Journal of International Money and Finance
19 (2000) 601–631

Journal of International Money and Finance

www.elsevier.nl/locate/econbase

The effect of monetary policy actions on exchange rates under interest-rate targeting

Catherine Bonser-Neal [a], V. Vance Roley [b,*], Gordon H. Sellon [c]

[a] *Kelley School of Business, Indiana University, 801 West Michigan Street, Indianapolis, IN 46202, USA*

[b] *Department of Finance, Box 353200, University of Washington, Seattle, WA 98195-3200, USA*

[c] *Economic Research Department, Federal Reserve Bank of Kansas City, 925 Grand Boulevard, Kansas City, MO 64198-0001, USA*

Abstract

We specify a theoretical model of the exchange-rate response to U.S. monetary policy actions that is capable of explaining a wide range of recent empirical results. We show that the response pattern of spot and expected future exchange rates depends on the predictability of Federal Reserve actions, the persistence of shocks to the economy, and the reaction of foreign central banks to the US monetary policy shock. We also show that the movements of spot and expected future exchange rates in anticipation of a monetary policy change can outweigh the immediate responses at the time of the change.

Keywords: Exchange rates; Interest-rate targeting; Overshooting; Monetary policy; Policy shocks

1. Introduction

Recent empirical studies find that a tightening of US monetary policy is associated with an appreciation of the dollar, while a loosening is associated with dollar depreciation. Using a VAR methodology, Eichenbaum and Evans (1995) find that contractionary shocks to monthly values of the federal funds rate, the ratio of nonborrowed reserves to total reserves, and the Romer and Romer (1989) index over the

* Corresponding author. Tel.: +1-206-685-7476.
E-mail addresses: cneal@iupui.edu (C. Bonser-Neal), vroley@u.washington.edu (V.V. Roley), gsellon@frbkc.org (G.H. Sellon).

PII: S0261-5606(00)00026-7

1974 to 1990 period led to a sharp increase in the differential between US and foreign interest rates and to a sharp appreciation in the dollar. Clarida and Gali (1994), Evans (1994) and Lewis (1995) also find that contractionary US monetary policy is associated with a dollar appreciation using similar methods. Bonser-Neal et al. (1998), using changes in the Federal Reserve's federal funds rate target as an alternative measure of monetary policy shocks, confirm these results. Specifically, they find that increases in the Federal Reserve's federal funds rate target during the 1974–79 and 1987–94 periods of interest-rate targeting are associated with significant increases in the value of the dollar.

While all of these studies estimate a dollar appreciation in response to contractionary monetary-policy shocks, they report different dynamic-response patterns. Bonser-Neal et al. (1998), for example, estimate spot and forward rate responses consistent with standard overshooting models in a majority of the cases they examine. In contrast, Clarida and Gali (1994), Eichenbaum and Evans (1995), and Evans (1994) estimate that it can take from one to three years for the maximal effect of the policy shock to be felt on exchange rates. Bonser-Neal et al. (1998) also estimate that the impact of a policy shock is expected to increase over time in the case of the yen/dollar exchange rate over the 1974–79 period. These latter results are clearly inconsistent with standard overshooting models. In overshooting models, contractionary US monetary policy causes the dollar spot rate to temporarily appreciate beyond, or overshoot, its new higher equilibrium level. Future exchange rates are therefore expected to appreciate by less than the current spot rate in response to a tightening of monetary policy. Taken together, these empirical results suggest that the standard overshooting model may be too restrictive to completely characterize the effects of monetary policy on exchange rates.

We present a theoretical model based on rational expectations and uncovered interest parity that is capable of explaining most of the recent empirical results concerning the effects of US monetary policy shocks on exchange rates. In all versions of the model, we assume that the US economy is subjected to economic shocks that may be persistent and that the Federal Reserve may choose to offset these shocks by changing its federal funds rate target. We also assume that foreign central banks alter their policies in response to either the common global economic shock or to the Federal Reserve action itself. This assumption is consistent with recent empirical evidence that foreign interest rates respond to US economic news and short-term interest rates. Finally, we assume that the expectations hypothesis of the term structure holds for both US and foreign interest rates, and that these interest rates are linked to exchange rates by uncovered interest parity. Together, these assumptions allow us to derive the dynamic response of exchange rates to changes in the federal funds rate target.

Under certain assumptions, our model replicates the standard overshooting results. In particular, an unanticipated increase in the federal funds rate target leads to an immediate and persistent increase in the differential between US and foreign interest rates, and to an immediate appreciation of the dollar. The policy shock causes the spot rate to overshoot its new equilibrium level, however, so that the magnitude of the dollar's expected appreciation decreases with the time horizon. We also find that