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12-5-2008

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Recommended Citation

Gagnon, Joseph and Holscher, Michael, "17. Purchases of Agency MBS and Debt" (2008). *YPFS Documents (Series 1)*. 10263.

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December 5, 2008

17. Purchases of Agency MBS and Debt

Joseph Gagnon and Michael Holscher¹

Executive Summary

This note examines the use of large-scale purchases of agency debt and agency MBS as an alternative monetary policy tool when short-term interest rates are at the zero bound. The goal of such purchases is to reduce conventional fixed mortgage rates and, more broadly, to lower long-term borrowing costs for the private sector, including corporate bond rates. The Federal Reserve announced on November 25, 2008 that it would conduct such purchases over the next few quarters.

Overall, the evidence suggests that this policy tool can have the desired effects, but that the scale of the purchases has to be very large. We are not aware of any studies of the effects of such operations *per se*, but the announcement of planned purchases on November 25, 2008 apparently had a significant effect on mortgage rates and bond yields. Moreover, there is a substantial literature supporting the view that purchases of long-term Treasury securities can lower long-term Treasury and private yields.² Similar conclusions should apply to purchases of private debt securities.

To the extent that the primary goal of this policy tool is to lower mortgage rates (and private borrowing costs more broadly) purchases of agency MBS are likely to be somewhat more effective than purchases of agency debt. Purchases of either are likely to lower long-term private borrowing costs more and provide greater macroeconomic stimulus than purchases of long-term Treasury securities of comparable size.

Two broad strategies for the use of this policy tool could be considered. The first strategy would be to purchase a specified quantity of securities over a specified time horizon. The second strategy would be to set a target for, or a ceiling on, the conforming fixed mortgage rate or some other market yield or yield spread. Under the second strategy, the Federal Reserve would stand ready to purchase as many securities as needed to enforce the target or ceiling. Relative to the first strategy, the second would pose more operational challenges and would create more uncertainty about the size of the Federal Reserve's balance sheet; in addition, it would require the FOMC to take full responsibility for the determination of an important asset price. However, policymakers might find the macroeconomic benefits of the second strategy comparatively easier to gauge and to explain to the public.

¹ Gagnon: Division of Monetary Affairs; Holscher: Federal Reserve Bank of New York. We thank Jim Clouse, Bill English, Mike Gapen, Dale Henderson, Spence Hilton, Andreas Lehnert, Brian Madigan, Wayne Passmore, and Dave Reifschneider for advice and comments.

² See Note 16, "Purchases of Longer-Term Treasury Securities."

Evidence on the Impact of Purchases

Outstanding agency debt and agency MBS combined, netting out agency holdings of agency MBS, are about \$7 trillion, somewhat larger than the \$5 trillion of marketable Treasury securities held by the public. As Note 16 discusses, a \$50 billion purchase of longer-term Treasury securities would reduce 10-year Treasury yields (holding short-term yields constant) by 2 to 10 basis points, based on the most plausible historical estimates. According to simple portfolio models, in order to have the same effect on yields, purchases need to be scaled by the size of the market; thus, a \$70 billion purchase of long-term agency debt or agency MBS would have the same effect on long-term agency yields as a \$50 billion purchase of long-term Treasury securities would have on long-term Treasury yields.³

The spreads between yields on agency debt and yields on comparable-maturity Treasury securities are well above historical averages, and, prior to the November 25 announcement, spreads of option-adjusted agency MBS yields over Treasury yields were also well above historical averages.⁴ Given the strained conditions in these markets, the prospect of a large Federal Reserve program to purchase agency debt and agency MBS could have a positive effect on sentiment that would lead to larger declines in their yields than implied by these historical estimates.

