Local Scale Economies in Secondary Market Financing and Access to Mortgage Credit: 1994-2008

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Abstract

While secondary loan markets have provided lenders with substantial liquidity, evidence of the impact of those markets on borrower access to credit is limited. In part, that is because it is difficult to separate out variation in the cost of accessing secondary markets from other factors that determine lending outcomes. We address this issue by drawing on spatial variation in the number of loans sold to the secondary market. More precisely, we assume that as the number of loans sold from a given local market increases, business contacts between local primary lenders and distant secondary market investors also increase. As those relationships become more established this likely reduces the transactions cost associated with subsequent sales to the secondary market. We examine empirical implications of this and related ideas for U.S. mortgage markets using HMDA data from 1994 to 2008.

Findings indicate that improved access to secondary market financing increases borrower access to mortgage credit, and especially so for high-risk borrowers. We also show that for conforming size loans, spatial variation in access to secondary market financing appears to have diminished over the 1994-2008 period, at least as influenced by the number of loan sales from a given local market. In contrast, non-conforming jumbo loans are less likely to be sold on the secondary market and access to credit remains sensitive to the number of nearby loans that have recently been sold. This is consistent with the more idiosyncratic nature of non-conforming loans which increases the importance of established business relationships if primary lenders are to sell such loans on the secondary market.

Key words: Access to Credit, Secondary Markets, Agglomeration Economies
JEL codes: G2, R0

1. Introduction

While secondary markets finance substantial lending activity, evidence of their impact on borrower access to credit is remarkably limited. In part, that is because it is difficult to separate out variation in access to secondary markets from other factors that determine lending outcomes. We address this issue by drawing upon ideas from the urban agglomeration literature (e.g., Glaeser and Gottlieb (209), Rosenthal and Strange (2001, 2004), and Duranton and Puga (2004)). Specifically, we argue that as the number of loans sold from a given local market increases, business contacts between local primary lenders and distant secondary market investors will also increase. As those relationships become more established this likely reduces the transactions cost associated with selling subsequent loans to the secondary market but in a manner that varies across locations and over time with the number of recent sales of locally originated loans. We examine implications of this and related ideas in the context of U.S. mortgage markets over the 1994 to 2008 period using a panel of census tract level data based on loan-level records from Home Mortgage Disclosure Act (HMDA) files. Before clarifying our estimation and identification strategy, some further background is in order.

Over the last two decades, secondary loan markets in the United States have experienced dramatic growth. Among syndicated corporate loans, for example, secondary market sales grew at a compound annual rate of 25 percent over the 1991-2006 period, reaching $239 billion in 2006 (Drucker and Puri (2008)). For commercial real estate debt, issuance of commercial mortgage-backed securities (CMBS) grew from about $5 billion in 1990 to $230 billion in 2007.[1] In the market for conforming size home purchase residential mortgages, the ratio of secondary market purchases to originations rose from roughly 50 percent in 1994 to nearly 100 percent by 2004 (see the far right column of Table 1a).[2] This growth likely reflects differences in comparative advantage between primary lenders who navigate the loan origination process and secondary market institutions that are better able to diversify and manage risk

[1] See Commercial Mortgage Securities Association (2008).
[2] Some of the ratios reported in the far right column of Table 1a exceed 1. This is possible both because some loans may be originated in a year subsequent to when they were originated, and also because some loans are sold more than once within a single year.

(e.g. Carlstrom and Samolyk (1995), Pennacchi (1988), Demsetz (2000), Guner (2006), Drucker and Puri (2008)).[3] As a consequence, secondary markets are thought to mitigate primary lender exposure to risk and reduce regional differences in access to credit by freeing lending institutions from reliance on local deposits.[4] For both reasons, secondary markets are thought to increase the supply of credit.

Against this backdrop, the primary goal of this paper is to test whether prospective mortgage borrowers in areas with high concentrations of loan sales enjoy greater access to credit. To shed light on this question, three core empirical issues must be addressed: we must develop a measure of access to credit, we need a measure of the number of locally originated loans that have recently been sold to the secondary market, and we must allow for the possibly endogenous nature of the number of locally originated loans that are sold. Each of these is addressed as follows.

We proxy for access to credit using two different measures, the census tract share of loan applications that are originated in a given year (the extensive margin), and the tract-level median size of loans requested (the intensive margin). Later in the paper we argue that if credit rationing prevails in equilibrium such that loan rates do not clear the market, then improved access to secondary market financing would likely increase the share of loan applications that are originated.[5] In addition, because access to secondary markets likely reduces the loan rate offered to a given applicant, improved access to secondary market financing is also expected to increase the median size of loans requested.

To measure the number of locally originated loans recently sold to the secondary market we use a two-year lag of the number of loans sold from the county in which the target census tract is located. County-level geography is used here because primary lender contacts with distant secondary market

[3] Pennacchi (1988) was one of the first to formalize the "comparative advantage hypothesis," whereby banks selling loans to secondary markets have a comparative advantage in loan origination but a comparative disadvantage in loan funding. Carlstrom and Samolyk (1995) add a geographic dimension, suggesting that banks have a comparative advantage in loan originations in their local market area, and then sell local loans to banks in other localities.

[4] In the mortgage market, for example, local house price declines associated with employment shocks or natural disasters could prove catastrophic to local lenders if they held large stocks of mortgages in portfolio. Such risks are greatly mitigated in the secondary market because of its tremendous geographic scope.

[5] As will become apparent, we build off of a model of equilibrium credit rationing from Stiglitz and Weiss (1981). For related discussion, in part based on concerns about discrimination in mortgage markets, see also Canner and Gabriel (1992), Duca and Rosenthal (1993), Munnel et al (1996), Berkovec et al (1998), and Deng and Gabriel (2006), among others.

investors likely are enhanced by loans sales beyond the immediate census tract in which a given borrower is situated. We lag this measure by two years to allow for the fact that business relationships evolve over time and are sensitive to past interactions.[6]

To address the possibility that the number of nearby loan sales may be endogenous we first estimate census tract fixed effect models that control for time invariant unobserved local attributes. Although revealing (as will become apparent), this approach does not control for time-varying tract specific factors that could be correlated with time varying measures of the number of nearby loans that have been recently sold to the secondary market.[7] It also does not allow for dramatic changes in market conditions over the 1994-2008 period.

For both reasons, and more robust, we also estimate a series of census tract year-by-year two-stage least squares (2SLS) models in which we instrument for the number of nearby recent loan sales using the 1990 population of the county in which the census tract is located. The core identifying assumption here is that lagged county population affects the scale of contemporaneous activity in the local mortgage market but sales of locally originated loans do not affect either the size of the county's population or its lag. Instrument validity is further reinforced by two additional features of our specifications. First, as described above our dependent variables are expressed as a rate (the loan origination rate) or depend on rates (e.g. loan size requested declines with higher mortgage interest rates). This helps to break any mechanical relationship between the dependent variables and both the level of nearby loan sale activity and county population. Second, the 2SLS models include an extensive set of contemporaneous census tract controls. Those controls include census tract house values, the density of development in the census tract, a wide array of socioeconomic attributes of the population, and MSA fixed effects. Conditional on

[6] Only a few previous studies have drawn on the loan purchase data in HMDA, including Canner and Gabriel (1992), Bunce and Scheessele (1996), Manchester, Neal and Bunce (1998), and Bunce (2002), and Gabriel and Rosenthal (2010). Instead, for the most part, early HMDA studies analyzed loan application accept/reject decisions, typically with a focus on applicant race and ethnicity (see, for example, Avery, Beeson and Sniderman (1994, 1999), Munnell, Tootell, Browne, and McEneaney (1996), Avery, Beeson, and Calem (1997), Huck (2001), and Dietrich (2002)). Other HMDA studies have examined the share of primary market originations that are documented in the HMDA data (see, for example, Berkovec and Zorn (1996), FFIEC (1996)), and other related features of the mortgage market.

[7] For example, a major plant closing in the local community could cause both borrowers and loan purchasers to become more cautious in their behavior in subsequent years.

these controls, and given the other features of the model specifications, it seems likely that 1990 county population would only affect our dependent variables through its impact on loan sales and is therefore a valid instrument.

Several additional elements of our empirical design should also be highlighted. First, and most important, as suggested above, the year-by-year estimation of the 2SLS models allows for changes in market conditions over the sample horizon. Those changes include dramatic shifts in mortgage underwriting standards that are well known, in addition to dramatic innovations in communication technology that have reduced the cost of communication and of doing business with distant agents.[8] For these reasons, temporal patterns in our estimates are central to much of the analysis and discussion to follow.

We also stratify our analysis into conforming size versus nonconforming size ("jumbo") loans. This is motivated in part by studies in the banking literature on business loan markets. It is well known that corporate loans tend to be sold on the secondary market while small business loans tend to be held by the originating institution. Laderman (2006) suggests that this arises in part because of differences in access to information that affect the ability of secondary market investors to assess and manage exposure to risk: small businesses typically do not have detailed public financial statements, for example, and this makes it difficult for secondary market lenders to evaluate risk (see Petersen and Rajan (2002) and Agarwal and Hauswald (forthcoming) for related discussion).[9]

By analogy, over most of our sample period, conforming size loans in the residential market were often subject to relatively well-defined underwriting guidelines to ensure eligibility for purchase by

[8] Petersen and Rajan (2002), for example, argue that information technology has allowed the geographic distance between small businesses and their lenders to increase, suggesting that the importance of proximity to lenders may have diminished in recent years.

[9] Corporate loans are often also characterized by restrictive covenants that tend to be more stringent as the potential for agency and information related costs becomes more severe although Drucker and Puri (2008) argue that with competitive markets borrowers would only accept such restrictions in exchange for lower borrowing costs. Consistent with this view, Guner (2006) offers evidence that corporate borrowers secure lower cost financing when they work with a lender who sells their loans loan on the secondary market. He argues that in equilibrium, the lower borrowing costs compensate borrowers for increased complexity and transactions costs that arise when their loans are sold in tranches to multiple banks. See also Berger and Udell (1993), Haubrich and Thomson (1996), and Demsetz (2000) for related discussion.

Fannie Mae and Freddie Mac (the government sponsored agencies, or GSEs). Those guidelines have their origins in federal government regulations that require that a minimum share of loans purchased by the GSEs must have been issued to low-income and minority borrowers in targeted neighborhoods. Sales of jumbo loans are subject to no such restrictions. For this reason, non-conforming size loans tend to be much more heterogeneous, and this makes it more difficult for distant secondary market investors to assess exposure to risk in addition to complicating their efforts to form pools of relatively homogeneous loans for securitization. These considerations have implications for our empirical work. They suggest, for example, that the jumbo loan segment of the mortgage market should be less reliant on secondary market financing than the conforming size segment of the market. They also reinforce the idea that sales of jumbo loans may be sensitive to the presence of strong working relationships between local primary lenders and potentially distant secondary market investors who may otherwise be hesitant to purchase such loans.

Tables 1a and 1f confirm the first of these predictions (Tables 1b-1e are discussed later in the paper for reasons that will become apparent). These tables present summary measures of census tract loan activity for conforming sized (Table 1a) and non-conforming size (Table 1f) conventional, home purchase loans from 1994 through 2008 (data are obtained from the Home Mortgage Disclosure Act (HMDA)). Notice that the far right column of each table provides the ratio of loan purchases to originations in a given year. Observe also that purchase/origination ratios trended up for both loan types from 1994 to 2006 until falling back with the onset of the 2007 financial crisis. More importantly, for each sample year, the ratio of purchases to originations is considerably higher in the conforming as compared to the non-conforming sized sector. This is consistent with our priors outlined above. For these reasons, we conduct separate empirical analyses of the conforming and non-conforming size sectors of the market.

As a final feature of our empirical design, we stratify census tracts into low- and high-risk populations using two different stratification schemes. In some models we define high risk tracts as those with exceptionally high rates of unemployment in 2000. In other models we define a tract as high-risk if

it was designated as undeserved by the department of Housing and Urban Development (HUD) in 1993 for purposes of GSE loan purchase requirements. Low-risk census tracts are defined in an analogous but opposite manner (details are provide later in the paper). Because secondary markets increase lender opportunities to manage risk, improved access to secondary market financing should have a greater impact on borrower access to credit in high-risk communities. We test this idea.

Results for the conforming sized segment are striking and largely consistent with our priors. Estimates from the tract fixed effect models indicate that an increase in the scale of recent local loan sales to the secondary market increases both the share of applications that are originated and also the size of loans requested by borrowers. These effects are all highly significant and of economically important magnitudes. Findings also indicate that borrower access to credit in high-risk locations is especially sensitive to access to secondary markets. Estimates from the year-by-year cross-section 2SLS models reinforce these findings but are more nuanced. For the conforming size market, it is clear that the impact of the local scale of secondary market activity peaks in the late 1990s, diminishes thereafter, and is close to zero for all groups of census tracts after roughly 2003. This pattern is suggestive that proliferation of GSE automated underwriting and related information technology has allowed lenders in smaller local markets to access secondary market financing at a cost similar to that of lenders in larger markets. In that regard, our findings suggest that there has been some leveling out of the geographic playing field, at least in the conforming size sector.

In the non-conforming size "jumbo" loan sector a different pattern emerges. In no sample year are jumbo loan origination rates affected by the local scale of secondary market activity. But for each year over the sample horizon, median loan size requested is substantively higher in markets with locally active secondary markets. Indeed, for most years in the 2000s, the elasticity of loan size with respect to the scale of secondary market activity is roughly 6 percent and highly significant. Later in the paper we argue that these patterns are consistent with the absence of credit rationing in the jumbo loan market in conjunction with an outward shit in credit supply in locations in which primary lenders have better access to secondary market financing. These patterns also suggest that for the idiosyncratic jumbo loan sector,

established relationships between local primary lenders and distant secondary market investors remains important.

The paper proceeds as follows. Section 2 provides a simple conceptual framework that motivates our testable hypotheses and helps to clarify discussion to follow. Section 3 discusses the data, Section 4 provides results, and Section 5 concludes.

2. Model

2.1 Overview

This section provides a simple conceptual framework that motivates our primary testable hypotheses and helps to interpret the empirical work to follow. Recall that we measure access to credit using the census tract level share of loan applications that are originated and also the median size of tract-level loans requested. In both cases our focus is on whether enhanced access to secondary market financing increases borrower access to credit. We consider this question under two market regimes, one in which loan rates clear the market and one in which credit rationing may exist in the sense that excess demand for credit prevails at equilibrium loan rates. We begin with the market clearing model.

2.2 Market clearing equilibrium

Note first that demand for mortgage credit in a given community n and year t depends on local mortgage rates (r_{tn}) and the attributes of the local applicant pool (Z_{tn}) that proxy for tastes and preferences. Accordingly, the number of local applications for mortgage credit (A_{tn}) in n and t is written as,

$$A_{tn} = A(r_{tn}, Z_{tn}) \quad . \tag{2.1}$$

The supply of credit in a given community (S_{tn}) depends on the risk free cost of funds (c_t), which is assumed to be invariant across locations, attributes of the local applicant pool which affect lender exposure to risk, and the transactions cost of accessing secondary market investors. This latter term is assumed to depend on the number of locally originated loans that were sold to the secondary market two

years earlier as described in the Introduction. Accordingly, we write the local supply of mortgage credit as,

$$S_{tn} = S(c_t, P_{t-2,n}, Z_{tn}) \quad . \tag{2.2}$$

where $P_{t-2,n}$ is the number of loans sold to the secondary market in neighborhood n in period t-2.

