PROVING THAT TIME IS MONEY

BEST EXECUTION: HOW BROKERS AND DEALERS COMPARE

Fund management is an increasingly competitive business. The interaction of turnover levels and total transaction costs can contribute significant drag to portfolio performance. Without the benchmarking of execution costs, active managers may be unwittingly turning excellent stock selection into poorer-than-expected returns.

One goal of fund managers, then, must be to achieve “best execution”. While this phrase is being used increasingly in the industry, an accurate definition of the concept remains elusive. Wayne Wagner of Plexus Group, a US firm providing execution benchmarking services to trustees and fund managers, has defined best execution as “that procedure most likely to inject maximum investment decision value into the portfolio”.1

Clearly, this definition includes not only the market price, but also a range of costs such as commissions, impact costs associated with the size and urgency of the trade, timing costs encountered when seeking and finding liquidity, and opportunity costs associated with trades which were not executed.

Estimating how close one is to best execution is a difficult task. A gross method, called the implementation shortfall approach, compares the return on a paper portfolio with that on the actual fund. The paper portfolio is assumed to change composition at the instant the investment decision is made and the transaction takes place at the prevailing security prices without any costs. The difference between theory and practice is due to a range of explicit and implicit cost components.

For fund managers, the primary goal is liquidity. To be able to implement investment decisions with “best execution”, the manager must find liquidity. Being unable to implement investment decisions because of a lack of liquidity can be a frustrating reality in today’s markets, and the cost of finding liquidity should be incorporated into the portfolio construction process.

COMPONENTS OF TRANSACTION COST

Commissions
This is the administrative and mechanism cost charged by stockbrokers to execute orders. If it were for an execution-only service, then its significance would be easy to measure. However, most stockbrokers in Australia charge commissions based not only on execution, but also on the research that they provide to their clients. The absolute level of commission should be considered in the light of the whole range of services received from the broker. Lower commission would not necessarily result in a better outcome for the fund manager, as cuts in broker research could adversely affect the information flow into the investment process. In future, Australia is likely to follow the US trend towards the “unbundling” of research and execution charges. One advantage of this is that fund managers would pay only for the services they require.

Market Impact
This is the cost of buying liquidity. In theory, it is how much the dealer would have to change the price so that execution would be completed quickly. The fact that in the Australian market, large

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Competition continually adds new dimensions to investment management, including a need for closer scrutiny of the costs of buying and selling. DAVID GIBSON shows how timing decisions embody costs which are reflected in the relative performances of brokers and dealers.
orders are often offered by brokers at a discount or premium, depending on whether they are selling or buying, is a recognition of this cost. These trades are executed in the belief that the sacrifice to the prevailing price is less than, or equal to, the price that would be achieved if the order were executed in the market, progressively influencing the price. Liquidity has been created, but at some cost. Estimating how much to pay for immediate liquidity is one of the primary skills required of institutional dealers. Market impact need not always be a cost. If the fund is in the fortunate position of providing liquidity in response to bids or offers from brokers then the impact cost of their desired trade may be negative. In this situation the dealer has disclosed no information of his intention to the market, while in a sense the counterparty is paying to advertise its liquidity requirements. Impact is difficult to measure, as it requires a knowledge of what the market price would have been in the absence of the transaction, but it can be modelled.

**Timing**
This is the cost of seeking liquidity at some later time or spreading a transaction over time. Over-emphasising the reduction of market impact may result in time delays and price changes. Recognising when to pay up or sell down is an important skill requiring knowledge of the dynamics of the market. Knowledge of the timing of the information driving stock prices, and the information itself, combine to enable a dealer to decide when an order should be actioned. If a timing decision cannot be made, then the "safe" option is to execute the trade over a period of time to encapsulate all subsequent price movements. The measurement of this cost is probably the most feasible, assuming records were maintained of orders conducted.

**Opportunity**
This is the cost of liquidity failure. Not gaining liquidity because the order is too large to be accommodated by the market is a common problem for institutional dealers. Prices sometimes move away, leaving orders unfilled on a dealer’s desk and brokers left wondering “what could have been”. Opportunity cost can be both intra-day and inter-day.

