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Is Official Foreign Exchange Intervention Effective?

Many governments have intervened in foreign exchange markets to try to dampen volatility and to slow or reverse currency movements. Their concern is that excessive short-term volatility and longer-term swings in exchange rates that "overshoot" values justified by fundamental conditions may hurt their economies, particularly sectors heavily involved in international trade. And the foreign exchange market certainly has been volatile recently. For example, one euro cost about $1.15 in January 1999, dropped to only $.85 by the end of 2000, and recently climbed to over $1.18. Over this same period, one U.S. dollar bought as much as 133 Japanese yen and as little as 102 yen—a 30% fluctuation. Many other currencies also experienced similarly large price swings in recent years.

Official intervention in the foreign exchange market means that the central bank or other agent of the government buys or sells foreign currency in an attempt to influence the exchange rate value. Purchases of foreign exchange usually are intended to push down the home currency value of the exchange rate, and sales usually are intended to push it up.

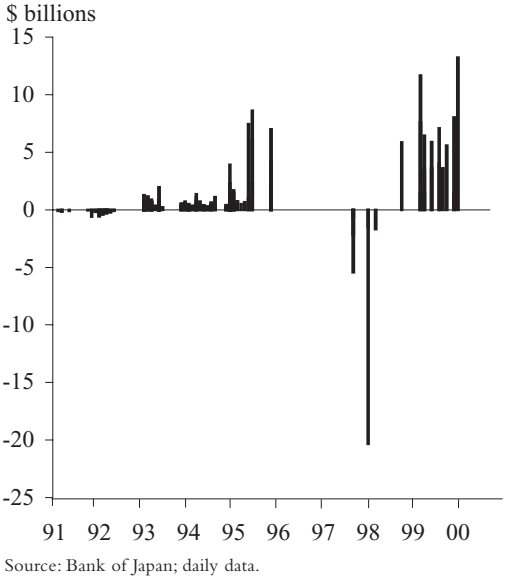
Conventional academic wisdom holds that "sterilized" interventions have little impact on the exchange rate and are a waste of time and of the government's foreign exchange reserves. In a sterilized intervention, the central bank offsets the purchase or sale of foreign exchange by selling or purchasing domestic securities so as to keep the domestic interest rate at its target. Since the domestic interest rate usually is considered the main determinant of the value of the domestic currency, many argue, it must change in order to influence the exchange rate. However, a body of work by Fatum and Hutchison —summarized in this *Economic Letter*—suggests that sterilized intervention is more effective than commonly believed.

Governments still intervene

Despite academic skepticism, many central banks intervene in foreign exchange markets. The largest player is Japan (Figure 1). Between April 1991 and December 2000, for example, the Bank of Japan (acting as the agent of the Ministry of Finance) bought U.S. dollars on 168 occasions for a cumulative amount of $304 billion and sold U.S. dollars on 33 occasions for a cumulative amount of $38 billion. A typical case: on Monday, April 3, 2000, the Bank of Japan purchased $13.2 billion of dollars in the foreign exchange market in an attempt to stop the more than 4% depreciation of the dollar against the yen that had occurred during the previous week.

These magnitudes dwarf all other countries' official intervention in the foreign exchange market—exceeding U.S. intervention over the same period, for example, by a factor of more than 30. It is also

Figure 1
Bank of Japan intervention



Source: Bank of Japan; daily data.

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much greater than German Bundesbank intervention operations when it had been responsible for exchange rate policy. Over September 1985 to December 1995, the Bundesbank intervened in the mark/dollar exchange rate market on a total of 234 days—selling dollars on 169 days (for a total of $18 billion) and purchasing dollars on 65 days (for a total of $9.5 billion). Since the introduction of the euro in January 1999, the European Central Bank has been very reluctant to intervene in the foreign exchange markets, doing so only four times in late 2000 (buying euros and selling dollars) in an attempt to stem the slide of its currency at that time.

The magnitudes of these interventions—even those by the Bank of Japan—are very small compared to overall market transactions in the foreign exchange market. The Bank for International Settlements survey on foreign exchange market activity in April 2001, for example, reports that average daily transaction value amounted to $1.2 trillion (U.S.) in "traditional" instruments and $387 billion in spot market transactions alone.

Because the magnitudes of official intervention are small, and because few studies have found evidence supporting a link between intervention and exchange rates, many professional economists tend to be skeptical about whether official intervention could play an important role as an effective policy instrument to influence exchange rates. Does this mean that official intervention policies—especially Japan's—are misguided and that central bankers are irrational? Or is evidence showing the effectiveness of sterilized intervention being overlooked?

New methodology

Fatum and Hutchison (2002, 2003a, b) and Hutchison (2003) report new empirical work investigating the effectiveness of intervention operations using daily data from the German Bundesbank, the Bank of Japan, the European Central Bank, and the Federal Reserve. By contrast with other studies, this research finds that official intervention is effective when used selectively and directed to short-run objectives. Active exchange rate management is alive and well, as long as the authorities have limited objectives, cooperate with other central banks, and are persistent!

The studies look at intervention "episodes"—periods of several days running when intervention is intense and persistent—and link intervention with systematic exchange rate changes. One example of a single event is the three consecutive days of the Bank of Japan's intervention on December 17–19, 1997 (during which a total of $8.2 billion in U.S. dollars were sold—and yen purchased—to support the yen exchange rate).