Standard portfolio models, such as the Capital Asset Pricing Model, imply that an exogenous change in the supply of one asset will affect yields on other assets according to the expected covariance of their returns. A reduction in the supply of an asset will tend to lower not only its yield, but also the yields of other assets whose yields move closely together. Table 1 displays the correlations of monthly changes in long-term interest rates since 1991.⁵ All of these markets are closely connected, providing support to the view that large-scale purchases of any long-term debt instrument should lower yields on other long-term debt securities. The correlation between agency MBS yields and conventional fixed mortgage rates is very high, suggesting that conventional mortgage rates will decline nearly one for one with agency MBS yields. Indeed, the link between conforming mortgage yields and agency MBS yields is even more direct than the links between other debt instruments; the difference between these yields reflects a relatively small and stable amount of guarantee and transaction fees.

The behavior of yields around the November 25 announcement provides further evidence on the efficacy of this policy tool. Assuming that the market expects a net

³ This analysis does not factor in differences in the maturity structure and duration of the agency market relative to the Treasury market. It also assumes that agency debt and agency MBS are close substitutes. Lehnert, Passmore, and Sherlund (2008) find that purchases of agency MBS funded by issuance of agency debt have little effect on mortgage rates (or agency MBS yields). However, yields on these assets have moved less closely together in recent months than under normal circumstances, suggesting that they may be less substitutable at present.

⁴ Option-adjusted yields are lower than coupon yields because they include an adjustment for the value of the prepayment option in the underlying mortgages.

⁵ Similar results hold for the post-2000 period. Correlations are generally lower, though still significantly positive, over the past 18 months.

	Treasury	Swap	MBS	Mortgage	AA	BBB
10-Year Treasury	1.00					
10-Year Swap	.97	1.00				
Fannie MBS	.91	.95	1.00			
30-Year Mortgage	.87	.90	.95	1.00		
AA corporate	.81	.80	.83	.80	1.00	
BBB corporate	.68	.66	.74	.72	.93	1.00

Treasury yield is on-the-run. MBS yield is coupon yield, not option-adjusted. Mortgage rate is conforming fixed rate. Corporate bond yields are 10-year.

increase in future government purchases of agency long-term debt and MBS equal to \$600 billion, the estimates discussed above imply that agency long-term debt and MBS yields would decline 17 to 85 basis points.⁶ On the day of the announcement, 10-year agency debt yields and option-adjusted agency MBS yields fell about 60 basis points, 10-year Treasury and swap yields fell about 20 basis points, and corporate bond yields fell about 10 basis points. However, some of these declines may have come in response to weaker-than-expected data releases that day. On the other hand, it is possible that the full market reaction to the program did not take place on the day; by November 28, all of these yields had fallen a further 10 to 20 basis points. Moreover, additional effects may be coming when actual purchases get underway.

Advantages and Disadvantages of Agency Purchases Relative to Treasury Purchases

A program of large-scale purchases of agency debt and agency MBS has significant advantages over comparable purchases of Treasury securities. Such a program would help to alleviate problems at the heart of the financial turmoil. It removes from the market assets that are in relatively low demand, as opposed to Treasury securities, which are in relatively high demand; thus, it may improve overall functioning in the fixed-income market. It is easier to explain the benefits of this policy tool to the public than the benefits of purchases of Treasury securities. Indeed, to the extent that it is clear that this policy is not permanent, it may encourage potential home buyers to enter the housing market in order to secure financing at an attractive rate; this could help to break the downward trend in house prices and establish a more favorable dynamic. The Mortgage Bankers Association reported large increases in mortgage applications during the week ending November 28 for both refinances and home purchases.

Dollar for dollar, this policy tool would provide more macroeconomic stimulus than purchases of long-term Treasury debt. Simulations with the staff's FRB/US model,

⁶ The volume of purchases was specified as "up to" \$600 billion, leaving open the possibility of a smaller program. Also, markets may now expect Treasury to abandon its program of purchasing agency MBS, ceding this role to the Federal Reserve, so that future government purchases of agency MBS on balance may have increased by less than the amount of the Federal Reserve program. On the other hand, the history of Federal Reserve actions over the past 15 months suggests that the program could be increased at a future date.

presented in Note 21, show that GDP rises slightly faster after large-scale purchases of agency MBS than after a similar magnitude of purchases of long-term Treasury securities. This result reflects the larger reduction in the private cost of capital that is assumed to occur through purchases of agency MBS. The lower cost of capital stimulates business and residential investment.

