# Why an MBS-Treasury swap is better policy than the Treasury twist

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This note compares the effect of an MBS-Treasury swap (a strategy of purchasing long-maturity agency MBS and selling long-maturity Treasury bonds) versus the Treasury twist (purchasing long-maturity Treasury bonds and selling short-maturity ones).

We make two main points:

1. Purchasing long MBS brings down long MBS yields by more than would an equal sized purchase of long Treasury bonds and thus is likely to create a larger stimulus to economic activity via a larger reduction in homeowner borrowing costs
2. Purchasing Treasury bonds brings down Treasury yields, but part of this decrease indicates a welfare cost rather than a benefit to the economy. Thus it would be better to sell rather than purchase long-term Treasury bonds.

These points lead us to conclude that a superior large-scale asset purchase policy for the Fed is an MBS-Treasury swap where the Fed purchases long-maturity MBS, financed by a sale of long-maturity Treasury bonds.

MBS rates fall more when the Fed purchases MBS than when it purchases Treasuries

Krishnamurthy and Vissing-Jorgensen (*Brookings Papers on Economic Activity,* 2011) document that purchasing long-term MBS is more effective at lowering long-term MBS yields than purchasing long-term Treasuries, and discuss evidence provided by other researchers that such reductions in secondary market rates reduce primary market rates.

First, we argue that one cannot reconcile the impact of QE1 on Treasury, agency, agency MBS, and corporate rates without ascribing the majority of the reduction in MBS rates to the purchases of MBS (with a smaller role played by a signaling channel i.e. that QE made markets expect that the Fed would hold short-rates down for longer than previously anticipated, thus lowering long yields via the expectations hypothesis). A central part of the argument is that CDS-adjusted rates on lower-grade corporate bonds did not fall by more than what can be accounted for by the signaling channel and long CDS-adjusted corporate bonds yields did not fall by more than intermediate ones. Therefore, yield reductions cannot be driven simply by a reduction in duration risk premium, leaving changes in the price of pre-payment risk due to QE1's MBS purchases as a more likely channel for explaining the large reductions in MBS yields

seen on the main QE1 announcement dates. Second, in QE2 (which unlike QE1 focused its purchases on Treasuries), MBS rates fell only by what can be explained by the signaling channel, consistent with the argument above that the MBS purchases in QE1 in fact were crucial for lowering MBS yields in QE1. Third, the policy changes on September 21, 2011 provide an ideal setting for comparing the effects of equal-sized purchases of Treasuries and MBS. The statement read:

> *"To support a stronger economic recovery and to help ensure that inflation, over time, is at levels consistent with the dual mandate, the Committee decided today to extend the average maturity of its holdings of securities. The Committee intends to purchase, by the end of June 2012, $400 billion of Treasury securities with remaining maturities of 6 years to 30 years and to sell an equal amount of Treasury securities with remaining maturities of 3 years or less. …"*

The Fed's intention to do a Treasury twist was widely anticipated by markets, although the size of the purchase was still a surprise. However, the next part of the statement was a surprise:

> *"To help support conditions in mortgage markets, the Committee will now reinvest principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities."*

Prior to this announcement, principal payments from the Fed's holdings of agency debt and agency MBS had been invested in Treasuries, amounting to purchases of around $200B per year. Market participants had not anticipated that the twist would also involve purchases of long-maturity MBS so this announcement provides a unique setting for comparing the effect of MBS purchases to the effects of an equal-sized purchase of Treasuries holding the purchase of duration fixed, but increasing the amount of MBS-specific risk purchased.

| Asset | One-day change in Yield |
|---|---|
| 1-year Treasury | +2 basis points (bps) |
| 3-year Treasury | +7 bps |
| 7-year Treasury | -3 bps |
| 10-year Treasury | -7 bps |
| 15-year MBS | -7 bps |
| 30-year MBS | -23 bps |

*Source: Federal Reserve, Bloomberg (MBS is average of current coupon of GNMA, FNMA, FHLMC).*

The table above gives the one-day change in yields (from end of day on September 20 to end of day on September 21) on Treasury bonds and Agency MBS bonds. The numbers indicate that the Treasury twist component lowered long-maturity yields and raised short-maturity yields, as one would expect. We interpret the fall in the 10-year Treasury yield as being through an increase in the scarcity price premium on long-term Treasury bonds (discussed more below).

The table also indicates that the largest move in yields was for the 30-year MBS, which fell by 23 basis points. The 30-year MBS has duration of roughly 7 years, so that if one thought of the Fed's purchase simply in terms of purchasing duration (as is common among many commentators, but which we argue against in our other writings), then the 30-year MBS and the 7-year Treasury should fall by the same amount. The fact that the MBS falls 20 basis points more indicates that the announcement must have worked through taking out mortgage-specific risk such as prepayment risk via additional purchases of MBS (relative to expectations prior to this announcement).

Welfare cost of Treasury purchase

As we have shown elsewhere (Krishnamurthy and Vissing-Jorgensen, *Brookings Papers on Economic Activity,* 2011) purchasing Treasuries lowers long Treasury yields. The effect occurs through two channels. The *signaling channel* mentioned above leads markets to expect the Fed to hold short-rates down for longer than previously anticipated. This channel will also affect private market rates such as those on MBS or corporate bonds. The *safety* channel is that by purchasing long-term Treasury bonds the Fed shrinks the supply of extremely safe assets, which drives up a scarcity price-premium on such assets and lowers their yields. This latter channel is a welfare cost to the economy.

