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Trading at London 4pm

The illusory benefits of maximum liquidity

Stuart Simmons

This paper explores why trading at the London 4pm WM/Refinitiv benchmark fix (Fix) brings Australian institutional investors only the illusory benefits of maximum liquidity.

The conclusion is that investors need to challenge the use of the Fix for execution purposes, and instead pursue strategies that meet with their objectives. It will require more rigour, but the reward is the conversion of very material and unobserved execution costs evolving into visible implementation 'profits' relative to the industry benchmark fix.

Background to the London 4pm benchmark

Those unfamiliar with benchmark fixing and its uses should start with the basic fact that the institutional foreign exchange market operates uninterrupted for over five days of the week; from the New Zealand open on Monday to the New York close on Friday.

To delineate one trading day from another, 'fixing' rates are published to represent a daily closing price. Market convention records this timing as London 4pm, with WM/Refinitiv's benchmarking service the most popular singular standard for the pricing of international asset portfolios and global benchmarks.

The mechanics of Refinitiv's fixing methodology utilises median market rates in a five-minute window around the time of the Fix—two-and-a-half minutes before and after 4pm for benchmark daily closing rates. But these benchmark rates are not just used to revalue international assets, benchmarks, and derivative positions.

Market participants are also drawn to executing trades at the Fix, and for investors seeking to guarantee the fixing rate, they will typically submit an order to a counterparty bank in advance of the Fix. This then leaves the bank to manage the risk around that and other fixing orders before delivering on the fixing price alongside a pre-agreed spread.

There is no doubting what attracts a number of investors to execute at the Fix:

- Some seek the additional liquidity (trading volumes/ market depth) and narrow bid-ask spreads which accompany elevated trading volumes.
- Others are drawn to the potential benefit through netting some of their trading interest at a fixed time.
- There are those who seek to simply minimise the level of tracking error to their respective benchmarks.
- Some are drawn in by the transparency that the Fix offers.
- Others trade at the Fix to generate scale in their currency management practices.

It all sounds rather compelling except for the very significant, largely unrecognised, and wholly avoidable market impact costs accompanying rebalancing at the Fix.

By not considering how unbalanced order flows distort exchange rates, investors are skirting 'best execution' obligations and incurring unobserved costs which elicits a material dollar cost to the end investor.

In the next section, we explain how market impact costs from herd behaviour completely overwhelm any benefits that accrue from the surge in trading volumes.

Herd behaviour: Triggering an adverse market reaction

Individual investors follow their own self-interest. Leaving an order to be filled at the London 4pm fix would generally anticipate a minimum of market impact given the elevated trading volumes and deep liquidity. However, it is the collective of these individual decisions that generates herd behaviour which itself triggers an adverse market reaction. As per the Financial Stability Board's Foreign Exchange Benchmarks Final Report:

"Price movements will always occur in the fixing window to reflect the net balance of supply and demand in the market."

Consider market moves around mid-March at the height of the COVID-19 crisis: global stocks suffered badly on March 12, 2020 with the MSCI World ex-Australia (AUD) Index falling 6.6%. As investors assessed the damage to their portfolios the following day, one response was an urgent need to rebalance hedging programs. The natural reaction for an Australian investor in that situation was to sell Australian dollars and buy foreign currencies to realign the hedges and reflect the lower portfolio valuation.

Here, timing matters—*a lot*.

An investor waiting until the Fix will see their orders combined with those of other investors pursuing a similar objective. The sheer weight of orders going in the one direction creates a massive imbalance for the market—one which is resolved by the Australian dollar cascading lower in the hour ahead of the 4pm fix. The galling result as shown in Figure 1 is that the investor rebalancing (selling) at the Fix will be doing so at a level that is 2% lower than where the dollar was trading just an hour earlier.

This result is not an accident or chance event. It is the natural outcome from a herd of investors rebalancing in the same direction and concentrating their flows at the same time. Nor is it an isolated incident, as the COVID-crisis provided a host of examples where the concentration of investor flows saw a very material and detrimental movement into the London 4pm Fix in both directions.

