

Federal Housing Finance Agency
Office of Inspector General



Impact of the Federal Reserve's Quantitative Easing Programs on Fannie Mae and Freddie Mac

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At A Glance

October 23,
2014

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Why OIG Did This Report

Fannie Mae and Freddie Mac (the Enterprises) provide liquidity to the housing finance system by purchasing qualifying mortgages from lenders and packaging them into mortgage-backed securities (MBS) that are sold to investors. In exchange for a fee, the Enterprises guarantee that investors will receive the timely payment of principal and interest on their MBS regardless of the credit performance of the underlying mortgage collateral.

As part of its effort to respond to the recent financial crisis and its aftermath, the Federal Open Market Committee (Federal Reserve) has purchased over \$2.3 trillion of the Enterprises' MBS under its three Quantitative Easing (QE) programs and related initiatives. The Federal Reserve initiated the QE programs to, among other things, lower interest rates and thereby stimulate growth in the housing markets and the broader economy.

In this report we assess the effects of the QE programs on the Enterprises' recent financial performance and the potential implications for the Enterprises of the Federal Reserve's December 2013 decision to reduce or "taper" its MBS purchases.

OIG Analysis

The Enterprises Benefited Financially from a Surge in Mortgage Refinancings Associated with the QE Programs and Higher Guarantee Fee Rates

The Federal Reserve's substantial MBS purchases likely contributed considerably to lower long-term mortgage rates from 2008 through mid-2013. The lower rates caused mortgage refinancings to surge from 2009 through mid-2013.

As the refinancing boom was occurring, FHFA directed the Enterprises to sharply increase their MBS guarantee fee rates. Since 2011 the rates have more than doubled.

In 2012 and 2013, the Enterprises benefited financially from the combination of the surge in mortgage refinancings and the sharp increases in their MBS guarantee fee rates. The new mortgages were packaged into MBS, which were subject to the higher guarantee fee rates. Mortgages subject to lower guarantee fee rates were prepaid through the refinancings.



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From 2011 to 2013 the Enterprises realized a \$4 billion increase in annual guarantee fee revenue from new single-family MBS issuances, most of which is attributable to refinanced mortgages purchased in 2012 and 2013. The Enterprises should generally expect to benefit from the increased guarantee fee revenue over the lifetime of the securities, but are subject to certain risks.

The Federal Reserve's Tapering of Its MBS Purchases Appears to Have Contributed to a Relative Decline in the Enterprises' More Recent Financial Performance

Long-term mortgage interest rates began to increase in mid-2013 due, in part, to the financial markets' perception that the Federal Reserve would begin tapering later in the year as well as other factors, such as an improving economy. Since then, the rates have generally stabilized above their 2013 levels. The increase has contributed to significant declines in mortgage refinancing activity and Enterprise MBS issuances in 2014. Consequently, the Enterprises' expected guarantee fee revenue on MBS issued in the first half of 2014 fell about 56% compared to their expected revenue on MBS issued in the first half of 2013.

FHFA, the Enterprises, and the Federal Reserve provided us with technical comments that we incorporated in the final report as appropriate.

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ABBREVIATIONS

Enterprises	Fannie Mae and Freddie Mac
Federal Reserve	Federal Open Market Committee
The Board	Board of Governors of the Federal Reserve System
FHFA or Agency	Federal Housing Finance Agency
Ginnie Mae	Government National Mortgage Association
LSAP	Large-Scale Asset Purchases
MEP	Maturity Extension Program or “Operation Twist”
MBS	Mortgage-Backed Securities
OIG	Federal Housing Finance Agency Office of Inspector General
QE	Quantitative Easing
Treasury	U.S. Department of the Treasury

PREFACE.....

The purpose of this evaluation report is to assess the effect of the QE programs on the Enterprises' recent financial performance, and the potential implications of the Federal Reserve's decision in December 2013 to taper its MBS purchases on the Enterprises' financial condition.

This report was prepared by Simon Wu, Chief Economist; Jacob Kennedy, Investigative Evaluator; David P. Bloch, Senior Counsel for Securitization & Risk Management; and Wesley M. Phillips, Director of the Division of Oversight and Review. We appreciate the assistance of officials from FHFA, the Enterprises, the Federal Reserve, and other government agencies in completing this report.

This report has been distributed to Congress, the Office of Management and Budget, and others and will be posted on FHFA-OIG's website, www.fhfaoig.gov.



Richard Parker
Deputy Inspector General for Evaluations

BACKGROUND

The Federal Reserve and Its Traditional Monetary Policies Intended to Promote Maximum Employment, Stable Prices, and Moderate Long-Term Interest Rates

As depicted in Figure 1, below, the Federal Reserve System is comprised of the Board of Governors (the Board), which is situated in Washington DC, twelve regional Federal Reserve Banks, and the member banks.¹ The Board and reserve banks share responsibility for supervising and regulating certain financial institutions and activities, providing banking services to depository institutions and the federal government, and ensuring that consumers receive adequate information and fair treatment in their business interactions with the banking system.²

FIGURE 1. FEDERAL RESERVE STRUCTURE



Source: www.federalreserveeducation.org/about-the-fed/structure-and-functions/

¹ The member banks are national banks and state-chartered institutions. Membership is required for the former and is discretionary for the latter. See 12 CFR 208 (regulation H).

² The information in this section is based on *The Federal Reserve System Purposes & Function*, at http://www.federalreserve.gov/pf/pdf/pf_complete.pdf.

Moreover, the Federal Reserve is responsible for **monetary policy**, which it traditionally exercises through its control over the **federal funds rate**. The mechanisms by which it exerts its control include:

- Influencing the demand for, and supply of, these balances through the purchase, sale, borrowing, or lending of securities—primarily short-term Treasury securities—in the open market;
- Adjusting the reserve requirements that must be held at a Federal Reserve Bank; and
- Extending credit to depository institutions.

The Federal Reserve Initiated the QE Programs to Augment Its Efforts to Combat the Financial Crisis

As the financial crisis began in 2007, the Federal Reserve sought to spur economic recovery through traditional means. It reduced the federal funds rate by lowering the overnight borrowing rates applicable to inter-bank lending.³ However, when the federal funds rate and other short-term rates approached zero percent at the end of 2008, the Federal Reserve initiated the first of three QE programs, the last of which—QE III—continues to this day.⁴

Through the QE programs, the Federal Reserve has, generally speaking, sought to strengthen the economy and housing markets by purchasing U.S. Treasury securities and MBS in order to lower interest rates and ease credit conditions.⁵ Figure 2, below, summarizes the timeline for the three QE programs and related initiatives; the balance of this section provides further information about them.

Monetary Policy: Actions undertaken by the Federal Reserve to promote maximum employment, stable prices, and moderate long-term interest rates.