One method used to reduce liquidity failure is principal trading. Principal trading involves the transfer of liquidity risk to brokers, who may be better able to manage this because of an often wider range of hedges and liquidity combinations available to them. Passive execution networks can also provide liquidity not expressed in the general market. Participants are able to disclose volume requirements anonymously without immediate price impact. Such networks may include fund managers and brokers who are outside the normal domestic users of the stockmarket. The measurement of opportunity cost requires the collection of significant quantities of data from a range of sources.

Collins and Fabozzi described how the expected total cost of transacting (or not transacting) is the total of opportunity cost and execution cost (impact and timing). This is shown in Figure 1. Execution cost is a declining curve; given a longer time-frame to complete an order; opportunity cost is an increasing one. The periods involved could be days or minutes.

One of the roles of the dealer is to incur the minimum cost in implementing an investment decision. The dealer has a range of sources of liquidity to achieve this minimum cost, such as broker order
To measure the time of order placement, we need a semi-automated computer based record keeper. While these systems exist overseas, there are none in Australia. Accordingly, a new system had to be designed and implemented. This system would record the time an order was given as well as the type of order. Three types of trades were assumed, representing the three main liquidity sources available to a dealer.

- an order could be given to a broker to execute at his discretion, but with expectations of a gain or advantageous price;
- an order could be submitted to a passive dealing system such as POSIT, where the dealer decides the timing merit of submitting deals given the known liquidity; or
- an order could be executed at the discretion of the dealer.

At the time of order placement, a decision would have to be made of the order type, with no possibility of a change in hindsight. The nominated order type, then, determines who controls the execution of the order.

This method of recording deals was applied on a best-endeavours basis over more than 20 months, during which time some 1,100 trades were logged. The trades analysed represent an unbiased sample of the dealer’s activity over the period. This may have been the first time in Australia that such a volume of data of this type was recorded.

The stock listing and time stamps were sent to the Burdett, Buckeridge & Young quant department, which calculated the VWAP appropriate for each trade and other relevant price/volume data. When recording the time stamps it was acknowledged that there might be a delay of a few minutes between the beginning of order execution and the time of its recording, or that the clock on the logging computer differed from the clock on the recording device by a few minutes. A possible benchmark could be the last traded price on the day, but this ignores the range of prices that would have been transacted since the order was placed. These prices and the volumes transacted would be necessary to an appropriate benchmark.

Overseas practice has defined a benchmark based on the volume-weighted average price (VWAP). However, defining this price is not simple and entails a number of choices. For example, should specials, crossings, overseas trades, portfolio specials and option exercises be included in the calculation? Clearly, if we include, say, option exercises, a large variation in VWAP can occur because of the differential between the exercise price and the prevailing market price.

I have attempted to make a logical definition that encompasses most of the liquidity avenues. Specials and crossings are certainly included, because about 40% of 1995/96 turnover was through these methods. Option exercises and portfolio trades have been excluded because they do not represent opportunities for turnover which are known to be within the time-frame of the trades being analysed.

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books, natural orders, and principal and passive dealing systems. How these resources are used may depend on whether the dealer is a liquidity supplier or demander. If the dealer is a liquidity supplier, then a premium may be paid or commanded, so that the minimum cost could, in fact, be negative – that is, a positive contribution to the fund manager.

Among the components of implementation costs, the timing costs are the easiest to measure. This is because the time an order is given to the dealer by a fund manager can be recorded. By comparing the price dealt with a benchmark based on this instruction time, it should be possible to measure the outcome in terms of timing and impact.

The timing decision is a complex one, requiring the collation of many pieces of information and assessing the result against rules learnt by experience. These rules tend to be “fuzzy” and the importance of each can vary depending on the market situation. For example, the Australian stockmarket can at times focus on the effect on a stock’s earnings of a change in the Australian dollar, and yet at other times completely ignore this change. Various researchers have attempted to model this “fuzzy logic” by using neural networks, which supposedly model the functioning of the human brain. This has met with limited success.

If we cannot fully understand the timing decision process, perhaps we can measure it instead. This may lead us to answer the question of whether active dealing is better than passive dealing. This debate is comparable to that about active versus passive management of funds. Many books and articles have been written debating which method achieves the highest return for the client, but it is only in the past few years that fund managers have begun to measure active versus passive dealing abilities.

Traditionally, stockbrokers who are uncertain about their ability to deal for a client on the day have spread out the order so as to capture any favourable or unfavourable price movements.

