Have the Affordable Housing Goals been a Shield against Subprime? Regulatory Incentives and the Extension of Mortgage Credit[1]

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Abstract

While the subprime mortgage loan product clearly expands access to credit, concerns have been raised about its costs, particularly to lower-income and minority populations. This paper examines whether GSE loan purchase activities might serve as an effective vehicle for mitigating these costs. The empirical evidence shows that measured in terms of market shares, increases in GSE purchase activity are associated with declines in subprime mortgage activity. Moreover, the effects tend to be stronger in neighborhoods with significant minority populations, precisely the neighborhoods where subprime lending has been concentrated and growing the fastest. A rough calculation shows that a ten percent increase in GSE market share could lead to 20,000 borrowers using prime instead of subprime loans, at a cost savings of about $100 million.

Keywords: Affordable housing goals, government-sponsored enterprise (GSE), subprime lending, homeownership

1. Introduction

The subprime lending market has increased substantially over the past decade, with subprime originations increasing from $35 billion in 1993 to $213 billion in 2002. Subprime loans account for approximately 9 percent of annual residential mortgage originations (Courchane, Surette, and Zorn, 2004; Chinloy and Macdonald, 2005). Due in part to this growth, subprime lending has received considerable attention in recent years. One strand of research has focused on the efficiency of subprime lending, with particular concern centering on whether subprime lending has been effective in alleviating credit rationing in mortgage markets and produced appropriate sorting of borrowers by their risk. A second line of analysis has considered the equity of subprime lending. This research has sought to determine whether subprime lending has targeted certain populations disproportionately and placed undue burdens on members of these populations given their level of credit risk. We place studies of predatory lending activities in this second category.

Regulation in mortgage markets has similarly sought to improve the efficiency and equity of mortgage markets. Because mortgage credit is viewed as essential for households seeking to build wealth and stability, institutions and regulations have been established to ensure its availability to all meeting certain risk standards. Regulation has also sought to influence the equity of mortgage markets by ensuring that mortgage credit is available to households believed to have historically not had access to such markets, particularly those in certain minority groups and those with lower incomes. Such regulation includes the Equal Credit Opportunity Act, the Home Mortgage Disclosure Act, and the Community Reinvestment Act, among other pieces of legislation.

The current study seeks to establish the extent to which one element of the regulatory structure focused on improving access to mortgage credit, the Federal Housing Enterprise Financial Safety and Soundness Act of 1992 (GSE Act), has influenced the flow of subprime mortgage credit. The GSE Act empowered the U. S. Department of Housing and Urban Development (HUD) to establish targets for Fannie Mae and Freddie Mac (together, the GSEs) purchases of mortgages originated to minority and lower-income

households and to households living in minority and lower-income neighborhoods. In prior research, An and Bostic (2006) showed that GSE responses to the incentives established by the affordable housing goals resulted in targeted borrowers shifting from higher cost loans originated through the Federal Housing Administration (FHA) insurance program into lower cost prime market loans. The analysis here examines whether a similar shift occurred with respect to subprime lending, which also is a higher cost loan relative to those in the prime market. A particular question of interest for this research is whether GSE activities serve to reduce the extent of spatial concentration associated with subprime lending, which would suggest that GSE activity help improves the equity of housing markets.

The main test is whether greater GSE purchase activity is associated with a reduction in subprime loan originations in a neighborhood. We find that such a relationship exists, and that it is more pronounced in neighborhoods with high minority household representation.

The study makes several contributions. Its focus allows for new insights regarding the relationships between different segments of the mortgage market and how these relationships change as the institutional setting evolves. Second, its findings can inform ongoing policy debates, including whether the thresholds for the affordable housing goals are appropriate, and whether new incentives should be provided for the GSEs to help expand homeownership opportunity for underserved populations. Importantly, these results can be helpful for policy-makers charged with overseeing the subprime market and identifying methods for mitigating any negative effects subprime lending activities might have on households and communities.

The paper proceeds as follows. The next section provides background on subprime lending, including considerations of market efficiency and equity, and the GSE Act and affordable housing goals, as well as their impact on mortgage credit and housing markets. Section 2 also includes a simple model that shows why one might expect to observe borrower shifts from subprime to prime loans given GSE actions in response to the affordable housing goals. A description of the empirical approach, the data used, and the results follow. The paper ends with concluding remarks.

2. Subprime Lending and the GSEs

2.1 Subprime lending

The subprime lending market serves those borrowers that have repayment risks higher than is generally considered acceptable within the prime mortgage market. Subprime borrowers typically have one or more of the following characteristics: a history of credit delinquencies and default, bankruptcies or public record filings on their records, high levels of non-real estate debt, little wealth to offer in terms of downpayment, residence in an area with a less stable labor or housing markets (Pennington-Cross, 2002; Nichols, Pennington-Cross and Yezer, 2005; Courchane, Surette, and Zorn, 2004; Gramlich, 2004). Because of the higher risk of its customer base, compared to prime market loans, subprime loans typically feature higher costs, including higher interest rates, points and fees, and features such as prepayment penalties that limit a borrower's repayment options.

In spite of these higher costs, subprime loans are widely regarded as a beneficial market innovation because these higher risk borrowers might not have access to mortgage credit markets absent such a loan product. Stiglitz and Weiss (1981) develop a model of lending in which the equilibrium outcome is credit rationing by which higher risk prospective borrowers are shut out of the market and receive no credit. Mortgage markets have many of the features of the Stiglitz and Weiss framework, including imperfect information where lenders do not know borrower quality but the borrower does, and as a result one might expect a pooling equilibrium with rationing in mortgage markets. Chinloy and Macdonald (2005) build a model that shows that the existence of a subprime market imparts a gain in social welfare by reducing borrowing constraints and mitigating the effects of credit rationing in the prime market. Others have developed models of subprime markets and reached the same conclusions (see, for example, Cutts and Van Order, 2005). Thus, the subprime market is widely believed to expand homebuying opportunities for households that would otherwise not have access to homeownership, allowing them to build wealth and stability.

Questions remain, however, as to whether the subprime mortgage market has costs that offset these benefits in significant ways. A primary issue is whether all borrowers who receive subprime loans have a risk profile that warrants the higher costs associated

with such loans. The evidence consistently suggests that this might not be the case, as factors other than a borrower's risk profile have consistently been found to influence one's likelihood of using the subprime market to receive a loan. For example, Nichols, Pennington-Cross, and Yezer (2005) find that, after controlling for income, debt, and credit history, the use of subprime loan products varies significantly by race, with blacks and Hispanics more likely and Asians less likely to hold a subprime loan. Courchane, Surette, and Zorn (2002) similarly find a race effect (primarily for Hispanics), but also find an important role for borrower behavior in engaging the mortgage market. They find that subprime borrowers are less knowledgable about the mortgage process and less likely to extensively search for the best mortgage rates available.[2] Calem, Hershaff and Wachter (2004) confirm the race effect but also found significant negative relationship between subprime lending and neighborhood educational level. More directly, Carr and Scheutz present evidence indicating that between 30 and 50 percent of all subprime borrowers had risk profiles consistent with receiving a lower-cost prime market mortgage. Clearly, the appropriateness of a subprime loan for individual borrowers remains an issue.

