# Do the GSEs Meet the Credit Needs of Underserved Communities of Color?

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## Abstract

*The government-sponsored enterprises (GSEs) are required by Congress to promote access to mortgage credit in underserved markets by meeting explicit affordable housing goals. Although the GSEs have met these goals in the aggregate, previous research suggests that the GSEs' targeted purchases have not encouraged sufficient lending to the most underserved homebuyers. By comparing primary-market lending and GSE secondary-market purchases in the periods before and after the Housing and Economic Recovery Act of 2008, this study revisits the questions of whether the GSEs lead the market and serve all members of underserved markets equally or serve primarily the least underserved of the underserved, especially when it relates to communities of color, who tend to be concentrated in many of the geographically targeted areas. Results from a series of logit models of the determinants of GSE purchases suggest that, although the new designations of underserved markets seem to do a better job in pinpointing low-income and minority communities compared with the early broader definitions, they do not guarantee that the GSEs serve the most underserved of the underserved, especially when it relates to communities of color. Policymakers should revisit the criteria currently adopted for the designation of underserved markets and consider incorporating race and ethnicity in the formulation of affordable housing goals, revising the designation of geographically targeted areas, and establishing subgoals that are specific to geography.*

## Introduction

In light of the severe distress recently experienced by the government-sponsored enterprises (GSEs; that is, Fannie Mae and Freddie Mac) and in a time of great uncertainty in the direction and extent of housing finance reform, this article revisits the question of whether and how the GSEs can ensure and promote lending among underserved communities of color. The 2013 Home Mortgage

Disclosure Act (HMDA) data indicate that people of color continue to lose ground in the homeownership market. In particular, African-American and Hispanic households represent an ever-shrinking fraction of homeowners and continue to receive higher cost mortgage loans compared with White borrowers. These patterns give cause for concern, particularly if we consider that people of color will account for three-fourths of household growth during the coming decade (Joint Center for Housing Studies, 2014).

This study calls into question the efficacy of the GSEs in promoting lending in communities of color. Significant government benefits are granted to Fannie Mae and Freddie Mac in exchange for their commitment to meet numerical targets specified by the affordable housing goals for purchasing mortgages made to borrowers from underserved markets. Past research provides little evidence that the affordable housing goals have spurred sufficient lending to the needs of the most underserved homebuyers, especially among people of color. Because this research largely predates the financial crisis and the revisions to the goals made by the Housing and Economic Recovery Act of 2008 (HERA), it is timely to examine whether the revisions have helped the GSEs improve their performance in serving the most underserved markets. In particular, this article brings attention to the fact that the affordable housing goals were never established in terms of race or ethnicity of the borrower and suggests that subgoals targeted at particular race and ethnicity groups might be needed.

By comparing primary-market lending and GSE secondary-market purchases in the pre- and post-HERA periods, this analysis addresses the question of whether the GSEs lead the market. Through a series of logit models, we test the alternative hypotheses either that the GSEs serve all members of underserved markets equally or that they serve primarily the least underserved of the underserved especially when it comes to communities of color, who tend to be concentrated in many of the geographically targeted areas. Further, we examine whether the criteria currently adopted for the designation of underserved markets, which are predominantly based on economic factors, should be revisited to better target communities of color that are still underserved and are in chronic need of mortgage credit, especially in the wake of the foreclosure crisis. Previous research has shown that the influence of the GSEs goes beyond those loans they actually purchase and their procedures and actions may affect the entire mortgage market (Williams, Mcconnell, and Nesiba et al., 2001).

After providing a background on the GSEs and the affordable housing goals, this article presents a literature review of research on the performance of the GSEs in underserved areas to set the empirical study in its larger theoretical framework. It then describes the methods and data used for the logistic regression analysis and presents results on the lending trends in income-based and race-based underserved markets and the determinants of GSE purchases in these markets. It concludes with a recommendation that the Federal Housing Finance Agency (FHFA), which regulates the GSEs, consider housing goals that include explicitly race-based criteria to encourage primary-market lending to African-American and Hispanic borrowers.

## Background

This section provides a brief background on the GSEs, their history, and the issues that led to HERA. In addition, this section briefly discusses the evolution of the affordable housing goals and changes to their formulation, especially those related to the geographically targeted underserved areas.

## The Government-Sponsored Enterprises

Fannie Mae and Freddie Mac, the GSEs on which this study focuses, are privately owned, federally chartered entities that purchase residential home mortgages from primary-market lenders and package most of the purchased loans into securities to be sold to private investors with a guarantee of full payment of principal and interest.[1] They are required by Congress to provide stability in the secondary market for residential mortgages and to promote access to mortgage credit in underserved markets. By enabling mortgage lenders to offer housing finance at lower mortgage interest rates, Fannie Mae and Freddie Mac are expected to make homeownership affordable to a wider range of households. In the early 1990s, the Federal Housing Enterprises Financial Safety and Soundness Act (the GSE Act) of 1992 expanded the housing mission for both Fannie Mae and Freddie Mac and called for the U.S. Department of Housing and Urban Development (HUD) to establish annual affordable and geographic goals for the GSEs' loan purchases. Significant government benefits were granted to the GSEs in exchange for their commitment to serve members of the markets specified by the housing goals.[2]

The regulatory structure, operations, and financial conditions of the GSEs have been subject to intense controversy, most notably in the early 1990s and during the subprime mortgage crisis that led to the collapse of the GSEs in 2008.[3] The housing crisis, in particular, has raised large questions about the future of the two entities and whether they should be nationalized, privatized, or extinguished or if they should maintain their current structure. Accounting scandals, a weak regulatory structure—especially regarding capital standards—and credit risk are among the issues related to the GSEs' solvency problems that have been intensely debated over time. With the substantial deterioration of the housing markets that materialized in 2007, Fannie Mae's and Freddie Mac's financial conditions were severely damaged and left them unable to fund mortgages and fulfill their mission without government intervention.

Important controversies emerged also in relation to the affordable housing goals. The goals have been revised several times since their early inception (appendix A). During the period from 1993 to 2009, the numeric targets were periodically increased based on the premise that if the affordable

[1] The federal government established Fannie Mae in 1938 to support the stabilization of the financial conditions of mortgage lenders. Its initial purpose was to increase liquidity for investment by purchasing mortgages insured by the Federal Housing Administration through funds raised by the sale of government-backed securities. The government created Freddie Mac in 1970 to provide a secondary market for conventional mortgage loans. Formerly a government agency, Fannie Mae was converted into a private-public entity in 1968 and became recognized as a GSE responsible for serving low-income and minority borrowers. In 1989, Freddie Mac also acquired the status of GSE.

[2] For instance, Fannie Mae and Freddie Mac are exempt from Securities and Exchange Commission regulations and state securities laws and pay no state or local income tax (Williams, 2006). The performance of the GSEs would be assessed in terms of their share of the conventional conforming market in each goal category and their ability to lead or meet the industry in making loans in each target category.

[3] In the early 1990s, concerns about the GSEs' capital adequacy encouraged HUD and Congress to perform a series of stress tests to calculate the amount of capital that each GSE would need to survive a serious economic downturn. According to HUD's capitalization study (HUD, 1991), neither GSE could survive 3 years of a severe recession. Despite this warning, the GSEs decided not to hold any more capital than they were forced to hold and, instead, to rely heavily on their government guarantees to borrow cheaply (Weicher, 2010).

housing goals were set at less than the primary market they would not be very effective in achieving the GSEs' public purpose of promoting homeownership. The GSEs stated that the affordable housing goals established in 2005 and later years were too high. Critics have also claimed that the affordable housing goals were substantially responsible for the two entities' collapse in 2008 when the purchases of single-family mortgages that the GSEs made to meet the goals targeted to low-income individuals and the potential for moral hazard induced by implicit government backing drove lending to high-risk borrowers (Roberts, 2010; Wallison, 2011). Counterarguments, however, have pointed out that other factors, such as misjudgments about capital requirements and risks associated with subprime activity rather than the housing goals, were responsible for the GSEs' collapse (Bolotnyy, 2012; Weicher, 2010).