It is also important to recognize that local equilibrium mortgage rates depend on all of the arguments of the demand and supply functions,

$$r_{tn} = r(c_t, P_{t-2,n}, Z_{tn}) \quad . \tag{2.3}$$

This suggests that even upon holding constant the attributes of the applicant pool, areas with high values for $P_{t-2,n}$ should enjoy lower loan rates because of an outward-shift in the local loan supply function. With downward sloping demand functions, this further suggests that an increase in $P_{t-2,n}$ should enhance access to credit in part by increasing loan size (the intensive margin). While our data do not allow us to directly observe loan rates, we do observe loan size allowing us to test this implication.[10]

2.3 *Credit rationing equilibrium*

Implicit in the discussion above is the assumption that the loan rate clears the market, in which case all loan applications would be originated and there would no systematic spatial variation in origination rates. This section addresses that issue by presenting an alternative market perspective that builds on a model of equilibrium credit rationing from Stiglitz and Weiss (1981). We first describe the model with a focus on the number of loans and origination rates. As the discussion develops, we also

[10] Evidence that active secondary markets reduce loan rates has proved difficult to produce, likely because of challenging identification issues. Lehnart, Passmore, and Sherlund (2008), for example, use time series VAR methods to examine the impact of GSE portfolio purchases and issuance of MBS between 1993 and 2005. Despite careful attention to the time series properties of the data and a number of robustness checks, they fail to find evidence that GSE activity affects either primary or secondary mortgage rate spreads. It is worth noting, however, that their focus is on GSE activity, and not on secondary market purchases per se. It is possible, therefore, that secondary markets more broadly defined could serve to lower market loan rates even if the incremental effect of GSE activity on loan rate spreads is limited. In addition, it is worth emphasizing that the identification strategy used by Lehnert, Passmore, and Sherlund (2008) relies on aggregate time series data in contrast to the geographic focus of this paper. See also Nothaft and Freund (2003) for a related analysis of multi-family mortgage rates.

reinterpret the model to provide insight into the possible impact of secondary market financing on loan size for a given borrower.

Figure 1 describes a four quadrant model of the demand and supply for credit in the primary mortgage market. A defining feature of the model is the general shape of the functions in the lower right quadrant which describe the expected return to mortgage investors (on the vertical axis) as a function of the loan interest rate (on the horizontal axis). Notice that regardless of whether secondary markets are present, the expected return from investing in a mortgage is assumed to initially increase with the loan rate, reach a peak, and then decline. This is because higher loan rates entail both benefits and cost for mortgage investors. On the one hand, higher mortgage rates generate higher interest payments that increase in proportion to the loan rate provided payments are made in a timely fashion. But, on the other hand, higher loan rates also increase lender exposure to costly sources of risk that are likely to increase at a nonlinear rate. These risks include the possibility that borrowers may exercise their call option to refinance at some point in the future (reducing the mortgage investor's return on the mortgage), or that borrowers may make late loan payments or default if they suffer a negative income shock.[11] As long as these potential costs increase at a nonlinear rate with the loan rate while interest payments increase linearly, expected returns will display the humped shape pattern in the lower right quadrant.

The lower left quadrant of the figure maps the expected return from investing in mortgages into the number of loans issued. This is then translated into the upper right quadrant as the loan supply function in the primary market. That function has a distinguishing humped shape that mirrors the shape of the expected return function in the lower right quadrant.

As described in detail by Stiglitz and Weiss (1981), for a humped shape loan supply function, a credit rationing equilibrium will arise if loan demand (in the upper right quadrant) intersects supply on the

[11] Default would also require that the borrower was in a negative net equity position as is the case for many families since the 2007 financial crash. Note also, that Stiglitz and Weiss (1981) motivate a similarly shaped expected return function by arguing that asymmetric information between borrowers and lenders contributes to adverse selection and moral hazard. In their modeling framework, as loan rates rise, borrowers who recognize that they may not be able to afford the higher loan payments drop out. In addition, with higher loan rates, investors favor higher risk investments as only such investments can generate expected returns high enough to offset the high borrower costs.

downward sloping portion of the supply function. In that instance, lenders maximize their expected returns by charging a loan rate equal to r^* at a point associated with the peak in the supply function and to the left of the market clearing rate (as determined by the intersection of supply and demand). For that reason, excess demand exists in equilibrium and some loan applications will be denied. If instead the demand function intersects the upward sloping portion of the supply function, then the loan rate clears the market and all loan applications are originated. In Figure 1, we display both scenarios by drawing two demand functions, one high and the other low.

Consider now the impact on borrower access to credit when secondary market financing is available. For reasons outlined earlier, access to secondary market financing should increase the mortgage investor's expected return on a loan origination for any given loan rate. Accordingly, access to secondary market financing shifts down the expected return function in the lower right quadrant, shifting up the supply function in the upper right quadrant. If loan demand is low, without access to secondary market financing equilibrium occurs at point *a*. With access to secondary market investors equilibrium occurs at point *b*. Notice that at point *b* loan rates are lower and the quantity of loans originated is larger. In addition, all loan applications are originated. This is the scenario outlined in the previous subsection.

Suppose instead that loan demand is high and the demand function intersects the downward sloping portion of the supply function. This implies that a credit rationing equilibrium is in force. Three cases could in principle arise and are as follows.

For the first case, notice that we have drawn both supply curves (with and without the secondary market) so that their peaks both occur at the same loan rate, r^*. This implies that the equilibrium loan rate would be the same regardless of access to secondary market financing (at r^*). Holding loan rate constant, the number of loan applications and the size of loans requested would also remain constant. On the other hand, the share of loan applications that are originated is clearly higher when primary lenders have access to secondary market financing. Thus, if secondary markets have only a modest effect on equilibrium loan rates, then impacts on the size of loans requested should also be modest but origination rates should be unambiguously higher.

For the second case, suppose that access to secondary markets reduces equilibrium loan rates by shifting the loan rate to a point somewhere to the left of r^*. Unambiguously, loan size requested will increase given the downward sloping nature of the demand curve. However, for a given demand function, impacts on origination rates are ambiguous and would depend on whether the leftward shift in the peak of the loan supply function was accompanied by an increase or decrease in the height of the peak. In contrast, for the third case, if access to secondary markets were to increase equilibrium loan rates (which seems unlikely but cannot be ruled out), then loan size requested will decline while the share of applications that are originated would increase. Moreover, as the loan rate approaches that of the market clearing rate origination rates would converge to 1.

Summarizing, if loan rates clear the market then access to secondary market financing should lower loan rates, increase the size of loans requested by borrowers, and have no systematic effect on origination rates. If instead a credit rationing equilibrium prevails, then the impact of access to secondary markets varies with the impact on equilibrium loan rates: (i) if loan rate effects are modest, then impacts on loan size requested will also be modest while origination rates will increase; (ii) if loan rates are reduced, then loan size requested will increase but impacts on origination rates are potentially ambiguous; (iii) if loan rates increase then loan size requested should decline while origination rates should increase.

In the empirical work to follow, various patterns are evident with respect to secondary market effects on loan size requested and origination rates, and in a manner that varies over time and across market segments. The scenarios above will help in interpreting those patterns.

3. Data and summary measures

3.1 Data

As noted earlier, our primary data for the analysis were obtained from the Home Mortgage Disclosure Act (HMDA) and the 1990 and 2000 census. Specifically, we drew upon the HMDA data

files for 1994, 1996, 1998, 2000, and every year thereafter through 2008. These data were obtained at the individual loan level and were aggregated to census tract values, the most refined level of geography identified in the data. Prior to 2003, HMDA data are reported based on 1990 census tract boundaries. From 2003 on, HMDA data are reported based on year-2000 census tract boundaries. We converted the earlier data to year-2000 boundaries to ensure that we follow the same neighborhood boundaries over time. Census tract data for 1990 and 2000 were then obtained from the neighborhood change data base produced by Geolytics, Inc. These data are all coded by Geolytics to year-2000 census tract geography and were merged with the HMDA data.

To further clean the data, certain loan records were dropped. When calculating tract-level mortgage outcomes (e.g. purchases, originations), individual loan records from the HMDA data were dropped if the type or purpose of the loan could not be determined. In addition, throughout the analysis, we retained only conventional, home purchase loans.

As highlighted in the Introduction, we also stratified the HMDA data into conforming size and non-conforming size loans. In the regressions to follow, all HMDA census tract aggregate variables were calculated separately for each loan type. When considering the conforming size segment of the market, all of the variables in the regressions models – specifically, the dependent variables, the number of nearby loans sold, and the HMDA census tract control measures – were based only on conforming size loans. When considering the non-conforming size segment of the market these variables were based only on non-conforming size loans.

When measuring tract-level loan origination rates, we divide the number of loan originations by the sum of originations and denials. This excludes loan applications that were withdrawn, incomplete, or approved but not originated. We drop those loan records when calculating origination rates because it seems likely that either the loan applicants decided they did not want to seek mortgage credit, or that they secured a mortgage loan from an alternate lender.

Finally, we restrict our samples to just those census tracts located in metropolitan statistical areas (MSAs). For each sample year, this yields roughly 50,000 tract-level observations. As noted in the

Introduction, we also use two different strategies to stratify the sample into high- and low-risk locations. In the first instance, we focus on tracts with unusually high and unusually low unemployment rates. These groups are defined as those with unemployment rates in the top and bottom quartiles as of the year 2000: specifically, unemployment above 7.8 percent and below 3.0 percent. The sample sizes for these groups are 13,210 census tracts and 13,072 census tracts, respectively. Our second approach to highlighting high- and low-risk locations is to stratify census tracts into those characterized by Congress (under the 1992 GSE Act) as underserved in 1992 versus those not classified as underserved. The sample sizes for these two groups are 21,031 and 27,659, respectively.

3.2 Sample Means

Table 1a presents summary measures for all conventional, home purchase loans below the conforming size limit for each sample year. As is broadly appreciated, the level of mortgage activity increased sharply over the 1994-2006 period and then crashed precipitously in 2007. Originations, for example, rose from 38.95 per tract in 1994 to a peak of 105.63 per tract in 2005, and then fell to 33.55 in 2008. As noted in the Introduction, the ratio of purchases to originations also moved up from roughly 60 percent in the early 1990s to roughly 100 percent by 2004, and remained at that high level even following the 2007 crash. This is consistent with the well known expansion in secondary market financing as a source of mortgage credit.

Tables 1b and 1c provide analogous summary measures for high- and low-unemployment census tracts, while Tables 1d and 1e display analogous measures for tracts that were classified as underserved and not underserved as of 1992. As expected, origination rates are lower in the high-unemployment (Table 1b) and underserved tracts (Table 1d). This is consistent with the idea that applications from these tracts are perceived as high risk. In 2000, for example, the origination rate among high unemployment tracts was 63 percent. For the low unemployment tracts (Table 1c), the corresponding value was 84 percent. Apart from these differences, the patterns in Tables 1b-1e are similar to those in Table 1a.

Table 1f provides a similar set of summary measures for conventional, jumbo home purchase loans of dollar magnitudes in excess of the conforming size limit. In this instance, we do not further stratify census tracts to highlight tracts with very high unemployment rates or those classified by congress as underserved. This is because the number of jumbo loan applications in such tracts is quite small.

Two items stand out in Table 1f that are worth highlighting. First, as observed in the Introduction, the ratio of loan purchases to originations is quite a bit lower in the non-conforming size sector of the mortgage market, reaching a peak of just 82 percent in 2006. Second, the pull back in secondary market financing with the onset of the 2007 crisis was especially dramatic, with purchase-to-origination ratios falling to 43 percent in 2008, and the level of purchases falling from a high of 22 loans per census tract in 2005 down to just 3 loans per tract in 2008. This is in sharp contrast to the conforming size segment of the market, where government takeover of the GSEs and related assurance of secondary market liquidity helped to keep purchase-origination ratios close to 1 even after the onset of the financial crisis. The lower purchase-to-origination ratios and the dramatic scaling back of secondary market financing in the jumbo loan sector highlights the greater reliance of this sector on portfolio lenders as a source of financing. We will return to this issue later in the paper.

4. Estimation Results

4.1 Tract fixed effect model

Estimates of the tract fixed effect models for conforming sized, conventional, home purchase loans are presented in Tables 2a and 2b. The dependent variables in these tables are, respectively, the log of the origination rate and the log of the median size of loans requested in a given census tract. The control for the number of nearby loans sold to the secondary market (lagged two years) is also in logs so its coefficient should be interpreted as an elasticity.

Consider first column 1 of Table 2a for which the sample is comprised of all census tracts in MSAs across the U.S. The coefficient on secondary market purchases is 0.0774, indicating an elasticity of 7.7 percent. This is consistent with the idea that a larger number of nearby loan sales reduces

transactions costs of access to secondary markets and increases the share of applications originated. Moreover, looking across columns, it is clear that this pattern is most pronounced among hard-pressed, high-risk communities. In column 2, the elasticity among tracts with unemployment in the top quartile in 2000 (with unemployment rates in excess of 7.8 percent) is sharply higher, at 10.79 percent. The same is true for tracts defined as underserved in 1992 (column 4), for which the elasticity is 11.98 percent. In contrast, the corresponding loan purchase elasticities for tracts in the bottom unemployment quartile (with unemployment below 3.0 percent in 2000) and those tracts that are not classified as underserved are significantly lower than their high-risk counterparts, at 5.18 percent and 5.72 percent, respectively, as reported in columns 3 and 5.

Estimates based on the log of the median loan size requested in the tract are reported in Table 2b. The core result is as before: a larger number of lagged nearby loan sales is associated with larger loan requests, consistent with the possibility that improved access to secondary market financing results in lower loan rates or more relaxed underwriting standards. However, evidence of differential effects across low- and high-risk neighborhoods is largely absent, with the elasticity of loan size with respect to the scale of the local secondary market equal to roughly 2 to 3 percent across the different samples, and a "full sample" elasticity of 3.03 percent.

Summarizing, the results in Tables 2a and 2b are suggestive that larger numbers of recent sales of locally originated loans reduces the transactions cost of accessing secondary market financing and increases local access to mortgage credit over the 1994 to 2008 period, on average. To the extent that origination rates provide a compelling measure of access to credit, there is also strong evidence that secondary markets have done more to enhance access to credit in high-risk communities. Recall, however, that the tract fixed effect models may be sensitive to time-varying unobserved factors that could be correlated with our measure of nearby loan sales. In addition, the tract fixed effect models constrain our estimates of secondary market effects to be identical across years. For these reasons, we turn now to the year-by-year 2SLS tract cross-section models which offer a more robust and richer assessment.

