	62.25	14.07	53.07	53.99	17.07	71.56	73.33	14.96
PCTSOLD	70.74	72.93	13.56	78.01	80.85	14.38	56.74	58.25	17.88
Property characteristics:									
MEDAGE	36.43	35.00	14.54	35.94	34.00	14.44	36.30	35.00	14.49
PCTOWNER	80.68	89.69	20.21	81.18	90.14	19.79	81.90	90.38	19.05
HVCHG	44.41	39.00	47.40	43.64	38.73	44.47	43.89	38.81	44.68
PCTVALUE300	64.21	69.52	23.36	64.74	69.95	23.03	65.38	70.31	22.37
PCTBOARD	0.42	0.10	1.28	0.37	0.10	1.12	0.41	0.10	1.23
CAPRATE	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00
PCTDETACH	61.83	68.10	25.45	62.47	68.38	24.94	62.82	68.52	24.52
PCTMOBILE	6.90	0.61	11.09	6.93	0.61	11.12	6.79	0.62	10.92
PCT1to4	85.56	93.10	18.78	85.86	93.08	18.23	86.34	93.13	17.38
PCTSECOND	7.87	6.92	5.56	8.15	7.26	5.54	8.20	7.31	5.49
Lender Characteristic:									
HERF	477.06	379.25	333.64	453.41	368.66	298.62	444.55	363.70	282.13
Macroeconomic Variables:									
PRIMERATE	5.72	6.19	1.43	5.73	6.19	1.43	5.67	4.68	1.43
TERM	1.69	1.49	0.97	1.68	1.49	0.97	1.71	2.50	0.97
DEFAULT	0.96	0.89	0.19	0.96	0.89	0.19	0.96	0.89	0.19
Regulation Variables:									
POST	0.49	0.00	0.50	0.49	0.00	0.50	0.51	1.00	0.50
*POST*PCTMINORITY*	9.97	0.00	17.22	8.46	0.00	15.30	11.84	0.00	19.56

Table 3: Correlation Matrix

This table shows the correlation coefficient estimates with the relevant *p*-values in italic for the key variables in our analysis. *PCTAPPROVAL* is the percentage of annual loan application approved in the census tract. *PCTSUBPRIME* is the annual number of subprime loans originated divided by number of prime loans originated in a census tract. *PCTMINORITY* is the percentage of minority borrowers in the census tract, while LTV is the approximated average loan-to-value ratio, the median loan amount relative to the adjusted median house values in the census tract (the census tract house values are adjusted using state level annual home value growth rates). *PCTREFINANCE* is the percentage of total loan approval for refinance purposes and *PCTSOLD* is the annual percentage of loans that is sold off to private and public loan purchasers in the same calendar year as the loan was approved. *PCTOWNER* is the percentage of owner-occupied housing units/total housing units. *HVCHG* is the average percentage change in house values between 1990 and 2000 at the Census tract level. *PCTBANK* is the percentage of loan applications filed with lenders that are depository institutions, such as commercial banks or thrift institutions in the Census tract. *POST*Minority* is an interaction term that takes on the value of the percentage of minorities in the Census tract only for the years after 2004, after the implementation of stricter HMDA reporting requirements. Under each coefficient estimate we report the relevant *p*-values in italic.

	PCTAPPROVAL	*PCTSUBPRIME*	*PCTMINORITY*	*LTV*	*PCTREFINANCE*	*PCTSOLD*	*PCTOWNER*	*HVCHG*	*PCTBANK*	*POST*Min*
PCTAPPROVAL	1.000									
PCTSUBPRIME	-0.678	1.000								
	<.001									
PCTMINORITY	-0.317	0.375	1.000							
	<.001	*<.001*								
LTV	-0.138	0.085	0.039	1.000						
	<.001	*<.001*	*<.001*							
PCTREFINANCE	0.216	0.031	-0.167	-0.060	1.000					
	<.001	*<.001*	*<.001*	*<.001*						
PCTSOLD	0.513	-0.194	-0.080	-0.099	0.168	1.000				
	<.001	*<.001*	*<.001*	*<.001*	*<.001*					
PCTOWNER	0.145	-0.125	-0.170	-0.149	0.222	0.064	1.000			
	<.001	*<.001*	*<.001*	*<.001*	*<.001*	*<.001*				
HVCHG	0.137	-0.089	0.155	-0.092	-0.050	0.111	-0.064	1.000		
	<.001	*<.001*	*<.001*	*<.001*	*<.001*	*<.001*	*<.001*			
PCTBANK	0.379	-0.647	-0.357	-0.040	0.081	-0.164	0.091	-0.064	1.000	
	<.001	*<.001*	*<.001*	*<.001*	*<.001*	*<.001*	*<.001*	*<.001*		
*POST*Minority*	-0.236	0.279	0.647	0.007	-0.296	-0.017	-0.171	0.303	-0.294	1.000
	<.001	*<.001*	*<.001*	*<.001*	*<.001*	*<.001*	*<.001*	*<.001*	*<.001*	

