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The effectiveness of central bank intervention in the EMS: The post 1993 experience

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Abstract

We analyze the effectiveness of intervention in the European Monetary System by using data on the DEM-intervention activity of six European central banks, covering the period from August 1993 to April 1998. To allow for regime-specific intervention effects, we estimate Markov Switching Autoregressive Conditional Heteroscedasticity models. We find that interventions have only limited effects on the conditional means and variances.
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1. Introduction

Whether foreign exchange intervention is an effective instrument has been the subject of heated debate for a long time. Most of the empirical literature deals with intervention in floating exchange rate regimes, focusing on the exchange rate relations between the US dollar (USD), the Deutsche mark (DEM) and the Japanese yen (JPY).[1] In contrast, this paper provides new

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[1] Only a few other papers deal with different currency pairs: Fischer and Zurlinden (1998) with the CHF/USD exchange rate, and Aguilar and Nydahl (2000) with the USD/SEK and DEM/SEK exchange rates. Mundaca (2001) analyzed spot rate fluctuations of the Norwegian krone vis-à-vis a trade-weighted basket of foreign currencies and the ECU. Weber (1996) discussed foreign exchange interventions of Germany, Japan, the United States and EMS countries.

evidence on the effectiveness of central bank intervention in a target zone, the European Monetary System (EMS).[2]

Monetary authorities use intervention in the foreign exchange market mainly to influence the level of exchange rates and/or to "smooth disorderly markets". The empirical literature on the effectiveness of intervention in floating exchange rate regimes provides only scant support for significant level effects. With respect to volatility, empirical findings based on survey data and econometric evidence demonstrate that intervention has an increasing rather than decreasing effect, if there are any significant volatility effects at all.[3] In their survey, Sarno and Taylor (2001) conclude that official intervention can be effective, especially if it is publicly announced, concerted and consistent with the underlying stance of monetary and fiscal policy. Still, it seems fair to say that in view of the empirical literature in the 1980s and 1990s, there is no clear evidence that intervention affects the level and volatility of spot rates in a consistent and predictable manner.

This paper investigates the intervention behavior of six European central banks, the Banque Nationale de Belgique, the Danmarks Nationalbank, the Banco de España, the Banque de France, the Central Bank of Ireland and the Banco de Portugal. We cover the period from August 2, 1993, the first day after the official widening of the bilateral bandwidth to $\pm 15\%$, to April 30, 1998, the day before the initial members of Stage Three of Economic and Monetary Union (EMU) were officially announced. During the sample period, intra-marginal intervention has been used widely.[4] This study is the first to systematically analyze the effectiveness of intra-EMS-intervention across different countries. In particular, we address the following issues:

- First, does intervention significantly influence the spot rate mean and variance? And if so, is the impact country-specific or is there a common pattern in the effectiveness across the six spot rates?
- Second, is the intervention effect contingent on specific market conditions? A visual inspection of the exchange rate series suggests that our sample period is characterized by different regimes: the post-August 1993 period with high volatility and large deviations from the bilateral DEM central parities, a period of medium volatility and moderate deviations and a period of convergence to the DEM parity in the run-up to EMU with low volatility.

In our empirical analysis, we estimate Markov Switching Autoregressive Conditional Heteroskedasticity (MS-ARCH) models. MS-ARCH models provide an adequate framework for studying the impact of intervention conditional on different regimes. Moreover, Engel and Hakkio (1996) show that this type of model is a convenient approach to model EMS exchange rates.

The paper is organized as follows: Section 2 briefly discusses the effects of central bank intervention on exchange rates and the empirical literature. The data and stylized facts are presented in Section 3. In Section 4 we discuss the MS-ARCH model. Section 5 presents the estimation results and Section 6 concludes.

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[2] Since the Exchange Rate Mechanism (ERM) lies at the heart of the European Monetary System (EMS), the abbreviation EMS will be used as a synonym for ERM. If not otherwise specified, EMS refers to ERM I, i.e., the period from 1979 until the end of 1998.

[3] Cheung and Chinn (1999) conducted a survey of United States foreign exchange traders. According to the answers, 61% of the respondents believe that interventions increase market volatility. Moreover, only 49% of the traders think that interventions achieve the desired goal.

[4] Intra-marginal intervention occurred within the band before bilateral intervention points had been reached.