In an effort to restore confidence in Fannie Mae and Freddie Mac by providing stronger regulation of the GSEs and injecting capital into the two entities, HERA created a new regulator, FHFA, which placed Fannie Mae and Freddie Mac into conservatorship, a legal status similar to Chapter 11 bankruptcy. In addition, HERA transferred the authority to establish, monitor, and enforce the GSEs' annual affordable housing goals from HUD to FHFA.

## The Affordable Housing Goals and Underserved Areas

The affordable housing goals were originally formulated to foster one of the public purposes of the GSEs: to provide ongoing assistance to the secondary market for conforming home mortgage loans, in particular those for low- and moderate-income families (Weicher, 2010).[4] The goals, which were specified in terms of total units financed by GSE purchases, addressed three segments of the mortgage market: (1) low- and moderate-income families; (2) borrowers in geographically targeted underserved areas; and (3) very low-income families and low-income families in low-income areas.[5] Defining the goals and establishing numerical targets for each goal involved the complex task of (1) determining who the target population was, both in terms of income and location; and (2) setting the targets with reference to the performance and effort of the GSEs toward achieving the targets in previous years.[6]

[4] Fannie Mae and Freddie Mac are restricted by law to purchasing single-family mortgages with origination balances that are less than a specific amount, known as the conforming loan limit. Loans that are more than this limit are known as jumbo loans. The national conforming loan limit for mortgages for the purchase of single-family, one-unit properties increased from $203,150 in 1993 to $417,000 in the 2006-to-2014 period. Since 2008, legislation increased the loan limits in certain high-cost areas in the United States (http://www.fhfa.gov/DataTools/Downloads/Pages/Conforming-Loan-Limits.aspx).

[5] The goals were statutorily specified as follows: (1) The Low- and Moderate-Income Housing Goal: loans to borrowers with incomes at or below the median income for the market area in which they live; (2) The Special Affordable Goal: loans to very low-income borrowers (those with incomes at or below 60 percent of the Area Median Income [AMI]), or to low-income borrowers living in low-income areas (borrowers with incomes at or below 80 percent of the AMI, living in census tracts in which the Median Family Income is at or below 80 percent of the AMI); and (3) The Underserved Areas Goal: loans to borrowers living in low-income census tracts (tracts in which the median income of residents is at or below 90 percent of the AMI) or high-minority tracts (tracts in which minorities comprise at least 30 percent of residents, and the median income of residents in the tract does not exceed 120 percent of the AMI).

[6] Weicher (2010) discussed this process at length and pointed out that the low-income category is not uniform but varies based on the median income in different metropolitan areas and nonmetropolitan counties.

The designation of affordable housing goals changed periodically based on the performance and efforts of the GSEs toward achieving the targets in previous years.[7]

The affordable housing goals were never established in terms of race or ethnicity of the borrower. With the exception of Goal 3, for which a minority presence in geographically targeted areas is mentioned, the affordable housing goals have continued to be based predominantly on economic factors. Further, where the goals explicitly address minority status, they do not distinguish among the racial and ethnic groups that make up minority neighborhoods.

The definition of geographically targeted areas has also changed considerably since the GSE Act of 1992[8] because of changes in the criteria and data used for the various definitions.[9] Until HERA, the geographic areas targeted by the GSEs covered a very large portion of the country,[10] leading to the question of whether such a broad definition of geographically targeted areas could actually be effective in addressing the needs of specific neighborhoods characterized by a consistently limited access to credit. With the adoption of different criteria by FHFA, the newly designated underserved areas occupy a much narrower portion of the nation's territory.[11]

[7] HERA modified the housing goals as follows. Goal 1: A low-income home purchase goal for home purchase mortgages to families with incomes of no greater than 80 percent of the Area Median Income (AMI). Goal 2: A very low-income home purchase goal for home purchase mortgages to families with incomes of no greater than 50 percent of AMI. Goal 3: A low-income area home purchase subgoal for mortgages to families living in census tracts with tract incomes of no greater than 80 percent of AMI or to families with incomes of no greater than 100 percent of AMI who live in census tracts with a minority population of 30 percent or more and a tract median income of less than 100 percent of AMI.

[8] The legislation provided operational definitions for a 3-year transition period (1993 through 1995) during which underserved areas consisted of central cities, as defined by the Office of Management and Budget. HUD replaced the interim definition in 1996 based on research that demonstrated that low-income and high-minority census tracts have high mortgage denial rates and low mortgage origination rates. The new designation defined underserved areas as follows. (1) Within metropolitan areas: census tracts with a median income of less than or equal to 90 percent of Area Median Family Income (AMFI) or a minority population of more than or equal to 30 percent and a median income of less than or equal to 120 percent of AMFI. (2) Within rural areas: counties with a median income of less than or equal to 95 percent of the greater of statewide nonmetropolitan or national nonmetropolitan median income, or counties with a minority population of more than or equal to 30 percent and a median income of less than or equal to 120 percent of the statewide nonmetropolitan median income (appendix A).

[9] The criteria used for the various definitions have largely been based on data provided by the U.S. Bureau of the Census. These criteria include information on race, ethnicity, and income from the decennial censuses and, more recently, from the American Community Survey (ACS). Census 1990 data provided the basis for the designation of underserved tracts from 1996 to 2004 and census 2000 data were used for the same purpose in subsequent years until 2011. With the releases of the 2010 census and the annual ACS, the definition and geographic distribution of underserved tracts have varied since 2012. In particular, the base data for the identification of low-income census tracts have been based on the annual releases of the 5-year ACS, yielding a more current designation of low-income areas. Because census tract boundaries have changed over time, the various definitions of targeted areas reflect these changes as well. In particular, census 1990 boundaries were used for the definitions provided from 1996 to 2002. Starting in 2003, census 2000 boundaries were used until 2011, whereas census 2010 boundaries have been reported since 2012 (appendix A).

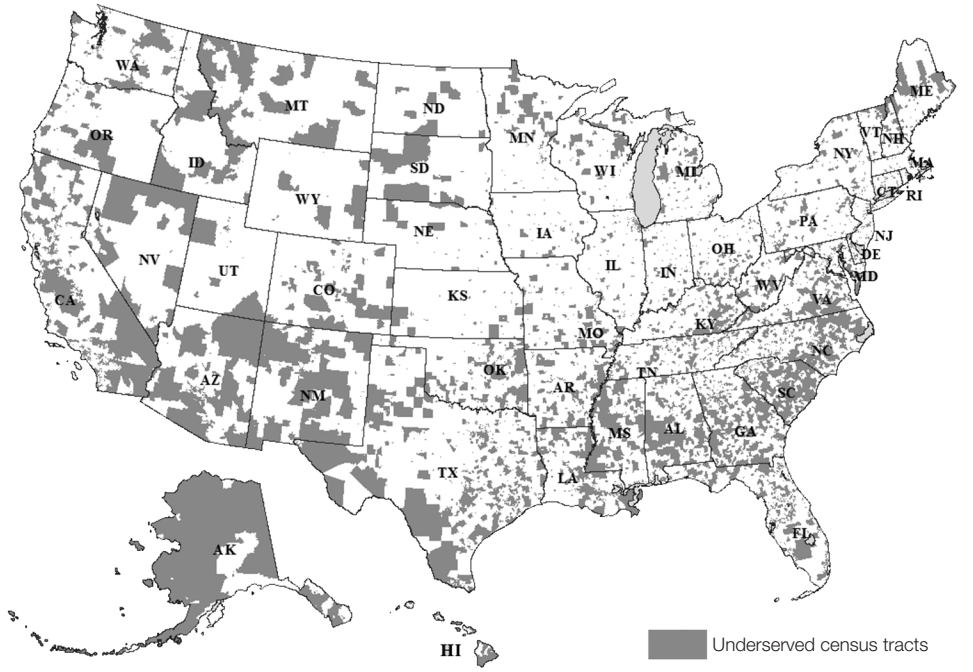
[10] From 1996 to 2004, nearly one-half of all census tracts were designated as underserved (48 percent). The percentage increased to 52 percent from 2005 to 2009.

