Real trading patterns and prices in spot foreign exchange markets

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Abstract

Most empirical FX microstructure research uses indicative quotes to proxy for firm, tradeable quotes. This paper presents comparison of the characteristics of one week of indicative DEM/USD data with contemporaneous, transactions-based data from an electronic FX brokerage. A high-frequency analysis yields the following results. Indicative returns are more volatile and more strongly autocorrelated than firm returns. Unlike firm spreads, indicative spreads contain no information on market liquidity. Indicative returns lag firm returns by around 3 minutes. These differences disappear with aggregation. Return properties are similar when sampled every 5 minutes and are essentially indistinguishable when sampled every 10 minutes. © 2002 Elsevier Science Ltd. All rights reserved.

1. Introduction

In recent years there has been a large increase in the amount of research devoted to the microstructure of foreign exchange markets and the behaviour of high-frequency exchange rate data. While some of this research has been driven by theoretical and statistical advances, the main impetus has been the increased availability of tick-by-tick exchange rate data to researchers. These data have been derived primarily from the FXFX, and later EFX, pages of Reuters' information systems and has been exten-

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sively employed in empirical studies. For example, FXFX midquotes are widely used as proxies for transaction prices in analysis of intra-day exchange rate volatility (Baillie and Bollerslev, 1991; Dacorogna et al., 1993; Andersen and Bollerslev, 1997; Payne, 1996), triangular arbitrage relationships (de Jong et al., 1998), and intra-day technical trading rule performance (Curcio et al., 1997). FXFX spreads have been used as measures of FX market liquidity in studies such as Bollerslev and Melvin (1994) and Hartmann (1999). Finally, FXFX quote frequency is used as a proxy for traded currency volumes in Bollerslev and Domowitz (1993) and Melvin and Yin (2000).

EFX data, however, have a number of shortcomings. First, and most importantly from a microstructure perspective, they contain no measure of traded currency volumes. This renders many interesting microstructure hypotheses untestable. Second, the bid and ask quotes derived from EFX screens are *indicative* rather than *firm*. This means that such quotes are not binding commitments to trade from the originator and hence they may not be accurate measures of tradeable exchange rates. Furthermore, while the EFX system gives a timestamp for the entry of a quote pair, no such timing is given for the exit of quotes. Hence there is no information on the effective lifetime of EFX quotes. Finally, each EFX bid and ask quote pair is input by a single dealer. As such, these quotes are likely to reflect dealer-specific characteristics (e.g. inventories or beliefs) and may be a poor representation of 'market quotes'.

These shortcomings raise concerns about the validity of EFX data as a proxy for both transaction prices and firm quotes. Below, we present an empirical comparison of the features of data derived from both indicative EFX quotes and firm data drawn from Reuters D2000-2 (an electronic FX broking system), using tick-by-tick observations for the same five days. As such, this work builds upon, extends and clarifies results in Goodhart et al. (1996), who compare the statistical features of EFX data and data from D2000-2. However, their analysis is subject to a number of limitations. First, their data covered only a single day. Hence, for example, they could not examine recurrent intra-daily patterns in the data or provide accurate information on how the statistical features of the data varied with time of day. The second main limitation of their study is that their D2000-2 data are not timestamped. Hence, in order to construct approximately contemporaneous data sets, they match them by maximizing the correlation between EFX and D2000-2 midquotes. Clearly, this implies that Goodhart et al. (1996) cannot properly examine the lead–lag relationships between EFX and D2000-2 returns and volatility measures.

Our analysis is based on a newly available transactions-based data set on the DEM/USD drawn from Reuters D2000-2.[1] The data covers the week from October 6 to October 10, 1997, and, in addition, we have EFX data from the same week. We examine the following statistical features of series drawn from the two data sources;

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[1] The data are available for academic research from the Financial Markets Group at the London School of Economics. See http://fmg.lse.ac.uk. To our knowledge, the data have not been used as yet in any published work.