This is demonstrated in Figure 2, with that March 13 move as the centrepiece. It is clear that herd behaviour generated a series of significant market moves into the Fix with investors often getting filled at levels at or near the extremes of that representative trading range.

Market impact: A systematic bias towards trading range extremes

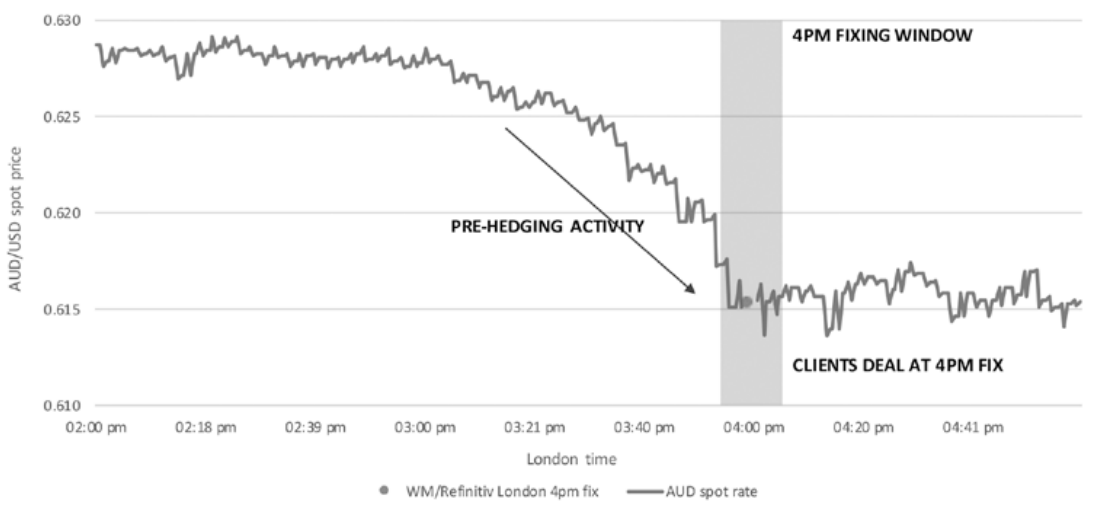
It is also important to recognise that this herd behaviour phenomenon is not isolated to crisis conditions. There exists a systematic market bias to the fixing rate being set towards the extremes of the trading range. Our earlier research has found there is a persistent tendency for the AUD to peak or trough at the Fix.

We can represent this by looking at the distribution of the AUD fix compared to the prevailing trading range around the Fix. Figure 3 shows the distribution of the AUD fix compared to its price range just ahead of the