[11] The percentage of targeted tracts dropped in 2010 (36 percent). HERA redefined "underserved areas" and the new geographic targets for the purchase of single-family owner-occupied homes, which came into effect in 2010, now include the following. (1) Census tracts or block numbering areas in which the median income does not exceed 80 percent of the Area Median Income (AMI). (2) Census tracts with a minority population of at least 30 percent and a median income of less than 100 percent of the AMI. (3) Designated disaster areas. See https://www.fhfa.gov/SupervisionRegulation/Rules/Pages/2009-Enterprise-Transition-Affordable-Housing-Goals-Mortgage-Market-Assessment-Final-Rule.aspx.

As exhibit 1 illustrates, geographically targeted areas are unevenly distributed throughout the country and most seem to be clustered predominantly in the South and West.

**Exhibit 1**

2014 Underserved Areas




*Source: Federal Housing Finance Agency 2014 low-income areas file*

# Literature Review

Numerous studies have examined the performance of Fannie Mae and Freddie Mac in relation to the affordable housing goals.[12] A few have specifically focused on the geographically targeted goal. Early research found that the GSEs tended to purchase loans on homes located in low- and moderate-income tracts at a rate that was, in general, less than that of the industry as a whole (Bunce and Scheessele, 1996; Lind, 1996). Gyourko and Hu (1999) found that GSE-purchased loans tended to be overrepresented in higher income census tracts characterized by higher ownership rates.[13]

More recent research has similarly found that, although Fannie Mae and Freddie Mac are meeting their housing goals, they tend to purchase loans in underserved areas with higher median incomes compared with other geographically targeted areas (Case, Gillen, and Wachter, 2002; Williams,

[12] See, for instance, Bunce (2002); Canner, Passmore, and Surrette (1996); Case, Gillen, and Wachter (2002); Weicher (2010); Williams (2006); Williams and Bond (2002); and Williams, McConnell, and Nesiba (2001).

[13] Gyourko and Hu (1999) noted that expected default costs probably are less in neighborhoods with more, rather than fewer, homeowners.

Mcconnell, and Nesiba, 2001). GSE purchase shares tend to be lower in central cities, lower in tracts with the highest minority concentrations, and lower in tracts with high vacancy rates (An and Bostic, 2008). An et al. (2007) showed that loan-purchase activity declined with tract median income and purchase activity decreased as minority share increased. Williams similarly found that the GSEs tended to serve underserved markets where borrowers have higher incomes, are less likely to be minorities, and are more likely to live in higher income neighborhoods and metropolitan statistical areas (MSAs; Williams, 2006).

Bhutta (2009) suggested that the GSEs' lending activity is not reaching the lower income neighborhoods within the designated underserved areas because it is more costly to do so and so is expected to have lower returns. Ambrose, Thibodeau, and Temkin (2002) similarly suggested that the GSEs were seeking to mitigate risk in underserved areas by purchasing loans from higher income borrowers located in underserved areas. They also found that GSE minority purchases are concentrated outside underserved areas.

In general, these pre-HERA studies show that the GSEs' lending activity led to limited improvements in housing market conditions in targeted neighborhoods along such indicators as homeownership rates, housing stock appreciation, and vacancy rates. Gabriel and Rosenthal (2007), for instance, examined the degree to which the GSEs focused more intensively on underserved markets and the extent to which their purchase activity served to crowd out private-sector loan purchases.[14] They found that gains in liquidity resulting from the GSEs' activities in these areas were partly offset by losses in the nonconforming sector and that GSE loan purchases were crowding out purchases by unsubsidized, private secondary-market intermediaries. They suggested that the increased activity in the conforming sector may come at the expense of lending activity in the nonconforming sector or may crowd out other unsubsidized, private secondary-market intermediaries. Bostic and Gabriel (2006) similarly found that GSE-targeted tracts on average did not show statistically significant improvements in housing market conditions, suggesting that the affordable housing goals were doing little to improve local homeownership rates or improve local housing conditions.

Research also stresses the importance of geographic variations: although patterns, in general, are consistent across metropolitan areas overall, variation in behavior exists across areas.[15] Pearce's study of GSE purchases in 10 high- and low-cost metropolitan areas, for instance, indicated that mortgage lending activity in low-income tracts is less than in middle-income tracts more often in low-cost MSAs than in high-cost MSAs (Pearce, 2001). Williams (2006) observed that the affordable housing goals set standards for the GSEs' nationwide performance and failed to recognize important variations across regions based on housing market characteristics and costs.

A few studies have questioned the effectiveness of the official designations of underserved areas and have suggested that refining the approach to designating which census tracts are to be considered underserved may have some benefit (Pearce, 2001). In general, these studies argue that, although low-income and high-minority representation, on average, is highly correlated with low levels of

[14] See also Gabriel and Rosenthal (2010, 2008).

[15] See, for instance, Boxall and Silver (2001); Case, Gillen, and Wachter (2002); Gyourko and Hu (1999); Lind (1996); MacDonald (2001). Gyourko and Hu, in particular, found that in the Boston, New York, and Los Angeles markets, a tract is more likely to be underrepresented the higher its income is relative to the area median.

mortgage activity, the low levels may not be sufficient to identify underserved neighborhoods, especially across different markets. Such proxies may not account for factors responsible for variations in mortgage availability in low-income neighborhoods across states or metropolitan areas. The GSEs may be meeting the housing goals by purchasing loans from low-income areas that have mortgage origination rates comparable with those of middle-income neighborhoods such as, for example, low-income areas characterized by a large presence of non-Hispanic Whites. Moreover, if a neighborhood does not have mortgage credit, it does not necessarily mean that it is underserved, and a neighborhood can be considered underserved only if both mortgage credit is absent *and* demand exists for that credit. McClure (2001) argues that directing credit to underserved areas is helpful only insofar as it helps to direct credit to neighborhoods that are marginally less desirable than the neighborhoods deemed to be well served. To the author's knowledge, however, no studies have specifically suggested incorporating race and ethnicity as a critical criterion in the designation of underserved areas.

## Methods and Data

This study covers the periods immediately preceding and following HERA legislation to understand the trajectory of lending in underserved markets. The analysis focuses both on officially designated underserved markets (Final Rule underserved markets)—whose definition is predominantly based on income—and on markets that we define in terms of race and ethnicity. Given the continuing importance of race in mortgage lending, we specifically employ a definition of race-based underserved markets by making a distinction among the major minority groups that make up the underserved market. The analysis makes a distinction among the segments of these markets that overlap with each other to highlight trends specific to geography and market overlaps. Indeed, significant overlap exists among the various underserved markets. For example, any very low-income family is also a member of the low-income market. Low-income families may reside in geographically targeted areas. Minority borrowers may not necessarily reside in geographically targeted areas. In summary, the study analyzes the following underserved markets.

We first analyze the following four Final Rule underserved markets.

1. Low-income market alone (Goal 1).
2. Very low-income market alone (Goal 2).
3. Geographically targeted low-income market alone (Goal 3).
4. Overlapping Final Rule underserved markets: any of the previous markets listed simultaneously.

We then consider the following three underserved markets, which, when contrasted with the official designation, are based on disaggregated racial and ethnic groups. This consideration is important to identify any underserved markets that are not currently captured by income-based official designations.

1. African-American borrowers.
2. Asian and Pacific Islander (API) borrowers.
3. Hispanic borrowers.

In addition, part of the analysis includes the following two served areas for comparison purposes.

1. Balance of geographically targeted areas: moderate- and high-income borrowers purchasing in geographically targeted areas.
2. Market outside geographically targeted areas: moderate- and high-income borrowers purchasing outside geographically targeted areas.