These findings suggest that members of minority groups in particular might bear significant costs as a result of their use of the subprime market. While the direct positive correlation between race and use of subprime loans makes this point clearly, one should also recognize that researchers have found a negative correlation between financial literacy and race (Betsey, 2005, for example). Thus, there is a second, indirect channel by which minority households are at risk of entering into a subprime loan when a cheaper prime market loan would be achievable. Such households will pay more for their mortgage, which retards the rate at which they build wealth and limits the resources available to weather any emergencies that might arise and thereby increases the likelihood of subsequent default and delinquency.

The concern that minorities may bear extra costs through the subprime market is exacerbated given the spatial distribution of subprime loans. Research has consistently found that subprime lending is heavily concentrated among minority households and in high-minority neighborhoods. U.S. Department of Housing and Urban Development and

[2] Closely related to this is a concern that households whose quality improves are unable to "graduate" from a subprime mortgage to a prime loan. Courchane, Surette, and Zorn (2004) find some support for this concern, though they note that there is mobility between these mortgage segments.

the U.S. Department of the Treasury (2000) found that subprime lending were five times more prevalent in black neighborhoods than white neighborhoods. Bradford (2002), Calem, Gillen and Wachter (2002), and National Community Reinvestment Coalition (2003) all show that this relationship holds even after controlling for neighborhood characteristics that reflect risk considerations. Moreover, researchers have found that the subprime lending in as a proportion of all lending in minority neighborhoods has accelerated (Canner, et al., 1999; Immergluck and Wiles, 1999; Hershaff, Wachter and Russo, 2005). Thus, there is great concern that the potential costs borne by minority (and lower-income) borrowers are growing rapidly.

Also worthy of mention in this regard is abusive or predatory lending, whose costs are generally far greater than those for the typical subprime loan. Though it lacks a straightforward consensus definition, predatory loans typically result in borrowers being locked into loans with onerous terms, paying excessive and repeated fees and penalties, and losing equity and, in some cases, their homes through foreclosure.[3] Predatory lending is relevant in the current context because, although all subprime loans and lenders are not predatory, there is broad consensus that predatory lenders primarily target subprime borrowers. Clearly, the increased prevalence of subprime lending in minority and lower-income communities makes households in these groups more vulnerable to exploitation by predatory lenders.

2.2 The GSE Act and the affordable housing goals

The persistent lag in homeownership rates for lower-income and minority populations helped lead policy makers to pass legislation seeking to address potential market failures that might have been contributing factors. Among this legislation, which included the Equal Credit Opportunity Act, the Home Mortgage Disclosure Act, and the Community Reinvestment Act, was the Federal Housing Enterprise Financial Safety and Soundness Act of 1992 (GSE Act). The GSE Act was viewed as facilitating the passing of the

[3] See Engel and McCoy (2001) for more on predatory lending, and Harvey and Nigro (2003, 2004) and Elliehausen and Staten (2004) for the effects of legislative remedies to address predatory lending practices.

benefits provided by the GSEs to, such as lower borrower mortgage costs and increased competition and credit flow, to lower-income and minority communities.[4]

The GSE Act calls for the U.S. Department of Housing and Urban Development (HUD) to establish "affordable housing goals" for the GSEs. These goals specify proportions of the GSEs' loan purchase portfolio that must be of mortgages made to lower-income borrowers (the "low and moderate income" goal), borrowers residing in lower-income communities and borrowers in certain high minority neighborhoods (the "underserved neighborhoods" goal), and borrowers with low and very low incomes that live in low income areas (the "special affordable" goal).[5] HUD established the first set of affordable housing goals in 1995 and these have evolved over time, as market conditions have shifted. Appendix A documents their evolution.

Research has shown that the GSEs have increased the proportion of loan purchases to targeted populations in the wake of the establishment of the affordable goals (Bunce and Scheessele (1996), Bunce (2002) and Manchester (1998)) and have generally fulfilled their goal requirements (U.S. Department of Housing and Urban Development, 2005a). In addition, Listokin and Wyly (2000) and Temkin, et al. (2001) show that the GSEs enhanced their product offerings so as to facilitate more purchases of loans from targeted communities. These new products often featured underwriting criteria that depart from industry norms and allow for higher risks.[6]

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[4] Hendershott and Shilling (1989), Cotterman and Pearce (1996), Ambrose, Buttimer and Thibodeau (2001), ICF (1990), U.S. Congressional Budget Office (2001), Naranjo and Toevs (2002), Passmore, Sparks and Ingpen (2002) and Ambrose, LaCour-Little and Sanders (2004), among many others, have shown that GSE activities are related to substantial mortgage rate reductions. See McKenzie (2002) and Sanders (2005) for surveys of the literature. González-Rivera (2000) and Roll (2003) argue that homeowners benefit not only from GSEs' guarantees, but also from their portfolio investments. Harrison, et al. (2002) shows that GSEs can help lower-income and minority communities by reducing information externalities and increasing transactions in thin markets.

[5] The GSE Act defines lower-income borrowers as having incomes less than the area median income. It defines lower-income neighborhoods as those with a median income less than 90 percent of the area median income and high minority neighborhoods as those with a minority population share that is at least 30 percent and a median income less than 120 percent of the area median. Low and very low income borrowers are defined by the Act those with incomes less than 80 percent and 60 percent of the area median income, respectively.

[6] In spite of this increased activity, evidence suggests that other market players have been more influential in serving lower-income and minority populations. See Bunce and Scheessele (1996), Manchester, et al. (1998) and Case, et al. (2002) among others.

However, evidence that this increased activity has translated into beneficial market outcomes for the targeted populations has not been forthcoming. Studying changes in single-family home sales volumes and price in Cleveland during the 1990s, Freeman and Galster (2004) find no links between secondary market activities, by the GSEs or others, and sales prices. In addition, while they do find some evidence indicating that secondary market activities are associated with some increases in sales volumes, their analysis suggests that GSE purchase activities do not drive this relationship. Similarly, Bostic and Gabriel (2004), examining housing market outcomes in California during the 1990s, find limited direct effects of affordable housing goal incentives. Ambrose and Thibodeau (2004) analyze a different dimension of market outcomes – the credit supply – but reach a similar conclusion, namely that the affordable housing goals had a limited effect on the overall supply of mortgage credit to targeted groups in the largest 308 metropolitan statistical areas during 1995 and 1999.

These two sets of results, increased purchase activity but no measurable housing market effects, seem on their face to be contradictory. However, An and Bostic (2006) posit that any effects might be observed in terms of the product mix and loan pricing rather than homeownership, vacancy, prices or aggregate credit supply. Their research supports this hypothesis, as they find that increases in GSE purchase activity are associated with declines in the use of the higher cost FHA insurance program. Thus, GSE activity results in cost reductions for households that might otherwise have had to attain their mortgage through the FHA.

