



Analyzing Federal Reserve asset purchases: From whom does the Fed buy?



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ABSTRACT

Asset purchases have become an important monetary policy tool of the Federal Reserve in recent years. To date, most studies of the Federal Reserve's asset purchases have tried to measure the interest rate effects of the purchases, and several provide evidence that these purchases do have important effects on longer-term market interest rates. The theory of how asset purchases work, however, is less well developed. Some of the empirical studies point to "preferred habitat" models in which investors do not have the same objectives, and therefore prefer to hold different types and maturities of securities. To study this more closely, we exploit Flow of Funds data to assess the types of investors that are selling to the Federal Reserve and their portfolio adjustment after these sales, which could provide a view to the plausibility of preferred habitat models and the transmission of unconventional monetary policy across asset markets. We find that the Federal Reserve is ultimately buying from only a handful of investor types, primarily households (which includes hedge funds), with a different reaction to changes in Federal Reserve holdings of longer-term versus shorter-term assets. Although not evident for all investors, the key participants are shown to rebalance their portfolios toward more risky assets during this period. These results can be interpreted as supporting, at least in part, the preferred habit theory and the view that the monetary policy transmission is working across asset markets.

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1. Introduction

Asset purchases and sales ("asset programs") have become an important tool of the Federal Reserve in recent years. The intent of the asset programs to date is to put downward pressure on longer-term interest rates in order to provide additional monetary policy accommodation when further reductions in the federal funds rate are constrained by the zero lower bound. Whether and how these tools of monetary policy are effective are critical questions for the economics profession.

To date, most studies of the Federal Reserve's asset programs have tried to answer whether these actions are effective at lowering longer-term interest rates and try to calibrate the interest rate effects of the policies. Several papers, such as Gagnon et al. (2011), D'Amico and King (2013), Krishnamurthy and Vissing-Jorgensen (2011), Li and Wei (2013), Wright (2012) and Ihrig et al. (2012) provide evidence that the asset programs do have important

effects in lowering longer-term market interest rates in the U.S.; Kapetanios et al. (2012) find evidence for the UK as well. These lower interest rates resulting from asset purchases, in turn, lead to a moderate boost to the economy, as shown by Chen et al., 2012. These studies employ a variety of techniques, from event studies, to time-series regression, to modeling the yield curve, to dynamic-stochastic general equilibrium models of the yield curve. Although some look to explicit measures of changes in the supply of longer-term securities to the markets as explanatory variables, they do not, in general, rely on a theoretical model as a basis for the estimation.

Indeed, the general theory of how asset purchases and sales by the central bank works is less well developed. Vayanos and Vila (2009) and Li and Wei (2013) point to "preferred habitat" models to provide a rationale. Preferred habitat models assume that there is a variety of investor types who have dissimilar objectives and, therefore, prefer to hold different types and maturities of securities. In such models, buying longer-term securities can affect longer-term rates because some investors are less willing to substitute into other assets. As a result, the prices of longer-term assets

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increase when the central bank decreases the supply of those assets relative to other assets.¹

In this paper, we exploit Flow of Funds data (described in the next section) to identify which types of investors are selling to the Federal Reserve during four different asset programs: the large-scale asset purchase program (LSAP) that took place from November 2008 to June 2010 (LSAP1); LSAP2, from November 2010 to June 2011; the maturity extension program (MEP), from September 2011 to December 2012; and the reinvestment program for proceeds of maturing and prepaying mortgage-backed securities, from August 2010 to December 2012. Then, knowing how these investors adjust the remainder of their portfolio provides some guidance on how monetary policy is transmitted across asset classes. Uncovering which investors are willing to sell securities when the Federal Reserve conducts purchases could offer some support for preferred habitat models. More generally, understanding how Federal Reserve purchases affect the portfolios of private-sector investors may provide insight into how the tool works in various settings. In addition, evaluating investor preferences could also provide some guidance as to how an unwinding of the Federal Reserve's balance sheet may affect financial markets and hence shed some light onto the likely market response as the Federal Reserve exits from its accommodative policy stance.

Overall, our results suggest that the Federal Reserve is ultimately interacting with only a handful of investor types. Households (the group that includes hedge funds)², broker-dealers, and insurance companies appear to be the largest sellers of Treasury securities when the Federal Reserve buys these securities. Households, investment companies, and to a lesser extent, pension funds, are the largest sellers of MBS when the Federal Reserve buys. With both the Federal Reserve's Treasury and MBS purchases, our results suggest that households are the largest, ultimate seller. Moreover, different investor types appear to react dissimilarly to changes in Federal Reserve holdings of longer-term versus shorter-term assets. This latter result is relevant for considering the maturity extension program (MEP) under which the Federal Reserve sold shorter-dated Treasury securities and bought long-term Treasury securities. Overall, these results can be interpreted as supporting, at least in part, the preferred habitat theory.