The analysis is divided into three parts. First, the study compares GSE purchases of underserved market loans with the proportion of those loans held in the primary market; that is, the lenders who make the loans in the first place. Comparisons are made throughout 8 years, including those immediately preceding HERA (2004 through 2007) and the 4 years of post-HERA economic recovery (2010 through 2013). Looking at data over time helps gauge whether changes in the designations of underserved markets and the affordable housing goals brought about by HERA may be associated with any improvements of GSE performance in these markets. In addition, by looking at changes in the composition of GSE purchases, it is possible to understand whether the GSEs are leading the market or simply reflecting the primary market. For instance, if the changes observed in GSE purchases follow similar changes in primary-market lending, then the GSEs are likely just reflecting the market. If increases in GSE purchases from underserved markets are followed by increased primary-market lending to those groups, then the GSEs are likely leading the market. Second, the study evaluates GSE performance by examining whether they serve all members of underserved markets equally or benefit primarily the least underserved of the underserved, consistent with the literature discussed previously. Third, to examine the determinants of GSE purchases in underserved areas, a set of logistic regressions—described in more detail in the results section of this article—is performed for the study years.

Data used for the analyses come from several sources.

1. The annual lists of geographically targeted areas provided by HUD and FHFA. These lists include the geographic identifiers of census tracts that can be merged with boundary files provided by the Census Bureau (2000 and 2010) to represent the targeted areas on maps with the use of Geographic Information Systems, or GISs.
2. HUD- and FHFA-provided information on conforming loan limits and annual housing goals.
3. National HMDA loan application registers from 2004 to 2007 and from 2010 to 2013. The series has consistent variable definitions (for example, racial and ethnic borrower characteristics and high-cost loans).[16] Coded to the census tract level, the data allow more detailed exploration

[16] HMDA data, made available by the Federal Financial Institutions Examination Council, provide information on mortgage loan applications received annually by depository and nondepository institutions. Institutions report information about each application or loan—loan type, purpose, occupancy, amount, and action taken—and about the census tract of the dwelling to which it relates. Only applicants for whom racial/ethnic background is reported and applications that are complete are included in the analysis. HMDA records with edit failures are omitted from the analysis.

of the factors influencing GSE performance compared with aggregated data. The analysis relies on HMDA data and not on the Public Use GSE datasets, because the construction of the latter greatly limits their usefulness for the sort of analysis undertaken here.[17]

4. The American Community Survey (ACS) 2008/2012 (5-year average) summary file by census tract.

The study focuses on the applications for conventional conforming loans for the purchase of one- to four-family owner-occupied units that resulted in either originations or denials. Federal Housing Administration (FHA) and U.S. Department of Veterans Affairs, or VA, loans were excluded. Jumbo loans, high-cost loans, and records with high loan-to-income ratios (6 or more) are excluded. Also excluded are cases with missing data on either applicant income or loan amount.

## Lending Trends in Underserved Conventional Markets

Exhibit 2 compares the underserved market performance of the GSEs with that of the primary market in the years before and following the HERA Act. For any given year, the numbers in the table indicate the percentage of loans made to or purchased from a particular underserved market. Notwithstanding some short-term fluctuations occurring from year to year, private-market lending in underserved markets increased throughout the study period while purchases by the GSEs tended to decrease. Consistent with previous studies (Williams, 2006), GSE-purchased loans in underserved markets continued to be underrepresented compared with the percentage of such loans made in the primary market (31 versus 37 percent in the 2010-to-2013 period).[18] The performance of the GSEs has distinct variations, however, both regarding the primary market and in trends over time, as the figures disaggregated by segments of the underserved market show. The share of the GSEs' purchases in low-income markets and geographically targeted areas decreased from the pre-HERA period to post-HERA years, whereas the share of purchases in very low-income markets increased. The share in overlapping markets remained the same. By contrast, primary-market lending increased in all but the geographically targeted areas.

Data related to the race-based markets show that the percentage of all loans going to borrowers of color decreased from 20.7 percent in the pre-HERA period to 19.4 percent in post-HERA years. The GSEs seem to lead the market by a small margin in the 2010-to-2013 period. Based on the race and national origin of borrowers, however, important variations are present. Despite a decrease in their share of loans in markets of color, primary-market lenders led the African-American and Hispanic markets in both periods, whereas the GSEs led the API markets throughout the years, with a substantial increase in their share of loans in the post-HERA period.

[17] For proprietary reasons, the GSE datasets are divided into three unlinkable datasets. The census tract file does not distinguish between home-purchase and refinance loans. Also, race and national origin of applicant and coapplicant have no distinction. Previous research, however, finds that the HMDA data provide very good estimates of GSE activity in underserved markets (Williams, Mcconnell, and Nesiba, 2001).

[18] Williams suggests that the GSEs have never been "leading the market," explaining that "underserved market loans that others were willing to buy or hold in portfolio were loans that the GSEs were either unwilling or unable to purchase" (Williams, 2006: vii).

**Exhibit 2**

Trends in Underserved Markets

| Underserved Market | Type of Lender/ Purchaser | Percent per Year | | | | | | | | Percent per Period | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pre-HERA | | | | Post-HERA | | | | | |
| | | 2004 | 2005 | 2006 | 2007 | 2010 | 2011 | 2012 | 2013 | 2004–2007 | 2010–2013 |
| **Final Rule Underserved Markets** | | | | | | | | | | | |
| Goal 1—Low-income borrowers (alone) | Primary Market | 13.2 | 16.2 | 15.7 | 13.5 | 15.8 | 16.0 | 15.2 | 13.6 | 14.6 | 15.2 |
| | GSE | 16.0 | 15.2 | 13.9 | 14.0 | 13.4 | 14.4 | 13.8 | 12.6 | 14.8 | 13.6 |
| Goal 2—Very low-income borrowers (alone) | Primary Market | 3.8 | 4.5 | 4.1 | 3.3 | 6.0 | 6.9 | 5.8 | 4.6 | 3.9 | 5.8 |
| | GSE | 4.5 | 4.2 | 3.6 | 3.4 | 4.7 | 5.4 | 4.7 | 3.6 | 3.9 | 4.6 |
| Goal 3—Geographically targeted low-income market (alone) | Primary Market | 8.6 | 8.5 | 9.4 | 9.9 | 7.2 | 6.5 | 7.5 | 8.1 | 9.1 | 7.3 |
| | GSE | 7.2 | 7.3 | 7.7 | 8.3 | 7.1 | 5.5 | 6.2 | 7.1 | 7.6 | 6.5 |
| Goals 1–3 (overlap) | Primary Market | 7.4 | 8.4 | 8.9 | 8.2 | 9.4 | 7.5 | 9.8 | 8.9 | 8.2 | 8.9 |
| | GSE | 7.0 | 6.1 | 5.8 | 6.5 | 7.2 | 5.1 | 6.5 | 6.3 | 6.3 | 6.3 |
| All | Primary Market | 33.0 | 37.5 | 38.1 | 34.9 | 38.4 | 36.8 | 38.3 | 35.2 | 35.9 | 37.2 |
| | GSE | 34.7 | 32.8 | 31.0 | 32.2 | 32.3 | 30.5 | 31.2 | 29.7 | 32.7 | 30.9 |
| **Race-Based Markets** | | | | | | | | | | | |
| African-American borrowers | Primary Market | 5.8 | 5.9 | 7.4 | 7.4 | 3.9 | 4.0 | 3.9 | 3.9 | 6.6 | 3.9 |
| | GSE | 4.7 | 4.1 | 4.6 | 5.7 | 1.5 | 2.0 | 1.9 | 2.2 | 4.8 | 1.9 |
| Asian/Pacific-Islander borrowers | Primary Market | 7.6 | 5.1 | 5.3 | 5.9 | 12.8 | 7.9 | 7.8 | 8.2 | 6.0 | 9.1 |
| | GSE | 7.1 | 6.3 | 6.2 | 6.2 | 18.3 | 10.8 | 9.9 | 9.8 | 6.4 | 12.2 |
| Hispanic borrowers | Primary Market | 10.5 | 9.2 | 10.6 | 11.2 | 5.7 | 5.9 | 5.9 | 5.9 | 10.4 | 5.8 |
| | GSE | 9.1 | 7.4 | 7.6 | 8.8 | 6.1 | 5.1 | 5.0 | 5.8 | 8.2 | 5.5 |
| All | Primary Market | 23.9 | 20.3 | 23.2 | 24.5 | 22.4 | 17.8 | 17.6 | 17.9 | 23.0 | 18.9 |
| | GSE | 20.9 | 17.8 | 18.4 | 20.6 | 25.9 | 17.9 | 16.8 | 17.9 | 19.4 | 19.6 |