4.2 Year-by-year cross-sectional models

This section presents estimates from the year-by-year cross sectional models for conforming sized, conventional, home purchase mortgages. As described earlier, these regressions include MSA fixed effects along with an extensive set of tract socioeconomic and environment indicators, as well as the mortgage applicant attributes included in the tract fixed effect models. Because of the long list of controls and the many coefficients to consider across years and sub-samples (e.g. low- and high-unemployment tracts), a parsimonious presentation is necessary. Accordingly, Tables 3 through 5 display the year-by-year OLS and 2SLS estimates of the coefficient on the log of county-level secondary market purchases for the different models and sample stratifications. Also displayed are the first-stage coefficients on the 1990 county population size along with the t-ratio on that coefficient from the first stage. In all models, note that the standard errors are clustered at the MSA level. The full sample model results for each of the 2SLS regressions are provided in the appendix for review.

Consider now the estimates in Table 3 for the conforming size sample, and note that Panels A and B report results from the origination rate and median loan size regressions, respectively. In all instances, the first-stage instrument, 1990 county population, is very strongly correlated with county-level secondary market purchases. The t-ratios from the first stage are typically above 30 and often above 40. This enables us to rule out concerns about possible weak instrument bias (e.g. Stock and Yogo (2005)).

Focus next on the difference between the OLS and 2SLS estimates in each year and for each dependent variable. Reading across columns, in the 1990s, the OLS estimates for origination rates (Panel A) are always a smaller positive number as compared to the 2SLS estimates. From a purely statistical and descriptive perspective, this suggests that sales to the secondary market tend to be more prevalent in census tracts with lower origination rates, ceteris paribus. This is consistent with the idea that a core function of secondary markets is to arbitrage risk, in which case it would not be surprising that secondary market investors seek business opportunities in areas subject to high rates of denials (low origination rates). At the same time, it is important to recognize that the differences in the OLS and 2SLS estimates

are generally small and tend to disappear in the 2000s. Further, there is even less of a difference between the OLS and 2SLS estimates in Panel B (median application loan size).

Two competing explanations could potentially account for the similarity between the OLS and 2SLS estimates. The first is that our instrument (1990 county population) may be correlated with the model error term in a manner that is biasing the 2SLS estimates towards those of the OLS models. Although we cannot truly rule out that possibility, we believe that a second explanation is more plausible. Specifically, that the extensive set of control variables included in the model help to control for unobserved factors that would otherwise bias the OLS estimates (see the Appendix tables, for example). Recall also that the dependent variables are rates whereas our measure of local secondary market activity is reflective of the *scale* of recent nearby loan sales. On the strength of these features of the model specification, the OLS estimates may be relatively immune to simultaneity bias. Nevertheless, in the remainder of the discussion we focus primarily on the 2SLS estimates as we view those as being more robust, and especially in the earlier sample years.

Figures 2a and 2b plot the 2SLS secondary market purchase coefficients together with their upper and lower 95 percent confidence bands from Table 3 for the different panels, respectively. These plots provide a compelling picture of changes in the effect of locally active secondary markets on access to credit over the 1990s and 2000s. Note that for the origination rate regressions (Figure 2a), the estimated elasticity is small in 1994, rises to 3 percent in 1998, and then declines monotonically to an approximate asymptote close to zero for the years after 2003. For the median loan size requested (Figure 3b), the effect of locally active secondary markets is initially roughly 2 percent in 1994, but declines over time in an approximately monotonic fashion, approaching zero by 2006. The elasticity then increases somewhat with the onset of the financial crisis, moving back up to roughly 1.5 percent in 2008.

The patterns in Figures 2a and 2b share two important similarities and one obvious difference. Both suggest that larger numbers of nearby recent loan sales enhanced borrower access to conforming size mortgage loans in the 1990s, and both suggest that this effect largely dissipated in the 2000s (with some caveats). The primary difference between the two plots is for the years 1994 and 1996. In those

years the elasticities from the origination rate regressions (Figure 2a) are low relative to 1998. This creates a humped shape pattern in Figure 1a which is notably absent in Figure 2b. Two well documented trends seem likely to have contributed to these patterns. These include the increasing maturity of the secondary mortgage market and the increasing sophistication of information technology. We consider each below.

It is worth remembering that in 1994 the secondary market for conforming size loans was relatively underdeveloped with many lenders still holding a large share of mortgage debt in portfolio (as documented in Tables 1a-1f). In that environment, primary lenders would likely have been cautious about originating loans that they did not want to hold in portfolio. But as the secondary market matured over the 1990s, lenders would have become more experienced in origination of loans intended for sale in the secondary market. This "experience effect" would have enhanced the value of local business networks that facilitated contact with loan purchasers, hence increasing the importance of the local scale of secondary market activity for reasons suggested earlier. Once business contacts with secondary market purchasers had become established, and with further advances in automated underwriting and information technology, the influence of nearby recent loan sales on access to secondary market investors would have diminished. This could account for the humped shape pattern in Figure 1a. Why then is there no corresponding humped shape pattern in Figure 2b?

Given the discussion surrounding Figure 1, one possible explanation is that credit rationing became more prevalent as the 1990s progressed, increasing secondary market impacts on loan origination rates. However, this explanation seems implausible given a wealth of anecdotal evidence that underwriting standards were slowly relaxed over the period. As an alternative, suppose that local mortgage rates adjust downwards as local lenders begin to access secondary market financing. With locally competitive markets, all lenders in a nearby community will offer lower loan rates in order to compete with the marginal lender regardless of whether individual lenders access secondary markets or not. The reduced loan rates would induce borrowers to request larger loans but secondary market impacts on loan origination rates would only occur once sufficient numbers of local lenders gained access to

secondary market financing. This could have resulted in some delay in the eventual increase in loan origination rates and could account for the patterns in Figures 2a and 2b.[12]

Figures 3a-3b consider these issues further. The figures plot the 2SLS estimates of the nearby recent loan sale elasticities from Tables 4 and 5 for the different sample stratifications, including high- and low-unemployment, and underserved and not underserved tracts. Also plotted for reference are the full sample results just reported. Note also that in Figures 3a-3b we refrain from plotting the confidence bands for the different estimates in order to allow the core patterns to be more readily apparent. Standard errors for the individual estimates are contained in Tables 4 and 5. It is also worth emphasizing that the sample sizes for the "high" and "low" unemployment tracts are each only about 25 percent of the full sample of census tracts, which contributes to some of the volatility in their plotted series. The underserved and not underserved samples are larger, each accounting for about half of the full sample of census tracts (see the appendix tables for details), and display smoother plots for that reason.

A clear pattern emerges from these figures that reinforces estimates obtained from the tract fixed effect and year-by-year cross-sectional models. First, the patterns for the individual subsamples are largely consistent with those observed for the unified samples. Second, as with the tract fixed effect regressions, the effect of recent sales of locally originated loans to the secondary market is most pronounced for high-risk census tracts, including those with high unemployment rates and those that are defined as underserved by Congress. Moreover, those larger effects mostly peak in the 1990s and largely disappear by the mid-2000s.[13]

[12] Note also that for those local lenders that still held most of their loans in portfolio in the early 1990s, lower local loan rates would create incentives to originate a more conservative, lower risk pool of loans. This would likely tend to reduce the loan origination rate among portfolio lenders and may have contributed to the comparatively modest 1994-1996 origination effect in Figure 1a.

[13] It should be emphasized that the greatly diminished impact of the local scale of sales to the secondary market in the 2000s – even among high-risk tracts – does not imply that the geographic provisions of the 1992 GSE Act have become obsolete. Instead, it likely suggests that lenders in smaller local markets are now as able to access secondary market financing as those in more active areas, at least in the conforming size segment of the market.

4.3 Nonconforming sized loans

Our analysis thus far has focused on the conforming sized segment of the conventional, home purchase market. That segment accounted for roughly 80 percent of conventional, home purchase loan originations in most years over the sample horizon (see Tables 1a and 1f). It has also been the focus of much federal government intervention, including mandated GSE loan purchases among low-income populations and underserved areas stemming from the 1992 GSE Act. Nevertheless, there are lessons to be learned from the non-conforming size sector as well. In particular, as discussed in the Introduction, it seems likely that a credible analogy can be made between the non-conforming size segment of the market and small business loans.

We consider first the tract fixed effect models using data for just the non-conforming size loans.[14] In Table 6, observe that in the origination rate regression (the first column), the coefficient on the local scale of secondary market activity has the wrong sign (negative), is close to zero, and is insignificant. On the other hand, in the median loan size request regression (column 2), the elasticity with respect to the local scale of the secondary market is 17.2 percent and is highly significant. Taken at face value, this suggests that nearby recent sales of jumbo loans have had little impact on jumbo loan originations, but have increased loan size requests, presumably by lowering loan rates.

Consider next the more robust year-by-year cross-section models in Table 7. To conserve space, the full models associated with Table 7 are once again provided in the Appendix. In addition, rather than commenting on the specific values in the table, we focus on Figures 4a and 4b. Those figures plot the 2SLS coefficients on the local scale of secondary market activity, along with the 95 percent confidence bands.

A quick review of Figures 4a and 4b reveals noticeable differences between the non-conforming and conforming sized sectors of the conventional, home purchase market. For the origination rate regressions (Figure 4a), the elasticity with respect to the local scale of secondary market activity in the

[14] We do not stratify census tracts for the non-conforming size sector into high- and low-unemployment groups, or underserved and not underserved. That is because few jumbo loans are sold in the high unemployment or underserved census tracts.

non-conforming market is only about 0.5 percent through the 1990s (but not significant), and drops down to just below zero for the remainder of the sample horizon. Based only on loan origination rates, this fails to provide evidence that access to secondary markets increases borrower access to non-conforming size mortgage credit, at least as proxied by the number of nearby recent loan sales.

The patterns for the median loan size regressions (Figure 4b), however, suggest that there is more to the story. Although the confidence bands around our estimates in Figure 4b are always relatively large, three patterns are noteworthy. First, the elasticity associated with sales of locally originated jumbo loans to the secondary market is positive in every year and significantly different from zero throughout the 2000s. Second, the elasticity is stable from 2001 to 2007, at roughly 6 percent. Third, the elasticity appears to rise somewhat with the onset of the 2007 financial crisis, as it does for the conforming size segment of the market in Figure 2b. These patterns suggest that access to secondary market financing reduces jumbo loan rates and thereby increases loan size requested. In conjunction with the patterns in Figure 4a and discussion around Figure 1, the evidence is also consistent with an environment in which loan rates clear the market. Finally, these patterns are suggestive that the scale of recent nearby loan sales, and by inference, business relationships between local primary lenders and distant secondary market investors, continues to reduce transactions costs and enhance access to jumbo loan credit.

5. Conclusion

This paper provides empirical evidence that markets for mortgage loan sales in the U.S. enhance access to mortgage credit over the 1994 – 2008 period. Central to our empirical strategy is an idea fundamental to the literature on agglomeration economies (e.g. Glaeser and Gottlieb (2009), Rosenthal and Strange (2004) or Duranton and Puga (2004)). Specifically, we argue that as the scale of locally originated loans sold to the secondary market increases, this strengthens business contacts between local primary lenders and distance secondary market investors. Once established, those contacts reduce the transactions cost of selling subsequent loans to the secondary market. This increases local primary lender access to secondary market financing and thereby increases local borrower access to credit.

Our analysis is conducted separately for the non-conforming and conforming size segments of the conventional, home purchase market. Evidence from the non-conforming (jumbo size) sector is suggestive that access to secondary markets lowers local loan rates increasing the size of loans requested. Moreover, for the jumbo loan sector, the scale of interactions between local primary and secondary market investors remains important throughout the 2000s. This is consistent with the idea that the risks associated with jumbo loans are more idiosyncratic in nature than for conforming size mortgages, and that jumbo loan sales remain especially sensitive to strong business contacts with secondary market investors for that reason. This would be analogous to small business loan markets in which a close relationship between agents (borrower and primary lender in this case) is necessary if the ultimate investor in the loan is to assess gain access to "soft" information necessary to assess and monitor risk (e.g. Laderman (2006).

Evidence from the conforming size sector of the mortgage market is in some respects more far reaching. The patterns in this sector are suggestive that high-risk segments of the market benefit most from improved access to secondary mortgage markets. In the 1990s, for example, secondary market effects on local loan origination rates and the size of loans requested are notably higher in high-unemployment and underserved census tracts, locations that are likely perceived as high-risk areas. These findings are consistent with the geographic targeting of conforming size loan purchases in underserved neighborhoods as embodied in the 1992 GSE Act.

From a broader perspective, our findings confirm that for more uniform loans, secondary market access increases borrower access to credit, and especially so for higher risk segments of the market. Moreover, relative to the 1990s, lenders operating in smaller local markets are less disadvantaged in their ability to access secondary market financing as compared to lenders operating in more active locations. On the other hand, for those types of loans most subject to idiosyncratic risk – as with non-conforming size mortgages and small business loans – secondary markets play a lesser role and relationships between local lenders and secondary market investors appear likely to remain important.