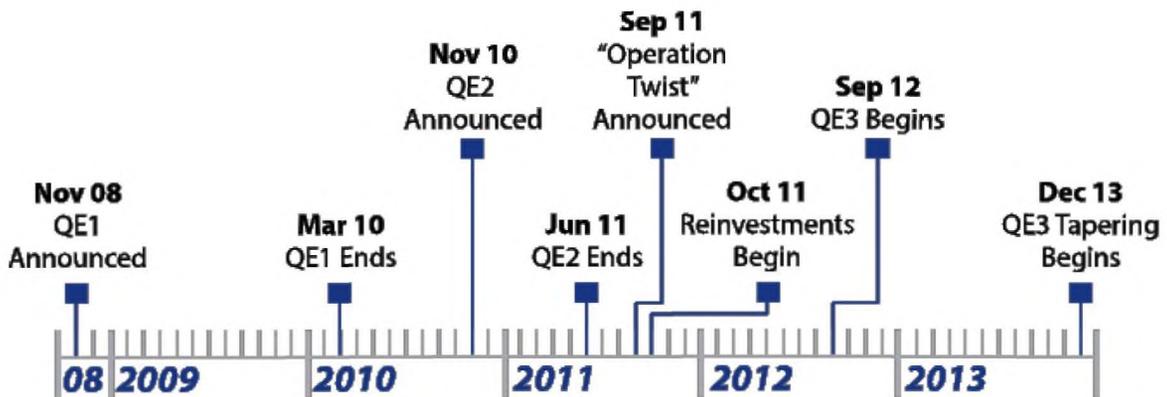
Federal Funds Rate: The overnight interest rate at which a depository institution lends funds maintained at the Federal Reserve to another depository institution or other eligible entity.

³ The Federal Reserve implemented myriad programs in response to the financial crisis. In this report we focus upon the QE programs.

⁴ Each of the subsequent QE programs was initiated in response to then-contemporaneous economic conditions.

⁵ For example, on September 13, 2012, the Federal Reserve stated that, “to support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate, the Committee [Federal Reserve] agreed today to increase policy accommodation by purchasing additional agency mortgage-backed securities at a pace of \$40 billion per month.” Board of Governors of the Federal Reserve System, *Press Release* (September 13, 2012), at www.federalreserve.gov/newsevents/press/monetary/20120913a.htm.

FIGURE 2. TIMELINE OF FEDERAL RESERVE QE PROGRAMS⁶



Source: www.federalreserve.gov.

QE I Involved the Purchase of MBS and Treasury Securities

In November 2008, the Federal Reserve announced QE I, which involved the purchase of Enterprise MBS and debt, MBS guaranteed by the Government National Mortgage Association (Ginnie Mae), and Treasury securities.⁷ By the time that QE I ended in March 2010, the Federal Reserve had purchased approximately \$1 trillion of Enterprise MBS⁸ and \$135 billion of their debt.⁹

QE II Focused Only on the Purchase of Treasury Securities

In November 2010, with the economy still lagging and the unemployment rate elevated, the Federal Reserve announced QE II. QE II focused on the purchase of longer-term Treasury securities rather than other types of assets such as MBS. Specifically, the Federal Reserve committed to purchasing \$600 billion of longer-term Treasury securities by the end of the second quarter of 2011. QE II ended on June 20, 2011.

⁶ In August 2010, the Federal Reserve announced its policy to reinvest principal payments from Enterprise debt and MBS into Treasuries.

⁷ Ginnie Mae guarantees investors that they will receive timely payment of principal and interest payments on MBS comprised of mortgages guaranteed by the Federal Housing Administration and the Department of Veterans Affairs.

⁸ During QE I, the Federal Reserve purchased \$1.25 trillion in total MBS. We note that approximately 80% of the Federal Reserve's MBS purchases during all three QE programs were Fannie Mae and Freddie Mac securities; the balance were MBS guaranteed by Ginnie Mae.

⁹ The Enterprises sell their MBS to primary market dealers such as Morgan Stanley. In turn, the dealers sell the MBS on the secondary market to investors, such as banks and pension funds, as well as the Federal Reserve.

The Federal Reserve Began Its Maturity Extension Program, “Operation Twist,” and Its MBS Reinvestment Policy

In September 2011, the Federal Reserve initiated Operation Twist.¹⁰ Under it, the Federal Reserve sought to extend the average maturity of its Treasury security holdings. It did so by purchasing longer-term Treasury securities and selling equal amounts of Treasury securities with remaining maturities of three years or less.

Operation Twist did not specifically target Enterprise MBS purchases. However, the Federal Reserve began purchasing such securities while the operation was ongoing and continued doing so when it ended. When some of the Enterprise MBS in its portfolio reached maturity or was pre-paid prior to maturity, the Federal Reserve used the proceeds to purchase additional Enterprise MBS.¹¹ The Federal Reserve labeled these transactions “reinvestment purchases.”¹²

QE III Focused Directly on Purchases of MBS and Treasury Securities

On September 13, 2012, the Federal Reserve initiated QE III to help support a stronger economic recovery. In addition to its reinvestment purchases, the Federal Reserve committed to purchasing new MBS at a pace of \$40 billion per month and long-term Treasury securities at a pace of \$45 billion per month, for a total of \$85 billion per month. From September 2012 to June 2014 the Federal Reserve purchased over \$1.3 trillion in Enterprise MBS.¹³

As shown in Figure 3, below, since the implementation of QE III in the third quarter of 2012, the Federal Reserve has purchased an increasing percentage of the Enterprises’ annual MBS issuances. New issuances rose from about 30% in the third quarter of 2012 to about 55% in the third quarter of 2013.¹⁴ From the end of the third quarter of 2013 to the end of the first quarter in 2014, the percentage of Enterprise MBS purchased by the Federal Reserve soared to nearly 85%. Thereafter, the Federal Reserve’s monthly MBS purchases began to decline as

¹⁰ The Federal Reserve’s MBS Reinvestment Policy is distinct from its maturity extension program, i.e., Operation Twist.

¹¹ The Federal Reserve’s MBS reinvestment policy involved the reinvestment of principal payments from its debt holdings, and was intended to prevent the runoff of its MBS holdings.

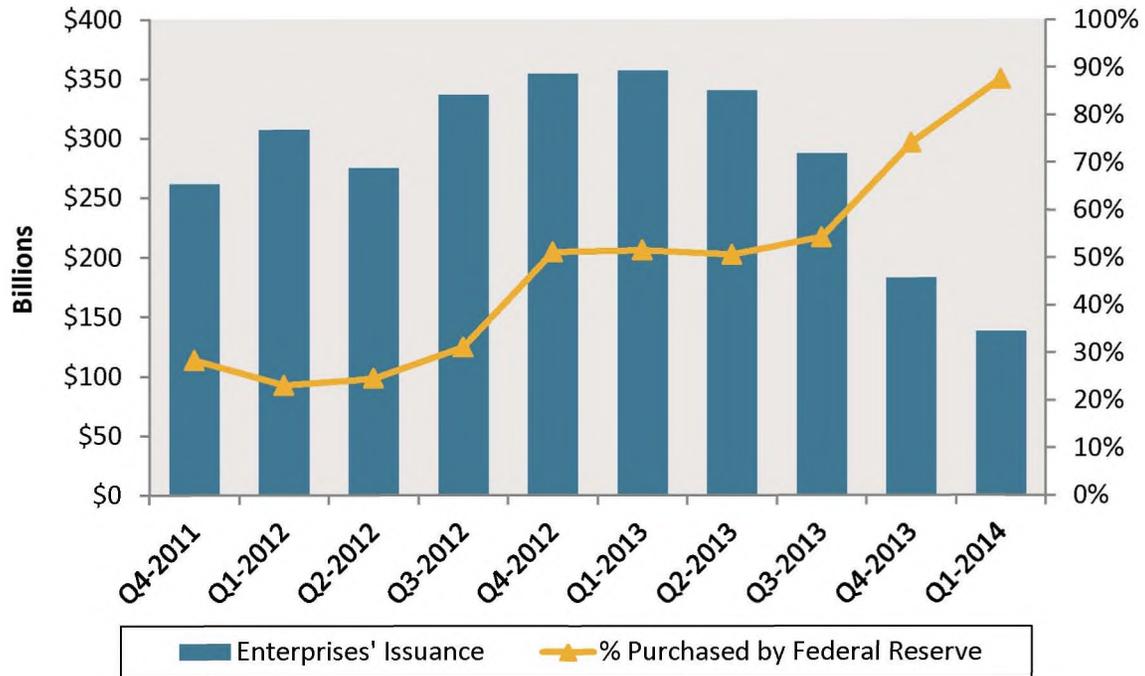
¹² See www.newyorkfed.org/markets/agency_agencymbs_faq.html for more information on the Federal Reserve’s reinvestment purchases.

