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An Evaluation of Large-Scale Mortgage Refinancing Programs

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This paper is preliminary and is circulated to stimulate discussion and critical comment. The analytic approaches and conclusions in this paper are the authors' and should not be interpreted as CBO's.

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An Evaluation of Large-Scale Mortgage Refinancing Programs

Abstract

We analyze a stylized large-scale mortgage refinancing program that would relax current income and loan-to-value restrictions for borrowers who wish to refinance and whose mortgages are currently insured by Fannie Mae, Freddie Mac, or the Federal Housing Administration. The analysis relies on an estimate of the volume of incremental refinancing that would occur and an estimate of how future default and prepayment behavior would be affected by such refinancing. Relative to the status quo, the specific program analyzed here is estimated to cause an additional 2.9 million mortgages to be refinanced, resulting in 111,000 fewer defaults on those loans and estimated savings for the GSEs and FHA of \$3.9 billion on their credit guarantee exposure, measured on a fair-value basis. Offsetting those savings, federal investors in MBSs, including the Federal Reserve, the GSEs, and the Treasury, would experience an estimated fair-value loss of \$4.5 billion. Therefore, on a fair-value basis, the specific program analyzed here would have an estimated cost to the federal government of \$0.6 billion. (The proposal analyzed here is a stylized one, and the estimated costs are not reported entirely according to the rules governing federal budget accounting; the figures in this paper do not represent a CBO cost estimate of a legislative proposal.) Because the estimated gains and losses are small relative to the size of the housing market, the mortgage market, and the overall economy, the effects on those markets and the economy would be small as well. We also discuss the impact of this program on various stakeholders, including homeowners, non-federal mortgage investors, mortgage lenders, mortgage service providers, private mortgage insurers, and subordinated mortgage holders. For example, non-federal investors would experience an estimated fair-value loss of \$13 to \$15 billion; most of that wealth would be transferred to borrowers.

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Introduction

Although the broader U.S. economy appears to be gradually recovering, the housing market remains weak. In addition to the significant number of mortgages in some stage of delinquency or default, many homeowners are unable to refinance to take advantage of historically low mortgage rates. The unusually low level of refinancing activity has prompted a number of proposals for federal programs that would provide refinancing opportunities to more mortgage borrowers. Such a program would allow participants to lower their monthly mortgage payments, freeing up household income for non-housing expenditures. It could also help some portion of struggling borrowers avoid a future default.

The ongoing housing crisis and the slow recovery from the recent recession have locked many borrowers out of the refinancing market. Two main factors drive that phenomenon:

- Weakened household balance sheets, reduced income and widespread unemployment have left many borrowers unable to qualify for a refinancing because of restrictions based on affordability tests. For some the constraint is a too high loan-to-value (LTV) ratio—the amount of mortgage debt divided by the assessed value of the home.¹
- Lenders and mortgage guarantors, including the government-sponsored enterprises (GSEs) Fannie Mae and Freddie Mac and the Federal Housing Administration (FHA), have instituted more stringent underwriting requirements, leaving many borrowers unable to qualify for a new loan even if they have remained current on their existing mortgages.

Policymakers have responded to these constraints by introducing new refinance programs, such as the GSEs' Home Affordable Refinance Program, HARP, and programs offered by FHA. Although those programs have helped some homeowners, program features and eligibility criteria exclude a significant number of borrowers who would benefit from a refinancing. For example, in 2010 Fannie Mae and Freddie Mac refinanced, through HARP, nearly 30,000 loans with a current LTV between 105 percent and 125 percent (the program maximum). This compares to the more than \$762.5 billion of mortgages (or approximately 5 million loans assuming an average balance of \$150,000) in the GSEs' portfolio that had a current LTV greater than 100 percent at the end of the fourth quarter of 2010.² A refinancing program that relaxed LTV limits and income tests, waived appraisal requirements, or allowed delinquent borrowers to participate in the program, could make refinancing at current market rates feasible or less expensive for many borrowers.

Existing federal mortgage refinancing programs and most proposals for new federal programs restrict eligibility to borrowers with mortgages insured by the GSEs or other federal agencies including the FHA, which collectively guarantee more than 56 percent of mortgages outstanding. Federal taxpayers are already obligated to bear the losses from default on those mortgages, so allowing those borrowers to refinance their loans would not increase the taxpayers' exposure to default loss. In fact, taxpayers would

¹ In this paper, LTV calculation is based on the first mortgage balance. The combination of first mortgage and any subordinate mortgages is referred to as combined loan-to-value (CLTV).

² HARP data are from Federal Housing Finance Agency, Foreclosure Prevention & Refinance Report, Fourth Quarter 2010. Current LTV data are from the Q4 2010 credit supplements from Fannie Mae and Freddie Mac.

benefit from lower losses on such guarantees, because the reduced financial burden from a lower mortgage payment would reduce the likelihood of default.

Although such a program would benefit borrowers and would lower federal guarantee costs, it would be costly to mortgage investors, who would experience losses on mortgages that are prepaid more rapidly than in the absence of the program. Some of those investment losses would be borne by the federal government, which, through the Federal Reserve, the GSE portfolios, and the Treasury, has substantial holdings of mortgage-backed securities (MBSs).

In this paper, we analyze the potential impact of a stylized program that would increase the availability of refinancing and slightly lower its cost. Specifically, the program would eliminate current loan-to-value and borrower income restrictions on refinancing existing loans guaranteed by Fannie Mae, Freddie Mac, or FHA. The new mortgages would have a maturity of 30 years and a fixed interest rate set at the prevailing market rate. The new guarantee fee would be limited to the fee on the existing loan. Eligibility would be limited to borrowers who are current on their existing mortgages. The program would be available for one year.

We use a probabilistic model of borrower behavior that CBO developed, estimated from the historic performance of GSE and FHA mortgages, in which borrower default and prepayment rates respond to changes in interest rates and home prices. Using the current population of loans guaranteed by the GSEs and FHA, the model allows us to assess the incremental refinancing volume expected under the stylized program. Those estimates of incremental refinancing activity serve as the basis to assess:

- **Borrower Benefits:** Borrowers who refinance experience the benefit of lower mortgage costs and less risk of defaulting in the future. In addition, both borrowers and their local communities benefit from avoiding the economic and social costs of the defaults and foreclosures that would otherwise occur.
- **Guarantee Savings:** Lower monthly payments for borrowers who refinance through the program reduce the probability of future defaults on the refinanced loans. As guarantors of those loans, the GSEs and FHA benefit in the form of lower expected costs.
- **Investor Losses:** Investors in the MBSs backed by the existing loans suffer a loss in the value of their investments, particularly for securities that are trading at prices that reflect the market's expectation that refinancing is unlikely. Those investors include both federal entities (the Federal Reserve, U.S. Treasury, and the GSEs) and non-federal entities (U.S. financial institutions, pension funds, foreign governments, and other private investors). Losses experienced by federal entities represent a cost to taxpayers.
- **Other Stakeholders:** The program would affect many additional stakeholders in the mortgage finance industry, including lenders (as loan originators), servicers, mortgage insurers, and third-party service providers; some would benefit but others would lose.
- **Macroeconomic Benefits:** Lower monthly mortgage payments for borrowers would produce a short-run stimulus because those borrowers would tend to increase their spending. (The stimulus effect would be slightly offset by the reduction in spending arising from capital losses to private investors.) Although not quantified in our analysis, the stimulus is likely to be small as a percentage of GDP, but large relative to the net federal cost of the program. The effects on the housing and broader markets from increased spending and averted defaults are likely to be small

because the gains and losses to borrowers and investors are likely to be small relative to the sizes of those markets.

Costs reported in this paper are calculated on a fair-value basis. Although that approach is consistent with CBO's budgetary treatment of the GSEs, it differs from the budgetary treatment of both the Federal Reserve, reflected in the budget on a cash basis, and the MBS purchases of the U.S. Treasury, presented on a Federal Credit Reform Act of 1990, or FCRA (Public Law 101-508), basis. With those differences in mind, reported costs in this paper are meant to provide an internally consistent measure of cost but not an estimate of the federal budgetary cost of a large-scale refinancing program. The proposal analyzed here is a stylized one and the estimated costs are not reported entirely according to the rules governing federal budget accounting. The figures in this paper do not represent a CBO cost estimate of a legislative proposal.

Under our base case assumptions, the stylized program is estimated to cause an additional 2.9 million mortgages to be refinanced, resulting in 111,000 fewer defaults on those loans and resulting in savings for the GSEs and FHA of \$3.9 billion on their credit guarantee exposure, measured on a fair-value basis.³ Offsetting those savings, federal investors in MBSs, including the Federal Reserve, the GSEs, and the Treasury, would experience a loss of \$4.5 billion (also on a fair-value basis). The net federal cost would be an estimated \$0.6 billion. From the borrowers' perspective, savings from lower mortgage payments is projected to total \$7.4 billion in the first year of the program; the associated effect on consumption would decline significantly over time as borrowers pay off those loans.

Non-federal investors hold approximately 65 percent of the outstanding MBSs included in the analysis. In addition to holding a larger share of the market than federal investors, those non-federal investors also hold a greater proportion of older, higher-coupon securities; the Federal Reserve and the Treasury purchased a large share of recently issued, lower-coupon MBSs as a part of their recent market interventions. As a result, non-federal investors are expected to experience a fair-value loss of \$13 to \$15 billion—about three times the size of the loss to federal investors.

In practice, the effects of such a program would depend significantly on several factors, including the design of the program (for instance, the fee structure and the eligibility criterion), the willingness of mortgage industry firms (lenders, mortgage insurers, and other ancillary service providers) to participate in the program, borrower acceptance, and the future movements of interest rates, home prices, and other economic variables.

Some analysts and advocates have called for large-scale mortgage refinancing programs that would include principal forgiveness by lenders or guarantors on mortgages where the loan balance significantly exceeds the value of the home, and others have called for refinancing programs that would offer borrowers new mortgage rates below current market rates. Such policies could have much larger effects on the housing market and the economy, but probably only if they also entailed significantly higher costs to the federal government. Policies of that sort are outside the scope of this paper's analysis.

³ The savings are calculated on a fair-value basis, which is an estimate of the market value of the averted defaults.