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Figure 1: Primary Mortgage Market With and Without a Secondary Financing

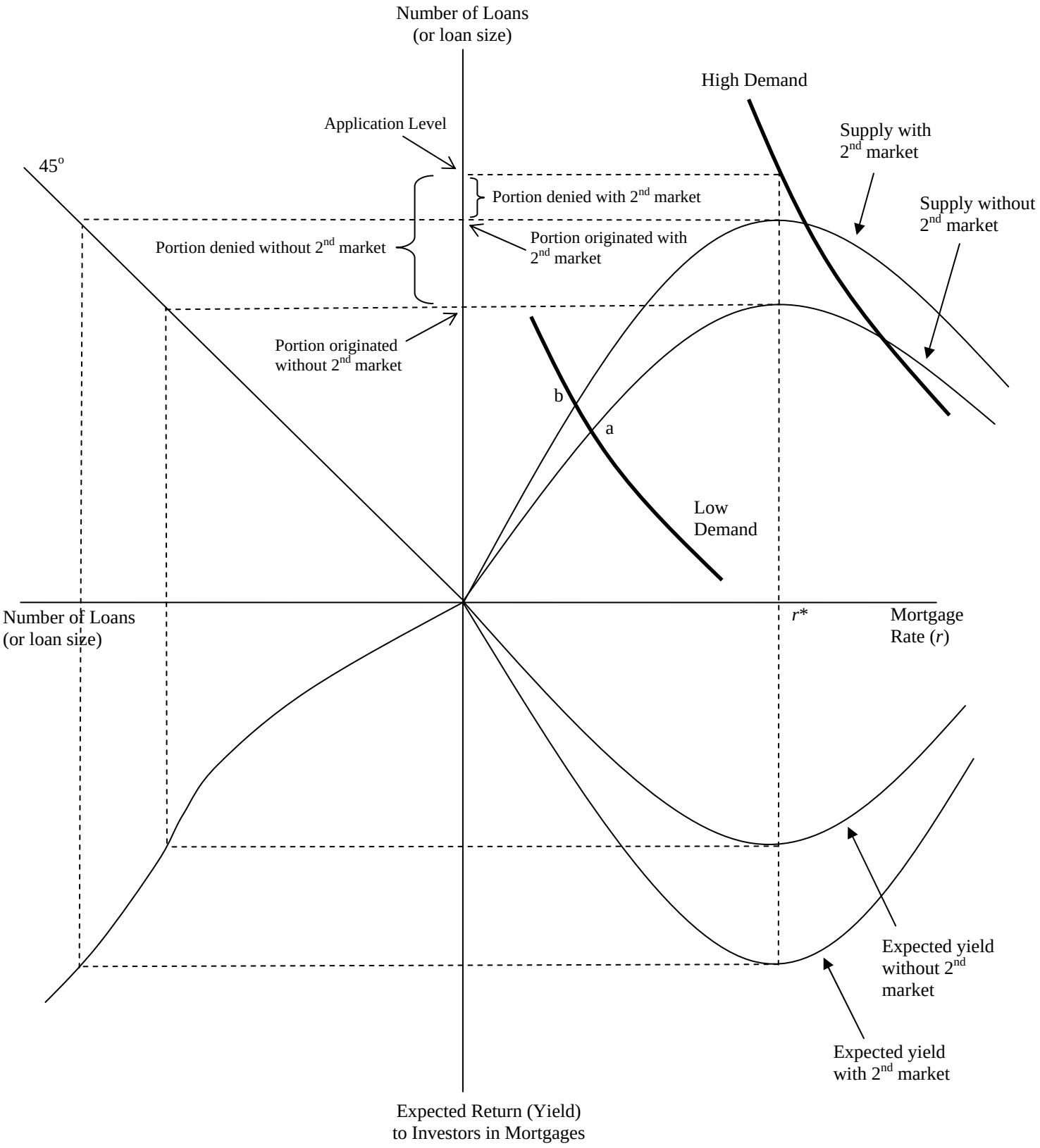

Figure 2a: Log Origination Rates for Conforming Sized Loans

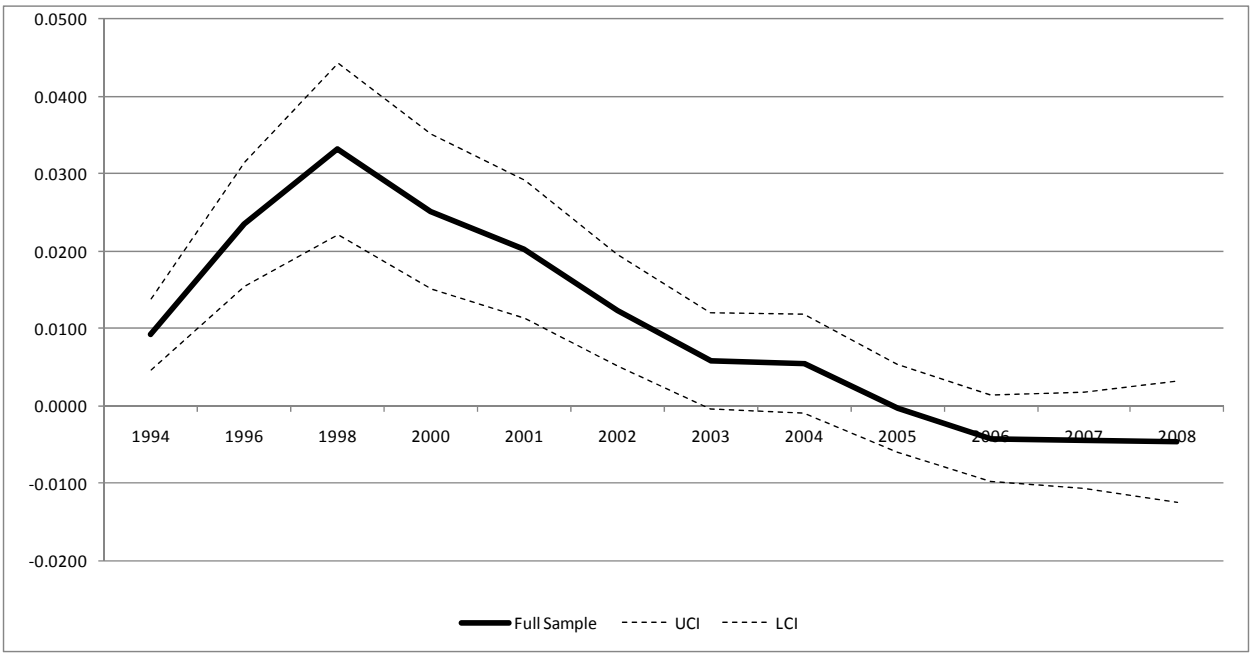

Figure 2b: Log Loan Size Request for Conforming Sized Loans

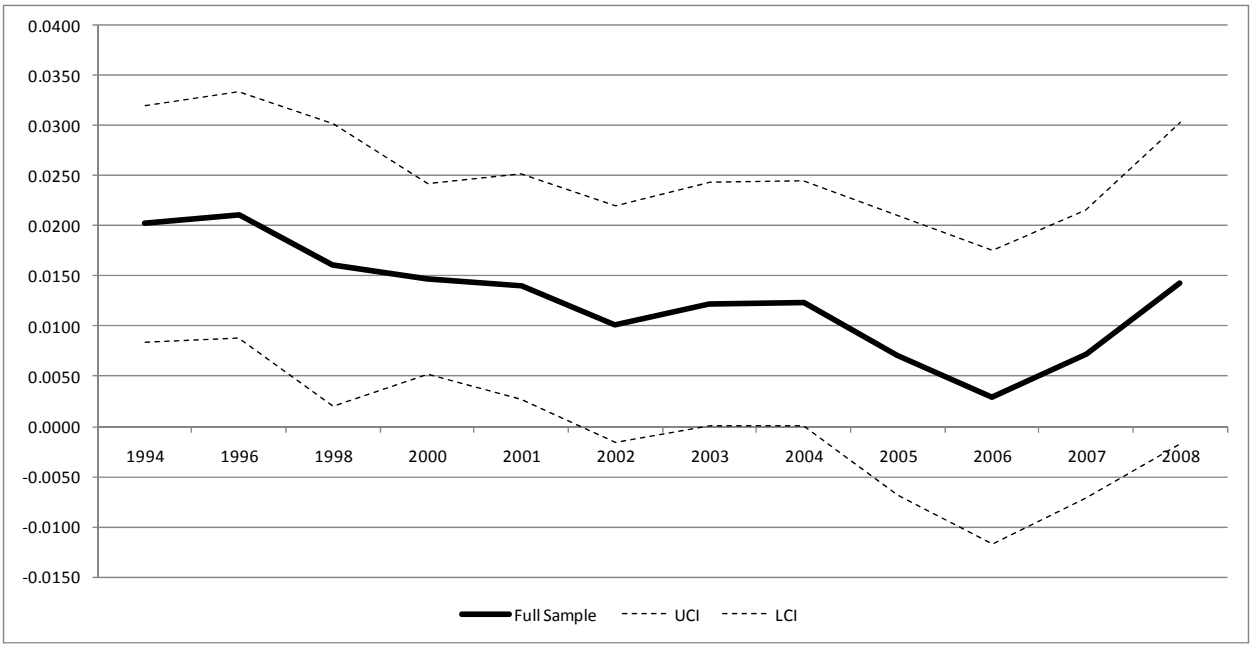

Figure 3a: Log Origination Rates for Conforming Sized Loans by Tract Economic Status

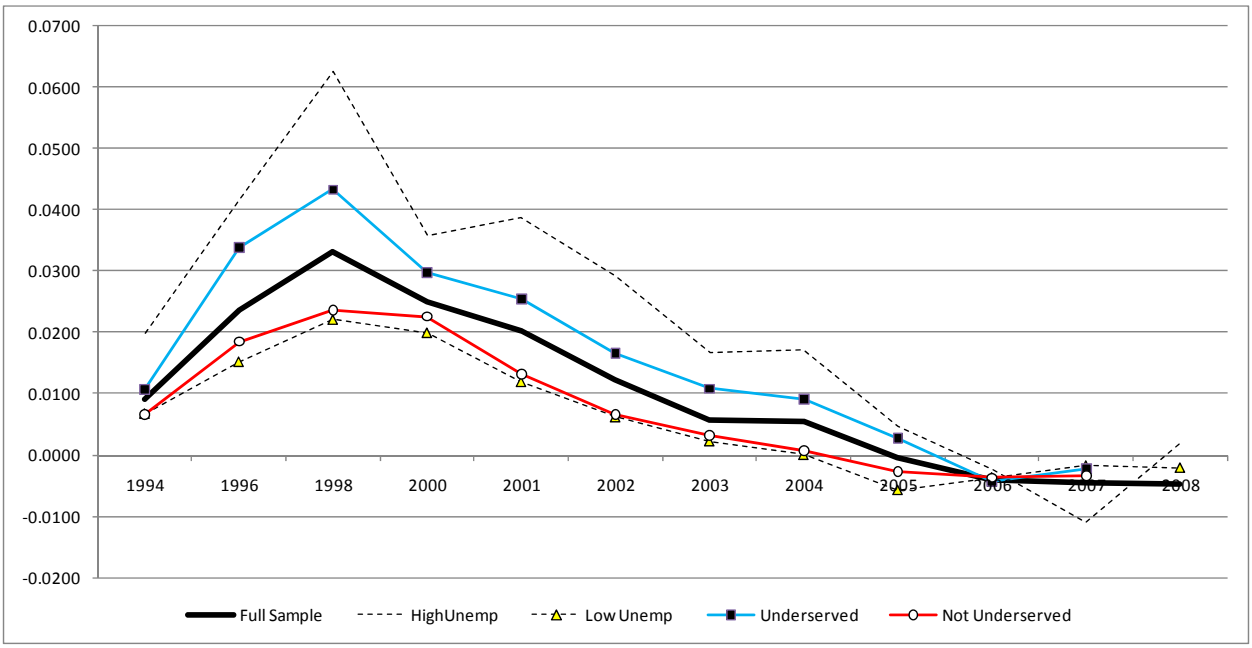

Figure 3b: Log Loan Size Request for Conforming Sized Loans by Tract Economic Status