¹³ This figure includes the reinvestment of principal payments from Enterprise debt and MBS and Ginnie Mae MBS.

¹⁴ During the QE programs, approximately 30% of the Federal Reserve’s MBS purchases were reinvestments of principal payments from agency debt and MBS.

a result of its “tapering” schedule.¹⁵ At the same time, however, new Enterprise MBS issuances declined even more dramatically, which accounts for the increased percentage of MBS purchases in late 2013 and early 2014.

FIGURE 3. FEDERAL RESERVE PURCHASES OF ENTERPRISE MBS ISSUANCES.
FOURTH QUARTER 2011 THROUGH FIRST QUARTER 2014



Source: The Federal Reserve Bank of New York – Domestic Market Operations; FHFA Annual Reports to Congress; and Fannie Mae and Freddie Mac Monthly Volume Summary reports.

The Federal Reserve Is Tapering Its Purchases of MBS and Treasury Securities

In December 2013, the Federal Reserve stated that it would begin tapering its asset purchases under QE III due to improved economic activity and gains in the labor markets.¹⁶

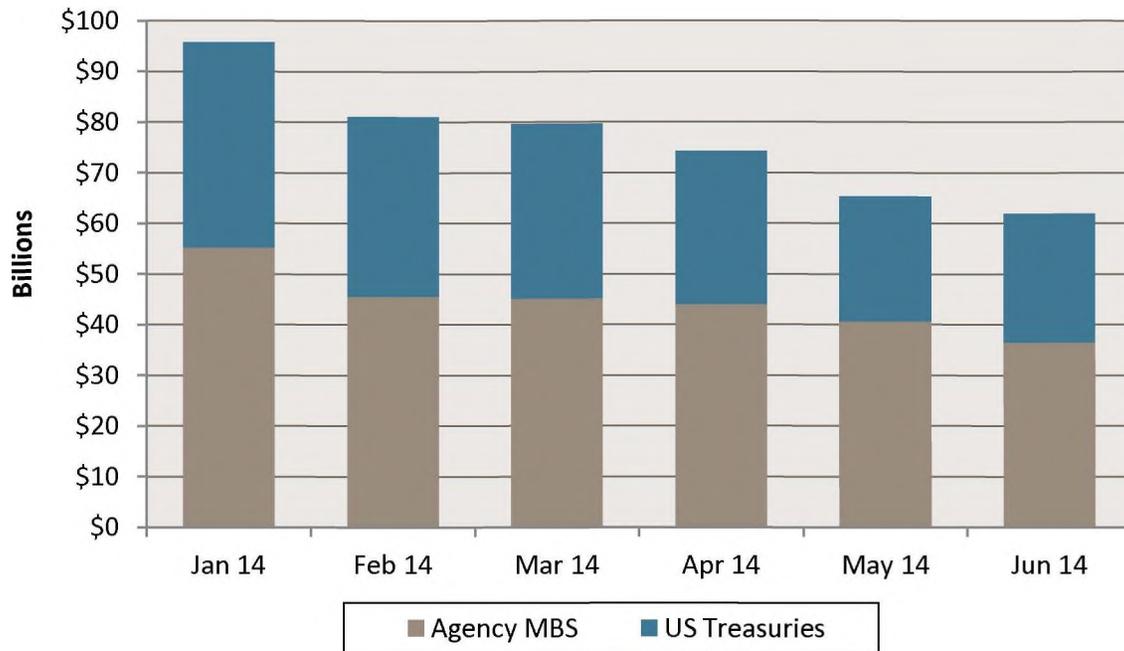
Accordingly, and as depicted in Figure 4, below, the Federal Reserve’s monthly MBS and

¹⁵ The percentage of the Federal Reserve’s purchase of Enterprise MBS declined to about 60% in the second quarter of 2014. This decline appears to be due to the Federal Reserve’s decision to taper QE III asset purchases.

¹⁶ The Federal Reserve determined that the improved economic activity and the gains in the labor market were, in part, engendered by the programs.

Treasury security purchases declined from nearly \$100 billion in January 2014 to \$61.9 billion in June 2014.¹⁷

**FIGURE 4. FEDERAL RESERVE MONTHLY ENTERPRISE MBS AND TREASURY SECURITY PURCHASES
JANUARY THROUGH JUNE 2014**



Source: The Federal Reserve Bank of New York – Domestic Market Operations.

On September 17, 2014, the Federal Reserve announced that it would reduce its monthly asset purchases to \$15 billion per month, which includes only \$5 billion for MBS and \$10 billion for Treasury securities.¹⁸

¹⁷ The \$100 billion in MBS and Treasury purchases in January 2014 includes the reinvestment of the payoff from maturing MBS and debt to fund the purchase of additional MBS, as well as the regular monthly purchase amount.

¹⁸ We note that although the Federal Reserve purchased more than \$2.3 trillion in Enterprise MBS since 2008, its balance of such MBS on March 31, 2014, was only about \$1.3 trillion. The difference reflects the fact that, prior to October 2011, the Federal Reserve permitted maturing or prepaying MBS to run-off its balance sheet and thereby reduce the size of its overall MBS portfolio. Since then, however, the Federal Reserve has used the principal payments from its holdings, agency debt, and agency MBS to fund the purchase of additional MBS.

ANALYSIS

The Federal Reserve's Purchases of MBS Under Its QE Programs Contributed Considerably to Lowered Mortgage Rates and Increased Refinances

The Federal Reserve's QE programs, among other factors, contributed considerably to the significant decline in long-term mortgage interest rates that occurred during the period from 2008 through mid-2013.¹⁹ Those declining rates, in turn, contributed to a substantial increase in mortgage refinance activity during the period.

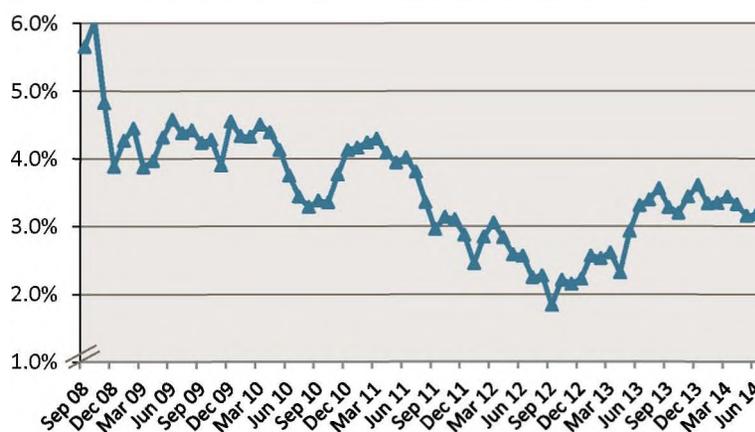
Economic Research Suggests that the Federal Reserve's MBS Purchases Helped Reduce MBS Yields and Long-Term Mortgage Rates

Economic research that we reviewed indicates that the Federal Reserve's substantial purchases of MBS since 2009 contributed to an increase in their price and a corresponding decrease in their **yields** (see Figure 5 for yield).²⁰

For example, one research paper concluded that shortly after the announcement of the Federal Reserve's QE I MBS purchases, the yields on MBS with a 30-year maturity declined, on average, by 107 basis points.²¹

We note that MBS yields increased moderately in the summer of 2013 and stabilized at these higher levels in 2014. This has been attributed, among other

**FIGURE 5. YIELD ON ENTERPRISE MBS
SEPTEMBER 2008 THROUGH JUNE 2014**



Source: Bloomberg (Fannie Mae 30-year current coupon mortgage yield based on bid quote).