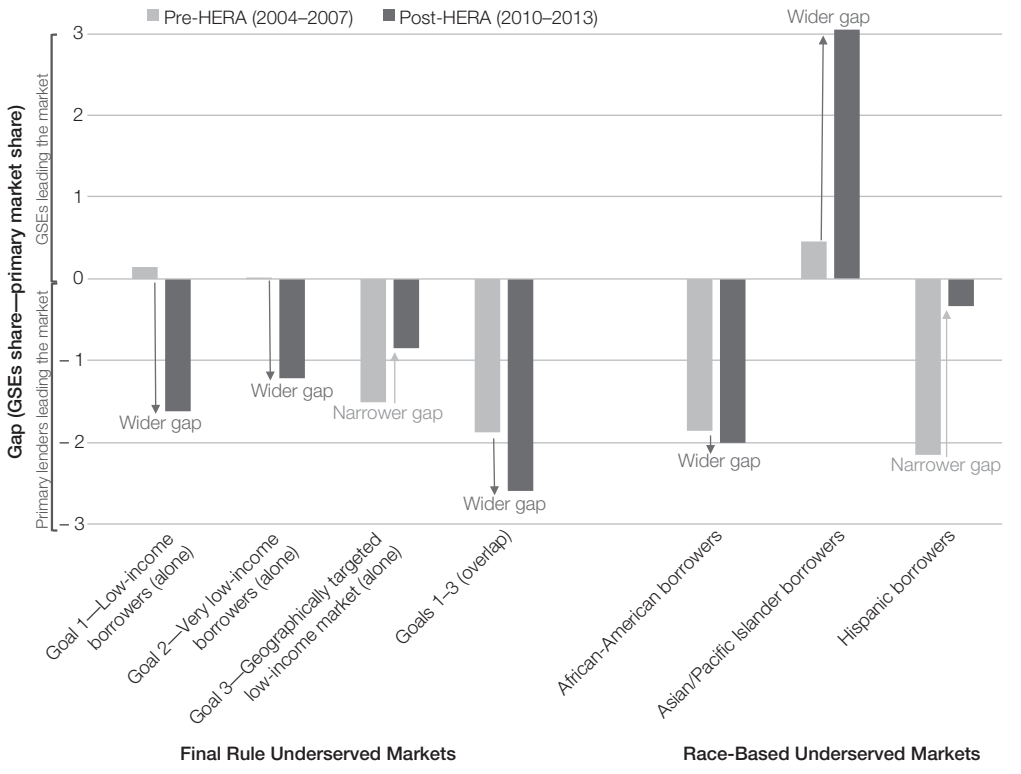
*GSE = government-sponsored enterprise. HERA = Housing and Economic Recovery Act of 2008.*

Exhibit 3 provides a graphic summary of the findings discussed previously and shows that the GSEs have trailed the primary market as a whole in both periods, with the exception of the pre-HERA period when the GSEs led the low-income market. For every Final Rule underserved market, except geographically targeted areas alone, the gap between the GSEs' performance and that of the primary market has widened over time. The gap increased especially in the low-income and very low-income markets. The panel on the right side of exhibit 3 illustrates that the gap between the GSEs and the primary market has increased by a large margin in API markets, whereas it has narrowed substantially in Hispanic markets, although, in the latter, primary lenders still lead the market, as in the case of African-American borrowers.

Existing studies of GSE performance suggest that, even in underserved markets, the GSEs tend to serve the least underserved. To explore whether this trend is still the case, exhibit 4 illustrates mean incomes of borrowers by underserved market segment for the pre- and post-HERA periods. Data for the 4 years comprising each period are adjusted for inflation and pooled to facilitate interpretation and minimize the noise represented by yearly fluctuations. Mean incomes associated with

**Exhibit 3**

Gaps Between GSEs and Primary Market in Underserved Market Shares Pre- and Post-HERA Periods




*GSE = government-sponsored enterprise. HERA = Housing and Economic Recovery Act of 2008.*

primary-market loans and GSEs' purchases are specifically compared with each other and with those of all applicants eligible for a loan in each underserved market segment. For example, the top rows of the table show that in both periods the mean income of all applicants for conventional conforming loans in the low-income bracket of the market (Goal 1) was $47,400. The mean income of borrowers of loans purchased by the GSEs was more than that of both all applicants and those with loans held in the primary market both in the pre- and post-HERA periods, with a slight increase in the latter years. Further, while in the first period the primary market seemed to favor those with higher average incomes, in the second period it clearly tended to hold loans made to borrowers with an average income that is less than that of all applicants in the low-income segment of the market.

Overall, the figures presented in exhibit 4 suggest that the GSEs have tended to mirror the primary market by favoring loans associated with borrowers with higher average incomes in all segments of the Final Rule underserved market, except the geographically targeted low-income market alone (Goal 3), where average incomes associated with GSE purchases are slightly less than those of all applicants in the same market. It is important to note that average incomes in the geographically

**Exhibit 4**

Borrower Income by Underserved Market and Type of Lender/Purchaser, Pre- and Post-HERA Periods

| Underserved Market | Type of Lender/ Purchaser | Mean Income (2013 thousands of dollars) | |
|---|---|---|---|
| | | Pre-HERA (2004–2007) | Post-HERA (2010–2013) |
| **Final Rule Underserved Markets** | | | |
| Goal 1—Low-income borrowers (alone) | Primary Market | 48.2 | 47.1 |
| | GSEs | 48.3 | 48.4 |
| Goal 2—Very low-income borrowers (alone) | Primary Market | 29.8 | 29.1 |
| | GSEs | 30.0 | 29.7 |
| Goal 3—Geographically targeted low-income market (alone) | Primary Market | 107.4 | 110.2 |
| | GSEs | 100.0 | 103.9 |
| Goals 1–3 (overlap) | Primary Market | 43.6 | 41.2 |
| | GSEs | 43.6 | 43.1 |
| **Race-Based Markets** | | | |
| African-American borrowers | Primary Market | 83.6 | 75.8 |
| | GSEs | 83.0 | 96.3 |
| Asian/Pacific Islander borrowers | Primary Market | 120.4 | 114.9 |
| | GSEs | 105.8 | 110.0 |
| Hispanic borrowers | Primary Market | 88.5 | 80.1 |
| | GSEs | 84.6 | 87.1 |

*GSE = government-sponsored enterprise. HERA = Housing and Economic Recovery Act of 2008.*

targeted segment of the market have experienced substantial variations throughout the study period and especially in the most recent years, when they, in general, have decreased, most likely as a result of the economic downturn.[19]

Data related to the race-based underserved markets show that, in the post-HERA period, the GSEs have clearly favored loans associated with borrowers of color with higher average incomes. It is interesting to note that, although average incomes associated with loans held in the primary market have tended to decrease across all markets of color between the two periods, average incomes associated with GSE purchases, in general, have climbed across the board. The gaps between the GSEs and the primary market regarding average incomes of borrowers have substantially increased in the case of African-Americans (from $500 in the pre-HERA period to $20,500 in the second period) and Hispanic borrowers (from $3,900 to $7,000), whereas the gap has narrowed in the case of API borrowers (from $14,600 to $4,900).

To understand whether the intersection between borrower race and ethnicity and each segment of the Final Rule underserved market contributes to the variations in market shares described previously, exhibit 5 illustrates mean incomes and percentage distributions of borrowers of color by

[19] Average incomes for all applicants in the geographically targeted low-income market alone decreased from $111,000 in 2010 to $98,000 in 2013.