2.3 The interaction between the GSEs and subprime lenders

The GSEs do not generally purchase subprime mortgages, so there is no direct relationship between GSEs and subprime lenders. Rather, the GSEs influence the subprime mortgage market by affecting the competitive balance for borrowers who are at the margin of prime mortgage market underwriting standards. The hypothesis in the current paper is that the affordable housing goals lead the GSEs to shift this balance in favor of the prime market by being more amenable to purchasing higher risk loans, which will cause prime market lenders to loosen their underwriting standards accordingly. As a consequence, these marginal borrowers will be more inclined to take prime mortgages as

opposed to the higher cost subprime mortgages. (figures 1 and 2) Thus, the impact of the GSEs on the subprime market will be similar to their impact on the FHA: more aggressive pursuit of targeted borrowers under the affordable housing goals induces potential subprime borrowers with the best credit quality to use the conventional market and obtain conforming conventional loans instead.

It is important to note that this dynamic does not necessarily imply a decline in subprime lending, as subprime lenders can increase their volume through other channels. For example, subprime lenders can increase the maximum risk level they will tolerate in extending credit. This would expand their reach by giving them access to very high risk households previously shut out of the mortgage market. Assuming the risks at this level could be priced appropriately and the households could credibly be expected to meet the repayment schedule, this could be a viable option. Alternatively, improvements in risk modeling technologies could lead to a recalibration of the risks posed by such households such that they might now be viewed as creditworthy. In this case, the maximum risk threshold would not change, but rather more households would have risks lower than that threshold.

In spite of these possibilities, however, one would still observe a negative relationship between GSE activity and subprime growth if our hypothesis is correct.

3. Empirical Approach

The remainder of this paper empirically tests the hypothesis articulated above. An ideal empirical test would seek to identify the prime mortgage market underwriting margin, demonstrate that it has moved over time, and show that borrowers who would previously have qualified for a subprime mortgage loan now can receive a prime market mortgage. Unfortunately, we lack data sufficiently rich to do this compellingly.

Rather, we seek evidence consistent with the hypothesis and then conduct a number of additional tests to invalidate potential alternative explanations. Specifically, we test for whether a negative relationship exists between the market shares of GSE loan purchases and subprime loan originations at the census tract level. The main regression model is:

$$\Delta S_i = \alpha + \gamma \Delta G_i + \beta Z_i + \varepsilon_i \quad (1)$$

Here, ΔS_i is the change of market share of subprime lending between t_1 and t_2 in census tract i; ΔG_i is the change of GSE market share during the same period; Z_i is a set of control variables that includes the change in economic environment and a set of demographic and economic variables and ε_1 is normally distributed disturbance. The demographic and economic controls are included out of a recognition that risk, for which these factors proxy, is a critical consideration for making underwriting decisions. The theoretical model implies negative values for γ.

There are several other salient features of the analysis. First, since it has been documented that suprime lending has been disproportionately concentrated in low-income census tracts and in tracts with higher minority population, we further test whether the relationship between the GSEs and subprime lenders is stronger in those tracts. This model is:

$$\Delta S_i = \alpha + \gamma \Delta G_i + \eta \Delta G_i I_i + \beta Z_i + \varepsilon_i \quad (2)$$

Here I_i is a set of indicators of whether the census tract is of low income and of high minority.

Second, we conduct a preliminary analysis of the relationship between the levels of GSE purchases and subprime originations by estimating:

$$S_i = \alpha + \varphi G_i + \beta Z_i + \varepsilon_i \quad (3)$$

These estimates provide a first indication of whether there is any relationship between the GSEs and subprime mortgage market activity.

Finally, we restrict the focus of the analysis to those census tracts with median family incomes between 80 and 120 percent of the median family income in the relevant metropolitan statistical area. Such a restricted sample offers two key advantages. First, it covers many of the tracts covered by the affordable housing goals, while including non-covered tracts that have similar income and demographic profiles. Second, it excludes the impacts of other legislation, most notably the Community Reinvestment Act, that also seek to increase credit flows to targeted communities. This permits clearer inferences of the results.

4. Data and Results

4.1 Data sources

The empirical analysis uses data pursuant to Home Mortgage Disclosure Act (HMDA) as its primary data source.[7] HMDA provides the most comprehensive mortgage-related dataset in terms of coverage. It contains loan level mortgage application and origination information, including borrowers' demographic traits, like age, race and income, loan type, loan amount, location of property, origination status and certain institutional variables all over the nation. Importantly, HMDA data include information on whether a loan was sold to the secondary market and, if so, the institution it was purchased by. We can therefore identify those loans purchased by the GSEs and calculate their market share.

The HMDA data do not identify whether a loan qualifies as a subprime loan based on price. Fortunately, HUD monitors lenders annually and develops a list of institutions that engage significantly in subprime lending.[8] This list has acknowledged shortcomings. For example, some lenders might originate subprime loans but not in numbers considered significant. Alternatively, lenders identified as subprime might also originate loans that are not subprime. Despite these limitations, it is the best available source for identifying subprime loans and is used here. All loans originated by lenders identified as subprime by HUD are considered to be subprime loans. Given this, we can identify subprime loan market shares.

Following Bunce and Scheesele (1996), we exclude loans with loan-to-income or loan amount outliers.[9] The loan-level HMDA data are aggregated at the tract level, focusing on census tracts in metropolitan areas.

Finally, information on neighborhood demographic and economic characteristics are drawn from the 1990 and 2000 Census. Metropolitan statistical area (MSA) data on regional income, employment, and wages are taken from the U.S. Bureau of Labor Statistics.

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[7] HMDA, enacted by Congress in 1975 and implemented by the Federal Reserve Board's Regulation C, requires lending institutions to report public loan data, mainly to enforce fair lending.

[8] Counts of subprime lenders as identified by HUD are reported in Appendix B. For more on this list, see http://www.huduser.org/datasets/manu.html.

[9] See table 1 for a detailed description of the criteria used to exclude loans.

The dynamic analysis focuses on two years, 1996 and 2000. We choose 1996 because it falls before the affordable housing goal thresholds increased (see Appendix A). Thus, it serves as a "pre-treatment" observation. The year 2000 was chosen because it falls within the treatment period after the goals had increased substantially and had a similar interest rate environment to that observed in 1996 (see Appendix D). Lending in 2000 thus reflects the GSE response to the increased goal requirements and subprime responses to market conditions, including the GSE response.

4.2 Empirical results

The mortgage market, as reported in HMDA, has increased markedly since 1995, with a majority of loans in most years being for home purchases as opposed to loan refinancings (table 1). Subprime market shares, though relatively small, increased considerably during the sample period, reaching a maximum of about 12 percent in 2000. Loans purchased by the GSEs as a fraction of total lending fell slightly between 1995 and 2001, although there was volatility from year to year. The data suggest a weak negative relationship between annual GSE purchase growth and annual growth in subprime loan originations (figure 3).

