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The Impact of the Fed's Mortgage-Backed Securities Purchase Program

By Johannes C. Stroebel and John B. Taylor

Some of the big questions looming about the Fed's exit strategy are if, when and at what pace the Fed should draw down its huge portfolio of mortgage-backed securities (MBS). At its meeting on December 15-16, 2009, the Federal Open Market Committee announced that it was continuing its MBS purchases at a "gradually slowing pace," but this will still leave \$1,250 billion in MBS on the Fed's balance sheet at the end of the first quarter of 2010. Another, more long-term question is whether such price-keeping operations—a term used by Peter Fisher, who once ran the trading desk at the New

York Fed (Fisher, 2009)—should be a regular part of monetary policy in the future. Brian Sack, who now runs the trading desk, concludes in a recent speech that they should be (Sack, 2009).

The answer to these important questions requires an empirical assessment of the impact of the MBS purchase program. The program was introduced with the explicit aim of reducing mortgage interest rates (Board of Governors, 2008). Conventional wisdom is that the program has been successful at achieving this aim. Figure 1 shows that contemporaneously to the *continued on inside...*

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increase in the volume of MBS held by the Fed (and Treasury, which had introduced an earlier, smaller program) there was a decline in primary and secondary market mortgage spreads¹. Evidence such as this has motivated Ben Bernanke to argue as early as January 2009 that “[...] mortgage rates dropped significantly on the announcement of this program and have fallen further since it

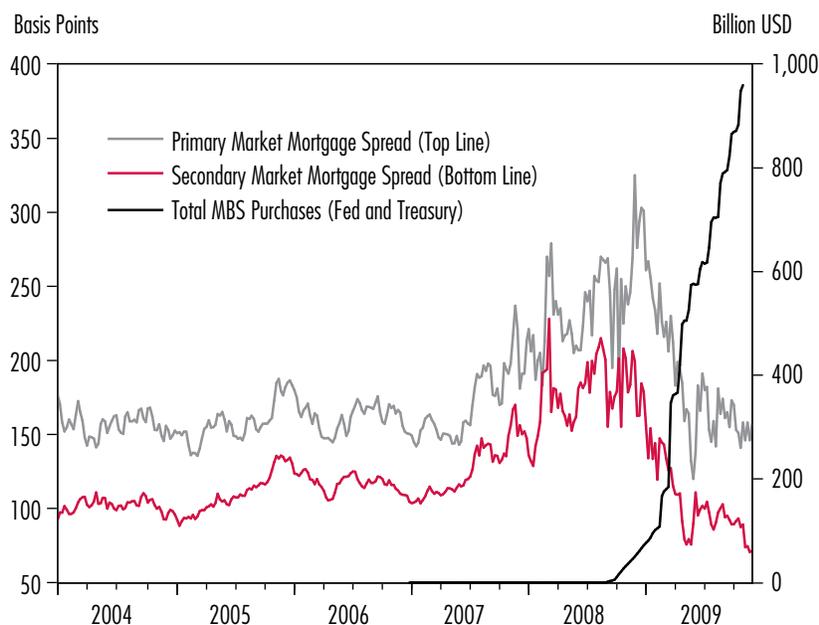
went into operation.”

However, in our view it is important to determine whether such statements can be supported by econometric analysis that controls for influences other than the MBS purchase program on mortgage spreads. In particular, any coherent story that links the decline in mortgage interest rates to the purchases of MBS by the Fed also needs to explain why mortgage spreads increased

so dramatically between 2007 and late 2008 and to consider whether those same factors may be responsible for at least part of the subsequent decline in 2009. It is conceivable that precisely those indicators of risk in mortgage lending that drove up mortgage spreads through 2007 and 2008 relaxed throughout the first half of 2009, providing a coherent theory for both the rise and the subsequent fall of mortgage spreads, without a large role for the government purchases.

Such an assessment requires that one carefully considers other influences on spreads of mortgage-backed securities. We focus on two obvious ones: prepayment risk and default risk. Mortgage-backed securities are structured products that are collateralized by residential mortgages. Most of these mortgages entail a prepayment option by the individual borrower, which gives the borrower the right to prepay the

Figure 1
Mortgage Spreads and Stock of MBS Purchases



¹ The primary market mortgage rate series comes from Freddie Mac's Primary Mortgage Market Survey. The secondary market mortgage is the Fannie Mae MBS 30-Year Current Coupon. The spreads are created by subtracting the yield on 10-year Treasuries from both series. The maturity difference between these series captures the fact that most 30-year mortgages are paid off or refinanced before their maturity.



mortgage at any time prior to the maturity of the loan and thereby to refinance at a favorable rate. Yields of mortgage-backed securities are adjusted upward to compensate the holder for this inherent prepayment risk, the value of which varies over time. We control for the prepayment risk in the underlying mortgages by considering the effect of the MBS purchase program on the swap option-adjusted spread (Swap-OAS), which is regularly used by MBS traders and investors. The OAS is the yield-spread of the MBS over a term structure of alternative interest rates after controlling for the value of the prepayment option. More details on the calculation of the OAS can be found in Stroebel and Taylor (2009) and in Windas (1996).

