RESEARCH REPORT

BALANCING RISK AND ACCESS:

Underwriting Standards and Qualified Residential Mortgages

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Balancing Risk and Access:
Underwriting Standards for Qualified Residential Mortgages

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Abstract

As policymakers develop underwriting guidelines for qualified residential mortgages (QRM)—which are exempt from risk retention requirements for privately securitized mortgages under the Dodd-Frank Wall Street Reform and Consumer Protection Act—both consumer and industry groups have raised concerns about the disproportionate impact that restrictive QRM guidelines may have on low-income, low-wealth, minority, and other households traditionally underserved by the mainstream mortgage market. In this study, we examine the way different QRM guidelines may affect access to mortgage credit and loan performance, with a special focus on historically underserved households. More narrowly, we estimate the additional impacts on defaults and access resulting from setting QRM underwriting guidelines over and above the proposed product restrictions for qualified mortgages (QM), which exclude loans with features associated with higher default rates such as lack of income documentation, hybrid adjustable-rate mortgages with teaser payments, interest only and balloon payments and negative amortization. To estimate the relative changes in mortgage default and access that would occur under different QRM underwriting thresholds, we use a unique, nationally-representative database on loan performance that includes information on loan characteristics and borrower demographics.

We find that the added benefits of reduced foreclosures resulting from restrictions beyond the QM product requirements do not necessarily outweigh the costs of reducing borrowers' access to QRM mortgages. In particular, loan-to-value (LTV) requirements of 80 or 90 percent produce a smaller benefit when the resulting reductions in defaults are weighed against the number of borrowers excluded from the market. The results for debt-to-income (DTI) and borrower credit scores similarly show that the most restrictive thresholds are less effective because they exclude a larger share of borrowers in relation to percent of defaults they prevent. In addition, we find that more stringent LTV, DTI, and credit score requirements could disproportionately deny low-income borrowers and borrowers of color access to QRM mortgages.

This research suggests that the QM loan term restrictions on their own would curtail the risky lending that occurred during the subprime boom and lead to substantially lower foreclosure rates without overly restricting access to credit. Based on this analysis, we believe that policymakers should not impose additional LTV, DTI and credit score requirements on QRM mortgages, especially given the potential disproportionate impact of these thresholds on low-income borrowers and borrowers of color.

Introduction

Four years into the worst housing crisis in U.S. history, foreclosures remain at historically high levels, and neighborhoods across the country are struggling with the negative spillover effects of real estate owned (REO) and vacant and abandoned properties. According to Moody's Analytics, approximately five million U.S. homeowners lost their homes to foreclosure between 2007 and 2010 (Moody's Analytics 2010). And the threat of additional foreclosures still looms large. In the third quarter of 2011, 9.3 percent of mortgages nationwide—more than four million loans—were 60 or more days delinquent on their mortgage or in the foreclosure process (Mortgage Bankers Association 2011).

The scale of the foreclosure crisis, and its roots in the subprime lending boom, have led to a critical policy debate about the future of the U.S. mortgage industry and the regulatory regime that governs it. Importantly, the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank) laid the groundwork for stronger consumer protection by establishing mortgage market protections, by eliminating the regulatory loopholes that allowed risky and abusive practices in consumer lending, and by creating the Consumer Financial Protection Bureau (CFPB) to regulate consumer financial transactions. However, the effectiveness of these reforms and their impact on American consumers will to some extent be decided by how regulators define and implement many of Dodd-Frank's provisions.

Key among these provisions is the establishment of Qualified Mortgages (QM) and Qualified Residential Mortgages (QRM)—two related statutory provisions that will provide incentives for lenders to originate safe and sustainable residential mortgages. The proposed QM loan standards define loans and underwriting criteria that will help to ensure that a borrower has a "reasonable ability to repay the obligation," and will restrict the origination of loans with features associated with higher default rates, such as lack of income documentation, prepayment penalties, and loans with interest-only, negatively amortizing or balloon payments. Loans meeting the QM standards are legally presumed to satisfy Dodd-Frank's "ability to repay" obligation.

QRM, on the other hand, defines which loans will be exempt from requirements that at least five percent of the credit risk be retained by the securitizer. While the QM

"ability to repay" obligation will apply to all residential mortgages, the QRM definition will apply only to mortgages that are privately securitized.[1] The assumption is that both lenders and investors will view QM and QRM loans as safer products, and that lenders will be more likely to originate loans that fit into both definitions in order to minimize their liabilities and maximize their ability to sell the loans into the secondary market.[2] Loans that fall outside of the QRM definition will likely still be available, but they will cost more—depending on the interpretation of various elements of the statute's provisions (e.g., premium capture[3]), estimates suggest that risk retention requirements will add anywhere from 75 to 400 basis points to the cost of a 30-year fixed rate loan.[4]

Regulators are currently developing the rules that will define both QM and QRM loans, and their challenge is to balance the goal of minimizing defaults without unduly restricting the flow of residential mortgage credit. One key question is whether or not the definition for QRM mortgages should include borrower underwriting requirements above and beyond the product term restrictions, which are present in both the QM and QRM proposals.[5] In their analysis, it is critical that policymakers consider the impacts of the proposed QRM underwriting guidelines on lower-income households and households of color. History is rife with examples of the government setting policies that have excluded lower-income, lower-wealth, and borrowers of color from housing and mortgage markets, with long-lasting impacts on opportunities to build wealth and achieve

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[1] FHA loans and loans guaranteed by Fannie Mae and Freddie Mac (while in conservatorship) are exempt from the risk retention provision.

[2] Policymakers could also set QRM restrictions extremely high—e.g. requiring 50 percent LTV—which would turn QRM loans into a niche market segment and make the vast majority of loans non-QRM and subject to risk retention and it associated costs. We do not assess the impact of this policy option in this paper.

[3] Securitizers charge borrowers a rate higher than they pay to the investors who purchase mortgage-backed securities, to help cover not only the costs of originating, servicing, and securitizing the mortgages. While the spread is collected over the life of the loan, securitizers historically have been able to collect the full discounted stream of income up front by selling an interest-only bond backed by the spread. The premium capture rule will effectively end this practice by making it prohibitively expensive. (See deRitis and Zandi 2011 for a more detailed explanation of premium capture and its impact on loan pricing.)

[4] Moody's Analytics initially estimated that non-QRM loans would cost 75 -100 basis points more (Zandi and deRitis 2011), but revised that estimate upwards to 1-4 percentage points depending on how regulators interpret the premium capture provisions (deRitis and Zandi 2011). The National Association of Realtors estimates an added cost of 80 – 185 basis points for non-QRM mortgages (Lischer 2011).

[5] The QM proposal, issued by the Federal Reserve, does not set a hard rule for what debt-to-income level constitutes a reasonable "ability to repay," nor does it set criteria for downpayment requirements or borrower credit history (Federal Reserve 2011). The Consumer Financial Protection Bureau will finalize this rule, likely in the first half of 2012.

greater economic security. (Quercia, Freeman and Ratcliffe 2011). By setting overly stringent regulatory thresholds for loan-to-value (LTV) or downpayment requirements, debt-to-income (DTI) ratios, and borrower credit scores, there is a risk that QRMs will disproportionately exclude lower-income households and households of color from access to lower-cost credit products, thereby increasing the barriers to homeownership.

In this study, we examine the impacts of various proposed QRM underwriting standards on access to credit. First, we show that implementing the QM product term restrictions in Dodd-Frank significantly reduces the default rate on our large sample of mortgages originated between 2000 and 2008. Second, we examine how imposing additional LTV, DTI, and credit score (proxied by FICO scores) restrictions onto the pool of QM mortgages reduces delinquency and foreclosure rates, and weigh those reductions against concerns about access to credit. Importantly, we find that the added benefits of reduced foreclosures resulting from underwriting restrictions beyond the QM product term requirements do not necessarily outweigh the costs of reduced borrower access to QRM mortgages. Put another way, restricting the origination of risky loan features and underwriting a loan with a consideration of a borrower's ability to repay has the largest benefit in terms of reducing default risk without limiting access to credit.

Second, we explore how QRM underwriting thresholds would affect access to credit for different segments of the population, focusing on low-income borrowers and borrowers of color. We find significant disparities in access for low-income borrowers and borrowers of color that occur under different LTV, DTI, and credit score requirements, and that tighter thresholds exclude a greater share of these borrowers from access to the QRM mortgage market. Based on this analysis, we believe that policymakers should not impose additional LTV, DTI and credit score requirements on QRM mortgages, especially given the potential disproportionate impact of these thresholds on low-income and minority borrowers.

Two caveats are worth noting. First, while it is critical that new consumer protection regulations prevent a repeat of the risky lending and irresponsible underwriting that occurred during the subprime boom, analyzing data on loan performance for the 2000-2008 period paints a skewed picture of the relationship among borrowers, neighborhoods, loan terms, and the drivers of default. Given the interrelated nature of

risky mortgage product features, the housing price bubble (especially in certain markets), and the resulting recession and prolonged high rates of unemployment, it is difficult to tease out the unique contribution of differences in LTV, DTI or borrower credit scores to loan performance.[6] Loans with low downpayment requirements have been originated safely for decades, and affordable homeownership programs have long helped lower-income and lower-wealth borrowers buy a home with comparably low rates of default (Quercia, Freeman and Ratcliffe 2011).[7] Setting market-wide LTV, DTI and credit score thresholds requires a longer view of history, one that does not conflate long-standing efforts to expand homeownership among historically disadvantaged groups with the risky subprime and Alt-A lending that occurred between 2004 and 2007.

Second, this analysis does not model the dynamic nature of mortgage and housing markets, so it is necessarily an incomplete accounting of what may happen under various QRM guidelines. As the recent period taught us, changes in the cost and terms of credit can have a significant impact on mortgage demand and consumer behavior. For some borrowers, the difference in cost between a QRM and non-QRM loan may not limit access to homeownership; instead, it may change their housing cost calculus and either lead them to take out the more expensive, non-QRM mortgage or buy a less expensive house, or it may simply delay their decision to buy a house. For other borrowers, the inability to obtain a QRM-loan may exclude them from the homeownership market entirely. We also don't model the impact of QRM on housing demand; restrictive thresholds could reduce housing demand, which in turn could reduce house prices further (thereby limiting the ability of current owners to sell their house) and prompt additional foreclosures. A more detailed understanding of the impacts of various QRM thresholds will require models that simulate shifts in supply and demand in both the housing and mortgage markets and that can assess how borrowing constraints influence household

[6] In this study, we do not control for known risk factors for default, such as unemployment rates and regional housing market trends (Doms, Furlong and Krainer 2007; Gerardi, Shapiro, and Willen, 2008; Quercia, Pennington-Cross and Tian 2011), whether or not a borrower received a higher-priced or subprime loan (Amromin and Paulson 2009; Immergluck 2009; Reid and Laderman 2009), or whether or not the loan was originated by a mortgage broker (Alexander et al. 2002; Ernst, Bocian and Li 2008; Reid 2010).