Other potential channels for this policy tool to support economic activity are not incorporated into FRB/US. For example, lower mortgage rates could prevent house prices from declining as much as otherwise, thereby minimizing the fall in private wealth and supporting consumption. Also, a wave of refinancing activity would raise disposable income for homeowners. Although this higher income would be offset to a large extent by reduced income to investors, about a quarter of the investors in mortgage-related assets are not U.S. residents, and investors in general may have a lower marginal propensity to consume than borrowers.

On balance, increased mortgage refinancing is probably a positive feature of this policy tool, as the current high risk spread evident in mortgage rates likely implies that borrowers would value the reduction in monthly payments more than investors.⁷ Holding the term of the mortgage constant, if the mortgage rate were to drop to 5 percent, households refinancing out of 6 percent mortgages would save about \$125 per month on a typical \$200,000 mortgage; moreover, these savings would last for the life of the loan. Overall, the gross boost to aggregate household income from this action would be roughly \$25 billion per year, given that about 80 percent of agency-backed mortgages have interest rates above 5½ percent, and so would be likely to be refinanced. Of course, a mass wave of mortgage refinancing might temporarily increase bond yield volatility as investors seek to maintain the duration of their portfolios as the mortgages they hold are prepaid.⁸ Nevertheless, this volatility would be only a transitory side effect of the beneficial transmission of lower long-term agency borrowing costs to long-term interest rates in other sectors.

This policy tool would tend to skew credit allocation toward one sector of the economy—something that, while perhaps appropriate at this time given the central role played by housing in the current crisis, would be unusual from a historical standpoint. Nonetheless, some distortion of credit allocation may be an acceptable price to achieve the Federal Reserve's dual mandate of maximum employment and price stability.

This policy tool would expose the Federal Reserve to minimal credit risk. The mortgages backing agency MBS are generally to borrowers with high credit scores and moderate loan-to-value ratios. Treasury has committed to providing at least \$100 billion in new capital to cover future losses for each of Fannie Mae and Freddie Mac, while

⁷ The agencies appear to be fairly well hedged against prepayment risk, including through use of short-term debt, callable debt, and swaptions. Fannie Mae's latest quarterly statement estimates that a 100 basis point decline in interest rates would cause it losses of only \$300 million.

⁸ Perli and Sack (2003) show that duration hedging activities by mortgage investors can temporarily magnify yield movements on Treasury securities when long-term yields move up or down.

Ginnie Mae has the full backing of the U.S. government.⁹ From the point of view of the overall U.S. government (assuming that the GSEs will not be allowed to fail) use of this policy tool would likely reduce credit risk exposure by making mortgage payments more affordable for many borrowers and also helping to stabilize house prices.

Implementation Strategy

There are two broad approaches to implementing this policy tool. The first approach is to announce a volume of purchases over a specific time period. Advantages to this approach include:

- It allows the Federal Reserve to maintain control over the size of its balance sheet.
- It is easier to balance purchases over different market segments, perhaps through an index replication strategy.
- It requires less active trading of the portfolio.
- It does not require the Federal Reserve to take full responsibility for the price of these mortgage-related assets.

The second approach is to try to set a target for, or a ceiling on, conventional fixed mortgage rates. For example, the Federal Reserve could announce a commitment to purchase at par all newly issued agency MBS with a given weighted average coupon in the to-be-announced market.¹⁰ Advantages of this approach include:

- It would provide a clear signal of policy, analogous to the regime of targeting the federal funds rate.
- It would be easily interpretable by the general public.