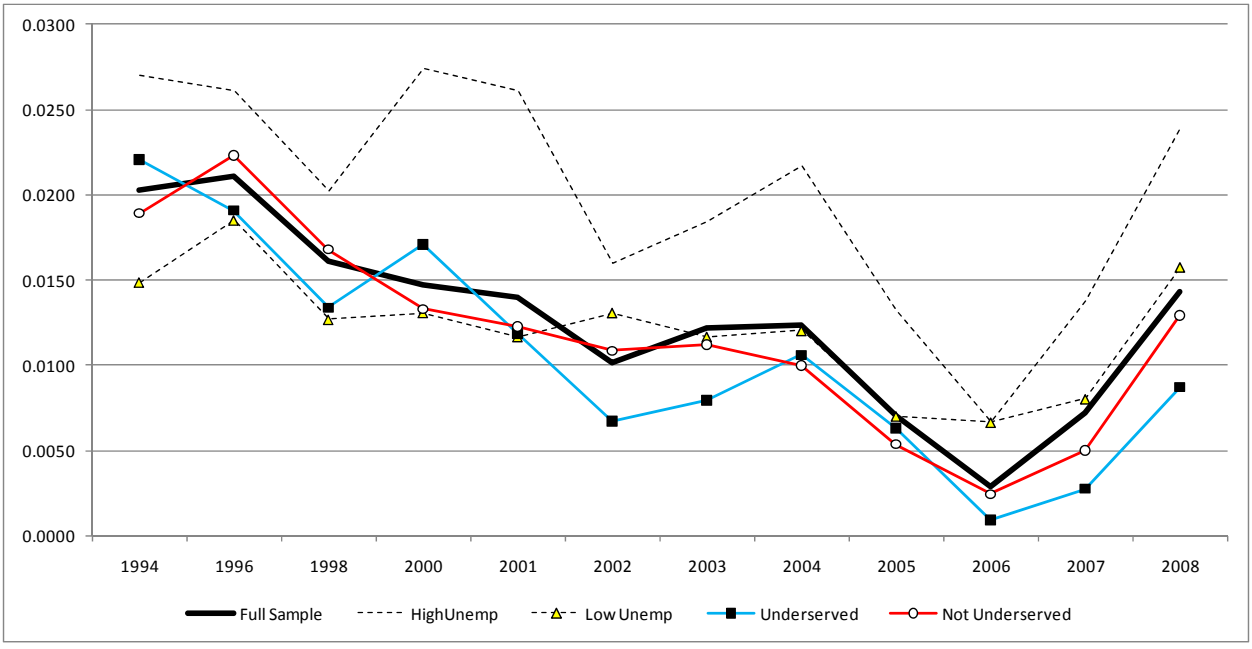

Figure 4a: Log Origination Rates for Non-Conforming Sized Loans

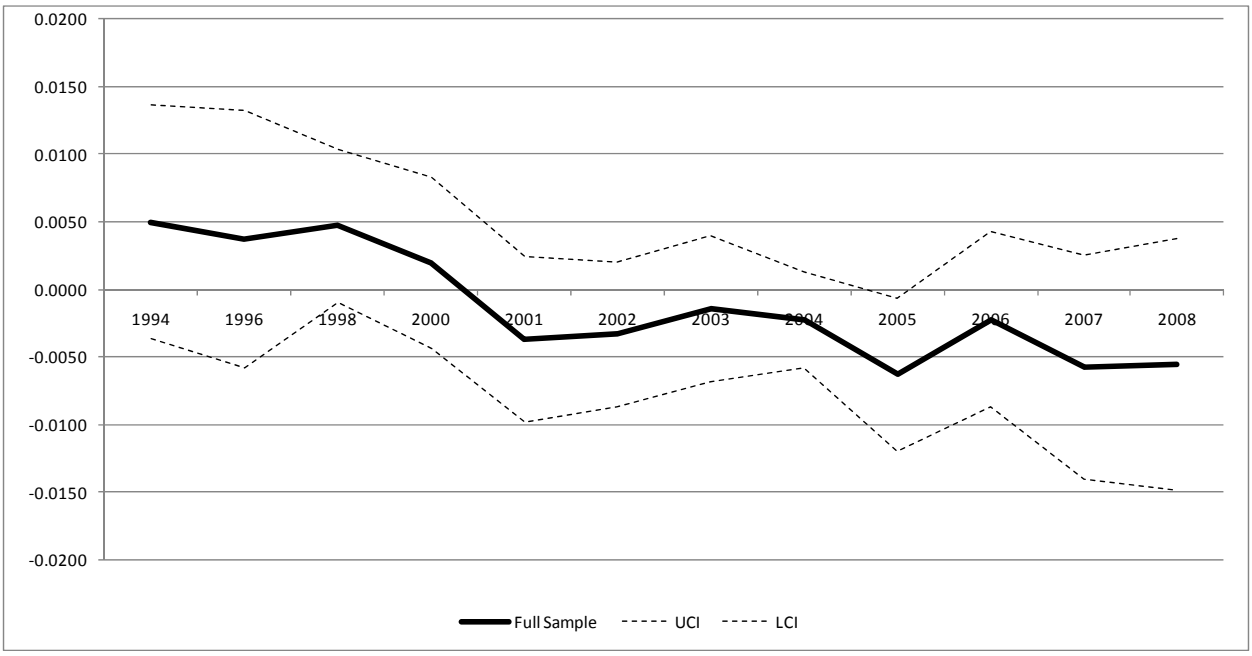

Figure 4b: Log Median Loan Size Request for Non-Conforming Sized Loans

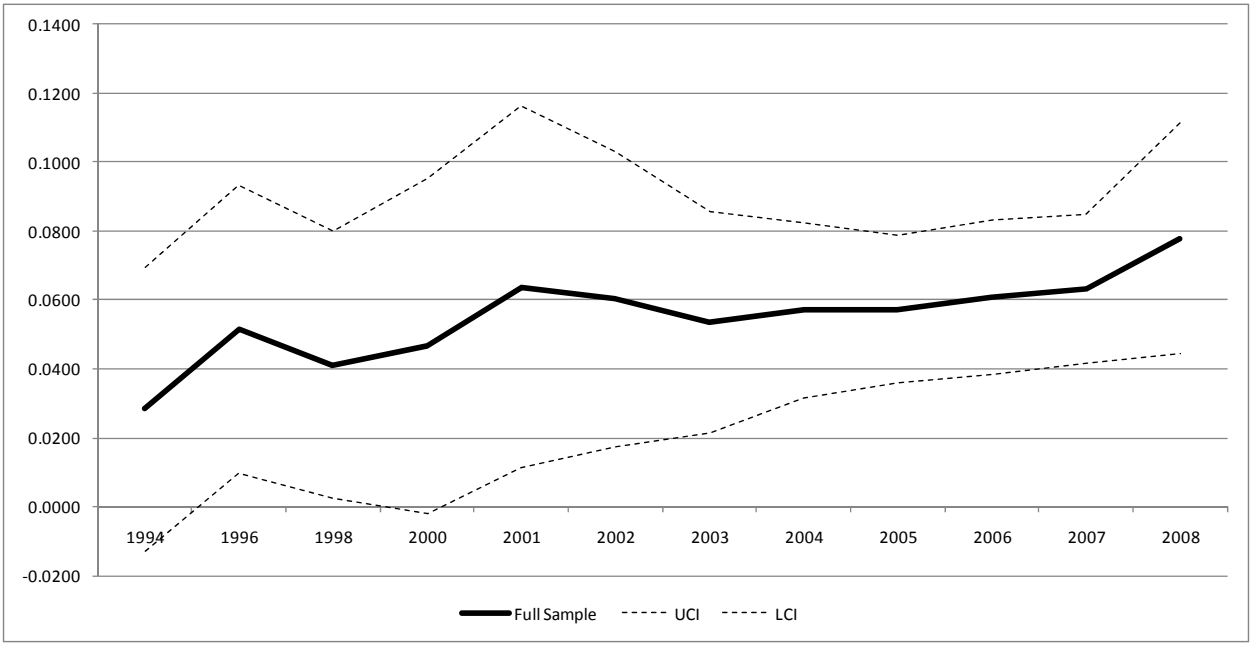

Table 1a
Sample Means for Conventional Home Purchase Loans
BELOW the Conforming Size Limit
All Census Tracts

Year	Originations	Denials	Originations/ (Orig + Denials) [a]	Secondary Market Purchases	Purchases/ Originations
1994	38.95	7.12	0.82	23.68	0.58
1996	43.21	13.44	0.77	30.49	0.68
1998	53.44	18.68	0.74	46.19	0.84
2000	56.36	18.68	0.74	47.92	0.81
2001	60.10	14.04	0.78	53.55	0.86
2002	64.83	11.86	0.81	61.22	0.91
2003	74.51	13.81	0.81	72.21	0.94
2004	88.66	18.70	0.80	90.09	0.99
2005	105.63	25.29	0.79	109.41	0.99
2006	99.80	27.12	0.77	110.89	1.07
2007	65.72	17.89	0.76	73.84	1.06
2008	33.55	8.40	0.78	35.46	1.01

Table 1b
Sample Means for Conventional Home Purchase Loans
BELOW the Conforming Size Limit
Census Tracts with High Unemployment (Top 25%; > 7.8%) in 2000

Year	Originations	Denials	Originations/ (Orig + Denials) [a]	Secondary Market Purchases	Purchases/ Originations
1994	17.18	5.63	0.75	8.93	0.50
1996	18.02	10.68	0.67	11.59	0.63
1998	21.81	14.80	0.64	17.74	0.81
2000	26.25	15.93	0.63	20.71	0.75
2001	27.04	12.02	0.67	22.96	0.82
2002	31.80	10.66	0.72	29.80	0.89
2003	39.06	13.04	0.72	37.46	0.91
2004	52.86	18.41	0.72	52.88	0.96
2005	65.63	25.61	0.70	67.32	0.97
2006	62.93	29.48	0.70	68.49	1.04
2007	34.73	18.29	0.64	37.74	1.03
2008	16.37	7.67	0.67	16.42	0.96

Table 1c
Sample Means for Conventional Home Purchase Loans
BELOW the Conforming Size Limit
Census Tracts with Low Unemployment (Bottom 25%; < 3.0%) in 2000

Year	Originations	Denials	Originations/ (Orig + Denials) [a]	Secondary Market Purchases	Purchases/ Originations
1994	54.67	6.33	0.89	35.55	0.63
1996	61.31	11.16	0.85	45.11	0.72
1998	76.29	15.20	0.84	68.29	0.87
2000	76.95	15.17	0.84	67.94	0.86
2001	84.40	11.69	0.87	77.44	0.89
2002	87.87	10.13	0.89	83.956	0.93
2003	98.37	11.69	0.88	96.04	0.96
2004	111.39	15.83	0.87	114.18	1.00
2005	128.15	20.93	0.85	133.52	1.01
2006	122.40	21.71	0.85	137.57	1.09
2007	87.74	15.24	0.85	100.23	1.08
2008	47.38	7.86	0.85	51.79	1.06

Table 1d
Sample Means for Conventional Home Purchase Loans
BELOW the Conforming Size Limit
Census Tracts Classified as Underserved in 1992

Year	Originations	Denials	Originations/ (Orig + Denials) [a]	Secondary Market Purchases	Purchases/ Originations
1994	23.77	7.03	0.77	13.03	0.53
1996	26.09	13.40	0.70	17.26	0.65
1998	32.22	18.53	0.66	26.42	0.81
2000	37.42	19.46	0.66	30.09	0.77
2001	38.35	14.63	0.70	32.67	0.82
2002	43.59	12.34	0.75	40.34	0.89
2003	52.95	14.49	0.76	50.57	0.92
2004	68.41	19.92	0.75	68.67	0.97
2005	84.68	27.36	0.73	87.11	0.98
2006	80.11	30.17	0.71	87.79	1.05
2007	47.80	19.19	0.69	52.53	1.04
2008	22.67	8.38	0.70	22.91	0.97

Table 1e
Sample Means for Conventional Home Purchase Loans
BELOW the Conforming Size Limit
Census Tracts Classified as Not Underserved in 1992

Year	Originations	Denials	Originations/ (Orig + Denials) [a]	Secondary Market Purchases	Purchases/ Originations
1994	52.07	7.38	0.87	32.89	0.62
1996	57.03	12.87	0.83	41.32	0.71
1998	70.87	17.88	0.81	62.72	0.87
2000	72.16	17.58	0.81	62.99	0.85
2001	78.22	13.37	0.85	71.12	0.89
2002	82.79	11.44	0.87	79.17	0.93
2003	92.93	13.38	0.87	91.05	0.96
2004	106.31	18.03	0.85	108.93	1.01
2005	123.67	24.05	0.83	128.90	1.01
2006	116.64	25.18	0.82	130.75	1.09
2007	80.26	17.08	0.82	91.20	1.09
2008	42.05	8.44	0.82	45.41	1.05

Table 1f
Sample Means for Conventional Home Purchase Loans
ABOVE the Non-Conforming Size Limit
All Census Tracts

Year	Originations	Denials	Originations/ (Orig + Denials) [a]	Secondary Market Purchases	Purchases/ Originations
1994	8.41	1.06	0.91	4.31	0.47
1996	8.43	1.36	0.89	4.95	0.54
1998	10.88	1.30	0.90	9.12	0.74
2000	12.80	1.88	0.87	8.32	0.61
2001	10.69	1.52	0.88	7.86	0.65
2002	12.92	1.62	0.89	9.88	0.71
2003	16.33	2.48	0.87	13.01	0.76
2004	20.47	3.92	0.86	17.21	0.72
2005	23.10	5.47	0.84	21.99	0.80
2006	15.38	5.20	0.80	14.70	0.82
2007	11.12	4.65	0.76	8.13	0.68
2008	6.13	2.13	0.81	2.99	0.43

Table 2a: Log Origination Rate Tract Fixed Effect Regressions for Conforming Sized Loans
(t-ratios based on standard errors clustered at the MSA level in parentheses)

	Full Sample	High Unemp Rate in 2000 (Top 25% > 7.8%)	Low Unemp Rate in 2000 (Bottom 25% < 3.0%)	Under-Served in 1992	Not Under-Served In 1992
Log county 2nd market loan purchases	0.0774	0.1079	0.0518	0.1198	0.0572
	(6.42)	(4.86)	(6.87)	(6.96)	(6.36)
Log tract median loan size application	0.0214	-0.0223	0.0659	0.0017	0.0362
	(1.56)	(-0.85)	(5.07)	(0.09)	(2.71)
Log tract median income of applicants	0.0797	0.0789	0.0417	0.0687	0.0624
	(3.01)	(2.25)	(2.89)	(2.39)	(3.10)
Log tract % app. Af. Amer. or Hispanic	0.0285	0.0133	-0.1240	0.0428	0.0745
	(0.53)	(0.25)	(-2.02)	(0.84)	(1.20)
Log tract % applicants female	-0.2971	-0.2152	-0.2060	-0.2779	-0.3258
	(-6.96)	(-4.97)	(-6.89)	(-6.48)	(-9.16)
Year Fixed Effects	12	12	12	12	12
Tract Fixed Effects	51339	13202	13065	21016	27658
Observations	605021	152023	153743	247064	330611
R-squared	0.07	0.07	0.07	0.08	0.09

Table 2b: Log Median Loan Size Request Tract Fixed Effect Regressions for Conforming Sized Loans (t-ratios based on standard errors clustered at the MSA level in parentheses)

	Full Sample	High Unemp Rate in 2000 (Top 25% > 7.8%)	Low Unemp Rate in 2000 (Bottom 25% < 3.0%)	Under-Served in 1992	Not Under-Served In 1992
Log county 2nd market loan purchases	0.0303	0.0179	0.0274	0.0240	0.0288
	(2.61)	(1.26)	(1.80)	(1.44)	(2.28)
Log tract median income of applicants	0.5428	0.4940	0.5216	0.5458	0.5447
	(16.56)	(19.92)	(11.68)	(21.83)	(9.92)
Log tract % app. Af. Amer. or Hispanic	-0.0986	-0.0927	-0.0227	-0.0659	-0.0756
	(-2.52)	(-2.71)	(-0.39)	(-1.82)	(-1.32)
Log tract % applicants female	-0.0752	0.0747	-0.1624	0.0239	-0.1837
	(-3.45)	(2.70)	(5.83)	(0.87)	(-5.64)
Year Fixed Effects	12	12	12	12	12
Tract Fixed Effects	51339	13202	13065	21016	27658
Observations	605021	152023	153743	247064	330611
R-squared	0.83	0.8	0.83	0.82	0.85

Table 3: OLS and 2SLS By Year for all MSA Census Tracts for Conforming Sized Loans
(t-ratios based on standard errors clustered at the MSA level in parentheses)

Panel A: Log Origination Rates

	1994	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
OLS Log 2nd Market Purchase	0.0049	0.0174	0.0275	0.0231	0.0191	0.0126	0.0081	0.0082	0.0024	-0.0020	-0.0035	-0.0038
	(2.50)	(4.93)	(5.54)	(4.61)	(4.51)	(3.80)	(2.55)	(2.81)	(0.89)	(-0.74)	(-1.16)	(-1.04)
2SLS Log 2nd Market Purchase	0.0092	0.0235	0.0332	0.0251	0.0202	0.0124	0.0057	0.0054	-0.0003	-0.0042	-0.0044	-0.0047
	(4.00)	(5.88)	(6.02)	(5.02)	(4.54)	(3.41)	(1.85)	(1.70)	(-0.12)	(-1.50)	(-1.41)	(-1.19)
1st Stage Instrument (# tracts in county)	1.0458	1.0237	0.8777	0.8768	0.8730	0.8646	0.8694	0.8879	0.8860	0.8788	0.8972	0.9042
1st Stage Instrument t-ratio	(21.48)	(26.75)	(39.55)	(38.48)	(36.74)	(38.49)	(37.28)	(40.66)	(38.81)	(43.37)	(45.63)	(42.74)

Panel B: Log Median Loan Size

	1994	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
OLS Log 2nd Market Purchase	0.0185	0.0208	0.0177	0.0201	0.0170	0.0133	0.0153	0.0157	0.0114	0.0077	0.0103	0.0149
	(6.21)	(5.85)	(4.01)	(5.19)	(5.07)	(3.29)	(3.45)	(3.21)	(1.83)	(1.17)	(1.58)	(2.29)
2SLS Log 2nd Market Purchase	0.0202	0.0211	0.0161	0.0147	0.0140	0.0102	0.0122	0.0123	0.0071	0.0029	0.0072	0.0143
	(3.43)	(3.42)	(2.28)	(3.10)	(2.48)	(1.72)	(2.01)	(2.02)	(1.02)	(0.40)	(1.00)	(1.79)
1st Stage Instrument (# tracts in county)	1.0484	1.0262	0.8790	0.8781	0.8744	0.8655	0.8706	0.8891	0.8866	0.8790	0.8976	0.9047
1st Stage Instrument t-ratio	(21.37)	(26.53)	(39.54)	(38.59)	(36.56)	(38.41)	(37.41)	(40.91)	(38.86)	(43.53)	(45.83)	(42.92)

Table 4: OLS and 2SLS Origination Rates By Year and High/Low Risk Census Tracts for Conforming Sized Loans
(t-ratios based on standard errors clustered at the MSA level in parentheses)

Panel A: Underserved

	1994	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
OLS Log 2nd Market Purchase	0.0047	0.0246	0.0338	0.0273	0.0231	0.0149	0.0138	0.0117	0.0063	-0.0024	-0.0015	-0.0022
	(1.57)	(4.37)	(3.94)	(3.76)	(3.89)	(3.19)	(2.76)	(2.94)	(1.42)	(-0.56)	(-0.29)	(-0.36)
2SLS Log 2nd Market Purchase	0.0107	0.0339	0.0433	0.0298	0.0255	0.0166	0.0108	0.0091	0.0027	-0.0044	-0.0023	-0.0019
	(2.71)	(4.64)	(4.49)	(3.69)	(3.67)	(3.01)	(2.02)	(2.03)	(0.58)	(-1.03)	(-0.44)	(-0.35)
1st Stage Instrument (# tracts in county)	1.1791	1.0111	0.9098	0.9047	0.9113	0.8988	0.9066	0.9242	0.9183	0.9031	0.9189	0.9229
1st Stage Instrument t-ratio	(24.11)	(32.98)	(41.97)	(40.65)	(38.08)	(36.21)	(34.29)	(35.52)	(33.93)	(37.29)	(36.30)	(34.14)

