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The open economy consequences of U.S. monetary policy

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A B S T R A C T

We consider the open economy consequences of U.S. monetary policy, extending the identification approach of Romer and Romer (2004) and adapting it for use with asset prices. Intended policy changes are orthogonalized against the economy's expected future path, which captures any effects from open economy variables. Estimated from a set of bilateral VARs, the dynamic responses of the exchange rate, foreign interest rate, and foreign output are consistent with recent work that identifies U.S. policy via futures market changes and *a priori* impulse response bounds. We compare the two approaches, finding important commonalities. We also outline some advantages of our approach.

1. Introduction

Estimating the impact of unanticipated and exogenous monetary policy shocks on open economy variables such as exchange rates and foreign interest rates is a perennial desideratum in the field of international finance. Important contributions to the open economy empirics of monetary policy include Eichenbaum and Evans (1995), Kim and Roubini (2000), Faust and Rogers (2003), and Faust et al. (2003). The identification of monetary policy shocks from broader movements in monetary instruments poses a particular challenge in the open economy context because of simultaneity amongst asset returns invalidating many of the short-run restrictions used to identify policy innovations in structural vector autoregressions (SVARs). In a partially identified framework, Faust and Rogers (2003) show that the exclusion restrictions associated with the recursive ordering of variables posited by Eichenbaum and Evans (1995) for a set of two-country VARs can be rejected for some country pairs.

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Furthermore, they find that the evidence for delayed exchange rate overshooting is sensitive to relaxing such restrictions.

Our strategy for addressing such simultaneity concerns is to incorporate information from outside of a VAR framework to achieve monetary policy identification.[2] We can then allow the contemporaneous and dynamic responses of open economy variables in the model to be completely unrestricted. The approach builds upon the work of Romer and Romer (2004), who use a two-step procedure to identify U.S. monetary policy shocks. In the first step, they use narrative sources to determine intended changes in the U.S. target federal funds rate. In the second step, these federal funds rate changes are decomposed into two components, one that can be explained by the Federal Reserve's Greenbook (in-house) forecasts for output growth, inflation, and unemployment, and one that cannot be explained by those forecasts. The second component, which captures interventions unrelated to economic forecasts, defines the monetary policy shock. In our implementation, we extend both parts of the identification procedure. In the first stage, we augment the Romers' narratively identified changes in the target federal funds rate at Federal Open Market Committee (FOMC) meetings for the period 1969–1996 with announced changes in the target for the period 1997–2001.[3] In the second stage, the augmented series is orthogonalized against a meeting-based information set that combines the Greenbook forecasts used by the Romers and a measure of capacity utilization constructed by the Federal Reserve.[4] If the controls in the orthogonalization adequately summarize the FOMC's information set regarding its objectives and expectations at the time of its decision, then the subsequent residuals represent the unanticipated and exogenous component of U.S. monetary policy.[5] We convert the resulting identified policy series from a meeting frequency to a monthly frequency via a novel aggregation method which ensures that period average asset price responses are correctly estimated. The identified policy series is then an exogenous variable in the estimation of the dynamic effects of U.S. policy on the exchange rate and other open economy variables.

To facilitate comparisons with previous work, we include our identified policy series in a set of 6 bilateral, monthly VARs, where the U.S. is Home and one of the non-U.S. G7 countries is Foreign. We find that the open economy dynamic responses to a contractionary monetary policy shock which raises the U.S. t-bill rate by 100 basis points (b.p.) are the following:

1. There is always an impact appreciation of the U.S.$ exchange rate.
2. The maximal appreciation of the exchange rate occurs between 1 and 2 months (Canada and Germany) and 20 months (France and Italy). It lies between 0.66% (Canada) and 4.38% (France).
3. There is strong, positive interest rate pass-through from the U.S. to the foreign countries, with the maximum response occurring between 3 months (Canada) and 10 months (Japan and the U.K.). It lies between 0.46 (Japan) and 1.24 (Canada).
4. Foreign output shows a mixed initial response (some positive and some negative) which uniformly becomes negative at horizons of 16 months (earlier for many).

U.S. output responses are generally negative, with the maximum contractions ranging from 1.3 to 2.1 percentage points and occurring between 17 and 27 months after the initial U.S. policy shock. The U.S. price responses in the baseline model are disappointing, showing a price puzzle. We investigated the price responses in detail, finding them to depend critically on the number of lags of the policy shock included in the model. As the number of policy shock lags is increased, the price puzzle disappears while preserving many of the other impulse responses. The response of U.S. non-borrowed reserves exhibits the classic liquidity effect, where a contractionary monetary policy shock leads to a decline in reserves held and a rise in domestic interest rates. We discuss all of these responses in more detail later.

[2] Such a strategy is not unique. Later in the paper, we discuss other strategies which also use outside information to aid identification.

[3] We present evidence for the contiguity of the two series later.

[4] Giordani (2004) has recently emphasized the value of the capacity utilization index as a proxy for the Federal Reserve's output gap perceptions. We discuss the measure in more depth later.

[5] We present arguments supporting such an assumption later.