Evaluating Foreign Exchange Market Intervention: Self-selection, Counterfactuals and Average Treatment Effects

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Summary

Central Bank and Ministry of Finance officials make decisions to intervene in the foreign exchange market based on particular economic conditions, political factors, changes in policy and so on. Intervention is typically not random but a process by which officials self select when deciding to intervene. The counterfactual – what would have occurred in the absence of intervention – is not directly observable and, as such, this constitutes a missing data problem. We address the issue of self-selection and the missing counterfactual by estimating the average treatment effect (ATE) of intervention on the exchange rate using a propensity score matching methodology. The counterfactual is derived by matching match pairs of observations (or an average of control observations) of exchange rate movements – each pair consisting of an exchange rate movement coinciding with intervention and one that coincides with no intervention – on similar observable characteristics.

The focus of our matching analysis is to examine the effects of daily Japanese official interventions in the JPY/USD exchange rate market over the January 1999 to March 2004 period. This is a fascinating and unprecedented period in the history of foreign exchange market intervention and fits our methodological framework perfectly. Firstly, the magnitude of intervention was extremely large. Secondly, there are distinct periods of intervention frequency during this sample period. A sharp departure from past Japanese intervention policy began in early 2003 when the frequency of interventions jumped dramatically. Massive official intervention continued in the first quarter of 2004 and this quarter stands out with an intervention frequency of 73% of business days.

Focusing on all intervention days and the general issue of effectiveness, the results of the ATE-matching analysis show that the effect of official intervention in Japan varies dramatically across the three sub-samples under study: significant effect (in the anticipated direction) during the period of infrequent interventions, no significant effect during the period of relatively frequent interventions, and either an insignificant or perverse (counterproductive) effect during the period of very frequent interventions. Furthermore, we find a systematic pattern of non-uniform intervention effects across specific types of intervention days, indicating structural parameter instability within different intervention regimes. These findings are consistent with the view that infrequent intervention operations may surprise markets and prove an effective policy strategy, while frequent intervention operations – even very large scale – are incorporated into market expectations with little or even counterproductive effects.