[7] In an analysis of CRA-motivated loans sold to a community development financial institution (CRL's affiliate Self-Help), researchers found that the default risk of these loans was three times lower than subprime loans made to borrowers with similar income and credit risk profiles (Ding et al.2011).

behavior over time. This study only seeks to provide a descriptive picture of the impacts of different QRM underwriting thresholds.

Despite these caveats, this study provides compelling evidence that QM product feature restrictions alone would have the intended effect of reducing foreclosure risk while not unduly restricting access to credit. There is the risk that too stringent QRMs will unnecessarily relegate low-income borrowers and borrowers of color to the non-mainstream higher-cost market. Setting up a new dual mortgage market that disadvantages historically underserved borrowers goes against both the spirit and intent of Dodd-Frank, and the goal of creating an efficient and fair mortgage lending market for all Americans.

Background

The fundamental importance of housing to household well-being, combined with persistent racial and ethnic inequalities in homeownership rates, has long provided the rationale for policy interventions in housing and mortgage markets. For decades, the U.S. government has sought to overcome barriers to credit for low-income and minority borrowers and communities. The Home Mortgage Disclosure Act (HMDA), the Community Reinvestment Act (CRA), and the Equal Credit Opportunity Act (ECOA) all affirmed the importance of access to fair and responsible credit, and were designed to work together to eliminate discrimination in home mortgage lending. In addition, the FHA's 203(b) mortgage insurance program was designed to help credit-constrained borrowers, and with the exception of the years during the subprime boom, served as the major source of mortgage financing for first-time, low-income and minority homebuyers.

Policymakers have long recognized that access to fair and responsible credit is a critical component not only for homeownership, but also for long-term asset building. Home equity remains an important component of family wealth, representing nearly half of total family assets among all but the very highest earners (Bricker et al. 2011). Promoting homeownership among lower-income and minority borrowers was driven by

the goal to close the large wealth gaps that exist among income and racial/ethnic groups.[8] Unfortunately, the risky lending and niche mortgage products that proliferated during the subprime boom undermined this goal, placing borrowers into loans without any regard for their ability to pay the balance over the long-term. The QM and QRM guidelines have the potential to have a significant, positive impact on the housing market, restoring the secondary market for mortgage loans and ensuring that borrowers have access to fairly priced and safe mortgage products. However, there is also a risk that going beyond the statutory product term restrictions and setting market-wide underwriting standards for QRM mortgages will unduly limit access to credit for lower-income borrowers and borrowers of color, especially if the definition includes stringent LTV, DTI and/or credit score requirements.

This question is particularly salient given the recent foreclosure crisis and its disproportionate impact on low-income borrowers and borrowers of color. Estimates suggest that African-Americans and Latinos have experienced much higher foreclosure rates than whites, even after controlling for income (Anacker and Carr 2011; Bocian et al. 2010; Bocian et al. 2011). The default rate for African Americans and Latinos is double that for white borrowers; as of February 2011, approximately 25 percent of loans to African Americans and Latinos originated between 2004 and 2008 were 60 or more days delinquent or had already been foreclosed upon (Bocian et al. 2011). Recent data also shows that in the wake of the crisis, both the homeownership and wealth gaps between whites and persons of color have grown considerably (Kochar, Fry and Taylor 2011; U.S. Census 2010). Disproportionately excluding borrowers of color from access to QRM mortgages going forward may have the unintended consequence of widening the homeownership gap even further, with long-term implications for inequality (Masnick 2001). While the current period has highlighted that homeownership does not guarantee rapid wealth building, studies have shown that, over time, homeowners do accumulate more wealth than their renter counterparts (Reid 2004; Stegman, Quercia and Davis 2007; Belsky, Retsinas and Duda 2007). Indeed, we could argue that the current period

[8] In 2010, 74 percent of white families owned their homes, but only 45 percent of blacks and 47 percent of Latinos. The homeownership rate for those with incomes in the top half was 82 percent, while for those with incomes in the bottom half it was 51 percent (US Census 2010).

represents a better time to help lower-income households and households of color achieve homeownership, especially if house prices are close to the bottom, than in 2004 - 2006 when prices were at their peak.

As a result, it is important that policymakers think carefully about balancing the need to reduce the risk of foreclosure on QRM loans with the goal of access to credit. In broad terms, two complementary theories help to explain why borrowers default: the "option" theory and the "trigger-event" theory (Quercia and Stegman 1992; Deng, Quigley and Van Order 2000; Pennington-Cross and Ho 2010). According to the option theory, borrowers exercise the "put option" and default when they have negative equity in the property (Foster and Van Order 1984; Kau, Keenan, and Kim 1993; Vandell and Thibodeau 1985). Research focused on the recent crisis has documented a strong link between the value of home equity (LTV) and default, especially in areas with rapidly declining house values (Doms, Furlong, and Krainer 2007; Haughwout, Peach, and Tracy 2008; Amromin and Paulson 2009; Gerardi, Shapiro, and Willen 2009). However, empirical work on mortgage default has found that borrowers do not default immediately when the value of the collateral property falls below the value of the loan. For example, Foster and Van Order (1985) found that even when equity was negative, Federal Housing Administration (FHA) loans exhibited default rates of less than 10 percent. More recently, Foote, Gerardi, and Willen (2008) estimated that of the roughly 100,000 households in Massachusetts who had negative equity during the early 1990s, fewer than 10 percent lost their homes to foreclosure. In other words, while negative equity can influence a borrower's willingness and/or ability to avoid foreclosure, there is little evidence that a high LTV *alone* prompts default.

What else matters? Trigger-event theory argues that life-changing events can affect the homeowner's ability to make mortgage payments, due to either a sudden drop in or loss of income (e.g., due to unemployment or illness) or to an unexpected increase in expenses (Vandell 1995). These triggers can be exacerbated by environmental factors, such as local economic conditions and changes in underwriting standards (Cutts and Merrill 2008). In their analysis of the recent subprime crisis, some researchers have focused attention on the latter, showing that risky product features and lenders' failure to evaluate the borrower's ability to repay the loan were important factors explaining the

very high rates of default. For instance, researchers have found that loan terms such as hybrid and interest-only ARMs, balloon payments, prepayment penalties, and negative amortization all significantly increase the likelihood of foreclosure, even after controlling for borrower risk characteristics (Ambrose, LaCour-Little, and Husza 2005; Pennington-Cross and Ho 2010; Quercia, Stegman and Davis 2005; Ding et al. 2011). Prolonged periods of high unemployment are also related to higher foreclosure rates, as the loss of income can affect a borrower's ability to repay their mortgage (Quercia, Pennington-Cross, and Tian 2011).

Taken together, the "option" and "trigger" theories suggest that LTV matters most when a borrower is already in trouble due to a trigger event or poor underwriting, since being in a position of negative equity precludes other resolutions to mortgage delinquency (such as selling or refinancing). This is one reason why policymakers have focused on LTV underwriting guidelines as a way to ensure mortgage sustainability: lower LTVs can protect against default by reducing the likelihood of negative equity. However, eliminating the risky terms and underwriting practices that were characteristic of the subprime lending boom between 2004 and 2007 would have prevented a large share of borrowers from getting into trouble in the first place. The underwriting of loans with initial teaser interest rates that reset to higher rates (and higher monthly payments) and with no documentation of income failed to ensure that borrowers had a reasonable ability to repay the loan, thus precipitating mortgage default when house prices began to decline (HUD 2010).[9] QM restricts these risky loan terms and poor underwriting practices, without unduly excluding borrowers from access to credit. While the origination of non-QM mortgage products is closely correlated with borrower underwriting characteristics such as credit scores, LTV, and DTI, there is evidence that many borrowers who received a risky loan would have qualified for a loan with better terms (Brooks and Simon 2007). Moreover, research has shown that subprime borrowers who received loans without risky product features (e.g. those that would qualify for QM product loans) performed significantly better than subprime borrowers who received non-

[9] Product features such as interest-only and negative amortization loans also have an impact on LTV by slowing down the repayment of the outstanding principal, thereby increasing the negative equity position of households, especially in declining markets.

QM qualifying loans (Ding et al. 2011). So while QM restrictions may limit mortgage access for some borrowers, their primary effect would be to protect consumers from getting a mortgage that is unsustainable over the long-term.

The concern is that imposing additional QRM underwriting guidelines on top of QM, particularly in terms of LTV, *will* cut off access to credit, particularly for lower-wealth households. Indeed, there are significant disparities in who can come up with a 20 percent downpayment. Research has shown that underwriting criteria (e.g., downpayment requirements, DTI ratios, and credit scores) can limit access to homeownership, especially for lower-income and minority households (Rosenthal 2002; Quercia, McCarthy, and Watcher 2003; Bostic, Calem, and Wachter 2005). In particular, high downpayment requirements create significant borrowing constraints, restricting or delaying the transition to homeownership (Linneman et al. 1997; Gyourko, Linneman and Wachter 1999). Intergenerational wealth transfers also play an important role in access to homeownership, and may further serve to delineate those who can and cannot afford to buy a home if high downpayment requirements are codified into QRM standards. Research from the Joint Center for Housing Studies at Harvard University found that as many as one-fifth of first-time homebuyers receive significant parental help, averaging more than half of the downpayment amount (Joint Center 2002).

Here, too, researchers have found significant racial differences. As the Joint Center report reveals, parental assistance "gives young white adults a significant head start that enables them to acquire better first homes and to do so earlier" (Joint Center 2002, p. 10). Among those with living parents, half of all whites come from families with the ability to deliver downpayment assistance, versus only a fifth of blacks. Melvin Oliver and Thomas Shapiro (2006) found that white families were four times more likely as black to benefit from a significant inheritance, and whites were much more likely to inherit considerably larger amounts. While existing research has found that wealth constraints are more important in limiting homeownership than income constraints, setting low DTI thresholds will serve to exclude primarily lower-income and minority borrowers, especially in high-cost markets (Di and Liu 2005). Given these factors, restricting access to QRM mortgages based on the ability to come up with high

downpayment requirements or requiring low DTI ratios could exacerbate the racial homeownership gap in the United States.

The proposal to set a minimum credit score, or its functional equivalent, for QRMs may similarly have disproportionate impacts. Research by the Federal Reserve Board of Governors has shown that African Americans and Latinos have, on average, lower credit scores than other demographic groups (Federal Reserve 2007). Bostic, Calem, and Wachter (2005), imputing credit scores for households in the Survey of Consumer Finances, showed that low-income and minority households were disproportionately concentrated in the lower score ranges in both 1989 and 2001. Numerous concerns have been raised about the reasons why these differences in credit scores persist, including the length of borrowers' credit histories, the lack of transparency in how credit scores are calculated, and the potential for feedback effects as credit scores affect individuals' credit options and vice versa (Spader and Quercia 2009). More research is needed to understand the interactions among individuals' economic characteristics, credit scores, and the pathways through which households are channeled toward high- and low-cost credit markets, but the existing studies suggest that setting high credit score thresholds may exclude a greater share of borrowers of color from the QRM market.

