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Identifying the efficacy of central bank interventions: evidence from Australia and Japan☆

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Abstract

Using a model incorporating the endogenous relationship between exchange rates and intervention, we show how a change in central bank policy can be used as an identification assumption. Estimating this model with simulated GMM for daily data from Australia and Japan, we find that a US$100 million purchase appreciates the Australian dollar by 1.3–1.8% but the yen by just 0.2%. Almost all of the impact of an intervention occurs during the day it is conducted and we confirm that central banks typically lean against the wind.

Keywords: Central bank intervention; Exchange rates; Identification; Heteroskedasticity

JEL classification: F31; C15

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1. Introduction

Since the introduction of floating exchange rates the use, and efficacy, of intervention in the foreign exchange market has been a controversial topic. Most central banks have at times engaged in frequent intervention and at other times followed a more *laissez-faire* approach to the exchange rate. No doubt the observed disparate range of policies between central banks, and within individual central banks over time, can in part be attributed to the lack of accord on the effectiveness and consequences of central bank intervention. Two key questions remain unresolved: how effective is foreign exchange intervention, and if it is effective, through which channel does it act?

A critical barrier to answering these questions has been overcoming the endogeneity of changes in the exchange rate and intervention. The central hypothesis is that intervention affects the exchange rate. But crucially, the decision to intervene is not independent of the movements in the exchange rate. Moreover, even after a central bank has decided to intervene, the quantity of currency it buys or sells and its timing will typically depend on the response of the exchange rate to its initial trades.

The literature has typically dealt with the simultaneous equations problem by assuming that the contemporaneous decision of the central bank is independent of the current innovations to the exchange rate. This is a strong assumption. For example, it assumes that the central bank does not alter its trading behavior after assessing the impact its actions have had on the exchange rate. There is strong evidence in stock markets that big players act strategically when they are unwinding large positions. Why should we expect that central banks do not behave in a similar manner?

In this paper, we use an alternative identification method to solve the problem of simultaneous equations. We use daily interventions by the Reserve Bank of Australia (RBA) over 7 years and by the Bank of Japan (BoJ) over 10 years. Both of these samples contain a dramatic change in intervention policy that we use for identification: the monetary authorities decided to eliminate “small” interventions and concentrate on “big” ones. This change in policy occurred because the authorities realized they were investing too much effort on small actions. We use these shift in policy as our instrument to solve the problem of identification. An important component of our strategy is that we interpret these policy changes as being exogenous. To use the policy change for identification, we developed a simple model that describes the relationship of the exchange rate with both the decision to intervene and the size of the intervention. This non-linear model enables us to specified directly the change in intervention policy and so estimate the parameters of the model. Our identification strategy depends crucially on both our model of intervention and this change in intervention policy.

The estimates we obtain have the correct sign and, in the case of Australia, is significantly larger than those found with more standard methods. This is not surprising given we would expect estimates that do not properly account for endogeneity to contain downward bias. Further, the vast majority of the effect of an intervention on the exchange rate is found to occur during the day in which it is conducted with a smaller impact on subsequent days. This explains why small effects are usually found when lag values are used in the typical OLS specifications.