Background

The terms of most mortgage loans in the United States permit the borrower to refinance without penalty or restriction. That is the case for loans guaranteed by Fannie Mae, Freddie Mac, or FHA. Because of those terms, investors expect that many borrowers with a financial incentive to refinance will do so. Apart from lowering their interest rate, borrowers may have an incentive to refinance for several reasons: to reduce the monthly payment; to obtain a more desirable amortization schedule (for example, moving from an interest-only loan to one with monthly principal and interest payments to eliminate a potential balloon payment, or changing the term to maturity on the mortgage); to reduce risk by moving from a floating-rate loan to a fixed-rate loan; or to extract accumulated equity as a means for increasing funds available for spending (also known as a cash-out refinancing).

Those benefits are weighed against the financial and non-financial costs associated with obtaining a new loan, including appraisal costs, origination fees, title fees, settlement fees, taxes, and the time and effort necessary to obtain the refinanced loan. The ultimate decision to refinance incorporates not only the borrowers' assessment of the direct costs and benefits of the transaction but also includes additional considerations, including the remaining term of the mortgage and how long they expect to remain in the home, their current credit profile, their expectation of future interest rates, and other factors.⁴ Finally, borrowers will weigh the decision to refinance against the other option inherent in their mortgage—the ability to default. Borrowers with significant negative equity or credit constraints may find that option particularly valuable and thus an extremely important consideration.⁵

The option to refinance granted to mortgage borrowers is not free to them. Investors in mortgages and MBSs are exposed to prepayment risk and will adjust the price they are willing to pay for those assets based on the perceived level of exposure. That compensation for prepayment risk is passed through to mortgage borrowers in the form of higher initial interest rates.⁶

In recent years, refinancing loans have represented a significant portion of total loan originations, particularly in periods of falling interest rates. Chart 1 provides a clear picture of that relationship during recent “refinancing waves” in 1992–1993, 1998, and 2001–2003. In each case, mortgage rates dropped more than 2 percentage points, sparking an increase in borrowers looking to lock in those lower rates. Since the early 1990s, several changes in the mortgage market have increased borrowers' likelihood to refinance. Some of those changes include the advent of automated underwriting systems (most notably Fannie Mae's Desktop Underwriter and Freddie Mac's Loan Prospector), the widespread use of credit scores and automated property-valuation models, and the development of streamlined refinancing

⁴ Many aspects of a borrower's decision to refinance fit within a traditional option pricing framework. For a description of that approach, see Paul Bennett, Richard Peach and Stavros Peristiani, “Structural Change in the Mortgage Market and the Propensity to Refinance,” *Journal of Money, Credit and Banking*, 33: 955–975, 2001.

⁵ For a discussion of the relationship between default and prepayment behavior in mortgage valuation, see Yongheng Deng, John M. Quigley and Robert Van Order. “Mortgage Terminations, Heterogeneity and the Exercise of Mortgage Options,” *Econometrica*, vol. 68, no. 2; March 2000.

⁶ For discussion of prepayment risk and its effect on MBS investors, see “The Handbook of Mortgage-Backed Securities,” Frank Fabozzi, ed., 2001.

products by the GSEs, FHA, and many financial institutions which have made the refinancing process both less costly and more efficient for both borrowers and lenders.⁷

Chart 1. Single Family Annual Mortgage Originations and 30-year Fixed-Rate Mortgage Rates



Source: Origination data from the Mortgage Bankers Association. Mortgage debt outstanding data from the Federal Reserve Board. 30-year mortgage rate from Freddie Mac.

Current Constraints on Mortgage Refinancing

Despite rates dropping more than 1.5 percentage points since 2007, refinancing volumes have not seen a spike similar to previous refinancing waves. Some explanations for the lack of refinancing activity are largely unconnected to the recent financial crisis. First, a significant portion of current mortgages were originated in the low-rate environment that has existed since 2003. According to data provided by Bloomberg on 30-year MBSs guaranteed by Fannie Mae, Freddie Mac, and FHA, approximately 46 percent of loans have an interest rate lower than 5.5 percent, and 67 percent have an interest rate lower than 6 percent.⁸ Under recent interest rate conditions, a majority of borrowers might not receive the 1 to 2 percentage point improvement in interest rate generally cited as the trigger for refinancing for rate reduction.⁹ Second, because rates have remained low for an extended period of time, many borrowers

⁷ Streamlined refinancing products allow borrowers to refinance, often with the same lender, without undertaking many of the steps of a traditional refinancing, including income and asset documentation, employment verification and property appraisal.

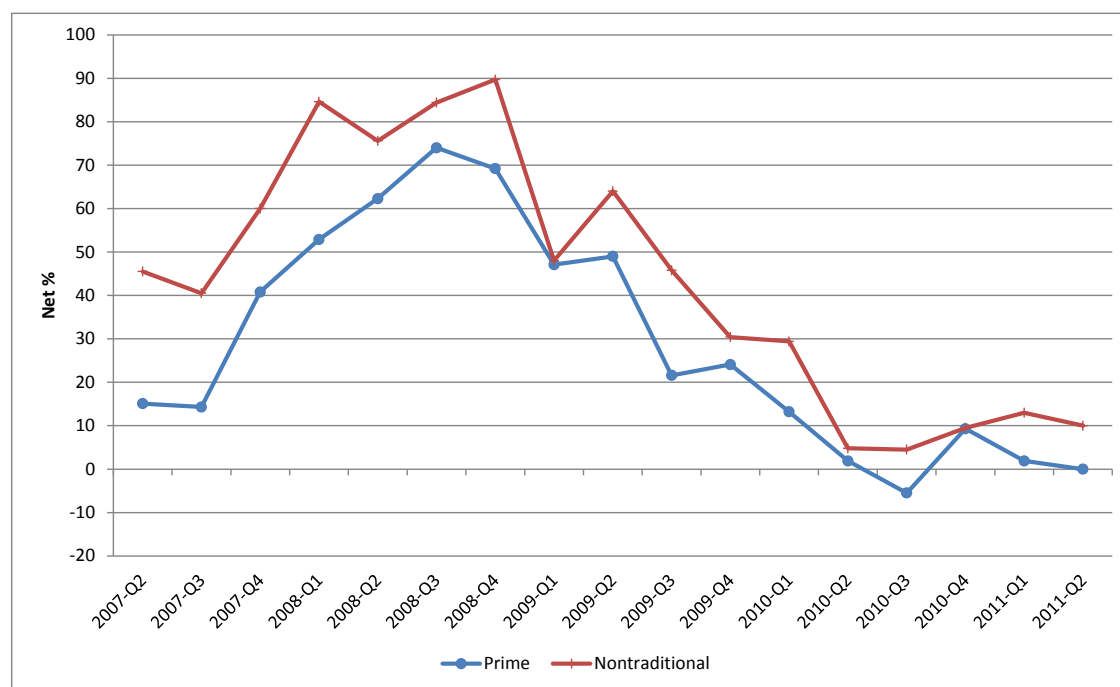
⁸ Loans guaranteed by FHA are securitized in Ginnie Mae MBSs, which also contain loans guaranteed by the U.S. Department of Veterans Affairs’ (VA), the U.S. Department of Housing and Urban Development’s Office of Public and Indian Housing, and the U.S. Department of Agriculture’s Rural Development programs.

⁹ See Sumit Agarwal, John C. Driscoll and David Laibson, “Optimal Mortgage Refinancing: A Closed Form Solution,” October 2007, for fuller discussion of refinancing economics.

inclined to refinance for rate reduction have already done so. Refinance volumes have exceeded \$1 trillion in each year after 2003, with the exception of the depths of the financial crisis in 2008.

It is widely acknowledged that impediments to refinancing high-interest-rate loans have increased in the wake of the financial crisis. In addition to the limited options facing borrowers—resulting from negative equity created by home price declines, reduced income or unemployment, and the continued high levels of consumer debt accumulated over the past decade—many lenders and private mortgage insurers have tightened their underwriting standards. Lenders have been tightening their underwriting standards for both prime and non-traditional mortgages during the past few years (see Chart 2). As a result, underwriting standards are significantly more restrictive than they were at the start of the financial crisis. Examples include the drastic curtailment of interest-only and negative amortizing loan guarantees issued by the GSEs since 2008 and the institution of minimum credit scores, LTV ratios, and other risk management policies by FHA.¹⁰ Another sign of tightening is that private lenders, the GSEs and the FHA now charge higher fees or rates than before the crisis on mortgages made to less creditworthy borrowers or with LTV ratios at origination that exceed 80 percent.

Chart 2. Net Percentage of Loan Officers (Domestic Respondents) Tightening Standards for Residential Mortgage Loans¹¹



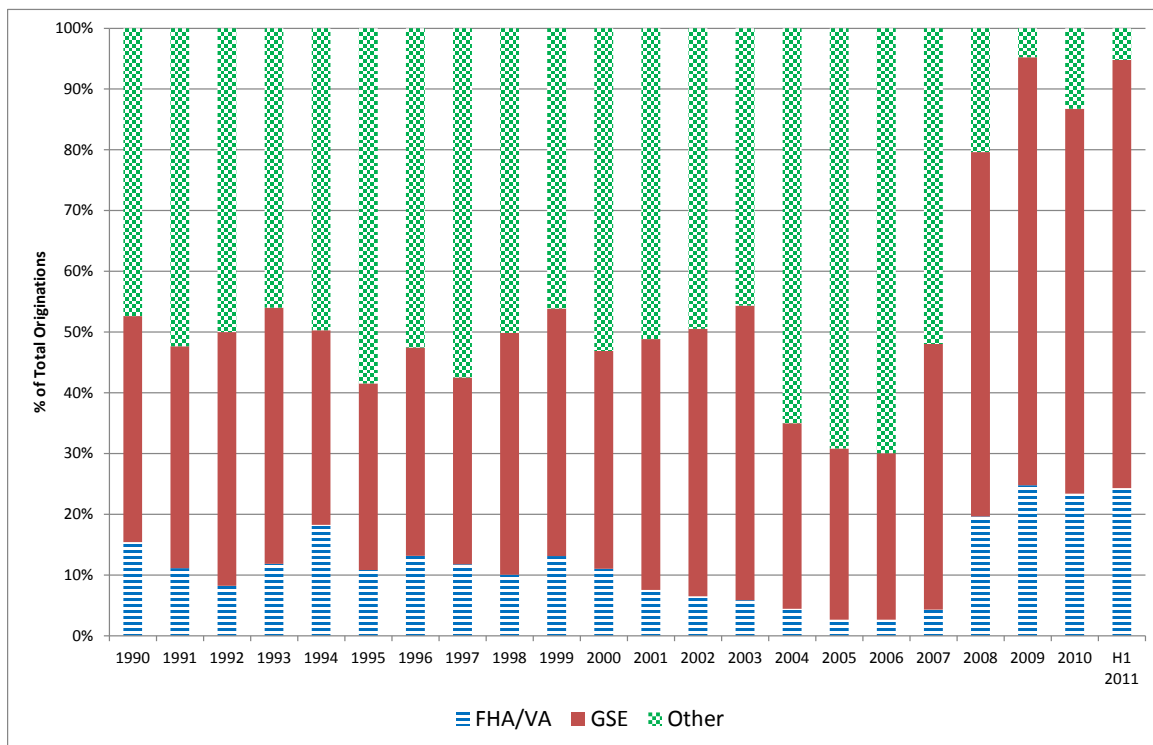
Source: Federal Reserve Board Senior Loan Officer Opinion Survey on Bank Lending Practices, April 2011.

