

# Foreign exchange intervention and equilibrium real exchange rates

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## Abstract

Monetary authorities intervene in the currency markets in order to pursue a monetary rule and/or to smooth exchange rate volatility caused by speculative attacks. In the present paper we investigate for possible intervention effects on the volatility of nominal exchange rates and the estimated equilibrium behaviour of real exchange rates. The main argument of the paper is that omission of intervention effects – when they are significant – would bias the ability to detect any PPP-based behaviour of the real exchange rates in the long run. Positive evidence for this argument comes from the experience of six Central and Eastern European economies, whose exchange markets are characterised by frequent interventions.

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## 1. Introduction

Official intervention in the foreign exchange market is defined as official purchases and sales of foreign exchange by the monetary authorities in order to affect the exchange rate. The literature on intervention states that central banks intervene in order (i) to correct misalignments or to stabilise the exchange rate at predetermined targeted levels or within targeted rates of change (when, for example, they pursue a monetary policy rule) and (ii) to address disorderly market conditions—mainly high exchange rate volatility and/or sharp exchange rate fluctuations caused

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by speculative bubbles phenomena.<sup>1</sup> As a result, in the first case, interventions may cause the real exchange rate to move in a target rate for long periods of time – and this can be interpreted as equilibrium values which shift from time to time – whereas in the second case, interventions may lead the exchange rate to move back to fundamental-based levels and/or to adjust faster to its long-run equilibrium level (for similar arguments see, *inter alia*, Sweeney, 1999).<sup>2</sup>

Whether or not intervention has an impact on exchange rates, offering the authorities an independent policy tool for influencing the foreign exchange market is an issue of great policy importance. As a consequence, intervention and its effects has been the subject of a large number of empirical articles in the international economics literature (see, *inter alia*, Baillie, 2000). The relevant empirical articles provide mixed evidence on the effectiveness of official interventions in the currency markets. Early empirical studies using data from the 1970s suggest that intervention operations have, at most, a short-lived influence on exchange rates (see the survey in Dominguez and Frankel, 1993a), whereas more recent studies indicate that the intervention operations influence both the level and variance of exchange rates (for a survey of the articles written till the mid 1990s, see Sarno and Taylor, 2002a). Most recent empirical studies (written from the mid 1990s on) tend to agree that there exists a significant effect of the monetary authorities' intervention at least on the short-run dynamics of the exchange rates. Empirical evidence is based on advanced country experience, mainly the US, Germany (and the EU), Japan and Australia, given that data on central bank operations are available for these countries.<sup>3</sup>

Alongside the studies on intervention, a vast empirical literature on the behaviour of the real exchange rates and the validity of purchasing power parity (PPP) has grown up during the last three decades or so and by now constitutes a great body of the international finance literature. Most recent studies use the concept of stationarity and cointegration to test for PPP. They raise the low power problem of the early studies, which is attributed to short sample sizes and the low statistical power of the early tests, and advocate the use of advanced econometric techniques (for a survey, see, *inter alia*, Sarno and Taylor, 2002b). Within this strand of the empirical literature, two recent studies raise the argument that the empirical inability to detect stationarity of the real exchange rate or some version of PPP may be due to the effects of interventions by the monetary authorities in the currency markets.<sup>4</sup> In particular, Taylor (2004) argues that intervention operations result in non-linear dynamics for the real exchange rate. He develops a regime switching model, in which the transition probabilities of switching between stable and unstable regimes depend upon

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<sup>1</sup> We use the standard definition of intervention which focuses on exchange rate-related objectives and not the definition used by Canales-Kriljenko et al. (2003) which also accounts for operations to accumulate and supply foreign exchange to the market.

<sup>2</sup> For a survey of the literature on theoretical and policy issues concerning intervention see *inter alia* Canales-Kriljenko et al. (2003) and Sarno and Taylor (2002a).

<sup>3</sup> In particular: positive evidence for the effectiveness of intervention strategies on the US\$/DM exchange rate volatility is presented in Dominguez and Frankel (1993b), Bonser-Neal and Tanner (1996), Hung (1997), Dominguez (1998), Fatum and Hutchison (2003a). Support for the effectiveness of intervention and monetary policies on the dynamics of the US\$/yen rate is provided by Bonser-Neal and Tanner (1996), Hung (1997), Dominguez (1998), Fatum and Hutchison (2003b), Brissimis and Chionis (2004) and Frenkel et al. (2005). Bonser-Neal et al. (1998) find that the US\$ exchange rates respond immediately to US monetary policy actions. Usman and Savides (1994) indicate that French intervention does not exert a significant influence on the FF/DM rate. Intervention is shown to be associated with the volatility (Edison et al., 2003) and the conditional variance of the return (Kim et al., 2000) of the Australian \$/US\$ rate. Aguilar and Nydahl (2000) provide weak support for the effects of intervention on the level and the volatility of the Swedish krona /US\$ rate.

<sup>4</sup> Actually, the idea that foreign exchange market intervention may prevent an exchange rate from always being at its PPP-defined value goes back to Cassel (see Officer, 1976).

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