While there are theoretical reasons to believe that stringent LTV, DTI or credit score requirements will disadvantage lower-income or minority consumers, to our knowledge, none of the existing studies on the effects of QRM underwriting guidelines have evaluated the impact of different thresholds on borrowers from different socio-economic and demographic groups (see, for example, FHFA 2011). This study provides a first attempt to fill that gap by estimating the additional impacts on foreclosures and access resulting from setting QRM guidelines over and above those for qualified mortgages (QM)—those mortgages originated ensuring borrowers have a reasonable ability to repay their obligations—and by exploring who would be most affected if QRM underwriting thresholds were put into place.

Data and Methods

The analysis in this study relies on data from two national, proprietary datasets on loan performance: Lender Processing Services (LPS) and BlackBox. LPS is collected from loan servicers, while BlackBox, which is exclusively comprised of loans that are in private-label securities, is collected from investor pools. The advantage of using both LPS and BlackBox in this analysis is that it allows us to analyze a broader segment of the mortgage market than using either one by itself. Importantly, the addition of BlackBox data allows us to assess the outcomes for a greater share of subprime and Alt-A mortgages—the risky loans that precipitated the crisis—since these were more likely to be securitized into the private secondary market.

We limit our analysis to first lien, owner-occupied, single-family mortgage loans originated between 2000 and 2008. We further limit the sample to loans with populated data for all our key fields, and restrict the data to loans with an original value of more than $3,600 and less than three million dollars, as well as those with a DTI ratio of at least five percent and less than 98 percent. This results in a sample of 19.5 million loans, covering the prime, subprime, Alt-A, and FHA mortgage market segments.[10]

For the analysis of borrower demographics, we match the LPS/BlackBox data with Home Mortgage Disclosure Act (HMDA) data. HMDA includes information on the borrower (including race, ethnicity, and income), the disposition of the loan (accepted or denied), and some information on the loan terms (for example, if it was used for purchase or refinance, and whether or not the loan was high cost). To combine these three databases, we employ a probabilistic matching technique that allows loans in LPS and BlackBox to be matched to loans in HMDA along loan characteristics that are common to all three datasets. The matching algorithm is explained in greater detail in Appendix 1. Due to reporting changes in HMDA data, we are unable to match loans originated earlier than 2004. As a result, our analysis on the differential impact of QRM definitions on low-income and minority borrowers focuses only on loans originated over the 2004-2008 time period, covering approximately 7.9 million loans.

[10] Prime v. subprime (Grade "B" or "C") loans are distinguished in both the LPS and BlackBox data; Alt-A loans are only separately identified in BlackBox. BlackBox does not include any FHA loans.

We developed the following coding definitions to identify QM and QRM mortgages in our database. We identify "QM" loans as those that 1) have full documentation, 2) are not interest-only or negative amortizing loans, 3) do not include a balloon payment, 4) do not have adjustable interest rates with fixed terms under five years, 5) do not have a maturity of greater than 30 years, and 6) do not include a prepayment penalty.[11] We refer to these as "QM loans" throughout the analysis.[12]

Although the proposed QRM regulations also include product feature restrictions, they largely overlap with the QM proposal; to simplify our analysis, in this paper we refer to QRM as only the additional LTV, DTI and credit score underwriting requirements that would be required 'above and beyond' the criteria for QM loans. In other words, to assess the additional impact of QRM, we start with the universe of QM loans and assess what would happen at alternate underwriting thresholds. We do not include FHA loans in the QM loan category, since these loans are excluded from QRM risk retention under Dodd- Frank. For LTV, we examine the effects of setting the requirements at 80, 90, and 97 percent. Because of the prevalence of piggyback loans over this time period, we focus our analysis on loans in our data with a populated combined loan-to-value ratio (CLTV).[13] For DTI thresholds, we examine the effect of applying 28, 30, 36, or 45 percent DTI requirements on QM loans.[14] The QRM proposal does not set a numerical credit score target (in part because lenders can use alternate credit scales in their

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[11] The QM proposal does not limit prepayment penalties entirely, but does pose significant restrictions on when prepayment penalties can be used. For example, prepayment penalties are not permitted on adjustable rate mortgages or higher-priced mortgages (see Federal Reserve (2011)). The QRM proposal excludes all loans with prepayment penalties. For simplicity, we assume that loans with prepayment penalties are not permitted and group them into our bucket of QM loans with "product term restrictions."

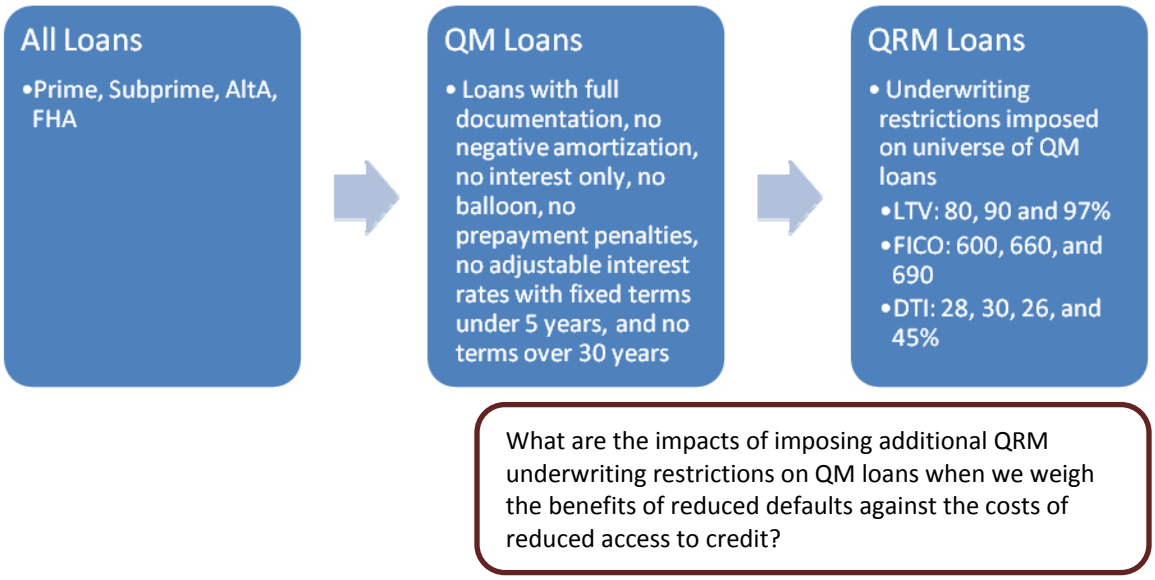
[12] The QM proposal includes two other product term restrictions which we cannot identify in our data: 1) the total points and fees cannot exceed 3% of the total loan amount, and 2) the underwriting will take into account any mortgage-related obligations.

[13] In our sample, we find that the performance of loans with CLTV information is worse than that for loans without CLTV data, suggesting that by excluding loans without CLTV information, our analysis likely overstates default rates compared to the market as a whole. To assess the effect of our decision to only include loans with CLTV, we replicated the analysis below for loans without CLTV data. The benefit/cost ratios do change slightly across the two different samples, however, the qualitative relationships between underwriting thresholds and our default/access measures remain the same.

[14] In loan performance data, the DTI field is poorly defined, and it is unclear whether or not the field captures front- or back-end DTI ratios. For 2004 – 2008, where we have borrower income information, we estimate that for 27 percent of loans, the HTI (calculated from HMDA and monthly P&I) is higher or the same as the DTI reported by the lender, suggesting it is front-end. In the other 73 percent, the calculated HTI is lower than the lender reported DTI by at least 2 percentage points, suggesting that it includes other debts.

underwriting), but the proposal's language on borrower credit history was intended to replicate the performance of loans of borrowers with FICO scores of 690/700 or above.[15] In our analysis, we assess the effects of imposing a minimum FICO score of 600, a minimum FICO score of 660, or a minimum FICO score of 690. Our analysis of the FICO data serves as a proxy for the proposed borrower credit history thresholds. Figure 1 presents a visual representation of our analytical approach.

Figure 1: Analytical Framework



Our measure of default includes all loans that were 90+ days delinquent, in the foreclosure process, or that had been foreclosed upon as of February 2011. In other words, a loan originated in 2005 that became delinquent in 2007 and then entered REO in

[15] The proposed rule states that a "mortgage loan could qualify as a QRM only if the borrower was not currently 30 or more days past due, in whole or in part, on any debt obligation, and the borrower had not been 60 or more days past due, in whole or in part, on any debt obligation within the preceding 24 months. Further, a borrower must not have, within the preceding 36 months, been a debtor in a bankruptcy proceeding, had property repossessed or foreclosed upon, engaged in a short sale or deed-in-lieu of foreclosure, or been subject to a Federal or State judgment for collection of any unpaid debt" (Department of the Treasury et al. 2011). Credit history is proxied using a credit score; in our dataset, this credit score is determined by the credit scoring model devised by Fair Isaac Corporation (FICO). The analysis in the proposed rule compares performance for borrowers with credit scores above and below 690 and above and below 700, noting that those with lower FICO scores have higher default rates. However, FICO's analysis of the proposed credit history requirement (which treats a 60-day delinquency on a $20 Sears charge the same as a 60-day delinquency on a mortgage payment) shows that the definition is both under- and over-inclusive; some borrowers with credit scores around 500 would meet QRM credit standards, while other borrowers with scores over 800 would not (Gaskin 2011).

2009 would be counted as one "default" in our measure of loan performance. It is worth emphasizing that our analysis thus reflects a very unique period in our nation's housing history, comprising the subprime boom, unprecedented declines in house prices, and a foreclosure crisis driven not only by the subprime crisis but also by a deep and prolonged recession characterized by high rates of unemployment. However, we believe that this is a strength rather than a weakness, in that it provides us with the ultimate housing market "stress test." The relative importance of a low LTV ratio (which protects against the risk of declining property values and a situation of negative equity) will be greatest when prices have dropped by an average of 30 percent (Case-Shiller 2011). To the extent that additional LTV underwriting guidelines effectively reduce additional foreclosure risk above and beyond product term restrictions, we are more likely to see it in analysis of the 2000-2011 time period than in analysis covering a less tumultuous time in the housing market.

Evaluating the Effect of QRM Underwriting Guidelines

In the first part of the analysis, we examine whether or not applying additional LTV, DTI, and FICO underwriting requirements, on top of the proposed QM product term restrictions, results in measurably greater reductions in delinquency and foreclosure rates, especially when weighed against concerns about access. Given that research on mortgage default has shown that risky product features such as no documentation loans, prepayment penalties, adjustable rate loans with short teaser periods, and interest only or negatively amortizing payments are strong and significant predictors of default, we would expect that the QM loan term restrictions alone would lead to sizeable reductions in the foreclosure rate.