¹⁰ See Fannie Mae 2011 First-Quarter Credit Supplement and FHA Mortgagee Letter 2010-29.

¹¹ A value greater than zero means more respondents in the survey indicated that they have tightened lending standards than those that indicated standards have loosened or remained the same. The nontraditional category includes but is not limited to adjustable-rate mortgages with multiple payment options, interest-only mortgages, and Alt-A products such as mortgages with limited income verification and mortgages secured by non-owner-occupied properties.

A further indication of the continuing dislocation in the mortgage market is the distribution of new originations between the GSEs, FHA, and the private market. In the first half of 2011, the GSEs, FHA and VA averaged 95 percent of new originations, continuing the trend of the past few years, far above levels during the peak of the housing boom and far above the pre-boom average of approximately 50 to 55 percent. The GSEs and FHA also continue to play an important role in the jumbo loan market (generally loans above \$417,000).¹² Increases in federally backed market share in both the jumbo market and the non-jumbo market have come even as both the GSEs and FHA have instituted a number of guarantee fee increases since the onset of the crisis. Charts 3 and 4 provide evidence of the prominence of the GSEs and FHA in recent years. Prospects for a rebound in the private market remain uncertain, with some analysts estimating that mortgage spreads would need to rise considerably for securitizations to become profitable again for non-federally guaranteed MBSs.

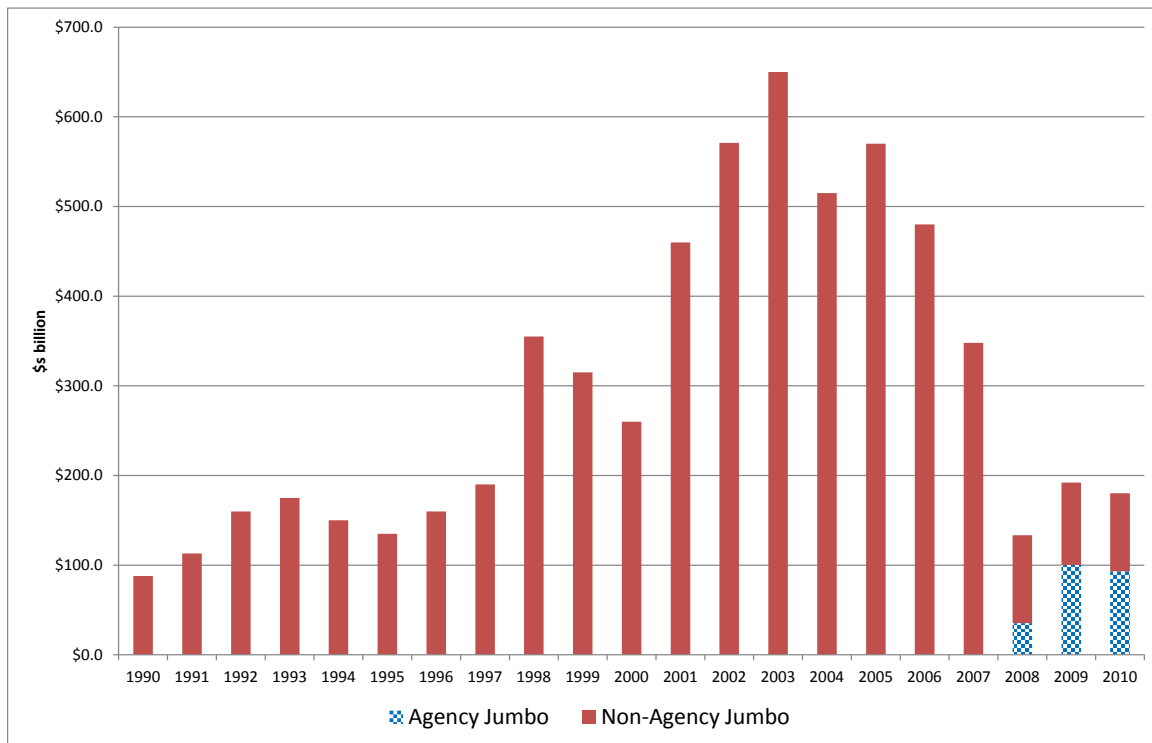
Chart 3. Mortgage Originations by Source



Source: Constructed from estimates by Inside Mortgage Finance.

¹² The expanded authority to guarantee jumbo mortgages is scheduled to expire on September 30, 2011, at which time the limit in high-cost areas will drop from \$729,750 to \$625,500.

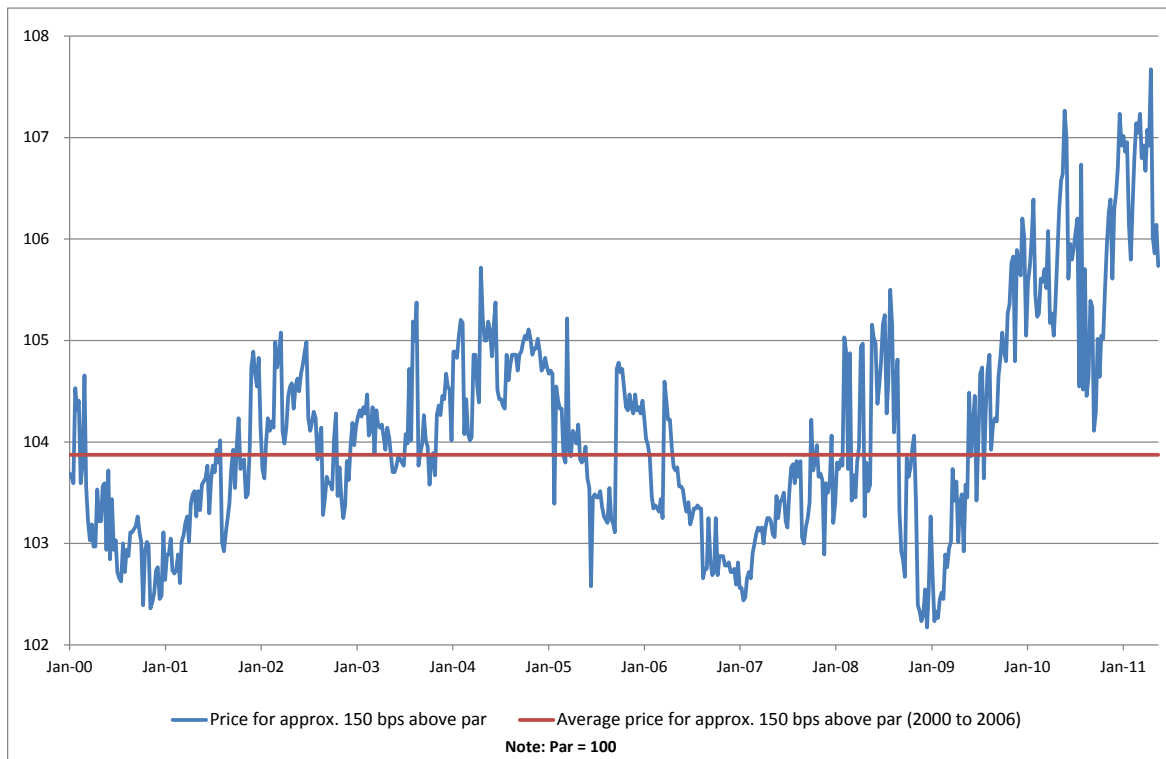
Chart 4. Jumbo Originations



Source: Constructed from estimates by Inside Mortgage Finance

A measure of the difficulty borrowers are experiencing in refinancing their mortgages is the unusually high premium over the face (or par) value that investors are willing to pay for MBSs with high coupon rates. The availability of the option to prepay the mortgage usually prevents the price of MBSs from rising too much above par value. In general, a coupon-paying bond, including a mortgage-backed security, will increase in value when interest rates fall. For MBSs, however, large increases above par value are uncommon because the decline in interest rates tends to speed up the rate of prepayment on the underlying mortgages and, hence, MBS investors do not expect to receive an above-market coupon for very long. The current high pricing suggests that investors expect impediments to refinancing to prevail considerably longer than usual. Chart 5, based on Fannie Mae 30-year MBSs that have coupons that are approximately 1.5 percent above the prevailing par coupon rate, shows that investors have increased the price for those securities since 2009. Although many factors affect pricing for MBSs, a strong case can be made for lower prepayment expectations as an important component in the price premium investors are currently willing to pay for those securities.

Chart 5. Weekly Pricing for Premium Fannie Mae 30-year Fixed-Rate MBSs



Source: Bloomberg data for Fannie Mae 30-year MBSs.

Existing Programs and Proposals

To address the lack of opportunities for borrowers with above-market mortgages to refinance, the Administration introduced the HARP, launched in tandem with the Home Affordable Modification Program (HAMP) in 2009. Since inception through the first quarter of 2011, the GSEs have refinanced nearly 750,000 borrowers through HARP. Approximately 700,000 of those borrowers had a current LTV of less than 105 percent, and the remaining (approximately 50,000) had LTVs between 105 percent and 125 percent.

HARP, which targets loans owned or guaranteed by the GSEs, provides flexibility that does not exist in the GSEs' standard refinancing programs. In particular, HARP allows borrowers with current LTVs up to 125 percent to refinance without increasing the current level of private mortgage insurance (PMI) attached to their loan. Although that feature reduces the cost of the refinanced loan to the borrower, other program parameters are less flexible than those in some proposals for a more comprehensive large-scale refinancing program. HARP requires borrowers to demonstrate that they have sufficient income to make the new payments, even if they are current on their more costly existing mortgage. The program limits current LTV to 125 percent, excluding many homeowners with the most severe negative equity. It also requires borrowers to be current on their existing loan, and not to have been more than 30 days past due on a payment over the past year. Finally, the program extends only to existing GSE borrowers.