Table 4: Neighborhood Loan Originations and Increased Regulatory Information Disclosure

This table summarizes the result from regressions of the *PCTAPPROVE*, total annual number of loan approved relative to the total number of loan applications by census tract, on neighborhood control variables as defined in Table 1. The model is estimated with three samples: (1) the combined all loan sample (292,809 tract-year observations), (2) the prime loan sample (291,946 tract-year observations), and (3) the subprime loan sample (277,345 tract-year observations). We use two-stage least square regressions (2SLS)[35] for the all loan sample because the percentage of subprime loan applications (*PCTSUBPRIME*) is endogenous. For the prime and subprime loan samples, we use OLS regressions with county fixed effects. For each sample, three sets of regression analysis results are presented: (1) for all loan applications, (2) for all purchase loan applications, and (3) for all refinance loan applications. We report robust *t*-statistics in parenthesis and use ***, **, and * to denote significance at the 1%, 5%, and 10% level (two-sided), respectively.

	Combined (2SLS)			**Prime (OLS with Fixed Effects)**			**Subprime (OLS with Fixed Effects)**		
	All	Purchase	Refinance	All	Purchase	Refinance	All	Purchase	Refinance
Endogenous Variable:									
PCTSUBPRIME	-0.123***	-0.137***	0.111***	---	---	---	---	---	---
	(11.87)	(17.02)	(7.32)						
Borrower risk characteristics:									
PCTMINORITY	-0.074***	-0.044***	-0.078***	-0.106***	-0.054***	-0.114***	0.026***	-0.041***	0.061***
	(52.97)	(32.40)	(41.26)	(45.37)	(31.38)	(39.93)	(13.02)	(16.80)	(25.96)
LOGINCOME	5.713***	4.815***	7.784***	5.429***	5.123***	4.973***	5.934***	4.353***	6.743***
	(72.79)	(96.53)	(55.79)	(43.12)	(69.37)	(49.65)	(59.33)	(33.50)	(62.76)
DTI30	-0.014***	-0.020***	0.009***	-0.025***	-0.019***	-0.012***	0.027***	-0.008*	0.072***
	(12.01)	(13.32)	(5.40)	(11.76)	(9.19)	(3.71)	(8.78)	(1.72)	(19.67)
PCTCOLLEGE	0.062***	0.048***	0.075***	0.074***	0.065***	0.071***	0.011***	-0.013***	-0.014***
	(39.42)	(26.49)	(39.16)	(37.44)	(45.55)	(29.83)	(5.02)	(3.42)	(5.60)
PCTUNEMPLOY	-0.140***	-0.140***	-0.149***	-0.179***	-0.151***	-0.177***	-0.099***	-0.129***	-0.042***
	(45.86)	(37.60)	(33.91)	(37.80)	(29.77)	(32.10)	(15.57)	(11.91)	(5.92)
PCTSELFEMPLOY	-0.027***	-0.007***	-0.025***	-0.011***	-0.003	-0.019***	-0.036***	-0.031***	0.009*
	(13.18)	(2.67)	(8.67)	(4.08)	(0.85)	(5.14)	(8.15)	(3.25)	(1.79)
Loan risk characteristics:									
LTI	1.876***	0.681***	1.850***	1.309***	0.480***	1.208***	1.108***	-0.382***	1.273***
	(82.33)	(35.39)	(68.81)	(5.19)	(2.88)	(4.05)	(7.39)	(2.80)	(8.40)
LTV	-0.001***	-0.001***	-0.000**	-0.000	-0.000	0.000**	0.013***	-0.024***	0.011***
	(2.95)	(3.87)	(2.22)	(0.15)	(0.27)	(2.44)	(6.72)	(8.98)	(5.73)
PCTCONVENTION	-0.005**	-0.103***	-0.028***	-0.069***	-0.114***	-0.007	-0.114***	-0.193***	-0.261***
	(2.28)	(55.59)	(6.12)	(29.42)	(80.82)	(1.18)	(6.92)	(15.21)	(14.66)
PCTREFINANCE	-0.032***	---	---	0.043***	---	---	-0.214***	---	---
	(18.09)	---	---	(14.58)	---	---	(89.63)	---	---
PCTSOLD	0.270***	0.183***	0.347***	0.214***	0.175***	0.196***	0.132***	0.073***	0.139***
	(115.79)	(142.63)	(75.91)	(70.51)	(95.65)	(54.48)	(61.63)	(28.10)	(63.87)
Property risk characteristics:									
MEDAGE	-0.041***	0.002	-0.037***	-0.054***	0.001	-0.053***	0.002	-0.069***	0.037***
	(36.69)	(1.42)	(26.53)	(51.09)	(0.56)	(41.27)	(0.88)	(20.70)	(16.78)