We control for default risk in our regressions by using spreads on senior and subordinated agency debt. In the case of agency-insured MBS, the default risk is related to the default risk of the underlying mortgages as well as to the potential of the

insuring government sponsored enterprise (GSE) being unable to meet its guarantee obligations. The ability to fulfill its pledge is a function of the health of the housing market and of a number of political factors that determine whether the government would eventually act as a backstop to GSE-issued guarantees. Since MBS guarantees rank *pari passu* to senior bonds, we believe that the spreads of agency senior and subordinated debt to Treasuries capture the default risk of agency-insured MBS well. Since the Fed intervened in the agency-debt market too (albeit to a smaller degree), we also use an alternative specification in which we instrument for the default risk with changes in house prices and general credit market indicators—our results are robust to such alternative specifications.

When we control for these other factors that influence the option-adjusted spread, we find that the MBS purchase program has not had an economically or statistically significant effect on

mortgage spreads. Our results, which are outlined in more detail in Stroebel and Taylor (2009), can be summarized as follows:

1. Using conventional option-adjusted spreads (OAS) based on LIBOR (London Inter-Bank Offered Rate) swaps to control for prepayment risk, we find that the MBS program has had *no significant effect*. Movements in prepayment risk and default risk explain virtually all of the movements in mortgage spreads. In particular, the decline in the OAS that occurred during the period of the MBS program can be better explained by a general decline in default risk.

Figure 2 illustrates this finding. It shows the swap option-adjusted spread (with its prepayment risk adjustment) in grey and the prediction of that spread using the agency debt spread (a measure of default risk) in red. We can see that movements in

default risk can explain the movement in Swap-OAS very well. The residual between the actual and the predicted Swap-OAS series, shown in black at the bottom of the graph, indicates that there is little left for the Fed's MBS portfolio to explain.

2. A more significant effect on mortgage spreads—*about 30 basis points*—can be found if one uses an alternative measure of OAS based on the Treasury yield curve, but even with this measure the volume

of purchases has no effect over and above the mere existence of the program. In other words the impact has not increased with the additional purchases of MBS since the start of the program. The higher estimated impact of Treasury-OAS compared with Swap-OAS is related to movements in the so-called TED spread between LIBOR and Treasury rates, which is unrelated to the MBS program.

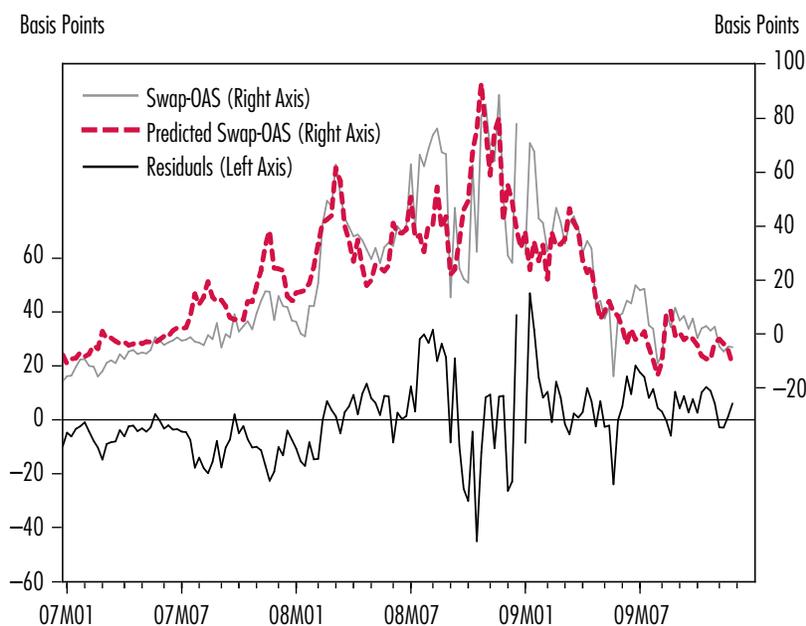
3. Estimating the impact using indirect methods to control

for prepayment risk generally confirms the analysis using OAS but shows somewhat larger effects in the secondary market. The impact of the program on primary market spreads *ranges from the wrong sign and insignificant to around 30 basis points*. For secondary market rates the impact is larger—in the *30 to 60 basis point range*—which corresponds to a less than full pass-through of any impact to primary mortgage spreads. In general, we find somewhat smaller effects when we control for default risk using senior agency debt than we do with subordinated agency debt or instrumental variables.

We emphasize that analyzing the effectiveness of the MBS purchase program is very difficult. The creation of adequate counterfactuals is complicated by the simultaneous government interventions in a large number of markets. Furthermore, the conservatorship status of the

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Figure 2
Residual Analysis of Swap-OAS





GSEs has contaminated many of the relevant GSE-default risk proxies that are most important to control for when analyzing the development of spreads on GSE-insured MBS. Nevertheless, the lack of publicly available statistical studies on the effectiveness of the Fed's program is worrying. We note that our estimates of the impact are much smaller than the impacts reported in the recent speech by Sack (2009). If our estimates hold up to scrutiny, they raise doubts about price-keeping operations such as the MBS purchase program and suggest that the Fed could gradually reduce the size of its portfolio without a significant impact on the mortgage market.

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