FHA offers two different programs designed to increase access to refinancing. The streamlined refinancing program targets existing FHA loans and provides for both reduced documentation and lower

costs. To qualify for a streamlined refinancing, borrowers must be both current on their existing loan, pass traditional underwriting criteria for sustainability, and have a maximum combined LTV of less than 125 percent.¹³ The much smaller Short Refinance program allows for the refinancing of non-FHA loans into a loan guaranteed by FHA. The program's main benefit to borrowers comes from the requirement that the loan must be written down to a level necessary to create a new loan with an LTV less than 97.75 percent. Although that lower loan balance would most likely reduce monthly mortgage payments, borrowers must still qualify for the loan based on a standard FHA underwriting. FHA completed nearly 213,000 streamlined refinancing loans in fiscal year 2010 and is on pace to achieve the same volume in fiscal year 2011. As of April 2011, only 151 Short Refinance loans had been executed in fiscal year 2011 (with none in fiscal year 2010).¹⁴

Policy makers, market participants, and academics have offered several proposals designed to address the limited success of HARP and the two FHA programs. The best known of those proposals are bills introduced in both houses of Congress¹⁵ and proposals put forth by R. Glenn Hubbard and Christopher Mayer, and by David Greenlaw. Although the details differ, each proposal aims to significantly boost refinancing activity by relaxing eligibility rules, including accepting higher LTV mortgages and less financially secure borrowers. Some proposals also limit the fees that may be charged on the refinanced loan. Table 1 provides a brief summary of existing and proposed programs.

¹³ Includes subordinate financing. LTV is based on either a new appraisal or the original appraised amount.

¹⁴ FHA Single-Family Outlook Report, April 2011

¹⁵ Housing Opportunity and Mortgage Equity Act of 2011 (H.R. 363, 112th Congress, 1st Session 2011) and the Helping Responsible Homeowners Act (S. 170, 112th Congress, 1st Session 2011)

Table 1. Existing and Proposed Refinancing Programs

Existing Programs	Key Features and Restrictions
Home Affordable Refinance Program (HARP)	<ul style="list-style-type: none"> • Allows for refinancing of loans owned or guaranteed by Fannie Mae and Freddie Mac. • Borrower required to pay designated Fannie Mae and Freddie Mac loan level price adjustments, which are fees based on assessed risk. • Existing level of private mortgage insurance may be retained on new loan, even if current loan to value has increased. <p><u>Restrictions</u></p> <ul style="list-style-type: none"> • Borrower must be current on existing mortgage and must not have been more than 30 days late on mortgage payment during prior year. • Existing loan must be less than 125 percent of current home value. • Borrower must display ability to make new payment.
FHA Streamlined Refinance	<ul style="list-style-type: none"> • Allows for refinancing of FHA loans. • Provides for reduced documentation and underwriting required to be performed by the lender. • Borrower upfront costs can be reduced in exchange for either a higher note rate or a larger mortgage principal balance. <p><u>Restrictions</u></p> <ul style="list-style-type: none"> • Borrower must be current on existing mortgage. • Existing loan must be less than 125 percent of current home value. • Borrower must display ability to make new payment.
FHA Short Refinance	<ul style="list-style-type: none"> • Allows for refinancing of non-FHA loans. • Holder of existing first mortgage must agree to write off at least 10 percent of unpaid principal balance of the mortgage, resulting in a new FHA loan of no more than 97.75 percent loan-to-value (and a combined loan-to-value of 115 percent if a subordinate mortgage exists). <p><u>Restrictions</u></p> <ul style="list-style-type: none"> • Borrower must qualify for the new loan under standard FHA underwriting requirements (including having a credit score equal to or greater than 500).
Proposed Programs	
Housing Opportunity and Mortgage Equity Act (H.R. 363)	<ul style="list-style-type: none"> • Allows for refinancing of loans owned or guaranteed by Fannie Mae and Freddie Mac. • Both current and delinquent borrowers are eligible. • Prohibits appraisal to establish current loan to value. • Limits interest rate and fees borrower may be charged on new loan.
Helping Responsible Homeowners Act (S. 170)	<ul style="list-style-type: none"> • Allows for refinancing of loans owned or guaranteed by Fannie Mae and Freddie Mac. • Borrower must be current on existing mortgage. • Removes limit on current loan to value. • Limits interest rate and fees (including loan level price adjustments and delivery fees) borrower may be charged on new loan.

Proposed Programs	
Proposals by R. Glenn Hubbard and Christopher Mayer, and by David Greenlaw	<ul style="list-style-type: none"> • Allows for refinancing of mortgages owned or guaranteed by Fannie Mae, Freddie Mac, FHA, and VA. • Describes a process that does not require new underwriting of borrower and proposes no limits on loan-to-value or borrower debt-to-income ratio (a measure of affordability of the loan). • Encourages servicers and lenders to limit fees associated with new loans. Fees are included in the principal balance of the new loan to reduce upfront costs to the borrower. • Early proposal by Hubbard and Mayer suggested allowing all owner-occupied loans to be refinanced at 5.25 percent with Fannie Mae and Freddie Mac.¹⁶

Source: Public disclosures and program documentation.

Design Considerations for a Large-Scale Refinancing Program

The scope and cost of any new large-scale mortgage refinancing program may vary considerably depending on several key design choices. Those include the types of mortgages that qualify, the determinants of borrower eligibility, the amount of any subsidies (for instance, offering below-market interest rates), the size and structure of associated transactions costs, and the incentives for lender and servicer participation.

Loans that are eligible for refinancing could be limited to those already guaranteed by the GSEs. Alternatively, the program could also include mortgages guaranteed by federal agencies such as FHA, or non-federal or so-called private-label mortgages. Refinancing of loans guaranteed by both the GSEs and federal agencies would reduce existing federal liabilities by reducing the probability of future defaults on those mortgages (and would also impose losses on the federal government by reducing the value of mortgage-backed securities, as discussed below). The expected savings would differ depending on mortgage and borrower characteristics. By contrast, extending the program to private-label mortgages and allowing those borrowers to refinance into loans with new federal guarantees could significantly increase federal costs by adding a significant new source of risk exposure. The higher costs could be partially offset by charging higher guarantee fees, but the fees would reduce the number of borrowers who could benefit from refinancing.

Some proposals allow borrowers who are delinquent on their existing mortgages to participate, whereas under other proposals borrowers must be current on their payments. Allowing delinquent borrowers to refinance at lower rates would make their mortgages more affordable and in some cases could avoid foreclosures. However, a subsequent default on a refinanced loan may entail additional costs if the value of the property decreases or if other costs increase as a result of granting the new loan. An additional issue is the extent to which delinquent borrowers with no intention of becoming current opt to refinance as a means of “resetting” their delinquency to delay the loss of their home.

The fees that the GSEs and FHA charge on the loans that they refinance could significantly affect program participation rates and federal cost. Charging higher fees would tend to reduce the federal cost of

¹⁶ R. Glenn Hubbard and Christopher Mayer, “First, Let’s Stabilize Home Prices,” *Wall Street Journal*, October 2, 2008

the program, but also would reduce the number of borrowers expected to participate (particularly if the fees take the form of significant upfront payments that require borrowers to come up with cash at the closing of the loan). Conversely, if the GSEs and FHA set fees at lower levels that would generate less revenue than is currently expected from those loans, it would increase the cost to the federal government and also tend to increase the program participation rates.

The degree to which underwriting procedures (including verification of borrower income and assets) and the ancillary services and fees required for a traditional refinancing are either waived or subsidized for loans in the program could significantly affect participation rates. Making a loan through the program easier to close and less costly for the borrower will increase participation among borrowers who view the financial and non-financial cost of a new loan as an impediment. However, eliminating certain aspects of a traditional loan underwriting and closing (including title services) or requiring service providers to offer them at a reduced cost may yield a loan with less appeal to potential investors, and hence would result in somewhat higher interest rates on the new loans. It also may lower incentives for lenders and other service providers to participate in the program.

A final consideration is the degree to which the current LTV is utilized in program eligibility criteria. Limiting the level of negative equity permitted on the refinancing may mitigate the severity of the loss should the borrower default on the new loan. Once again, however, that risk of loss is one that the guarantor already has and hopes to reduce through the lower probability of default created by the lower-cost refinancing. A related question is whether the current LTV is even assessed, through an appraisal or an automated valuation process, during the refinancing process. Eliminating the appraisal may produce an additional cost saving for borrowers at the expense of not providing investors with an up-to-date assessment of the potential risk of default inherent in the new loans.

Estimating Participation in a Large-Scale Refinancing Program

To quantify the potential effects of a large-scale refinancing program, we analyzed a stylized program that draws on the structure of current and proposed programs. The analysis relies on an estimate of the volume of incremental refinancing—those refinancings that would not have occurred absent the relaxed eligibility requirements and reduced costs provided under the program—and an estimate of how future default and prepayment behavior are affected by a mortgage being refinanced at a lower monthly payment (based on both a reduced interest rate and a potentially longer amortization term). The analysis is based on models developed by CBO to predict mortgage prepayments, defaults, and the severity of default as functions of borrower characteristics, loan terms, and economic conditions. The economic assumptions, particularly for interest rates and house prices, are consistent with CBO's January 2011 baseline forecast.¹⁷

A Stylized Program

For the purposes of the analysis, we considered the following stylized program parameters:

- The program starts in the first quarter of 2012 and will be available for one year.
- Eligibility includes existing loans guaranteed by Fannie Mae, Freddie Mac, or FHA.

¹⁷ See Congressional Budget Office, *Budget and Economic Outlook: Fiscal Years 2011 to 2021*, January 2011. CBO subsequently updated its economic projections. See *The Budget and Economic Outlook: An Update, August 2011*.

- A borrower must be current on an existing mortgage and must not have been more than 30 days late on any mortgage payments during the prior year, but there are no limits on the borrower's current income or on the loan-to-value ratio of the new loan.
- The GSEs and FHA will assess a guarantee fee equal to the fee charged initially on the existing loan. The fee will be incorporated into the interest rate on the new loan by the GSEs and charged as an annual premium by FHA.
- The new loan has a fixed rate of interest, at the prevailing market rate, and a term of 30 years.
- Lenders and select third parties (for example, closing services and title search to ensure no new liens have been placed on the property) charge fees amounting to the lesser of 1 percent of principal or \$1,000 to process the loan.

The program shares many of the features of existing proposals for a large-scale refinancing program. Eliminating current LTV or borrower income limits and restricting the ability to charge fees on the refinanced loans are key elements driving participation and are primary points of departure from existing programs such as HARP and FHA's Streamlined Refinance. Allowing FHA loans in addition to GSE loans is a significant difference between the stylized program considered here and the two bills before Congress.