Table 1 presents the default rate for various loan types within our sample. The table shows that even without imposing any limits on LTV, DTI, or FICO scores, loans meeting the QM product feature definition have performed better than most other loan segments, including FHA loans and even prime conventional loans. Loans consistent with the QM product features—which include both prime and subprime loans—have fared extremely well, with just 5.8 percent of loans either 90+ days delinquent, in the foreclosure process, or foreclosed upon as of February 2011. In comparison, the default

rate for prime conventional loans in our sample was 7.7 percent, nearly two percentage points higher. The default rate for FHA loans (excluding those financed under the Seller Financed Downpayment Assistance Program (SFDPA), see footnote 18) in our sample was 9.7 percent, higher than prime but still significantly below the rates for the subprime and Alt-A market segments, at 32.3 and 22.3 percent, respectively.

Table 1: Loan Performance for Different Loan Types
(2000 – 2008 Originations, All Loans)

Loan Type	Number of Loans in Sample[16]	Default Rate Percentage of Loans 90+ Days Delinquent, in the Foreclosure Process, or Foreclosed Upon by February 2011
All Loans	19,467,990	11.0%
Loans Meeting QM Product Feature Limits[17]	10,871,569	5.8%
Prime Conventional	15,114,926	7.7%
Federal Housing Administration (FHA), excluding Seller-Financed Downpayment Assistance (SFDPA)[18]	1,631,318	9.7%
Alt - A	1,313,661	22.3%
Subprime Conventional	1,408,085	32.3%

[16] Loans do not add up to total loans in sample due to missing data as well as overlap between the QM loans and other market segments.
[17] Loans meeting QM product features are those that have full documentation, are not interest-only or negative amortizing loans, do not include a balloon payment, do not have adjustable interest rates with fixed terms under five years, do not have a maturity of greater than 30 years, and do not include a prepayment penalty. We also exclude FHA loans from the QM product loan category.
[18] For all FHA loans in the sample, the default rate is 14.4 percent. This rate includes loans originated through the Seller-Financed Downpayment Assistance (SFDPA) Program. SFDPA provided borrowers with downpayment assistance provided by a seller-funded nonprofit. However, the program was fraught with abuse, including seller fraud, that severely increased default rates for reasons unrelated to the borrower's creditworthiness or actual loan-to-value ratios. (See GAO 2005 for more information.) FHA ended this program in October 2008 and SFDPA loans are no longer permitted. According to HUD (2008), the ratio of SFDPA loans to other FHA loans on expected lifetime claim rate is 2.33. SFDPA loans accounted for 37 percent of all FHA purchase loans with LTV>90 percent in FY 2007. Therefore, for FHA loans excluding SFDPA, their default rate is estimated as the default rate of all FHA loans divided by 1.4858.

While all of these rates are extremely high by historical standards, it must be remembered that we are analyzing loans through February of 2011, a time period which includes the effects not only of the subprime boom and bust but also a severe and prolonged recession; these percentages would be significantly lower in other historical periods.[19]

Table 2 shows that the relative performance of each of the loan types is similar when we consider the purpose of the loan. For each purpose type (purchase, rate refinance, or cash-out refinance), loans meeting QM product feature restrictions fared best.

Table 2: Default Rate by Loan Type and Purpose
(Default Rate: Percent of Loans 90+ Delinquent, in the Foreclosure Process, or Foreclosed Upon by February 2011, 2000 – 2008 Originations, All Loans)

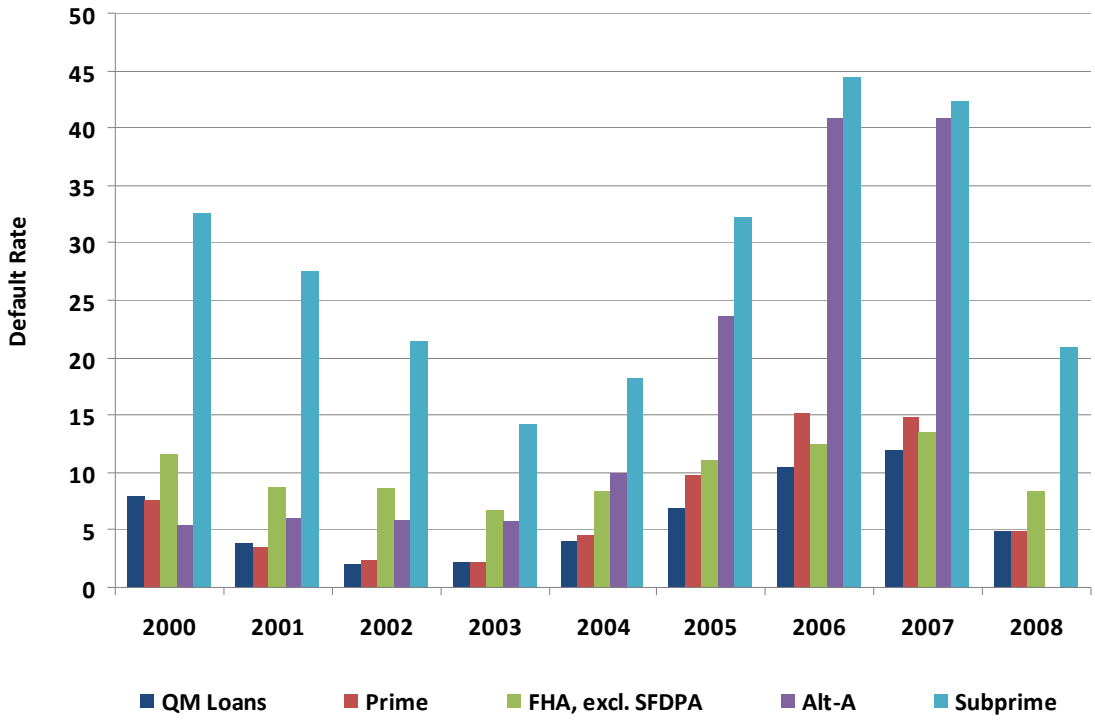
	QM Loans	Prime	FHA, excluding SFDPA Loans	Alt-A	Subprime
Purchase	7.1%	9.2%	9.7%	25.3%	37.7%
Rate/Term Refinance	4.1%	6.2%	9.4%	18.0%	22.8%
Cash Out Refinance	6.4%	8.6%	10.7%	21.8%	27.0%

Figure 2 presents the loan performance data broken down by both loan type and year of origination. For 2000 through 2004 originations, QM loans performed similarly to prime conventional loans; however, during the height of the subprime boom (e.g. 2005, 2006 and 2006), imposing QM product feature restrictions results in a default rate of three to five percentage points below prime. Although the majority of prime mortgages originated between 2005 and 2007 would have met the QM definition, about 35 percent included at least one risky feature (e.g., prepayment penalty, limited

[19] For example, during the 1990s, the MBA foreclosure rate for prime mortgages ranged from 0.83 to 1.07 percent; the FHA foreclosure rate over this same time period ranged between 1.72 and 2.47 percent (Elmer and Seelig 1998).

documentation, interest-only and/or negative amortization) and would not have qualified. The default rate for prime loans that would have met QM standards is 5.2 percent, compared to 13.5 percent for non-QM prime loans, suggesting that risky products were a key factor in the mortgage crisis. The relatively strong performance of FHA loans originated between 2005 and 2007—especially in contrast to the subprime loans that served borrowers with similar credit profiles—is further indication that product features, not LTV, were significant drivers of default over this time period, since the majority of FHA loans lacked risky features but only required small downpayments.

Figure 2: Default Rate by Loan Type and Year of Origination
(Default Rate: Percent of Loans 90+ Delinquent, in the Foreclosure Process, or Foreclosed Upon by February 2011, 2000 – 2008 Originations, All Loans[20])

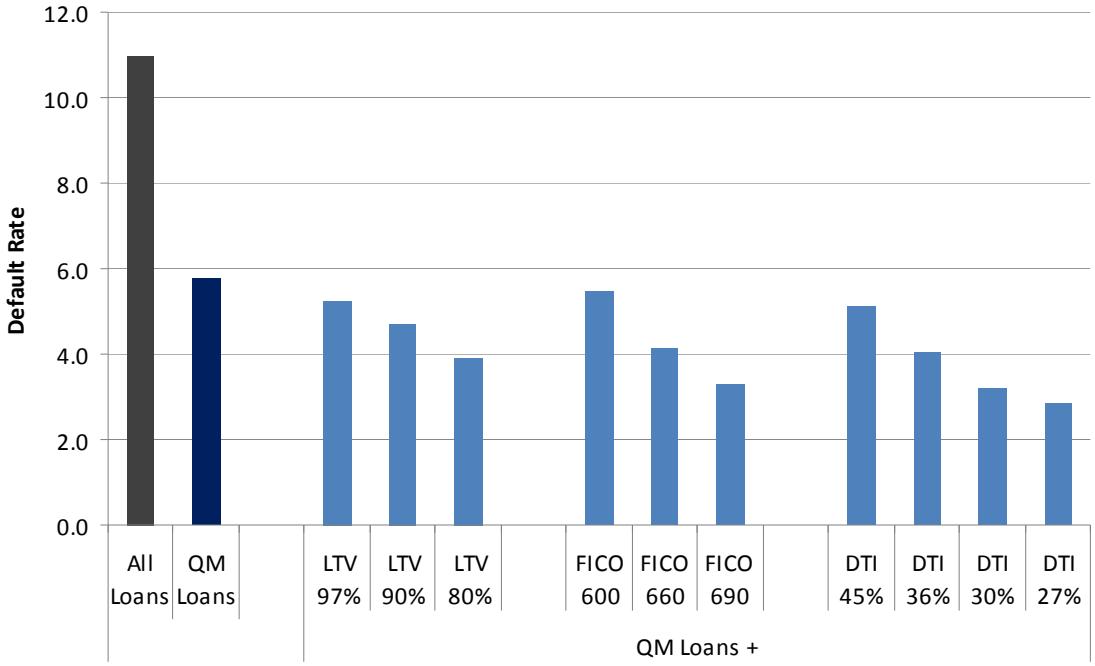


Not surprisingly, when we impose further underwriting restrictions on QM loans, the default rate decreases even further. (See Figure 3.) For example, loans that meet QM guidelines as well as a 90 percent LTV requirement had a default rate of 4.7 percent,

[20] Our sample does not include a sufficient number of Alt-A loans originated in 2008 in order to calculate the default rate for that cohort of loans.

compared with the 5.8 percent for QM loans only. Loans that meet QM guidelines and have a DTI ratio of less than 27 percent have the lowest default rate, at 2.9 percent.

