



Trading activity, dealer concentration and foreign exchange market quality

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ABSTRACT

We study the relation between foreign exchange market quality and both trading activity and dealer concentration by considering two currency pairs with significant differences along both dimensions – the Euro–US dollar and Canadian dollar–US dollar. A variance ratio test reveals over-reaction in currency prices, but that this is smallest when trading activity is high and dealer concentration at its peak. A GARCH model shows that over-reaction declines as trading activity and dealer concentration increase, with the results being stronger for the Euro. Our results confirm that trading activity is an important determinant of market quality, but also point to a significant role for dealer concentration.

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1. Introduction

Market quality is a key characteristic of financial markets because it summarizes the speed and accuracy with which information is impounded in prices.¹ Thus, uncovering the factors that are associated with improved market quality in financial markets is important to academics, financial market participants and regulators. Although the conventional wisdom is that market quality is highest when the level of trading activity is highest, recent work in market microstructure suggests that other factors may also influence market quality. The list of such factors includes the identity of traders (e.g. Peiers, 1997; Sapp, 2002) and the level of competition between dealers (e.g. Huang and Masulis, 1999). These factors, however, have not received as much attention in empirical analyses of

market quality. Using high frequency data for the Euro–US dollar and Canadian dollar–US dollar currency pairs, this paper investigates the effects of trading activity and dealer concentration on foreign exchange market quality.²

The new hypothesis explored in this paper is that dealer concentration (the percentage of trading involving the most active dealers) affects foreign exchange market quality. Huang and Masulis (1999), Evans (2002), and Evans and Lyons (2002) suggest that greater concentration of trading in the hands of large dealers makes market prices less noisy, due to less dispersed private information and inventory effects. Therefore, at times of increased dealer concentration, currency prices should be more efficient and market quality higher.

The Euro–US dollar and the Canadian dollar–US dollar are ideal cases to consider because they have very different characteristics. The Euro–US dollar (henceforth, the Euro) is the most heavily traded currency pair. It is also traded by almost all the large foreign exchange dealers and many small ones as well, so dealer concentration is low for the Euro. The Canadian dollar–US dollar (henceforth, the Canadian dollar) is significantly less heavily traded, traded predominantly by North American (and especially

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¹ Much of the literature that we build on focuses on market efficiency, which is a key component of market quality. Market quality is a broader characterization of the state of a financial market because it incorporates information and trading cost measures as well as the deviation between the actual and theoretically correct (or “efficient”) prices (see, for instance, Hasbrouck, 1993). Recent studies include Akram et al. (2008) shed light on market efficiency in the spot and forward markets for the Euro, Yen and Pound versus the US dollar by examining deviations from covered interest parity. Mizrahi and Neely (2008) examine the relative efficiency of the US T-bond and futures markets by computing the information shares of the two markets. Tse (1999) studies information transmission for Japanese government bond futures contracts trading in London and Tokyo.

² In contrast to the many studies of equity market quality, there are few studies of foreign exchange market quality. An exception is Andersen et al. (2001) which studies aspects of market quality for one currency (the yen) around a specific event, the introduction of lunch hour trading in Tokyo.

Canadian) dealers, and sees a much higher degree of dealer concentration³. We use these currencies to investigate if the level of trading activity is the main influence on market quality (the conventional wisdom) or whether dealer concentration also plays an important part.

We study two measures of market quality. First, we consider the variance ratio statistic, which captures the efficiency with which all price relevant information is impounded in prices. In a high quality market, price changes tend to be permanent and transitory volatility low, so the ratio of a long-term return variance to an appropriately scaled short-term variance should be close to 1.0.⁴ This analysis is complemented by an analysis of the return dynamics for the currency pairs, the presumption being that higher market quality means more rapid and accurate incorporation of both currency-specific and common information into prices. We use a GARCH framework to study intraday returns and volatility for the Euro and Canadian dollar and explicitly relate these to trading activity and dealer concentration.

Our results are based on intraday indicative quote data for the calendar year 2000. The dataset includes information on the identity of the quoting banks, allowing us to consider how the level of trading activity (as captured by aggregate quoting activity)⁵ and the presence of influential dealers (as measured by the percentage of quotes issued by the most active dealers) affect market quality. We proceed by calculating both aggregate quoting activity as well as the percentage of the total number of quotes submitted by the most active dealers (the reported results are based on the five largest dealers) in 15-min intervals throughout the day. We expect market quality to be directly related to aggregate quoting activity. Further, if greater participation by active dealers implies that prices are more likely to be set by better-informed traders, we expect higher dealer concentration to be associated with higher market quality.⁶

We start by examining the intraday (15-min) patterns in quoting activity and dealer concentration for the two currency pairs. For the Euro, quoting activity increases rapidly as the European markets open, rises further as the North American markets open, stabilizes until the European markets close, and then declines. For the Canadian dollar, quoting activity increases as the European markets open and especially as the North American markets open, peaks during the overlap in European and North American trading and remains relatively high until the close of the North American markets. These patterns suggest that trading activity for the Euro is relatively evenly spread out across the major European and North American markets (being highest when both Europe and North America are open). For the Canadian dollar, trading activity is heaviest in the North American market.

