# *The Microstructure of Foreign Exchange Markets,*

**Edited by Jeffrey A. Frankel, Giampaolo Galli and Alberto Giovannini, NBER 1996, Chicago, pp. x+346, $71.50**

Ever since the advent of the generalised floating exchange rate regime many theoretical and empirical research have appeared explaining the behaviour of exchange rates. The theoretical insight of all recent empirical research is the so-called asset market approach, which has produced a number of models and have been useful in explaining and quantifying exchange rate movements. The asset market approach, which assumes free capital mobility presumes that current or future change in the return on assets denominated in different currencies has an immediate and unambiguous effect on exchange rates. The basic characteristic of these models is that they are highly aggregated. The need for looking into the microstructure of foreign exchange markets stems from the shortcomings involved in the macro models. These models face a prima facie contradiction between the models and reality, fail to predict exchange rates at short horizons and are incapable of explaining exchange rate movements ex post and volatility of exchange rates. This edited volume by Frankel, Galli and Giovannini addresses the micro aspects of foreign exchange markets with special emphasis on institutional aspects and behaviour of market participants. Certain aspects like transparency, decentralisation, the use of brokers, the location of trading, the efficiency of clearing of foreign exchange transactions, the relation between spot and derivative markets, and the importance of systemic risk in the market are also covered in this volume. This edited volume is composed of two parts containing nine innovative essays. The first part of the book covers broad areas like trading volume, asymmetric information, and bid-ask spreads, whereas the second part covers analytical issues like speculation, exchange rate crises and macroeconomic fundamentals.

In the first chapter of this book, Philipe Jorion makes an attempt to examine the correlation between trade volume and volatility of prices (average of trader's option prices) in the foreign exchange market based on the theory developed by Tauchen and Pitts. The theory says that the correlation between trading volume and volatility should be positive when the source of trading volume is from heterogeneous (fixed number of) traders and negative when source of trading volume is determined by a large number of traders. Jorion considers daily closing quotes for deutsche mark (DM) currency futures and options over January 1985-February 1992 for his analysis. He uses the Implied Standard Deviation (ISD) and the Generalised Autoregressive Conditional Heteroscedastic (GARCH) models to estimate the volatility. This study confirms positive relationship between unexpected risk and unexpected volume. The study also finds that spreads are positively correlated with expected risk.

In Chapter 2, Hsieh and Kleidon explore the implications of foreign exchange markets for alternate markets of intra-day price and volume behaviour. They argue that current models of asymmetric information appear inadequate to explain volatility in the foreign exchange market because private information associated with high volatility in one market is not picked up by the other market. They suggest two possible explanations to account for the behaviour of prices and volumes in foreign exchange markets. First, importance should be given to nature of traders, their behaviour, structure of the market, and identity of other traders. Second, at the close of the trade, much of activity in the closing market may be due to the inventory-related activities of traders at market close, especially for the large group of intra-day traders who must close their

positions by the end of trading.

In Chapter 3, Perraudin and Vitale develop a theory which examines the reasons behind the high percentage of trading volume being accounted for by dealers instead of customers. They emphasise that, because the foreign exchange market is decentralised, order of flow cannot be observed by everyone. Perraudin and Vitale provide a model for trading process by means of which the new information gets disseminated to the market place by dividing the interval into four stages. They found that bid-ask spreads are wider in decentralised markets. By posting wider spreads in a decentralised market the dealers can discourage pricesensitive liquidity traders and hence improve the information contents of their order flow. The information embodied in orders can in turn be used to earn high profits and can be 'sold' to the market makers through interbank transactions at advantageous prices. Decentralised markets are much less subject to market crashes than centralised markets. Under certain circumstances static or centralised markets would crash owing to excessive number of informed traders, whereas, in decentralised markets dealers will have an incentive to preserve some turnover as they can employ the information in the order flow in the subsequent trading.

