



**Raewyn Williams, director, research and after-tax solutions, Parametric**

Williams is responsible for setting the Australian research agenda to research and develop new products for the Australian market. She is a current member of the FTSE ASFA advisory committee and the Taxation Institute of Australia superannuation committee. She is a qualified solicitor, graduating with Bachelors of Economics and Law from the University of Sydney and a Graduate Diploma of Legal Practice from the UTS College of Law. Prior to joining Parametric, Raewyn was director, after-tax investment strategies at Russell Investments.

# UNDER THE SPOTLIGHT: HOW MUCH DOES IT COST TO TRADE EQUITIES?

Raewyn Williams

**T**he ‘bread and butter’ investment activity of any large superannuation fund is the day-to-day trading that occurs within its equity portfolios. Ask a typical fund about its trading and the fund’s response will capture attributes like its active or passive investment philosophy, broad turnover attributes and (unless insourced) the names and styles of managers who were each selected by the fund to independently manage a particular equity portfolio ‘sleeve’. What is less likely to be shared is a real sense of how efficient this day-to-day trading is and how much it is costing the fund (or, rather, the fund members). Trading costs are not typically measured and reported separately, but instead, are embedded in net performance figures disclosed to the fund and its members. Most funds are given little information about how efficient their equity managers’ day-to-day trading is and lack the means to identify inefficient execution practices which may be costly. This black box approach surely cannot last at a time when two of the (related) trends reshaping the superannuation industry are transparency and implementation efficiency.

This paper focuses a ‘spotlight’ on equity portfolio trading by, on behalf of, superannuation funds. We explain the key concepts, identify the main drivers of trading costs and compare indicative costs for a representative set of trades in Australian and International equities across a range of common fund scenarios, including passive versus active portfolios, small versus large order sizes, and patient versus urgent trading styles.

The paper demonstrates the skill required for trading well: there is a world of difference between the cost of even very patient trading styles, from 21 to 66 basis points per dollar traded for Australian equities and 11 to 26 basis points for International equities. If a more aggressive trading style is employed to get the trade order executed sooner, the range of possible trading cost outcomes widens further and could be as much as 119 basis points for Australian equity trades and up to 32 basis points for International equity trades. Where, along this range of outcomes, does a particular superannuation fund sit? This is a question that, through this paper, we encourage funds to answer. Some clues lie in conditions we identify as positively correlated with rising trading costs; in particular, the size of the trade order and the urgency to get the trade order filled. Two key take-outs from this research are that equity trading costs can be higher the larger the fund is, and higher the more ‘active’ the portfolio is, and how much it departs from simple market cap (or ‘beta’) exposure.

We encourage funds to use our research to affirm their confidence in their selected managers and engage where areas of leakage are identified. In some cases, it may be appropriate for a fund to move to an equities solution with an explicit focus on trading costs and implementation efficiency to improve outcomes for members.

What is meant by ‘trading efficiency’?

We believe funds should think along the two dimensions of trading efficiency:

The process, which reflects a commitment to ‘best execution’.

The outcome, which confirms objectively that a fund’s trading costs are reasonable and within expectations.

## Process

Best execution reflects an undertaking by the manager similar to the following: “to seek to execute its clients’ securities transactions so that each client’s total cost or proceeds for a particular transaction is the most favourable under the circumstances at the time.”

Execution (for each trade order) can be conducted:

- On a pure agency basis, meaning the trade is taken to the market on behalf of the fund or manager and the counterparty to the trade is legally transacting with the fund or manager; or
- On a principal basis, meaning the broker is legally transacting with the fund or manager and takes the equities onto the broker’s own books.

Good investment managers (and funds who insource investment management) will have a policy which articulates their commitment to best execution and documents the processes by which best execution is pursued. This is often framed according to external regulations (for example, ASIC Market Integrity Rules in Australia, SEC rules in the US, MiFID in Europe). When a superannuation fund retains an investment manager, part of the fund’s due diligence should be to ensure the manager has an articulated ‘best execution’ policy and that the manager in fact adheres, as far as possible, to this policy.

