

## Discussion

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In their paper, Evans and Lyons develop a multi-stage model of the foreign exchange market. Although the focus is different, the model is similar in many respects to the simultaneous interdealer trading models presented in papers by Lyons (1997) and Evans and Lyons (2002). While speculative motives for interdealer trading are analyzed in their previous work, the authors choose here to focus on the risk-sharing decisions of dealers and the public in the foreign exchange market. The initial catalyst for trading in the model is an exogenous portfolio shift by customers in terms of their foreign exchange holdings. Since dealers and the public are risk-averse, they demand a risk premium to absorb the undesired position of their counterparties. The connection between the model presented by Evans and Lyons and the portfolio-balance model in its previous form (Branson and Henderson 1985) is now clear: the central assumption of the portfolio-balance models is the imperfect substitutability of assets.

The model presented by Evans and Lyons allows for asymmetric information among dealers in the foreign exchange market. Specifically, each dealer has private information about his or her own customers' orders. Trade transparency is also enhanced with observations of order flow, or the net foreign exchange imbalance in the market. Although transmitted in reality via interdealer brokers, this addition to the model conveys a dealer's "feel for the market." The model is able to clarify the role played by order flow in conveying information about portfolio shifts that is critical to dealers making decisions about risk-sharing. Evans and Lyons are able to closely replicate many of the features of the market in their model, an essential feature in the market microstructure literature.

The model is complicated by the multiple rounds of trading among dealers. In every round, each dealer must update his or her priors about the

magnitude of the portfolio shift before submitting a trade order. The paper focuses on the risk premium (or price-level adjustment) that dealers demand in order to adjust their inventory position as a result of the portfolio shift. The paper also examines the compensation that the public must be awarded to take on this market imbalance when dealers end each day with a zero net position.

In their empirical analysis, the authors attempt to measure both the transitory risk premium demanded by individual dealers from the temporary position they hold, and the persistent price effect resulting from the risk premium demanded by the public. This persistent effect exists once risk-sharing among the wider market is complete. The results are then used to characterize the effects of hypothetical sterilized (non-policy-related) secret intervention operations by the monetary authority. Transaction-level trade data for the DM/US\$ over the period 1 May to 31 August 1996, collected from the Reuters Dealing 2000–1 system, are employed in the exercise. While the size of each transaction is not known, the trade initiator is known, so that order flow is measured as the sum of buyer-initiated purchases less seller-initiated sales.

The authors find strong support for the portfolio-balance approach. Specifically, there is a 0.44 per cent change in the DM/US\$ exchange rate for a \$1 billion trade. More importantly, 83 per cent of this effect persists indefinitely. This estimate is then used by Evans and Lyons to determine the impact of sterilized secret intervention by the monetary authority. Non-parametric kernel estimation is used to determine whether the price impact of trades depends on the state of the market. One result suggests that when the number of macroeconomic announcements is large, the effect on prices from order flow is large.

The order-flow view of the exchange rate has allowed macroeconomists to look at an alternative and promising view of the foreign exchange market that explicitly accounts for the microeconomic features of the market. In Evans and Lyons (2002), 60 per cent of the variability in the DM/US\$ exchange rate can be accounted for by order flow. In D'Souza (2002), 35 to 40 per cent of the variability in the Can\$/US\$ is accounted for by order flow. Macro models rarely account for more than 10 per cent of the variation in exchange rates. The most interesting feature of this paper is the characterization of the model in the light of the portfolio-balance approach. The model clearly demonstrates that a large proportion of the variability in exchange rates is a result of portfolio shifts.

A powerful feature of market microstructure models is their ability to accurately reflect the institutional features of the market. While the paper has many positive aspects, several important assumptions of the paper need

to be further examined. The first is that if the central bank intervenes secretly, and in a sterilized manner, with no implicit monetary policy signal, the estimates obtained in the paper from interdealer trades can be used as a proxy in determining the impact of the central bank intervention operations. The authors point out that this exercise would be more informative if public trades were available. But of greater concern is the fact that the authors make no distinction between public orders and central bank orders. They have assumed that central bank trades, like public trades, are a result of an exogenous portfolio shift in the holdings of the monetary authority. The problem with this assumption is that the term “intervention” necessitates an objective function for the intervening agent. Surprisingly, the authors propose that policy-makers may intervene to ensure liquid or orderly markets. Altering the technical outlook to avoid the emergence of extrapolative expectations, or adding liquidity in periods of added uncertainty when currency markets “gap,” are two instances where the monetary authority intervenes to ensure orderly markets. If these are the types of examples that the authors have in mind, then the monetary authority does indeed have an objective function, and an inconsistency exists within the model.

If the central bank intervenes when markets are believed to be disorderly, even though intervention is secret, dealers will, over time, estimate a non-zero prior that an incoming trade has originated from the central bank. Possible opportunities for speculation by dealers who have received the trade will arise and, as such, prices may not only reflect a risk premium, but speculative strategies based on a game played between the central bank and dealers, and subsequently, between dealers and other dealers.

The second point that needs to be addressed is that the authors assume that public trades do not convey payoff-relevant information and, therefore, any persistent price effects are a result of portfolio shifts. Alternatively, persistent price movements may not only reflect the risk premium demanded by the public as a result of a portfolio shift, but information in trades about macroeconomic fundamentals. This is not to say, however, that traders knowingly have this information at hand (e.g., insider trade information). What I have in mind is that public trades may implicitly summarize the competitiveness of the economy via international trade and investment flows (mergers and acquisitions). Furthermore, once aggregated, net order flow may convey this fundamental information to a wider market. Hasbrouck (1991, 1995) finds that in equity (and derivative) markets there is private information in trades. Identifying the two types of persistent effects in the Evans and Lyons study may be possible only with a long enough data set.

My final concern relates to the state dependency results of the paper. It suggests that the impact of trade orders on prices was not significantly affected by price volatility, which the authors argue suggests that intervention would affect foreign exchange markets in similar ways whether orderly or disorderly. Is this not counterintuitive? The price-level impact or the risk premium should adjust with increases in the standard deviation of prices. Does the insignificance of the result have something to do with the length of the data sample, a period where disorderly markets in the DM/US\$ were not a concern?

Overall, the model and results of the paper are new and innovative. They make a definite contribution to the exchange rate literature by exploring the impact of risk-sharing by dealers and the public on the dynamics of short-term exchange rates. The paper is able to quantify the temporary and permanent impact of customer trades on exchange rate. Leaving out the application of the model and its estimates to exchange rate intervention will not reduce the importance of the paper to the literature.

## References

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