**Exhibit 5**

Income and Percentage Distribution of Borrowers by Underserved Market Type of Lender/Purchaser and Applicant/Borrower Race and Ethnicity, 2013

| Underserved Market | Type of Lender/ Purchaser | Mean Income (thousands of dollars) | | | | | Percent of Total | | | | N |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Non-Hispanic White | African-American | API | Hispanic | Total | Non-Hispanic White | African-American | API | Hispanic | Total |
| Goal 1—Low-income borrowers (alone) | Primary Market | 44.1 | 45.9 | 50.8 | 43.6 | 44.8 | 86 | 3 | 5 | 5 | 33,004 |
| | GSEs | 45.5 | 47.6 | 50.6 | 45.0 | 46.1 | 85 | 2 | 7 | 5 | 69,249 |
| Goal 2—Very low-income borrowers (alone) | Primary Market | 27.5 | 28.3 | 30.2 | 27.9 | 27.8 | 85 | 3 | 5 | 6 | 11,293 |
| | GSEs | 28.4 | 29.4 | 31.2 | 28.2 | 28.7 | 85 | 2 | 7 | 5 | 20,303 |
| Goal 3—Geographically targeted low-income market (alone) | Primary Market | 105.4 | 84.7 | 104.8 | 84.1 | 103.9 | 72 | 7 | 11 | 8 | 19,020 |
| | GSEs | 96.7 | 90.4 | 101.6 | 81.5 | 96.8 | 72 | 4 | 13 | 10 | 38,099 |
| Goals 1–3 (overlap) | Primary Market | 38.6 | 39.0 | 43.3 | 36.1 | 39.1 | 60 | 13 | 10 | 16 | 21,453 |
| | GSEs | 40.6 | 42.0 | 45.2 | 38.3 | 41.2 | 65 | 5 | 14 | 15 | 34,595 |
| All underserved markets | Primary Market | 50.6 | 48.7 | 60.7 | 45.9 | 51.7 | 76 | 6 | 8 | 9 | 84,770 |
| | GSEs | 53.4 | 57.5 | 62.4 | 51.4 | 55.1 | 78 | 3 | 10 | 8 | 162,246 |

*API = Asian/Pacific Islander. GSE = government-sponsored enterprise.*

Final Rule underserved market segment and type of lender/purchaser. The table, which shows data for 2013, also presents income and racial distributions of the sample of applicants selected for this study.[20] As the last row of data indicates, the racial and ethnic breakdown of borrowers served in all underserved markets combined reveals that most borrowers with GSE loans (88 percent) are either non-Hispanic Whites or APIs, whereas GSE loans are underrepresented in the African-American and Hispanic markets. Only 3 and 8 percent of GSE-purchased loans serve African-American and Hispanic borrowers, respectively, compared with 6 and 9 percent of loans held in the primary market. Moreover, the table shows that the average income of borrowers whose loans were purchased by the GSEs tends to be higher than that associated with loans held in the primary market and that of the whole applicant pool. The differences between the incomes of borrowers with GSE loans and those with loans held in the primary market are especially high among African-American and Hispanic borrowers—nearly $9,000 and $6,000, respectively.

In general, the patterns described previously hold for each segment of the underserved market except the geographically targeted areas (Goal 3). Overall, borrowers in the latter feature much higher incomes than borrowers in the other segments of the market. It is interesting to note that average incomes of non-Hispanic White and API borrowers tend to be less than those of the respective pools of applicants, although these borrowers are clearly overrepresented. This income trend is in sharp contrast with other borrowers of color, especially African-Americans, who tend to be underrepresented among borrowers with GSE loans but feature much higher average incomes—$90,400 compared with $85,500 for the African-American pool of this segment of the market.

In summary, the descriptive statistics presented previously suggest that, consistent with earlier research, the GSEs reflect primary-market activity and tend to serve the least underserved; that is, those with higher average incomes. It is most important to note that the GSEs seem to underserve African-American and Hispanic markets by focusing predominantly on non-Hispanic White and API borrowers and the most affluent segments of the African-American and Hispanic markets.

It is possible, however, to estimate the likelihood that mortgage loans in underserved communities of color will be purchased by the GSEs after controlling for some key variables.

## Determinants of GSE Purchases in Underserved Markets of Color

Exhibit 6 illustrates a set of logistic regressions modeling the determinants of GSE purchases and compares them with loans held in the primary market in both pre- and post-HERA periods (2004 through 2007 and 2010 through 2013), after controlling for the characteristics of the borrowers, neighborhoods, lenders, and geographic areas. To identify which markets are most in need of the GSEs' attention, the models estimate simultaneously the effects of each of the following underserved market: (1) those defined by the affordable housing goals for single-family home purchase loans; (2) the segment of these markets that overlap with each other; (3) the geographically targeted areas not affected by the affordable housing goals rule; (4) the served markets outside targeted census

[20] Equivalent tables for the previous years are available from the author.

## Exhibit 6

Logistic Regressions of Determinats of GSE Purchases, Odds Ratios, 2004–2007 and 2010–2013 (1 of 2)

| Predictors | 2004 | 2005 | 2006 | 2007 | Average 2004–2007 | 2010 | 2011 | 2012 | 2013 | Average 2010–2013 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Odds Ratios | | | | | | | | | |
| Goal 1 | 0.64*** | 0.85*** | 0.75*** | 0.75 | 0.75 | 0.83*** | 0.86*** | 0.84*** | 0.85*** | 0.84 |
| Goal 2 | 0.54*** | 0.94*** | 0.76*** | 1.35*** | 0.90 | 0.75*** | 0.77*** | 0.77*** | 0.75*** | 0.76 |
| Goal 3 | 0.84*** | 0.93*** | 0.94*** | 0.98* | 0.92 | 0.95** | 0.91** | 0.93*** | 0.92*** | 0.93 |
| Goals 1–3 (overlap) | 0.52*** | 0.77*** | 0.73*** | 1.19*** | 0.80 | 0.69*** | 0.71*** | 0.71*** | 0.70*** | 0.70 |
| Targeted areas—balance | 0.95 | 0.99 | 1.08 | 1.02 | 1.01 | 0.99 | 0.99 | 1.04 | 0.96 | 1.00 |
| African-American borrower | 0.69*** | 0.63*** | 0.63*** | 0.71*** | 0.67 | 0.43*** | 0.50*** | 0.52*** | 0.60*** | 0.51 |
| Asian/Pacific Islander borrower | 1.11*** | 1.05*** | 1.09*** | 0.93*** | 1.05 | 1.05*** | 0.97* | 0.93*** | 0.87*** | 0.96 |
| Hispanic borrower | 0.78*** | 0.70*** | 0.70*** | 0.71*** | 0.72 | 0.91*** | 0.75*** | 0.76*** | 0.81*** | 0.81 |
| Borrower of other race/ethnicity | 0.95** | 0.91*** | 0.91*** | 0.84*** | 0.90 | 0.89*** | 0.75*** | 0.77*** | 0.75*** | 0.79 |
| Loan amount | 0.99 | 1.00 | 1.00 | 1.01 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Borrower income | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| AMI | 1.01 | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | 1.00 | 1.01 | 1.00 | 1.00 |
| Census tract minority population (%) | 1.00 | 1.00 | 1.00 | 0.99 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Census tract median income/AMI ratio | 1.47*** | 1.38*** | 1.48*** | 0.89*** | 1.30 | 1.00 | 1.00 | 1.33*** | 1.30*** | 1.16 |
| Owner-occupied units in census tract | 1.03 | 0.98 | 1.00 | 1.02 | 1.01 | 1.02*** | 1.04*** | 1.06*** | 1.05*** | 1.04 |
| CRA lender | 0.22*** | 0.25*** | 0.47*** | 0.41*** | 0.34 | 0.92*** | 0.43*** | 0.29*** | 0.23*** | 0.47 |
| Lender size (assets) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Midwest | 1.04*** | 1.35*** | 1.40*** | 1.45*** | 1.31 | 1.85*** | 1.83*** | 1.93*** | 1.84*** | 1.86 |
| South | 0.95*** | 1.04*** | 1.11*** | 1.16*** | 1.06 | 1.02* | 1.23*** | 1.20*** | 1.27*** | 1.18 |
| West | 0.92*** | 1.13*** | 1.27*** | 0.83*** | 1.04 | 2.08*** | 2.03*** | 2.03*** | 2.15*** | 2.07 |
| N | 1,160,338 | 1,019,886 | 1,009,773 | 1,039,269 | 4,229,266 | 404,538 | 419,973 | 580,628 | 773,596 | 2,178,735 |