Panel B: Not Underserved

	1994	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
OLS Log 2nd Market Purchase	0.0035	0.0162	0.0192	0.0190	0.0135	0.0077	0.0051	0.0026	-0.0003	-0.0012	-0.0020	-0.0016
	(2.15)	(6.42)	(5.22)	(5.19)	(4.34)	(3.25)	(2.36)	(1.16)	(-0.17)	(-0.55)	(-0.81)	(-0.62)
2SLS Log 2nd Market Purchase	0.0066	0.0185	0.0236	0.0226	0.0132	0.0066	0.0032	0.0007	-0.0027	-0.0037	-0.0034	-0.0041
	(3.78)	(6.98)	(6.12)	(5.53)	(3.94)	(2.50)	(1.45)	(0.27)	(-1.32)	(-1.69)	(-1.19)	(-1.27)
1st Stage Instrument (# tracts in county)	0.9625	0.8772	0.8033	0.8029	0.7985	0.7944	0.7932	0.8115	0.8131	0.8179	0.8418	0.8539
1st Stage Instrument t-ratio	(20.19)	(27.86)	(34.27)	(33.61)	(30.40)	(32.80)	(32.16)	(34.27)	(33.02)	(37.20)	(39.38)	(37.73)

Panel C: High Unemployment (Top 25%; > 7.8%)

	1994	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
OLS Log 2nd Market Purchase	0.0128	0.0233	0.0505	0.0355	0.0349	0.0268	0.0181	0.0193	0.0066	-0.0016	-0.0082	-0.0015
	(2.72)	(2.41)	(5.53)	(3.44)	(4.08)	(3.24)	(2.84)	(3.75)	(1.22)	(-0.24)	(-1.22)	(-0.18)
2SLS Log 2nd Market Purchase	0.0200	0.0414	0.0626	0.0358	0.0387	0.0293	0.0167	0.0171	0.0046	-0.0024	-0.0110	0.0019
	(3.80)	(3.81)	(5.38)	(3.35)	(3.63)	(3.01)	(2.26)	(2.64)	(0.77)	(-0.34)	(-1.50)	(0.22)
1st Stage Instrument (# tracts in county)	1.0793	1.1174	0.9626	0.9607	0.9567	0.9409	0.9622	0.9914	0.9792	0.9540	0.9680	0.9705
1st Stage Instrument t-ratio	(13.00)	(20.32)	(32.56)	(31.81)	(30.58)	(27.76)	(28.55)	(29.85)	(26.21)	(29.75)	(29.21)	(25.79)

Panel D: Low Unemployment (Bottom 25%; < 3.0%)

	1994	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
OLS Log 2nd Market Purchase	0.0039	0.0126	0.0200	0.0185	0.0138	0.0078	0.0034	0.0020	-0.0031	-0.0013	-0.0001	0.0006
	(2.18)	(4.84)	(4.79)	(4.12)	(3.58)	(2.66)	(1.18)	(0.80)	(-1.31)	(-0.54)	(-0.03)	(0.18)
2SLS Log 2nd Market Purchase	0.0067	0.0152	0.0221	0.0199	0.0119	0.0062	0.0022	0.0000	-0.0057	-0.0037	-0.0017	-0.0021
	(3.15)	(5.03)	(4.97)	(4.17)	(2.87)	(1.79)	(0.81)	(0.01)	(-2.21)	(-1.51)	(-0.60)	(-0.52)
1st Stage Instrument (# tracts in county)	0.9870	0.9332	0.8303	0.8303	0.8197	0.8090	0.8038	0.8180	0.8216	0.8237	0.8447	0.8526
1st Stage Instrument t-ratio	(20.23)	(24.93)	(29.91)	(29.54)	(30.44)	(33.64)	(32.65)	(36.22)	(35.88)	(40.06)	(42.54)	(39.95)

Table 5: OLS and 2SLS Log Median Loan Size Request By Year and High/Low Risk Census Tracts for Conforming Sized Loans
(t-ratios based on standard errors clustered at the MSA level in parentheses)

Panel A: Underserved

	1994	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
OLS Log 2nd Market Purchase	0.0194	0.0183	0.0126	0.0183	0.0130	0.0083	0.0091	0.0106	0.0062	0.0011	0.0019	0.0063
	(6.07)	(4.31)	(2.51)	(4.19)	(3.31)	(1.53)	(1.64)	(1.71)	(0.70)	(0.12)	(0.23)	(0.85)
2SLS Log 2nd Market Purchase	0.0220	0.0191	0.0134	0.0171	0.0119	0.0068	0.0079	0.0106	0.0063	0.0010	0.0028	0.0087
	(4.13)	(3.00)	(2.05)	(3.19)	(1.98)	(0.96)	(1.18)	(1.54)	(0.72)	(0.11)	(0.31)	(0.95)
1st Stage Instrument (# tracts in county)	1.1815	1.0119	0.9101	0.9054	0.9118	0.8991	0.9069	0.9245	0.9184	0.9031	0.9189	0.9228
1st Stage Instrument t-ratio	(24.03)	(32.61)	(41.76)	(40.55)	(37.88)	(36.19)	(34.30)	(35.45)	(33.84)	(37.29)	(36.22)	(33.94)

Panel B: Not Underserved

	1994	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
OLS Log 2nd Market Purchase	0.0180	0.0247	0.0200	0.0192	0.0160	0.0152	0.0161	0.0151	0.0111	0.0098	0.0108	0.0158
	(5.53)	(6.41)	(4.16)	(4.92)	(4.31)	(4.02)	(4.17)	(3.60)	(2.33)	(1.88)	(2.14)	(3.24)
2SLS Log 2nd Market Purchase	0.0189	0.0223	0.0168	0.0133	0.0123	0.0109	0.0112	0.0100	0.0054	0.0025	0.0051	0.01230
	(3.63)	(3.87)	(2.36)	(3.17)	(2.66)	(2.15)	(2.21)	(1.91)	(0.88)	(0.38)	(0.84)	(2.19)
1st Stage Instrument (# tracts in county)	0.9658	0.8804	0.8057	0.8040	0.8001	0.7962	0.7954	0.8129	0.8137	0.8181	0.8423	0.8553
1st Stage Instrument t-ratio	(20.14)	(27.61)	(34.33)	(33.56)	(30.27)	(32.67)	(32.31)	(34.34)	(32.95)	(37.09)	(39.33)	(37.97)

Panel C: High Unemployment (Top 25%; > 7.8%)

	1994	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
OLS Log 2nd Market Purchase	0.0189	0.0215	0.0149	0.0251	0.0235	0.0143	0.0138	0.0160	0.0104	0.0052	0.0097	0.0187
	(3.07)	(4.18)	(2.45)	(4.60)	(4.63)	(2.36)	(2.18)	(2.36)	(0.76)	(0.36)	(0.68)	(1.93)
2SLS Log 2nd Market Purchase	0.02670	0.0261	0.0202	0.0274	0.0261	0.0160	0.0185	0.0217	0.0133	0.0067	0.0138	0.0239
	(2.83)	(3.10)	(2.30)	(3.38)	(2.65)	(1.96)	(2.25)	(2.83)	(1.06)	(0.45)	(0.99)	(2.04)
1st Stage Instrument (# tracts in county)	1.0791	1.1178	0.9621	0.9612	0.95710	.9410	0.9619	0.9908	0.9791	0.9540	0.9678	0.9702
1st Stage Instrument t-ratio	(12.94)	(20.06)	(32.03)	(31.56)	(30.13)	(27.48)	(28.22)	(29.42)	(25.97)	(29.65)	(28.96)	(25.50)

Panel D: Low Unemployment (Bottom 25%; < 3.0%)

	1994	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
OLS Log 2nd Market Purchase	0.0160	0.0232	0.0178	0.0205	0.0154	0.0166	0.0161	0.0181	0.0128	0.0124	0.0130	0.0172
	(4.59)	(5.49)	(3.54)	(3.91)	(4.22)	(4.10)	(3.91)	(4.15)	(2.52)	(2.82)	(3.19)	(3.56)
2SLS Log 2nd Market Purchase	0.0149	0.0185	0.0127	0.0131	0.0117	0.0131	0.0117	0.0120	0.0070	0.0067	0.0080	0.0158
	(2.98)	(3.66)	(1.97)	(2.43)	(2.53)	(2.32)	(2.09)	(2.11)	(1.10)	(1.13)	(1.53)	(2.75)
1st Stage Instrument (# tracts in county)	0.9909	0.9379	0.8330	0.8318	0.8217	0.8115	0.8067	0.8205	0.8225	0.8244	0.8456	0.8542
1st Stage Instrument t-ratio	(20.48)	(25.28)	(30.71)	(29.94)	(30.65)	(33.85)	(33.12)	(36.53)	(36.22)	(40.41)	(42.85)	(40.52)

Table 6: Tract Fixed Effect Regressions for Non-Conforming Sized Loans
(t-ratios based on standard errors clustered at the MSA level in parentheses)

	Log Origination Rate	Log Median Loan Size Requested
Log county 2nd market loan purchases	-0.0091	0.1723
	(1.22)	(7.90)
Log tract median loan size application	-0.0248	-
	(8.49)	-
Log tract median income of applicants	-0.0451	1.3541
	(7.89)	(20.26)
Log tract % app. Af. Amer. or Hispanic	-0.0873	-0.0501
	(2.33)	(0.33)
Log tract % applicants female	-0.0685	-0.4284
	(4.20)	(9.24)
Year Fixed Effects	12	12
Tract Fixed Effects	45388	45388
Observations	324272	324272
R-squared	0.05	0.61

Table 7: OLS and 2SLS By Year for all MSA Census Tracts for Non-Conforming Sized Loans
(t-ratios based on standard errors clustered at the MSA level in parentheses)

Panel A: Log Origination Rates

	1994	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
OLS Log 2nd Market Purchase	0.0063	0.0043	0.0040	0.0024	-0.0028	-0.0017	0.0004	0.0018	-0.0026	-0.0064	-0.0137	-0.0069
	(1.53)	(1.06)	(1.36)	(0.84)	(-0.92)	(-0.70)	(0.18)	(0.95)	(-1.22)	(-2.94)	(-4.63)	(-2.05)
2SLS Log 2nd Market Purchase	0.0050	0.0037	0.0047	0.0020	-0.0037	-0.0033	-0.0015	-0.0022	-0.0063	-0.0022	-0.0057	-0.0056
	(1.15)	(0.78)	(1.65)	(0.62)	(-1.20)	(-1.23)	(-0.54)	(-1.26)	(-2.23)	(-0.69)	(-1.38)	(-1.20)
1st Stage Instrument (# tracts in county)	1.3783	1.4178	1.3612	1.3437	1.3315	1.2745	1.2951	1.2053	1.1831	1.1465	1.1433	1.1611
1st Stage Instrument t-ratio	(13.43)	(13.27)	(15.73)	(13.39)	(13.27)	(16.02)	(15.33)	(18.28)	(20.29)	(22.51)	(26.41)	(31.89)

Panel B: Log Median Loan Size

	1994	1996	1998	2000	2001	2002	2003	2004	2005	2006	2007	2008
OLS Log 2nd Market Purchase	0.0396	0.0516	0.0516	0.0458	0.0720	0.0745	0.0530	0.0674	0.0663	0.0723	0.0818	0.0573
	(3.84)	(7.47)	(5.30)	(4.74)	(5.56)	(6.60)	(5.60)	(8.05)	(9.23)	(8.89)	(9.95)	(4.49)
2SLS Log 2nd Market Purchase	0.0284	0.0515	0.0411	0.0466	0.0638	0.0602	0.0535	0.0570	0.0572	0.0609	0.0631	0.0778
	(1.38)	(2.46)	(2.12)	(1.91)	(2.43)	(2.81)	(3.34)	(4.48)	(5.34)	(5.44)	(5.83)	(4.64)
1st Stage Instrument (# tracts in county)	1.3796	1.4202	1.3648	1.3461	1.3375	1.2803	1.2978	1.2125	1.1907	1.1535	1.1515	1.1615
1st Stage Instrument t-ratio	(13.40)	(13.22)	(15.73)	(13.37)	(13.39)	(16.17)	(15.29)	(18.34)	(20.47)	(22.73)	(26.80)	(31.86)

Appendix: Complete 2SLS Second-Stage Regression Tables

Table A-1a: 2SLS Log Origination Rate Regressions By Year for Conforming Sized Loans
(t-ratios based on standard errors clustered at the MSA level in parentheses)

	1994	1996	1998	2000	2001	2002
Log 2nd market loan purchases	0.0092	0.0235	0.0332	0.0251	0.0202	0.0124
	(4.00)	(5.88)	(6.02)	(5.02)	(4.54)	(3.41)
Log median loan size among applications	0.1694	0.2234	0.2260	0.2249	0.2052	0.1439
	(14.48)	(11.12)	(9.38)	(5.87)	(7.86)	(8.18)
Log median income of applicants	0.0187	0.0901	0.1491	0.0441	0.0159	0.0169
	(1.08)	(4.01)	(5.76)	(1.50)	(0.56)	(0.83)
Log % applicants Af. Amer. or Hispanic	-0.0081	-0.0640	-0.3154	-0.0749	-0.1037	-0.1185
	(-0.25)	(-1.53)	(-3.71)	(-0.90)	(-2.22)	(-2.93)
Log % applicants female	-0.0347	-0.0798	-0.1262	-0.1139	-0.0232	0.0229
	(-0.95)	(-2.19)	(-2.40)	(-2.63)	(-0.53)	(0.57)
Average age of population	0.0037	0.0039	0.0047	0.0042	0.0045	0.0027
	(9.13)	(6.63)	(8.78)	(8.26)	(10.06)	(7.98)
% population African American	-0.0989	-0.0784	-0.0319	-0.1978	-0.1989	-0.1409
	(-5.30)	(-4.26)	(-0.88)	(-3.61)	(-8.02)	(-6.72)
% population Hispanic	-0.0365	-0.0081	0.1580	0.0494	0.1012	0.0662
	(-1.26)	(-0.20)	(3.71)	(0.87)	(2.99)	(2.06)
% of age 25+ with high school diploma	0.0819	0.2047	0.1733	0.1779	0.1976	0.1764
	(2.22)	(3.98)	(3.40)	(3.39)	(5.78)	(4.70)
% of age 25+ with some college	0.2078	0.2849	0.4657	0.4086	0.4854	0.4158
	(5.46)	(6.17)	(9.28)	(9.32)	(13.37)	(11.62)
% of age 25+ with college degree or more	0.1717	0.2846	0.3952	0.4599	0.4365	0.3355
	(6.05)	(7.11)	(9.71)	(13.56)	(15.98)	(13.68)
25th percentile family income	0.0003	0.0006	0.0006	0.0006	0.0004	0.0005
	(1.15)	(2.02)	(2.11)	(3.76)	(2.42)	(3.05)
50th percentile family income	-0.0003	-0.0004	-0.0008	-0.0010	-0.0008	-0.0007
	(-1.61)	(-1.82)	(-5.49)	(-6.24)	(-7.28)	(-5.37)
75th percentile family income	-0.0007	-0.0009	-0.0010	-0.0008	-0.0009	-0.0007
	(-5.42)	(-6.69)	(-8.93)	(-7.45)	(-8.16)	(-7.02)
% of age 16+ in labor force and unemployed	-0.0848	-0.1549	-0.1308	-0.1744	-0.1500	-0.2002
	(-1.27)	(-1.50)	(-2.75)	(-2.42)	(-3.16)	(-3.64)
Population Density (pop/sq. mi. land area)	1.220E-06	1.680E-06	1.620E-06	9.300E-07	6.400E-07	1.040E-06
	(1.50)	(1.80)	(1.39)	(1.04)	(0.69)	(1.41)
Log(House Value)	0.0340	0.0158	0.0282	0.0391	0.0473	0.0437
	(5.94)	(2.79)	(3.98)	(4.57)	(5.04)	(4.59)
1st Stage Instrument (# tracts in county)	1.0458	1.0237	0.8777	0.8768	0.8730	0.8646
	(21.48)	(26.75)	(39.55)	(38.48)	(36.74)	(38.49)
Kleibergen-Paap Weak Inst Statistic	461.52	715.40	1564.13	1480.39	1349.57	1481.27
MSA Fixed Effects	323	331	331	330	330	330
Observations	47461	49262	49606	49547	49580	49615

