

Russell Research



By: Lloyd Raynor, CFA, Senior Consultant, Consulting

MAY, 2012

Still overpaying for FX?

Time to give this area more attention

Historically many institutional investors overlooked the fees they paid for transacting foreign exchange (FX). The situation has now changed. An increasing number of high profile investors have queried the extent to which they have received best execution in FX. In this paper, we present research indicating that FX costs are still too high notwithstanding recent press coverage. For an average \$1bn fund savings in the order of \$330,000 per annum would have been achievable from adoption of an agency approach to FX¹ and in some cases funds could have saved much more. Under an agency approach, investors or managers outsource all FX trading to a third party. This third party then “shops around” for the best deal for each set of FX trades using competition between possible counterparties to ensure that the prices achieved are as attractive as possible.

FX COSTS IN THE PUBLIC EYE MORE THAN EVER

Russell has written extensively on this often overlooked area. We first discussed this issue in our 2004 thought piece “It’s time for more choice in FX”². We then presented the results of a second major study in our February 2010 thought piece “Are your FX fees too high?”³.

While our first paper was written at a time that the issue of execution efficiency in FX received very little press coverage, our second paper coincided with this issue hitting the headlines in a big way. Since then, this issue has continued to receive significant coverage in the press as other pension funds and government agencies have sought to take legal action on behalf of investors claiming they too had paid excessively for currency transactions. In short, efficient execution of FX trades remains a hot topic and is an area on which fiduciaries should have a proper grasp.

FX costs still aren't coming down

With this focus in the press on the efficiency of FX trading, and a number of FX service providers offering to increase transparency for clients, one might have expected average FX costs to have been decreasing. However, based on our latest extensive research into this area, and using an even larger sample of trades than previously, we actually find the opposite to be the case.

The results of our latest research into the costs of trading FX are presented as follows. First, we provide an update of our own research on the efficiency of FX markets based on an analysis of over 173,000 FX trades conducted on institutional assets over 2010/2011 totalling assets of approximately \$76 billion. Second, we restate potential reasons for the observed inefficiency in FX execution. Finally, we discuss the different ways in which clients can seek to reduce their FX costs and note some of the ways in which the custodian banks are offering to increase transparency in this area. For example, some evidence exists that time stamping of trades is gaining traction, a development we encourage.

THE UNSEEN COST

Most investors today still grant their managers responsibility for execution of the FX transactions required to settle international trades. In theory at least, these managers are incentivised to achieve the best possible FX result, as any inefficiency in this area will detract from their performance. In so doing, these managers use a number of different approaches to transacting FX:

- Some managers will explicitly try to ensure that the process of executing FX trades remains efficient by **building a full FX trading desk**, with a wide range of counterparties and dedicated trading staff and technology.
- Other managers will establish **preferred relationships with one or two counterparties**, but will pay close attention to these relationships, measuring the resulting execution results and acting to resolve poor pricing outcomes.
- However, a significant group of managers simply **outsource FX trading** to the custodian bank of their investor's account, in the same way that many end investors simply choose to use their custodian for passive currency hedging services. Custodians can be experts in the field of FX trading, transacting billions of dollars worth of trades every day, and the manager can be assured that the FX trade will be coordinated with settlement of the underlying security transaction.

While the first and second approaches detailed above should result in efficient FX execution, the third approach has more room for slippage. Indeed, our 2004 and 2010 studies revealed surprisingly high costs in FX trading. We have updated our analysis, and include these results in this paper. The latest study reveals that the high costs detailed in our 2004 and 2010 papers appear to remain in place today.

Increasingly detailed research into FX costs

After studying this issue in 2004, we repeated our analysis in 2010. That more recent study focused on the results of execution audits carried out for 19 clients over the period from January 2008 to December 2009. The audits represented four domestic base client currencies: US Dollar, Canadian Dollar, Sterling, and Australian Dollar. In all, nearly 40,000 trades were analysed, involving approximately \$19bn. The new study presented here used the same methodology to evaluate significantly more transactions: over 173,000 trades valued at \$76 billion executed on behalf of 31 clients in 2010 and 2011. Again all the major currencies were represented, indicating the global breadth of investors and demonstrating that the problem of elevated transaction costs was not confined to the United States.