The quote

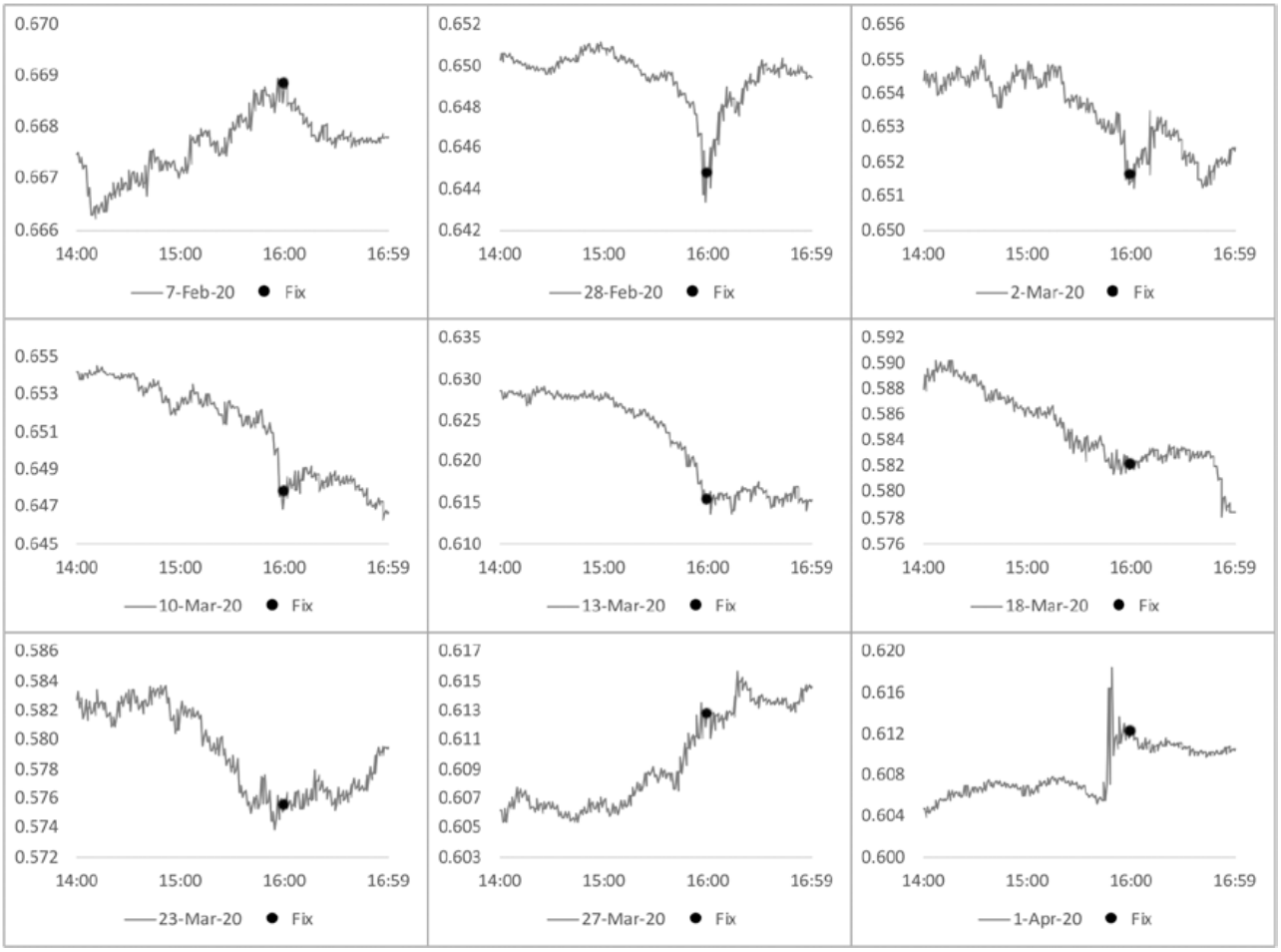
Investors need to challenge the use of the Fix for execution purposes, and instead pursue execution strategies which meet with their objectives.