Having recorded the time the instruction to the dealer and the executed price, how do we choose the benchmark? I have assumed that deals are completed on the day so that opportunity costs are excluded. A possible benchmark could be the last traded price on the day, but this ignores the range of prices that would have been transacted since the order was placed. These prices and the volumes transacted would be necessary to an appropriate benchmark.

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that of SEATS. As a result, the VWAP calculation may not have included the executed trade itself. This would have created errors.

Accordingly, when calculating VWAP, the time stamp was adjusted back by five minutes to ensure that it included the beginning of the order execution. Five minutes was deemed to be sufficient, but not so long a period that it could distort the recording of an order.

After measuring the difference between the execution price and VWAP, we were able to determine the average percentage improvement contributed by each group on a per-trade basis. This is shown in Table 1.

**SIGNIFICANT RESULTS**

A t-statistic of greater than or equal to 1.96 (2.576) for a two-tailed test gives us a 95% (99%) confidence that the non-zero result was not observed as a result of chance.

Table 1 shows that the most significant statistical result comes from the broker dealing in the afternoon. The broker has had a negative result, with a significance of more than 99%, that the result was not caused by chance. This may not be surprising, given that the average order size is larger in the afternoon than in the morning. The broker has typically been working a substantial order. It is possible that the broker has, on average, overestimated the difficulty of completing the order, has “gone in too hard” and not spread out the deal over the remaining trading period. Given that, in the circumstances described, the VWAP (including the transaction) could be a relatively “soft” benchmark, an awareness of this tendency should help brokers to achieve results closer to VWAP.

The dealer also, with 99% confidence, can achieve an average price better than VWAP. This certainly arises from the order being given to the dealer in the morning. The dealer is able to consistently use information from all the brokers, such as the books, to achieve a positive timing effect. Both results point to the importance of placing orders so that the maximum amount of the trading day can be utilised to achieve the best price.

POSIT, although not achieving a statistically significant result, did achieve a price little different from the market average. It is reassuring to know that a passive dealing system is exactly that – passive. It was evident that, since POSIT is run twice daily, the market move on the day would have affected the recorded performance, depending on whether we were buying on selling. If we adjusted for this, then POSIT achieved a price even closer to the average market price. This facility appears to be quite valuable, given that the commission costs reflect an execution-only service.

Figure 2 shows the smoothed distribution of the broker's percentage profit/loss. This curve looks remarkably normal and illustrates the range of outcomes. The more brokers that are used,
the more their individual market views are diversified, and hence the narrower the distribution should become; conversely, if particular brokers show statistically significant execution skills, then perhaps they should be favoured in some way.

In evaluating this data, we must remember the limitations of the benchmark, particularly in relation to the order size. If the order is large enough, the execution price could effectively become the VWAP, diminishing the possibility of achieving better than average. The proportion of market turnover executed from the time the order was placed then becomes an important consideration. The average proportion of turnover executed from the time the order was placed was 53%.

This is a sizeable amount, which may have caused the execution price to converge towards VWAP. Given also that the dealt volume represented approximately on average 18% of the total turnover in a stock, we see how much volume was missed by a timing decision made during the day.

Examination of the average trade size for each group yields an interesting result. The broker and POSIT executed orders with an average size of less than $1 million, yet the dealer executed orders double that. This may result from the tendency of the dealer to handle larger orders in the belief that they require more care and control. It may also be significant that the dealer will attempt to conceal the size of the order to avoid a large effect on the market.

Given the larger average size of the dealer’s trades, one might suspect that this factor contributes to profitability. However, a check showed no significant correlation between trade size and percentage profitability. This confirms that the performance of the dealer was not a result of the size of the orders, but rather of his timing ability.

**CONCLUSION**

Overall we can conclude that an active approach to dealing can contribute positively to execution performance. When commissions are regarded as execution costs only, passive dealing systems can be an effective means of execution. Allowing both the broker and the dealer the maximum amount of the day to execute and complete an order gives them a more likely chance of being able to exceed the volume-weighted average price in the market. The methodology outlined should provide a basis for future determination of execution performance once systems are developed to automatically record order implementation.

“Investment Management is two activities: Investment and Management. Investment involves finding the stocks and deciding how much to put into the portfolio. Management involves placing them into the portfolio. Traditionally, 99% of effort is expended on security analysis and portfolio management; only 1% is expended on investment management. Effective managers know the importance of both.”

**NOTES**