Characterizing the Affected Borrower Population

Summary data provided by Bloomberg on the dollar amounts, coupons, origination dates, and prices of 30-year and 15-year MBSs guaranteed by Fannie Mae, Freddie Mac, and FHA (through Ginnie Mae securitizations) determine the potentially eligible population of existing mortgages.¹⁸ According to Bloomberg, those MBSs had outstanding balances totaling \$4.3 trillion as of June 1, 2011. Of that total, Fannie Mae and Freddie Mac guarantee \$3.5 trillion. (The estimates reported here are based on the Bloomberg sample; Fannie Mae and Freddie Mac guarantee an additional \$1.5 trillion or so of mortgages that may have adjustable rates—ARMs—or other non-traditional terms, or that are held by the GSEs as whole loans rather than in an MBS. Some of those borrowers might also benefit from an easing of refinancing rules. We excluded ARM and non-traditional borrowers from the analysis because of the complexities associated with estimating the incentive to refinance into a fixed rate loan. In addition, we excluded whole loans held in the GSEs' portfolios, because a growing percentage of those loans were recently modified or are currently non-performing.)

To capture differences in the behavior, costs, and risks associated with different borrowers, but to keep the analysis relatively simple, we classify the population of borrowers who could refinance into representative groups based on the interest rate on their current mortgage, on whether the mortgage was originally a 30-year or 15-year fixed-rate mortgage, and on risk category. The risk categories reflect the characteristics that affect borrowers' propensity to default on their mortgages, and are designated as high, medium, and low risk. Each group is further characterized by the following variables (Table 2 provides an overview of the loan groupings):

- Borrower FICO score¹⁹

¹⁸ According to Ginnie Mae's 2010 Annual Report, FHA loans represent approximately 80 percent of Ginnie Mae securities. The FHA volumes are based on the outstanding balances reported for Ginnie Mae securities, adjusted downward by 20 percent to exclude non-FHA loans.

¹⁹ Borrower credit scores were calculated using models developed by Fair Isaac Corporation (FICO).

- Current, or mark-to-market, loan-to-value (MTMLTV) ratio on existing mortgage
- Origination year of existing mortgage
- Interest rate on existing mortgage
- Imputed interest rate on new mortgage

In total, potential refinancers are classified into 108 distinct groups, representing the combination of 2 maturities, 9 coupon rate pools, and 3 risk categories for the GSE population and for the FHA population. Total program costs are the sum of the estimated cost per dollar of loans outstanding multiplied by the estimated total principal balances across each of the 108 groups.

The behavioral models predict the quarterly probability of prepayment, default, and default severity for each group. Those probabilities are based on statistical estimates using historical data on individual mortgages originated between 2000 and 2010 and fairly standard statistical specifications.²⁰

Calculating Incremental Refinancing

As a first step in determining incremental refinancing attributable to the program, we run the behavioral models to simulate a scenario without the program (the “base case” scenario). Under those conditions, we record expected prepayments, defaults, and loss severities over the remaining lifetime of existing mortgages for each representative group.

Next, we run the models under conditions designed to capture the incremental refinancing volumes expected with the program (the “program” scenario). Specifically, we remove the constraint facing borrowers with negative equity by assuming that all borrowers possess a LTV ratio of 50 percent, low enough not to create an impediment to refinancing. Also, we assume that all borrowers have a FICO score of 780, high enough to ensure that credit availability is not a barrier to refinancing, even under the fairly stringent underwriting criteria currently in effect. The assumed rates on a new mortgage reflect expected market conditions and a discount for the lower transaction costs charged to the borrower. The assumed rates also reflect a small positive premium arising from the higher financing costs typically charged by MBS investors for non-standard loans.²¹ In the program scenario we assume that the net effect of lower transaction costs and a non-standard product amounts to a 0.25 percentage point net rate reduction for borrowers. Thus, the rate the borrower obtains on a mortgage refinanced through the program is the projected mortgage rate at the date of the refinance (as per CBO's baseline economic assumptions) less 0.25 percentage point, and hence, is only 0.25 percentage point lower than the rate in the base case scenario. Because the assumed transactions cost savings are small, the main factors that drive additional refinancing activity in the model are the loosening of FICO and LTV restrictions.

The difference in prepayment volumes between the base case and the program model represent the incremental refinancing attributed to the program over the course of calendar year 2012. Those incremental participation rates, applied to estimated unpaid loan principal balances, determine the expected dollar volumes of incremental refinancing.

²⁰ For an overview of a standard model consistent with CBO’s approach, see Appendices A through F in “Actuarial Review of the Federal Housing Administration Mutual Mortgage Insurance Fund (Excluding HECMs) for Fiscal Year 2009,” U.S. Department of Housing and Urban Development, November 2009.

²¹ Loans that do not meet certain standards cannot be included in the most liquid MBSs (also known as TBA, or To Be Announced, mortgage-backed securities).

Table 2. GSE and FHA Loan Groupings

GSE Population

30YR											
MBS Coupon	ALL		HIGH			MIDDLE			LOW		
	AGE (qtrs)	\$ TOTAL (millions)	FICO	MTMLTV	% OF COUPON	FICO	MTMLTV	% OF COUPON	FICO	MTMLTV	% OF COUPON
3.0 and below	8	\$113	620	100	1%	710	90	1%	780	50	98%
3.5	2	\$38,528	620	100	1%	710	90	8%	780	50	91%
4.0	5	\$418,011	620	100	2%	710	90	8%	780	50	90%
4.5	7	\$752,275	600	110	3%	700	100	10%	740	70	87%
5.0	16	\$618,117	600	110	5%	700	100	10%	740	70	85%
5.5	21	\$557,648	600	110	5%	700	100	10%	740	70	85%
6.0 and above	22	\$506,821	578	121	8%	678	105	15%	729	80	77%

15YR											
MBS Coupon	ALL		HIGH			MIDDLE			LOW		
	AGE (qtrs)	\$ TOTAL (millions)	FICO	MTMLTV	% OF COUPON	FICO	MTMLTV	% OF COUPON	FICO	MTMLTV	% OF COUPON
3.0 and below	2	\$14,457	620	85	1%	710	77	1%	780	43	98%
3.5	2	\$109,092	620	85	1%	710	77	8%	780	43	91%
4.0	8	\$184,379	620	85	2%	710	77	8%	780	43	90%
4.5	20	\$142,009	600	94	3%	700	85	10%	740	60	87%
5.0	26	\$89,047	600	94	5%	700	85	10%	740	60	85%
5.5	25	\$38,176	600	94	5%	700	85	10%	740	60	85%
6.0 and above	29	\$22,427	579	102	8%	679	89	15%	730	68	77%

FHA Population

30YR											
MBS Coupon	ALL		HIGH			MIDDLE			LOW		
	AGE (qtrs)	\$ TOTAL (millions)	FICO	MTMLTV	% OF COUPON	FICO	MTMLTV	% OF COUPON	FICO	MTMLTV	% OF COUPON
3.0 and below	19	\$68	620	100	30%	710	90	40%	780	50	30%
3.5	2	\$12,134	620	100	30%	710	90	40%	780	50	30%
4.0	3	\$101,372	620	100	40%	710	90	30%	780	50	30%
4.5	5	\$269,086	600	110	40%	700	100	30%	740	70	30%
5.0	9	\$208,167	600	110	40%	700	100	30%	740	70	30%
5.5	18	\$94,994	600	110	40%	700	100	30%	740	70	30%
6.0 and above	22	\$93,475	578	121	51%	678	106	40%	729	81	9%

15YR											
MBS Coupon	ALL		HIGH			MIDDLE			LOW		
	AGE (qtrs)	\$ TOTAL (millions)	FICO	MTMLTV	% OF COUPON	FICO	MTMLTV	% OF COUPON	FICO	MTMLTV	% OF COUPON
3.0 and below	1	\$43	620	85	30%	710	77	40%	780	43	30%
3.5	2	\$4,545	620	85	30%	710	77	40%	780	43	30%
4.0	5	\$12,144	620	85	40%	710	77	30%	780	43	30%
4.5	12	\$5,015	600	94	40%	700	85	30%	740	60	30%
5.0	23	\$2,931	600	94	40%	700	85	30%	740	60	30%
5.5	22	\$1,334	600	94	40%	700	85	30%	740	60	30%
6.0 and above	25	\$1,074	579	103	51%	679	89	40%	729	68	9%

Source: Bloomberg data with CBO analysis.

Table 3 summarizes the expected refinancing rates under the base case and program scenarios for the representative groups. Values in the table represent the unpaid balance in each group expected to refinance during the period of time that the program is in effect as a percent of total unpaid balance outstanding at the start of the program. In total, the model predicts that \$428 billion of incremental refinancing would occur under the program.

Table 3. Expected Incremental Refinance Rates

GSE Population

MBS Coupon	30YR					
	HIGH		MIDDLE		LOW	
	Base Case	Program	Base Case	Program	Base Case	Program
3.0 and below	1%	7%	2%	7%	3%	7%
3.5	2%	10%	4%	10%	6%	10%
4.0	2%	14%	5%	14%	8%	14%
4.5	3%	20%	4%	20%	11%	20%
5.0	4%	25%	6%	25%	14%	25%
5.5	3%	23%	5%	23%	12%	23%
6.0 and above	4%	29%	6%	30%	13%	31%

MBS Coupon	15YR					
	HIGH		MIDDLE		LOW	
	Base Case	Program	Base Case	Program	Base Case	Program
3.0 and below	3%	6%	4%	6%	3%	6%
3.5	4%	10%	6%	10%	6%	10%
4.0	5%	14%	7%	14%	8%	14%
4.5	4%	18%	7%	18%	10%	18%
5.0	4%	19%	8%	19%	11%	19%
5.5	5%	23%	9%	24%	14%	24%
6.0 and above	4%	41%	13%	43%	26%	43%

FHA Population

MBS Coupon	30YR					
	HIGH		MIDDLE		LOW	
	Base Case	Program	Base Case	Program	Base Case	Program
3.0 and below	1%	6%	2%	6%	4%	6%
3.5	2%	9%	4%	9%	6%	9%
4.0	3%	15%	5%	15%	9%	15%
4.5	2%	17%	4%	17%	10%	17%
5.0	3%	18%	4%	18%	10%	18%
5.5	4%	25%	6%	25%	14%	25%
6.0 and above	4%	31%	7%	31%	14%	31%

MBS Coupon	15YR					
	HIGH		MIDDLE		LOW	
	Base Case	Program	Base Case	Program	Base Case	Program
3.0 and below	3%	6%	4%	6%	4%	6%
3.5	4%	9%	5%	9%	6%	9%
4.0	5%	13%	7%	13%	7%	13%
4.5	7%	30%	12%	30%	17%	30%
5.0	4%	19%	7%	19%	11%	19%
5.5	5%	23%	9%	23%	14%	23%
6.0 and above	4%	31%	9%	31%	18%	31%

Source: CBO analysis.