¹⁹ See Appendix A of this report for a discussion of the relationship between the Federal Reserve's MBS purchases, MBS yields, long-term mortgage interest rates, and mortgage refinance activity.

²⁰ Appendix A provides a listing and summary of these economic research papers.

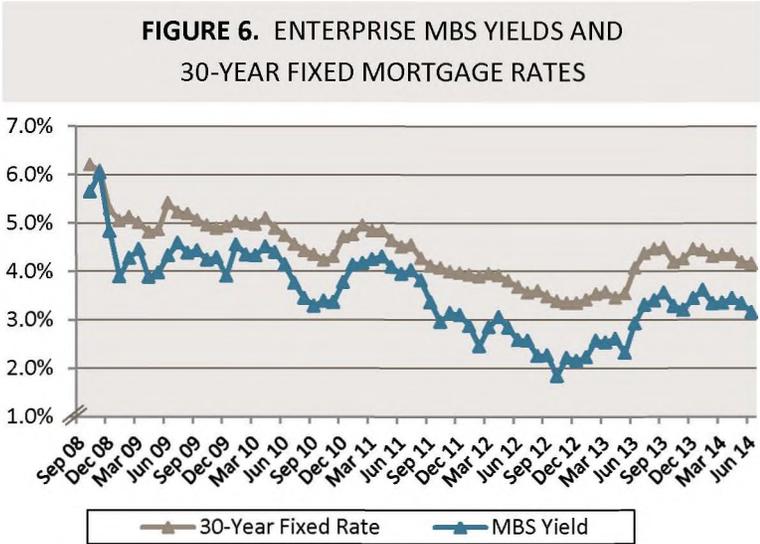
²¹ A basis point equals one hundredth of one percent, or 0.01%. Thus, a decrease of 107 basis points would reduce the annual yield on a MBS with a 30-year maturity from 5.00% to 3.93%. See Arvind Krishnamurthy and Annette Vissing-Jorgensen, *The Ins and Outs of LSAPs*, Federal Reserve Bank of Kansas City (September 16, 2013), at www.kansascityfed.org/publicat/sympos/2013/2013Krishnamurthy.pdf. The estimated averages in the working paper include MBS issued by the Enterprises as well as those guaranteed by Ginnie Mae.

things, to the perception on the part of financial market participants that the Federal Reserve would begin to taper its MBS and Treasury security purchases later in the year.²²

MBS yields and long-term mortgage interest rates generally move parallel to each other because an MBS' yield is, essentially, the prevailing mortgage interest rate less the compensation paid to the Enterprises, underwriters, and servicers.²³ See Figure 6, below. Thus, decreasing MBS yields caused, in part, by the QE programs resulted in reductions in long-term mortgage interest rates; this, in turn, led to the spike in refinancing.

Yield: The yield on a security, such as MBS, is its return to the investor. There is generally an inverse relationship between a security's price and its yield. As the price goes up the yield goes down; and as the price goes down the yield goes up.

As shown in Figure 6, the decline in the 30-year mortgage rate generally paralleled the decline in MBS yields. Specifically, the rate declined from just above 6% in October 2008 to a record low (in nominal terms) of about 3.5% in July 2013. During the remainder of 2013, long-term mortgage rates increased moderately to more than 4% and have remained above their 2013 lows in 2014.²⁴



We note that several other factors likely contributed to the decline in MBS yields and long-term interest rates. These include:

Source: Freddie Mac Primary Mortgage Market Survey and Bloomberg (Fannie Mae 30-year current coupon mortgage yield based on bid quote).

²² Some commenters have suggested that these perceptions reduced the demand for, and prices of, these securities.

²³ The difference between the mortgage rates and MBS yields is called the “primary-secondary spread.” See Andreas Fuster, Laurie Goodman, David Lucca, Laurel Madar, Linsey Molloy, and Paul Willen, *The Rising Gap Between Primary and Secondary Mortgage Rates*, The Federal Reserve Bank of New York Economic Policy Review, December 2013.

²⁴ The increase in 2013 has been attributed, in part, to perceptions on the part of financial market participants that the Federal Reserve would begin to taper its QE III asset purchases in the near term.

- General weakness in the U.S. economy since 2008, which has likely reduced the demand for credit, including mortgage credit.
- A worldwide investor “flight to safety,” which has increased demand for U.S. Treasury securities and other impliedly “safe” securities, such as Enterprise-issued MBS and their debt. Increased demand for these securities has caused a decrease in their yields. Given that long-term mortgage rates run parallel to these yields, those rates have also declined.

Lower Mortgage Rates Contributed to Substantial Refinancing Activity

The significant decline in long-term mortgage interest rates, which were likely influenced considerably by the Federal Reserve’s MBS purchases, helped trigger a substantial increase in **mortgage refinancing** activity from early 2009 through mid-2013.²⁵

Mortgage Refinancing:
Replacing an older loan with a new loan, generally due to lower interest rates.

For example, as shown in Figure 7 below, mortgage refinancing activity increased sharply in the first half of 2009 shortly after the Federal Reserve initiated QE I. During the latter half of 2010, there was a temporary increase in 30-year mortgage rates and mortgage refinancing activity declined substantially in the first quarter of 2011.²⁶ However, in the second quarter of 2011, general market mortgage refinancing activity began to increase again as 30-year mortgage rates began to fall.²⁷ This refinancing activity continued its upward trend in 2012, and accelerated toward mid-year, shortly before the Federal Reserve initiated QE III in the third quarter of 2012.²⁸ However, as 30-year mortgage rates increased during late 2013, mortgage refinancing activity declined markedly.