In Chapter 4, Goodhart, Ito and Payne study the foreign exchange dealers' behaviour as reported by the 2000-2 Reuters foreign exchange trading system. Using data from the Reuters system they have compared the actual transaction prices with the indicative quotes. They found that movements in the two are very close. On the other hand, Lyons examines the traders' behaviour through the structure of the foreign exchange data in Chapter 5. He examines the trading intensity with the help of two competing theories, viz., *the event-uncertainty view* and *the hot potato view* as found in the literature. The event-uncertainty view holds that traders are more informative when trading intensity is high whereas, the hot potato view holds that traders are more informative when trading intensity is low. His empirical evidence supports the hot potato view: the quantity traded has a significant effect on the trader's prices only when the time between transactions is very long.

Garber and Spencer examine the effects of dynamic hedging strategies on foreign exchange markets during the periods of excessive volatility in the exchange rate in Chapter 6. During the European currency crises of 1992, dynamic hedging instrument were put into practice by a number of countries to contain speculative activities that caused increased sales of the currencies under attack following defensive interest rate hikes by central banks. Garber and Spencer argue that in a fixed exchange rate regime, a defensive exchange rate policy requires that interest rates must be raised to high levels albeit gradually. Such a policy would trigger daily selling of the currency by dynamic hedgers, but not in quantities that would overwhelm the central bank's net reserve limits by the end of the day beyond its reserve position limits.

One feature of this dynamic hedging is that different agents respond differently to the same information. This issue of heterogeneity across agents is discussed explicitly by Bagliano, Beltratti and Bertola in Chapter 7. They analyse Italian data from the balance of payments statistics and central bank's balance sheets and conclude that there is evidence of heterogenous behaviour before the September 1992 crisis. During the pre-crisis period in Italy, non-bank residents were net exporters of capital and revealed gradual portfolio diversification. They argued that there were sources of heterogeneity which were linked to risk aversion, need for

liquidity, and asset preferences rather than those related to perceptions of market players in determining the direction and intensity of trading by different agents. Furthermore, formal and informal regulatory constraints, especially on banks, was also an important factor.

While establishing the microstructure analysis of exchange rate dynamics, Flood and Taylor in Chapter 8 have questioned the strength of conventional macro models in explaining the exchange rate movements in the short run. They have critically reviewed the asset market approaches to exchange rate determination and tested them empirically for industrialised economies. Using data on 21 industrialised countries for the floating rate period, they found that macro fundamentals are poor guide to variations in short-run exchange rate movements (where the short-run is defined as one year or less), although they may have considerable explanatory power over longer horizons.

The last Chapter of the book by Eichengreen, Rose and Wyplosz deals with policy prescriptions to be followed during currency crises under self-fulfilling speculative attacks against a pegged exchange rate. They argue that European Monetary Union (EMU) will not be achieved unless the Maastricht Treaty is amended in one of the following ways. Either the exchange rates are required to fluctuate within the 'normal' fluctuations band, or capital controls are required to maintain the required stability in exchange rates during the transition. Their specific proposal is to introduce a non-interest bearing deposit on bank lending to non-residents where bank lending is observed to be the raw principles for carrying out speculative activities. Using data for twenty-two countries over twenty-five years, they found that capital controls have been associated with significant differences in the behaviour of macroeconomic variables such as budget deficits and growth rates.

In the recent period there have been significant developments in the Indian foreign exchange market. The monthly average turnover rose significantly from about US $78 billion during 1996-97 to about US $ 109 billion during 1997-98 where about 80 per cent of the total transactions were undertaken by the inter-bank segment. Towards further deepening the foreign exchange market in the context of a globalised financial system, a large degree of freedom has been given to the authorised dealers. They have been allowed to use longer term hedging instruments. Looking into the microstructure of the Indian foreign exchange market, in terms of spread of information and use of risk-based instruments, the market is not well developed and dominated by spot transactions. While establishing a well developed foreign exchange market, a detailed re-examination of the microstructure aspect of the market along with a sound financial system is required.

This book offers a unique contribution to the microstructure theory of foreign exchange markets by discussing both the operational and analytical aspects. The issues addressed in this book will be extremely useful for both macro and micro model builders to arrive at a balanced approach.

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by

Dr. G. Balachandran

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