[35] The unreported first stage results are available upon request.

Table 4 continued

	Combined (2SLS)			Prime (OLS with Fixed Effects)			Subprime (OLS with Fixed Effects)		
	All	Purchase	Refinance	All	Purchase	Refinance	All	Purchase	Refinance
…									
PCTOWNER	-0.032***	-0.018***	-0.053***	-0.026***	-0.009***	-0.029***	-0.062***	0.062***	-0.118***
	(23.26)	(14.30)	(24.68)	(9.71)	(4.20)	(8.76)	(15.07)	(16.82)	(25.64)
HVCHG	-0.001***	-0.003***	-0.001***	-0.002***	-0.005***	0.000	-0.005***	-0.003***	-0.014***
	(4.36)	(11.00)	(4.28)	(6.33)	(13.19)	(0.82)	(8.37)	(3.62)	(19.86)
PCTVALUE300	0.029***	0.056***	0.019***	0.032***	0.059***	0.013***	0.025***	0.065***	0.026***
	(43.07)	(65.65)	(20.24)	(30.13)	(57.09)	(9.78)	(16.75)	(25.37)	(16.13)
PCTBOARD	-0.325***	-0.193***	-0.352***	-0.378***	-0.166***	-0.431***	-0.349***	-0.411***	-0.404***
	(38.02)	(17.39)	(29.33)	(19.69)	(8.95)	(17.89)	(13.80)	(10.50)	(13.09)
CAPRATE	-345.635***	-151.987***	-504.673***	-378.951***	-140.338***	-535.337***	-462.765***	-84.361***	-599.199***
	(62.53)	(23.66)	(59.71)	(26.19)	(10.71)	(24.88)	(23.61)	(3.69)	(26.41)
PCTDETACH	-0.009***	-0.051***	-0.000	-0.018***	-0.059***	0.002	-0.002	-0.037***	-0.002
	(10.89)	(52.26)	(0.28)	(13.31)	(48.76)	(1.08)	(1.49)	(14.48)	(0.88)
PCTMOBILE	-0.083***	-0.177***	-0.052***	-0.093***	-0.178***	-0.049***	-0.106***	-0.132***	-0.095***
	(50.18)	(86.19)	(26.66)	(51.02)	(77.38)	(22.49)	(35.77)	(26.10)	(27.87)
PCT1to4	-0.021***	-0.006***	-0.025***	-0.022***	-0.003**	-0.022***	-0.011***	-0.010***	-0.025***
	(20.67)	(5.17)	(17.50)	(16.24)	(2.12)	(12.88)	(5.06)	(2.76)	(9.59)
PCTSECOND	0.201***	0.323***	0.235***	0.169***	0.307***	0.196***	0.247***	0.229***	0.241***
	(68.86)	(87.25)	(54.69)	(47.39)	(66.86)	(34.56)	(40.97)	(24.10)	(33.89)
Lender Characteristics:									
PCTBANK	0.232***	0.138***	0.444***	0.130***	0.164***	0.046***	0.192***	0.051***	0.216***
	(41.64)	(48.95)	(45.48)	(42.99)	(88.26)	(11.77)	(89.60)	(18.84)	(88.97)
HERF	-0.001***	-0.002***	-0.001***	0.000***	-0.002***	0.001***	-0.006***	-0.007***	-0.006***
	(26.25)	(47.00)	(10.57)	(3.45)	(20.18)	(12.16)	(52.72)	(22.81)	(52.95)
Macroeconomic variables:									
PRIMERATE	-0.139***	-1.725***	0.708***	0.354***	-1.158***	0.367***	-1.997***	-5.866***	0.147**
	(3.81)	(44.38)	(15.64)	(9.05)	(26.82)	(8.84)	(31.74)	(52.90)	(2.04)
TERM	1.327***	-1.744***	2.689***	1.858***	-1.481***	3.198***	-0.994***	-5.167***	2.331***
	(19.84)	(27.71)	(30.87)	(29.31)	(22.89)	(48.78)	(10.16)	(30.21)	(21.05)
DEFAULT	-1.187***	-0.919***	-1.305***	-2.148***	-0.136	-3.604***	8.778***	-3.820***	10.042***
	(13.31)	(8.62)	(10.14)	(23.24)	(1.22)	(30.22)	(55.34)	(11.80)	(53.69)
Law Variables:									
POST	-2.526***	0.113*	-3.762***	-2.086***	0.106*	-4.682***	4.078***	-0.448**	5.375***
	(37.81)	(1.91)	(43.87)	(19.18)	(1.81)	(42.58)	(43.05)	(2.31)	(50.39)
*POST*PCTMINORITY*	-0.007***	-0.008***	0.035***	-0.006***	-0.041***	0.029***	-0.015***	0.006**	-0.011***
	(4.14)	(5.75)	(21.31)	(3.98)	(25.82)	(16.60)	(7.30)	(2.12)	(4.28)
INTERCEPT	30.083***	69.508***	-10.491***	44.189***	61.825***	49.690***	51.009***	114.986***	26.628***
	(36.88)	(119.15)	(7.04)	(55.14)	(107.48)	(57.61)	(27.84)	(60.12)	(13.53)
Observations	292,809	286,851	290,042	291,946	284,525	281,307	277,345	152,644	261,697
R-squared	0.750	0.571	0.660	0.653	0.531	0.563	0.392	0.181	0.319