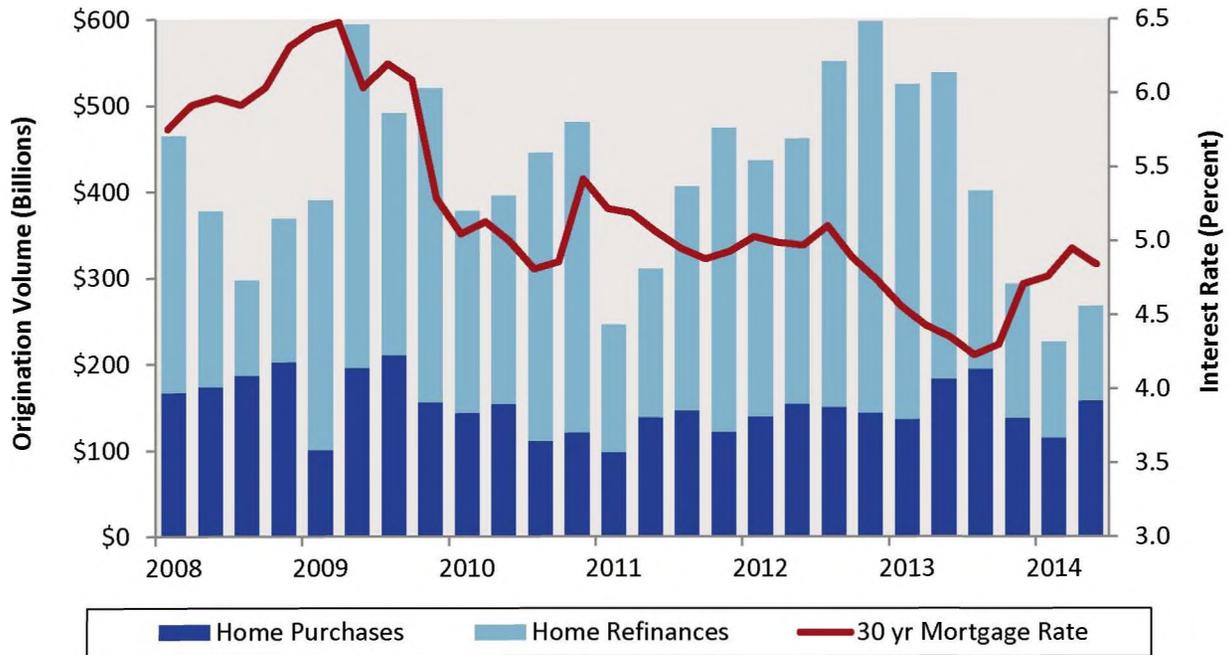
²⁵ Both Enterprises have stated that the QE programs contributed directly to the increase in mortgage refinance activity. See Fannie Mae, *Signs of Improvement Emerge but Economic Outlook Remains Uncertain* (October 18, 2012), at www.fanniemae.com/portal/about-us/media/financial-news/2012/5867.html; and Freddie Mac, *Economic & Housing Market Outlook – QE3 in Motion* (October 23, 2102), at www.freddiemac.com/finance/pdf/Oct_2012_public_outlook.pdf.

²⁶ It is not clear why mortgages rates increased in 2010. We note that interest rates can change for a variety of reasons independent of the Federal Reserve’s monetary policy initiatives.

²⁷ The Federal Reserve initiated MBS reinvestment purchases separately from, but during the tenure of, Operation Twist. These purchases may have contributed to declining long-term mortgage rates in 2011 and the increased mortgage refinance activity.

²⁸ We note that FHFA-directed modifications to the Home Affordable Refinance Program also contributed to the substantial increase in refinancing activity during this period. For further information, see FHFA-OIG, *Home Affordable Refinance Program, A Mid-Program Assessment*, EVL-2013-006 (August 1, 2013), at <http://fhfa.ig.gov/Content/Files/EVL-2013-006.pdf>.

FIGURE 7. VOLUME OF MORTGAGE ORIGINATION AND REFINANCING, 2008 THROUGH 2014



Source: Mortgage Bankers Association Quarterly Mortgage Originations Estimates as of May 2014 and the Freddie Mac Primary Mortgage Survey, historical monthly data for conventional, conforming 30-year fixed-rate mortgages.

Home purchase mortgages fluctuated from 2009 through mid-2013 while mortgage refinancing activity sharply increased during the same period. According to federal officials²⁹ and FHFA and Enterprise executives, mortgage refinance activity is highly sensitive to declining interest rates. Borrowers focus primarily upon interest rates when determining whether to refinance – and they tend to do so when rates fall sufficiently to offset closing and other transaction costs.

On the other hand, individuals seeking to purchase homes tend to consider factors in addition to interest rates, such as their employment prospects. The potentially weakened financial situation of many potential home buyers during the period 2009 through 2013 may have impeded their willingness or ability to take advantage of lower rates then available.

²⁹ We spoke with officials of Treasury, Congressional Budget Office (CBO), and Office of Management and Budget (OMB).

Mortgage Refinance Activity Contributed to Significantly Higher Enterprise Guarantee Fee Revenue in 2012 and 2013

Increased mortgage refinancing activity significantly benefitted the Enterprises' financial performance in 2012 and 2013. During this period FHFA directed the Enterprises to raise the guarantee fees on MBS for safety and soundness and policy reasons, as well as to implement legislation designed to offset temporary cuts in payroll taxes. The Enterprises packaged refinanced mortgages into MBS subject to the higher guarantee fees and, in doing so, replaced older mortgages in previous MBS issuances subject to lower guarantee fees. Thus, the Enterprises realized substantial increases in their guarantee fee revenue from 2011 to 2013.

The Enterprises Have Purchased Relatively Large Volumes of Refinanced Mortgages Since 2008

As shown in Figure 8, below, the Enterprises substantially increased the percentage of refinanced mortgages that they acquired during the period 2006 through 2013. During the housing boom era of 2006 and 2007, only about half of the mortgages the Enterprises purchased were refinanced loans. Since 2009 refinanced loans constitute about 77% of the Enterprises' mortgage acquisitions.³⁰

**FIGURE 8. PERCENTAGE OF REFINANCE MORTGAGES ACQUIRED BY THE ENTERPRISES
2006 THROUGH 2013 (\$BILLIONS)**

	2006	2007	2008	2009	2010	2011	2012	2013
Total Mortgage Purchases	\$876	\$1,125	\$941	\$1,176	\$994	\$879	\$1,263	\$1,156
Refinance Mortgages	\$417	\$577	\$555	\$940	\$783	\$674	\$1,010	\$822
Percent Refinances	48%	51%	59%	80%	79%	77%	80%	71%

Source: Fannie Mae and Freddie Mac SEC Filings Form 10K.

FHFA Has Directed the Enterprises to Significantly Increase Their MBS Guarantee Fees

From 2011 to 2013, the Enterprises nearly doubled their average MBS guarantee fees (g-fees) from about 28 basis points to 54 basis points. FHFA directed the Enterprises to do so because their formerly low fees exposed them to significant financial losses during the financial crisis.

³⁰ The Enterprises' increased percentage of refinanced mortgage purchases from 2009 through 2013 is consistent with the general trend toward increased mortgage refinances depicted in Figure 7 above.

Further, FHFA saw the fee increase as a way to attract private capital to housing finance.³¹ FHFA also raised guarantee fees by 10 basis points in April 2012 as required by the *Temporary Tax Cut Continuation Act of 2011*.³²

As a result of the sharp increase in guarantee fees, the Enterprises realized significant annual increases in their expected guarantee fee revenue on MBS issued subsequent to 2011. See Figures 9 and 10, below.³³ Specifically their expected guarantee fee revenue increased by about \$4 billion on MBS issued in 2013 compared to MBS issued in 2011.³⁴

FIGURE 9. FANNIE MAE AVERAGE GUARANTEE FEES AND MBS ISSUANCES, 2011 THROUGH 2013

	2011	2012	2013
Average G-Fee (basis points)	28.8	39.9	57.4
Single-Family MBS Issuance Volume	\$545 billion	\$828 billion	\$733 billion
Expected Annual Revenue	\$1.6 billion	\$3.3 billion	\$4.2 billion

Source: Fannie Mae SEC Filings Form 10K. Expected revenue calculations estimated by OIG.

FIGURE 10. FREDDIE MAC AVERAGE GUARANTEE FEES AND MBS ISSUANCES, 2011 THROUGH 2013

	2011	2012	2013
Average G-Fee (basis points) ³⁵	26.8	38.3	51.4
Single-Family MBS Issuance Volume	\$305 billion	\$446 billion	\$435 billion
Expected Annual Revenue	\$817 million	\$1.7 billion	\$2.2 billion

Source: Freddie Mac SEC Filings Form 10K. Expected revenue calculations estimated by OIG.