Relaxing underwriting constraints (by setting an LTV ratio of 50 percent and a FICO score of 780) for all borrowers under the program scenario of our behavioral models results in identical refinance rates between high, middle, and low risk borrowers with the same MBS coupon. Borrowers in the high and middle risk categories, with the highest current LTV and lowest FICO score in the base case scenario, benefit most from the program's relaxed eligibility requirements (reflected in the largest increase in refinance rates between the base case and program scenarios). Because those groups represent a small portion of the borrower population, however, the greatest number of incremental refinanced loans is expected from the borrowers in the low risk category. Those borrowers, while less likely to be inhibited from refinancing under existing programs because of credit or LTV issues, may be attracted by the lower costs of the program.

Impediments to Program Participation

The estimate of incremental refinancing volume is based on data on transactions made prior to the current financial crisis. Projecting this behavior on a post-crisis mortgage market may not capture some of the structural changes that have occurred over the past few years. Although it is extremely difficult to quantify the impact of those changes on program participation, there are several important considerations that could affect the program take-up rate.

One of the key structural considerations is the ability of lenders to scale up quickly to the capacity that would be needed to meet program demand. With relatively low origination volumes in recent years and with significant investments required in the servicing area to handle delinquent loans and foreclosures, many lenders may be unwilling to make the investments in capacity necessary to accommodate greater demand. That may be particularly evident if lenders are required to originate those loans without the latitude to charge normal refinancing fees. In addition to operational issues, lenders must also be willing to take on the liability associated with closing the new loan for the GSEs or FHA (generally referred to as "representations and warranties"). As part of program design, that liability could be reduced or eliminated to reflect the streamlined nature of the new loan. However, eliminating the option to "put back" the loan to the original lender (whose obligation generally terminates when the loan refinances) and forgoing standard representations and warranties for the lender on the refinanced loan leaves the risk for any errors or omissions in the loan origination process with the GSEs or FHA, potentially increasing the expected cost of the program to the federal government.

A second consideration is the willingness for subordinate lien holders (for instance, banks that financed second mortgages), PMIs, and servicers to make the financial or operational concessions necessary to facilitate the refinancing of the existing first mortgage. For example, in many states, the subordinate lien holder must agree to "re-subordinate" its lien to the new, refinanced first mortgage. Similarly, the private mortgage insurer must agree to the terms of the refinancing if its coverage is required on the new loan (as is the case for Fannie Mae and Freddie Mac loans with current LTVs greater than 80 percent). Although the GSEs and FHA may be compelled to participate in the program, the voluntary participation of private market entities is not guaranteed. That issue is often cited as a factor behind low participation rates in the Administration's HAMP and other loan-modification programs, where the benefits to servicers and MBS investors are not always clear-cut.²² However, because making mortgages more affordable, and thereby reducing default rates, is also in the interest of private mortgage insurers and second lien holders, our estimates assume third-parties will participate (after making required technical and operational changes to accommodate the program) rather than attempt to extract additional concessions in exchange for their involvement. If this assumption proves incorrect, the number of borrowers with second liens or private mortgage insurance able to participate in the program may be reduced significantly.

²² For discussion of conflicting incentives in loan modifications, see Adelino, Manuel, Kristopher Gerardi, and Paul S. Willen, "Why Don't Lenders Renegotiate More Home Mortgages? Redefaults, Self-Cures, and Securitization," *Federal Reserve Bank of Boston Public Policy Discussion Papers*, July 2009.

Third, the potential benefit to borrowers with LTVs in excess of 125 percent may be mitigated by a higher cost of financing those mortgages. Under one interpretation of the tax code, such mortgages may not be eligible for inclusion in securitizations classified as Real Estate Mortgage Investment Conduits (REMICs), a type of mortgage-backed security.²³ As a practical matter, loans with a current LTV greater than 125 percent are generally ineligible for REMIC inclusion.²⁴ To date, the GSEs have not securitized loans that were ineligible for inclusion in a REMIC, although in principle they could. If this policy remains in place, the GSEs will need to place all loans refinanced under the program with a current LTV greater than 125 percent in their portfolios, similar to loans modified under HAMP or other loan modification programs.

Finally, the estimate of participation is sensitive to the projected future interest rates and home prices. The path of short-term interest rates is a key component. If rates rise more than projected during the program (or if program implementation is delayed in a rising rate environment), participation will decline because fewer borrowers will see a benefit to refinancing at current market rates. On the other hand, rates rising less than expected will have the opposite effect. Short-term deviations in home prices from those projected by our models will have a less pronounced impact on participation. Prices rising more than anticipated may allow more homeowners to qualify for existing programs, lessening the need for the program. Falling prices may drive more borrowers into default, reducing potential participation. Similar to their effect on participation, both home prices and interest rates have a significant impact on the projected costs and benefits of the program.

Costs and Benefits of the Program

A program that offers refinancing under terms and conditions that extend beyond existing programs will benefit borrowers through lower monthly mortgage payments resulting from lower interest rates. Both borrowers and credit guarantors such as the GSEs and FHA will benefit from the lower default rates created by reducing monthly mortgage payments for certain borrowers. However, the program is costly to MBS investors, who suffer a loss when the securities they hold are repaid more rapidly than in the absence of the program. Some of the investors are federal, creating investment losses for the federal government. Other stakeholders in the mortgage industry, including lenders, servicers, mortgage insurers, and ancillary service providers, will also accrue both costs and benefits as a result of such a program.

Benefits to Homeowners and the Economy

Refinancing at a lower interest rate generates several benefits for homeowners. First, households make lower interest payments per month, which is much like an increase in disposable income. Second, payments of mortgage principal per month are lower. Households that refinance into mortgages with longer terms than the remaining terms on their existing mortgages spread their payments of mortgage principal over more years and thus their monthly principal payments decline (although those payments extend for longer). Lower payments of mortgage principal provide households with greater liquidity, which helps borrowers without access to affordable credit. The increases in liquidity and in disposable income after mortgage interest payments lead to higher non-housing expenditures. In addition, the ability to make a lower monthly mortgage payment helps some portion of

²³ REMICs are typically backed by MBSs and are structured to provide to investors payments of principal and interest with characteristics different from those of the underlying MBSs.

²⁴ REMIC Regulations, §Reg. 1.860G-2

refinancers avoid default. Finally, both borrowers and their local communities benefit from avoiding the economic and social costs of the averted defaults and foreclosures.²⁵

Two factors affect that reduction in borrower payments: the amount by which the interest rate is reduced, and the maturity of the new mortgage. Under the stylized program, all new mortgages have a maturity of 30 years. The model predicts first-year gross cash savings from reduced mortgage payments of approximately \$7.4 billion, or roughly \$2,600 per borrower.

A default and a resulting foreclosure have direct and indirect costs, affecting both the borrower and the local community. The model predicts approximately 111,000 fewer loans will default as a result of this program, in comparison to the approximate 4 million borrowers currently past due on their mortgages.²⁶

Costs and Benefits to Federal Entities

The program has cost implications for a number of federal entities, including Fannie Mae and Freddie Mac, FHA, the Federal Reserve System, and the Treasury Department. Because of their mix of credit guarantees and portfolio investments, the GSEs experience both gains and losses. FHA, which does not have a portfolio, will experience gains from its credit guarantees. The Federal Reserve and the Treasury, with exposure through their investment in MBSs, will face a loss.

The analysis here reports all costs on a fair-value basis, which is an estimate of the market value of the gains or losses from the program. In some cases, the budgetary cost would be higher or lower than the fair-value cost because of the rules governing budgetary accounting. In particular, the fair-value approach is consistent with CBO's budgetary treatment of the GSEs, but it differs from the budgetary treatment of both the Federal Reserve, reflected in the budget on a cash basis, and the MBS purchases of the U.S. Treasury, presented on a FCRA basis. With those differences in mind, reported costs in this paper are meant to provide an internally consistent measure of cost but not an estimate of the federal budgetary cost of a large-scale refinancing program. Because the proposal analyzed here is a stylized one and the estimated costs are not reported entirely according to the rules governing federal budget accounting, the figures in this paper do not represent a CBO cost estimate of a legislative proposal. (See the Appendix on the effects of fair-value and alternative budgetary treatments of credit programs.)

The program results in a net federal cost of \$0.6 billion on a fair-value basis, but the various federal entities involved are affected quite differently. FHA achieves savings from reduced losses on its outstanding guarantees. For the GSEs, the savings from lower guarantee losses approximately offset the losses on their portfolios. The Federal Reserve and the Treasury experience losses on their portfolio holdings. See Table 4 for a summary of the estimated costs and savings.

The greatest uncertainty affecting those estimates is the volume of additional refinancing that the program would trigger. Changes in a variety of assumptions would affect these estimates, but the conclusion that the program has a net fair-value cost to the government overall is robust to a wide set of alternative assumptions.

²⁵ For example, there is evidence that concentrated foreclosures depress the prices of nearby properties. See Jenny Schuetz, Vicki Been and Ingrid Gould Ellen, "Neighborhood effects of concentrated mortgage foreclosures," *Journal of Housing Economics*, Volume 17, Issue 4, December 2008, pp 307-319.

²⁶ Based on the Q4 2010 Mortgage Bankers Association National Delinquency Survey.

Table 4. Incremental Refinancing and Components of Federal Fair-Value Cost

Category	Amount (\$ billions)
Volume of incremental refinancing from program	\$428
Percentage of outstanding 30-year and 15-year MBSs	10%
Number of incremental loans refinanced	2.9 million
Number of defaults averted	111,000
First-year gross cash savings from reduced mortgage payments	\$7.4
Reduction in subsidy cost on GSE guarantees ^a	\$2.5
Reduction in subsidy cost on FHA guarantees ^a	\$1.4
Lost portfolio value to GSEs	(\$1.8)
Lost portfolio value to Federal Reserve	(\$2.4)
Lost portfolio value to Treasury	(\$0.3)
Total federal gain / (loss)	(\$0.6)
^a Reduction in subsidy costs for the GSEs and FHA are net of lost put-back option value.	