A best execution policy and commitment by a manager is a necessary ingredient in trading efficiency. Without it, favourable outcomes could be fortuitous, not attributable to any particular manager skill or culture and not likely to persist. However, an articulated and documented commitment to best execution is not, of itself, sufficient to provide assurance to a fund that its underlying equity trading is efficient and not unnecessarily costly.

## Outcome

The second ingredient for trading efficiency is measurable, transparent results which disclose costs associated with executing trade orders. Trading costs can be broken into two components – explicit costs and implicit costs. As we will show later, it is important for trading cost metrics to fully incorporate implicit costs as this component is, in most cases, much larger and more variable than explicit costs and is highly skill-dependent.

## Explicit costs

Explicit costs cover commissions, fees and taxes. Commissions rates are typically negotiated between managers and brokers and the main drivers of the rate charged are:

- Whether research is being provided in addition to the execution.
- The amount of ‘order flow’ (size and frequency of trade orders) the manager sends to the broker.

In the following analysis, we estimate explicit costs of five basis points for both Australian and International equities, driven primarily by brokerage commissions. Managers may pay rates different (often higher) from those we have used in our analysis, but five basis points

per trade reflects the results of our own measurement and reporting (as a specialist implementation manager) and is in our view a reasonable estimate for execution only services with little or no research.

## Implicit costs

Implicit costs capture:

- Bid-ask spreads – the difference between the price at which providers of liquidity are willing to buy (bid) and sell (ask) the stock. The spread reflects the compensation for providing liquidity and for assuming the risk that comes with it.
- Price-impact costs – an adverse price move where prices move up (down) as a fund or manager is trying to buy (sell) equities. The trades are providing a signal (information) to the market that there is a buyer or seller and market participants are adjusting the prices they are seeking in response to this perceived demand. As the trade ‘moves the market’, the fund is paying more for equities it is buying or receiving less for equities it is selling than if there were no price impact costs.

Implicit costs are the ‘invisible costs’ noted in studies like Edelen, Evans and Kadlec (2013) which are not directly observable but can be measured by comparing the trade execution price to a pre-trade or post-trade benchmark price. There is discretion over the choice of an appropriate benchmark trade price, with no one universally appropriate benchmark. We offer the following guidelines:

- The most common examples of a benchmark price are: price at (market) open, price at close, and volume-weighted average price (VWAP).
- A fund could choose to measure implicit trade costs against more than one benchmark.
- The benchmark must specify a reference date such as the trade date, order start date, order end date or one day following order end date.
- Among all the benchmark options, the price at the time of order initiation is usually the most appropriate—and certainly sets ‘the highest bar’—as comparing the actual trade price to it fully captures the price-impact and opportunity costs associated with orders that are executed over multiple days. However, if there are no time stamps for the orders available (to show the exact timing of the order and referable order initiation benchmark), then the price at the open on order start date is a reasonable benchmark.
- If the order start date associated with each trade is unknown, it can be approximated by using the logic that trades in the same stock in the same direction less than N days apart are part of the same order.

With these guidelines in mind, funds looking to receive (or who do receive) information about trade outcomes should invest some time in understanding how costs are calculated and which benchmarks are used.

A good understanding of the components of trading costs, both explicit and implicit, and a robust process for measuring trading outcomes is a valuable asset to a su-



### The quote

*A best execution policy and commitment by a manager is a necessary ingredient in trading efficiency.*

perannuation fund. We believe funds with equity exposure should be able to receive trading cost reports which fully disclose the explicit and implicit costs of their equity trades and how these are measured. The result, it seems, can only be good: to 'light up' a previously opaque area of the fund's investment portfolio so as to either validate the fund's confidence in their selected managers or to highlight areas where improvement is needed to address 'implementation leakage' from member returns. In either case, the result should also enhance the fund's reputation with the regulators (APRA and ASIC) who have been tasked with ensuring the superannuation industry addresses hidden costs and improves transparency in investment portfolios.