Tables 2 and 3 report sample statistics. Table 2 reports on the loans for our sample of about 34,700 census tracts. This sample excludes tracts not located in metropolitan statistical areas (MSAs), tracts for which data on tract median income or minority population share was missing, and tracts whose boundary changed between the 1990 and 2000 Census.[10] While the aggregate trends mirror those observed in the broader mortgage market, the data disaggregated into census tracts suggests that the distribution of loans is not uniform. For example, subprime market shares are consistently higher when the data are aggregated at the tract level, which suggests a skewed distribution with some tracts having particularly high subprime loan market shares. This is consistent with research discussed earlier that finds that subprime lending is not spatially distributed in a random fashion. By contrast, GSE shares calculated at the tract level are generally lower

[10] Out of a concern that the omission procedure might introduce sample selection issues, we compared the characteristics of sample and omitted tracts. This comparison, reported in appendix D, suggests only minor differences between the tract groups. We conclude there is a low likelihood that sample selection is a problem.

than those in the aggregate, suggesting there are tracts with very low GSE penetration. Interestingly, the loan-to-income ratio, which is a rough proxy for the riskiness of borrowers in a census tract, rises during the period. Table 3 reports on the characteristics of the census tracts included in the sample.

Table 4 reports the estimation results of the level regression (equation (3)) for subprime market share. We estimate the model each year, and these results show that there is a consistent and strong negative relationship between GSE activity and subprime lending activity.[11] This indicates that the GSEs and subprime lenders do interact and subprime lending is weaker where the GSEs are relatively more active.

The model in table 4 performs well in identifying census tract risk characteristics, as coefficients of many of the control variables are significant and have expected signs. As has been consistently found in other research, subprime lending market shares are higher in lower-income and minority census tracts, as well as in areas with low median house values and high unemployment rates. Also consistent with prior research, subprime market shares are lower for Asian populations and in higher-income neighborhoods, although the latter relationship weakens toward the end of the sample period. In addition, consistent with intuition, subprime market shares are found to be higher in metropolitan areas with low affordability and lower in areas with high affordability. The lone unexpected result in these estimates was the negative coefficient on the loan-to-income ratio, a rough proxy for average borrower risk. Given the complex nature of underwriting and the many dimensions that determine borrower risk that are not incorporated into this measure, a lack of conformity to expectations is perhaps not surprising[12].

While the analysis in table 4 suggests a negative relationship in levels, our hypothesis is more a story of dynamics and change. We posit that increases in purchases by GSEs lead to reductions in market share by subprime lenders. Note that this is not a necessary result, as the GSEs and subprime loan segments account for only about 30-40 percent of originations in the average census tract during the sample period. Thus, GSE gains could

[11] 288 observations are omitted from this analysis because we were unable to calculate "percent change in median house value, 1990s". Regressions using lagged GSE market share instead of contemporaneous GSE market share, run in order to assess model robustness, produced qualitatively identical results. These results are available from the author upon request.

12 Aside from the omitted variable issue, the loan-to-income ratio might, in fact, be endogenous. Lenders and borrowers might negotiate this value as they do with other loan terms.

arise at the expense of other market players. Indeed, we have already discussed the An and Bostic (2006) finding that some of the GSE gain is at the expense of the FHA. Even with that knowledge, however, market players other than subprime lenders could be the primary losers of market share, given that GSE purchase, subprime and FHA loans account for roughly 50 percent of the total loan originations in a given tract in 2001 (table 2, assuming each group of loans is mutually exclusive).

The results of estimating equation (1) and (2) are shown in table 5. The estimates in table 5 omit any tracts that saw fewer than 5 loans purchased by the GSEs or originated by subprime lenders. This is to reduce the likelihood of tracts showing very large percentage gains or losses in lending and market share. We also addressed the outlier issue directly by estimating equation (1) and (2) using a sample that excluded those tracts in the top and bottom quartiles for percent change in subprime and GSE market shares. The results were largely identical, so only the results for the first analysis are reported.[13]

Estimation results of equation (1) (model 1 in table 5) show that the change in subprime market share in a census tract is significantly and negatively related to the change in GSE market share in that tract. A one percent increase in GSE market share leads to 0.27 percent reduction in subprime market share. Thus, the data support the main hypothesis. Other results conformed to expectations. For example, increase in FHA market share leads to decrease in subprime market share but the magnitude of impact is much smaller than that of GSE. Subprime market share growth was larger in high minority census tracts and lower-income census tract. It was also positively related to unemployment growth. Subprime market share was lower in tracts with more valuable homes. Other results are a bit more surprising. For example, subprime market growth was smaller in low affordable areas. This might be because of the low growth in borrower base in these areas. Moreover, subprime market shares were increasing in MSAs with increasing per capita income. This is a new finding, and suggests that the geography of subprime lending is evolving, perhaps in unanticipated ways.

These results are consistent with a view that growth in GSE activity induces borrowers to choose the prime mortgage market instead of the subprime market. A rough calculation based on the model's coefficients indicates that a ten percent increase in GSE

[13] The results for the other anlaysis are available from the authors upon request.

market share (e.g., from 20 percent to 22 percent) in moderate-income neighborhoods would result in about 20,000 borrowers receiving prime instead of subprime loans. We estimate the aggregate borrower savings from this shift to be on the order of $100 million.

Model 2 in table 5 (equation 2) adds interactions of GSE market share change and census tract income and minority characteristics. The estimates for these terms are not significant. However, the point estimates are negative, which suggests that the GSEs' negative effect on subprime tends to be stronger in high minority tracts. Unrestricted model specifications show that the stronger effects in neighborhoods with significant minority populations are significant. Table 6 reports results of separate estimations with high minority samples. GSE impact on subprime lending is especially stronger in neighborhoods with minority population shares higher than 30 percent.

An alternative interpretation of these results is that the subprime market has increased its lending at the expense of GSE purchases. Indeed, the aggregate data indicating an average market share growth of -0.08 for GSE purchases and 0.95 for subprime loans do support this view. From a practical perspective, such a dynamic is unlikely, however, as subprime loans made under this circumstance would still be eligible for GSE purchase unless the GSEs tightened underwriting standards. That said, we repeated the analysis focusing only on those tracts with positive GSE market share growth to exclude the possiblity of a contracting conforming market. The estimates from this, reported in table 7, are identical to those reported earlier. This provides additional evidence that the main hypothesis is the correct one.

Further, the results might be idiosyncratic to the particular years we used as the starting and ending date for the change analysis. We repeated the analysis multiple times, varying either the starting year, the ending year, or both. The results, not reported, were identical to those in table 5.

5. Conclusions and Discussions

This paper has explored the hypothesis that the affordable goals established through the GSE Act have been effective incentives for GSEs to increase their loan purchases, and that the subsequent GSE response has led to a reduction in the market penetration of subprime lenders. Given the many questions regarding the extent to which many

subprime borrowers have risks commensurate with prime mortgages, such a substitution would be clearly beneficial for those households receiving prime mortgages rather than the higher cost subprime loans. The fact that subprime lending appears to be concentrated in minority and lower-income populations, groups that have historically had limited access to credit markets and lower rates of homeownership, gives the potential benefits even more salience from a policy perspective.

The empirical results support the hypothesis. While there is a negative relationship between the GSE purchase market share and the subprime lending market share at a point in time, there is also a negative relationship between the growth in GSE market share and the growth in subprime market share over time. The impact tends to be stronger in high minority neighborhoods. Importantly, this result is not a statistical artifact, as the combined share of GSE and subprime lender activity ranges from 30 to 40 percent during the sample period. A ten percent increase in GSE market share (e.g. from 20% to 22%) can cause 2.7 percent decrease in subprime market share, and this could lead to 20,000 borrowers using prime instead of subprime loans, at a cost savings of about $100 million.