³¹ For more information about guarantee fees, see FHFA-OIG, *FHFA's Initiative to Reduce the Enterprises' Dominant Position in the Housing Finance System by Raising Gradually Their Guarantee Fees*, EVL-2013-005 (July 16, 2013), at http://fhfaoig.gov/Content/Files/EVL-2013-005_4.pdf.

³² This statutorily directed increase was not intended to confer a financial benefit upon the Enterprises. Rather, it was designed to raise revenue over a period of 10 years and thereby offset the costs associated with temporary reductions in payroll taxes.

³³ The Enterprises' combined expected annual guarantee fee revenue for single-family MBS issuances (from Figures 9 and 10) increased from \$2.4 billion in 2011 to \$6.4 billion in 2013; an increase of 168%.

³⁴ We note that the structure of guarantee fees also likely resulted in financial benefits to the Enterprises from the increased refinancing activity discussed above. Guarantee fees include an upfront fee, which is incurred at the time a mortgage is originated and acquired by an Enterprise, and an ongoing monthly fee. The increased collection of upfront fees permitted the Enterprises to derive one-time revenue gains on the large volume of refinanced mortgages they purchased in 2012 and 2013.

³⁵ Freddie Mac has historically set its guarantee fees lower than Fannie Mae as a means to strengthen market demand for its MBS. Fannie Mae receives relatively higher market demand for its MBS.

Officials from the Enterprises, FHFA, and other federal officials generally agreed that the Federal Reserve’s QE programs have significantly benefitted the Enterprises’ financial performance in recent years. However, they cautioned that it is nearly impossible to quantify the extent to which the QE programs resulted in increased Enterprise revenues and earnings, as there were many other domestic and international macroeconomic factors impacting the Enterprises’ performance.

The Enterprises’ Purchases of Refinanced Mortgages Present Some Risks

We also note that Enterprises’ purchases of refinanced mortgages in recent years have involved the following risks:

- *Prepayment risks associated with the MBS in the Enterprises’ retained mortgage portfolios:* The Enterprises generally package mortgages that they purchase into MBS that they sell to investors. However, the Enterprises also hold some MBS in their retained mortgage portfolios.³⁶ When borrowers refinance—and thereby prepay—the mortgages that collateralize the MBS in the Enterprises’ retained portfolios, the Enterprises are deprived of the level of principal and interest that they expected to earn over the natural lives of such mortgages.³⁷
- *Counterparty Credit Risk:* In a recent report, we noted that both FHFA and Enterprise officials believe that some of the small and nonbank lenders that focused on the sale of refinanced mortgages to the Enterprises present elevated counterparty credit and other risks as compared to traditional banks.³⁸

The Federal Reserve’s Decision to Taper Its MBS Purchases Has Contributed to Significant Declines in Expected Guarantee Fee Revenue for 2014 MBS Issuances

Although the Federal Reserve’s QE programs benefitted the Enterprises’ financial condition in 2012 and 2013, its decision, among other factors, in late 2013 to taper its MBS purchases contributed to an upturn in long-term interest rates.³⁹ This, in turn, has contributed to a

³⁶ The Enterprises’ transfer prepayment risk when they sell their MBS to investors.

³⁷ For additional information about the Enterprises’ prepayment risk and efforts to mitigate it, see FHFA-OIG, *The Housing Government-Sponsored Enterprises’ Challenges in Managing Interest Rate Risks*, WPR-2013-01 (March 11, 2013), at http://fhfaig.gov/Content/Files/WPR-2013-01_2.pdf.

³⁸ For more information see FHFA-OIG, *Recent Trends in the Enterprises’ Purchases of Mortgages from Smaller Lenders and Nonbank Mortgage Companies*, EVL-2014-010 (July 17, 2014), at www.fhfaig.gov/Content/Files/EVL-2014-010_0.pdf.

³⁹ Mortgage and other interest rates may have increased for other reasons as well, including generally improved economic conditions and higher demand for credit.

significant decline in the Enterprises' guarantee fee revenues on MBS issued in 2014. It remains to be seen whether this trend will continue.

As discussed previously, the Federal Reserve purchased more than 55% of the Enterprises' new MBS issuances in 2013, and nearly 85% of them in the first quarter of 2014. In operating the QE programs, the Federal Reserve purchased MBS according to program-specific criteria, including predetermined monthly and annual purchase targets.⁴⁰ By doing so, the Federal Reserve increased the demand for, and the price of, the Enterprises' MBS. This, in turn, helped drive down considerably their yields as well as the mortgage interest rates that run in tandem with them.

As the Federal Reserve tapers its monthly MBS purchases, other market participants, such as banks and investment funds, will decide if they should buy MBS based upon their anticipated risk-adjusted return relative to other investments.⁴¹ These market participants may demand a more favorable price for MBS than does the Federal Reserve.⁴² A consequent drop in the price of Enterprise MBS could cause an increase in their yields – and a corresponding increase in mortgage interest rates.

Indeed, as discussed earlier, MBS yields and long-term interest rates increased moderately in late 2013 as a result of anticipation in the market that the Federal Reserve would begin to taper its MBS purchases under QE III. The rise in interest rates contributed to a substantial decrease in mortgage refinance and home purchase activity which, in turn, has contributed to significant declines in MBS issuances and expected guarantee fee revenue in the first half of 2014. See Figure 11, below. Therefore, the Enterprises' financial performance and earnings have been adversely affected by the higher mortgage rates associated with tapering.

⁴⁰ One of the Federal Reserve's primary missions is to conduct monetary policy. Its purchases and sales of assets are not intended to generate a profit, as would be the case for any other market participant. Each QE program had different targets over varied frequencies. For example, the Federal Reserve announced the total size of the program as well as the anticipated end date for QE I. For QE III, the Federal Reserve announced a monthly purchase amount, i.e., the size, pace, and composition of its intended purchases.

⁴¹ An investment's risk-adjusted return is a measurement of the risk that the investor must bear in order to achieve the anticipated return. The measurement is generally expressed as a number or rating. Such ratings are applied to investment portfolios, funds, and individual securities.

⁴² The Federal Reserve purchases MBS through competitive auctions; so while it is not profit-driven, competitive market prices are elicited.

FIGURE 11. ENTERPRISE SINGLE-FAMILY MBS ISSUANCES AND EXPECTED REVENUES, 2013 AND 2014

(January–June Only)	Issuances (\$Millions)	Avg G-Fee (Basis Points)	G-Fee Revenue (\$Millions)	Change from 2013
Fannie Mae				
2013	\$428,843	55.7	\$2,389	
2014	\$161,068	62.8	\$1,012	(57.7%)
Freddie Mac				
2013	\$269,000	49.9	\$1,342	
2014	\$111,000	57.0	\$633	(52.9%)
Total				
2013	\$697,843		\$3,731	
2014	\$272,068		\$1,644	(55.9%)

Source: Fannie Mae and Freddie Mac SEC Form 10Q – June 2014.

Reductions in the Federal Reserve’s MBS portfolio, under some scenarios, could also affect the Enterprises’ future financial performance. Specifically, it could put additional upward pressure on mortgage interest rates. This, in turn, could reduce refinance and home purchase activity and thereby diminish Enterprise mortgage acquisitions and MBS issuances.⁴³ We note, however, that under other scenarios these adverse outcomes could be offset by an improving economy and rising home prices, which could benefit the Enterprises’ financial performance.