The availability of time stamps would make our investigation of whether our clients are getting a good deal in FX easier, and we would hope to see increased use of time stamping of FX trades.

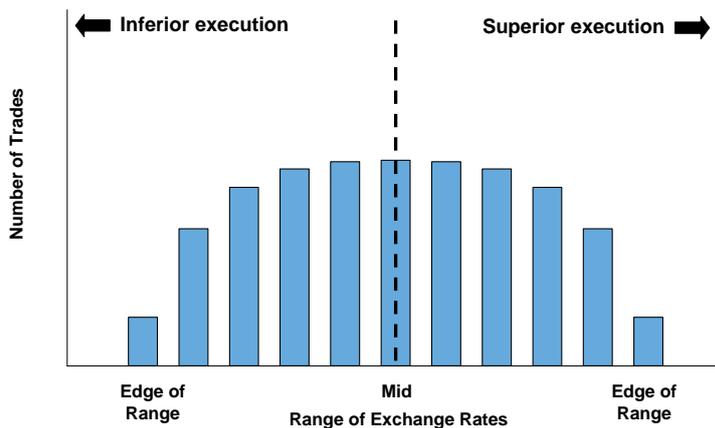
It remains the case that it is not normal practice to time stamp trades, although some evidence of change in this area is apparent. Time stamps would give us the opportunity to retrieve market price data from market information providers like Bloomberg and Reuters at the time of each trade, allowing us to carry out a direct comparison of the transaction exchange rate with those rates available in the market at the time of trading. The availability of time stamps would make our investigation of whether our clients are getting a good deal in FX easier, and we would hope to see increased use of time stamping of FX trades over time.

As a result the methodology for evaluating the efficiency of FX trading has remained largely unchanged in each of our studies; we evaluate each trade against the total trading range for that day. Using the day's trading range is a substitute (and a good substitute at that, given a large sample size) when time stamps are unavailable. That range is then divided into bands and trades allocated to those bands according to where they fell within the day's range. For example, a trade executed at the worst price of the day would be allocated to the "edge of range" band on the left of the exhibits overleaf, and vice versa. More details of the precise methodology used are included within Appendix 1.

Results of our latest studies

Figure 1 below shows a theoretical distribution based on simulated price movements with execution at random points in the day and no bid-ask spread. In this model we see that relatively few trades would occur at the edge of the day's range and more would occur towards the middle of the range. We also see an equal number of trades taking place at better prices and at worse prices; the distribution is symmetric. Analysis of the executions achieved by a provider that is trading FX efficiently should produce an outcome distribution similar to this one. Processes that add (or detract) value would be expected to result in a shift in this outcome distribution.

Figure 1: Simulated distribution of FX trades



Source: Russell Investments

In practice, if we look at figures 2 and 3 below, we can see that the actual range of trades in both our 2008/9 and 2010/11 studies show a very marked skew to the left, indicative of inferior FX execution. In both cases there were far more trades, as well as a far higher volume of trades, executed at prices close to the worst price of the day than at prices close to the best⁴.

Figure 2: Actual distribution of FX trades – 2008/9



Source: Russell Investments

...the actual range of trades in both our 2008/9 and 2010/11 studies show a very marked skew to the left, indicative of inferior FX execution.

Figure 3: Actual distribution of FX trades – 2010/11



Source: Russell Investments

So what was the average cost (shortfall from the midpoint between the bid and offer prices) incurred by our clients in both studies? For our 2008/9 study, excluding a significant transition event for an investment advisor, the average cost was approximately 9 basis points (“bps”)⁵. For our most recent study, we see the average cost actually rising to approximately 10 bps notwithstanding the increased focus that efficiency of FX execution has recently received in the press. As a result the average cost incurred by clients greatly exceeded most cost estimates of what it costs to trade in the FX market, which has typically been in the range of 1-3 bps for the most traded developed market currencies more recently⁶. In addition, FX execution costs for many individual clients were found to be much higher on average. For example, one investor in our 2008/9 study suffered average FX execution costs in excess of 40 bps, while our 2010/11 study found that an investment manager had paid over 37 bps for trades executed with its custodian. It is clear that trading is not, as is often thought, a friction-free process.

