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4 One Day in June 1993: A Study of the Working of the Reuters 2000-2 Electronic Foreign Exchange Trading System

Charles Goodhart, Takatoshi Ito, and Richard Payne

4.1 Introduction

This is a study of foreign exchange dealers' behavior as revealed in the working of Reuters 2000-2, a recently developed electronic foreign exchange trading system. It was launched in 1992 with twenty-three subscriber sites in two countries and by September 1993 had more than 230 dealing sites in twenty-eight cities in seventeen countries (Blitz 1993). The working of the system is described in more detail in section 4.2. This dealing system 2000-2 (henceforward termed D2000-2) is, however, still at the developing rather than a mature stage, and the snapshot that we have of its operations on one day—

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This lengthy empirical exercise was conducted in a number of stages. After one of the authors, C. Goodhart, had obtained the original videotapes from Reuters, to whom we are most grateful, the data on the tapes were transcribed onto paper by two of the authors' wives, Mrs. Goodhart and Mrs. Ito, assisted by Yoko Miyao, a painstaking task beyond and above the normal requirements of matrimony. The data were then sorted and organized by T. Ito and R. Payne, separately in the United States and the United Kingdom. The graphic appendix is entirely Ito's work. The descriptive material in sections 4.1 and 4.2 was mostly written by Goodhart. The comparison of D2000-2 and FXXF in section 4.3 had input from all authors, but mostly Goodhart and Payne. The comparable FXXF data were obtained from Olsen and Associates, to whom we are most grateful. Only the first three sections were ready in time for the July Perugia conference, so this is all that our discussants, to whom we are most grateful, then had before them. Section 4.4, completed thereafter, was entirely the work of Goodhart and Payne, with Payne responsible for the econometrics, apart from table 4.16 by Ito. Charles Goodhart and Richard Payne wish to thank the Economic and Social Research Council for financial support. Takatoshi Ito thanks Charles Kramer for technical assistance in producing the graphic appendix.

16 June 1993—may have become outdated and obsolete by the time that this is published.¹

Reuters has become subject to competition in this marketplace, from Minex and from the Electronic Broking Service (EBS). The former was established in April 1993 by Japanese institutions and, according to Blitz (1993), is “much used in Asia,” although, as of September 1993, it did not reveal the number of trades crossed or terminals used. EBS was founded on Wednesday, 21 September 1993. It cost, again according to Blitz, around £40 million to launch and has been backed by a dozen leading banks in foreign exchange—such as Citibank and Chase Manhattan—who formed a consortium with Quotron, an electronic information screen competitor with Reuters.

In September 1993, Bob Etherington, Reuters’ international marketing manager, would not reveal his dealing system’s current volume levels, although Blitz (1993) did report that the “system has reached [its] initial target of 1,000 trades a day, each for a minimum 1 million units of currency dealt.”² As noted, Minex was not then disclosing the number of trades, and EBS had not started but was going to invite dealers “to trade in standard amounts of \$5 million in Dm/\$ and £5 million in £/Dm.”

Such electronic *dealing* systems (as contrasted with informational pages supplying indicative bid-ask quotes, such as the Reuters FXFX page) are still in their early stages and are highly competitive. Moreover, they may have an important future: “Roughly 60 per cent of deals in the currency market are now done by traders in two banks—or counterparties—who call one another up directly. The remainder of deals are done through brokers, who bring together diverse buyers and sellers. . . . But they [the banks] complain that the commissions charged for broking a deal are very high. Automated brokerage terminals do the same job as humans at a reduced cost. . . . The banks are attracted by the reduced cost of commission. But they fear that 2000-2 will help monopolize the market in electronic dealing systems. Mr. Bartko [chairman of the EBS partnership] admits that this is one of the principal motives for this week’s launch of EBS” (Blitz 1993).

Electronic trading systems have been in use for rather longer in other financial markets, notably in standardized futures and options markets. Instinet and Globex are two such that Reuters has again been developing. A useful taxonomy of the modus operandi of such electronic trading systems has been provided by Domowitz (1990, 1993).

1. Readers wanting more up-to-date information should refer directly to Reuters Limited, 85 Fleet Street, London EC4P 4AJ, United Kingdom.

2. The total amount thus traded is large in absolute amount but small relative to reported daily turnover in this market of some \$900 billion or more. We find it hard to relate the data reported above to the BIS (1993) report in their 1992 survey that, “in the United States and the United Kingdom, the share of deals going through such [automated dealing] systems in April 1992 was 32 and 24% respectively” (table 1, p. 21, and p. 24). Probably definitions of automated dealing systems would have been somewhat wider, including Reuters D2000-1 as well as D2000-2, but, even so, the above percentage seems surprisingly high.

