

# Russell Research

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## Does trading at the Fix fix FX?

Foreign exchange transactions are significant components of millions of daily financial transactions, yet most currency transactions are not measured. Not measuring currency trades makes managing transaction costs difficult, if not impossible. Surprisingly, the foreign exchange market had eluded the transaction scrutiny experienced by the equity market, complicating some investors' desire to answer basic questions such as: Where was the market when the trade was executed? What is a good benchmark with which to measure the exchange rate? What did it cost to trade?

### Introduction

Historically, the information needed to answer those questions was difficult to obtain, hindering an investor's effort to manage transaction costs. That's because currencies are traded over-the-counter, involving many simultaneous bilateral deals in an unregulated and decentralized market. No institution, such as an exchange, exists to collect and post trade information. Dealers closely guard the rates they offer and the trade sizes in which they transact as proprietary information, rarely revealing these deals to other market participants. As a result, some investors find it challenging to identify "where the market is" when they want to trade.

Additionally, well publicized lawsuits claimed some investors were charged excessive fees for currency transactions. Those lawsuits highlighted the difficulty of managing transaction costs when the time of trading wasn't provided.

The combination of the lack of market trade information and the desire to verify the time at which trades were done has spurred some investors to seek ways to trade at a transparent price. Trading at published or posted rates can be done by executing at a fixing time. A fix involves using an algorithm to determine the market rate for a currency at a particular point in time. Fixes can be set by a central bank. For example, Barbados and Belize have fixed exchange rates set by their respective central banks<sup>1</sup>. For currencies whose exchange rates fluctuate based on market demand, the more typical process is for a private firm to calculate the rate using a proprietary method.

<sup>1</sup> Caribbean Single Market Economy. Fixed and Floating Exchange Rates. <http://www.csmeonline.org/en/free-movement-capital/item/64-what-are-fixed-and-floating-exchange-rates>.

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Several firms including Citibank and Royal Bank of Scotland publish fixing rates, but the set of rates most commonly used are those determined by WM/Reuters, a joint venture between The WM Company and Thomson Reuters. Popular WM/Reuters fixes include those at 4 pm or 8 pm London, times which represent the transfer of trading operations from one global region to another.<sup>2</sup> In particular, investors use exchange rates from the WM/Reuters London 4 pm fix (the London fix) to value international portfolios to make comparison to other international portfolios and benchmarks easier. While the attractiveness of using this popular performance benchmark (and others, too) for execution is understandable, research by Morgan Stanley, The Royal Bank of Scotland and Russell demonstrates that trading at a fixing can result in substantial investment regret.

Put simply, while fix trading strategies sound appealing because of their apparent transparency, they are not generally the best approach for investors.

### Point-in-time trading

Trading at a fixing is an example of point-in-time (PIT) trading. PIT execution involves buying or selling foreign currencies at a particular time or times, generally the same time(s) every day. For example, trading at the London fix is a popular PIT execution strategy, although not the only one; the London 8 pm fix is another favorite PIT trading time.

PIT execution addresses a couple of investor issues. PIT trading eliminates the concern about receiving the market price. Accurate reports of PIT prices are typically widely available to investors through information services like Bloomberg or Reuters, making it easy to confirm one received the PIT price. Being able to demonstrate that the transaction was done at the market price is useful for financial entities trying to make FX trading efficient. For example, units of a firm located in various parts of the world may require transparent and reportable set of rates to reconcile transactions among themselves. PIT prices also provide evidence for assessing best execution and auditing. Because the process of trading at a PIT can be set up with the investor's custodian bank to occur automatically (a standing instruction<sup>3</sup>), PIT trading may make it less costly for the investor to execute the trade because it reduces the need for staff and other resources and because it minimizes operational risk: this reduction in administrative cost, however is not necessarily accompanied by a better investment outcome for the investor.

The second issue involves minimizing tracking error when valuing an international portfolio. Many investors direct investment managers to value the investor's portfolio (a process known as "mark-to-market") at a particular time each day. Tracking error results if the investment manager trades currencies on behalf of the investor's portfolio at times different than the valuation. As a result, the desire to minimize tracking error results in substantial orders being traded at the mark-to-market PIT.

### The London 4 pm fix

The London 4 pm fix has been a particularly popular benchmark, primarily because it was the first. Introduced in 1994 by The WM Company (later a joint venture between The WM Company and Thomson Reuters), the London 4 pm closing spot rates addressed an investor requirement to compare the value of a portfolio against benchmarks and other portfolios without concern for changes in exchange rates. Investor acceptance was rapid

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<sup>2</sup> Morgan Stanley, A Guide to FX Transaction Cost Analysis, Part II, Comparing Liquidity Based Phenomena Across Currencies, 16 February 2010, page 10.

