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## Real exchange rates and transition economies



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### ABSTRACT

In a number of empirical studies, transition economies have been shown to be subject to the Harrod-Balassa-Samuelson effect. This implies that the currencies of these countries have experienced a prolonged appreciation in real terms as their convergence proceeded. In this paper we find that a long-run relationship exists between the real exchange rate, productivity differentials, real interest rate differentials and the capital account for eight transition economies of Central and Eastern Europe, using monthly data over a period which extends from 1996 to 2013. We find that there are two sources of appreciation of the currencies of these countries, namely the Harrod-Balassa-Samuelson effect and the capital account effect, and argue that their significance depends on the type of investment received by the countries. While long-run foreign direct investment enhances productivity, portfolio investment leaves productivity unaffected, so our argument is that the larger foreign direct investment relative to portfolio investment, the greater the contribution of productivity in the determination of the real exchange rate. Moreover, we find that while the variables are linked by a linear long-run equilibrium relationship, adjustment towards equilibrium is nonlinear and is well represented by a smooth transition mechanism where the degree of equilibrium correction is a function of the sign and/or the size of the deviation from equilibrium. Interestingly, we find that a logistic smooth transition model fits well a larger number of countries, by allowing a different response of the real exchange rate to misalignments of different sign.

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## 1. Introduction

The Harrod-Balassa-Samuelson effect, introduced by [Harrod \(1933\)](#), [Balassa \(1964\)](#) and [Samuelson \(1964\)](#), states that countries that have high productivity gains experience prolonged real appreciations of their currencies against the currencies of less productive countries. A vast empirical literature focusing either on transition or on industrialized economies supports this perspective. For example, [Halpern and Wyplosz \(1996\)](#), using panel data techniques for a number of transition economies find significant evidence in favour of the Harrod-Balassa-Samuelson effect at a relatively early stage of the transition process. More recently, though, there has been a growing recognition that the Harrod-Balassa-Samuelson effect accounts only partly for the observed appreciation of the currencies of transition economies. A detailed overview of this literature, covering both theoretical and empirical aspects of recent contributions, including several additional explanations for the movements of real exchange rates in transition economies, can be found in [Ěgert et al. \(2006a\)](#). Two recent studies by [Babecky et al. \(2009, 2010\)](#) offer interesting insights on the interaction between foreign direct investment, net exports and sustainable real exchange rates in the new EU member states, and their findings are particularly relevant for the focus of our paper. Using a calibrated and simulated theoretical model, these studies conduct a sectoral analysis of foreign direct investment (FDI) and argue that transition economies where FDI is absorbed by the tradable sector are likely to benefit substantially from capital inflows and experience real currency appreciation.

Building upon this literature, using time series econometric techniques, in this paper we take an innovative approach to investigate the way the composition of the capital account affects productivity and the real exchange rate in transition economies. We explore this channel by revisiting the behaviour of the real exchange rate in eight Central and Eastern European (CEE) countries, namely the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic and Slovenia, using monthly data over a sample period which goes from 1996 to the end of 2013. This period covers relatively early stages of the transition from planned to market-based economies, includes the entire period of preparation for accession to the European Union, which for these eight countries took place on 1 May 2004, and extends to the most recent years covering the Great Recession of 2008–09, which has clearly had an impact on the state of the convergence of these countries.

We begin our empirical analysis by examining whether a long-run relationship exists among the real exchange rate, the productivity differential, the real interest rate differential and the capital account, and find supportive evidence of large productivity differential and capital account effects on the real exchange rate for a number of these transition economies. In addition, we show that the capital account effects depend on the composition of the country's capital inflows. In particular, we find that the capital account plays a role in the appreciation of the currency only to the extent that foreign direct investment exceeds portfolio investment. This is because FDI enhances productivity, while productivity is not affected by portfolio investment and, consequently, economies in transition can achieve a faster convergence by attracting long-run productivity-enhancing FDI. Long-term capital flows are the FDI which fosters growth, as it is generally taken to be determined by long-term profitability considerations and often leads to the transfer of state-of-the-art technology. As a result, these kinds of flows are less subject to market sentiment. On the contrary, portfolio investment and short-term bank lending (financial products) are short-run investments and subject to any kind of market volatility. Therefore, if portfolio investment is the key component of capital inflows to a transition economy, then it is likely that productivity is less strengthened compared to developed countries.

Secondly, having established a long-run relationship between the real exchange rate and the variables mentioned above, namely, the productivity differential, the real interest rate differential and the capital account, we explore the possibility that the variables cointegrate in a nonlinear fashion, such that the speed of adjustment towards the long-run relationship varies over time, depending on the size and/or the sign of the exchange rate misalignment. A good deal of evidence in favor of nonlinear dynamical structure for the exchange rate and other macroeconomic variables has been reported in the literature. For example, in an application to transition economies during the 1990s, [Taylor and Sarno \(2001\)](#) find that the real exchange rate and the real interest rate differential cointegrate in a nonlinear fashion. [Lothian and Taylor \(2008\)](#) also employ models with nonlinear adjustment to test for

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