Table A-1a cont.: 2SLS Log Origination Rate Regressions By Year for Conforming Sized Loans
(t-ratios based on standard errors clustered at the MSA level in parentheses)

	2003	2004	2005	2006	2007	2008
Log 2nd market loan purchases	0.0057	0.0054	-0.0003	-0.0042	-0.0044	-0.0047
	(1.85)	(1.70)	(-0.12)	(-1.50)	(-1.41)	(-1.19)
Log median loan size among applications	0.1321	0.1455	0.1622	0.1182	0.0710	0.0611
	(5.12)	(8.79)	(8.71)	(7.68)	(3.45)	(2.33)
Log median income of applicants	-0.0465	-0.0267	-0.0429	-0.0441	-0.0636	0.0074
	(-1.60)	(-1.48)	(-2.42)	(-2.16)	(3.92)	(0.49)
Log % applicants Af. Amer. or Hispanic	-0.1863	-0.2729	-0.3457	-0.5497	-0.6304	-0.4955
	(4.82)	(-8.40)	(-10.55)	(-13.40)	(-10.98)	(-10.73)
Log % applicants female	0.0388	0.1191	0.1267	0.1479	0.1075	0.1376
	(1.22)	(4.90)	(4.21)	(5.58)	(2.86)	(3.73)
Average age of population	0.0025	0.0017	0.0017	0.0012	0.0033	0.0035
	(7.66)	(5.92)	(6.85)	(4.41)	(12.39)	(7.87)
% population African American	-0.1055	-0.0666	-0.0487	-0.0194	-0.0713	-0.0682
	(-4.99)	(-5.16)	(-3.18)	(-1.11)	(-3.07)	(-2.92)
% population Hispanic	0.0811	-0.0282	-0.0261	-0.0606	-0.1230	-0.0874
	(2.90)	(-1.39)	(-1.50)	(-3.04)	(-5.60)	(-2.86)
% of age 25+ with high school diploma	0.1417	0.1047	0.0956	0.1768	0.1857	0.1296
	(4.30)	(4.06)	(2.39)	(6.34)	(4.35)	(3.33)
% of age 25+ with some college	0.3819	0.3296	0.3000	0.3134	0.3986	0.3525
	(13.93)	(12.69)	(11.02)	(11.52)	(13.98)	(10.75)
% of age 25+ with college degree or more	0.2959	0.2106	0.2185	0.3282	0.4523	0.3415
	(14.71)	(10.59)	(9.63)	(17.62)	(17.52)	(8.16)
25th percentile family income	0.0007	0.0005	0.0005	0.0005	0.0004	0.0009
	(4.36)	(2.90)	(3.84)	(3.51)	(2.31)	(4.91)
50th percentile family income	-0.0006	-0.0004	-0.0003	-0.0005	-0.0005	-0.0006
	(4.62)	(-3.02)	(-2.24)	(-3.97)	(-3.59)	(-3.86)
75th percentile family income	-0.0005	-0.0004	-0.0004	-0.0003	-0.0005	-0.0007
	(-4.43)	(-4.57)	(-4.97)	(-3.82)	(-6.03)	(-6.57)
% of age 16+ in labor force and unemployed	-0.1451	-0.1523	-0.1564	-0.2165	-0.1795	-0.1428
	(-4.67)	(-4.19)	(-4.86)	(-8.49)	(-5.77)	(-2.11)
Population Density (pop/sq. mi. land area)	6.900E-07	6.900E-07	9.200E-07	8.100E-07	8.800E-07	1.040E-06
	(1.28)	(1.59)	(1.65)	(4.50)	(5.46)	(7.50)
Log(House Value)	0.0453	0.0357	0.0336	0.0297	0.0340	0.0548
	(5.11)	(4.46)	(4.42)	(6.27)	(4.97)	(6.70)
1st Stage Instrument (# tracts in county)	0.8694	0.8879	0.8860	0.8788	0.8972	0.9042
	(37.28)	(40.66)	(38.81)	(43.37)	(45.63)	(42.74)
Kleibergen-Paap Weak Inst Statistic	1389.59	1652.95	1506.63	1880.57	2082.30	1826.37
MSA Fixed Effects	331	331	331	331	331	331
Observations	49914	49921	49950	49938	49815	49192

Table A-1b: 2SLS Log Median Loan Size Request Regressions By Year for Conforming Sized Loans
(t-ratios based on standard errors clustered at the MSA level in parentheses)

	1994	1996	1998	2000	2001	2002
Log 2nd market loan purchases	0.0202	0.0211	0.0161	0.0147	0.0140	0.0102
	(3.43)	(3.42)	(2.28)	(3.10)	(2.48)	(1.72)
Log median income of applicants	0.7869	0.8803	0.9033	0.8106	0.9052	0.9489
	(29.46)	(34.62)	(37.25)	(22.82)	(19.03)	(23.24)
Log % applicants Af. Amer. or Hispanic	0.0788	0.1462	0.2700	0.4251	0.3915	0.4417
	(1.64)	(3.50)	(2.59)	(4.59)	(5.29)	(8.26)
Log % applicants female	-0.3325	-0.3549	-0.4120	-0.3368	-0.2643	-0.1317
	(-9.87)	(-12.19)	(-6.29)	(-9.36)	(-4.28)	(-3.53)
Average age of population	-0.0017	-0.0016	-0.0017	-0.0007	-0.0010	-0.0015
	(-3.67)	(-2.77)	(-3.82)	(-0.95)	(-1.80)	(-2.83)
% population African American	-0.0607	-0.0469	-0.0768	-0.1118	-0.1101	-0.1666
	(-2.77)	(-1.57)	(-1.27)	(-1.95)	(-2.21)	(-4.20)
% population Hispanic	0.1901	0.1945	0.0993	0.1613	0.1006	0.0504
	(5.10)	(5.31)	(1.89)	(3.42)	(2.45)	(1.49)
% of age 25+ with high school diploma	0.2142	0.2420	0.1850	0.1780	0.2224	0.2150
	(5.32)	(6.03)	(4.33)	(3.42)	(5.58)	(5.81)
% of age 25+ with some college	0.4231	0.3770	0.3901	0.6232	0.4022	0.3365
	(8.90)	(8.76)	(8.77)	(10.29)	(8.11)	(7.59)
% of age 25+ with college degree or more	0.0859	0.0775	0.1022	0.1498	0.0571	-0.0143
	(1.96)	(1.63)	(3.45)	(2.56)	(1.01)	(-0.26)
25th percentile family income	0.0017	0.0018	0.0011	0.0018	0.0012	0.0008
	(4.25)	(5.39)	(4.21)	(4.62)	(4.74)	(3.56)
50th percentile family income	-0.0007	-0.0012	-0.0011	-0.0020	-0.0011	-0.0011
	(-2.50)	(-3.60)	(-4.54)	(-6.53)	(-5.03)	(-5.29)
75th percentile family income	-0.0008	-0.0012	-0.0003	-0.0010	-0.0005	-0.0003
	(-6.17)	(-7.70)	(-2.46)	(-3.64)	(-3.63)	(-2.20)
% of age 16+ in labor force and unemployed	-0.8404	-0.8307	-0.3490	-0.4201	-0.3132	-0.3513
	(-10.09)	(-8.08)	(-7.39)	(-6.75)	(-6.97)	(-7.03)
Population Density (pop/sq. mi. land area)	1.59E-06	1.47E-06	1.64E-06	2.30E-06	1.94E-06	1.51E-06
	(4.55)	(3.60)	(5.77)	(3.11)	(3.99)	(3.58)
Log(House Value)	0.1339	0.1286	0.0955	0.1165	0.1044	0.0908
	(12.76)	(11.21)	(9.24)	(10.46)	(12.48)	(11.02)
1st Stage Instrument (# tracts in county)	1.0484	1.0262	0.8790	0.8781	0.8744	0.8655
	(21.37)	(26.53)	(39.54)	(38.59)	(36.56)	(38.41)
Kleibergen-Paap Weak Inst Statistic	456.86	703.68	1563.65	1489.43	1336.62	1475.60
MSA Fixed Effects	323	331	331	330	330	330
Observations	47461	49262	49606	49547	49580	49615

Table A-1b cont.: 2SLS Log Median Loan Size Request Regressions By Year for Conforming Sized Loans
(t-ratios based on standard errors clustered at the MSA level in parentheses)

	2003	2004	2005	2006	2007	2008
Log 2nd market loan purchases	0.0122	0.0123	0.0071	0.0029	0.0072	0.0143
	(2.01)	(2.02)	(1.02)	(0.40)	(1.00)	(1.79)
Log median income of applicants	0.9406	0.8638	0.7357	0.6616	0.7087	0.8005
	(24.49)	(23.39)	(19.49)	(15.16)	(21.72)	(32.17)
Log % applicants Af. Amer. or Hispanic	0.2359	0.0665	-0.0544	-0.0075	-0.0136	-0.0062
	(5.74)	(0.74)	(-0.75)	(-0.12)	(-0.30)	(-0.13)
Log % applicants female	-0.2044	-0.1415	-0.1377	-0.0695	-0.0427	-0.1441
	(-5.00)	(-2.92)	(-3.82)	(-1.87)	(-1.33)	(-4.26)
Average age of population	-0.0013	-0.0015	-0.0008	-0.0015	-0.0021	-0.0018
	(-2.66)	(-2.99)	(-1.85)	(-2.73)	(-3.59)	(-2.99)
% population African American	-0.1111	-0.0723	-0.0261	-0.0553	-0.0547	-0.0606
	(-3.06)	(-2.14)	(-0.80)	(-1.51)	(-1.51)	(-1.73)
% population Hispanic	0.1339	0.2579	0.2610	0.2237	0.2308	0.1630
	(3.60)	(7.99)	(5.32)	(3.43)	(4.07)	(4.41)
% of age 25+ with high school diploma	0.2057	0.2265	0.2478	0.1790	0.1868	0.1724
	(5.10)	(5.55)	(4.31)	(2.34)	(2.49)	(3.13)
% of age 25+ with some college	0.3533	0.4308	0.5090	0.4572	0.4548	0.3438
	(7.21)	(8.45)	(8.57)	(7.54)	(7.68)	(6.57)
% of age 25+ with college degree or more	-0.0184	0.0636	0.1471	0.0840	0.0353	-0.0066
	(-0.41)	(1.40)	(3.43)	(1.56)	(0.66)	(-0.13)
25th percentile family income	0.0008	0.0018	0.0021	0.0022	0.0022	0.0015
	(3.84)	(6.28)	(5.94)	(5.22)	(5.98)	(5.42)
50th percentile family income	-0.0011	-0.0014	-0.0012	-0.0011	-0.0011	-0.0009
	(-6.34)	(-6.75)	(-4.96)	(-4.13)	(-4.16)	(-3.57)
75th percentile family income	-0.0003	-0.0006	-0.0007	-0.0005	-0.0006	-0.0003
	(-3.09)	(-3.83)	(-4.22)	(-2.91)	(-3.06)	(-1.94)
% of age 16+ in labor force and unemployed	-0.3860	-0.4118	-0.4081	-0.4403	-0.4476	-0.3860
	(-8.41)	(-7.68)	(-7.13)	(-6.34)	(-5.90)	(-4.86)
Population Density (pop/sq. mi. land area)	1.38E-06	1.36E-06	1.13E-06	1.22E-06	1.00E-06	1.47E-06
	(3.24)	(3.68)	(3.23)	(3.86)	(2.44)	(4.68)
Log(House Value)	0.0844	0.0925	0.0878	0.0790	0.0863	0.1110
	(9.70)	(12.33)	(11.53)	(9.70)	(9.86)	(11.67)
1st Stage Instrument (# tracts in county)	0.8706	0.8891	0.8866	0.8790	0.8976	0.9047
	(37.41)	(40.91)	(38.86)	(43.53)	(45.83)	(42.92)
Kleibergen-Paap Weak Inst Statistic	1399.17	1673.84	1510.47	1895.21	2100.69	1842.27
MSA Fixed Effects	331	331	331	331	331	331
Observations	49914	49921	49950	49938	49815	49192

Table A-2a: 2SLS Log Origination Rate Regressions By Year for Non-Conforming Sized Loans
(t-ratios based on standard errors clustered at the MSA level in parentheses)