Turning to the patterns in dealer concentration, we find that dealer concentration is always lower for the much more heavily and broadly traded Euro than for the Canadian dollar. For instance, the mean percentage of quotes accounted for by the top five dealers in the Euro never exceeds 45%, whereas the mean percentage of

quotes submitted by the five most active dealers in the Canadian dollar typically averages 80% and is rarely less than 50%. In the case of the Euro, dealer concentration increases at the start of European trading, peaks during the heaviest European trading, declines briefly as the North American markets open, increases as North American trading moves into full swing, and then declines after the European markets close. For the Canadian dollar, dealer concentration increases during European trading but remains relatively flat during active trading in Europe and North America. Consequently, dealer concentration is not merely a function of trading activity for these two currency pairs.

When we examine market quality, we find that the variance ratio for both currencies is below 1.0 for much of the trading day, suggesting some degree of over-reaction. The variance ratio for the Euro is generally farther below 1.0 than that for the Canadian dollar. Possible contributors to the larger short-term distortions in the case of the Euro include a higher rate of information arrival or dispersed inventory effects due to lower dealer concentration. Across the trading day, the variance ratio is closest to 1.0 for the Canadian dollar during North American trading, when the dollar is most actively traded and dealer concentration is highest. For the Euro, the variance ratio is closest to 1.0 when only the European markets are open. As the North American markets open – and trading activity peaks while dealer concentration declines – the variance ratio for the Euro moves further below 1.0. These patterns are not entirely consistent with the conventional wisdom that higher trading activity improves market quality, but they are consistent with the hypothesis that higher dealer concentration promotes market quality.

To formally investigate the importance of quoting activity and dealer concentration, we estimate a GARCH model that captures information assimilation within and across the currency pairs. We extend prior research (e.g. Baillie and Bollerslev, 1991; Engle et al., 1990) by including quoting activity and dealer concentration in the conditional mean and conditional variance equations. Consistent with the variance ratio results, there is negative autocorrelation in currency returns. For the Euro, the autocorrelation becomes significantly less negative as quoting activity or dealer concentration increases. The coefficients for the Canadian dollar tell a similar story although they are not significant.⁷ Thus, there is an improvement in the efficiency with which currency-specific information is impounded in the prices of the Euro and the Canadian dollar as either the level of quoting activity or the degree of dealer concentration increases. Cross-currency effects, which reflect the incorporation of common information, reveal some return predictability running from the Euro to the Canadian dollar but some volatility predictability in the reverse direction. These results suggest that the incorporation of currency-specific information depends on both the level of trading activity and dealer concentration, and that common information-related efficiency is somewhat higher for the more actively-traded Euro.

In sum, the patterns in market quality do not mechanically follow those in aggregate trading activity, as widely believed, but also reflect patterns in dealer concentration. Thus, while we confirm the importance of the level of trading activity, the main contribution of our analysis is to highlight the role of dealer concentration in explaining variations in market quality. An additional contribution is our description of the market microstructure and market quality of a less actively traded currency, the Canadian dollar. Even though

³ BIS (2001) statistics show that the Euro–US dollar currency pair is involved in approximately 28% of all foreign exchange transactions and actively traded around the globe. The Canadian dollar–US dollar is the sixth most actively traded currency pair, accounting for roughly 4% of all transactions, and has over two-thirds of its trading volume in North America.

⁴ For a detailed discussion, see Lo and MacKinlay (1988) or Bessembinder (2003).

⁵ Our use of quoting activity as a proxy for trading activity is standard in the foreign exchange literature, where trading volume data are not widely available. Several studies (e.g. Goodhart and Payne, 1999, and Danielsson and Payne, 2002) have shown that there is a close correspondence between quoting activity and trading activity.

⁶ Prices are determined by both demand and supply. Thus, market quality should depend on, not only dealer presence, but also customer orders. However, our hypothesis is that influential dealers are better able to assess the implications of customer orders and thus set more efficient prices.

⁷ As discussed in Section 3.4, the main reason for this lack of significance appears to be collinearity with the geographic dummies. A second potential factor is the greater noise in measuring trading activity and dealer concentration in the case of the Canadian dollar.

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