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# Monetary policy's role in exchange rate behavior<sup>☆</sup>

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## Abstract

We address the role of monetary policy shocks in exchange rate behavior using an inference procedure that allows us to relax dubious identifying assumptions. We find: (i) The peak exchange rate response may be delayed or nearly immediate; (ii) In every *otherwise reasonable* identification, monetary policy shocks lead to large uncovered interest rate parity (UIP) deviations; (iii) Monetary policy shocks may account for a smaller portion of exchange rate variance than found earlier. While (i) is consistent with overshooting, (ii) implies that the overshooting cannot be driven by Dornbusch's mechanism, and (iii) casts doubt on monetary policy shocks being the main source of exchange rate volatility.

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Exchange rate changes are volatile and difficult to explain. Economists have long suspected that monetary policy shocks might play an important role in accounting for this behavior, and a great deal of theoretical and empirical work has been directed at confirming this suspicion. This paper combines recent developments in international finance and econometrics to assess what firm conclusions can be drawn about the role of monetary policy shocks in exchange rate behavior.

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An obvious starting point for our study is Dornbusch's (1976) overshooting model. Having received over 800 citations,<sup>1</sup> this work remains at the core of international finance. Dornbusch's prediction that the exchange rate should initially overshoot its long-run level in adjusting to a monetary shock owes much of its huge appeal to two factors. First, it provides hope of explaining the empirical regularity that exchange rates in the post-Bretton Woods era are more volatile than macroeconomic fundamentals such as the money supply, output, and interest rates. Second, the overshooting conclusion follows directly from three familiar components: the liquidity effect of monetary policy shocks on nominal interest rates, uncovered interest rate parity (UIP), and long-run purchasing power parity (PPP).

While overshooting is a dominant theory in international finance, its reliance on uncovered interest rate parity means that when confronted with data, the theory will be enmeshed in a dominant empirical puzzle in international finance—the tendency of the exchange rate to change in the direction opposite to that predicted by UIP. Labelled *the forward premium anomaly*, this tendency has been extensively documented (Fama, 1984; Hodrick, 1987; Engel, 1996). Nevertheless, if monetary policy shocks have small effects on currency risk premia, as many models predict, then the Dornbusch story could hold conditionally in response to monetary policy shocks, even if it fails unconditionally.

Motivated by these facts, we focus primarily on whether or not the exchange rate overshoots. More specifically, at what lag horizon does the exchange rate peak after a U.S. monetary policy shock? We also consider two related questions: Is the dynamic response of the exchange rate roughly consistent with uncovered interest rate parity? Can U.S. monetary policy explain a large share of exchange rate variance under *any reasonable* theory?

The questions regarding peak timing and conditional UIP shed light on whether the data are consistent with Dornbusch overshooting. The final question addresses whether monetary policy shocks can account for a large share of exchange rate variance under overshooting or any other theory of international finance.

Several papers examining the first question (Clarida and Gali, 1994; Eichenbaum and Evans, 1995; Grilli and Roubini, 1996) find that the exchange rate overshoots its long-run value in response to monetary policy shocks, but that the peak occurs after one to three years as opposed to happening immediately as predicted by Dornbusch.<sup>2</sup> A typical “delayed overshooting” result is shown in Fig. 1, which gives the estimated dynamic response of the U.S. dollar/U.K. pound and dollar/German mark exchange rates to a stimulative U.S. monetary policy shock in our replication of work by Eichenbaum and Evans (1995). Based on such evidence, a consensus seems to be emerging that the exchange rate shows delayed overshooting

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<sup>1</sup> Social Science Citations Index.

<sup>2</sup> The results are quite consistent for bilateral rates between the U.S. and Europe and Japan: Eichenbaum and Evans (1995) and Clarida and Gali (1994) nearly uniformly find delay; Grilli and Roubini (1996) generally find delay, although Kim and Roubini (2000) find delay only in a few cases. Cushman and Zha (1997) find no delay for the U.S.–Canada rate.

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