<sup>3</sup> A standing instruction is a direction to the custodian of the investor's account to automatically manage the conversion of foreign currency without further consultation with the investor. As a result, the investor has no opportunity to influence the exchange rate (price) received.

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and, as the WM/Reuters website states, the WM/Reuters spot rates “...became the de facto standard for closing spot rates on a global basis.”<sup>4</sup>

In 2001, WM/Reuters launched the intraday spot rates, and these values can also be used for PIT trading and execution benchmarks. A seven year head start is hard to beat, however, and so the 4 pm London spot prices remain the favorite for valuing, comparing, and benchmarking portfolios.

Besides calculating portfolio values, investment professionals use the London 4 pm fix rates for many purposes including

- To calculate global bond and equity indexes
- As a benchmark in settling various financial derivatives
- To value corporate currency holdings from different global offices so that the same rates are used for consistency
- As independently fixed rates useful for audits

### So, what's not to like?

A PIT trading strategy can result in performance that makes it more likely that the investor will not achieve best execution objectives and that will increase the chance of suffering significant investment regret.

Morgan Stanley research in 2010 addressed this issue. It viewed best execution as the optimization of the trading process. For buys, trading value is added when the benchmark execution price minus the realized effective price is greater than zero<sup>5</sup>. For sells, trading value is achieved when the realized effective price minus the benchmark price exceeds zero. For the benchmark, Morgan Stanley used a flow weighted average price. The FWAP is the sum of all prices observed during a transaction period weighted by a price's proportion of the total order flow. Mathematically, FWAP is equal to

$$\sum_{m=1}^M w_m s_m$$

Where  $s_m$  is the  $m$ 'th price observed in the sequence of  $M$  prices and  $w_m$  is the corresponding weight associated with each price, where the weights represent the proportions of total order flow that are observed in each time period  $m$ .

Regret occurs when these calculations result in a negative value; that is, when the realized exchange rates underperform the benchmark. Most traders are keen to minimize regret, and they invest substantial energy, money, and time into creating regret minimizing strategies. Morgan Stanley, in a landmark series of foreign exchange transaction cost studies<sup>6,7,8</sup> pointed out that regret from PIT trading is based on a number of factors:

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<sup>4</sup> WM/Reuters. (2010) “Spot & Forward Rates Methodology Guide”. Available at: <http://www.wmcompany.com/pdfs/026808.pdf>.

<sup>5</sup> Morgan Stanley, A Guide to FX Transaction Cost Analysis, Part III, Towards an Effective Currency Execution Benchmark, 14 May 2010.

<sup>6</sup> Morgan Stanley, A Guide to FX Transaction Cost Analysis, Part I, How to Measure the Hidden Costs of an FX Transaction, 12 October 2009.

<sup>7</sup> Morgan Stanley, A Guide to FX Transaction Cost Analysis, Part II, Comparing Liquidity Based Phenomena Across Currencies, 16 February 2010.

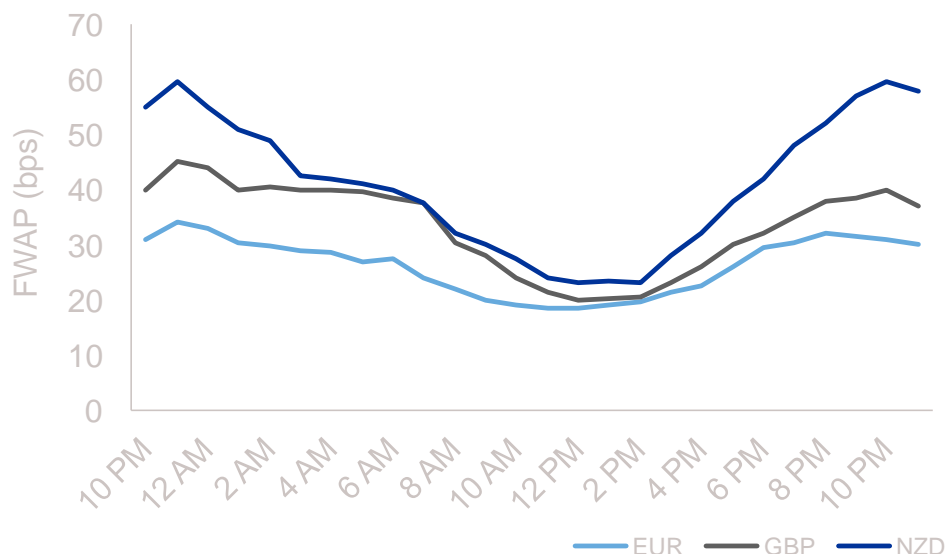
<sup>8</sup> Morgan Stanley, A Guide to FX Transaction Cost Analysis, Part III, Towards an Effective Currency Execution Benchmark, 14 May 2010.

## PRICE DISPERSION

Morgan Stanley first looked at PIT trading from an intuitive point of view. If exchange rates are random, then it's unlikely that the best price of the day will be consistently observed at a particular time. Furthermore, selecting the best price means skillful trading and market insight, both of which are absent in a PIT strategy, which simply follows a rigid rule of when to trade. The result: regret at least half of the time.

Morgan Stanley examined how observed prices deviated from the FWAP. Morgan Stanley compared the absolute basis point deviation of observed prices for one minute increments to the 24-hour FWAP for various currencies (see Figure 1) during 2009 and noted that dispersion ranged from 18 to 60 basis points. This dispersion, or deviation, around the 24-hour FWAP can be construed as either regret or value added, depending on whether the investor was buying or selling. The dispersion was lowest at London 12 pm (18 bp) and increased in the afternoon, with a deviation ranging between 22 and 32 bp (depending on the currency) at London 4 pm and over 50 bp at London 8 pm (another popular PIT, representing the start of the close of the New York trading day). Clearly, Morgan Stanley concluded, trading late in the London day could result in substantial regret, with investors susceptible to an annualized 500 bp of regret relative to the FWAP.

Figure 1: Average intra-day price dispersion around the 24-hour FWAP<sup>9</sup>



## INFORMATIONAL CONTENT AND PRICE SHADING

The FWAP is a statistical average. As the number of data points increases, the average converges to its expected value (its end of day value). The FWAP approaches this value between London 2 pm and 3 pm. This convergence has substantial value to inter-market dealers who watch order flow and gain insight to where the market will be at the London 4 pm fix.

Dealers who have a net-long or net-short position as the day's end approaches often seek to offset that position and may engage in price shading. Dealers may be willing to offer better prices which reduce those positions and less competitive prices if an order would contribute to the position. If a dealer is long yen, for example, the dealer may quote a better price to customers willing to purchase the Japanese currency while showing poorer prices to those wanting to sell yen (and thus increasing the dealer's undesired net-long position).

<sup>9</sup> See footnote 8.

If the market is collectively long or short, then significant price dispersion can result. Morgan Stanley research demonstrates that at less liquid times of the day (such as the London 4 pm and 8 pm fixes), prices can vary as much as 40 basis points compared to prices observed during more liquid periods of the trading day.

## VOLATILITY

Popular PIT trading strategies often involve trading at times when the currency markets are transitioning from one global region to another. As markets close, liquidity declines. If a dealer's order book is out of balance during these transition periods or if the market is collectively long or short a currency, the effect of additional orders can cause wide variations in price. Research<sup>10,11,12</sup> shows that volatility increases at market transition times, including the London 4 pm fix.

## TRANSACTION COSTS AND BID OFFER SPREADS

Morgan Stanley noted an increase in transaction costs beginning from London 3 pm, with the most pronounced costs late in the London day. In particular, significant spikes occurred at around 6 pm (the finish of London trading), 8 pm (start of the New York close) and 10 pm (Asia open). Bid-offer spreads correlated well with transaction costs. Morgan Stanley's charts showed muted increases or small decreases in transaction costs and spreads at 4 pm with substantial spikes at the other times. Royal Bank of Scotland noted the similar effects in spreads at these key transition times. RBS commented, however, that spread costs decreased for euro-dollar trades at the London 4 pm fix during its analysis period from 2005 to September 2010.

Russell also evaluated volatility based on its agency currency trading for institutional investors. Many Russell clients are equity investment managers who submit their FX orders to Russell periodically through the day, often coinciding with the close of markets. Russell timestamps its transactions and calculates spread costs by comparing the transaction exchange rate to the midpoint of the bid and offer rates available in the market at the time of the transaction.

Because Russell has volume associated with each trade, a volume weighted average price is routinely calculated. For this study, we compared the VWAP for euro and British pound trades to the average rate  $[(\text{day's high rate} + \text{day's low rate})/2]$  for each trade day during 2011. Standard deviation is a good measure of the dispersion of data, and that information is presented in Table 1.

Table 1: Standard deviation for EUR/USD and GBP/USD transactions, 2011

Strategy	STANDARD DEVIATION (BPS)	
	EUR	GBP
WM/Reuters London 4 pm fixed point-in-time	33.5	27.4
Volume weighted average price	10.5	7.7

Figure 2 graphically presents the dispersion data from Table 1 for EUR/USD transactions using a probability distribution with 95% confidence level. Figure 2 presents the volatility for the two strategies<sup>13</sup>. The trades presented in the figure happened over the same period to

<sup>10</sup> The Royal Bank of Scotland, FX Intraday Seasonality, Is the WMR 4pm fix special? 14 October 2010.

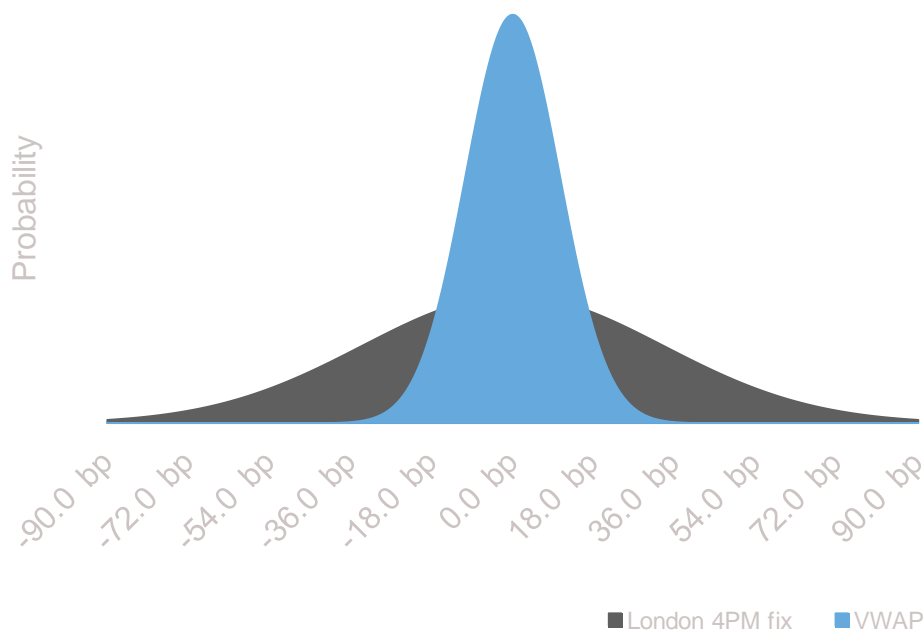
<sup>11</sup> Morgan Stanley, A Guide to FX Transaction Cost Analysis, Part II, Comparing Liquidity Based Phenomena Across Currencies, 16 February 2010.

<sup>12</sup> Morgan Stanley, A Guide to FX Transaction Cost Analysis, Part III, Towards an Effective Currency Execution Benchmark, 14 May 2010.

<sup>13</sup> The distributions and volatility graphs for GBP/USD are similar to the EUR/USD graphs.

show that the investor's selection of trading at a point-in-time compared to a volume weighted approach can make a significant difference. The standard deviation results and the graphs demonstrate trading at a fixed PIT like the WM/Reuters London 4 pm fix was more volatile compared to Russell's VWAP strategy.