Table 5: Neighborhood Loan Originations and Increased Regulatory Information Disclosure for Depository and Nondepository Institutions

This table summarizes the result from regressions of the *PCTAPPROVE* variable on the neighborhood control variables defined in Table 1, for depository and nondepository institutions. The dependent variable, *PCTAPPROVE*, is the annual total number of loan approved divided by the total number of loan applications for each census tract for a given year. Three samples are used for each type of institutions: (1) the all loan sample, (2) the prime loan sample, and (3) the subprime loans sample. We use two-stage least square regressions (2SLS) for the all loan sample because the percentage of subprime loan applications (*PCTSUBPRIME*) is endogenous. For the prime loan and subprime loan sample, we use OLS regressions with county fixed effects. We report robust *t*-statistics in parenthesis and use ***, **, and * to denote significance at the 1%, 5%, and 10% level (two-sided), respectively.

	Depository Institutions			**Nondepository Institutions**		
	Combined	Prime	Subprime	Combined	Prime	Subprime
Endogenous Variable PCTSUBPRIME (predicted)	-0.486***	---	---	-0.405***	---	---
	(46.67)	---	---	(72.23)	---	---
Borrower risk characteristics:						
PCTMINORITY	-0.085***	-0.125***	-0.005*	0.039***	-0.034***	0.039***
	(66.71)	(48.84)	(1.88)	(21.90)	(15.10)	(16.77)
LOGINCOME	2.510***	4.467***	5.241***	7.325***	7.195***	6.711***
	(31.76)	(25.42)	(34.04)	(101.29)	(82.75)	(61.92)
DTI30	-0.024***	-0.036***	0.005	0.025***	0.024***	0.057***
	(20.25)	(14.93)	(1.10)	(13.26)	(9.00)	(16.31)
PCTCOLLEGE	0.067***	0.079***	0.052***	0.006**	0.104***	0.011***
	(55.57)	(29.60)	(16.57)	(2.22)	(57.72)	(4.28)
PCTUNEMPLOY	-0.141***	-0.193***	-0.157***	-0.101***	-0.175***	-0.066***
	(43.27)	(39.59)	(17.31)	(22.21)	(25.80)	(8.97)
PCTSELFEMPLOY	-0.028***	-0.010***	-0.078***	0.023***	0.060***	-0.004
	(13.28)	(3.69)	(12.31)	(6.99)	(12.93)	(0.70)
Loan risk characteristics:						
LTI	1.399***	1.438***	0.694***	0.670***	0.260**	1.071***
	(60.50)	(4.52)	(10.15)	(42.26)	(2.47)	(8.06)
LTV	0.004***	0.003	0.025***	-0.002***	-0.001***	0.001
	(15.48)	(1.21)	(4.23)	(12.17)	(4.53)	(0.55)
PCTCONVENTION	-0.023***	-0.056***	-0.088***	-0.042***	-0.153***	-0.241***
	(12.35)	(20.45)	(3.14)	(14.28)	(69.53)	(18.00)
PCTREFINANCE	0.017***	0.019***	-0.099***	-0.013***	0.080***	-0.282***
	(12.54)	(5.63)	(38.92)	(5.74)	(41.82)	(111.89)