A direct implication of the results is that increased GSE attention to higher risk borrowers can impart significant cost-related benefits. Given that subprime borrowers have less income and wealth to cover costs associated with adverse labor market, medical and familial emergencies, they are more vulnerable to delinquency, default and foreclosure and less likely to reap the full benefit of homeownership. By moving these households into lower cost mortgages, this vulnerability declines and the benefits of homeownership more fully realized.

This argues for policy prescriptions that increase the competition for subprime borrowers from prime mortgage market participants such as the GSEs. Such an approach has been recommended by others (Courchane, Surette, and Zorn, 2004). However, the performance of these loans will be a key issue. If, as is asserted by Carr and Scheutz (2001), many subprime borrowers represent prime market risks, then this expansion can proceed relatively costlessly. If, by contrast, these borrowers perform significantly worse than prime market borrowers, then one must consider the impact of such policies on the risk exposure of banking and other regulated institutions.

In addition, there is an ongoing debate regarding whether HUD should continue to raise the affordable housing goals thresholds, with some in opposition arguing that this might have a negative impact on primary market participants such as the FHA (for example, National Association of Realtors, 2004, Independent Community Bankers of America, 2004). The issue is perhaps more complex, as our results suggest an additional negative impact on subprime market participants as well. Given that these negative effects translate into cost savings for borrower households, this might be welfare improving on balance. A full benefit-cost analysis has yet to be completed and remains for future researchers.

There are other issues for future researchers to examine. Clearly our use of the HUD subprime lender list raises issues given its widely recognized limitations. Replication of these results using a dataset that includes explicit pricing information to verify and validate the current findings would be welcome. Perhaps the newly available pricing data in HMDA might be useful in this regard.

In conclusion, regardless of the outcome of the various debates about the affordable housing goals policy, one thing is clear. Homeownership is important. Given this fact, policy-makers should continue searching for new instruments to help lower-income and minority households gain access to credit and homeownership in vehicles that are beneficial and most advantageous for wealth-building and household stability.

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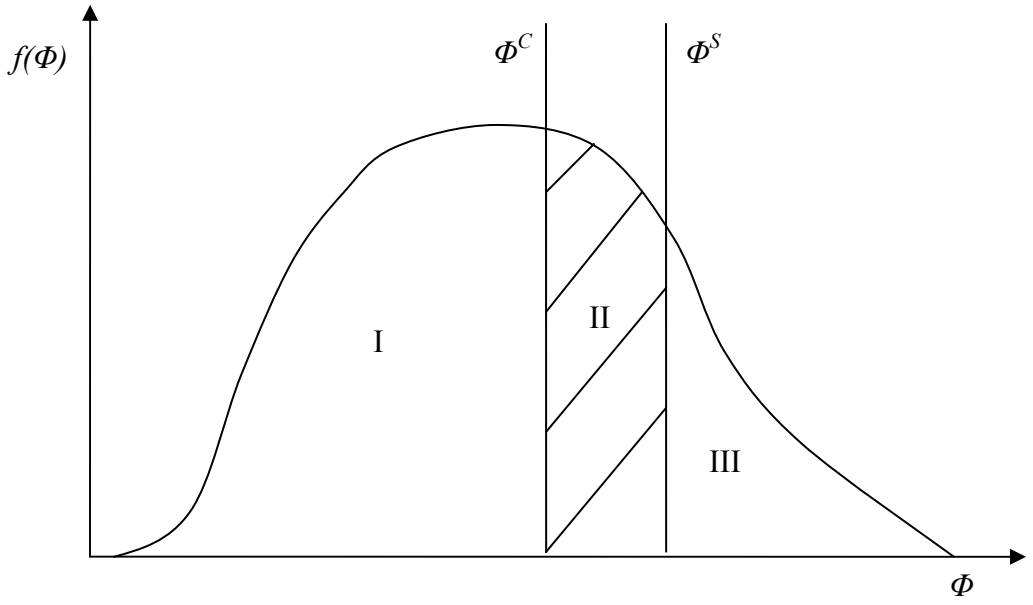