Figure 3: Effect of Alternate QRM Definitions on the Default Rate
(Percent of Loans 90+ Days Delinquent, in the Foreclosure Process, or Foreclosed upon by February 2011, 2000 – 2008 Originations)

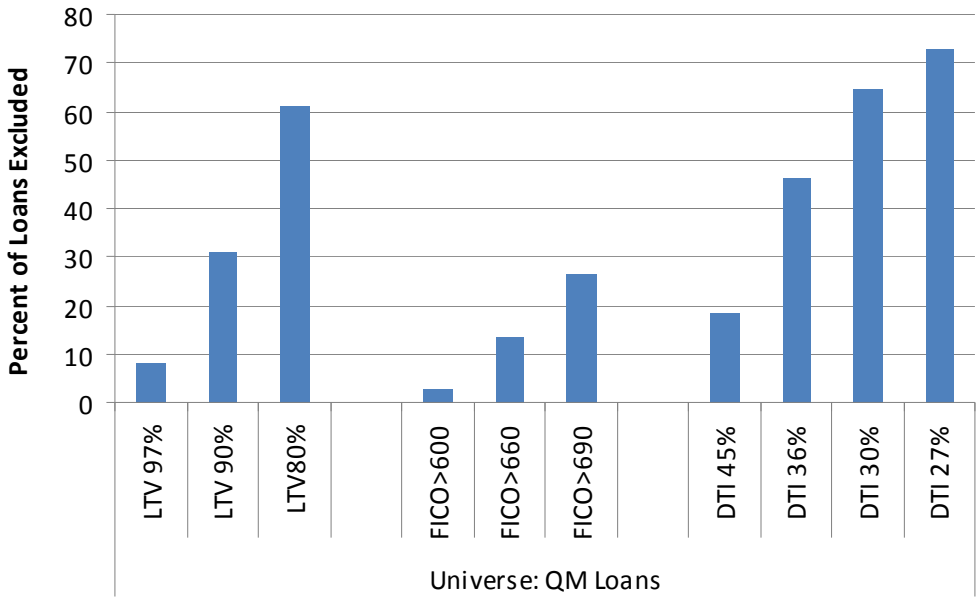


However, these lower default rates are achieved by excluding a large share of QM loans from the QRM market. As Figure 4 shows, the 2.9 percent default rate achieved with a 27 percent DTI ratio on top of product term restrictions excludes around 70 percent of all QM eligible loans originated between 2000 and 2008.[21] Requiring an 80 percent LTV would exclude 60 percent of all QM loans from the QRM market.[22] In addition to potentially restricting access to lower-cost credit, setting such strict thresholds could become self-defeating. If a large share of borrowers are excluded from the mortgage market, either because the loans aren't available or because they are priced too

[21] In part, this may reflect a tendency for the borrower and/or lender to report an income that meets the minimum underwriting requirement and no more (FHFA 2011).
[22] Not surprisingly, analysis of loans with missing combined LTV information shows a smaller effect. For loans without CLTV data, an 80% LTV requirement results in excluding 27 percent of loans from the QRM market.

high, this could result in a lower demand for houses, which in turn could reduce house prices further and lead to higher foreclosures. Clearly, in establishing QRM guidelines, policymakers need to carefully weigh the benefits of reducing foreclosures against the costs of reducing access to QRM mortgages.

Figure 4: Percent of QM Loans that Would Be Excluded Under Alternate QRM Underwriting Thresholds
(2000 – 2008 Originations)



To get at the tradeoff between reduced defaults and restricted access, we develop two separate but related measures of whether or not additional underwriting guidelines produce the desired result of reducing risk in the mortgage market while still ensuring that credit is not unduly restricted. While neither is a strict benefit/cost ratio, our intent is the same—to compare the benefits of reduced foreclosures against the costs of excluding borrowers from the QRM market. The first measure, which we refer to as a "benefit ratio," does this by comparing the ***percent*** *reduction in the number of defaults* to the ***percent*** *reduction in the number of borrowers who would have access* to QRM mortgages, based on applying underwriting criteria onto the universe of QM loans.[23] A

[23] The ratio for QM loans is calculated as the benefit of reduced foreclosures of applying QM product term restrictions over the cost of reduced access on the universe of all loans. It is important to note that the

larger benefit ratio would suggest that the proposed change provides greater benefits than one with a smaller value. To provide a hypothetical example, an underwriting restriction that results in a 50 percent reduction in the number of foreclosures among QM loans while excluding only 10 percent of borrowers (50/10=5) would be preferable to a change that results in a 50 percent reduction in the number of foreclosures but excludes 20 percent of borrowers (50/20=2.5).

Figure 5: Benefit Ratio for Alternate LTV Thresholds
(2000 – 2008 Originations)

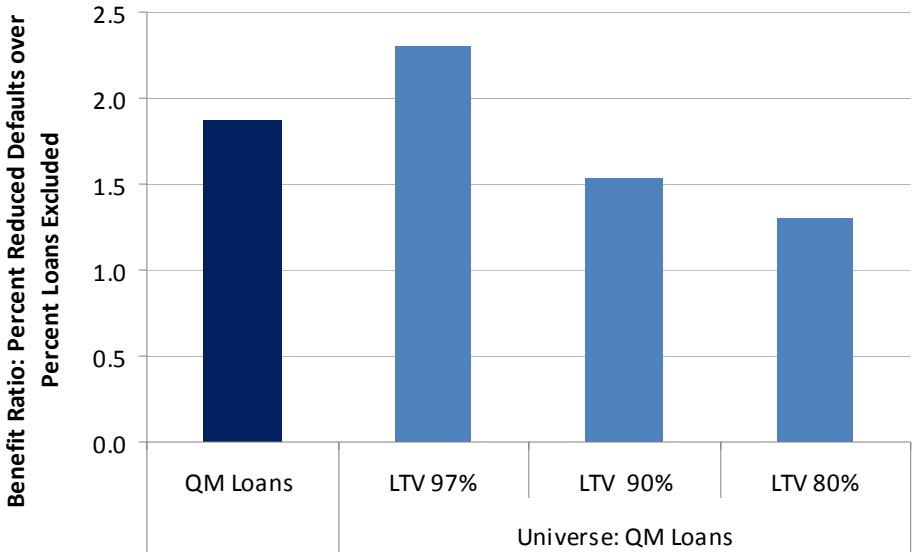


Figure 5 presents the results of this ratio, first for QM loans, and then when we impose alternative LTV thresholds on QM loans. Importantly, we find that LTV ratios of 80 and 90 percent result in poorer outcomes: while the percent of defaults avoided is certainly greater at lower LTVs, this gain is achieved by restricting access to a disproportionately larger percentage of borrowers. In other words, the benefit ratio is

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origination of non-QM mortgage products, such as no documentation loans, negative amortization loans, or hybrid ARMS, is closely—if imperfectly—correlated with borrower underwriting characteristics. The ratios that we can measure resulting from QM product term restrictions is therefore due at least in part to excluding borrowers with high LTVs, low FICO scores, and high DTIs from the market. However, research has shown that subprime borrowers who received loans without risky product features (e.g. those that would qualify for QM product loans) performed significantly better than subprime borrowers who received non-QM qualifying loans (Ding et al. 2011), and that many borrowers who received a risky loan would have qualified for a loan with better terms (Brooks and Simon 2007).

larger (i.e., better) at an LTV of 97 percent than at an LTV of 80 percent.[24] However, we do find added benefits of reduced defaults relative to borrower access at an LTV of 97 percent: the benefit ratio is higher than when we consider QM restrictions on their own. In contrast, the benefit ratio at 80 and 90 percent LTV requirements are actually lower than for QM restrictions on their own. This suggests that even very modest downpayments may play an important role in protecting against default, while excluding a smaller share of borrowers than higher downpayment requirements would.

Figure 6: Benefit Ratio for Alternate FICO and DTI Thresholds
(2000 – 2008 Originations)

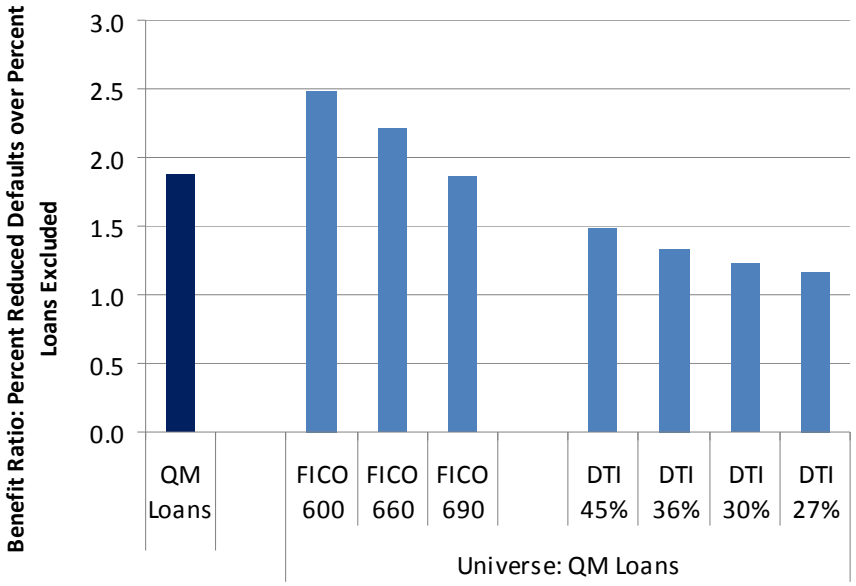


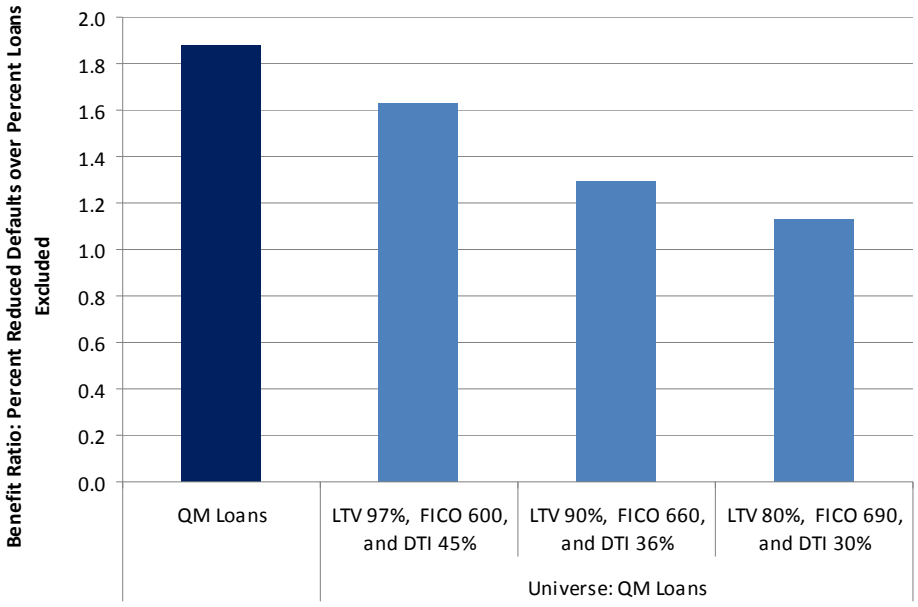
Figure 6 shows the ratio for varying FICO and DTI thresholds. Here, the story is slightly different: we find that at FICO thresholds of both 600 and 660, the ratio is higher than that for QM restrictions on their own; at a FICO threshold of 690, the ratio is the same as for QM loans. However, as with LTV requirements, we find that the ratio is highest for the least restrictive threshold (which excludes borrowers with FICO scores below 600).[25] When we consider alternate DTI ratio thresholds, we find that, across the

[24] We also examined the effects at a 95 percent LTV, and find that the benefit ratio is slightly lower than at the 97 percent LTV threshold.
[25] Setting the minimum FICO level lower than 600 does not produce a larger positive ratio.

board, QM restrictions alone reduce the greatest percentage of foreclosures while minimizing the percent of borrowers excluded from the market.

