

# Volatile and persistent real exchange rates with or without sticky prices<sup>☆</sup>

Michael J. Moore<sup>a,\*</sup>, Maurice J. Roche<sup>b,c</sup>

<sup>a</sup>*School of Management and Economics, Queen's University Belfast, Belfast BT7 1NN, Northern Ireland, UK*

<sup>b</sup>*National University of Ireland, Maynooth, Ireland*

<sup>c</sup>*Queen's University, Kingston, Ont., Canada*

Received 1 December 2005; received in revised form 12 January 2007; accepted 16 January 2007

Available online 16 February 2007

---

## Abstract

The flexible-price two-country monetary model is extended to include a consumption externality with habit persistence. Two methodologies are employed to explore this model's ability to generate volatile and persistent exchange rates. In the first, actual data is used for the exogenous driving processes. In the second, the model is simulated using estimated forcing processes. The theory, in both cases, is capable of explaining the high volatility and persistence of real and nominal exchange rates as well as the high correlation between real and nominal rates.

© 2007 Elsevier B.V. All rights reserved.

*JEL classification:* F3; F4

*Keywords:* Exchange rates; Habit persistence

---

## 1. Introduction

Little consensus exists in international economics as to why nominal exchange rates are so volatile. In standard macroeconomic models, the nominal exchange rate depends on home and foreign money as well as on home and foreign income. To mimic the volatility of nominal exchange rates, either money or income has to display a variability that they obviously do not possess.<sup>1</sup> Real exchange rates exhibit similar volatility and to compound the mystery, real and nominal rates are closely correlated.<sup>2</sup> The traditional response to this conundrum is to invoke sticky prices. The overshooting model of Dornbusch (1976) began a tradition that has

---

<sup>☆</sup>This paper was funded by the Irish Higher Education Authority's North-South Programme for Collaborative Research. Our thanks to Rich Lyons, John Campbell, Alan Taylor and Alan Sutherland who provided us with comments on earlier drafts. We also wish to thank two anonymous referees and the editor of this journal for helpful comments. All remaining errors are our own.

\*Corresponding author. Tel.: +44 28 90973208; fax: +44 28 90335156.

E-mail address: [m.moore@qub.ac.uk](mailto:m.moore@qub.ac.uk) (M.J. Moore).

<sup>1</sup>Alternatively, the covariances between money and income or home and foreign variables have to assume values not observed in the data.

<sup>2</sup>This is related to the *Purchasing-Power Parity Puzzle*. See Obstfeld and Rogoff (2001).

always been contested by opponents of sticky prices such as Stockman (1979) and Plosser (1981). The new open economy macroeconomics has restated the sticky price viewpoint and Chari et al. (2002) and Bergin and Feenstra (2001) argue that a sticky price international business cycle model produces simulated moments that broadly mimic the properties of exchange rates.

This paper presents a flexible price model that also matches the stylised facts. The modelling strategy is to extend Campbell and Cochrane (1999) preferences to both a monetary and an international setting. The utility function depends not only on the consumption of home and foreign goods but also on the surplus of consumption over an externally generated habit that is both volatile and persistent. This makes the marginal rate of substitution between home and foreign goods volatile enough to explain the variability in real exchange rates. The high volatility of nominal exchange rates follows since prices are pinned down by the modest volatility of consumption expenditure and the money stock. The high correlation between real and nominal exchange rates also follows since variations in both have a common source.

The plan of the paper is as follows. In Section 2 the exchange rate stylised facts are introduced. The theory is developed in Section 3. In Section 4, the model is calibrated and the results are presented. The final section offers some concluding remarks.

## 2. Some facts about real and nominal exchange rates

Stylised facts are presented for the two most heavily traded exchange rates pairs during the period 1973–1998, namely, Dollar–Deutschmark and Dollar–Yen. The former accounted for between 20% and 25% of trading volume during the period while the latter had a market share that varied between 17% and 20% (see BIS, 2004). The analysis is confined to this period as the deutschmark ceased trading in 1999. Basic statistics for the two Hodrick–Prescott filtered real and nominal exchange rate pairs are reported in Table 1 (see the rows labelled ‘observed data’).<sup>3</sup> The standard deviation of the real and nominal exchange rates are between 8.56% and 9.41%, the first-order autocorrelation coefficient of the real and nominal exchange rates are between 0.80 and 0.82 and the correlation coefficient between the two exchange rates are between 0.98 and 0.99. Clearly real and nominal exchange rates are volatile, persistent and highly correlated with each other. These statistics are of similar magnitude to those found for a larger number of exchange rates (see Chari et al., 2002).

## 3. The model

The basic structure of the model is the well-known Lucas two-country, two-good, two-money representative agent story. In this model the real exchange rate is equated with the intratemporal marginal rate of substitution between domestic and foreign goods and can be written as

$$R_t = \frac{\delta U / \delta C_{it}^2}{\delta U / \delta C_{it}^1}. \quad (1)$$

Utility is  $U$ ,  $C_{it}^j$  is the consumption of goods and services of country  $j$  by the household of country  $i$  at time  $t$  and  $R_t$  is the time  $t$  relative price of foreign to home goods expressed in a common currency.<sup>4</sup> It can be written as  $R_t = S_t P_t^2 / P_t^1$ , where  $S_t$  is the nominal exchange rate and  $P_t^j$  is the price of country  $j$  goods in terms of

<sup>3</sup>The online data appendix at [http://www.qub-efrg.com/uploads/JME\\_appendix.pdf](http://www.qub-efrg.com/uploads/JME_appendix.pdf) details the data sources and how the real exchange rate series are constructed.

<sup>4</sup>Strictly speaking, this is the terms of trade and the real exchange rate is the relative price of non-traded to traded goods. In this respect, the analysis follows Finn (1999) and Bergin and Feenstra (2001). Mendoza (1995) compares the stylised facts of real exchange rates to those of the terms of trade. For example, the former is somewhat more volatile than the latter. Obstfeld and Rogoff (2000) also show that the correlation between nominal exchange rates and the terms of trade is weaker than that which typically characterises the comovement of nominal and real exchange rates. Nevertheless, all of the same qualitative stylised facts apply to both measures.

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات