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Did the reform fix the London fix problem? ☆

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ABSTRACT

This paper examines the consequences of the 2015 reform on the London fixing in the interbank forex market, which resulted from finding and imposing a penalty on banks' collusive behavior around the fixing window. The banks changed their behavior after the reform, and the volume spike in the fixing window disappeared. However, the anomalies on price dynamics reported in the previous literature still exist, and banks' passive trading strategy generates another predictability in the price movement. A theoretical model of optimal execution is used to calibrate the execution of fixing transactions by banks, and evaluate the increase in the cost and risks of fixing trades incurred by the banks' behavior. This paper is the first to examine the efficiency of banks' behavior after the reform. The volume pattern during the fixing time window suggests that banks, by avoiding (even the appearance of) collusion, now incur the costs of executing customers' orders.

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1. Introduction

“Fixing” is a practice in the foreign exchange market that determines the bid-ask mid-point exchange rate (fixing price) in a transparent formula based on pre-announced time windows in various markets in different time zones. The London WM/Reuters fixing price, which is calculated based on spot transactions in inter-bank foreign exchange markets at around 4 p.m. in London, is widely used for the settlement of foreign exchange transactions between banks and bank customers and for the valuation of foreign securities, mutual funds and derivative contracts on the financial institutions' balance sheets in Europe and North America. By using the fixing price, bank customers, including broker-dealers, institutional investors, insurance companies, exporters, and importers, are supposedly reassured that the execution of their orders by the bank is fair and non-discriminatory. The WM/Reuters fixing rate is the benchmark rate in the interbank foreign exchange market in London.

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It was first reported in June 2013 that bank dealers had colluded by sharing information about customer orders just before the fixing time window. After the investigation, banks were heavily penalized for this collusion. In addition, the regulatory authorities introduced a reform in February 2015 where the time window to calculate the fixing price was changed from one minute to five minutes. Restrictions were enacted to prevent bank dealers from taking advantage of private information from customer orders. As a result, post-reform, the banks significantly modified their trading strategies around the fixing window. In this paper we examine the exchange rate (price) and trading volume movements in pre-, during, and post-fixing time windows in the London market, comparing pre- and post-reform. We evaluate the market consequences of the reform using a theoretical model of optimal execution strategy. The volume pattern during the fixing time window suggests that, by avoiding (even the appearance of) collusion, banks now bear the costs of executing customers' orders. This paper is the first to examine the efficiency of banks' behavior following the London fixing's 2015 reform.

The objective of this paper is threefold. First, it is well known that transaction volumes tend to skyrocket at 10 a.m. in Tokyo and 4 p.m. in London (Chaboud et al. (2004) and Melvin and Prins (2015), among others).¹ The price, which is associated with this volume spike, is also affected. Evans (2014) first reported the anomaly of price behavior in relation to the fixing time. In contrast to the other market events, such as macro announcements, the price jumps and spikes during the fixing window supposedly represent only temporary order imbalances and liquidity shortages, which are expected to last for only a short time. We investigate a pattern of price volatility to infer the reasons behind it.

Second, we evaluate the 2015 reform by comparing the price and volume movements in pre-, during, and post-fixing time windows before and after the reform. This part can be regarded as an extension of the findings by the Financial Stability Board (2015). As was shown in Evans (2014), before the reform, the path of the price showed a reversal after the end of fixing the window, while² the volatility in the pre- and the post-fixing period was abnormally high. These features were most evident at the end-of-month trading days. Before the reform, the trading volume was much larger in the first half of the 1-min window than that in the second half. However, this pattern disappeared after the reform and the trading volume became more evenly distributed over the 5-min window. After the reform, the total trading volume during the fixing window did not decline, suggesting that the demand for fixing trade by bank customers is still high. However, the new evenly-distributed trades pose the question of whether the banks' trading patterns became predictable so that non-banks could take advantage to earn profits. This question was examined in data and found to indeed be the case. After several months, the pattern of even distribution was corrected so that there was much less predictability.

Third, we apply a theoretical model of optimal execution strategy by Obizhaeva and Wang (2013) to the fixing time window. Banks face the task of executing customer orders in the interbank markets during the fixing time window. The price volatility during the window may result in the deviation of the average price of banks trades from the fixing price that must be applied to customer trades. This is both costly and risky for banks. In order to minimize such risks and costs, banks can choose the timing of trades around the time window. We quantitatively evaluate the cost and risk for executing customers' trades that are settled with the fixing price (fixing traders). The calibration is conducted based on the optimal execution model, adapted to high-frequency data on the limit order book.³ The reduction of the transaction cost for fixing traders after the reform is not large enough to offset the increase of risk. Moreover, if the traders are not allowed, or are strongly discouraged, to use pre-hedge, the transaction cost increases dramatically. The trading pattern after the reform suggests that banks are not behaving optimally.

The rest of the paper is organized as follows. Section 2 will describe the EBS tick-by-tick data used in this paper. Section 3 will present econometric analysis on the exchange rate (price) and transaction volumes in the periods of "pre-", "during" and "post-" the fixing window. The regime change by the reform will be the main objective of the investigation. Section 4 will construct and examine the model of cost and risk from fixing trades for a bank, and Section 5 will provide a conclusion.

2. Scandal, penalty and the reform

Prior to the February 2015 reform, WM/Reuters announced the fixing price just after 4 p.m. London time, based on transaction prices during the one-minute window around 4 p.m. (that is, from 15:59:30 to 16:00:30). The WM/Reuters 4 p.m. fixing rate was calculated as the median of sampled transactions during the one-minute window. The WM/Reuters fix was widely used as the exchange rate for customer trades by banks in the London and New York markets, and for evaluation of financial products on the financial institutions' book. This affected the price and volume movements at around 4 p.m. In the 24-h cycle, transaction volumes are highest from 1 p.m. to 4 p.m. in London (8 a.m. to 11 a.m. in New York). For the dollar/yen (USDJPY) trades, the Tokyo fixing at 10 a.m. Tokyo time produced a large spike in trading volume, which was analyzed by Ito and Yamada (2016). After the 4 p.m. fixing in London, transaction volumes and price volatility quickly diminished.

¹ In addition to the London 4 p.m. fixing, there are other times of the day that have spikes in trading volumes: Tokyo 9:55 am fixing, US macro announcement times, New York option cut at 3 p.m.. For the Tokyo fixing, see Ito and Yamada (2016).

² Melvin and Prins (2015) also report that the past positive equity return in a country is associated with the currency depreciation of that country at the end-of-month fixing. Equity investors hedge the growth of equities of foreign countries by selling the currency of each country. The timing of the hedging trade is typically at the London fixing at the end of the month, generating the predictability of price around end-of-month fixing.

³ Osler and Turnbull (2017) theoretically discuss banks' strategic behavior to generate the fixing anomalies. In contrast, our model aims to calibrate the dynamic of trade and does not focus on the strategic relationships between banks.

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