...the average cost incurred by clients greatly exceeded most cost estimates of what it costs to trade in the FX market...

Finally, we must also note that in both studies, roughly 10% of trades fell outside of the trading range⁷. This is indicative of the fact that a number of FX trades fell outside of the lower and upper prices for the FX markets as specified on Bloomberg for that particular trading day, with these lower/upper prices relating to 5pm to 5pm New York time each “day”. Out of range trades may simply represent trades being apportioned to the wrong trading day; for example, as FX executions are date

stamped but not time stamped, the evening trade of a US west coast manager with a Japanese trading desk at 9pm NY time may have been assumed to take place prior to 5pm NY time on that day, when in practice it should be related to the following day. However, once again we often find that trades outside of the pre-specified range are heavily skewed to inferior execution, and this is indeed found in the results of our two surveys included here.

FOUR POSSIBLE CAUSES?

There are four main features of the FX market which could potentially lead to higher costs than otherwise:

- **Lack of specialist competency:** FX trading is not a core competency of many investment managers, with managers often viewing FX trading as an administrative process. These managers will typically regard the potential cost of FX transactions as de minimis, and will often allow the custodian bank to execute the FX transaction by means of a default instruction attached to the trade ticket without a strict process for monitoring the price achieved.
- **Bundled service mix:** Certain investors may agree, as part of the custody relationship, to direct all FX trading to the custodian bank, or one of its affiliates. This bundling of additional services may result in lower explicit (and visible) custody fees. However, unless there is stringent execution quality measurement in place this practice could result in sub-optimal FX execution and therefore higher trading costs.
- **Lack of market structure:** The vast majority of FX trades are processed away from central exchanges; there are no official trading hours and very few reliable trading statistics. There is also no common regulator charged with defending the interests of clients, an issue which arguably takes on greater importance given the dominance of a small number of very large market makers. Finally, there is no conventional reporting requirement or time stamp obligation for FX trades. All these factors mean that it is very difficult, even for investors that are active participants in the FX market, to quantitatively monitor their FX trades effectively.
- **Potential conflict of interest:** Often the parties, such as custodian banks, that conduct FX trades on behalf of investors also take the other side of the trade as a principal. There is potential for a conflict of interest as these participants are in a position to execute FX at uncompetitive prices. This is of greater concern given the lack of time stamp obligations in the FX market which makes auditing trades difficult.

It is important to note that some managers executing trades on behalf of clients are very good at ensuring efficient FX execution. However, investors need to analyse the actual trades conducted on their behalf to ascertain whether their FX trades are receiving the right level of attention.

WAYS TO CLOSE THE RESPONSIBILITY GAP

If you want to manage it, measure it!

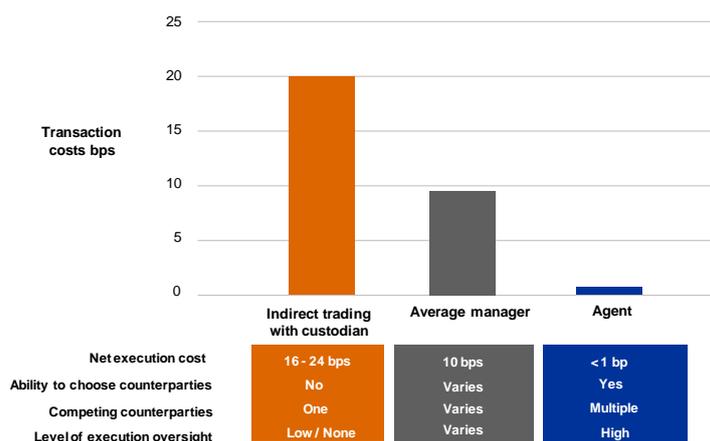
One of the most effective ways to improve FX execution efficiency is to state publicly that you will be reviewing the costs associated with its execution – and then to measure the results achieved on a regular basis.

There are three key areas that investors should focus on when attempting to understand the costs associated with FX execution:

One of the most effective ways to improve FX execution efficiency is to state publicly that you will be reviewing the costs associated with its execution – and then to measure the results achieved on a regular basis.