PCTSOLD	0.134***	0.162***	0.084***	0.137***	0.183***	0.081***
	(78.19)	(40.02)	(36.06)	(67.75)	(80.52)	(43.74)
Property risk characteristics:						
MEDAGE	-0.052***	-0.061***	0.026***	0.010***	-0.014***	-0.012***
	(51.76)	(57.00)	(9.71)	(5.88)	(8.64)	(5.13)
PCTOWNER	-0.021***	-0.026***	0.031***	-0.106***	-0.085***	-0.104***
	(15.80)	(9.24)	(5.72)	(49.01)	(35.74)	(26.40)
HVCHG	-0.004***	-0.003***	-0.015***	0.003***	-0.000	-0.004***
	(16.82)	(6.09)	(12.40)	(6.89)	(0.32)	(6.40)
PCTVALUE300	0.018***	0.025***	0.003	0.039***	0.048***	0.026***
	(26.56)	(20.14)	(1.37)	(37.74)	(37.32)	(14.87)
PCTBOARD	-0.374***	-0.433***	-0.447***	-0.224***	-0.172***	-0.383***
	(43.05)	(21.30)	(12.24)	(15.98)	(7.32)	(12.70)

Table 5 continued

	Depository Institutions			Nondepository Institutions		
	Combined	Prime	Subprime	Combined	Prime	Subprime
CAPRATE	-376.720***	-441.333***	-478.645***	-329.556***	-369.029***	-426.694***
	(65.60)	(25.23)	(15.43)	(40.73)	(24.96)	(20.93)
PCTDETACH	0.001	-0.004***	0.012***	-0.053***	-0.086***	-0.007***
	(0.79)	(2.79)	(5.65)	(43.26)	(57.02)	(3.85)
PCTMOBILE	-0.078***	-0.086***	-0.064***	-0.192***	-0.162***	-0.127***
	(53.33)	(39.96)	(14.32)	(75.44)	(55.48)	(35.84)
PCT1to4	-0.013***	-0.025***	-0.016***	-0.017***	-0.012***	-0.011***
	(13.07)	(16.32)	(4.96)	(10.92)	(6.18)	(4.20)
PCTSECOND	0.139***	0.149***	0.236***	0.356***	0.361***	0.230***
	(45.21)	(39.80)	(28.56)	(79.89)	(69.01)	(32.66)
Lender Characteristics:						
HERF	-0.000***	0.001***	-0.005***	-0.007***	-0.007***	-0.007***
	(7.17)	(16.63)	(34.91)	(125.70)	(45.63)	(53.02)
GOODRATING	-0.012***	-0.013***	0.032***			
	(15.99)	(12.85)	(25.20)			
Macroeconomic variables						
PRIMERATE	0.058	0.138***	-8.091***	0.241***	-0.812***	1.787***
	(1.16)	(3.18)	(99.46)	(4.44)	(14.31)	(24.17)
TERM	2.250***	2.284***	-11.024***	1.610***	-2.142***	4.513***
	(28.86)	(30.14)	(83.70)	(19.86)	(23.60)	(38.02)
DEFAULT	-1.107***	-1.555***	12.436***	-1.364***	-1.817***	1.572***
	(11.11)	(17.17)	(57.18)	(10.20)	(11.16)	(7.76)
Law Variables:						
POST	-2.051***	-2.420***	3.001***	0.175*	-1.879***	1.542***
	(39.19)	(20.80)	(22.90)	(1.70)	(18.98)	(13.46)
*POST*PCTMINORITY*	-0.024***	-0.012***	-0.081***	0.065***	0.038***	-0.002
	(20.36)	(7.45)	(29.97)	(36.19)	(15.96)	(0.74)
INTERCEPT	72.039***	64.214***	101.444***	58.533***	68.397***	51.640***
	(154.02)	(62.13)	(33.11)	(71.76)	(83.60)	(30.93)
Observations	291,620	290,832	217,700	285,403	269,392	257,189
R-squared	0.719	0.634	0.319	0.672	0.510	0.354