Figure 1: Market composition of conventional and subprime lending

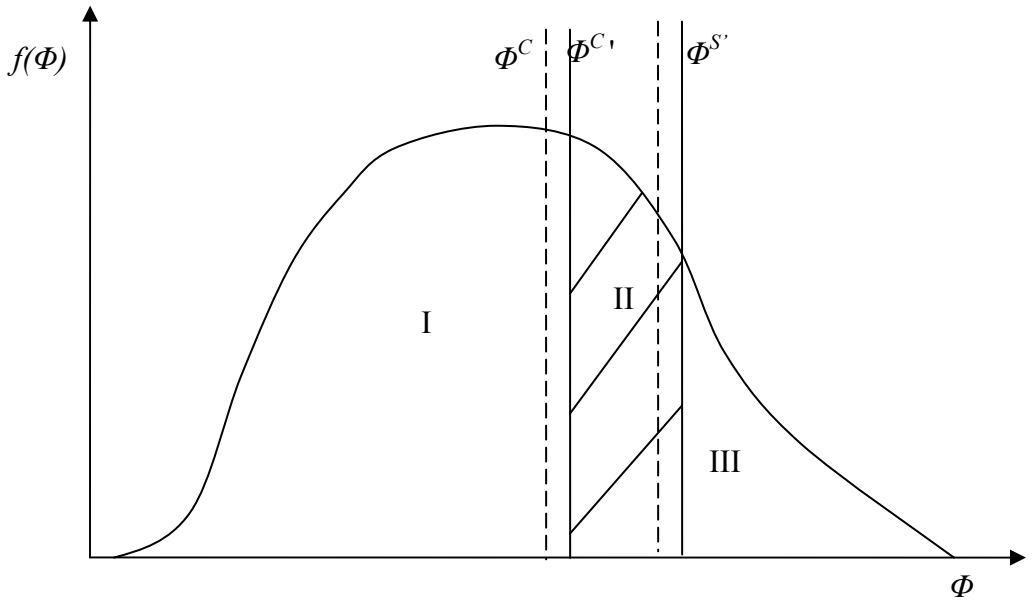

Figure 2: New market composition of conventional and subprime lending

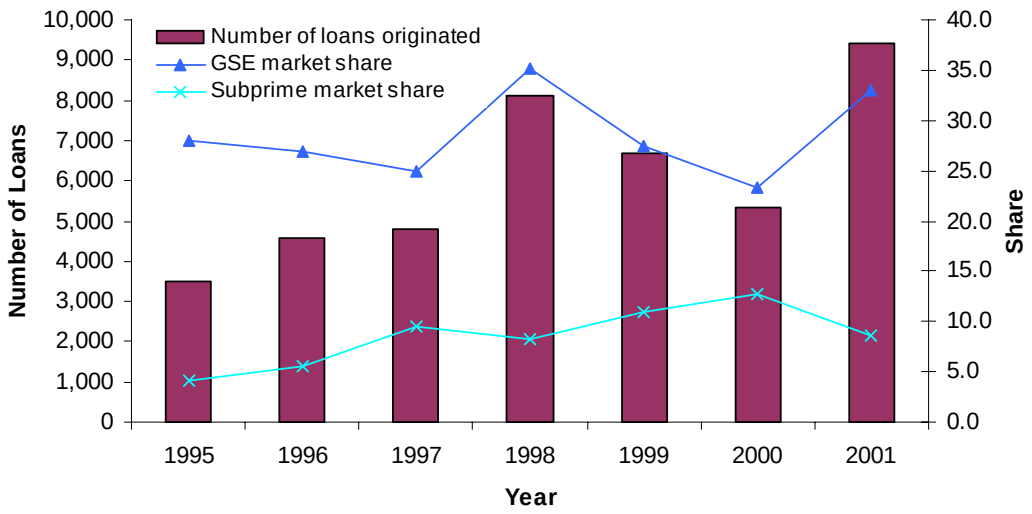

Fig.3: Loans originated and GSE, Subprime Market Shares

Table 1: Loan Volumes, by loan purchase, loan type and purchase status, 1995-2001

	1995	1996	1997	1998	1999	2000	2001
Number of loans (000s)	3,515	4,585	4,785	8,108	6,669	5,326	9,419
Loan purpose (percent)							
Home purchase	62.24	54.83	51.63	36.20	46.88	55.49	32.95
Refinance	37.76	45.17	48.37	63.80	53.12	44.51	67.05
Loan type (percent)							
Subprime	4.06	5.61	9.50	8.27	11.03	12.67	8.55
FHA	13.55	13.25	13.59	9.08	11.97	13.74	8.98
Purchase type (percent)							
Not sold	37.87	39.85	35.58	29.71	33.84	35.37	33.48
Fannnie Mae	18.16	15.01	14.46	20.23	15.50	13.86	18.48
Freddie Mac	9.89	11.89	10.42	14.93	12.00	9.53	14.58
Number of census tracts	45,047	45,186	45,162	45,253	45,233	45,408	49,113

NOTE: 1) Source: HMDA. 2) Data include only home purchase and refinance loans originated for owner-occupied properties. Loans for properties not located in a metropolitan statistical area, loans smaller than $15,000 (thought to be home improvement loans), and loans with loan to income ratios in excess of 6 (thought to have incorrect income information, e.g. monthly income rather than annual income recorded). 3) Subprime loans are loans originated by institutions identified by HUD as subprime lenders. We identify subprime loans using HUD's subprime lender lists (not including manufactured lenders). HUD monitors lenders annually and develops a list of institutions that engage significantly in subprime lending. While this list has acknowledged shortcomings, it is the best available source for identifying subprime loans during the analytical period. For more on this list, see http://www.huduser.org/datasets/manu.html.

Table 2: Selected Sample Statistics for Distribution of Loans by Type

	1995	1996	1997	1998	1999	2000	2001
Aggregate sample-wide (percent)							
Subprime	4.32	6.01	10.26	8.91	11.83	13.41	8.82
GSE	27.50	26.26	23.98	34.30	26.62	22.50	32.71
FHA	13.41	12.93	13.12	8.82	11.61	13.54	8.90
Tract average (percent)							
Subprime	5.71	8.17	13.05	13.61	15.77	16.58	12.57
GSE	25.54	23.73	21.10	28.60	23.42	20.48	28.77
FHA	14.88	14.91	15.24	11.48	12.97	14.19	10.95
Loan-to-income ratio	1.64	1.59	1.60	1.60	1.66	1.68	1.71
Number of tracts	34,691	34,691	34,691	34,691	34,691	34,691	34,691
Number of loans (000s)	2,337	3,045	3,179	5,351	4,364	3,409	5,994

NOTE: 1) Source: HMDA. 2) The sample omits tracts that (a) are not located in metropolitan areas, (b) are missing values of tract median family income or tract minority population shares, and (c) had a boundary change between the 1990 and 2000 Census.

Table 3: Descriptive Statistics of Census Tract Characteristics

	Mean	St. Dev.
Tract family income as a percentage of the MSA median family income, percent of tracts		
Less than 80 percent	0.293	0.455
80-90 percent	0.125	0.331
90-100 percent	0.133	0.340
100-120 percent	0.216	0.411
Greater than 120 percent	0.233	0.423
Minority population share, percent of tracts		
Share less than 10 percent	0.435	0.496
Share between 10 and 30 percent	0.261	0.439
Share greater than 30 percent	0.304	0.460
Housing market indicators		
Homeownership rate, 1990 (%)	56.160	23.622
Homeownership rate, 2000 (%)	56.525	23.803
Vacancy rate, 1990 (%)	7.682	7.105
Vacancy rate, 2000 (%)	7.107	6.661
Median house value, 1990 ($)	108,792	89,528
Median house value, 2000 ($)	143,037	113,585
Percent change in homeownership rate, 1990s	3.072	49.795
Percent change in vacancy rate, 1990s	6.942	77.815
Percent change in median house value, 1990s	42.057	52.005
Percent change in median house value, 1990s	42.057	52.005
Demographic characteristics		
Percentage aged 17 or less, 1990	24.557	7.005
Percentage aged 65 or older, 1990	15.841	7.874
Percentage minority, 1990	26.890	30.324
Percentage Asian, 1990	3.769	8.935
Unemployment rate, 1990 (%)	4.641	3.064
Household size, 1990	2.762	2.114
Percentage central city tracts	0.534	0.499
Percentage 1-4 unit structures, 1990	81.729	21.642
Percentage single family homes, 1990	66.544	27.241
Number of owner-occupied units, 1990	930	532
Median family income, 1990 ($)	37,847	16,888
Percent change in unemployment rate, 1990s	8.054	109.885
Percent change in number of units, 1990s	11.601	57.873
Percent change in median family income, 1990s	41.446	33.354
Metropolitan area characteristics		
Per capita income in PMSA, 1990 ($)	19,425	3338
Share of Population Employed, 1990 (%)	0.496	0.059
Per capita wages in PMSA, 1990 ($)	22,813	3384
Percent change in PMSA per capita income, 1990s	51.328	8.533
Percent change in PMSA employment, 1990s	3.740	6.717
Percent change in PMSA per capita wages, 1990	47.589	10.197
High affordable, percent of tracts	0.165	0.371
Low affordable, percent of tracts	0.320	0.467
Number of tracts	34,691	

NOTE: 1) Source: Census 1990 and census 2000. 2) Income, housing and demographic characteristics are compiled from Census 1990 and 2000. Metropolitan area characteristics are from Bureau of Labor Statistics. 3) "Highly affordable" metropolitan areas are defined as those PMSAs ranked in the lowest quartile in terms of their median house value to median family income ratio. "Low affordable" metropolitan areas have ratios that fall in the top quartile.