- **Execution quality:** It is vital that those executing FX, such as custodian banks⁸, have a clear and well thought out execution-quality management process in place. This will require that there are at least detailed time stamped records available around the FX process and that whoever is responsible for choosing the FX execution counterparty can understand and assess the results of the execution process. This assessment can be challenging to achieve where default instructions to execute through the custodian are attached to the settlement instructions of the underlying security trade.
- **Conflict Management:** Whoever is providing FX execution must clearly disclose any transactions executed with affiliates, and all other potential conflicts of interest. In particular, these parties must make it clear when they (or an affiliate) are involved in the transaction in any role other than as the client's agent.
- **Counterparty selection:** If selection of the party executing FX trades has been delegated by the investor to investment managers, it is important that the investor understands the FX processes adopted by the different investment managers. For example, has a particular investment manager chosen to direct all FX trades to a single counterparty or have they chosen to build a competitive counterparty execution programme whereby they shop around for the best deal for executing FX trades? Managers that have chosen not to build a full FX trading capability, represented by the "average manager" below, could reasonably be expected to outsource their FX trading to an agency provider to act on their behalf. Based on our 2010/11 analysis, the chart below shows how the average trading cost varied according to the number of counterparties used and whether an agency model was adopted.

Figure 4: Comparison of FX execution strategies



Source: Russell Investments.

Notes: Analyses from 2010 and 2011. Actual results may vary and past performance is not a guarantee of future results. For illustrative purposes only.

It is helpful to turn the above exhibit into real-world figures. If we assume that a \$1bn fund has 80% (i.e. \$800m) invested in growth assets with a non-domestic component⁹, that 70% (i.e. \$560m) of these growth assets are invested in foreign assets and that turnover averages 35% (i.e. c.\$200m) of these assets each year, the net execution cost under each of the models specified above would be as follows:

	Indirect trading with custodian	Average investor	Agent
Net execution cost each year	c.\$400,000 (20bps)	c.\$200,000 (10bps)	c.\$20,000 (1bp)
Potential saving from each approach, (net execution cost only)	N/A	c.\$200,000	c.\$380,000

From the above table, it can be seen that employing an agent could have reduced the FX fees of a \$1bn fund by around \$380,000 per annum before the fees of the agent are taken into consideration, and by around \$330,000 per annum after such fees are taken into account¹⁰. Such savings are substantial. Indeed they are likely to cover the fees paid to many investment consultants!

The result of focusing on these three key areas should be a clear understanding of how the investor's investment managers (or custodian, where the FX execution process is bundled in the custody relationship) approach the issue of efficiency in FX execution.

If necessary, get help with the review of FX trading from specialists

FX trading can be a complex area and few investors have experience carrying out reviews of FX trading. To assist our clients, in Appendix 2 we enclose a series of questions covering each of the three areas above. This has been designed to be completed by whoever is planning to execute FX transactions. In each of these areas you should expect responses that demonstrate a well thought-out understanding of the issues concerned, and, if necessary, the ability to back up opinions or policies with detailed analysis. You can also call upon the services of companies – such as Russell – that offer analytical and advisory services with respect to FX execution.

Consider appointing an agent to manage your FX trades

Investors concerned that FX trades transacted on their behalf are being executed inefficiently should require their managers to improve their capability in this area. This change would require managers to increase oversight and reporting of FX trades carried out on behalf of clients and to consider enhancing their FX trading processes. In many cases, it may not be appropriate for managers to build up specialist FX capabilities due to cost and resource implications. In these cases, investors or managers may want to consider appointing a third-party agent to manage all or some of their FX trades.