⁴³ As noted in Figure 3 above, there was a substantial decrease in Enterprise MBS issuances in the fourth quarter of 2013 and the first quarter of 2014.

CONCLUSION.....

The combination of the Federal Reserve’s QE programs and FHFA’s decision to increase the Enterprises’ guarantee fees contributed considerably to their financial performance in 2012 and 2013. Some of these contributions will bolster the Enterprises’ financial performance over time. Specifically, the revenues that the Enterprises realized by packaging large amounts of refinanced mortgages into MBS subject to substantially increased guarantee fees in 2012 and 2013 will continue over the lifetime of the securities.⁴⁴

More recently, the Federal Reserve’s decision in late 2013 to taper its MBS purchases appears to have contributed to higher mortgage rates which, in turn, contributed to significant reductions in the Enterprises’ guarantee fee revenues on MBS issued in 2014. Continued tapering by the Federal Reserve and the eventual reduction of its massive MBS portfolio could have an adverse impact upon the Enterprises’ financial performance. Under other scenarios, however, an improving economy and higher home prices could be of benefit to the Enterprises’ financial performance. FHFA has a responsibility to monitor these issues and risks as well as their implications for the Enterprises.

⁴⁴ Of course, if there are substantial borrower defaults on the underlying mortgages, the Enterprises would face significant financial obligations to honor their MBS guarantees to investors.

OBJECTIVE, SCOPE, AND METHODOLOGY

The primary objectives of this report were to assess the effect of the QE programs on the Enterprises' recent financial performance and to assess the potential implications of the Federal Reserve's decision to taper its MBS purchases on the Enterprises' financial condition.

To address these objectives, we interviewed officials at FHFA, Fannie Mae and Freddie Mac, Treasury, the CBO, and the OMB. We also conducted an informal discussion with the staff at the Federal Reserve Bank of New York.

To accomplish our analysis, we obtained published data on the Federal Reserve's MBS purchases and holdings. We analyzed the Enterprises' mortgage purchase volume, refinance volume projections, MBS issuance, and guarantee fee revenue, as well as the 30-year mortgage interest rate and MBS yields. In addition, we analyzed and incorporated data from academic research literature, government and industry research papers, and other federal agencies. The data used in this report covered the period from 2006 through the second quarter of 2014, when available. We shared the preliminary results of our analysis with FHFA and Enterprise officials, who generally agreed with our analysis. However, we did not independently test the reliability of the Enterprises' or Federal Reserve's data.

This study was conducted under the authority of the Inspector General Act and is in accordance with the Quality Standards for Inspection and Evaluation (January 2012), which was promulgated by the Council of the Inspectors General on Integrity and Efficiency. These standards require OIG to plan and perform an evaluation that obtains evidence sufficient to provide reasonable bases to support its findings and recommendations. We believe this report meets these standards.

FHFA, the Enterprises, and the Federal Reserve provided us with technical comments on a draft of this report, which we incorporated in the final draft as appropriate.

The performance period for this evaluation was between February 2014 and September 2014.

APPENDIX A

Overview of the Quantitative Easing Programs' Impact on Mortgage Interest Rates and Refinancing Activity

This appendix provides information on the means by which the Federal Reserve's QE programs are believed to have contributed to lower MBS yields. It also addresses the QE programs' impact on long-term mortgage interest rates and summarizes the economic literature on the programs. Finally, it includes a discussion of the relationship between lower mortgage rates and mortgage refinancing activity.

Mechanisms by Which the QE Programs Have Lowered MBS Yields and Mortgage Interest Rates

As explained in the main report, in operating the QE programs, the Federal Reserve purchased MBS according to program-specific criteria, including predetermined monthly and annual purchase targets. By doing so, the Federal Reserve increased the demand for, and the price of, the Enterprises' MBS. This, in turn, helped drive down considerably their yields as well as the mortgage interest rates that run in tandem with them. Recent studies⁴⁵ have discussed several additional mechanisms by which the Federal Reserve's QE programs are said to have had an impact upon MBS yields and mortgage interest rates:

1. Market Signaling Effect of QE Programs

Asset purchases by the Federal Reserve are often interpreted by investors and market participants as signals about the central bank's intentions regarding interest rates. Unlike the Federal Reserve's usual short-term Treasury securities purchases, long-term asset purchases, such as those made under the QE programs, may increase the credibility of the Federal

⁴⁵ Source: Diana Hancock and Wayne Passmore, *How the Federal Reserve's Large-Scale Asset Purchases (LSAPs) Influence Mortgage-Backed Securities (MBS) Yields and U.S. Mortgage Rates*, Federal Reserve Board Working Paper, 2014-12 (2014) at www.federalreserve.gov/pubs/feds/2014/201412/201412abs.html; Arvind Krishnamurthy and Annette Vissing-Jorgensen, *The Ins and Outs of LSAPs*, Federal Reserve Bank of Kansas City (September 16, 2013), at www.kansascityfed.org/publicat/sympos/2013/2013Krishnamurthy.pdf; Johannes Stroebel and John B. Taylor, *Estimated Impact of the Federal Reserve's Mortgage-Backed Securities Purchase Program*, *International Journal of Central Banking*, Vol. 8, No. 2 (June 2012), at www.ijcb.org/journal/ijcb12q2a1.pdf; Iryna Kaminska and Gabriele Zinna, *Official Demand for U.S. Debt: Implications for U.S. real interest rates*, IMF Working Paper (April 2014), at www.imf.org/external/pubs/ft/wp/2014/wp1466.pdf; and Saty Patrabansh, William M. Doerner, and Samuel Asin, *The Effects of Monetary Policy on Mortgage Rates*, FHFA Working Paper 14-2 (June 2014), at www.fhfa.gov/PolicyProgramsResearch/Research/Pages/Working-Paper-14-2.aspx.

Reserve's commitment to maintain low interest rates for the long-term and possibly even after the start of an economic recovery.⁴⁶

2. Removing Risks from Investors' Portfolios

The Federal Reserve's purchases reduce interest rates through what is termed the "portfolio balance effect." A rise in the demand for a particular financial asset – in this case, MBS – will increase the asset price and reduce its yield (asset prices and yields move in opposite directions).⁴⁷ Thus, when investors sell MBS to the Federal Reserve, they may rebalance their portfolios by investing the cash proceeds in other assets. This would have the effect of raising the prices and lowering the yields of these assets. This "ripple effect" of increased asset prices across a variety of investments is consistent with the Federal Reserve's intentions for QE.

This same argument can also be characterized in terms of reducing duration and convexity (prepayment) risks in the portfolios of private investors.⁴⁸ Duration and prepayment risks are more prominent for fixed-income securities with longer maturities such as MBS, as these risks positively correspond with the lifespan of the securities. Investors generally demand an extra return to bear these risks. Thus, by removing a considerable number of risks, the Federal Reserve's purchases could lower MBS yields and thereby reduce primary mortgage rates.

3. Liquidity Enhancement – An Effect of the QE Programs

The Federal Reserve's purchases of MBS created liquidity in the marketplace. Liquidity refers to an entity's ability to sell or dispose of its assets for cash. In general, investors are willing to pay a liquidity premium for a security that remains easy to sell. To a certain extent, the Federal Reserve's programmed purchases of MBS served to assure investors that it would continue to purchase MBS even during distressed times. This, in turn, increased the liquidity of these securities and caused them to become more valuable as a result.