Calculating Guarantee Savings

The GSEs and FHA benefit from lower future default rates on the refinanced loans. Those savings are calculated based on the incremental refinance amounts predicted by the behavioral models and the differences in lifetime loss rates across the base case and program scenarios. For that calculation of averted losses on a given loan, the only difference between the two scenarios is the interest rate on the loan—without the program it is the original rate, and with the program it is the new market rate obtained by refinancing. (An alternative calibration takes into account that the new mortgage has a potentially longer lifetime and a different pattern of prepayments, defaults, and guarantee fee receipts. Those assumptions result in somewhat higher savings but do not change the conclusion that the program has a net cost to the government.) In all cases, LTVs and credit profiles reflect the observed indicators of the risk characteristics of borrowers.

The reduction in the fair-value cost of the GSEs’ and FHA’s guarantee obligations is based on the difference in the present value of net guarantee costs between the base case and program scenarios, where the price of risk is accounted for in the choices of rates used to calculate the value of MBSs and whole loans. In cases where the program allows a borrower to refinance into a lower mortgage rate, the likelihood of default will fall, lowering future expected costs on the loan. The savings rates calculated for each group are applied to the incremental refinancing volumes (calculated as described above) to determine the expected dollar volume of guarantee savings.

The effect on the cost of mortgage guarantees depends on revenues from fees on borrowers and other sources, as well as from default and recovery rates. A potentially important consideration is that a large-scale refinancing program may negatively affect the value of the GSEs’ and FHA’s contractual right to recover money from the originating lender in some instances. Specifically, they may “put back” a defaulted loan to the originating lender if the loan was closed in violation of the lender’s representations and warranties, avoiding losses associated with those loans. Once a loan is refinanced, they forgo the right to put back losses associated with the original loan (assuming the refinanced loan does not also violate those representations and warranties). To take that effect into account, the estimated net guarantee savings shown here have been adjusted downward. The size of the downward adjustment is based on public information about put-back rates over the past few years and on settlements that have already occurred and that reduce future potential volume. There is considerable uncertainty associated with this effect, which depends on how negotiations are resolved and on legal decisions. However, potential recoveries from put-backs on the mortgages refinanced under the program that would not have been refinanced without the

program appear to be relatively small and hence, the loss of those put-back rights imposes only a small loss on the GSEs and FHA (approximately \$100 million in our estimate).²⁷

Calculating Portfolio Losses

The accelerated prepayment of MBSs that are yielding above-market interest rates results in significant losses on the portfolio holdings of the GSE, Federal Reserve, and Treasury portfolios. The cost is calculated as the difference between the current market value of the mortgage and its par or principal value, which is the amount received when it is prepaid. The loss estimates rely on the incremental prepayment rates described above, public disclosures of portfolio size and composition, and data on the market prices of the MBSs.

The total size of GSE holdings of agency MBSs, estimated to be about \$540 billion, is based on information provided in the GSEs' Monthly Summaries. The analysis excludes both private-label securities held in portfolio (loans that are not guaranteed by the GSEs are not eligible for refinancing under the program) and whole loans, which the model assumes do not participate. GSE whole loan holdings in portfolio comprise two main categories: loans purchased directly from lenders that have not been placed in MBS pools and loans modified by the GSEs as a result of a loss-mitigation program (also known as a "loan modification"). Loans recently purchased from lenders are already at market rates and would be unlikely to refinance. Similarly, recently modified loans would have an interest rate lower than the rate obtainable under the program and are therefore unlikely to refinance because of it.

The Federal Reserve's MBS Purchase Program commenced in January 2009 and ended in March 2010. The principal value of holdings from purchases of GSE and FHA (through Ginnie Mae securitizations) MBSs totaled about \$899 billion as of June 2, 2011. The remaining principal value of the Treasury's investment in similar agency MBSs made in response to the financial crisis totaled about \$93 billion. Both the Federal Reserve and the Treasury are reported to have purchased recently issued lower-coupon MBSs (as opposed to older, higher-coupon securities) in order to maximize the effect of its purchases on interest rates on new mortgages.

In comparison to the Federal Reserve and the Treasury, the GSEs' portfolios include a greater share of older issues for which the interest rate exceeds current market rates. Because the losses due to prepayment differ significantly across MBS coupon and maturity pools, we infer the share of the portfolio held in different pools to estimate losses. While the GSEs' Monthly Summaries do not provide that detail, public data on the total population of GSE MBSs outstanding and data on recent purchases by the Federal Reserve serve as benchmarks. The GSEs' portfolio distribution across coupon-product combinations is assumed to be at the midpoint of the total market portfolio and the Federal Reserve's portfolio. This calculation is based on the assumption that the GSEs actively manage their portfolios and thus hold a higher percentage of more recent, lower-coupon securities than the market as a whole, while at the same time they hold older vintages than the Treasury and Federal Reserve, which purchased mortgages only during a short window of time.

We use market data from June 2011, adjusted to reflect the expected life of the security and changes in market interest rates at the program start date in the first quarter of 2012, to calculate a weighted average price for each MBS coupon-original maturity combination. Those prices represent securities that trade at both a premium (i.e., a price greater than 100 percent of outstanding face value) and discount (i.e., a price less than 100 percent of outstanding face value) to par. As a result, an incremental refinancing of a loan contained in an MBS trading

²⁷ Our estimate of the value of the lost put-back option is based on the \$428 billion of incremental refinancings expected from the program, which is limited to borrowers who are current on their existing mortgage. For the put-back option on the incremental participating loans to have value, the borrower must default on the loan, a violation of representations and warranties must be uncovered and the loan must be from a lender that has not already negotiated a settlement with the GSEs or FHA on violations of previously-originated loans.

below par represents a gain to investors (because they receive 100 percent of outstanding face value as a function of the refinancing) but a loan contained in an MBS trading above par generates a loss. On aggregate, the program creates a loss on the portfolios of federal entities because the majority of expected refinancing is in higher-coupon loans pooled in MBSs priced at a premium.

The final step in calculating portfolio losses is to multiply the estimated holdings in each coupon–product combination by the price associated with those securities by the expected incremental refinancing rates for each group.

Costs and Benefits to Non-Federal Stakeholders

Nearly all loans eligible for refinancing under the stylized program described above currently afford the borrower the opportunity to refinance without penalty under the terms and conditions of the existing loan. The goal of this program is not to alter the contracts associated with those existing loans but to make the refinancing opportunity for the borrower more readily available, less expensive, or a combination of both. However, refinancing that would not occur absent the program will affect a number of stakeholders beyond those with a direct budgetary impact. Those stakeholders include non-federal investors in MBSs guaranteed by the GSEs and by FHA. Also affected are lenders, loan servicers, ancillary service providers (title insurers, appraisers, settlement providers, etc.), local taxing authorities, and investors in second mortgages and MBSs.

Non-Federal Investors

Investors in GSE and FHA (through Ginnie Mae) MBSs include international investors (both private and government), U.S. banks and other financial institutions, pension funds, life insurance companies, money market funds, mutual funds, and state and local governments. Like their federal counterparts, non-federal investors will see the fair value of their investments fall as a result of this program. Non-federal investors hold approximately 65 percent of the outstanding MBSs assumed to be affected by the program. Those investors hold a greater proportion of older higher-coupon securities than federal entities and are expected to experience a disproportionately large fair-value loss of \$13 to \$15 billion.

Lenders and Other Service Providers

The effect of the program on lenders (as mortgage originators) is consistent with the effects of any refinancing on the entities that participate in the existing loan or the new loan. For the originator of the existing loan, a refinancing represents the loss of both a borrower relationship and a servicing obligation (assuming the servicing was not sold subsequent to the origination process). It also relieves the originator of any obligation it may have had with respect to representations and warranties on the existing loan. The originator of the new loan represents a mirror image of that situation—picking up a new customer relationship, servicing obligation, and representation and warranty obligation (though the nature of this obligation may be different as a result of the streamlined nature of the program). In addition, the new originator will earn the allowable fees for processing the new loan.

Several other parties are involved in most mortgage transactions, facilitating the closing of the loan (including appraisers, settlement attorneys, document preparation firms, and couriers) and taking an ongoing interest in the loan after closing (title insurers and servicers).

The scope and scale of additional services related to processing the new loan depend upon the specifics of the refinancing program. In general, the desire to reduce cost for the borrower will require that many services associated with a new loan be waived, curtailed, or offered at reduced cost. That desire to reduce cost is balanced against the goal of producing a well-documented transaction. The impact on firms that provide those services will depend on the extent to which they participate in these refinancings and the degree to which they are permitted to charge a fee commensurate with their costs.

The effect on servicers is similar to those described for lenders. The servicer of the existing loan will lose its servicing asset and customer relationship but will also be relieved of any representation and warranty obligations attached to the servicing process. In addition, the servicer of the refinancing will acquire a new asset, a new customer, and all responsibilities associated with that transaction. To the extent that servicers attract different proportions of the new business, some servicers will come out ahead and others will take a loss.²⁸

In some traditional refinancing transactions, the borrower is required to pay a recordation tax or “stamp” to the local government. If this requirement applies to loans refinanced under the program, the local taxing authority will receive the benefit of this additional revenue.

Private Mortgage Insurers and Subordinate Mortgage Investors

The role of private mortgage insurers in the refinancing transaction depends upon the specific definition of the program. In the stylized program used for this analysis, the mortgage insurance policy attached to the existing loan will transfer to the new loan in a manner similar to the Administration’s HARP. Under that proposal, the PMI retains existing coverage and receives the current monthly premium payments from the borrower. Like the exposure for the Federal guarantor, the PMI’s risk profile should decline as a result of the lower monthly payment created by the refinancing transaction. That effect is balanced by the extension of the loan term, allowing more time for defaults to occur and premiums to be collected for a longer period of time. The net effect of those factors should be an increase in the fair value of the PMI’s policy to its shareholders. There is some lost value to the PMI from a missed opportunity to increase premiums or coverage levels based on the current borrower and loan characteristics that would come from a traditional refinancing’s full underwriting.

In traditional refinancing transactions where the borrower also has a subordinate lien, the investor in that subordinate mortgage is often asked to re-subordinate its interest to ensure that the refinanced first mortgage remains in primary position. It is assumed that this requirement will apply to loans refinanced under the stylized program. If that is the case, the value of the subordinate lien investor’s asset would be affected by many of the same factors discussed above, particularly the expected reduction in defaults associated with the refinanced first mortgage.

