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Central bank intervention and foreign exchange rates: new evidence from FIGARCH estimations

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Abstract

In this paper, we investigate the effects of official interventions on the (short run) evolution and volatility of exchange rates. To this aim, we rely on a new measure of volatility implied by the FIGARCH model that outperforms the traditionally used GARCH one. It is found that central bank interventions exert an incorrectly signed effect on the levels of exchange rates and tend to increase their volatility in the short run. In general, our results also show that the traditional GARCH estimations tend to underestimate the effects in terms of volatility. © 2002 Published by Elsevier Science Ltd.

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1. Introduction

There is some extensive evidence showing that real exchange rates became more volatile when the nominal rates were allowed to float, and that such exchange rate volatility may have destabilized domestic economies (see Flood and Rose, 1995). Such evidence is part of the rationale for the historical attempts to reduce exchange

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rate volatility through European exchange rate arrangements and monetary union. It also justifies the proposals for stabilizing exchange rates within fundamentals—determined target zones (Williamson, 1985; Williamson and Miller, 1987 and more recently, Bergsten and Miller, 1999). However, in the latter case, the reorganization of the International Monetary System can be successful only if central banks have powerful instruments to stabilize the exchange rates around what they think to be their fundamental values. The two available instruments are monetary policy and direct intervention in the foreign exchange market. These instruments are interrelated as far as official interventions are not sterilized. However, interventions can also have a signaling effect, i.e. they can provide information about future monetary policy (Dominguez and Frankel, 1993). In this case, the impact of interventions is independent from contemporaneous monetary policy.

Existing evidence on the impact of official interventions on exchange rates is rather mixed. A first generation of studies provided estimations based on quarterly variations of official reserves¹. They showed little impact of these variations on exchange rates, especially when interventions were sterilized. However, the proxies used for interventions were subject to valuation effects which have nothing to do with interventions. In addition, such studies based on quarterly data could not assess the short-run impact of interventions. Since the early 1990s, the question of the effectiveness of central bank interventions on the foreign exchange market has nevertheless received a renewed interest due to the public release of daily data of interventions by several major central banks over past periods, and to the development of econometric techniques for daily data displaying non-normal distributions as well as time-dependent conditional variance. A second generation of empirical work devoted increasing attention to the effects on volatility (Bonser-Neal and Tanner, 1996; Baillie and Osterberg, 1997a,b; Dominguez, 1998) which was the cornerstone of the 1987 Louvre Agreement. Quite surprisingly, the literature as a whole concludes that interventions either have no impact, or have a positive effect on exchange rate volatility. In addition, there is some moderate evidence that the purchase of dollars by central banks was associated with subsequent dollar depreciation, which is often interpreted as a “leaning-against-the-wind” behavior from the central banks (Baillie and Osterberg, 1997b)².

In this strand of literature, two approaches have been adopted to analyze the effects of central bank interventions on exchange rate volatility. The first approach focuses on exchange rate volatility expectation. For instance, a usual strategy makes use of measures of expected volatility derived from option prices (Bonser-Neal and Tanner, 1996; Galati and Melick, 1999). The second approach relies on another measure of exchange rate volatility which is drawn from econometric models allowing the vari-

¹ See Dominguez and Frankel (1993) and Edison (1993) for surveys. Frankel (1982) and Obstfeld (1990) use such data.

² Using a quite different approach (based on the event study methodology), Fatum (2000) reached nevertheless the opposite conclusion that official interventions can be effective to the extent that the whole episode of operations is considered. Such an approach therefore involves a longer horizon than those considered in the literature under review here.

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