Figure 2: Probability distribution for EUR/USD transactions, 2011

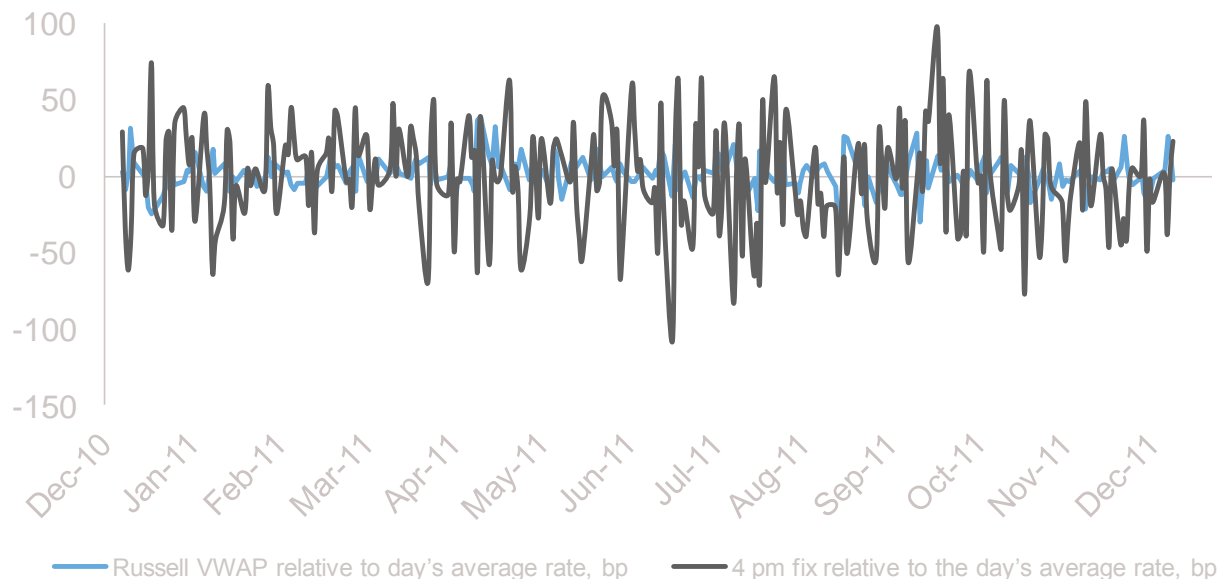


Some investors might find times during the trade day which exhibit higher volatility as opportunities for profit, but most investment managers trading currencies simply to fund international security transactions would likely seek to avoid those times. That's because these investors may trade sporadically and execute only a small number of trades each day. Their orders may vary in size from less than \$100,000 to a few million dollars but can, on occasion, involve much larger volumes (for example, significant currency trades might result from a client funding or a transition event).<sup>14</sup> An investor of this type – sporadic dealing, varying trade sizes, and different sides (buying sometimes and selling at other occasions) – could find trading at a fixed PIT with no intention of profiting from excess volatility to be unnecessarily costly.

For example, an investor trading only a few million dollars daily may suddenly need to trade \$100 million to complete a transition event. Trading at a volatile period like the WM/Reuters London 4 pm fix could result in a ~100 bp deviation from the day's average rate (see Figure 3). One might argue that the deviation could result in a gain as well as a loss, and over a long period of time other trades will offset this deviation and one will achieve the average rate. That may be small consolation to the transition client who experiences an immediate \$1,000,000 loss [\$100 million x 100 bp (0.01)]. Many trades experiencing outperformance could be required to recover from a loss of this size. This risk could be avoided by an algorithmic strategy to achieve the day's average rate.

<sup>14</sup> A transition involves the buying and selling of securities when investors restructure their portfolios. A large restructuring can involve billions of dollars of trading in securities and currencies.

Figure 3: VWAP and WM/Reuters London 4 pm Fix trading versus day's average rate in 2011  
– EUR/USD in basis points



## Conclusion

Trading foreign exchange at a fixed point in time seems an attractive approach for many institutional investors. Because common PIT exchange rates are published, the strategy solves issues about knowing when an order was traded and at what price. With these published exchange rates, a currency investor can easily calculate spread costs and check that the provider included the agreed upon fee.

Because many other investors and benchmark providers use the PIT exchange rates to value their portfolios and indices, a PIT trading program makes it easy to compare performance among portfolios or to a benchmark without worrying about the effect of differences in currency rates. Leaving standing instructions with the custodian to always execute at a particular PIT for an agreed upon fee reduces an investment manager's operational effort and risk. In fact, confident in receiving the market price, the investment manager can substantially or even completely eliminate a foreign exchange trading and operations group, resulting in a better allocation of scarce resources from currency to other endeavors.

These benefits, however, can be costly. Popular trading times such as London 4 pm or 8 pm represent market times when one global region is closing and transferring dealing activity to another region. These transitions are marked by declining liquidity, increased volatility, higher transaction costs, and wider bid offer spreads. Trading at these times, as well as other fixed points, can lead to substantial investment regret. For example, based on Morgan Stanley research, investors who trade a MSCI World™ portfolio at the London 4 pm fix may suffer up to 500 bp of annualized tracking error (interpreted as potential regret which investors could experience as sub-optimal execution) compared to a flow weighted average price trading program.

Some investors dismiss these concerns. These investors claim that while trading consistently at the same time every day may result in substantial volatility, over time good outcomes cancel poor results. Phrases like “currency washes out” and “zero sum game” are used to justify the trading strategy. The strategy of tolerating excessive risk makes sense only if low cost alternatives don't exist, but that's not the case. Investors can trade more frequently through the day, with the aim of reducing regret.

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