Figure 1. AUD/USD London 4pm fixing on 13 March 2020



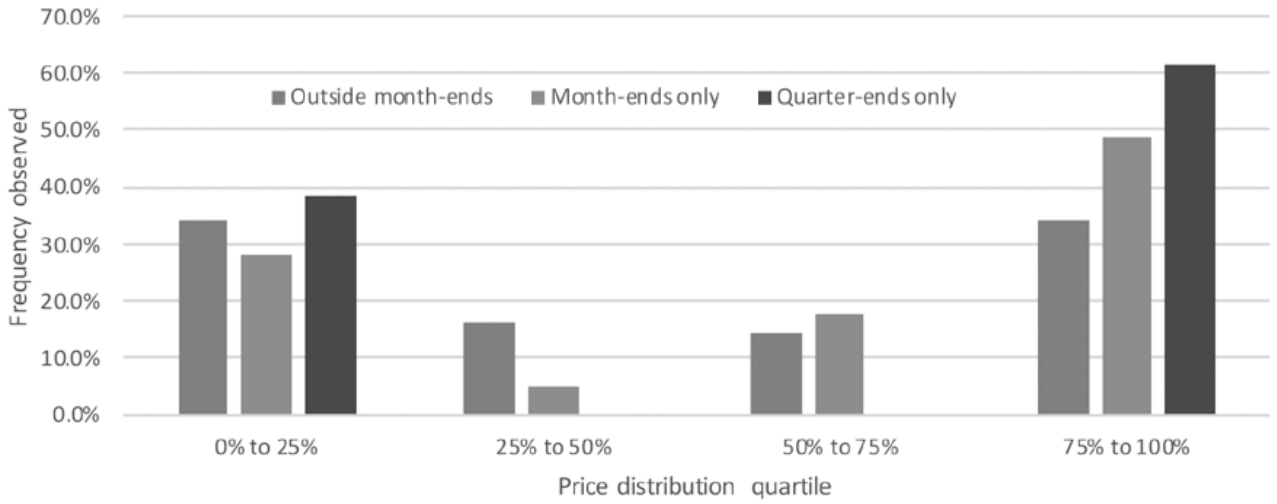
Source: QIC, Bloomberg

Figure 2. Significant market moves around AUD/USD London 4pm fixing on various dates



Source: QIC, Bloomberg

Figure 3. London 4pm bias distribution(s)



Source: QIC, Bloomberg

Fix (3:46pm–4:03pm) with observations across each trading day from July 2017 to September 2020.

Note: The WM/R London 4pm fix is technically calculated over a window covering 2.5 minutes either side of 4pm. Calibrating our sample to 4:03pm covers the entire fixing window.

On regular trading days outside of month-ends, there is a general bias towards fixing in the first and fourth quartiles of the trading range around the Fix. This only gets more exacerbated when taking in the observations at month-end and quarter-end dates. It is also intuitive as a greater concentration of investors rebalance at the end of month/ quarter, with these flows also tending to be more significant commensurate with the accumulated monthly move in underlying assets as less frequent rebalancing allows the exposure 'drift' to widen.

Knowing there is a tendency for the AUD fix to occur at a price extreme means that at best, trading outcomes will tend to be binary and volatile. Further, this outcome will cause investors to either benefit or suffer depending on whether an individual investor's flow is trading in the same direction as other market participants during a fixing window.

One may claim that given we typically have no foresight to what the balance of investor volume is on any given day, this volatility will reflect random noise that is not expected to cost over time.

However, for investors wishing to hedge their international investment portfolios, this claim is not quite true. Australian superannuation funds typically allocate a significant proportion of their investment portfolio in international equity markets, which generate currency hedging needs. As equities rise or fall, the foreign currency exposure from international equities will move out of alignment with their currency hedge, leading to a need to rebalance the hedge. The requirement for rebalancing is typically elevated either after significant equity-market moves, or at popular rebalancing points such as month-ends, leading to a certain amount of predictability in some investor flows.

Indeed, Figure 4 shows the cumulative difference between the AUD 4pm fix relative to its time-weighted average price (TWAP) between 3:46–4:03pm over time— a measure of the cumulative market impact into the Fix— relative to the MSCI World Index. There is a clear co-movement between the 4pm market impact to equity prices highlighting the significant influence exerted by portfolio hedging flows on the Fix, particularly following periods of heightened market volatility.

In fact, this effect is so prominent that during the period of extreme market volatility during the COVID-crisis, prior equity returns became a clear predictor of the daily trading patterns into the AUD 4pm fix. This was because the significant swings in equity prices meant trading volumes from investor rebalancing also surged. As Figure 5 shows, the combination of elevated rebalancing episodes during this period, coupled with a larger than average market impact into the 4pm fix, meant investors dealing at the Fix incurred a massive, and largely unrecognised, trading cost.

Industry warnings

The heightened volatility from concentrated flows was so prominent the Global Foreign Exchange Committee took the extraordinary step of issuing a warning to institutional investors on 26 March 2020. In a press release titled 'GFXC Issues Statement on FX Market Conditions', the GFXC advised institutional investors to reconsider trading behaviour around the March month/ quarter end, warning of significant volatility associated with hedge rebalancing.

