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Factors Influencing the Development of the Czech Crown

Emil Adámek[a],*

[a]VŠB-Technical University of Ostrava, Faculty of Economics, Department of National Economy, Sokolská tř. 33, 701 21 Ostrava 1, Czech Republic

Abstract

Lots of possible explanations of the development of the exchange rate can be found in the available literature. The aim of this paper is to find which factors influence the development of the Czech currency (measured as real bilateral exchange rate compared to euro area – CZK/EUR expressed in real terms) and to assess periods with overvalued and undervalued exchange rate. A long run relationship among exchange rate, approximation of Balassa-Samuelson effect, short run interest rate differential, government debt differential, terms of trade, government expenditures and domestic and foreign investments has been found using quarterly data for 2000Q1–2015Q3 periods.

1. Introduction

The knowledge of Equilibrium Exchange Rate (EER) is important for both policy makers and market participants. Komárek and Motl (2012) declare four reasons why central bank should monitor estimates of equilibrium exchange rate. The first one is to gather knowledge for monetary policy implementation. The second motive is that knowledge of EER level helps central banks to set policy instruments. The third reason is that exchange rate is a key factor for evaluation the competitiveness of whole economy. The last reason, which is very important especially in the case of the Czech Republic, is that information about EER is a crucial factor when setting central parity or conversion ratio before joining a common monetary union. Market participants, for example, can utilize the knowledge of EER to identify an investment opportunity.

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* Corresponding author.
E-mail address: emil.adamek@vsb.cz

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Moreover, the real exchange rate misalignments have their negative impacts. Frait et al. (2006) claim that the risks implied by the overvaluation of currency are more important for policy makers, than those implied by the undervaluation of currency. Overvalued currency leads to lower economic growth (via the impact on manufacturing); unsustainable current account deficits; and increasing external debt and risk of speculative attacks.

The aim of this paper is to find which factors influence the development of the Czech currency (measured as real bilateral exchange rate compared to euro area – CZK/EUR expressed in real terms) and to assess periods with overvalued and undervalued exchange rate.

Firstly, there are mentioned theoretical and empirical backgrounds of EER. Then, there are described used methods and data. In the next part, the results are presented. Conclusions and discussion remain the last part of this paper.

2. Theoretical and empirical backgrounds

2.1. Determination of exchange rate and concepts of equilibrium exchange rate

One of the oldest theories, explaining the development of exchange rate, is the Purchasing Power Parity Theory (PPP). PPP proposes that the only determinant of exchange rate development is price level (in the case of absolute version of PPP), respectively inflation rate (in the case of relative one). Nevertheless, there exist some reasons (such as the Ballasa-Samuelson (BS) effect) why this theory does not provide good explanation of exchange rate development especially in the case of transitive economies. Another traditional theory is the Uncovered Interest Parity Theory (UIP). Since PPP deals with international movement of goods and services, UIP deals with international movement of capital flows. UIP declares that expected change in the nominal exchange rate is determined by the interest rate differential. Nevertheless even UIP does not provide good empirical results. That is why EER concepts have become popular. The first one is called Capital Enhanced Equilibrium Exchange Rate (CHEER, developed by Johansen and Juselius (1992)) and it is actually combination of PPP and UIP. It claims that PPP holds in the long-run, and that the difference in domestic and foreign interest rates can cause short-run misalignment between spot exchange rate and exchange rate defined by PPP. Behavior Equilibrium Exchange Rate (BEER), created by MacDonald (1997), is based on above mentioned approaches but it also tries to find other determinants of exchange rate development. Škop and Vejmělek (2009) call it a statistical approach because it uses statistical methods to find determinants of exchange rate development (so called data mining). BEER approach is the most similar approach to this paper. For other approaches to EER such as Fundamental Equilibrium Exchange Rate (FEER), Desired Equilibrium Exchange Rate (DEER), Atheoretical Permanent Equilibrium Exchange Rate (APEER), Permanent Equilibrium Exchange Rate (PEER) or Natural Real Exchange Rate (NATREX), see e.g. Driver and Westaway (2003), MacDonald (2000) or Égert et al. (2006).

2.2. Review of empirical literature

Komárek and Motl (2012) compute BEER and FEER for Czech Republic using quarterly data (from 1996:Q1 to 2011:Q4). They estimate real (bilateral) exchange rate (CZK/EUR). As concerns BEER, the cointegration analyses are used. Depending variables are productivity difference, net foreign assets and ratio of real investments and export on GDP. The results confirm the estimates of exchange rate overvaluation by mid-1997 and in 1998, 2002 and 2008. Since 2009, the model suggests a significant slowdown in the appreciation of the equilibrium. Škop and Vejmělek (2009) estimate NATREX. Quarterly data covered 1995:Q1–2007:Q4 period. They construct VECM while depending variables are output gap, time preference gap and terms of trade gap. They find that exchange rate is overvaulted in 1995–1998 periods and that NATREX appreciated in long run. Babetskii and Égert (2005) estimate BEER for Czech Republic. They use monthly data from 1993:M1 to 2004:M9. They apply several alternative cointegration techniques and identify a period of an overvaluation in 1997 and in 1999, an increasing overvaluation until 2002, an undervaluation in 2003 and a correction towards equilibrium in the second half of 2004. Komárek and Melecký (2005) estimate BEER in 1994:Q1–2004:Q1. As determinants of the real equilibrium exchange rate they consider the productivity differential, the interest rate differential, the terms of trade, net foreign direct investment, net foreign assets, government consumption and the degree of openness. They find that the exchange rate is on average undervalued over the period 1994 to 2004 by about 7 percent with respect to the estimated BEER.