Next, we identify the main drivers of trading costs and compare costs for a representative set of trades in Australian and International equities across a range of scenarios common to funds, including passive versus active portfolios, small versus large order sizes and patient versus urgent trading styles.

## What is the cost of equity trading to a large superannuation fund?

### Method

We simulate costs for two types of superannuation fund investors: one, a passive investor who invests in and trades a pro-rata slice of the index; two, an active investor who invests in and trades a subset of stocks in the index. Active portfolios are typically more concentrated than passive portfolios and so are likely, for a given level of assets, to generate stock orders that are larger in size. This should translate to higher trading costs for active portfolios compared to passive portfolios with similar levels of assets (noting also that active managers tend to trade more frequently than passive managers, making the costs of trading an even more pressing question). For the active investor in this scenario, we sort stocks in the index by market capitalisation and pick every fifth stock in the index. The 'arbitrarily' chosen stocks are then used to create two active portfolios—one that is cap-weighted and the other equal-weighted. This is an objective way to simulate two quite different types of active portfolios.

We also cover the two main 'growth' asset classes used by Australian superannuation funds for this analysis: the S&P ASX200 index for Australian equities and MSCI World ex-Australia index for International equities.

Explicit costs are held constant at five basis points (as discussed above), which is an average buy-sell cost as the fees and taxes components of explicit trade costs differ for buys versus sells. Our base case assumes, conservatively, a patient trade execution style where the trader has time to 'work the trade' into the market at low participation rates. We then relax this condition to show how more aggressive execution generally increases the implicit costs of a trade, sometimes quite substantially.

We use ITG's ACE Model to generate ex-ante estimates of implicit costs to trade these portfolios. We use MDV (percentage of median daily volume to fill the order) to capture the trade order size from a liquidity perspective, where:

$MDV = \text{number of shares in order} / \text{historical 21-day median daily share volume}$

An MDV of 5% suggests we expect to require 5% of a day's trading volume to fill the order. As MDV increases, the order demands more liquidity from the marketplace. This causes price-impact costs to go

up as it becomes more difficult to execute the order without 'moving the market'.

To show how costs relate to order size, we examine costs for trading portfolios of different sizes. For Australian equities, we look at trading passive portfolios slices ranging from \$100 million to \$1 billion as well as two different \$100 million active portfolios<sup>9</sup>. For International equities, we look at trading portfolios that are five times larger. We choose these values to create a representative set of portfolio trades.

## Results – Australian equities

Figure 1 presents the hypothetical results for a superannuation fund trading Australian equities. Panel A simulates a passive equity portfolio and Panel B our two alternative active portfolios. Panel A shows that trading a \$100 million slice of the index requires 2.4% of MDV to fill the order. The order size increases to 11.8% of MDV for a \$500 million slice and to 23.6% of MDV for a \$1 billion slice of the index. We estimate implicit costs for the patient execution of this trade order to range from 16 basis points for a \$100 million slice (2.4% of MDV) to 43 basis points for a \$1 billion slice (23.6% of MDV). Implicit costs increase with order size as the price-impact associated with the trade rises. Total costs are estimated to be 21-48 basis points for passive Australian equity portfolios.

Figure 1. Cost of trading Australian equities

Trading costs				
Portfolio traded	Order size (MDV)(%)	Explicit costs (bps)	Implicit costs (bps)	Total costs (bps)
<b>Panel A. Trade slice of ASX 200 index</b>				
\$100 million slice	2.4	5	16	21
\$250 million slice	5.9	5	25	30
\$500 million slice	11.8	5	33	38
\$1 billion slice	23.6	5	43	48
<b>Panel B. Trade active portfolio that invests in every fifth stock in ASX 200 index (sorted by cap)</b>				
\$100 million slice (Cap-wt)	12.7	5	32	37
\$100 million slice (Equal-wt)	62.9	5	61	66