"Given the intense volatility seen in global financial markets this month, it is possible that FX market participants may execute larger than usual FX volumes during end-of-month benchmark fixings … In light of these possible develop-

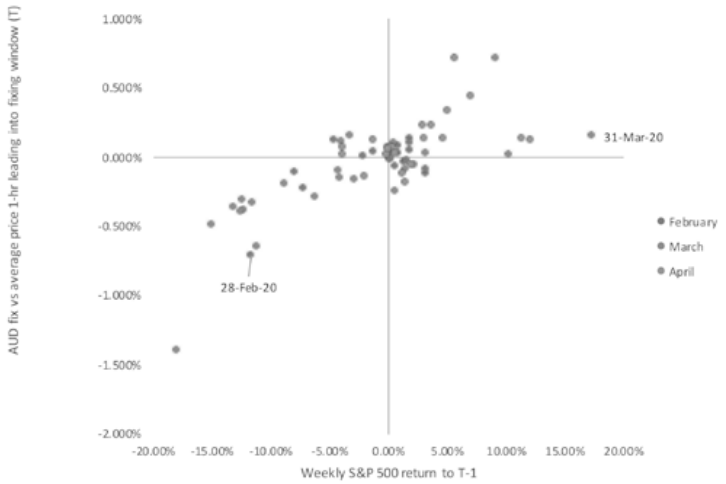
The quote

Knowing there is a tendency for the AUD fix to occur at a price extreme means that at best, trading outcomes will tend to be binary and volatile.

Figure 4. London 4pm fix versus TWAP & MSCI World (local)

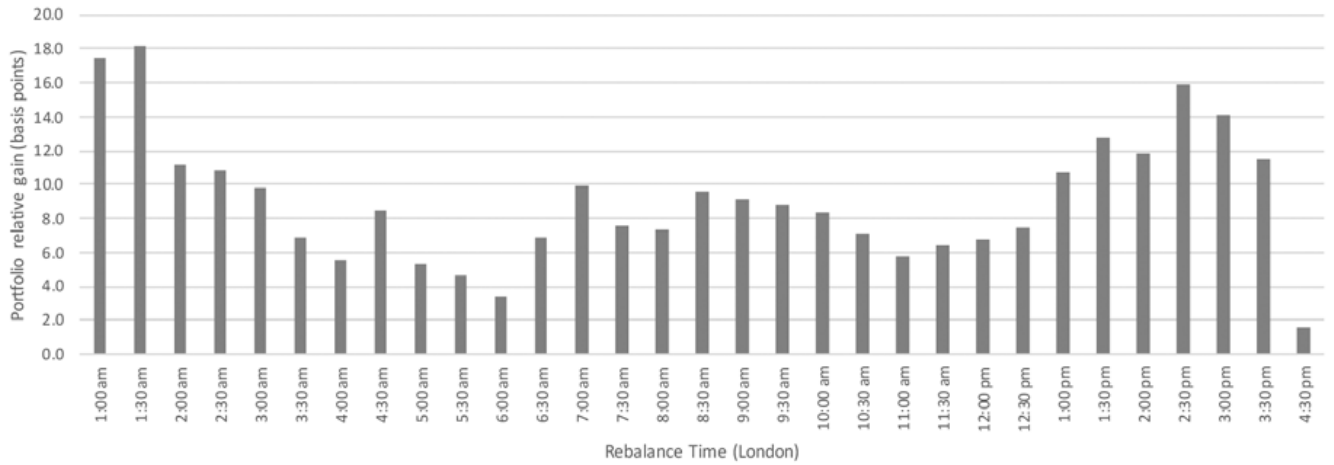
Source: QIC, Bloomberg

Figure 5. AUD trading bias into 4pm fix versus prior week equity return



Source: QIC, Bloomberg

Figure 6. Net P&L difference versus rebalancing at London 4pm fix (March 2020)



Source: QIC, Bloomberg

ments, significant volatility and price movements may be observed during FX fixings in the coming days."

This certainly helped to avert a major event at the end of March, with investors introducing more flexibility into their processes. However, routinely executing at the Fix continues to prompt industry leaders to question whether this practice represents the most appropriate method of execution.

