General Discussion*

Richard Lyons opened the discussion by saying that the comments on the need to include institutional realism in their model were relevant. However, he noted, the model did capture some important institutional realities, namely, that dealers do not carry overnight positions, and the interdealer market is where the process of price discovery takes place. He admitted that it is possible that price discovery also takes place in the direct (as opposed to brokered) interdealer market, but they did not have data on this and modelled what they could within the limits of their data and a parsimonious model specification.

Regarding the need to include a central bank's objective function, Lyons emphasized that the central bank's actions come as a surprise to the market, and this surprise causes a price adjustment. Having a predictable objective function won't change the price effect, only the timing of the price adjustment.

As to whether prices are adjusting to movements in fundamental information or risk premiums (portfolio-balance effects), Lyons argued that the order flow is itself information-relevant to the market, and that the traditional definition of "fundamentals" (macroeconomic data releases only) is too narrow. He asked whether the central bank's order flow communicates information about macroeconomic fundamentals. If the order flow is stochastic, he would argue that it does not. The authors had done other work that indicates that the order flow does contain information about fundamentals, but in this other paper, macroeconomic information explained

* Prepared by William Barker.

only about 20 per cent of the order flow. He estimated that an upper bound of the macroeconomic effect on order flow would be about 30 per cent. He said that the paper presented at this conference did argue for the effectiveness of portfolio-balance effects (as opposed to shifts in macroeconomic fundamentals), but that the case should not be overstated.

Finally, in regard to the comments on time-variant volatility of asset prices and risk-premium effects, he pointed out that the model assumes constant variance (and implies no shifts in risk premiums). They did not find any evidence of time-variable volatility, but this would be a suitable topic for further empirical analysis.

Lawrence Schembri addressed the issue of whether the order flow is picking up portfolio-balance effects or changes in macroeconomic fundamentals. He wondered if the authors had considered projecting (regressing) the order flow on the fundamentals and using the resulting orthogonal residuals in the model. Lyons responded that the data set used in the paper did not have enough observations—it was too short, at only fours years—to be able to do this effectively. He said, however, that there are now data sets available that are seven to eight years long and would allow this approach to work. He added that this was a good suggestion for future work.

Alain Chaboud asked Lyons whether he thought that the one-hour time frame the authors were using to define their data was too short to pick up inventory-adjustment effects, effects that may take longer to transact. Lyons said that they have lagged returns in the model, and that they do show persistence of adjustment. He noted, however, that adding a richer lag structure to pick up longer-term adjustments does not materially change the model's parameter estimates or conclusions.

Chaboud said that there are now extensive intervention data available from the Bank of Japan. He said that these data do not seem to show the magnitude of intervention effectiveness suggested by the paper's results. Lyons admitted that the Japanese data do appear to indicate less effective results for their intervention. This, he suggested, might be due to the strategy used by the Bank of Japan at the time. In particular, if a central bank reverses a previous portfolio shift, this will in turn reverse the effects of the previous intervention. The authors' results apply for a permanent shift in the central bank's balance sheet.

Chaboud asked whether, instead of defining the model in terms of "intervention," why not simply present it as a study of the persistence of order-flow effects? The type of intervention described in the model is now an "empty set": central banks don't use secret intervention any more, but rely on the signalling effect of their highly visible interventions to influence

the market. Lyons replied that the authors had limited their study to secret interventions, and the estimates cannot be directly applied to other, more visible intervention techniques. The results do show that if a central bank uses secret intervention, then the impact on foreign exchange markets should be approximately of the magnitude estimated.

Asani Sarkar noted that one piece of information missing in the model was the trade direction. He asked whether including this would have affected the results.

Lyons replied that although the data do not indicate the volume of trading or size of individual trades, they do show the direction of the trade (i.e., the data are signed either positive-one or negative-one, depending on whether the "aggressor" who initiated the trade was a buyer or a seller). He added that although it would be interesting to have more information about the size of each transaction, that information is not available. Nonetheless, he noted, they were still able to obtain useful results based on the information they did have on trade direction.