Once these separate intervention "episodes" or "events" are identified, the authors analyze the subsequent effect on the exchange rate. Using several criteria for "success," they find that intervention operations are usually successful in either slowing or reversing the direction of exchange rate change—the objective of most central banks—over periods of up to two weeks. (The success criteria are based on changes in either the level or rate of change in the exchange rate in the days following the intervention operation, compared to those prevailing prior to intervention.)

Evidence of effectiveness

The authors identified 34 intervention episodes (yen sales or purchases) by the Bank of Japan between April 1991 and December 2000 of which 24 were successful. The odds that this rate of success is random are less than 1%. Similarly, they identified 26 intervention episodes (deutsche mark sales or purchases) by the German Bundesbank between 1985 and 1995 (daily data) in response to either an appreciating or depreciating currency of which 24 were successful. Again, the odds of this rate of success being "random" are less than 1%.

Not surprisingly, intervention supported by central bank interest rate changes has an even larger impact than intervention alone—but both are effective in moving exchange rates. Similarly, cases where intervention was coordinated between the Bank of Japan and the Federal Reserve or the Bundesbank and the Federal Reserve—that is, where both central banks were in the market at the same time—had a larger impact on exchange rates than unilateral foreign exchange operations. (Episodes of coordinated intervention are rather rare, however, as the Fed has intervened in the foreign exchange market against the yen on only 22 occasions during the sample period.) Furthermore, the likelihood of success was greater the larger the volume of intervention and the longer the central bank was persistently "in the market."

Why do these studies find that intervention is effective in moving the exchange rate over periods of several days to several weeks when other studies have failed to find a link? The main reason is methodological. Previous work has tried to link the intense and sporadic bursts of intervention activity episodes that occur infrequently to exchange rates that change almost continuously on a daily basis. (Too few intervention episodes relative to the overall size of

the sample give low power in statistical tests). The episodic approach employed by Fatum and Hutchison —an "event study" framework—is better suited to detecting statistical linkages in this circumstance, as long as the focus is on short-term exchange rate changes.

Caveats

There are costs and benefits to using any methodology, and the great benefit of the event study approach is that it can find a connection in a simple and intuitive way between intervention and exchange rate fluctuations.

One drawback, however, is that an event study approach does not help identify the particular channel through which intervention works; that is, it cannot say much about why intervention works, in terms of distinguishing among alternative explanations. The event study findings are consistent with recent literature interpreting intervention as a means to "signal" future monetary policy and the central bank's views on the fundamental, or equilibrium, value of the exchange rate. But the findings also may be consistent with other channels of transmission through which central bank intervention moves exchange rates. A second drawback is that an event study methodology in our context is really useful only in analyzing the short-run linkages between intervention and exchange rates—up to a one month period with this sample of daily data. If the period of investigation following the event is too long (for example, longer than three to four weeks), then one episode of intervention runs into another, and a clear identification of separable events is not possible.

Policy implications

Policymakers often are constrained in their use of fiscal and monetary policy to influence exchange rate values. Sterilized intervention is one additional instrument that may help. The body of literature reviewed here, based on event study methodologies, suggests a role for sterilized intervention in the short run. An even stronger case may be made for concerted or coordinated sterilized intervention policy.

These results shed light on why central banks continue to pursue sterilized intervention despite widespread academic skepticism over its effectiveness. Intervention events—when viewed as a related set of daily intervention operations—appear to influence exchange rates in the short run. These effects are likely to be missed in the standard time-series analysis that generally have been used in this context.

Sterilized intervention may be especially useful when the exchange rate is under speculative attack (that is, when a change in the exchange rate is not justified by fundamentals) or to help coordinate private sector expectations. Recent research has emphasized that several equilibrium exchange rate values may be consistent with the same set of "fundamentals" but with different sets of private market expectations (see, for example, Obstfeld 1996). In these cases sterilized intervention may play a particularly important role since it can move the market toward the desired point without changing such fundamentals as monetary policy.

The empirical evidence discussed here supports only the short-run effectiveness of intervention. Therefore, the results should not be interpreted as a rationale for intervention as a longer-term management tool for exchange rates that supplants more fundamental policy actions. Nonetheless, in many cases the effectiveness of intervention in the short run may be all that is needed.

Michael Hutchison
Visiting Scholar, FRBSF, and
Professor of Economics, UC Santa Cruz

References

[URL accessed July 2003.]

Fatum, Rasmus, and Michael M. Hutchison. 2002. "ECB Foreign Exchange Intervention and the Euro: Institutional Framework, News, and Intervention." *Open Economies Review* 13(4), pp. 413–425

Fatum, Rasmus, and Michael M. Hutchison. 2003a. "Effectiveness of Official Daily Foreign Exchange Market Intervention Operations in Japan." NBER Working Paper 9648 (April). http://www.nber.org/papers/w9648

Fatum, Rasmus, and Michael M. Hutchison. 2003b. "Is Sterilized Foreign Exchange Intervention Effective After All? An Event Study Approach." *The Economic Journal* pp. 390–411.

Hutchison, Michael M. 2003. "Intervention and Exchange Rate Stabilization Policy in Developing Countries." *International Finance* 6, pp. 41–59.

Obstfeld, Maurice. 1996. "Models of Currency Crises with Self-Fulfilling Features." *European Economic Review* 40, pp. 1,037–1,048.

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