	1994	1996	1998	2000	2001	2002
Log 2nd market loan purchases	0.0050	0.0037	0.0047	0.0020	-0.0037	-0.0033
	(1.15)	(0.78)	(1.65)	(0.62)	(-1.20)	(-1.23)
Log median loan size among applications	0.0063	-0.0009	-0.0077	0.0044	0.0022	0.0044
	(0.99)	(-0.21)	(-1.41)	(0.61)	(0.55)	(1.15)
Log median income of applicants	0.0066	-0.0305	0.0199	-0.0140	-0.0035	-0.0195
	(0.35)	(-2.36)	(1.31)	(-0.86)	(-0.35)	(-1.63)
Log % applicants Af. Amer. or Hispanic	-0.1461	-0.3126	-0.2727	-0.3274	-0.3529	-0.3818
	(-1.77)	(-4.28)	(-3.59)	(-4.42)	(-4.54)	(-7.40)
Log % applicants female	-0.0565	-0.0478	-0.0252	-0.0245	-0.0459	-0.0635
	(-0.92)	(-0.91)	(-0.60)	(-0.68)	(-1.12)	(-1.90)
Average age of population	0.0003	0.0008	0.0013	0.0008	0.0013	0.0002
	(0.43)	(1.28)	(2.53)	(1.43)	(2.44)	(0.47)
% population African American	-0.0601	0.0100	-0.0279	-0.1561	-0.0917	-0.0536
	(-1.53)	(0.28)	(-0.71)	(-3.29)	(-2.44)	(-2.00)
% population Hispanic	-0.1482	0.0219	-0.0171	-0.0183	-0.0150	-0.0493
	(-1.85)	(0.36)	(-0.40)	(-0.39)	(-0.37)	(-1.16)
% of age 25+ with high school diploma	0.0920	0.0824	-0.1669	-0.1097	-0.0770	-0.0804
	(0.80)	(0.85)	(2.67)	(1.08)	(1.04)	(1.17)
% of age 25+ with some college	0.0535	-0.0064	-0.1353	0.0841	-0.0454	0.0428
	(0.76)	(-0.09)	(-2.24)	(0.95)	(-0.61)	(0.68)
% of age 25+ with college degree or more	0.1254	0.1736	-0.0195	0.1413	0.0862	0.0944
	(1.78)	(3.16)	(-0.46)	(2.00)	(1.75)	(1.97)
25th percentile family income	-0.0001	-0.0004	0.0001	-0.0001	0.0000	-0.0001
	(-0.14)	(-0.87)	(0.52)	(-0.60)	(0.01)	(-0.48)
50th percentile family income	-0.0001	0.0003	-0.0003	-0.0003	-0.0001	-0.0001
	(-0.23)	(1.19)	(-1.71)	(-2.12)	(-0.47)	(-0.44)
75th percentile family income	-0.0002	0.0000	0.0003	0.0003	0.0000	0.0000
	(-1.08)	(0.05)	(2.34)	(1.99)	(0.12)	(0.32)
% of age 16+ in labor force and unemployed	0.2545	0.1729	-0.0374	-0.1277	-0.0067	-0.0304
	(1.48)	(1.30)	(-0.49)	(-1.35)	(-0.07)	(-0.48)
Population Density (pop/sq. mi. land area)	8.400E-07	4.600E-07	-2.500E-07	-2.800E-07	-2.900E-07	-9.000E-08
	(1.78)	(1.67)	(-1.42)	(-1.45)	(-2.01)	(-0.42)
Log(House Value)	0.0266	0.0295	0.0108	0.0100	0.0137	0.0048
	(3.33)	(2.93)	(2.44)	(1.54)	(2.03)	(0.68)
1st Stage Instrument (# tracts in county)	1.3783	1.4178	1.3612	1.3437	1.3315	1.2745
	(13.43)	(13.27)	(15.73)	(13.39)	(13.27)	(16.02)
Kleibergen-Paap Weak Inst Statistic	180.48	176.09	247.53	179.32	176.23	256.52
MSA Fixed Effects	278	308	320	318	323	325
Observations	16146	20228	22786	22330	23126	24734

Table A-2a cont.: 2SLS Log Origination Rate Regressions By Year for Non-Conforming Sized Loans
(t-ratios based on standard errors clustered at the MSA level in parentheses)

	2003	2004	2005	2006	2007	2008
Log 2nd market loan purchases	-0.0015	-0.0022	-0.0063	-0.0022	-0.0057	-0.0056
	(-0.54)	(-1.26)	(-2.23)	(-0.69)	(-1.38)	(-1.20)
Log median loan size among applications	-0.0148	-0.0115	-0.0172	-0.0353	-0.0698	-0.0606
	(-4.96)	(-3.39)	(-4.47)	(-6.18)	(-8.55)	(-9.37)
Log median income of applicants	-0.0145	-0.0334	-0.0454	-0.0532	-0.0578	-0.0886
	(-1.43)	(-3.85)	(-4.82)	(-3.87)	(-2.38)	(-7.73)
Log % applicants Af. Amer. or Hispanic	-0.3161	-0.3135	-0.4469	-0.5477	-0.8434	-0.4604
	(-7.87)	(-6.61)	(-9.74)	(-7.12)	(-10.58)	(-7.46)
Log % applicants female	-0.1378	-0.0623	-0.0523	-0.0744	-0.1218	-0.0484
	(-3.77)	(-3.09)	(-2.06)	(-2.69)	(-2.55)	(-1.48)
Average age of population	0.0014	0.0005	0.0002	0.0013	0.0029	0.0025
	(3.71)	(1.37)	(0.48)	(2.49)	(5.36)	(3.35)
% population African American	-0.0300	-0.0091	0.0415	0.0519	0.0448	0.0054
	(-0.85)	(-0.21)	(1.02)	(0.77)	(0.76)	(0.08)
% population Hispanic	0.0577	-0.0933	-0.1133	-0.1174	-0.3153	-0.0838
	(1.77)	(-3.24)	(-5.94)	(-3.38)	(-5.77)	(-2.43)
% of age 25+ with high school diploma	0.0036	0.0389	-0.0579	0.0109	-0.1138	-0.2693
	(0.06)	(0.81)	(-1.01)	(0.14)	(-0.97)	(-3.15)
% of age 25+ with some college	0.1435	-0.0230	0.0323	-0.0327	-0.2569	-0.3346
	(2.39)	(-0.44)	(0.56)	(-0.47)	(-3.26)	(-4.89)
% of age 25+ with college degree or more	0.1989	0.1623	0.1892	0.2816	0.3985	0.1545
	(4.32)	(4.56)	(5.30)	(5.27)	(5.03)	(2.78)
25th percentile family income	0.0002	-0.0001	-0.0001	-0.0011	-0.0018	-0.0011
	(1.22)	(-0.38)	(-0.56)	(-4.65)	(-5.17)	(-3.94)
50th percentile family income	-0.0002	-0.0002	0.0000	0.0004	0.0004	0.0002
	(-1.48)	(-2.08)	(0.14)	(2.83)	(1.49)	(0.89)
75th percentile family income	-0.0001	0.0003	0.0001	0.0003	0.0003	0.0002
	(-0.69)	(3.36)	(0.77)	(2.61)	(1.07)	(1.27)
% of age 16+ in labor force and unemployed	-0.0392	-0.0447	-0.0330	0.0428	0.0753	0.0198
	(-0.83)	(-0.85)	(-0.78)	(0.68)	(1.00)	(0.19)
Population Density (pop/sq. mi. land area)	1.300E-07	5.400E-07	4.800E-07	9.700E-07	1.070E-06	8.100E-07
	(1.05)	(4.92)	(3.25)	(6.36)	(1.99)	(2.27)
Log(House Value)	0.0128	0.0118	0.0151	0.0048	-0.0010	0.0075
	(3.93)	(3.95)	(3.76)	(1.05)	(-0.10)	(0.93)
1st Stage Instrument (# tracts in county)	1.2951	1.2053	1.1831	1.1465	1.1433	1.1611
	(15.33)	(18.28)	(20.29)	(22.51)	(26.41)	(31.89)
Kleibergen-Paap Weak Inst Statistic	235.02	334.06	411.71	506.70	697.33	1017.17
MSA Fixed Effects	325	327	328	325	326	325
Observations	23719	26968	28648	27151	25876	19378

Table A-2b: 2SLS Log Median Loan Size Request Regressions By Year for Non-Conforming Sized Loans
(t-ratios based on standard errors clustered at the MSA level in parentheses)

	1994	1996	1998	2000	2001	2002
Log 2nd market loan purchases	0.0284	0.0515	0.0411	0.0466	0.0638	0.0602
	(1.38)	(2.46)	(2.12)	(1.91)	(2.43)	(2.81)
Log median income of applicants	2.2738	2.0195	1.9915	2.0030	2.0199	2.0988
	(28.31)	(18.85)	(19.77)	(24.10)	(14.02)	(29.79)
Log % applicants Af. Amer. or Hispanic	0.0579	-0.3972	-0.0492	0.0946	0.6061	0.6050
	(0.22)	(-1.19)	(-0.15)	(0.47)	(3.52)	(2.93)
Log % applicants female	-1.5401	-1.2014	-1.5314	-1.0294	-1.0894	-1.0916
	(-9.82)	(-6.58)	(-8.78)	(-10.65)	(-8.59)	(-8.71)
Average age of population	0.0092	0.0101	0.0054	0.0057	0.0073	0.0050
	(4.72)	(4.10)	(3.35)	(3.47)	(3.72)	(3.27)
% population African American	0.1058	0.2481	0.1000	0.0379	-0.2728	-0.1837
	(0.52)	(1.28)	(0.68)	(0.25)	(-3.12)	(-2.73)
% population Hispanic	0.1795	-0.1746	-0.1997	-0.2467	-0.2822	-0.2040
	(0.87)	(-0.78)	(-1.40)	(-2.07)	(-2.49)	(-1.97)
% of age 25+ with high school diploma	-1.8713	-1.7319	-1.4218	-1.4942	-1.6608	-1.6562
	(-7.49)	(-8.11)	(-6.43)	(-8.97)	(-7.51)	(-7.23)
% of age 25+ with some college	-1.9367	-2.0019	-1.7679	-2.1501	-1.9238	-1.3228
	(-6.33)	(-8.13)	(-7.50)	(-8.58)	(-7.89)	(-7.66)
% of age 25+ with college degree or more	-0.4728	-0.1282	-0.2206	-0.5494	-0.6794	-0.6745
	(-2.23)	(-0.69)	(-1.24)	(-3.56)	(-3.65)	(-5.63)
25th percentile family income	-0.0031	-0.0060	-0.0025	-0.0018	-0.0014	-0.0002
	(-2.82)	(-5.59)	(-3.26)	(-1.87)	(-1.32)	(-0.31)
50th percentile family income	-0.0049	-0.0029	-0.0060	-0.0067	-0.0069	-0.0064
	(-5.66)	(-3.11)	(-5.44)	(-7.38)	(-10.05)	(-7.92)
75th percentile family income	0.0003	0.0017	0.0015	0.0032	0.0018	-0.0005
	(0.31)	(2.02)	(2.17)	(4.92)	(2.80)	(-1.08)
% of age 16+ in labor force and unemployed	0.6154	1.1583	0.6448	0.6676	0.7628	0.4788
	(1.16)	(2.78)	(2.60)	(3.99)	(3.95)	(2.68)
Population Density (pop/sq. mi. land area)	-9.20E-07	7.00E-08	1.11E-06	2.91E-06	2.85E-06	1.57E-06
	(-0.68)	(0.08)	(1.16)	(4.61)	(3.71)	(1.33)
Log(House Value)	0.1558	0.1046	0.0387	0.0755	0.1228	0.1000
	(4.83)	(2.34)	(0.80)	(1.97)	(3.69)	(5.41)
1st Stage Instrument (# tracts in county)	1.3796	1.4202	1.3648	1.3461	1.3375	1.2803
	(13.40)	(13.22)	(15.73)	(13.37)	(13.39)	(16.17)
Kleibergen-Paap Weak Inst Statistic	179.56	174.78	247.58	178.85	179.21	261.45
MSA Fixed Effects	278	308	320	318	323	325
Observations	16146	20228	22786	22330	23126	24734

Table A-2b cont.: 2SLS Log Median Loan Size Request Regressions By Year for Non-Conforming Sized Loans (t-ratios based on standard errors clustered at the MSA level in parentheses)

	2003	2004	2005	2006	2007	2008
Log 2nd market loan purchases	0.0535	0.0570	0.0572	0.0609	0.0631	0.0778
	(3.34)	(4.48)	(5.34)	(5.44)	(5.83)	(4.64)
Log median income of applicants	2.1400	1.8014	1.6326	1.5997	1.4866	1.2534
	(31.65)	(23.78)	(24.74)	(21.65)	(20.14)	(17.44)
Log % applicants Af. Amer. or Hispanic	0.3175	0.0595	0.0948	0.2506	0.0901	-0.3533
	(1.52)	(0.36)	(0.72)	(1.71)	(0.62)	(-2.09)
Log % applicants female	-0.9429	-0.7054	-0.5905	-0.5403	-0.4474	-0.7838
	(-11.55)	(-10.73)	(-7.55)	(-7.02)	(-5.47)	(-7.87)
Average age of population	0.0027	0.0026	-0.0002	0.0004	0.0006	0.0016
	(1.88)	(1.79)	(-0.16)	(0.24)	(0.37)	(0.95)
% population African American	0.0985	0.2795	0.2814	0.1968	0.2798	0.3164
	(1.44)	(4.55)	(4.38)	(3.09)	(3.94)	(4.30)
% population Hispanic	0.0948	0.4348	0.3694	0.3388	0.3560	0.2905
	(1.01)	(6.72)	(5.24)	(3.81)	(4.46)	(3.87)
% of age 25+ with high school diploma	-0.8261	-0.7474	-0.4805	-0.6785	-0.8463	-1.4802
	(-3.68)	(-3.52)	(-2.78)	(-3.37)	(-3.82)	(-5.79)
% of age 25+ with some college	-0.6029	-0.5544	-0.2885	-0.4411	-0.4073	-0.8177
	(-3.27)	(-2.58)	(-1.51)	(-1.80)	(-1.63)	(-3.01)
% of age 25+ with college degree or more	-0.4460	-0.2664	-0.1542	-0.2813	-0.3506	-0.4351
	(-3.97)	(-2.68)	(-1.69)	(-2.51)	(-2.93)	(-3.28)
25th percentile family income	0.0012	0.0004	0.0008	-0.0009	-0.0007	-0.0020
	(1.28)	(0.58)	(1.14)	(-1.09)	(-0.94)	(-2.67)
50th percentile family income	-0.0053	-0.0045	-0.0039	-0.0035	-0.0033	-0.0036
	(-8.80)	(-9.72)	(-9.17)	(-7.22)	(-6.20)	(-4.84)
75th percentile family income	-0.0020	-0.0002	-0.0002	0.0011	0.0012	0.0016
	(-5.00)	(-0.52)	(-0.42)	(2.52)	(2.93)	(3.38)
% of age 16+ in labor force and unemployed	-0.0696	0.1958	0.2425	0.2864	0.1102	0.1656
	(-0.37)	(1.43)	(2.17)	(2.10)	(0.83)	(0.95)
Population Density (pop/sq. mi. land area)	3.40E-07	-1.22E-06	-1.38E-06	-1.38E-06	-6.80E-07	1.20E-06
	(0.40)	(-3.15)	(-3.17)	(-2.84)	(-1.53)	(1.50)
Log(House Value)	0.0686	0.0708	0.0549	0.0444	0.0555	0.0949
	(2.95)	(3.39)	(2.75)	(1.50)	(2.45)	(5.70)
1st Stage Instrument (# tracts in county)	1.2978	1.2125	1.1907	1.1535	1.1515	1.1615
	(15.29)	(18.34)	(20.47)	(22.73)	(26.80)	(31.86)
Kleibergen-Paap Weak Inst Statistic	233.81	336.38	419.01	516.64	718.16	1015.10
MSA Fixed Effects	325	327	328	325	326	325
Observations	23719	26968	28648	27151	25876	19378