Panel B in Figure 1 shows the costs for patiently trading a \$100 million active portfolio that is either cap-weighted or equal-weighted. The \$100 million cap-weighted portfolio which invests in every fifth stock in the index sorted by market capitalisation should, intuitively, have a similar order size as the \$500 million passive portfolio. It is investing in a similar cap-profile as the index and is investing 20% of the money in 20% of the names, so the order size should be comparable. If the order sizes are similar, then the trading costs of the two portfolios should also be similar. We see that this is indeed the case. The \$100 million cap-weighted active portfolio demands 12.7% of MDV and is estimated to cost 37 basis points, similar to the 38 basis points total cost for trading a \$500 million pro-rata slice of the index. This again highlights that order size is the primary determinant of implicit costs. The equal-weighted active portfolio is relatively more illiquid and demands a very high 62.79% of MDV to get the order filled. As a result, the implicit costs increase substantially to 61 basis points to give total trading costs of 66 basis points.

These cost numbers represent costs per dollar traded. Hence, if a fund's Australian equity portfolio has 25% one-way turnover per year which translates to 50% round-trip turnover and total trading

costs are 30 basis points per dollar traded, the annual performance drag for this portfolio due to trading costs will be around 15 basis points. This performance drag, which clearly increases for larger trade orders and higher turnover styles, can also be thought of as an initial 'alpha hurdle' for active managers.

## Results – International equities

**Figure 2. Costs of trading international (developed ex-Australia) equities**

Trading costs				
Portfolio traded	Order size (MDV)(%)	Explicit costs (bps)	Implicit costs (bps)	Total costs (bps)
<b>Panel A. Trade slice of MSCI World ex-Australia index</b>				
\$500 million slice	0.2	5	6	11
\$1 billion slice	0.5	5	8	13
\$2.5 billion slice	1.2	5	14	19
\$5 billion slice	2.4	5	21	26
<b>Panel B. Trade active portfolio that invests in every fifth stock in ASX 200 index (sorted by cap)</b>				
\$500 million slice (Cap-wt)	1.2	5	14	19
\$500 million slice (Equal-wt)	3.4	5	20	25

Figure 2 shows the full trading costs of patiently trading International equities. In Panel A, trading passive portfolios of \$500 million to \$5 billion in size generates orders that demand, on average, 0.2% to 2.4% of MDV to fill the order. The variation in order sizes across the portfolio is not large even though the portfolios are five times the size of the Australian equity portfolios. This is because the International equity markets are large, with an aggregate market capitalisation approximately 40 times that of the Australian market. A superannuation fund can expect implicit costs to range from six basis points for trading a \$500 million slice to 21 basis points for trading a \$5 billion slice of the index.

For the active portfolios in Panel B, we again see (as is intuitive) that trading a \$500 million active cap-weighted portfolio that invests in every fifth name in the index has a similar order size and similar trading costs as a passive \$2.5 billion slice of the index. Moving from cap-weighted to equal weighted active portfolios increases order size from 1.2% to 3.4% of MDV and increases total costs from 19 basis points to 25 basis points.

## Increasing the urgency of the trade order

**Figure 3. Trading costs and urgency in trade execution**

Implicit costs under different levels of urgency for trade execution				
Portfolio traded	Patient (bps)	Neutral (bps)	Aggressive (bps)	Very aggressive (bps)
<b>Panel A. Trade slice of ASX 200 index</b>				
\$100 million slice	16	17	19	23
\$250 million slice	25	25	29	37
\$500 million slice	33	35	42	55
\$1 billion slice	43	46	62	83
<b>Panel B. Trade active portfolio that invests in every fifth stock in ASX 200 index (sorted by cap)</b>				
\$100 million slice (Cap-wt)	32	36	42	57
\$100 million slice (Equal-wt)	61	64	81	119

**Implicit costs under different levels of urgency for trade execution (continued)**

Portfolio traded	Patient (bps)	Neutral (bps)	Aggressive (bps)	Very aggressive (bps)
<b>Panel C. Trade slice of MSCI World ex-Australia index</b>				
\$500 million slice	6	10	11	11
\$1 billion slice	8	12	14	15
\$2.5 billion slice	14	16	20	22
\$5 billion slice	21	22	26	31
<b>Panel D. Trade active portfolio that invests in every fifth stock in MSCI World ex-Australia index (sorted by cap)</b>				
\$500 million slice (Cap-wt)	14	16	19	22
\$500 million slice (Equal-wt)	20	23	27	32