Under an agency model, investors or managers outsource all FX trading to a third party. This third party then “shops around” for the best deal for each set of FX trades using competition between possible counterparties to ensure that the prices achieved are as attractive as possible. This model is prevalent in the equity market, but is a newer development in the FX business. Obviously, clients should ensure that the explicit fee paid for the services of the third party is lower than any savings achieved by ensuring more efficient FX execution. This is something that the executing agent should be able to demonstrate with confidence for the investor. Given the fact that the explicit total fee inclusive of execution costs for an agency service in FX has been in the region of 2 to 4 bps, or around \$70,000 per annum for the \$1bn fund included in the example above, this would not have been especially difficult. With such fee levels, the saving relative to indirect trading with a custodian would have been in the region of \$330,000 per annum once the fees for the agent are taken into consideration. In other words, investors should not dismiss the use of the agency model simply because of the existence of an explicit commission. This

...employing an agent could have reduced the FX fees of a \$1bn fund by around \$380,000 per annum before the fees of the agent are taken into consideration, and by around \$330,000 per annum after such fees are taken into account.

new **visible** cost of around \$70,000 per annum in the case of the \$1bn example fund is designed to save investors much more in better execution outcomes, and by doing so reduces costs that previously were *hidden*.

While custodian banks have started to publish explicit rates for the transaction of FX, a development that should be encouraged, typically these rates are still substantially above the 3 to 4 bps in total charged by an agent. For example, at the time of writing we understand from published material that BNY Mellon offers a rate of c.10 bps for developed market currencies and c.15 bps for emerging market currencies and that they have also started trading at specific times of the day¹¹. Even taking into account an “exceptionally high level of service” on the part of the custodian banks, we still believe that the agency approach to FX is likely to offer better value.

Russell decided to move to an agency model for FX trading following the review of the FX trades in its own multi-manager funds. As a result of concerns over the efficiency of FX execution, in 2003 Russell moved FX trades in-house rather than relying solely on the managers in its equity funds. In comparison to the results outlined in the research above, we have managed to achieve average execution costs below 1 basis point over the 2007 to 2011 period¹². This agency approach results in economies of scale and a greater specialist focus, which has helped us to save over \$77m for clients over the seven years to December 2011¹³.

The potential benefits of the agency model in FX

Having an agent that is dedicated to FX transactions may provide investors with the following benefits:

- **Lower FX costs:** An FX execution specialist should have sufficient resources to run a fully fledged FX trading desk (trading infrastructure, personnel and risk management/settlement systems) and view FX trading as a value-added service, not an administrative function. These resources should enable the FX agent to track the effectiveness of execution choices and to establish a process designed systematically to minimise costs and risk. The agent should be able to explore a wider range of sources, maintain a panel of counterparties, monitor their performance and make use of competitive pressures to get the best from each.
- **Clearer audit trail and greater transparency:** An FX execution agent should have access to a full audit trail for all orders to enable them to track each appropriate stage of the process. In particular, the use of time stamped executions should be a requirement of the FX execution agent and is a key part of measuring the effectiveness of executions.
- **Alignment of interest:** FX agency teams are by definition compensated for acting solely in the interests of clients; the payment mechanism provides an alignment of interest that does not exist under the principal route (where the trader executing the FX transaction could be the other side of the trade). This removes doubt about potential conflict of interest.

Agency model options

There are two possible broad options for investors considering appointing an FX agent.

- **Direct appointment:** The investor may choose to instruct all of their investment managers to pass all FX trading to an agency provider directly appointed by the investor. That provider is then responsible for the whole FX execution process, and acts as the investor’s agent throughout.
- **Indirect encouragement:** The investor may instead adopt a “comply or explain” approach to FX, asking managers to report and justify their results

This agency approach results in economies of scale and a greater specialist focus, which has helped us to save over \$77m for clients over the seven years to December 2011.

in this area. In turn, this may encourage your managers and custodians to apply greater resource to FX execution on your behalf. This could ultimately result in your managers employing the services of an FX execution agent on your behalf.

The approach that is preferred will vary by investor. Russell is able to work with investors to determine the approach that best matches their intentions and preferences.

FX TRADING CONTINUES TO BE BELOW THE RADAR

In summary, the results of our analysis here suggest that investors cannot simply rely on the manager or custodian to execute FX trades efficiently. Too often the lack of expertise and resources have led to uncompetitive execution and had a material impact on transaction costs for investors.