**Exhibit 6**

Logistic Regressions of Determinats of GSE Purchases, Odds Ratios, 2004–2007 and 2010–2013 (2 of 2)

| Predictors | 2004 | 2005 | 2006 | 2007 | Average 2004–2007 | 2010 | 2011 | 2012 | 2013 | Average 2010–2013 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Odds Ratios | | | | | | | | | |
| Pseudo *r* squared | 0.136 | 0.0763 | 0.0314 | 0.1027 | | 0.0479 | 0.0731 | 0.0815 | 0.098 | |
| Log likelihood | – 657,943*** | – 594,725*** | – 638,055*** | – 636,346*** | | – 239,749*** | – 258,003*** | – 334,279*** | – 429,047*** | |

** p < 0.05; ** p < 0.01; *** p < 0.001.*

*AMI = Area Median Income. CRA = Community Reinvestment Act. GSE = government-sponsored enterprise.*

tracts; and, most importantly, (5) the markets consisting of borrowers of color. The models include regional indicators to account for variations across different housing markets. The national sample used for the regressions includes all originated conforming loans for the purchase of one- to four-family owner-occupied dwellings. Records for which a loan-to-income ratio is equal to or exceeds 6 are omitted, following Williams, Mcconnell, and Nesiba (2001). Excluded are also second lien loans and records for which the race and income of the applicant is not known. Binomial logistic regression is appropriate for this analysis because it involves estimating equations for a dependent variable with two categories. For each year examined, the logistic regression equation takes the following form—

$$ln\left[\frac{P(Y=1|X)}{P(Y=0|X)}\right] = \sum^{k} b_k \; X_k \qquad (1)$$

where $Y$ is coded 1 for GSE-purchased loans. Loans held in the primary market represent the reference category ($Y = 0$). Each equation predicts the log odds of a loan being purchased by the GSEs rather than being held in the primary market, after controlling for a vector of $k$ borrower, lender, neighborhood, and geographic characteristics, $X_k$, each associated with a specific coefficient $b$. The odds are estimated for each underserved market. Applicant characteristics include annual family income, loan amount, and race and ethnicity. Income and loan amount are used as proxies of risk of default in the absence of any credit history information in HMDA datasets. Non-Hispanic White applicants represent the reference racial group. Neighborhood characteristics include the percentage of minority residents, the number of owner-occupied units in the census tract, and the ratio of the census tract median family income to the Area Median Family Income, or AMFI. The independent variables include lender size in terms of assets and an indicator coded 1 for lenders subject to Community Reinvestment Act (CRA) regulations. Variations in local housing markets are captured through the inclusion of the Area Median Income, or AMI, associated with each loan and the geographic region in which the loan was made.[21] Loans made in the Northeast represent the reference category.

Regression results indicate that the likelihood of loans being purchased by the GSEs is significantly less that of a loan being held in primary-market portfolios in the underserved markets defined by Goal 1 and Goal 2 and in the markets characterized by an overlap of the affordable housing goals in both periods, after controlling for all other variables.[22] The likelihood of loans being purchased by the GSEs is also significantly less in the underserved markets defined by borrower race, especially in African-American markets and, to a lesser extent, in Hispanic markets. Further, the odds ratios associated with contextual variables and lender characteristics indicate that, in general, the likelihood of loans being purchased by the GSEs is significantly less in the case of lenders subject to CRA regulations, whereas it tends to be more in more affluent census tracts, in the Midwest, and in the Western region.

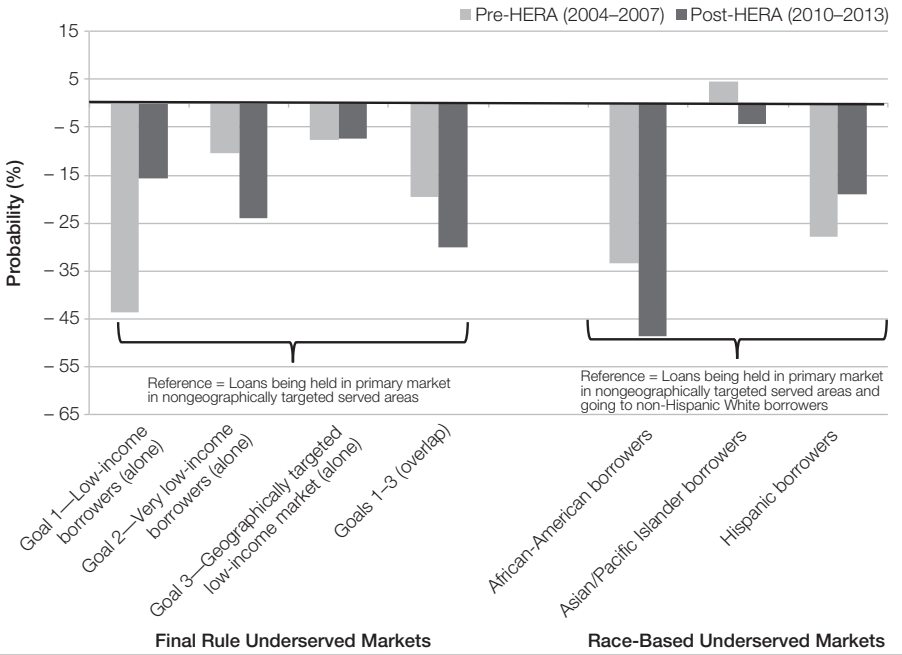
To facilitate the interpretation of the logit model results, exhibit 7 summarizes the regression results by focusing on the net probabilities of GSE purchases in both the Final Rule underserved

[21] Note that geographically targeted areas tend to be concentrated in the South and the West.

[22] Note that the p-values are very low for most predictors, possibly due to the large sample size of the data used for this analysis. The p-values have been omitted for variables presenting odds ratios equal to 1.

**Exhibit 7**

Conditional Probabilities of GSE Purchases Versus Probability of Loans Being Held in Primary Market




*GSE = government-sponsored enterprise. HERA = Housing and Economic Recovery Act of 2008.*

market segments and the race-based underserved markets in the pre- and post-HERA years. The graph specifically compares average probabilities for the two periods. After controlling for all other variables, the loans purchased by the GSEs clearly are less likely than the loans held in the primary market to serve the underserved markets designated in the affordable housing goals rule in both periods, despite some variations across the different segments of the market. In the pre-HERA era, for instance, the average likelihood of a loan in a low-income market being purchased by the GSEs was 44 percent less than a loan in primary-market portfolios. Since 2010, however, the GSEs have performed better in this market, with an average probability of serving this market just 16 percent less than that of primary-market lenders. The GSEs similarly have performed slightly better in geographically targeted markets alone. By contrast, in very low-income markets and in overlapping markets, the likelihood of the GSEs purchasing loans has decreased—from 10 to 24 percent and from 20 to 30 percent, respectively, less than the likelihood of loans being held in the primary market.

In race-specific markets, the performance of the GSEs has been generally higher in API markets compared with other markets of color, although the probability of the GSEs purchasing loans in this market has decreased over time. The likelihood of the GSEs purchasing loans issued to African-American and Hispanic borrowers, in general, has been much less than in the case of API borrowers. It is interesting to note, however, that while the GSEs' performance has improved over time in Hispanic markets, it has worsened further in African-American markets, after controlling

for all other variables, including income levels. While the likelihood of GSE purchases in African-American markets was 33 percent less than the probability of loans being held in the primary market in the pre-HERA period, the GSEs were, on average, 49 percent less likely than the primary market to hold loans issued to African-American borrowers in the post-HERA period.