Figures 1 and 2 reflect our base case where we assume a patient trading style to get the order filled. Price-impact costs are lowest under this trading style. In Figure 3, we compare implicit costs under four different levels of urgency for order execution – patient, neutral, aggressive, and very aggressive. As the level of urgency increases moving from patient to very aggressive, a larger fraction of the order is implemented sooner rather than later, demanding greater intra-day liquidity. We therefore expect implicit costs to increase with the level of urgency to get the order executed and see that this is the case. For all the portfolios in Figure 3, we see an increase in costs as we become more aggressive in getting the trade order filled.

Also, within each panel of Figure 3, we see that the increase in costs is greater for portfolios that demand more liquidity. So, for instance, in Panel A we see that moving from a patient to a very aggressive style of order execution results in an increase in implicit costs of 7 basis points (from 16 basis points to 23 basis points) for a \$100 million dollar slice of the index to 40 basis points (from 43 basis points to 83 basis points) for a \$1 billion slice of the index. This demonstrates that manager trading styles—or events outside the manager's control, such as a client's liquidity demands or transition timetable—which are time-critical and demand a more urgent style of trade execution can come at a higher cost which may not be obvious to the fund client.

A final comment is that the above analysis assumes non-discretionary orders, where the orders generated must be executed. If traders have discretion to get the orders filled, then realised trading costs can be different and lower, especially if the discretion relates to whether or not the price moved favourably prior to trade execution.

## Conclusion

The motivation of this paper has been to guide and empower superannuation funds on how to respond to the twin themes of transparency and implementation by shining a spotlight on their day-to-day equity trading. It is remarkable that funds are given relatively little information on activities endemic to around 44% of their total funds invested.

We have shown that passive strategies can bear quite a range of combined explicit plus implicit trading costs: 21 to 48 basis points for Australian equity trades and 11 to 26 basis points for international equity trades. For active strategies, these costs begin at 37 to 66 basis points for Australian equity trades and 19 to 25 basis points for International equity trades and move up substantially. This increase in costs is based on the assumption that active strategies will generate orders that are, on average, larger in size as they invest in more concentrated portfolios. The costs can be even higher if the

trade needs to be executed with a high level of urgency. Most trading is 'round trip' (out of one stock, into another and vice versa), which doubles these costs. The costs are economically significant and may represent a material performance drag on a superannuation fund's equity portfolio.

The size of these trading costs is important, but so is the range of possible outcomes. Our results confirm that trading is a nuanced practice where skills seem to matter. The size of the trade order and the level of urgency required to get the order filled can materially impact the ultimate cost to the fund (that is, fund members).

Beyond the manager's (or fund's) interaction with brokers and related trading processes is a key attribute of the superannuation fund itself: the size of the fund's portfolio. As the superannuation industry continues to discuss the merits (or otherwise) of scale, we demonstrate that the cost of trading equities will generally be higher for large funds than for funds with less scale. This is driven by the assumption that larger funds will generate orders that are larger in size and demand more liquidity in the marketplace. Reallocating from Australian to International equities (a broader trend) will help.

It is one thing for us to 'shine a spotlight' on equity trading costs, but it is another for superannuation funds to understand and use this information. We encourage funds to find ways to better inform themselves about trading costs, not as an end in itself, but to achieve the truly useful end of ensuring overall implementation efficiency, which directly links to bolstering member returns and wealth. One welcome outcome could be a renewed confidence that the fund's chosen managers are ensuring their clients' portfolios are traded efficiently and with sensitivity to costs. More generally, it is a strong statement that 'black boxes' do not serve fund trustees or members well and the ability to scrutinise all aspects of a fund's investment portfolio is a valuable element of good fiduciary practice. **FS**