Focusing on those investors that are participating in the Federal Reserve's asset programs, additional investigation shows how these investor types' portfolios adjust in response, which provides insight into the transmission of the Federal Reserve's asset purchases to broader financial markets. In particular, our results suggest that "households" – one of the investor classes most likely to sell to the Federal Reserve – reallocate their portfolios coincident with Federal Reserve purchases. Federal Reserve purchases of Treasury securities and MBS induce households to shift toward corporate bonds, commercial paper, and municipal debt and loans. In addition, when pension funds sell MBS to the Federal Reserve, they then shift their portfolio toward repurchase agreements, or very short-term assets. This evidence of shifting investors from one asset class to another points to a credible monetary policy transmission channel for the effects of asset purchases on broader financial markets.

The remainder of this paper is as follows. We start with a discussion of the data. Then we focus on how the major investors and the Federal Reserve are interacting within the asset programs. From there we see how these investors rebalance their portfolios. Finally, we conclude.

¹ Polkovnichenko (2005) finds similar evidence for households of "preferred habitat" behavior, or preferences over portfolios that deviate from traditional portfolio choice models. Lu (2013) also discusses new theoretical bases for quantitative easing.

² As will be discussed in more detail in the Data section, households not only include "true" households but also hedge funds and a few other investor types.

2. Data

We focus our analysis on the low-frequency relationship of how securities move between the Federal Reserve and the ultimate counterparties. The Flow of Funds data published by the Federal Reserve Board provides, at a quarterly frequency, an accounting of holdings of different asset types by various entities.³ The data are measured in billions of dollars as a level at the end of the period, and are not seasonally adjusted.

There are two noteworthy limitations of the data, although the impact of these limitations are likely small. First, the actual asset purchases and sales—"open market operations"—that the Federal Reserve conducts are performed with the primary dealers as counterparties.⁴ However, the primary dealers may be, to some extent, a conduit between the Federal Reserve and the ultimate holder of the security. Specifically, for the primary dealers to be able to sell a substantial amount of securities to the Federal Reserve, they would have to buy those securities in the market. The purchases by the dealers could be done in anticipation of Federal Reserve purchases, however; most programs have lasted several months to over a year. As such, a low-frequency analysis over a long period seems appropriate for uncovering the ultimate counterparties to the Federal Reserve. Second, for the sample covered in our analysis, there is not a series for agency MBS separate from that for agency debt. Consequently, our analysis focuses on changes in the holdings in both together for the different entity types. While this construction may bias our results to some degree, over this period, most of the Federal Reserve's changes in holdings were of agency MBS, and as reported on selected GSE filings, the amount of agency MBS outstanding is about twice that of agency debt.

We use data beginning in 1991:Q1 and ending in 2012:Q3 for our analysis. This long sample ensures that the results are not skewed by recent, unusual actions by the Federal Reserve. That said, to confirm that the results are indicative of the asset programs, we analyze a shorter sample as well.

We focus on the nine largest investor types in the data: the rest of the world, depository institutions (DIs), insurance companies, investment funds, pension and retirement funds, state and local governments, broker-dealers, households and the Federal Reserve. Table 1 shows summary statistics on these categories. These investors represent over 80 percent of Treasury and agency securities holdings. Much attention in popular press has been given to the amount of U.S. debt, especially federal debt that is held by foreign investors. As a result, the "rest of the world" category is of particular interest. Because the asset programs have resulted in a large increase in the quantity of reserve balances in the banking sector, understanding if DIs have sold assets to the Federal Reserve sheds some light on the evolution of banks' balance sheets over the course of the programs. Finally, it should be noted that the "household" category is perhaps a bit different than the label might imply. Given the conventions and information available in generating the Flow of Funds data, hedge funds are usually included in the "household" category.⁵ As a result, instead of reflecting the actions

³ Flow of Funds data and information about the data are available at <http://www.federalreserve.gov/releases/z1/>.

⁴ The list of primary dealers is available on the website of the Federal Reserve Bank of New York. http://www.newyorkfed.org/markets/pridealers_current.html. A general discussion of open market operations is available at <http://www.newyorkfed.org/markets/openmarket.html>.

⁵ The Flow of Funds description of the household sector states "the values for the household sector are calculated as residuals. That is, amounts held or owed by the other sectors are subtracted from known totals, and the remainders are assumed to be the amounts held or owed by the household sector. ...because of the residual nature of the household sector, assets of entities for which there is no data source, such as domestic hedge funds, private equity funds, and personal trusts, are included in this sector." See <http://www.federalreserve.gov/apps/fof/DisplayTable.aspx?t=1.100>

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