Table 6: Concentration of Relatively High-priced Loans for Depository and Nondepository Institutions

This table summarizes the results from regressions of the *PCTHIGHCOST* variable on the neighborhood control variables defined in Table 1, for depository institutions and nondepository institutions. The dependent variable, *PCTHIGHCOST*, is the total number of high-cost loans (loans that are required to be reported based on their rate spreads) divided by the total number of loans originated for each census tract for a given year. Outputs from OLS regressions with county fixed effects and robust *t*-statistics in parenthesis are reported in the table below. We use ***, **, and * to denote significance at the 1%, 5%, and 10% level (two-sided), respectively.

	All Institutions	**Depository Institutions**	**Nondepository Institutions**
Borrower risk characteristics:			
PCTMINORITY	0.311***	0.200***	0.163***
	(41.33)	(32.25)	(60.52)
LOGINCOME	-5.641***	-5.687***	-5.583***
	(26.41)	(23.74)	(29.65)
DTI30	0.009***	0.016***	-0.033***
	(3.29)	(5.50)	(8.45)
PCTCOLLEGE	-0.089***	-0.060***	-0.215***
	(31.59)	(15.56)	(70.87)
PCTUNEMPLOY	0.010*	0.037***	0.024***
	(1.77)	(6.41)	(2.90)
PCTSELFEMPLOY	-0.053***	-0.039***	-0.067***
	(11.73)	(7.05)	(9.43)
Loan risk characteristics			
LTI	-2.047***	-2.195***	-0.991***
	(5.68)	(4.93)	(3.00)
LTV	-0.007***	-0.007***	-0.009***
	(7.83)	(7.25)	(2.83)
PCTCONVENTION	0.146***	0.089***	0.341***
	(26.64)	(17.82)	(46.29)
PCTREFINANCE	0.019***	0.048***	0.043***
	(4.41)	(9.72)	(10.61)
PCTFIRSTLIEN	19.969***	16.318***	16.257***
	(52.64)	(53.03)	(34.28)
Property risk characteristics:			
MEDAGE	0.037***	0.011***	0.074***
	(27.38)	(7.20)	(32.14)
PCTOWNER	-0.031***	-0.020***	-0.054***
	(7.12)	(4.38)	(10.52)
HVCHG	0.004***	0.007***	0.004***
	(6.94)	(11.35)	(5.10)
PCTVALUE300	-0.010***	-0.022***	0.017***
	(5.60)	(10.02)	(7.18)
PCTBOARD	-0.019	-0.020	-0.030
	(1.01)	(0.86)	(1.09)
CAPRATE	305.009***	339.981***	558.842***
	(14.69)	(13.63)	(23.64)
PCTDETACH	0.017***	0.020***	0.012***
	(9.08)	(8.86)	(4.97)
PCTMOBILE	0.021***	0.070***	-0.099***
	(8.48)	(27.34)	(25.20)

Table 6 continued

	All Institutions	Depository Institutions	Nondepository Institutions
PCT1to4	0.024***	0.033***	-0.003
	(13.50)	(17.89)	(1.03)
PCTSECOND	-0.058***	-0.073***	-0.038***
	(10.20)	(11.66)	(4.74)
Lender Characteristics:			
PCTBANK	-0.145***	---	---
	(29.69)	---	---
*PCTBANK*PCTMINORITY*	-0.003***	---	---
	(24.05)	---	---
HERF	0.001***	0.001***	-0.002***
	(2.76)	(6.34)	(13.80)
GOODRATING	---	-0.020***	---
	---	(9.34)	---
*GOODRATING*PCTMINORITY*	---	-0.002***	---
	---	(18.94)	---
Macroeconomic variables:			
PRIMERATE	-4.957***	-1.059***	-13.962***
	(44.82)	(7.84)	(86.92)
TERM	-11.405***	-5.329***	-23.870***
	(73.88)	(30.22)	(102.82)
INTERCEPT	68.182***	29.594***	122.627***
	(67.11)	(30.61)	(68.31)
Observations	144,062	143,521	140,860
R-squared	0.706	0.631	0.502