Best practice dictates that all investment decisions should be reviewed periodically and FX execution is no exception. Such a review would help you to understand and better control costs, and may help you to consider more cost-effective solutions. It would help you to close the responsibility gap which is common today. In addition, if managers are unable or unwilling to increase their FX capabilities, investors may want to go one step further and consider the use of third-party specialists to ensure ongoing efficiency of FX execution.

APPENDIX 1 – AUDIT METHODOLOGY

Each individual trade was analysed as follows.

1. The high and the low prices for the trading day in question were taken, and the difference between these calculated. We used prices defined by Bloomberg, which defines the day to be 5 pm NY time the previous day to 5 pm NY time on the trade date. So for a trade dated 31 December 2010 we would calculate the range of the day to be 5 pm on 30 December 2010 to 5 pm on 31 December 2010.
2. A series of bands were created. In the 2004 research, each band was one tenth as wide as the total high-low difference calculated in 1. above. In the 2008/9 and 2010/11 studies each band was one eleventh as wide as the total high-low difference (see 3. below for rationale for the change of method)
3. In the 2004 study, the "edge of range" bands were centred on the high and the low of the day, with the intermediary bands between these two bands covering the full range of prices. In the subsequent two analyses, an additional band was added. This extra band allows trades with exchange rates very close to the midpoint of the day's range to be allocated to the left or right of this price, depending on whether the transaction exchange rate was better or worse than the midpoint. If the transaction exchange rate exactly equaled the midpoint rate, the trade was allocated to the interval to the immediate right.
4. Trades were allocated to a band depending on the actual net price obtained. A purchase at the high of the day (or a sale at the low) would fall into the left hand (inferior) "edge of range" band. A sale at the high would fall into the right hand (superior) edge band. The number of trades and volume in each interval was added up and plotted in the charts shown.

APPENDIX 2 – QUESTIONS TO HELP INVESTORS ASSESS THEIR FX TRADING PROCESS

Execution quality

How do you as the end client, and your managers, assess the quality of execution achieved in the FX market from the counterparties chosen? Investors and managers should be able to demonstrate that they are managing to achieve fair prices and effective executions from the counterparties selected.

- Do you or your managers have a regular process for assessing FX execution quality?
- What is the exceptions process for trades identified as being outside appropriate ranges?
- Are all trades time stamped to the second?
- Does the result of this analysis impact on the proportion of the foreign exchange trade flow that the counterparty receives?
- What reporting is provided with respect to foreign exchange executions?

Counterparties

With which counterparties do you and your managers execute foreign exchange, and how do you and your managers get orders to counterparties? The key concern here is whether you, or managers to whom you have delegated the selection of parties to execute FX, have adopted a single counterparty model, or have instead chosen to build a competitive execution counterparty programme.

- Are more than 50% of the executions within a relevant mandate performed with the custodian?
 - If so, why?
 - Is this due to a client instruction?
 - Is this the manager's choice?
 - If due to client instruction, what % of all clients instruct the manager to trade exclusively with the custodian
 - If so, which legal entity within the custodian's Holding Company structure are orders communicated to?
 - The custody unit?
 - The treasury unit?
 - If so, what is the performance result?
- Are more than 50% of the executions performed with a single non-custodian third party?
 - If so, what is the reason for you adopting such a concentrated approach to counterparty selection
- How are foreign exchange transactions resulting from corporate actions and tax rebates traded? What is the fee structure applied to these transaction, whether the fee is collected directly or through an applied spread?
- Does the manager have a clear process in place for counterparty selection and management?

Conflict management

How does a relevant investment manager deal with the conflicts of interest that may arise from the FX execution process?

- What sources of revenue does the investment manager (or affiliated companies) receive from foreign exchange transactions?
- Does the manager (or affiliated companies) ever trade foreign exchange as a principal with the client, i.e. is the client ever trading directly with the manager or its affiliate?
- Does the manager ever trade foreign exchange with an affiliate? If so, how is this disclosed to the clients, and how are the conflicts recorded and managed?
- How does the manager assess and manage counterparty risk. (There should be a particular focus on those situations where trading is executed with a single counterparty. For example, if all FX trades for a custodian bank are executed through an in-house affiliate, all counterparty trades are concentrated in this single affiliate. If the whole entity ceases to trade, then all of these FX trades will be without a counterparty to make payment on settlement date.)

