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## Summary of Neely (2011): “The Large-Scale Asset Purchases Had Large International Effects”<sup>1</sup>

### Background

A number of studies, e.g., Gagnon et al. (2010), Hamilton and Wu (2010), D’Amico and King (2010), consider the domestic effects of the Fed’s large-scale asset purchase (LSAP) program. However, the LSAP affects international asset prices, as well, including bond yields and exchange rates, because risk-arbitrage ties expected international returns closely together in a world of capital mobility. That is, if the LSAP reduces U.S. bond yields, international investors will tend to bid up the prices of similar foreign bonds, reducing their yields. Neely (2011) evaluates how the LSAP affected international long bond yields and exchange rates, then considers whether the observed behavior is consistent with a simple portfolio balance model and standard exchange rate parity conditions.

Because financial markets react rapidly to publicly available information, LSAP news—not the transactions—should immediately affect asset prices.<sup>2</sup> Therefore, an event study is most appropriate to estimate LSAP effects.<sup>3</sup> An event study accurately estimates the effect of the event on asset prices if all changes in expectations about the event occur within the event windows and the event drives all changes in expectations during event windows. While this is not exactly true, Neely argues that it is a reasonable approximation for the November 2008 and March 2009 LSAP announcements.

Gagnon et al. (2010) describe the LSAP’s institutional details as follows: The Federal Reserve Bank of New York purchased Treasury, MBS, and agency debt securities across the yield curve, with maturities from 3 months to 30 years, but bought most heavily in 4- to 10-year and “underpriced” issues. The rate of purchase was fairly steady, but increased (decreased) when liquidity was good (poor). Gagnon et al. (2010) estimate that the \$1.725 trillion total debt purchase of the December 2008 and March 2009 rounds of quantitative easing was 22 percent of the long-term agency debt, fixed-rate agency MBS, and Treasury securities outstanding as of November 24, 2008, just prior to the first LSAP announcement.

### Methods and Results

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<sup>1</sup> These summaries have been prepared by the St. Louis Fed’s research staff and are designed to provide a general audience overview of the authors’ research. Any errors present or misinterpretations of the authors’ views are the sole responsibility of the St. Louis Fed’s staff. The views expressed in these summaries do not necessarily reflect the official positions of the Federal Reserve Bank of St. Louis, the Federal Reserve System, or the Federal Open Market Committee.

<sup>2</sup> D’Amico and King (2010) find that transactions affect the specific securities purchased. These effects are very small compared with the announcement effects, however.

<sup>3</sup> The “event window” is the range of time around an event in which an asset price change is calculated.

Neely divides the important LSAP events into five “buy” events that discussed or announced future purchases of assets and three “sell” events that discussed or announced delays or reductions in future purchases of assets. These events are the same as those identified in Gagnon et al.

The five LSAP buy announcements were associated with large cumulative changes in foreign bond yields: Australian, Canadian, German, Japanese, and British long bond yields cumulatively fell by 78, 54, 50, 19, and 65 basis points during the two-day windows around five Fed announcements or speeches that discussed increasing asset purchases. The USD cumulatively declined by 3.6 percent to almost 10.8 percent—depending on the currency—over these five buy days, and these declines were very large compared with the typical movements in the value of the dollar. These changes in international interest rates and exchange rates closely followed LSAP announcement times and were very unlikely to have occurred by chance. That is, the LSAP announcements substantially reduced international long-term bond yields and the spot value of the dollar.

The “sell” events had very minor and inconsistent effects on international bond yields and asset prices, probably because the information was much less important than for the buy events.

Are the observed changes in yields consistent with a simple model of how investors might reallocate their portfolios after a big change in the available supply of U.S. government bonds? To quantify how much of an effect on U.S. and foreign bond returns to expect from the LSAP, Neely considers a standard portfolio allocation (a “portfolio balance”) model for an investor who cares about the mean and variance of his returns. This hypothetical investor represents all agents except the Federal Reserve and the U.S. government.

With asset return data from January 1985 to May 2010, Neely uses the portfolio balance model to predict the effect of a 22 percent reduction in the publicly held quantity of U.S. securities (including guaranteed securities) on asset returns. The estimated model implies that this purchase would reduce the real returns (in U.S. dollars) to foreign 10-year bonds by 20 to 135 basis points. The model also predicts that real U.S. 10-year bond returns would decline somewhat more, by 30 to 150 basis points.

After converting the observed changes in bond nominal yields to likely changes in real dollar returns, we find that the actual changes in international yields are fairly consistent with those of the simple portfolio balance model. The changes in U.S. real yields (about 185 basis points) are even greater than those predicted by the model.

In addition to calculating whether the bond yield changes were consistent with the portfolio balance model, one can also calculate whether the observed changes in dollar exchange rates were consistent with the observed changes in relative U.S./foreign interest rates and inflation expectations using two commonly used parity conditions: purchasing power parity (PPP) and uncovered interest parity (UIP).<sup>4</sup>

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<sup>4</sup> PPP describes the tendency of exchange rate changes to be determined by relative inflation rates over time. UIP suggests that the interest rate differential should determine exchange rate changes. Neither parity condition fits the data very well, but both are still benchmark conditions.

Neely finds that the exchange rate changes implied by PPP and UIP are about twice as large as the 4 to 11 percent USD immediate depreciations observed in the actual data around LSAP buy announcements. In other words, the LSAP announcements prompt smaller exchange rate responses than parity conditions predict, but the actual responses are qualitatively consistent with those predictions.

### **Conclusions**

The LSAP's success in reducing international long-term interest rates and the value of the dollar shows that central banks are not toothless when short rates hit the zero bound.