More recently, this sentiment was reiterated by GFXC chair and RBA deputy governor Guy Debelle in a 'The Global Foreign Exchange Committee and the FX Global Code speech of October 2020:

"In periods of volatility, it is inevitable that there will be a greater focus on benchmark fixes. Large changes in asset prices and currencies generally mean that investors have greater-than-normal rebalancing flows when managing their portfolios. This was certainly the case at the height of market volatility in March. Ordinarily, a lot of these rebalancing flows will go through the market at times that match benchmark fixings … At the same time, it remains as important as ever for users of the 4pm fix and other benchmarks to regularly assess whether executing at those times suits their requirements."

Investors cannot claim they have not been warned.

While London 4pm may indeed see a surge in market trading volumes, this only becomes a liquidity benefit for investors if that trading volume is balanced. Australian investors in particular will often find herd behaviour systematically skews the market as their trading needs often coincide with other investors, leading to significant unrecognised market impact costs when dealing at the Fix.

This is why leading industry committees are pointedly reminding investors that they often have a duty to seek best-execution outcomes—and this is not represented by systematically rebalancing at the Fix. As per the Financial Stability Board's Foreign Exchange Benchmarks Final Report:

"It is important to stress that trading at the Fix price, even at the mid-rate, is not necessarily going to give best execution for a customer in the sense of the best possible price. In fact, trading at the Fix leaves the client exposed to the price movements arising from the net order flow taking place at that point in time."

Implementation shortfall: Giving consideration to market impact

Clearly, there is a need for investors to do more than celebrate a narrow bid-ask spread. This is where a measurement of implementation shortfall comes in—ensuring that investors give consideration to the trading costs inclusive of market impact.

The example of 13 March 2020 provides a relatively simple illustration. With global developed market equities (in Australian terms) falling 6.6% on 12 March 2020, the rebalancing response from an investor who maintains a 50% hedge is to sell approximately 3.3% AUD forward. Considering only the US component of the equity benchmark which represents approximately two-thirds of the MSCI World (ex-Australia) index, the cost of waiting that extra hour for the Fix is over four basis points at fund level.

On a global equity allocation of $1 billion, this represents an avoidable market impact cost of $435,000 for just one trade. This does not even include the disclosed spread a counterparty will apply to the trade.

We know that 13 March 2020 was not an isolated move and can expand this analysis by simulating the implementation shortfall of an Australian global equity investor who rebalances a 50% hedge throughout March. Capturing the daily range where exchange rates are more liquid, as Figure 6 demonstrates, executing at London 4pm is the single most costly time to be executing. Every other half hourly increment generates a better result for the investor.

By executing one hour ahead of the Fix, that hypothetical investor can save 0.14%, or $1.4 million at the fund level. This goes up to $1.6 million if the investor had executed just 90 minutes ahead of the 4pm fix. The investor's effort to minimise trading costs perversely ends up with an overwhelming implementation shortfall that clearly dominates any modest narrowing of the 'visible' spread cost. For a $10 billion portfolio, this impact goes up to $16 million.

Another reason this market impact cost appears to be hidden from investors is the alignment between the execution time and the benchmark market convention. Any investor executing at the London 4pm fix is almost certainly capturing the same rate as their benchmark

(excluding the commission), and an associated attribution of performance will not identify the opportunity available through avoiding that benchmark rate. The same market impact costs being incurred by the fund are also being absorbed by the benchmark performance.

Only an investor who is actively avoiding that fixing/benchmark rate will be able to identify the very material gains accruing to those willing to put more rigour into their execution process.

Conflicts of interest, agency issues and alignment

We have identified the systematic behaviour of exchange rates around the fixing window and the associated investor flows that contribute to that market impact. Now it is important to explore how the lack of alignment across different market participants is directly linked to that market impact and skewed fixing outcomes.