END NOTES

¹ Based on an “average” asset allocation for a fund and historical average execution costs as specified in the main body of the paper.

² Collie (2004), *It's Time for More Choice in FX*, Russell Viewpoint.

³ Kothare & Raynor (2010), *Are your FX fees too high?*, Russell Research.

⁴ There may be times when a small column, indicating a low number of trades, is combined with high volume. If this were to occur for columns to the right of the midpoint in figures 2 and 3, it would explain why FX execution costs appeared favourable, notwithstanding a skewed distribution to the left.

⁵ Our initial analysis of the average cost incurred by clients in our 2008/9 study was just over 13 bps before the significant transition event for an investment advisor was accounted for.

⁶ In Table 2a of FX Liquidity Update – January 2012, by RBS, the “average spread in” for Quarter 4 2011 for the following major currency pairings were as follows:

- a. EURUSD – 0.9 basis points (“bps”) (0.009%)
- b. USDJPY – 1.1 bps
- c. EURJPY – 2.4 bps
- d. GBPUSD – 1.6 bps

Whilst this snapshot of spreads is useful for comparison purposes for our later survey results in particular, we would note that spreads will change from quarter to quarter.

⁷ These outlier trades are transactions in which the exchange rate was lower than the low for the trade day or greater than the highest rate observed that trade day, as specified on Bloomberg.

⁸ In practice, one can trade with a variety of financial institutions including:

- a. the custody branch of a custodian bank
- b. the dealing desk of a custodian bank (instead of trading through the custody branch who then trades with its dealing desk)
- c. prime brokers
- d. insurance companies
- e. electronic trading platforms where one might trade with hedge funds, Commodity Trading Advisors, and other investors
- f. banks that aren't custodians
- g. other financial institutions.

⁹ Assuming the other 20% is in liability hedging assets, we make the assumption that there will be no foreign exposure within that allocation.

¹⁰ This assumes a total fee of 3 bps for an agency approach to FX execution, and is inclusive of the net FX execution costs. In practice, the fees for an agency approach can vary but we estimate that they will typically be in the range of 2 to 4 bps per annum.

¹¹ See “Foreign Exchange Standing Instruction Service Options”, BNY Mellon, 7 February 2012.

¹² Russell's average execution cost over each of these five years was as follows:

2007: 0.73 bps

2008: 0.81 bps

2009: 0.59 bps

2010: 0.38 bps

2011: 0.35 bps

¹³ Based on savings for “Separate Affiliated Accounts”, “Russell Investment Management Ltd.”, “Japanese Funds”, “London Funds”, and “United States Funds”, 1 Jan 2003 to 31 Dec 2011.

For more information:

Call Russell Investments on **+44 (0)20 7024 6000**
visit **www.russell.com**

Important information

This material is not intended for distribution to retail clients. This material does not constitute an offer or invitation to anyone in any jurisdiction to invest in any Russell product or use any Russell services where such offer or invitation is not lawful, or in which the person making such offer or invitation is not qualified to do so, nor has it been prepared in connection with any such offer or invitation.

Unless otherwise specified, Russell Investments is the source of all data. All information contained in this material is current at the time of issue and, to the best of our knowledge, accurate. Any opinion expressed is that of Russell Investments, is not a statement of fact, is subject to change and, unless it relates to a specified investment, does not constitute the regulated activity of "advising on investments" for the purposes of the Financial Services and Markets Act 2000.

The value of investments and the income from them can fall as well as rise and is not guaranteed. You may not get back the amount originally invested.

Any forecast, projection or target is indicative only and not guaranteed in any way. Any past performance figures are not necessarily a guide to future performance.

Any reference to returns linked to currencies may increase or decrease as a result of currency fluctuations. Any references to tax treatments depend on the circumstances of the individual client and may be subject to change in the future.

Issued by Russell Investments Limited. Company No. 02086230. Registered in England and Wales with registered office at: Rex House, 10 Regent Street, London SW1Y 4PE. Telephone 020 7024 6000. Authorised and regulated by the Financial Services Authority, 25 The North Colonnade, Canary Wharf, London E14 5HS.