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Real exchange rate misalignment: Prelude to crisis?

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Abstract

A model of the long-run equilibrium real exchange rate based upon macroeconomic fundamentals is employed to calculate real exchange rate misalignments for Poland and Russia during the 1990s using the Beveridge and Nelson (Beveridge, S., Nelson, C., 1981. A new approach to decomposition of economic time series into permanent and transitory components with particular attention to measurement of the business cycle. J. Monetary Econ. 7, 151–74) decomposition of macrofundamentals into transitory and permanent components. Short-run movements of the real exchange rate are estimated with ARIMA and GARCH error correction specifications. The different nominal exchange rate regimes of the two countries generate different levels of misalignment and different responses to exogenous shocks. The average misalignment in Russia is substantially greater than that in Poland, indicating incipient pressures to devalue the ruble immediately preceding the August 1998 crisis. The half-life of an exogenous shock is found to be much shorter for Poland than for Russia in the pre-crisis period. Dynamic forecasts indicate that the movements of the real exchange rate in the post-crisis period are significantly different from those in the pre-crisis period. Thus, the currency crisis in Russia could not be anticipated with the movements of the real exchange rate estimated with the macroeconomic fundamentals.

JEL classification: F31; F36; P17

Keywords: Equilibrium real exchange rates; Misalignment; Cointegration; Forecasting; Exogenous shocks; Macroeconomic; Crises

1. Introduction

The role of the real exchange rate in the macroeconomic adjustment mechanism is of central importance in many debates on economic development, growth strategies and stabilization

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policies. Dornbusch (1982) and Williamson (1985), *inter alia*, discuss the effects of real exchange rate misalignments on macroeconomic stabilization[1] and, following Edwards (1994), there is a consensus that persistent misalignments of the real exchange rate imply serious macroeconomic imbalances. Economies with fixed or less than flexible nominal exchange rate regimes without foresight and suitable policies on the part of the government are subject to real exchange rate misalignment that may have disastrous consequences. Accordingly, a successful development strategy for a less-developed economy or emerging market economy should include efforts to maintain the real exchange rate at or near the 'equilibrium' level regardless of exchange rate regime. Nonetheless, Asia and Latin America have suffered exchange rate and related banking crises, which have been studied extensively,[2] and several of the transition economies of Eastern Europe and the former Soviet Union have experienced similar problems. Here we examine the implications of the exchange rate regimes of two transition economies; Russia, which had a peg or less flexible managed exchange rate regime and experienced a currency and banking crisis in August 1998, and Poland, which had a more flexible managed or freely floating exchange rate regime with better macroeconomic performance and virtually no currency or banking system management problems. We then ask: (1) can the long-run equilibrium real exchange rate for a transition economy be modeled with conventional tools? (2) is the error correction model appropriate for explaining short-run behavior of the real exchange rate in these economies? (3) do different nominal exchange rate regimes generate explicitly different equilibrium relationships and are the responses to exogenous shocks different? (4) given the appropriateness of the model, to what extent has there been real exchange rate misalignment in these two economies? and (5) to the extent that the misalignment is persistent, is it an effective indicator of a potential crisis?

We begin with a popular model of long-run equilibrium real exchange rate determination applied to developing economies by Elbadawi (1994). The model, based upon earlier work by Dornbusch (1974) and Rodriguez (1989), specifies the long-run equilibrium exchange rate as a function of 'sustainable' or 'permanent' values of the macroeconomic fundamentals, such as the terms of trade, net capital inflows, government expenditure and the respective governments' openness to free trade, *inter alia*. We then estimate short-run movements of the real exchange rate in an error correction model using GARCH estimation procedures. The responses to exogenous shocks are calculated and we find that the real exchange rate returns to equilibrium much faster in Poland than for Russia. In the pre-crisis period in Russia an exogenous shock takes twice as long to correct as in Poland, because in Poland the real exchange rate adjusts to the shocks by changes in both the nominal exchange rate and the foreign and domestic price levels, whereas in Russia the nominal exchange rate is relatively rigid (in the pre-crisis period). Misalignments are calculated as the short-run deviations of the real exchange rate from the long-run equilibrium values. For Poland, the misalignments in the real exchange rate are relatively small and decline as the nominal exchange rate regime becomes more flexible. The average misalignment in Russia, however, is significantly higher and the misalignment measures in Russia prior to the currency

[1] Harberger (1986) and Dervis and Petri (1987) discuss the relationship between real exchange rates and economic performance. Serven and Solimano (1991) found that the stability of the real exchange rate has a positive effect on private investment. Edwards (1986a,b), Edwards and Wijnbergen (1986, 1987), Mussa (1978, 1974), and Pinto (1988) show the relevance of the real exchange rate to export promotion and generation of optimal output and employment in behavioral models.

[2] Agénor et al. (1992, 2000), Aghion et al. (2000, 2001), Berg and Pattillo (1999a,b), Eichengreen et al. (1996), Frankel and Rose (1996), Goldstein et al. (2000), Kamin and Babson (1999), Kaminsky et al. (1998), Kaminsky and Reinhart (1998, 1999), Krugman (2000), Obstfeld (1994, 1996), and Reagle and Salvatore (2000) are representative papers.