Simply put, leaving an order with a counterparty at the London 4pm fix naturally introduces a mismatch in alignment. When orders are left with a bank counterparty, the currency risk is transferred from the customer to the bank, as the bank is exposed to exchange rate movements at the Fix.

Dealers accept these orders and act as principal bearing the consequent price risk, rather than executing orders on an agency basis where the risk remains with the investor. Another way of expressing it is that the dealer agrees to execute those orders at an unknown price which is subsequently established during the fixing window.

At a minimum, the investor's goals are not aligned with the bank whose primary objective is profitability, while the investor may be pursuing transparency or minimising the 'visible' cost. The bank will profit if the average rate at which it buys is lower than the fix rate which it 'sells' to the client, or the average rate at which it sells is higher than the fix rate which it 'buys' from the client. The foundation of this misalignment is that both parties want the price to move in different directions into the Fix.

No doubt the trading environment has improved from the heavily publicised market manipulation that existed prior to 2013, which led to massive fines against banks and wider industry scrutiny that also resulted in penalties levied against buy-side firms. Benchmark reform and the introduction of the FX Global Code have seen a seismic shift in behaviours, but investors remain systematically worse-off. That issue of misalignment ensures that there are inherent issues irrespective of conduct.

The systematic price trends that extend from an hour ahead of the Fix indicate fixing-related activity commences well before the Refinitiv London 4pm fixing window which 'opens' two-and-a-half minutes before the hour. This could be the result of three factors:

1. Banking activity front-loading their risk management which advertently or inadvertently improves their average against the Fix.
2. The actions of speculators who are capitalising on the predictable market imbalance for their own gain, and/or
3. The less-common usage of the Bloomberg BFIX fixing methodology which has a heavy skew towards activity ahead of (and precisely at) 4pm.

This is a natural consequence of loss-aversion from banks which want to prevent being caught offside by the fixing rate—and an inclination to front-load any trading to harness levels that are prevailing before too much market impact has occurred.

Similarly, speculative trend following will also occur ahead of and around the Fix—even in the case of market participants which have no natural fixing flows. We have already seen how there is a predictability to exchange rate movements around the Fix for the Australian dollar, with a clear relationship to equity market movements.

Even without that information, our research has identified systematic patterns which can be exploited from observing momentum leading in to 4pm, and mean reversion of exchange rates after 4pm.

We are not alone in identifying these patterns, with researchers Carl Husselmann and Kristjan Kasikov also observing similar trends in their 'Trend-following market behaviour at the 4pm London time BFIX and WMR fixing windows' paper of August 2019:

"Excess concentration of large one-way orders and potentially some speculative trading around fixing times has also given rise to certain distortions in FX markets."

This combination of bank and speculator activity exacerbates exchange rate movements into the Fix. It is fertile ground where an investor's implementation shortfall may end up as bookable profits for other market participants.

It is also critical for an investor to understand the misalignment is not limited to the relationship between an investor and the counterparty bank. There is often also a fundamental misalignment between the investor and their own investment manager.

Some currency managers operate with huge scale with associated standardised, inflexible processes which accommodate that scale. These processes may include standardisation of execution practices, standardisation in tenor selection, standardisation in rebalancing and standardisation of reporting. Executing at London 4pm generates the type of efficiency which enables such scale, and there is simply no incentive to deviate from extremely scalable practices to head-off a sub-par outcome for the investor.

The FX Global Code

Before an investor considers themselves a victim of misconduct, it is important to walk through what is acceptable under the FX Global Code—the global principles of good practice developed to provide a common set of guidelines to promote the integrity and effective functioning of the wholesale foreign exchange market.

Principle 10 encapsulates acceptable conduct around handling orders relating to the Fix, requiring market participants to handle orders fairly, with transparency, and "in a manner consistent with the specific considerations relevant to different order types".

More specifically, trading activity which intentionally influences the benchmark fixing rate to benefit from the fixing is classed as misconduct:

"Market Participants handling a Client's order to transact at a particular fixing rate (Fixing Order): should not intentionally influence the benchmark fixing rate to benefit from the fixing, whether directly or in respect of any Client-related flows at the underlying fixing."

