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Order flow and central bank intervention: An empirical analysis of recent Bank of Japan actions in the foreign exchange market

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A B S T R A C T

This paper examines the behaviour of end-user order flows in the foreign exchange market around periods of intense and large-scale intervention activity by the Bank of Japan. First, we find very limited evidence that corporate customers are more than usually likely to be net sellers of yen on days when the Bank of Japan is intervening to sell yen. However, there is somewhat stronger evidence that financial customers are more likely to be net buyers of yen on the same days. Second, we find very clear evidence that intervention matters in a microstructure analysis. The strong contemporaneous correlation between order flows and exchange rate changes essentially disappears on days in which the Bank of Japan intervenes.

1. Introduction

This paper is a contribution to the extensive literature on whether central bank intervention in foreign exchange markets works. It is novel in that instead of analysing the effect of intervention on the value of the exchange rate, the volatility of the exchange rate, expectations of the level of the future exchange rate or even the full probability density function of the future exchange rate, it examines end-user (customer) order flows in the foreign exchange market.[1]

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[1] Girardin and Lyons (2006) have also analysed order flow in a similar context.

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Why is this interesting? Decades of research have unearthed only one type of variable that appears correlated with exchange rate changes at high frequencies, namely order flow. Early work by Evans and Lyons (2002) showed that interbank order flows into a currency are highly correlated with the contemporaneous appreciation of that currency. However, interbank order flows primarily result from risk-sharing activities of banks in the face of inventory shocks caused by end-user order flows. Subsequent work shows that end-user order flows – private information observed only by the bank acting as counterparty – are also correlated with exchange rate changes (Evans and Lyons, 2004; Froot and Ramadorai, 2005; Marsh and O'Rourke, 2005). These end-user flows are the driving force behind turnover in the market. Even so, the nature of the correlation between flows and exchange rate changes is contentious. Since order flow data are usually only available at daily frequencies, the direction of causation is hard to prove. Feedback trading, where flows react to exchange rate changes, is arguably as plausible as flows causing exchange rate changes. However, to the extent that order flows lead to exchange rate changes (either within the day or over longer horizons), intervention activities that alter the behaviour of end-users will affect exchange rates. This paper initially focuses on the link between end-user order flows and intervention, before returning to the order flow-exchange rate link in the process.

We examine the Bank of Japan's recent attempts to manage the value of the yen. This intervention episode is itself the subject of several analyses and is of interest primarily because of the huge amount of yen sold by the central bank in an attempt to hold down the value of its currency. The analysis is in two parts. First, we use a variety of metrics used previously in the literature to test the effectiveness of intervention on the level of the exchange rate to test instead whether intervention successfully altered the nature of customer order flows as observed by a major European commercial bank. We find very limited evidence that corporate customers are influenced to trade in the same direction as the intervention flows. However, there is somewhat stronger evidence that financial customers are inclined to accommodate the demand for dollars for the Bank of Japan.

Second, we find very clear evidence that intervention matters in a microstructure context. The strong contemporaneous correlation between order flows and exchange rate changes observed in many studies also holds for our data over the full sample. However, the relationship essentially disappears for the yen-dollar on days in which the Bank of Japan intervenes. Furthermore, the strong relationship between customer order flows and exchange rate changes in the (hugely liquid) euro-dollar market also disappears on days when the Bank of Japan intervenes in the yen-dollar market. While the nature of the relationship between flows and exchange rate changes is not unequivocally established in the literature yet, this relationship is clearly affected by the presence of a central bank in the foreign exchange market.

We briefly summarise the literature on intervention by the Japanese authorities in recent years in Section 2, before describing the data used in our analysis in Section 3. Section 4 contains the analysis outlined above and we end with some brief conclusions.

2. Intervention in the Japanese yen market

Government intervention to manage the exchange rate has a "bad press" in the academic literature. While several theoretical reasons can be found to explain why it could work, empirical analyses struggle to find much evidence of success (Sarno and Taylor, 2001).

While central banks in most developed countries have increasingly shied away from intervention, the Japanese authorities have been extremely active in their attempts to manage the value of the yen in recent years. Intervention is instigated by the Japanese Ministry of Finance and executed by the Bank of Japan as its agent. For simplicity, we will refer to it as intervention by the Bank of Japan below. As discussed in Ito (2002) and Chaboud and Humpage (2005), the intervention strategies employed by the Japanese authorities have altered over time, usually coinciding with new appointments as Director General of the International Bureau of the Ministry of Finance. Between 1991 and June 1995, intervention was small, frequent, persistent, and often coordinated with the United States. However, the strategy changed to one of large, infrequent interventions following the appointment of Eisuke Sakakibara as Director General in June 1995. This strategy was continued by his successor Haruhiko Kuroda. The appointment of Zembei Mizoguchi as Director General at the start of 2003 prompted a shift to very frequent but somewhat smaller uncoordinated interventions. The increased frequency of interventions more than compensated for the drop in values such