Since the underwriting criteria may not be applied in isolation to one another—indeed, the proposed rules impose all three—we also calculated the benefit ratio for possible QRM underwriting restrictions that impose a combination of LTV, FICO score, and DTI thresholds on QM loans. We evaluated three hypothetical combinations: one with very strict underwriting criteria (80 percent LTV, FICO above 690, and DTI of 30 percent), one with more relaxed underwriting criteria (97 percent LTV, FICO above 600 and DTI of 45 percent), and one in the middle (90 percent LTV, FICO above 660, and DTI of 36 percent). (See Figure 7.) We find that the strictest guidelines produce the worst ratio—indeed, the least restrictive is the best of the three—and none performs as well as the QM restrictions on their own.[26]

Figure 7: Benefit Ratio for Alternate "Combined" QRM Thresholds
(2000 – 2008 Originations)



[26] Evaluating the effect of combining only an LTV ratio of 97 percent and a FICO score of 600 shows that there is an improved benefit over QM alone (a benefit ratio of 2.2 versus 1.9), but that the combined restrictions are less effective than either an LTV ratio of 97 percent (benefit ratio=2.3) or a FICO score of 600 (benefit ratio=2.5) on its own.

Another way to assess the effects of the underwriting thresholds is not to look at the *percentage* change in performance and access, but rather to look at the *number* of performing loans a certain threshold would exclude to prevent one additional default. This second measure, our "exclusion ratio," examines the loans that are excluded at each QRM threshold and assesses *the **number** of performing loans that would be excluded for each default prevented*. An underwriting threshold that excludes 10 performing loans (i.e. which are not in default) to prevent one additional foreclosure is less desirable from a policy standpoint than one that excludes four performing loans to prevent one additional foreclosure. In this measure, the number of excluded loans can be viewed as a proxy for the number of borrowers who would be excluded from the QRM market, despite the fact that they have shown that they can sustain the payments on their mortgage[27] through one of the worst housing market downturns in history.

In Table 3 we present the results of this analysis. The table shows that imposing 80 percent LTV requirements on the universe of QM loans would exclude performing10 loans from the QRM market to prevent one additional default. Under a scenario where policymakers would impose an extremely strict QRM definition—with an LTV of 80 percent, FICO of above 690, and a 30 percent DTI ratio—12 performing QM loans would be excluded from the QRM market in order to prevent one more default. Imposing an LTV of 97 percent on QM loans excludes six performing loans for each prevented default; for FICO scores below 600, the ratio is five to one.

While this measure is only descriptive and does not take other factors that influence default into account, it nevertheless shows that strict underwriting criteria would exclude a large share of performing loans from the QRM market, which would impose additional mortgage costs on borrowers who have shown that they can sustain their mortgage payments.

[27] By definition, these loans have not become seriously delinquent or ended in foreclosure by February of 2011.

Table 3: The Effect of Alternate QRM Thresholds, Exclusion Ratio
(2000 – 2008 Originations)

Alternate Underwriting Criteria	Exclusion Ratio (Number of Performing Loans Excluded per Prevented Default)
Universe: QM Loans	
LTV 97%	6:1
LTV 90%	9:1
LTV 80%	10:1
FICO < 600	5:1
FICO < 660	6:1
FICO < 690	7:1
DTI 45%	9:1
DTI 36%	10:1
DTI 30%	11:1
DTI 27%	12:1
LTV 97%, FICO 600, and DTI 45%	8:1
LTV 90%, FICO 660, and DTI 36%	10:1
LTV 80%, FICO 690, and DTI 30%	12:1

In Table 4, we present both our benefit and exclusion ratios, breaking the sample down into purchase, refinance, and cash-out refinance loans, and look at the effectiveness of the proposed LTV requirements for each type of loan purpose. The current QRM proposal sets even more stringent criteria for rate-term and cash-out refinance loans than it does for purchase loans, requiring an 80 percent LTV for purchase loans, a 75 percent LTV for rate-term refinance loans, and a 70 percent LTV for cash-out refinance loans. For all three loan types, we find that the QM product restrictions are the most effective at balancing the demand between reducing the default rate and ensuring continued access to credit.

By these measures, we also find that the QM product restrictions are more effective for refinance loans than for purchase loans. For example, QM restrictions result in a benefit ratio of 2.1 for rate-term refinance loans, compared with 1.8 for purchase loans. This reinforces the importance of loan term restrictions for refinance as well as

purchase loans, particularly given the fact that other research has documented a link between subprime refinance products and subsequent foreclosure.[28]

Table 4: Measures of the Effectiveness of Additional QRM Underwriting Requirements, by Loan Purpose
(2000 - 2008 Originations)

	Purchase Loans		Rate-Term Refinance Loans		Cash-Out Refinance Loans	
	QM Loans	QM + 80% LTV	QM Loans	QM + 75% LTV	QM Loans	QM + 70% LTV
Benefit Ratio	1.8	1.3	2.1	1.2	2.0	1.3
Exclusion Ratio	4:1	10:1	3:1	10:1	3:1	10:1

Note: The benefit ratio is calculated as the percent reduction in the foreclosure rate over the percent of loans that would be excluded. The exclusion ratio is calculated as the number of performing loans that would be excluded from the QRM market for each default prevented. The ratios for QM loans are calculated on the universe of all loans, while the ratios for QRM underwriting thresholds are calculated on the universe of loans meeting QM product restrictions.

Overall, the evidence presented in this section suggests that stricter underwriting may not be the best approach to reducing foreclosures when weighed against ensuring continued access to sustainable mortgage credit. Instead, the data show that putting QM product restrictions in place effectively reduces a significant share of foreclosure risk, and that strict additional underwriting restrictions do not yield significantly greater benefits when weighed against concerns over access to credit. We find some evidence that imposing LTV ratios of 97 percent or minimum FICO thresholds of 600 on top of QM product restrictions may produce benefits beyond loan term restrictions, in that they reduce a greater percentage of foreclosures relative to the percentage of borrowers who would be excluded from the QRM market. However, QM, and its emphasis on ensuring that a borrower has a reasonable ability to repay the loan, would likely lead to these same protections through responsible underwriting without having to set a bright line for the QRM market. In addition, combining LTV, DTI and credit score underwriting criteria

[28] For example, researchers at the Federal Reserve Bank of Boston found that 70 percent of borrowers in Massachusetts who had lost their home to foreclosure by 2008 (and who had taken out a subprime refinance loan) had originally bought their home with a prime mortgage (Foote et al. 2008).

leads to worse outcomes, even when we consider the least restrictive underwriting scenario. Clearly, downpayments and credit scores matter, but our analysis suggests caution before setting market-wide QRM underwriting restrictions given the likely impact on access to lower-cost credit. This tradeoff is of particular concern when we consider who would bear the costs of non-QRM mortgages. In the following section, we examine to what extent lower-income borrowers, and borrowers of color, would be excluded from the QRM market if policymakers set restrictive underwriting guidelines.

Access to Credit for Low-Income Borrowers and Borrowers of Color

As discussed in the literature review, more restrictive downpayment, credit score, or DTI ratio requirements are likely to have a disproportionate effect on reducing mortgage credit access for lower-income borrowers and borrowers of color. In this section, we document the extent to which alternate underwriting restrictions would exclude borrowers from the QRM mortgage market, disaggregating the results by borrower race/ethnicity and income. For this analysis, we focus on purchase loans originated between 2004 and 2008, and consider only performing loans—those that were not 90 or more days delinquent, in foreclosure, or foreclosed upon by February 2011. We focus on purchase originations since QRM underwriting restrictions will likely have the biggest impact on access to credit in the purchase market, either by increasing the cost of a mortgage for lower-wealth families, delaying the ability to buy a home, or by excluding them from obtaining a loan altogether.

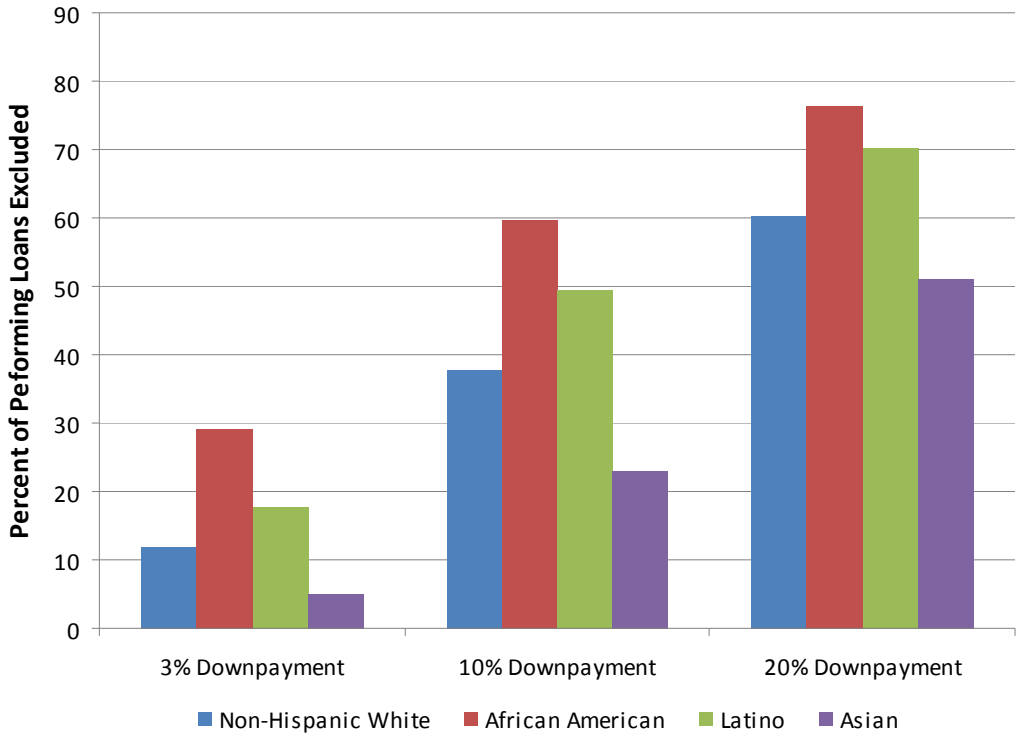
Overall, we find that imposing a 10 percent downpayment requirement would eliminate 38 percent of performing loans from the QRM market, and that at the 20 percent downpayment threshold, 61 percent would be excluded. In Figures 8 and 9, we show the percentage of borrowers with performing loans who would not qualify for a QRM mortgage if additional downpayment requirements were imposed (assuming QM product restrictions are in place), stratified by borrower race and ethnicity and borrower income.[29] Strikingly, imposing a 20 percent downpayment requirement on QM loans

[29] Income categories are classified as follows: low-income—less than 50 percent of the MSA median income; moderate-income—at least 50 percent and less than 80 percent of the MSA median income; middle-income—at least 80 percent and less than 120 percent of the MSA median income; and upper-

would prevent three-quarters of African Americans and 70 percent of Latinos from qualifying for a QRM mortgage, compared with 60 percent of non-Hispanic whites and 51 percent of Asians. Our analysis shows that these borrowers would be excluded from the QRM market even though they could be successful homeowners, since this analysis is based on homeowners who avoided foreclosure during our study period.