## Discussion

This study shows that the GSEs' performance in underserved markets has continued to trail behind that of the primary market in the post-HERA period. Further, it shows that the GSEs extend credit largely to non-Hispanic White borrowers, API borrowers, and other minority borrowers with higher income levels. For every Final Rule underserved market except the geographically targeted market alone, the gap between the GSEs' performance and that of the primary market has widened over time. This gap increased especially in the low-income and very low-income segments of the market. Further, primary-market lenders still lead the African-American and Hispanic markets, although, in the latter, the gap between the GSEs' performance and that of the primary market has narrowed. The GSEs have continued to lead the API market, especially after HERA. Moreover, the GSEs have tended to mirror the primary market by favoring loans associated with more affluent borrowers of any race and ethnicity. This behavior is particularly clear in low-income and very low-income markets and in overlapping markets. Borrowers of color tend to be underrepresented in the underserved markets targeted by the GSEs, except in the case of APIs, who are particularly overrepresented in geographically targeted areas. Although in geographically targeted areas average incomes are generally higher than in other segments of the underserved market—most likely driven by designation criteria—it is important to note that in these areas the GSEs clearly favor African-American borrowers with average incomes that are much higher than those served by the primary market. Even after controlling for several borrower, neighborhood, and lender characteristics, the GSEs' performance in Hispanic and, especially, in African-American markets lags behind that of the primary market.

In summary, although the new designations of underserved markets seem to do a better job in pinpointing low-income and minority communities compared with the early broader definitions, especially from a geographic perspective, they do not guarantee that the GSEs serve the most underserved of the underserved, especially when it comes to communities of color. This finding may have several explanations that unfortunately cannot be fully spelled out with currently available HMDA data. HMDA data do not report any information on credit history, net worth, and total indebtedness, which differ systematically among racial groups and may play a role in the GSEs' decision to purchase loans from groups that are perceived as risky, especially in light of the recent controversial issues related to the GSEs' solvency. The economic recession and stricter underwriting criteria have made loans more difficult to access by communities of color that have been disproportionately hit by the subprime lending and foreclosure crisis. The primary market and the GSEs may refrain from taking risks in these communities. Further, FHA loans may be perceived as the channel of choice by borrowers of color and seem to compete with the conventional market in these communities. Some have also argued that lenders subject to CRA—commercial banks, savings and loans—deliberately hold in portfolio loans to low-income and minority communities that are likely to make them look good from a CRA point of view, thus reducing the likelihood

that these loans are sold to the GSEs (Williams, 2006). Additional explanations may attribute the observed disparities to differences among the lending institutions involved based on their size, scale, legal obligations, the federal agencies to which they report, and the geographic areas in which they operate. It is also important not to discount racial discrimination in mortgage lending. What may be perceived as the GSEs' neglect of communities of color may well be a reflection of the disparate treatment that these borrowers may receive in the primary market. Notwithstanding the frequent overlap between low-income markets and race-based underserved markets, the GSEs are held accountable only formally on the basis of their performance in markets defined predominantly by their income level and only tangentially by their racial and ethnic composition. Yet, the GSEs' performance seems to fare worse in the very markets that are characterized by high concentrations of people of color.

Limitations in available data do not allow for a thorough testing of all the previously mentioned hypotheses, especially when it comes to the incorporation of credit history data in any analysis.[23] The findings presented here, however, support the argument that basing the designation of underserved markets solely on economic factors may lead the GSEs to miss an important segment of the underserved market that has been historically excluded from broad access to mortgage credit. The most direct way that the GSEs can affect home mortgage lending is through the loans they purchase. They can also have indirect effects on lending, because GSE activity in an area may encourage more lenders to be active there (Williams, 2006). Therefore, a shift of focus to race and ethnicity in the GSEs' practices may have the potential to influence the mortgage market at large. This focus is particularly crucial in the wake of the foreclosure crisis. The evidence in this paper suggests that policymakers should revisit the criteria currently adopted for the designation of underserved markets, in particular by incorporating race and ethnicity in the formulation of affordable housing goals, revising the designation of geographically targeted areas, and establishing subgoals that are specific to geography to promote the GSEs' outreach in communities of color that still lag behind the mainstream market in terms of their access to mortgage capital.

In addition, it is important to fine-tune race-based designations of underserved markets based on a disaggregation of borrowers of color by race and ethnicity. This redesignation is particularly critical in API markets that are characterized by a significantly heterogeneous population in terms of national origins, immigrant status, and socioeconomic characteristics. The findings of this study, as they apply to API markets, may be misleading because of the lack of disaggregated data for these markets. It is worth noting that aggregated data generally have shown that API borrowers have experiences that are similar to those of non-Hispanic White borrowers. Yet, HMDA data have failed to reveal disparities in access to mortgage lending experienced by different groups of Asian descent. It would be very useful for HMDA data to break down information related to APIs into subcategories that represent the largest ethnic groups in the nation to better understand the mortgage lending experience of these groups, both in the primary and secondary markets.

By incorporating race and ethnicity in the formulation of affordable housing goals and fine-tuning the designations of underserved markets, the benefits the GSEs receive in exchange for promoting underserved market lending might be put to some more effective use.

[23] Limitations are notably attributed to HMDA's absence of data on borrowers' credit history and default risk.

# Appendix

## Exhibit A-1

Definitions of Underserved Areas and Affordable Housing Goals (1993–2014)

| Year | Underserved Area Definition | Tract Boundary (Census Year) | Data on Which the Definition Is Based | Affordable Housing Goals | | |
|---|---|---|---|---|---|---|
| | | | | Geographically Targeted (Underserved) Area Goal | Low- and Moderate-Income Goal | Special Affordable Goal |
| 1993 | Central cities | | | 30 | 30 | NA |
| 1994 | | | | 30 | 30 | NA |
| 1995 | | | | 30 | 30 | NA |
| 1996 | **Metropolitan census tracts** with (1) tract MFI of less than or equal to 90 percent of AMI or (2) minority concentration of at least 30 percent and tract MFI of less than or equal to 120 percent of AMI. **Nonmetropolitan counties** with (1) MFI of less than or equal to 95 percent of the greater of state or national nonmetropolitan median income or (2) minority concentration of at least 30 percent and county MFI of less than or equal to 120 percent of the greater of state or national nonmetropolitan median income (HUD 1996–2008; FHFA 2009). | 1990 | Census 1990 | 21 | 40 | 12 |
| 1997 | | 1990 | Census 1990 | 24 | 42 | 14 |
| 1998 | | 1990 | Census 1990 | 24 | 42 | 14 |
| 1999 | | 1990 | Census 1990 | 24 | 42 | 14 |
| 2000 | | 1990 | Census 1990 | 24 | 42 | 14 |
| 2001 | | 1990 | Census 1990 | 31 | 50 | 20 |
| 2002 | | 1990 | Census 1990 | 31 | 50 | 20 |
| 2003 | | 2000 | Census 1990 | 31 | 50 | 20 |
| 2004 | | 2000 | Census 1990 | 31 | 50 | 20 |
| 2005 | | 2000 | Census 2000 | 37 | 52 | 22 |
| 2006 | | 2000 | Census 2000 | 38 | 53 | 23 |
| 2007 | | 2000 | Census 2000 | 38 | 55 | 25 |
| 2008 | | 2000 | Census 2000 | 39 | 56 | 27 |
| 2009 | | 2000 | Census 2000 | 32 | 43 | 18 |
| | | | Census 2000 | | | |
| 2010 | Census tracts or block numbering areas in which the median income does not exceed 80 percent of the AMI; census tracts with a minority population of at least 30 percent and a median income of less than 100 percent of the AMI; designated disaster areas (FHFA 2010–2014). | 2000 | Census 2000 | 13 | 27 | 8 |
| 2011 | | 2000 | Census 2000 | 13 | 27 | 8 |
| 2012 | | 2010 | Census 2010 | 11 | 23 | 7 |
| 2013 | | 2010 | Census 2010, ACS 2007–2011 | 11 | 23 | 7 |
| 2014 | | 2010 | Census 2010, ACS 2008–2012 | 11 | 23 | 7 |

*ACS = American Community Survey. AMI = Area Median Income. FHFA = Federal Housing Finance Agency. HUD = U.S. Department of Housing and Urban Development. MFI = Median Family Income. NA = Data not available.*

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