



Informational linkages across trading regions: Evidence from foreign exchange markets

Fang Cai ^a, Edward Howorka ^b, Jon Wongswan ^{c,*},¹

^a *Division of International Finance of the Federal Reserve Board, Washington, DC 20551, United States*

^b *EBS, 535 Madison Avenue, New York, NY 10022, United States*

^c *Barclays Global Investors, 45 Fremont Street, San Francisco, CA 94105, United States*

Abstract

Using a new high-frequency data set from Electronic Broking Services (EBS), this paper examines informational linkages in the euro–dollar and dollar–yen exchange rates across five trading regions: Asia Pacific, the Asia–Europe overlap, Europe, the Europe–America overlap, and America. Information is proxied by exchange rate return, direction of return, volatility, trading activity, and order flow. We find that informational linkages are statistically significant at both own-region and inter-region levels, but own-region spillovers dominate in economic significance, especially for volatility and trading activity. In addition, order flow spillovers from the Europe–America overlap trading region are the most important source of spillovers to other trading regions for both currency pairs.

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1. Introduction

Foreign exchange is traded around-the-clock in major global financial centers, including Tokyo, London, and New York. With this market structure, exchange rates can incorporate new information instantly. Thus, we expect information that is incorporated into exchange rates

* Corresponding author. Tel.: +1 415 894 6428; fax: +1 415 618 1757.

E-mail address: jon.wongswan@barclaysglobal.com (J. Wongswan).

¹ All of the work was done while Wongswan was at the Federal Reserve Board.

to pass on from one financial center to the next. However, there are only a few studies that examine informational linkages across major financial centers, and they use only a short sample period which makes the results hard to generalize (e.g., Engle et al., 1990; Baillie and Bollerslev, 1990). In addition, previous studies use only exchange rate volatility as a proxy for information.

This paper examines informational linkages in the global interdealer foreign exchange market across major financial centers. We use a unique data set of prices, trading volume, and order flow in spot euro–dollar and dollar–yen trading from Electronic Broking Services (EBS) covering the period from January 1999 to February 2004. This EBS data set has two important advantages. First, the EBS data set consists of transactable quotes, as opposed to indicative quotes from Reuters used in previous studies. The EBS data set also contains actual trading volume and order flow that were previously not available. Second, EBS has become the major trading platform for the two most traded currency pairs, the yen and the euro, making the results based on this data set a true representation of the behavior of global interdealer foreign exchange markets.

As informational linkages can manifest themselves by the transmission of exchange rate return, direction of return, volatility, trading activity, and order flow, we investigate these financial variable spillovers across three major trading areas (centered in Tokyo, London, and New York) for two currency pairs (euro–dollar and dollar–yen).² We are interested in the extent to which changes in exchange rates, volatility, trading activity, and order flow in one financial center influence those in the other financial centers. Specifically, this paper explores and makes contributions to several issues as follows.

First, this paper uses regional trading volume from the EBS data set to classify different trading regions in the global foreign exchange market for the euro–dollar and dollar–yen currency pairs. Trading volume is a more accurate measure of trading activity than quote frequency used in previous studies (e.g., Melvin and Yin, 2000; Melvin and Melvin, 2003). EBS records regional trading volume by transactions that occur between pairs of the three physical locations of the EBS computer centers: Tokyo, London, and New York. These computer centers are linked together in real time, and EBS classifies the origin of each trade by the physical location of the computer center that serves each region.³ Based on our assessment, we define five distinct trading regions: Asia Pacific, the Asia–Europe overlap, Europe, the Europe–America overlap, and America.⁴

Second, we explore the spillovers of exchange rate return, direction of exchange rate return, return volatility, trading activity, and order flow across different trading regions for the two currency pairs. We test two hypotheses first studied in Engle et al. (1990) for exchange rate volatility: the *meteor shower* hypothesis and the *heat wave* hypothesis. The meteor shower hypothesis suggests that there are information spillovers across trading regions. For example in the case of volatility, high (low) volatility in one region today tends to be followed by

² Trading activity and order flow are measured either by trading volume or by the number of transactions. All results based on trading volume and the number of transactions are qualitatively very similar. This is not surprising since average trade size shows little variation over time.

³ All dealers located in the Asia Pacific area are served by the computer center in Tokyo, and all trades are recorded as originating from Tokyo. The computer center in London serves dealers that are located in Europe, the Middle East, and Africa, and the computer center in New York serves dealers that are located in both North and South America.

⁴ Results are qualitatively similar when we use the number of transactions to classify trading regions. We do not consider the America–Asia overlap period since it is very short (half an hour or so), and trading is very light.

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