⁴⁶ Frequently, bond yields and prices move in anticipation of upcoming Federal Reserve actions and, at times, even before such actions are announced by the Federal Reserve.

⁴⁷ Conversely, if financial assets are seen as interchangeable, then any price and yield effects from the Federal Reserve's purchase would be minimal, as investors would be indifferent about exchanging one asset for another.

⁴⁸ Duration is a measure of the sensitivity of the price of a bond to a change in interest rate. Convexity is a measure of the curvature in the relationship between bond price and interest rate that demonstrates how the duration of a bond changes as the interest rate changes.

4. Concurrent Targeting of Treasury Securities to Lower Interest Rates

Throughout the QE era the Federal Reserve has continued to purchase long-term Treasury securities. Due mainly to their perceived risk-free nature, Treasury securities are considered to be one of the most liquid fixed-income securities in the world.⁴⁹ Consequently, other bonds are frequently priced based upon their riskiness relative to Treasury securities; their prices are quoted as a spread between their yields and those of Treasury securities. The wider the spread between the security's yield and that of the comparable Treasury security, the riskier it is perceived to be. All else equal, when the yields on long-term Treasury securities decline as a result of the Federal Reserve's purchases, then the yields on other bond securities, such as MBS, would be expected to decline as well.

A Summary of Current Economic Research Into the Effectiveness of the QE Programs

The economic research that we analyzed generally supported the view that the QE programs achieved their intended impact, i.e., lowering interest rates, including MBS yields and primary mortgage rates. However, researchers disagreed on the magnitude of these impacts. The following summarizes this research:

- Hancock and Passmore focused on the effect of the QE programs on MBS yields. They showed that MBS yield levels decline when the Federal Reserve holds substantial amounts of the Enterprises' securities. In mid-2013, the Federal Reserve held about 24% of all MBS, which was equivalent to about a \$1.21 trillion portfolio. Hancock's and Passmore's analysis suggests that the cumulative effect of the MBS purchases alone had lowered the MBS yields by 55 basis points.⁵⁰ Furthermore, they found that an increase in the Federal Reserve's holdings of available Treasury securities also lowered the MBS yield.
- Krishnamurthy and Vissing-Jorgensen examined the entire QE period. They showed that the large-scale purchases by the Federal Reserve had lowered the MBS and Treasury yields as intended, though the effects were much more pronounced during QE I than the later QE programs.⁵¹ Figure 12, below, captures the immediate changes

⁴⁹ The financial markets perceive the odds of the U.S. Federal government defaulting on Treasury securities to be nearly zero.

⁵⁰ Diana Hancock and Wayne Passmore, *How the Federal Reserve's Large-Scale Asset Purchases Influence Mortgage-Backed Securities (MBS) Yields and U.S. Mortgage Rates*, Federal Reserve Working Paper, 2014-12 (February 2014).

⁵¹ Arvind Krishnamurthy and Annette Vissing-Jorgensen, *The Ins and Outs of LSAPs*, Federal Reserve Bank of Kansas City (September 16, 2013).

in MBS and 10-year Treasury yields around the announcement dates of the QE programs.⁵²

FIGURE 12. CHANGES IN ASSET YIELDS AROUND EVENT DATES (IN BASIS POINTS)

	QE I	QE II	Twist	QE III
10-Year Treasury	-107	-18	-7	-3
30-Year MBS Yield	-107	-12	-23	-15

Source: Arvind Krishnamurthy and Annette Vissing-Jorgensen, *The Ins and Outs of LSAPs*, Federal Reserve Board Working Paper, at 12 (September 16, 2013).

- On the other hand, Stroebel and Taylor focused only on the purchases of MBS by the Federal Reserve during the QE I era and measured mortgage rates in terms of their spreads over popular benchmarks, such as the London Interbank Overnight Rate swap curve and the Treasury yield curve. They concluded that although the mortgage spreads may have declined by a statistically significant amount of 30 basis points during QE I, a sizable portion of the decline likely could be attributed to concurrent declines of default and prepayment risks, rather than the QE program itself.⁵³
- Kaminska and Zinna analyzed the Federal Reserve’s long-term Treasury securities purchase operations from 2008 through November 2012, just after the start of the QE III program. They found that the QE program had been effective.⁵⁴ In particular, they estimated that in the absence of Federal Reserve purchases, the 10-year real yields of Treasury securities would have been higher by as many as 140 basis points.
- Finally, FHFA’s working paper concluded that, as intended, the QE program affected long-term interest rates and mortgage rates, with mortgage rates lower than they would have been without the QE intervention and reaching historical lows in the post-crisis era.⁵⁵

⁵² The total changes could be even higher than the changes illustrated in Figure 15, as some of movements in yields could take place prior to the Federal Reserve’s announcements of program initiation due to the anticipation by the markets.

⁵³ The position of the Federal Reserve is that the declining default and prepayment risks during the QE period were not coincidental. Rather, the declining risks were at least partially the result of the Federal Reserve’s own large-scale purchases of mortgage assets.

⁵⁴ Iryna Kaminska and Gabriele Zinna, *Official Demand for U.S. Debt: Implications for U.S. real interest rates*, IMF Working Paper (April 2014).

⁵⁵ Saty Patrabansh, William M. Doerner and Samuel Asin, *The Effects of Monetary Policy on Mortgage Rates*, FHFA Working Paper 14-2 (June 2014).

The QE Programs' Influence on Mortgage Refinance and Home Purchase Activity

The QE programs were intended to support the weak housing market in the United States by lowering mortgage rates and thereby spurring increased mortgage originations.

Mortgage origination volume is comprised of two types of borrowing activities: new home purchases and existing home refinances. Lower interest rates typically lead to increases in both types of borrowing, although the effect on refinances is greater than on new home purchases.

In summary, this is the case because the prevailing interest rate is the most significant factor in the decision matrix of a borrower who wants to refinance; but it is only one factor among many in the matrix of a borrower who wants to purchase a new home. Thus, in the absence of non-economic external factors, e.g., asset division as a result of a divorce, a borrower will not refinance unless it results in a lower monthly mortgage payment. On the other hand, the decision to purchase a new home usually involves many other important economic and non-economic factors, including the stages of life, overall financial situation, personal preferences, etc.

There is also empirical support for different levels of effects of interest rate movement on refinances and new purchases. Using historical data, CBO estimates that every 25 basis point reduction in the prevailing interest rate results in a 5.2% increase in total mortgage origination over the course of the following year. See Figure 13 below.

FIGURE 13. MORTGAGE ORIGINATION VOLUME AND INTEREST RATE CHANGE

Interest Rate Change	New Purchase	Refinance	Weighted-Average Total
10 BPS Reduction	0.6%	3.7%	2.0%
25 BPS Reduction	1.3%	9.8%	5.2%
50 BPS Reduction	2.7%	19.6%	10.4%

Source: FHFA-OIG's derived estimates based on separate estimates provided by the Congressional Budget Office, Fannie Mae, and Freddie Mac.

When broken down further by types of origination activity, the 5.2% increase represents a 9.8% increase in refinance volume and a weighted-average 1.3% increase in new purchase volume. Accordingly, the impact on the refinancing activity is more than seven times as much as the impact on the new purchase activity.

Separate independent sensitivity estimates provided by Enterprise officials are similar in terms of the relative scale. Numerically, the data confirms that interest rate reduction has a much greater impact on refinance volume than on new purchase volume.

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