Under these circumstances, details of the workings of such systems remain commercially sensitive. The database that we have studied, a videotape of all the entries over D2000-2 for almost exactly seven hours for the deutsche mark/dollar, and some sixteen minutes less for five other bilateral exchange rates, shown on the D2000-2 screen during European business hours on 16 June 1993 (from 08:31:50 to 15:30:00 British Standard Time [BST], i.e., GMT + 1), remains the copyright of Reuters.³ Anyone wishing to use these data should refer to Reuters, not to us. We should like to emphasize that this videotape did not include, and we have not been given any access to, any information regarding the identity of any of the parties involved in trading; all the trades observed by us remain anonymous. Indeed, it is not possible for any observer, even in Reuters itself, to identify which are the individual banks using the system.

Readers should keep in mind the shortcomings of these data. They represent a short snapshot of conditions in a rapidly changing market over a year ago. Trading undertaken over such electronic trading systems may well be, as discussed further below, not representative of the market as a whole; trading activity on D2000-2 on 16 June 1993 may have differed in some respects significantly from that in surrounding days and weeks; the volume and characteristics of electronic trading (over Reuters) in June 1993 may well be quite different from that now since over a year has passed.

Given these disclaimers, why should anyone bother to read on? Despite these shortcomings, there are, however, several reasons why this study provides new insights in the literature of high-frequency exchange rate behavior. First, until now there have been virtually no *continuous* time-series data available at all on actual trades, prices, and volumes in the foreign exchange market.⁴ The 60 percent or so of deals done directly by two bank counterparties over the telephone remain, naturally, private information. There has been little use made of data on foreign exchange *transactions* intermediated by specialist interbank brokers, no doubt partly because of commercial and confidentiality sensitivities. The only studies currently known to us making use of such data are by Lyons (1995, chap. 5 in this volume). Data of any kind on the characteristics and continuous time-series behavior of actual trading transactions on the foreign exchange market are, therefore, still rare.⁵ Second, there have been so few data on *transactions* in the foreign exchange market that almost all the

3. We are most grateful to Reuters in general and to Mr. Etherington in particular for allowing us to record the quantitative details reported below.

4. There is, of course, the survey of foreign exchange business that has now been undertaken three times at three-year intervals in April 1986, 1989, and 1992 by central banks under the aegis of the Bank for International Settlements (BIS), but this does not provide time-series data. The volumes reported are aggregates for the month of April.

5. We have little doubt that such data will become more plentiful and easily available in the future. But for the time being at least they have rarity value. Also, as electronic trading systems mature, it should be of historical interest to observe how they looked and operated in the early stages of their development.

studies on this market have used data on bilateral currency exchange rates that emanate from the *indicative* bid-ask prices shown on electronic screens by the specialist information providers, for example, Reuters, Telerate, Knight Ridder, and Quotron. There has, naturally, been some concern whether the high-frequency characteristics of such indicative quotes, for example, the negative auto-correlation and the fact that the size of the spread clusters at certain conventional values, are representative of the characteristics of *firm* (committed) bid-ask quotes at the touch. The *touch*, a term more commonly used in the United Kingdom than in the United States, is defined as the difference between the best (highest) bid and the lowest ask on offer, where these are (usually) input by different banks. Lyons, for example, expressed such concerns when he wrote, "Some of the shortcomings of the indicative quotes include the following. First, they are not transactable prices. Second, while it is true that the indicated spreads usually bracket actual quoted spreads in the interbank market, they are typically two to three times as wide. . . . Third, the indications are less likely to bracket true spreads when volatility is highest since there are limits to how frequently the indications can change. And finally, my experience sitting next to dealers at major banks indicates that they pay no attention at all to the current indication; rather, dealers garner most of their high-frequency market information from signals transmitted via intercoms connected to inter-dealer brokers [see Lyons 1993]. In reality, the main purpose of the indicative quotes is to provide non dealer participants with a gauge of where the inter-dealer market is trading" (1995, pp. 331–32; see also Flood 1994, esp. n. 6, p. 154).

Do, for example, the frequency and volatility of the *indicative* quotes provide a reasonable proxy for the same characteristics both in the *committed* bid-ask quotes and in the associated *transactions* in the electronic trading systems? We provide an initial answer to such questions in section 4.3, where we seek to compare characteristics of the FXFX time series⁶ with those of the D2000-2 data for the overlapping seven hours. As described in more detail in section 4.3, the D2000-2 series was *not* time-stamped, and our study of this relation is conditional on the assumptions and techniques used to match these two series temporally.

Subject to that condition, and to anticipate some of our main findings in section 4.3, the averages of the bid-ask in both series (FXFX and D2000-2) are almost identical. A graph of the time path for the deutsche mark/dollar from the two sources looks like one line (see figure 4.1). Thus, the time path of the indicative quotes *can*, on this evidence, be taken as a very good and close proxy for that in the underlying firm series. Nevertheless, some of the characteristics of the bid-ask series, for example, the pattern of autocorrelation, are somewhat different. Even so, both series indicate a somewhat similar GARCH

6. We obtained the accompanying FXFX data series from Dr. M. Dacorogna of Olsen and Associates in Zurich.

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