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Empirical exchange rate models of the nineties: Are any fit to survive?

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Abstract

We re-assess exchange rate prediction using a wider set of models that have been proposed in the last decade: interest rate parity, productivity based models, and a composite specification. The performance of these models is compared against two reference specifications – purchasing power parity and the sticky-price monetary model. The models are estimated in first-difference and error correction specifications, and model performance evaluated at forecast horizons of 1, 4 and 20 quarters, using the mean squared error, direction of change metrics, and the "consistency" test of Cheung and Chinn [1998. Integration, cointegration, and the forecast consistency of structural exchange rate models. Journal of International Money and Finance 17, 813–830]. Overall, model/specification/currency combinations that work well in one period do not necessarily work well in another period.
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1. Introduction

The recent movements in the dollar and the euro have appeared seemingly inexplicable in the context of standard models. While the dollar may not have been "dazzling" – as it was described in the mid-1980s – it has been characterized as overly "darling."[1] And the euro's ability to repeatedly confound predictions needs little re-emphasizing.

It is against this backdrop that several new models have been forwarded in the past decade. Some explanations are motivated by findings in the empirical and theoretical literature, such as the correlation between net foreign asset positions and real exchange rates and those based on productivity differences. None of these models, however, have been subjected to rigorous examination of the sort that Meese and Rogoff conducted in their seminal work, the original title of which we have appropriated and amended for this study.[2]

We believe that a systematic examination of these newer empirical models is long overdue, for a number of reasons. First, while these models have become prominent in policy and financial circles, they have not been subjected to the sort systematic out-of-sample testing conducted in academic studies. For instance, productivity did not make an appearance in earlier comparative studies, but has been tapped as an important determinant of the euro–dollar exchange rate (Owen, 2001; Rosenberg, 2000).[3]

Second, most of the recent academic treatments' exchange rate forecasting performance relies upon a single model – such as the monetary model – or some other limited set of models of 1970s' vintage, such as purchasing power parity or real interest differential model.

Third, the same criteria are often used, neglecting alternative dimensions of model forecast performance. That is, the first and second moment metrics such as mean error and mean squared error are considered, while other aspects that might be of greater importance are often neglected. We have in mind the direction of change – perhaps more important from a market timing perspective – and other indicators of forecast attributes.

In this study, we extend the forecast comparison of exchange rate models in several dimensions.

- Five models are compared against the random walk. Purchasing power parity is included because of its importance in the international finance literature and the

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[1] Frankel (1985) and The Economist (2001), respectively.

[2] Meese and Rogoff (1983) was based upon work in "Empirical exchange rate models of the seventies: are any fit to survive?" *International Finance Discussion Paper* No. 184 (Board of Governors of the Federal Reserve System, 1981).

[3] Similarly, behavioral equilibrium exchange rate (BEER) models – essentially combinations of real interest differential, nontraded goods and portfolio balance models – have been used in estimating the "equilibrium" values of the euro. See Bank of America (Yilmaz, 2003), Bundesbank (Clostermann and Schnatz, 2000), ECB (Schnatz et al., 2004), and IMF (Alberola et al., 1999). A corresponding study for the dollar is Yilmaz and Jen (2001).