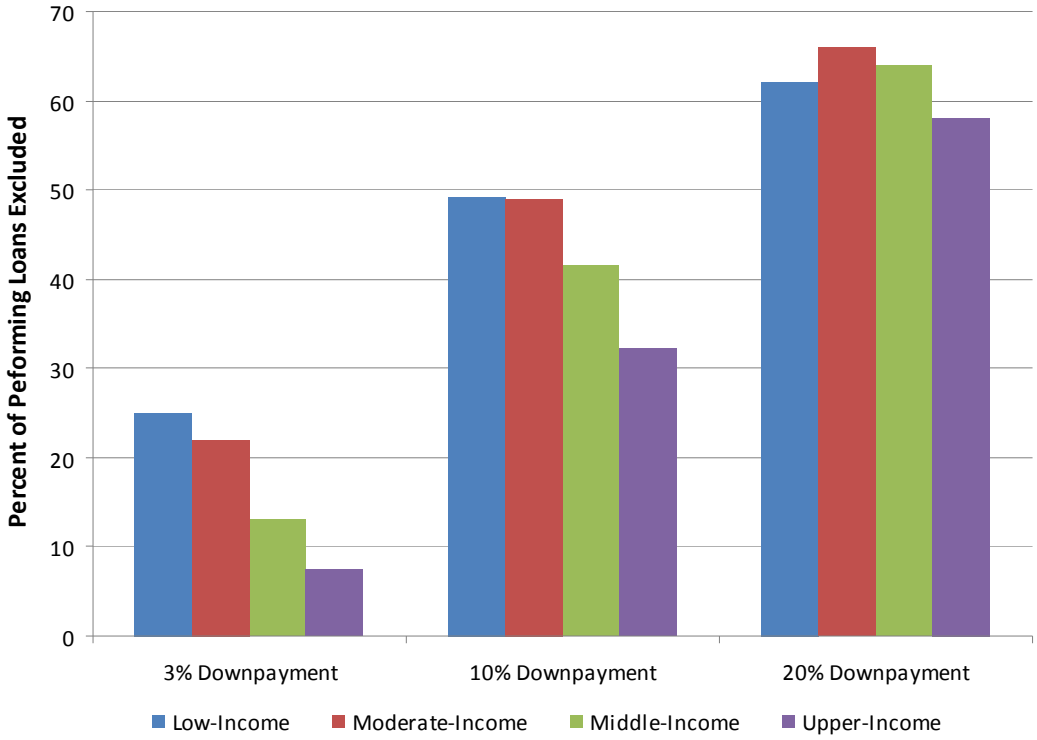
Disparities are prevalent at lower thresholds at well: nearly one-third of African American borrowers and 20 percent Latino borrowers would not have qualified for a QRM mortgage if they required a three percent downpayment, compared to 12 percent for non-Hispanic Whites and five percent of Asians.

Figure 8: Percent of Performing Loans Excluded from the QRM Mortgage Market, Alternate LTV Definitions, by Borrower Race/Ethnicity
(2004 – 2008 Originations)



income—at least 120 percent of MSA median income. The mean incomes for each of the categories are $26,000 for low-income, $41,000 for moderate-income, $61,000 for middle-income, and $108,000 for higher-income.

Figure 9: Percent of Performing Loans Excluded from the QRM Mortgage Market, Alternate LTV Definitions, by Borrower Income
(2004 – 2008 Originations)



Downpayment requirements of three percent or 10 percent also disproportionately affect low- and moderate-income borrowers. Among low-income families, 25 percent would be excluded at the three percent downpayment level, and 50 percent would not qualify with a 10 percent downpayment requirement. However, it is noteworthy that at 20 percent downpayment requirements, the impact is greatest on moderate- and middle-income families. Imposing a 20 percent downpayment requirement on QM loans would exclude nearly two-thirds of loans to middle-income households from the QRM market. Of course, it is possible that these households—particularly those with higher incomes or access to intergenerational transfers—could tap into additional savings to meet these higher downpayment requirements and still qualify for a QRM mortgage.

Figures 10 and 11 present similar statistics, but this time for alternate FICO and DTI thresholds, again focusing solely on the purchase market. Racial and ethnic disparities are most prominent when we impose different FICO underwriting criteria onto QM loans. At FICO scores above 690, 42 percent of African-American and 32 percent of

Latino borrowers with performing loans would be excluded from QRM mortgages. The differences by race and ethnicity for DTI ratios are not as significant, although the pattern of a larger share of loans to African-American and Latino borrowers being excluded at each threshold is the same. At a 36 percent DTI, 50 percent of African-American and Latino borrowers would be excluded from QRM mortgages. Yet the percent is high for White and Asian borrowers as well, at 43 and 48 percent, respectively.

Figure 10: Percent of Performing Loans Excluded from the QRM Mortgage Market, Alternate FICO and DTI Definitions, by Borrower Race/Ethnicity
(2004-2008 Originations)

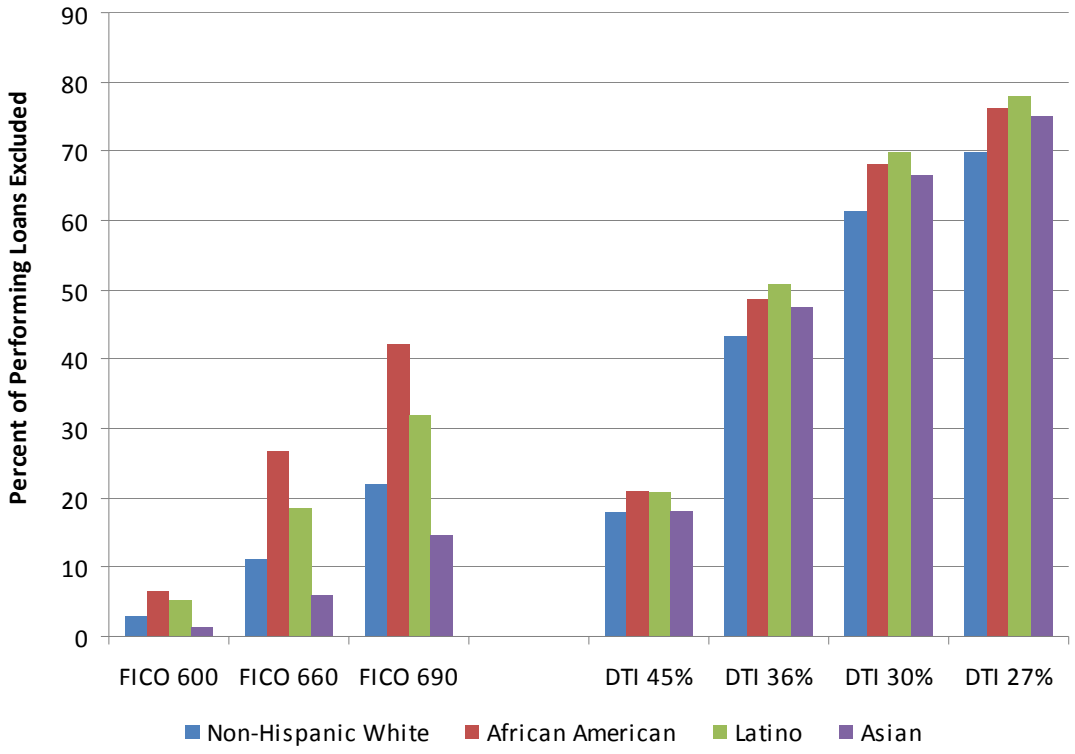
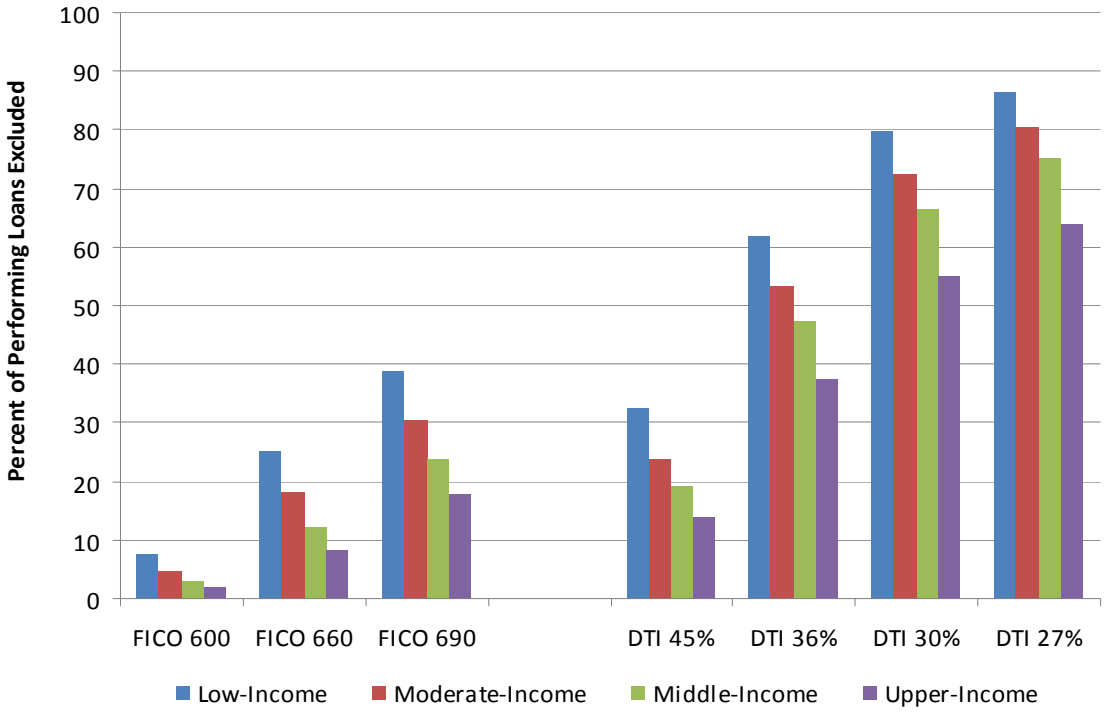


Figure 11: Percent of Performing Loans Excluded from the QRM Mortgage Market, Alternate FICO and DTI Definitions, by Borrower Income
(2004 – 2008 Originations)



Breaking down the analysis by borrower income shows that low- and moderate-income borrowers with performing loans would also be disproportionately affected by FICO and DTI underwriting guidelines. Requiring FICO scores of 690 or above would exclude 39 percent of low-income and 30 percent of moderate-income borrowers from the QRM market. Not surprisingly, DTI has a greater effect on low- and moderate-income borrowers as well. More research is needed to disentangle the importance of DTI to mortgage sustainability, and particularly for lower-income families, residual income (i.e., the income left over after a family has paid the mortgage) may be an important factor that lenders should consider in combination with DTI in assessing whether or not a borrower has the ability to repay the loan (Stone 2006). However, without adequate empirical data and models that document the relationship between residual income, back-end DTI, and loan performance, it is hard to determine which thresholds would be the most effective at producing high-quality mortgages while not excluding lower-income borrowers from access to credit.