Macroeconomic Benefits

The program has the potential to provide economic stimulus by increasing the resources households have available to spend because of the reduction in the size of their mortgage payments. However, those effects would be partially offset by a reduction in spending by investors as a result of their losses from the program. In aggregate, the fair-value loss to both federal and non-federal investors is equivalent to the gain experienced by borrowers from the decline in their interest payments (less transaction costs for both parties). Nevertheless, because a significant share of investors is composed of foreigners and the U.S. government, and because private investors would be expected to reduce spending in response their losses by less than the increase in spending by borrowers in response to their lower interest payments as well as their lower mortgage principal payments, the net effect would be an economic stimulus. The total impact on GDP would be a multiple of the direct impact of the program to the extent that it stimulates additional economic activity; for instance, because additional hiring and investment would be needed to meet increased consumption demand. We have not quantified the potential stimulus in our analysis, but it is likely to be small relative to GDP while large relative to the net federal cost of the program.

With respect to the housing market, the overall impact of the program is also small; the 111,000 homeowners saved from foreclosure by virtue of lower monthly mortgage payments will have a minor impact on the path of

²⁸ Firms often both lend and service loans.

future home prices. Because this program is directed toward current homeowners, it would do little to alleviate the tighter underwriting standards and increased credit pricing for purchase loans. In addition, it would not create much demand for homes, because all of its participants would already have at least one property.

Sensitivity of Results to Alternative Policy Choices

The goals of a large-scale refinancing program include maximizing the participation of qualified borrowers, reducing the cost to those borrowers, improving the chances that they perform on the refinanced loans, and minimizing the negative effects on taxpayers and other stakeholders in the mortgage finance industry. Not all of those goals are completely compatible, requiring policymakers to make trade-offs.

One example is the inclusion of borrowers with a higher probability of default on the refinanced loan. Most existing programs, including HARP and the FHA’s Streamlined Refinance, require the borrower to meet certain LTV thresholds and to exhibit the ability to afford the payment associated with the refinanced loan. While our stylized program eliminates those restrictions, we can test their impact by eliminating all borrowers in our high-risk category from the eligible population. As Table 5 shows, the change has only a modest effect on program participation (because most borrowers expected to participate in the program due to lower fees or less restrictive LTV limits are outside the high-risk category) but has a significant impact on expected costs. Excluding high-risk borrowers eliminates much of the expected benefit on the GSEs’ and FHA’s guarantee portfolios, because the remaining borrowers are much less likely to default under the terms of their existing or refinanced loan. Not surprisingly, the change has a greater effect on the number of foreclosures averted (dropping approximately 51 percent to 54 thousand) than on the projected annual payment reduction (dropping approximately 14 percent to \$6.4 billion).

Table 5. Incremental Refinancing and Components of Federal Fair-Value Cost without High Risk Loans

Category	Amount (\$ billions)
Volume of incremental refinancing from program	\$359
Percentage of outstanding 30-year and 15-year MBSs	9%
Number of incremental loans refinanced	2.4 million
Number of defaults averted	54,000
First-year gross cash savings from reduced mortgage payments	\$6.4
Reduction in subsidy cost on GSE guarantees ^a	\$1.2
Reduction in subsidy cost on FHA guarantees ^a	\$0.1
Lost portfolio value to GSEs	(\$1.7)
Lost portfolio to Federal Reserve	(\$2.0)
Lost portfolio value to Treasury	(\$0.1)
Total federal gain / (loss)	(\$2.5)

^a Reduction in subsidy costs for the GSEs and FHA are net of lost put-back option value.

A second policy decision is the degree to which program participants are offered an opportunity to refinance at a reduced cost. Reducing or eliminating certain fees in the refinancing transaction will induce some borrowers, but may lessen the motivation of lenders and other services providers to participate. Under our stylized program, we assume borrowers receive an interest rate on their refinanced mortgage that is 0.25 percentage point below the prevailing market rate at that time, a proxy for the reduced costs associated with the proposed program. Table 6 provides the results if that cost advantage is eliminated and borrowers are assumed to refinance at the prevailing market rate (including their existing guarantee fee in the form of an ongoing payment) and pay all standard

refinancing fees (but other program parameters, including the ability to avoid LTV and income checks, are left intact). In this case, the change has only a moderate effect on program participation. However, expected total program losses increased by more than 80 percent (as GSE and FHA guarantee savings decreased more than portfolio losses were reduced) and both the number of foreclosures averted and the projected annual payment reduction dropped approximately 20 percent.

Table 6. Incremental Refinancing and Components of Federal Fair-Value Cost without Cost Advantage

Category	Amount (\$ billions)
Volume of incremental refinancing from program	\$386
Percentage of outstanding 30-year and 15-year MBSs	9%
Number of incremental loans refinanced	2.6 million
Number of defaults averted	86,000
First-year gross cash savings from reduced mortgage payments	\$6.0
Reduction in subsidy cost on GSE guarantees ^a	\$2.0
Reduction in subsidy cost on FHA guarantees ^a	\$1.0
Lost portfolio value to GSEs	(\$1.7)
Lost portfolio to Federal Reserve	(\$2.1)
Lost portfolio value to Treasury	(\$0.3)
Total federal gain / (loss)	(\$1.1)

^a Reduction in subsidy costs for the GSEs and FHA are net of lost put-back option value.

Discussion

A well-designed and well-executed large-scale refinancing program with relatively broad eligibility criteria would have benefits both for borrowers with above-market interest rate mortgages and for the enterprises providing the credit guarantee on those same loans. Those benefits would come at a cost to those who invested in the MBSs backed by the loans. Some of that cost would be borne by the federal entities (the GSEs, the Federal Reserve, and the Treasury) that have amassed portfolios of those securities. An additional consideration is that such a program could be rolled out to the market relatively quickly.

A large-scale mortgage refinancing program would not address many of the problems facing the U.S. housing market. The significant number of borrowers who are in some stage of default would not be helped. For many borrowers struggling to afford their mortgages, refinancing at a market rate might not provide the level of payment relief necessary to avoid an eventual default. In those circumstances, a payment reduction modification (such as those offered by HAMP) might be more likely to forestall a default.

A further issue is the large number of borrowers with significant negative equity in their homes. Negative equity affects the broader economy in several ways: by leaving borrowers susceptible to delinquency caused by life events (such as illness, divorce, or short-term disruptions in income) that could otherwise be solved by a traditional refinancing or sale of the home; by creating an incentive for some borrowers to “strategically” default; and by restricting labor mobility for homeowners who are restricted in their ability to move outside their local market for employment. It also may cause homeowners to postpone home sales motivated by the desire to change residences. Once again, a refinancing program would do little to address that situation. While providing an opportunity for some homeowners to take advantage of lower rates by waiving constraints on current LTV, any program that does not include principal forgiveness would not significantly address the problems associated with negative equity.

Appendix: Fair Value and Alternative Budgetary Treatments of Credit Programs

The budgetary cost of a large-scale mortgage refinancing program would differ from the cost on a fair-value basis, which is the methodology used in this analysis. The federal budget is primarily a record of the cash spent on federal activities in a year. However, for certain contracts that obligate the government to make or receive payments that extend for a longer period, the budget records accruals rather than cash outlays. Accruals measure the value of projected net future payments on a discounted present-value basis. The Fair Credit Reporting Act (FCRA) specifies that the costs of the government’s direct loans and loan guarantees—such as those made by FHA—are to be reported on an accrual basis.²⁹ It requires that Treasury rates be used to discount projected cash flows, and excludes administrative costs associated with the loans (those costs are recorded in the budget separately on a cash basis).³⁰

Fair-value accounting—an alternative method of accrual accounting that recognizes that the government’s assumption of financial risk has costs for taxpayers that exceed the average amount of losses that would be expected from defaults—has made several appearances in the federal budget process. The legislation that established the Troubled Asset Relief Program specified the use of a fair-value approach—in particular, that the estimated cost of the program’s obligations be recorded in the budget on a FCRA basis but that the discount rate used for such estimates be adjusted for the cost of market risk.³¹ In addition, CBO uses a fair-value approach to incorporate the cost of Fannie Mae and Freddie Mac into its baseline budget projections.³² And in recent years, CBO has provided supplementary information to the Congress about the fair-value cost of several federal credit and insurance programs, including FHA’s single-family mortgage insurance program.³³

Both the FCRA approach and the fair-value approach rely on the same projections of future cash flows. With accrual accounting, expenses are recorded when they are incurred and revenues when they are earned, rather than when payments are made or received. Both approaches take into account the lifetime cost of a direct loan or loan guarantee made in a given year (including the expected cost of defaults, net of fees collected). But fair-value’s inclusion of financial risk (market risk) is a key distinction from estimates produced using the FCRA methodology. In practice, the main difference between FCRA estimates and fair-value estimates is the effective discount rates used (either explicitly or implicitly) to calculate the present value of future guarantee costs and receipts: For FCRA estimates, projected cash flows are discounted using interest rates on Treasury securities, but fair-value estimates are calculated using discount rates that incorporate a premium for market risk. Market risk is the component of financial risk that investors cannot avoid by diversifying their portfolios. Investors require additional compensation for market risk—known as a market risk premium—because investments exposed to such risk are more likely to have low returns when the economy as a whole is weak and resources are scarce and highly valued. That premium is reflected in the fact that assets carrying more market risk have higher expected returns and lower prices.

For a large-scale mortgage refinancing program, some of the costs would appear in the budget on a cash basis, others on a fair-value basis, and still others on a FCRA basis. The activities of the Federal Reserve are reported in the budget on a cash basis. Accelerated prepayment of the MBSs the Federal Reserve holds would lower its

²⁹ 2 U.S.C. §661a (5) (B), (C), 104 Stat. 1388-610

³⁰ 2 U.S.C. §661a (5) (E), 104 Stat. 1388-610 and 2 U.S.C. §661a (5) (A), 104 Stat. 1388-610

³¹ Section 123 of the Emergency Economic Stabilization Act of 2008, Division A of Public Law 110-343, 12 U.S.C. §5232 (6) 122 Stat. 3790

³² See “CBO’s Budgetary Treatment of Fannie Mae and Freddie Mac,” Congressional Budget Office, January 2010.

³³ For a more complete comparison of FCRA and fair-value budgetary treatment for mortgage guarantees, see “Accounting for FHA’s Single-Family Mortgage Insurance Program on a Fair-Value Basis,” Congressional Budget Office, May 2011.

income and hence its remittances to the Treasury. The MBS holdings of the Treasury are accounted for under FCRA.

The Office of Management and Budget treats the Federal Reserve and Treasury transactions similarly to CBO, but it does not consider Fannie Mae or Freddie Mac to be federal entities. Hence it records transactions with the GSEs on a cash basis.