Understanding bilateral exchange rate volatility[☆]

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Abstract

This paper develops an empirical model of bilateral exchange rate volatility. We conjecture that for developing economies, external financial liabilities have an important effect on desired bilateral exchange rate volatility, above and beyond the standard optimal currency area (OCA) factors. By contrast, industrial countries do not face the same set of constraints in international financial markets. In our theoretical model, external debt tightens financial constraints and reduces the efficiency of the exchange rate in responding to external shocks. We go on to explore the determinants of bilateral exchange rate volatility in a broad cross section of countries. For developing economies, bilateral exchange rate volatility (relative to creditor countries) is strongly negatively affected by the stock of external debt. For industrial countries however, OCA variables appear more important and external debt is generally not significant in explaining bilateral exchange rate volatility.
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1. Introduction

What are the principal determinants of exchange rate volatility? This has been perhaps the biggest research question in international finance over the last three

decades. Despite hundreds of follow-up papers, the results of Meese and Rogoff (1983) suggesting that movements in exchange rates are largely unpredictable remain largely intact.

Our paper also focuses on exchange rate volatility. But we take an alternative perspective to the literature that has directly followed in the tradition of Meese and Rogoff. Rather than focusing exclusively on the time series properties of exchange rates relative to a single large currency such as the dollar or the euro, we are concerned with understanding what drives bilateral exchange rate volatility across countries. Looking at a large cross section of both developing and developed countries, we seek to identify the main determinants of bilateral exchange rate volatility between country pairs.

Our starting point is the optimal currency area (OCA) hypothesis of Mundell (1961). Mundell isolated the key economic factors that make two regions or countries part of a common currency area. These factors include trade inter-dependence and the degree of commonality in economic shocks.[1] As in previous work (e.g. Bayoumi and Eichengreen, 1998; Hausmann et al., 2001; Larrain and Tavares, 2000), we use these as explanatory variables in modeling bilateral exchange rate variability across countries.

But in addition to the standard set of OCA variables, we add a further set of determinants measuring financial linkages between countries. Recent theoretical literature suggests that these variables may be of key importance in understanding exchange rate variability, especially for developing economies. Our central hypothesis is that for developing countries, high levels of financial linkages with a creditor country C (in the form of portfolio debt or bank loans) will, ceteris paribus, be associated with a lower level of bilateral exchange rate variability vis-à-vis country C.

This hypothesis is derived from a substantial recent body of work that points to the importance of financial factors in understanding exchange rates in emerging market economies. Many writers have questioned the neglect of financial market structure in standard macroeconomic models. Bernanke et al. (1999) stress the importance of balance sheet effects in understanding the properties of business cycles. Among others, Krugman (1999), Cook (2000), Aghion et al. (2001), Cespedes et al. (2000, 2001), Devereux and Lane (2001), Gertler et al. (2001) and Eichengreen (2002), have extended these ideas to the open economy. All these papers highlight a fundamental failure of the 'Modigliani–Miller' theorem: balance sheet effects matter for macroeconomic outcomes and especially for the exchange rate.

One conclusion of this literature is that, combined with these balance sheet effects, the presence of external debt (denominated in foreign currency) may have an important effect on the way in which movements in the exchange rate impact

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[1] See also Alesina and Barro (2002).