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Foreign exchange market microstructure and the WM/Reuters 4 pm fix

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Abstract

A market fix serves as a benchmark for foreign exchange (FX) execution, and is employed by many institutional investors to establish an exact reference at which execution takes place. The currently most popular FX fix is the World Market Reuters (WM/R) 4 pm fix. Execution at the WM/R 4 pm fix is a service offered by FX brokers (normally banks), who deliver execution at the fix provided they obtain the trade order ahead of time. In this paper, we study the market microstructure around 4 pm. We demonstrate that market dynamics can be distinguished from other times during the day through increased volatility and size of movements. Our findings question the aggregate benefit to the client base of using the WM/R 4 pm fix in its current form.

Keywords: Finance; Financial markets; Foreign exchange markets; Market microstructure; Behavioural finance; Exchange rate benchmarks; FX execution; Market manipulation; WM/Reuters 4 pm fix; FX market microstructure

1. Introduction

Execution of foreign exchange transactions at a fixed market benchmark rate is common amongst institutional investors. Appeal lies in the fact that, particularly when tracking benchmark indices in other asset classes, currency conversion can be performed by the same underlying FX rates as employed by their target index. Furthermore, aggregation of fixing trades by market makers prior to execution increases liquidity, which, in theory, enables clients to trade large FX amounts at a trusted rate. Fixing trades therefore enable clients to trade without having to worry about best execution, such that they do not have to minimise the risk of moving the price when transacting in the market. Moreover, as a market fix is uniform across providers, it is also intended to build trust in client/provider relationships, as a clearly defined and measurable service arises.

The currently most important benchmark rate is the World Market Reuters 4 pm London fix (WM/R 4 pm fix), which accounts for approximately 1–2% of the total $2 trillion daily volume in the FX spot market.[1]

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The WM/R 4 pm fixing rate[2] is determined using the methodology described in Section 2. It is based on the last trade prices as well as the last best bid and offer quotes at the end of each one second interval between 15:59:30 to 16:00:30 GMT. Therefore, to achieve the WM/R 4 pm fix rate, service providers execute their fixing orders within this 60 s interval.

Compression of large order flow into a narrow time window can be expected to give rise to a special market structure around the fixing time, which is part of what we will look at in this paper.

The described structure has recently come to the attention of the wider public, as concerns have been raised regarding market participants who may have used the construction mechanism of the WM/R 4 pm fix to influence the benchmark.[3−5]

Subsequently, multiple suggestions regarding how to improve the construction of the WM/R 4 pm fix have been brought forward.[6,7] These investigations mainly focus on the mitigation of eventual manipulation possibilities. Generally, little research has been done on the observable market structure around the WM/R 4 pm fix,[8,9] despite the importance of the WM/R 4 pm fix in the services received by many institutional investors.

In this regard, spot rate volatility and extreme spot rate movements are of particular interest, since they are important parameters in the quest for best execution practice. With best execution we refer to the trader's intention to execute as close as possible to the average market rate during the respective part of the trading day. High volatility and extreme spot rate movements increase the probability to trade at an outlier price. Such dynamics consequently introduce tracking error by pushing the realised transaction rates away from the sought after average rates.

In previous work, Osler and Bruce (2008),[10] Osler and Tanseli (2011),[11] as well as Bjønnesa and Rime (2005)[12] have investigated the general interactions between clients and dealers, while the recent work by Chaboud et al (2013)[13] shifts the focus to the impact of algorithmic order execution.

In this paper, we investigate the influence of the WM/R 4 pm fix on the dynamics of both spot rate volatility and extreme spot rate movements. Our study shows that the order compression around the fix indeed changes the market behaviour, resulting in spiking volatility within the WM/R 4 pm fixing window, and an increased probability for spot rate extrema during this period.

2. WM/R 4 pm fix methodology

Before discussing the market dynamics around the WM/R 4 pm fix, a short description of its construction shall be provided.[2,6] The WM/R 4 pm fixing rate is determined for currency spot, forward, and non-deliverable forward rates. The calculation differs between forward and spot rates. While, for the former, a single rate snapshot at the fixing time is used as the benchmark, the spot rate calculation utilises several price quotes within an interval around the fixing time. In the following, we will focus on spot rates only.

Spot fixings are determined for 160 currency pairs, which are split into trade currencies for liquid pairs[a] and quote currencies for illiquid pairs. For our analysis, we consider 12 trade currency pairs.[b]

To calculate the fix, WM/R sources data from Thomson Reuters, EBS, and Currenex. For the time period over which we investigate the WM/R 4 pm fix, all trade currency data is obtained from a primary source.[c] For currency pairs involving CHF, EUR, and JPY, WM/R uses data from EBS. Currenex data supplements it as a secondary source, if the number of datapoints is too low. RUB data is solely obtained from EBS. Benchmark rates for other pairs are based on Thomson Reuters data only.[d] The WM/R 4 pm fix rate is obtained by accumulating quote and trade data within a set time interval around the fixing time. For the time period prior to 15/02/2015, which we investigate here, this interval is 1-min for trade currencies and 2-min for quote currencies, i.e., for the WM/R 4 pm fix the accumulation times are 15:59:30−16:00:30 and 15:59:00−16:01:00, respectively.

Notably, following recent recommendations,[6] WM/R implemented changes to its calculation methodology,[2] which became effective on 15/02/2015. After this date, the data sourcing window is widened to 5-min, i.e., for the WM/R 4 pm fix the accumulation time changes to 15:57:30−16:02:30. Additionally, trade currency data will be gathered from different sources. To this end, Thomson Reuters data is pooled together with EBS and Currenex data for pairs containing CHF, EUR, JPY, and RUB.

[a] Pairs containing only the following currencies: AUD, CAD, CHF, CZK, DKK, EUR, GBP, HKD, HUF, ILS, JPY, MXN, NOK, NZD, PLN, RON, RUB, SEK, SGD, TRY, and ZAR.

[b] We selected the pairs: EURUSD, USDJPY, EURJPY, EURGBP, USDGBP, AUDUSD, EURCHF, USDCHF, GBPCHF, EURSEK, USDMXN, USDSGD. (see Section 3) which were selected to include the most liquid G10 currencies (USD, EUR, JPY). We furthermore selected two highly liquid EM pairs (MXN, SGD) and three less liquid G10 pairs (AUD, CHF, SEK), for which data was readily available.

[c] After changing the methodology of the WM/R 4 pm fix on the 15/2/2015, WM/R now sources currency data from multiple sources and combines these datasets.

[d] AUD, CAD, CZK, DKK, GBP, HKD, HUF, ILS, MXN, NOK, NZD, PLN, RON, SEK, SGD, TRY, and ZAR.