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International channels of the Fed's unconventional monetary policy[☆]



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Previous research has established that the Federal Reserve's large scale asset purchases (LSAPs) significantly influenced international bond yields. We use dynamic term structure models to uncover to what extent signaling and portfolio balance channels caused these declines. For the U.S. and Canada, the evidence supports the view that LSAPs had substantial signaling effects. For Australian and German yields, signaling effects were present but likely more moderate, and portfolio balance effects appear to have played a relatively larger role than in the U.S. and Canada. Portfolio balance effects were small for Japanese yields and signaling effects basically nonexistent. These findings about LSAP channels are consistent with predictions based on interest rate dynamics during normal times: Signaling effects tend to be large for countries with strong yield responses to conventional U.S. monetary policy surprises, and portfolio balance effects are consistent with the degree of substitutability across international bonds, as measured by the covariance between foreign and U.S. bond returns.

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1. Introduction

In response to the extreme credit market disturbances in the fall of 2008, the Federal Reserve lowered the Federal funds rate target to near-zero, announced unprecedented bond purchases, and offered forward guidance to markets to reduce expectations of future short rates. Eventually, the Fed would announce three rounds of asset purchases that would total over \$3 trillion from November 2008 through 2013. Federal Open Market Committee (FOMC) statements and speeches described the motives for these asset purchases in several ways but repeatedly returned to the themes of directly supporting credit markets—especially for housing—to reduce medium- and long-term U.S. interest rates in order to ultimately stimulate real activity. Other central banks, that is, the Bank of Japan, the Bank of England and the European Central Bank, would later initiate or expand similar programs. A growing literature studies the empirical effects of these unconventional policies. For the United States, the event study estimates of [Gagnon et al. \(2011\)](#) and [Krishnamurthy et al. \(2011\)](#) establish that the Fed's asset purchases strongly affected domestic bond yields. [Neely \(2013\)](#) finds that the purchases had substantial international effects on bond and foreign exchange markets.

Announcements of large scale asset purchases (LSAPs) can affect government bond yields through both signaling and portfolio balance channels. The signaling channel implies that investors interpret asset purchase announcements as implying a lower path for future short-term interest rates, which reduces the expectations component of long-term interest rates.¹ On the other hand, asset purchases can also affect prices of imperfectly substitutable assets through the portfolio balance channel. A purchase of U.S. bonds can reduce the term premia in both U.S. long-term yields and in international substitutes.

A crucial question is how important signaling and portfolio balance channels are empirically for the effects of these asset purchases on government bond yields. For the U.S., the term structure estimates of [Gagnon et al. \(2011\)](#) appear to indicate that portfolio balance effects dominate, and these authors conclude that the signaling effects are negligible. On the other hand, [Bauer and Rudebusch \(2013b\)](#) and [Christensen and Rudebusch \(2012\)](#) find a substantially larger role for the signaling channel of asset purchase announcements.² [Neely \(2013\)](#) argues that the large impact of the Fed's LSAP announcements on international yields are consistent with a portfolio balance effect but he does not directly evaluate the relative importance of signaling/portfolio balance effects. There has been no serious analysis of the channels through which the Fed's LSAP announcements affected international bond yields. This paper aims to fill that gap by using term structure models to evaluate the relative importance of LSAP channels in mediating the impact of the Fed's asset purchases on international bond yields. In addition to U.S. yields, we study the effects on interest rates in Canada, Germany, Australia, and Japan.³ We consider announcements associated with the three LSAP programs during the period from 2008 to 2012: QE1, QE2, and QE3.

Before presenting our results on the relative importance of LSAP channels of unconventional policy, we investigate what past data would lead us to expect for each country. We predict the impact of U.S. LSAPs on expectations of foreign short-term interest rates by analyzing how conventional U.S. monetary policy surprises affect foreign yields. For example, the strong reaction of Canadian yields to conventional U.S. monetary shocks implies a significant signaling effect for that country's markets. Analysis of the covariances between real foreign and U.S. bond returns predict that Australia and Germany would show the strongest portfolio balance channel effects.

Using dynamic term structure models (DTSMs) we estimate changes in short-rate expectations and term premia around key LSAP announcements. Their respective contribution to the observed decreases in long-term yields is a measure of the importance of the signaling and portfolio balance channels.

¹ The announcements can contain both direct (explicit) and indirect (implicit) signals about the future short-rate path ([Woodford, 2012](#)). The event study approach chosen here and in other papers cannot distinguish between these.

² [Joyce et al. \(2011\)](#) cite swap rates to argue that the Bank of England's purchases worked mainly through the portfolio balance channel. [Christensen and Rudebusch \(2012\)](#) confirm the importance of portfolio balance effects on domestic government yields.

³ We omit the U.K. from our analysis because news unrelated to U.S. policies significantly influenced U.K. short-term interest rate movements during the policy event windows. These movements distorted measurement of the effect of U.S. unconventional policies on the U.K., but not other bond markets.

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