To be more precise, we have argued elsewhere that Treasury bonds trade at a price-premium because of the scarcity of assets with extremely low default risk and extremely high liquidity (see Krishnamurthy and Vissing-Jorgensen, *Journal of Political Economy,* 2012). The safety premium is driven by the economic benefit Treasuries provide as high-quality collateral and a long-term extremely safe (in nominal terms) store of value (something that may be particularly valued by pension funds and insurance companies to the extent these have liabilities that are fixed in nominal terms). One way to think about investor willingness to pay extra for assets with very low default risk, and to distinguish our explanation from a conventional asset pricing relation between default risk and risk premia, is to plot an asset's price against its expected default rate. We argue that this curve is very steep for low default rates, with a slope that flattens as the supply of Treasuries increases.

By reducing the supply of Treasury bonds, the economy is deprived of extremely safe and liquid assets and welfare is reduced. How much is welfare reduced? The answer depends on the

current scarcity price premium (for extreme safety and liquidity) on long-term Treasury bonds. This premium is not directly observable, so we outline two rough ways to assess it, both based on data from 7/20/2012.

Our first approach is to take the yield on Barclays' US corporate investment grade bond index which is 2.96%. Barclays state that the duration of this index is 7.14 years. The Markit index for investment grade CDS for 7 year tenor is 1.31%. Thus, a credit-risk adjusted investment-grade bond yield is 1.65% ($= 2.96\% - 1.31\%$). This yield corresponds to an asset that via a derivative is a riskless bond. The 7-year constant maturity Treasury yield is 0.95%. Thus an estimate of the scarcity value of the Treasury is 70 basis points ($= 1.65\% - 0.95\%$). Note that this number is likely a lower bound because implicit in our computation is the assumption that a derivative-hedged corporate bond does not satisfy investor's demand for extremely safe/liquid long-term assets (due to e.g. counter-party risk on the CDS contract or lack of demand for corporate bonds from foreign central banks).

Our second approach is to calculate another lower bound based on the logic of Fleckenstein, Longstaff and Lustig (working paper, 2010). The 10-year constant maturity TIPS yield is -0.67%. The 10-year inflation swap yields 2.40%. Thus purchasing the TIPS and received fixed on the swap, to eliminate variability in the inflation-linked payments, produces a yield of 1.73% ($= 2.40\% - 0.67\%$). The 10-year constant maturity Treasury yield is 1.49%, implying a yield discount on (nominal) Treasuries of 24 basis points. Again this is a lower bound because the hedged-TIPS are likely a substitute for Treasuries for at least some investors.

We use the average estimate (average of 70 and 24) of 47 basis points as the Treasury yield discount. We translate this into units of a price premium on a 10-year bond based on modified duration of the 10-year bond of 9, giving a price premium of 4.23%. Consider a hypothetical purchase of $500 billion of 10-year Treasury bonds. Holding the scarcity premium fixed, the purchase reduces consumer surplus by $4.23\% \times 500 = \$21$ billion.

The yield discount is likely to rise with such a purchase. The decrease in consumer surplus from the Treasury purchase is equal to the integral under the demand curve for Treasury bonds, based on a quantity reduction of $500 billion of Treasury bonds. In Krishnamurthy and Vissing-Jorgensen (*Brookings Papers on Economic Activity,* 2011, Section 5.c) we laid out a computation that estimated that a $511 billion purchase will increase the premium by between 8 and 20 basis points in terms of yields. We use the average increase of 14 basis points, which translates to a price premium increase of 1.26% on a 10 year bond. Taking a linear demand curve with slope of 1.26% per $511 billion gives a total decrease of surplus of $\frac{1}{2} \times 1.26\% \times \frac{500}{511} \times 500 + 4.23\% \times 500 = \$24$ billion.

Finally, the liquidity/safety premium on short-term Treasury bonds is quite small now (this is not the case historically). One way to see this is to compare the yield on the safest commercial paper to that on Treasury bills. This yield spread captures the lack of liquidity in the CP market as well as the differential credit risk of CP and T-bills. 3-month nonfinancial commercial paper based on the Fed's 7/20 H15 release was 0.19%, while the yield on 3-month Treasury bills was 0.09%, implying that both the equilibrium price of liquidity and the equilibrium price of extreme safety for short durations must be small, adding up to at most 10 basis points (``at most'' because we have neglected to adjust for any credit risk effects here to assess the extreme safety effect). Note that the low current price of liquidity for short-term bonds is likely at least in part to the large injections of reserves under QE1 and QE2.

Thus, it is not the case that by supplying more short-term Treasury bonds in a twist that the Fed undoes the welfare cost of purchasing long-term Treasury. This is because the higher scarcity premia on long-maturity Treasuries relative to short-maturity ones indicates that the scarcity at present is primarily on long-maturity Treasury bonds.

In sum

A policy of buying long-term MBS and selling long-term Treasuries would both (1) generate larger effects on MBS rates (and thus on household mortgage rates) than an equal-sized purchase of long-term Treasuries and (2) inject long-term Treasuries back into the economy thus generating a welfare increase from increasing the supply (to the private sector) of assets trading at low yields due to their extremely high safety.

References

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