Combining downpayment, FICO, and DTI thresholds has the expected effect of cutting off access to QRM mortgages even more dramatically. Applying even the least restrictive combination of underwriting criteria (e.g. LTV of 97 percent, FICO above 600 and DTI of 45 percent) would mean that 46 percent of performing loans to African Americans and 37 percent of performing loans to Latinos would not have qualified for QRM status. At the most restrictive thresholds (e.g. LTV of 80 percent, FICO above 690, and DTI of 30 percent), the vast majority of borrowers—approximately 85 percent—would not have qualified for a QRM mortgage, with the impacts greatest for African Americans (93 percent) and Latinos (91 percent).

Table 5: The Impact of QM Loan Term Restrictions on Loan Default, by Borrower Race/Ethnicity and Income

(Default Rate: Percent of Loans 90+ Delinquent, in the Foreclosure Process, or Foreclosed Upon by February 2011, 2004 – 2008 Originations, All Loans)

	Share of Loans that Would Qualify Under Proposed QM Term Restrictions	Default Rate - Non QM Loans	Default Rate - QM Loans	Ratio of non-QM to QM Default Rates
Borrower Race/Ethnicity				
Non-Hispanic White	66.4	19.6	6.8	2.9
African American	56.1	34.3	14.8	2.3
Latino	47.7	44.4	15.7	2.8
Asian	59.1	27.0	8.0	3.4
Borrower Income				
Low	74.5	21.3	10.3	2.1
Moderate	70.1	21.7	9.4	2.3
Middle	65.0	24.2	8.4	2.9
Upper	58.3	28.1	7.6	3.7

Importantly, the product term restrictions in QM would lead to significant protections, especially for borrowers of color. Borrowers of color received a much greater share of non-QM loans. Less than half of loans originated to Latino borrowers between 2004 and 2008 would have qualified under QM restrictions, compared to two-thirds of white borrowers. (See Table 5.) Non-QM loans have a significantly higher foreclosure rate—between 2.3 and 3.3 times higher than loans that would have met QM

product restrictions. Restricting the origination of non-QM loans would thus result in large benefits for borrowers of color, especially Latino and Asian borrowers; in part, this is due to the fact that Asians and Latinos were concentrated in areas of the country that saw the highest rates of risky subprime and Alt-A lending (Bocian et al. 2011). Overall, QM restrictions play a critical role in protecting borrowers from receiving a mortgage that is destined to fail, either through risky loan terms or through bad underwriting that did not adequately consider a borrower's ability to repay the loan.

Conclusion

In this study, we examine the way different QRM guidelines may affect loan performance and access to mortgage credit, looking both at the entire market and the impact on historically underserved households. More narrowly, we estimate the additional impacts on foreclosures and restricted access resulting from setting QRM underwriting guidelines over and above those for QM product restrictions. We find that the added benefits of reduced foreclosures resulting from restrictions beyond the QM product requirements do not always outweigh the costs of reduced borrower access to QRM mortgages. In particular, LTV requirements of 80 or 90 percent are less effective than QM restrictions alone, when the benefits of reduced foreclosures are weighed against the number of borrowers excluded from the market. For example, we find that imposing 80 percent LTV requirements on QM loans would exclude 10 otherwise performing loans to prevent one foreclosure.

We find that LTVs of 97 percent result in a better benefit ratio, suggesting that a small downpayment requirement may have an important protective effect against default risk while still providing broad access to mortgage credit. Similarly, we find that the benefit ratio for a FICO score threshold of above 600 is also higher. However, when underwriting thresholds are combined, even the least restrictive definition (LTV of 97 percent, FICO above 600 and DTI of 45 percent) is less effective than QM product restrictions on their own. The results for DTI suggest that more stringent underwriting requirements produce little additional benefit in terms of the tradeoff of reduced foreclosures and credit access, above and beyond QM product restrictions.

In addition, we find that imposing additional LTV, DTI, and FICO underwriting requirements on QM loans has disproportionate effects on low-income borrowers and

borrowers of color. When we look at the impact of underwriting thresholds on performing purchase loans, we find that higher thresholds would exclude a greater share of these borrowers from access to the QRM mortgage market. Just over 75 percent of African-American borrowers and 70 percent of Latino borrowers would not qualify for a QRM mortgage if downpayment requirements were set at 20 percent. Significant racial and ethnic disparities are evident for FICO underwriting standards as well. At FICO scores above 690, 42 percent of African-American and 32 percent of Latino borrowers would be excluded from QRM mortgages, compared with 22 percent of white households and 15 percent of Asian households. At the most restrictive combined thresholds (e.g. LTV of 80 percent, FICO above 690, and DTI of 30 percent), the vast majority of borrowers—approximately 85 percent—would not have qualified for a QRM mortgage, with the impacts greatest for African Americans (93 percent) and Latinos (91 percent). These excluded borrowers represent households that have not gone into foreclosure, indicating that unduly restrictive underwriting guidelines could bar borrowers who can be successful homeowners from obtaining a QRM mortgage.

In conclusion, this study provides important descriptive evidence for the benefits and costs of alternate QRM underwriting definitions. However, there remain many unanswered questions about how the QRM mortgage market will develop, its evolving effect on demand for both credit and housing, and the implications of the QM and QRM mortgage markets for different segments of the population. As regulators seek to develop evidence-based policies, additional analyses of borrowers' savings and debt balance sheets, credit scores, and preferences and behaviors would help to create a better understanding of how to balance market risk with access to safe and affordable credit. To the extent possible, these analyses should take into consideration the experiences of different demographic and socio-economic groups. We also encourage CFPB, as part of its QM rule-making process, to look carefully at the issues related to residual income and debt-to-income as it concerns a borrower’s ability to repay, especially for lower-income households.

Nevertheless, our research provides compelling evidence that the QM product loan guidelines on their own would curtail the risky lending that occurred during the subprime boom and lead to substantially lower foreclosure rates, while not overly

restricting access to credit. Clearly, the policy goal should be to encourage the origination of loans that are appropriately underwritten and that take into account a borrower's ability to pay. In addition, both QM and QRM should retain the product term restrictions, which would limit the origination of loans with terms that significantly heighten the risk of default. But we caution policymakers against setting overly restrictive QRM standards for LTV, DTI and credit score requirements, especially given the disproportionate impact of these thresholds on low-income borrowers and borrowers of color.

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Appendix 1. Data Methodology

The two databases used in this analysis are BlackBox (BBx) and Lender Processing Services (LPS), both proprietary loan-level datasets that include information on loan terms and performance. BlackBox data covers over 90 percent of non-agency (private-label) securitization pools, including jumbo, subprime and Alt-A. BlackBox coverage of the U.S. market includes nearly 7,600 deals, over 5,700 of which are active.[30] LPS, which is comprised of loan-level data collected from servicers, is not limited to private-label securities. We estimate that LPS covers approximately 66 percent of the first-lien mortgages reported to federal regulators in the HMDA data from 2005 through 2008.

To analyze the potential disproportionate impact of different QRM underwriting guidelines by borrower race and income, we merge the loans in LPS/BlackBox with loans in Home Mortgage Disclosure Act (HMDA). HMDA contains loan origination information, as well as information on borrower race/ethnicity and income. Our first step in merging these databases was to assign each HMDA loan a unique identifier. Next, we match loans from HMDA to loans in LPS by geography and loan amount. Because HMDA reports data by census tract and LPS by zip code, we created a "cross-walk" file using spatial location within ARCGIS. For each census tract, we estimate the share of housing units that are in the overlapping zip codes. These become our geographic weights, which we use to represent the probability that a loan is, in fact, in that zip code. For loans that are in tracts that overlap multiple zip codes, we create additional HMDA records for each potential zip code that the loan could be in. The result of this step in matching HMDA to LPS is, in essence, a Cartesian product, where every HMDA record with a given loan amount-zip code combination is allowed to match to every LPS record with the same combination. We then filter out those matches where other common fields between the two databases (e.g. lien status, loan purpose, and loan type) are inconsistent with each other .

30 http://www.bbxlogic.com/data.htm.

After matching HMDA to LPS in this manner, we separately match HMDA to BlackBox using the same methodology. The resulting two combined datasets (i.e. HMDA-LPS and HMDA-BlackBox) are then appended, and a "matching weight" is assigned to each loan. The matching weight is given based on the number of times a unique HMDA loan was matched to loans in LPS and BlackBox.[31] A final weight is calculated by multiplying the geographic weight by the matching weight. Formally, the weights are developed as follows. For a HMDA loan *A* in census tract *X*, suppose there are total of *n* LPS/BB loans matched to *A*. For the i^{th} loan matched to HMDA loan *A*, suppose it is from zip code *Y*. *X* and *Y* overlap at *Z*, as illustrated in Figure A1.

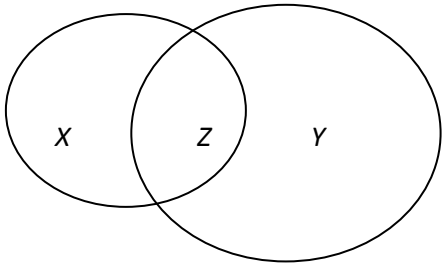

Figure A1. Census tract *X* overlaps with zip code *Y* at *Z*

Let *X*, *Y* and *Z* also denote their area size. The probability that the HMDA loan *A* is in *Z* is given by

$$P_A = Z/X,$$

assuming that *A* has an equal chance of being located anywhere in *X*. Similarly, the probability that the i^{th} loan is in *Z* is given by

$$P_i = Z/Y.$$

The joint probability that both the HMDA loan *A* and the i^{th} loan of LPS/BB are in *Z* is given by

$$P_{iA} = P_A * P_i = Z^2/XY$$

31 For example, if one HMDA loan was matched to two loans in LPS and one loan in BBx, each match would be given a weight of 1/3.

The probability that HMDA loan *A* and the i^{th} loan are the true match is given by

$$Q_{i\,A} = \frac{P_{iA}}{\sum_{i=1}^{n} P_{iA}}$$

For HMDA loan *A*, any supplemental information obtained from the i^{th} loan of LPS/BB is weighted by Q_{iA}. This final weight is used in the analysis.

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