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Global Finance Journal 15 (2005) 281–302
Global Finance Journal

Technical trading, monetary policy, and exchange rate regimes

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Received 1 September 2003; received in revised form 1 April 2004; accepted 1 July 2004
Available online 20 December 2004

Abstract

The paper extends and empirically tests the noise trader exchange rate model of Jeanne and Rose (2002). We introduce technical trading in the exchange market as a source of noise and explicitly incorporate monetary and exchange rate policy. With these modifications, it is possible to directly test the model's prediction of an U-shaped relation between exchange trend and volatility. We find strong empirical evidence supporting the implications of the model. As a corollary, we develop a measure of excess exchange rate volatility and categorize exchange rate regimes based on the de facto behavior of the exchange rates.

JEL classification: F31; E52; G15
Keywords: Chartists; Exchange rates; Monetary policy; Multiple equilibria; Noise

1. Introduction

Policymakers often legitimate fixed exchange rate regimes as a means to safeguard against the destabilizing behavior in currency markets. Floating exchange rates are seen to be subject to irrational bubbles and market-driven fads. Exchange rate volatility is believed to include a non-fundamental component, which can be eliminated by fixing the exchange rate. According to this view, there is a free lunch of stabilizing exchange rates.

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doi:10.1016/j.gfj.2004.07.002

These concerns about irrational market behavior have hardly been taken into account in exchange rate theory, however. Conventional exchange rate models are typically based on rational expectations with volatile exchange rates reflecting volatility in fundamentals. The choice of the exchange rate system is a decision to allocate the fundamental volatility between the exchange rate and other economic variables. According to this view, there is no free lunch of stabilizing exchange rates—instead Mundell's well-known "incompatible trinity" holds. If policymakers want to stabilize the exchange rate, they have to give up monetary policy as an independent policy instrument or have to introduce capital controls.

Jeanne and Rose (2002, p. 538) develop a model "...that makes sense of the policymakers' view". They apply the noise trader model of De Long, Shleifer, Summers, and Waldmann (1990) to the exchange rate markets (see Lyons, 2001 for a comprehensive overview of the microstructure approach to exchange rates) and incorporate two sources of exchange rate volatility: a conventional part based on fundamental shocks and a part driven by so-called noise traders participating in the currency market. In this situation, there can be a free lunch of exchange rate stability. If the central bankers manage to keep noise traders out of the market, exchange rate volatility can be reduced significantly without changing the macroeconomic fundamentals.

While the approach of Jeanne and Rose (2002) has been very fruitful, it leaves open a number of questions. For one, they do not explicitly model why some of the currency traders face noise. In addition, the mechanics of fixing the exchange rate via monetary policy are not explicitly taken into account. The fixed and the flexible exchange rate regime comprise the same monetary policy but differ only with respect to the credibility of the announced exchange rate peg. It is only this commitment that prevents noise traders to enter the foreign exchange market. Most importantly, Jeanne and Rose do not estimate and test their model but provide only indirect empirical evidence for their approach.

In this paper, we address these problems by extending the Jeanne and Rose (2002) approach. First, we introduce technical trading in exchange markets as the source of noise. A crucial component of nearly all models that can generate irrational bubbles is the use of technical trading rules by at least some of the traders. Technical trading typically implies that traders react to some sort of trend. This is always associated with noise, as this trend measure is based on stochastic realizations of data. De Long et al. (1990, p. 735) show that technical trading rules can be a rational behavior in a market with heterogenous traders. Technical trading can also better take into account policymakers' concerns that market exchange rates might diverge from their fundamental values. While pure noise trading is by definition undirected, technical trading implies a trend following behavior, which can reinforce non-fundamental exchange rate movements (see e.g. Rötheli, 2002 or Frenkel, 1997). We formalize the technical analysis as in De Grauwe and Grimaldi (2002), De Grauwe, Dewachter, and Embrechts (1993), and Lux and Marchesi (2000), who analyze models with fundamentalists and short horizon chartists.

This incorporation of technical analysis into the Jeanne–Rose model leads to an U-shaped relation between the currently observed trend and the conditional volatility of the exchange rate. Chartists base their market entry decision on fundamental information as well as the currently observed exchange rate trend. This creates an interrelation between the number of chartists and conditional exchange rate volatility. As chartists enter the market, their stochastic actions add excess volatility to the exchange rate process. This in