Table 4: OLS Estimates for the Level Regressions

Dependent variable: subprime market share

	1995	1996	1997	1998	1999	2000	2001
Independent Variable							
Intercept	-0.91***	-1.31***	-1.33***	-1.48***	-1.19***	-1.05***	-0.87***
	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
GSE market share	-0.17***	-0.22***	-0.28***	-0.36***	-0.32***	-0.33***	-0.35***
	(0.01)	(0.01)	(0.01)	(0)	(0)	(0)	(0)
FHA market share	-0.14***	-0.15***	-0.20***	-0.20***	-0.17***	-0.22***	-0.16***
	(0.01)	(0.01)	(0)	(0)	(0)	(0)	(0)
Tract to MSA median family income ratio <=80%	0.04*	0.02	0.11***	0.08***	0.08***	0.15***	0.15***
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)
Tract to MSA median family income ratio 80-90%	-0.06**	-0.13***	-0.05**	-0.09***	-0.07***	0.02	-0.01
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Tract to MSA median family income ratio 90-100%	-0.05*	-0.09***	-0.04**	-0.07***	-0.06***	0.01	-0.01
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Tract to MSA median family income ratio 100-120%	-0.04*	-0.06***	-0.04**	-0.06***	-0.05***	-0.01	-0.03*
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Tract minority population share 10-30%	0.08***	0.13***	0.11***	0.12***	0.17***	0.19***	0.17***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Tract minority population share >=30%	0.42***	0.51***	0.47***	0.55***	0.64***	0.64***	0.64***
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Tract average loan to income ratio in 1995	0.00	-0.01*	0.02**	-0.02***	-0.03***	-0.03***	-0.05***
	(0.01)	(0.01)	(0.01)	(0)	(0)	(0.01)	(0)
Median house value, 1990	-0.18***	-0.23***	-0.32***	-0.31***	-0.34***	-0.36***	-0.28***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Percent change in median house value, 1990s	0.01	0.02***	0.00	-0.02***	-0.04***	-0.08***	-0.06***
	(0.01)	(0)	(0)	(0)	(0)	(0)	(0)
Percentage aged 62 or older, 1990	0.00	0.00	0.00	0.00	0.01*	0.01*	0.00
	(0.01)	(0)	(0)	(0)	(0)	(0)	(0)
Percentage Asian, 1990	-0.04***	-0.07***	-0.05***	-0.07***	-0.09***	-0.06***	-0.08***

	(0.01)	(0.01)	(0)	(0)	(0)	(0)	(0)
Unemployment rate, 1990 (%)	0.16***	0.23***	0.20***	0.23***	0.22***	0.19***	0.21***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Indicator of central city tract, 1990	0.09***	0.13***	0.13***	0.17***	0.13***	0.13***	0.10***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Percentage 1-4 unit structures, 1990	0.04***	0.08***	0.08***	0.10***	0.12***	0.12***	0.13***
	(0.01)	(0.01)	(0)	(0)	(0)	(0)	(0)
Per capita income in PMSA, 1990	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Share of population employed in PMSA, 1990 (%)	0.52***	0.19	0.48***	0.13	-0.02	-0.32***	-0.31***
	(0.11)	(0.1)	(0.09)	(0.08)	(0.08)	(0.08)	(0.08)
Tract in highly affordable area	-0.18***	-0.19***	-0.14***	-0.11***	-0.14***	-0.12***	-0.07***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Tract in low affordability area	0.19***	0.15***	0.13***	0.06***	0.02*	0.04**	0.02
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
N	34,403	34,403	34,403	34,403	34,403	34,403	34,403
Adjusted R-Square	0.1997	0.3450	0.4211	0.5826	0.5829	0.5383	0.5469

NOTE: 1) Standard errors are in parenthesis. *** denotes significance at 0.1% significance level, ** for 1% significance level and * for 5% significance level. 2) All continuous variables are standardized to have zero means and unit variances. 3) 288 observations are omitted from this analysis because we were unable to calculate "percent change in median house value, 1990s".

Table 5: OLS Estimates for the Change Regression

Dependent variable: percent change in subprime market share, 1996-2000

	Model 1	Model 2
Independent Variable		
Intercept	1.38***	1.41***
	(0.22)	(0.22)
Percent change in GSE market share	-0.27***	-0.27***
	(0.04)	(0.06)
Change in GSE market share * tract to MSA income ratio <=80%		0.13
		(0.08)
Change in GSE market share * tract to MSA income ratio 80-90%		-0.01
		(0.08)
Change in GSE market share * minority population share 10-30%		-0.03
		(0.08)
Change in GSE market share * minority population share >30%		-0.12
		(0.09)
Percent change in FHA market share	-0.07***	-0.07***
	(0.01)	(0.01)
Percent change in average loan to income ratio	-0.03	-0.03
	(0.07)	(0.07)
Percent change in median house value, 1990s	0.00**	0.00**
	(0)	(0)
Percent change in tract unemployment rate	0.00**	0.00**
	(0)	(0)
Percent change in total housing units	-0.21***	-0.20***
	(0.04)	(0.04)
Percent change in MSA per capita income	0.01***	0.01***
	(0)	(0)
Percent change in MSA share of population employed	-0.02***	-0.02***
	(0)	(0)
Tract to MSA median family income ratio 80-90%	0.05	0.06
	(0.04)	(0.04)
Tract to MSA median family income ratio 90-100%	0.09**	0.09**
	(0.03)	(0.03)
Tract minority population share 10-30%	0.11***	0.11**
	(0.03)	(0.03)
Tract minority population share >=30%	0.08	0.06
	(0.04)	(0.05)
Tract average loan to income ratio in 1995	-0.22***	-0.23***
	(0.06)	(0.06)
Median house value, 1990	0.00**	0.00**
	(0)	(0)
Percentage aged 62 or older, 1990	-0.01***	-0.01***
	(0)	(0)
Percentage Asian, 1990	0.00	0.00
	(0)	(0)
Unemployment rate, 1990 (%)	-0.04**	-0.04**
	(0.01)	(0.01)

Indicator of central city tract, 1990	-0.08**	-0.09**
	(0.03)	(0.03)
Percentage 1-4 unit structures, 1990	0.01***	0.01***
	(0)	(0)
Per capita income in PMSA, 1990	0.00***	0.00***
	(0)	(0)
Share of population employed in PMSA, 1990 (%)	0.04	0.04
	(0.31)	(0.31)
Tract in highly affordable area	0.02	0.02
	(0.05)	(0.05)
Tract in low affordability area	-0.18***	-0.18***
	(0.04)	(0.04)
N	5540	5540
Adjusted R-Square	0.0769	0.0770

NOTE: 1) Standard errors are in parenthesis. *** denotes significance at 0.1% significance level, ** for 1% significance level and * for 5% significance level. 2) Tracts with less than 5 GSE loans or subprime loans in 1996 are omitted to alleviate outlier problem.