What is captured as acceptable conduct includes trading before the fixing window opens:

"Indicative Examples of Acceptable Practices: transacting an order over time before, during, or after its fixing calculation window, so long as not to intentionally negatively impact the market price and outcome to the Client."

Consider the example of 13 March 2020, where investor orders would have been significantly skewed in one direction—to sell Australian dollars in a very material size. The FX Global Code enables a bank to execute ahead of the five-minute window if it is judged that

this will mitigate market impact. Excess volatility can occur irrespective of the conduct of banks participating in the Fix. It is the imbalance of market orders which drives that volatility and invariably works against the investor.

What is the alternative?

Avoiding the Fix is easy, whereby landing on the optimal alternative trading process requires a lot more rigour. It necessitates a more considered approach to achieve 'best execution', and one which considers the market environment rather than methodically and naively trading at the Fix. As per the Financial Stability Board's Foreign Exchange Benchmarks Final Report:

"The most sophisticated asset managers (especially those with a centralised FX desk) more generally execute their trades throughout the day, possibly using a range of facilities."

There is no 'silver bullet', but a good place to start is to recognise the purpose of the trade. If an investor needs to rebalance their hedging program because it is out of structure, there is no need to wait until the close of the following day. This is accepting an unwanted and uncompensated risk for longer than necessary.

Consider again that example of March 13, 2020 where investors were responding to the equity correction that occurred over prior days. Investors leaving orders at the 4pm fix were doing so in an environment where stocks were already undergoing a fierce rebound, eventually posting an 8.2% gain (MSCI World ex-Australia net total return (AUD)) on the 13th.

This more closely aligned the timing of the hedging unwind with the theoretical timing of when investors should have been reinstating positions—an implementation and risk management failure. To effectively mitigate unwanted market risk from their hedging program, investors need to more closely align the rebalancing timing with the change in underlying assets and any cash flows.

Also consider the not-uncommon scenario of an investor outsourcing their currency program to a manager with real or perceived conflicts of interest—this is where the lines between the manager acting as principal or agent are blurred because of related-party dealing. In these circumstances, executing at the London 4pm fix often represents a compromise that brings much-needed transparency to the investment process. But this is also one area where the cure—implementation shortfall—may be even worse than the disease—related-party dealing. The simple solution to this is to employ a manager with full alignment to the investor.

To be clear, we are also not advocating for a complete withdrawal from executing at the London 4pm fix. There are circumstances such as a transition between accounts or managers, where it is necessary to find a clearing price that matches off against an opposing flow.

There are also occasions where the timings of currency trades are linked to investor cash flows and achieving a rate close to the 4pm fix is necessary to minimise market risk. In these circumstances, investors can consider other trading strategies that enable them to capture the rate close to the Fix but where any 'gains' relative to the published fixing rate from their own market impact also accrue to themselves.

Conclusion

Systematically executing FX hedge rebalancing trades at the benchmark closing rate of London 4pm does not represent 'best execution'. Despite several attributes that at face value, appear very attractive, evidence through the COVID-crisis and beyond indicates that it is the antithesis for an investor concerned about execution costs.

Through the relatively liquid phase of a trading day there was no worse time to have executed, with a concentration of orders in the same direction leading to severe order imbalances and commensurate market impact. The end-investor gets lumbered with a trade fill established at the end of a predictable market surge corresponding to movements in underlying assets.

This is not an innocuous, unbiased auction process to determine a clearing rate for participants into the close. There is a highly predictable element of the direction of flows which appears to be capitalised on by speculators and may also be exacerbated by banks which can act in advance of the Fix. It is not isolated to crisis periods either, with systematic patterns observable through 'normal' market periods, and especially at month and quarter ends where rebalancing volumes tend to be elevated.

Investors need to challenge the use of the Fix for execution purposes and instead pursue execution strategies which meet their objectives. It will require more rigour, but the reward is the conversion of very material and unobserved execution costs evolving into visible implementation 'profits' relative to the industry benchmark fix. **FS**