Setting a low ceiling on mortgage rates would likely spark a refinancing boom and the Federal Reserve would have to stand ready to purchase a potentially large volume of MBS. Given that 95 percent of agency-backed mortgages carry interest rates of 5 percent or higher, if the Federal Reserve were to set a mortgage rate ceiling much below this level, issuance of new MBS backed by refinanced mortgages could total \$5 trillion, or even more, to the extent that homeowners are able to increase the size of their mortgages or new buyers are drawn into the market. It is difficult to estimate the ultimate share of these MBS issues which the Federal Reserve would have to purchase.

⁹ Freddie Mac recently announced it had received \$14 billion in new capital from Treasury.

¹⁰ The weighted average coupon refers to the weighted average rate of an underlying mortgage pool, less servicing, guarantee, and other fees. It is the interest rate received by the holder of the MBS. Market participants have indicated that over 90 percent of all agency MBS are traded in the “to-be-announced” or “to-be-assigned” forward market. Certain characteristics of the underlying mortgages are specified when the trade is assigned, such as agency program and coupon rate. However, the terms of these transactions also typically allow for some variation in the characteristics of the underlying pool that will be delivered, resulting in a “cheapest-to-deliver” option for the seller of the contract.

The Federal Reserve's announcement on November 25, 2008 essentially was a compromise between these two strategies. It leaned toward the first strategy by announcing a specific number for the volume of purchases and no specific number for mortgage rates. However, the volume number was described as a ceiling, leaving open the possibility that a smaller volume might be purchased if the effect on mortgage rates is viewed as sufficiently large.

As with other nonstandard central bank policy tools, use of this tool would expand the volume of excess reserves. Should policymakers desire to sterilize some of the excess reserves created, the Federal Reserve could borrow against agency debt and MBS in the short-term repo market. Such borrowings would not undo the benefits to housing finance from the original purchases. However, the markets for non-Treasury repo collateral have been strained in recent months, and a large volume of additional borrowing demand could put further pressure on spreads and haircuts in this market. On the other hand, Federal Reserve purchases of a substantial quantity of agency securities might improve conditions in the agency repo market even if a substantial volume was financed through repo borrowing.

Operational Considerations

The Markets Group at the Federal Reserve Bank of New York currently does not have the capacity to execute monetary policy objectives in the agency MBS market and thus this activity is being outsourced to an external asset manager.¹¹ Hiring an outside manager raises concerns about the confidentiality of Federal Reserve trading strategy and the potential for "front-running" by the manager or by third parties in contact with the manager. In addition, the System will need to devise non-market performance measures by which to monitor the money manager.

As with purchases of long-term Treasury securities, this policy tool exposes the Federal Reserve to possible capital losses in the future should long-term interest rates rise above the levels that prevailed at the time the assets were purchased. The risk of such losses is compensated by the extraordinary profits that will accrue to the Federal Reserve from the extra asset holdings, financed by zero- or low-interest-rate reserves, in the period prior to any future capital loss. Moreover, maximizing its net worth is not part of the Federal Reserve's legislative mandate.¹²

The Federal Reserve should keep in close contact with the Treasury and the Federal Deposit Insurance Corporation regarding their plans for supporting mortgage markets, including through subsidized loan rates and assistance with restructuring

¹¹ Agency MBS are much more complicated than Treasuries or agency debt, and holding them directly would require significant outlays in personnel and technology to properly execute trades and perform all post-execution functions. In addition, time to implementation could prove unacceptably long. In 2003, staff at the Federal Reserve Bank of New York estimated that the effort to prepare to buy Ginnie Mae MBS would take 2 to 5 years.

¹² As long as the Federal Reserve can set the interest rate on its liabilities at zero, as it always did prior to this year, it need not have a positive net worth to maintain budgetary independence.

troubled loans. Ideally, our actions would complement these other actions and not appear to create confusion.

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