Table 6: OLS Estimates for the Change Regression with High Minority Tracts

Dependent variable: percent change in subprime market share, 1996-2000

	Minority share 10-30%	Minority share >30%
Independent Variable		
Intercept	1.52***	2.64***
	(0.41)	(0.37)
Percent change in GSE market share	-0.32***	-0.41***
	(0.07)	(0.07)
Percent change in FHA market share	-0.12***	-0.18***
	(0.03)	(0.03)
Percent change in average loan to income ratio	-0.10	0.00
	(0.17)	(0.09)
Percent change in median house value, 1990s	0.00**	0.00*
	(0)	(0)
Percent change in tract unemployment rate	0.00	0.00
	(0)	(0)
Percent change in total housing units	-0.30***	-0.09
	(0.07)	(0.06)
Percent change in MSA per capita income	0.02***	0.03***
	(0)	(0)
Percent change in MSA share of population employed	-0.02**	-0.02*
	(0.01)	(0.01)
Tract to MSA median family income ratio 80-90%	0.12	0.02
	(0.07)	(0.07)
Tract to MSA median family income ratio 90-100%	0.09	0.06
	(0.07)	(0.06)
Tract average loan to income ratio in 1995	-0.19	-0.04
	(0.12)	(0.1)
Median house value, 1990	0.00**	0.00
	(0)	(0)
Percentage aged 62 or older, 1990	-0.01*	0.00
	(0)	(0.01)
Percentage Asian, 1990	-0.01	0.00
	(0.01)	(0)
Unemployment rate, 1990 (%)	-0.07**	-0.07***
	(0.02)	(0.02)
Indicator of central city tract, 1990	0.06	-0.18**
	(0.06)	(0.05)
Percentage 1-4 unit structures, 1990	0.01***	0.00
	(0)	(0)
Per capita income in PMSA, 1990	0.00**	0.00***
	(0)	(0)
Share of population employed in PMSA, 1990 (%)	-0.02	-1.71*
	(0.65)	(0.7)
Tract in highly affordable area	0.12	0.09
	(0.12)	(0.13)
Tract in low affordability area	-0.21*	-0.24**

	(0.08)	(0.09)
N	1864	1380
Adjusted R-Square	0.0910	0.1462

NOTE: 1) Standard errors are in parenthesis. *** denotes significance at 0.1% significance level, ** for 1% significance level and * for 5% significance level. 2) Tracts with less than 5 GSE loans or subprime loans in 1996 are omitted to alleviate outlier problem.

Table 7: OLS Estimates for the Change Regression with Only Tracts with GSE Market Share Increase

Dependent variable: percent change in subprime market share, 1996-2000

	Model 1	Model 2
Independent Variable		
Intercept	1.93***	1.94***
	(0.4)	(0.4)
Percent change in GSE market share	-0.20***	-0.21*
	(0.06)	(0.1)
Change in GSE market share * tract to MSA income ratio <=80%		0.19
		(0.15)
Change in GSE market share * tract to MSA income ratio 80-90%		0.02
		(0.14)
Change in GSE market share * minority population share 10-30%		-0.08
		(0.15)
Change in GSE market share * minority population share >30%		-0.20
		(0.16)
Percent change in FHA market share	-0.05*	-0.05*
	(0.02)	(0.02)
Percent change in average loan to income ratio	0.11	0.10
	(0.15)	(0.15)
Percent change in median house value, 1990s	0.00***	0.00**
	(0)	(0)
Percent change in tract unemployment rate	0.00***	0.00***
	(0)	(0)
Percent change in total housing units	-0.20**	-0.21**
	(0.07)	(0.07)
Percent change in MSA per capita income	0.01**	0.01**
	(0)	(0)
Percent change in MSA share of population employed	-0.02***	-0.02***
	(0.01)	(0.01)
Tract to MSA median family income ratio 80-90%	0.05	-0.02
	(0.06)	(0.08)
Tract to MSA median family income ratio 90-100%	0.06	0.05
	(0.06)	(0.07)
Tract minority population share 10-30%	0.15*	0.17*
	(0.06)	(0.08)
Tract minority population share >=30%	0.18*	0.26**
	(0.08)	(0.1)
Tract average loan to income ratio in 1995	-0.26*	-0.25*
	(0.11)	(0.11)
Median house value, 1990	0.00**	0.00**
	(0)	(0)
Percentage aged 62 or older, 1990	-0.01**	-0.01**
	(0)	(0)
Percentage Asian, 1990	-0.01	-0.01
	(0)	(0)
Unemployment rate, 1990 (%)	-0.06**	-0.06**

	(0.02)	(0.02)
Indicator of central city tract, 1990	-0.17***	-0.17***
	(0.05)	(0.05)
Percentage 1-4 unit structures, 1990	0.01***	0.01***
	(0)	(0)
Per capita income in PMSA, 1990	0.00***	0.00***
	(0)	(0)
Share of population employed in PMSA, 1990 (%)	0.79	0.78
	(0.54)	(0.54)
Tract in highly affordable area	0.07	0.07
	(0.08)	(0.08)
Tract in low affordability area	-0.09	-0.09
	(0.08)	(0.08)
N	2193	2193
Adjusted R-Square	0.1118	0.1115

NOTE: 1) Standard errors are in parenthesis. *** denotes significance at 0.1% significance level, ** for 1% significance level and * for 5% significance level. 2) Tracts with less than 5 GSE loans or subprime loans in 1996 are omitted to alleviate outlier problem.

Appendix A: The HUD-specified Affordable Housing Goal Percentage Thresholds

Period	Goal		
	Low- and Moderate-Income	Underserved Neighborhoods	Special Affordable
1994-1995	30	30*	In dollar amount
1996	40	21	12
1997-2000	42	24	14
2001-2004	50	31	20
2005-2008	52-56	37-39	22-27

NOTE: 1) Source: HUD. 2) All figures are percentages of the total number of units covered by the mortgages purchased by each GSE. 3) The year 1994 and 1995 is the experimental period, with the underserved neighborhoods defined differently from the current definition. The thresholds for 1996-2000 were published on December 1, 1995, those for 2001-2003 were published on October 31, 2000, and those for 2005-2008 were published on November 2, 2004. HUD explains that is increase of the underserved neighborhoods goal from 31% to 37% incorporates the effects of 2000 census data, under which the 2001-2004 31% goal would be 36%.

Appendix B: Number of subprime lenders identified by HUD

	1995	1996	1997	1998	1999	2000	2001
Number of Subprime lenders	103	143	210	249	256	197	188

NOTE: 1) Source: HUD. 2) This does not include manufactured home lenders.

Appendix C: Selected Statistics for Omitted Census Tracts

	1995	1996	1997	1998	1999	2000	2001
Tract average (percent)							
Subprime	4.11	6.08	9.91	10.79	12.90	13.96	8.79
GSE	26.20	24.28	22.18	29.19	24.21	21.75	24.09
FHA	15.71	16.14	17.99	12.41	13.80	14.63	15.98
Loan-to-income ratio	1.67	1.63	1.63	1.62	1.68	1.68	1.83
Number of tracts	10,356	10,495	10,471	10,562	10,542	10,717	14,423
Number of loans	1,178	1,540	1,607	2,756	2,306	1,917	3,425

NOTE: 1) This sample *includes* those tracts that (a) are not located in metropolitan areas, (b) are missing values of tract median family income or tract minority population shares, and (c) had a boundary change between the 1990 and 2000 Census.

Appendix D: Interest Rates, 1994-2001