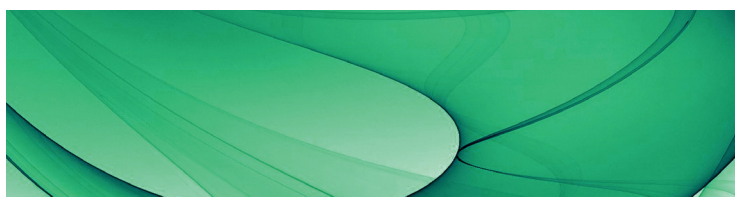




Market Impact Costs

Centre Point and Centre Point Crossing Orders

By Associate Professor Andrew Lepone and Anthony Flint of The University of Sydney



Mid Spread Execution

Centre Point Market Impact

Executive Summary

In June 2010 the ASX introduced Centre Point and Centre Point Crossing orders to its range of equity execution options.

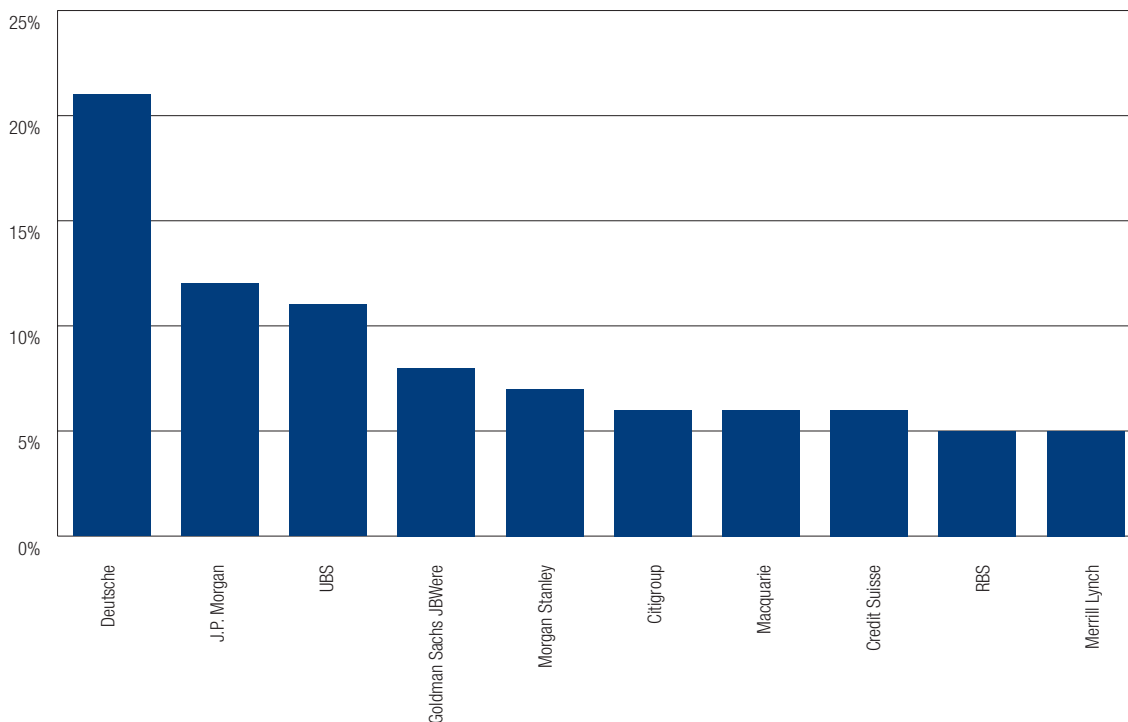
This study looked at the price improvement benefits arising from using the Centre Point order taking into account explicit costs such as the ASX Trade Fee and the cost of crossing the spread in the CLOB. It did not take other implicit costs into account. Trades executed using Centre Point orders incurred market impact costs which were 10.5 to 12.5 basis points lower than for those executed in the CLOB, during the research period. The research was performed by Associate Professor Andrew Lepone and Anthony Flint of The University of Sydney with qualitative input provided by ASX.

Background

The ASX launched a range of new order types in June 2010. Two of those new order types were Centre Point¹ (CX) orders and Centre Point Crossing (CXXT) orders. A CX order is an anonymous order that enables execution at the midpoint of the best bid and offer in the ASX Central Limit Order book (CLOB). The CXXT order enables participants to cross at the midpoint price of the prevailing best bid-offer. CX orders and CXXT crossings thus offer a way for investors to lower execution costs by trading at the midpoint.

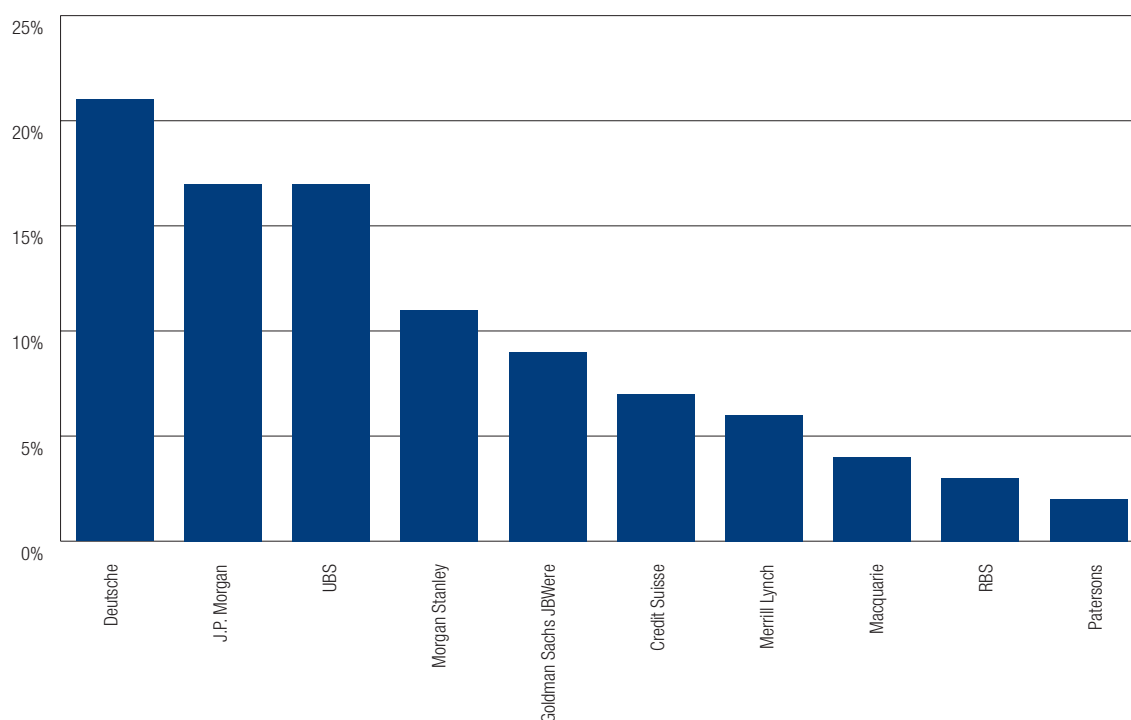
Charts 1 and 2 show that the majority of CX and CXXT trading is being executed by the top 10 institutional brokers. This is expected as optimal usage requires automation and possibly algorithmic development. This study examines whether price impact is lower for CX orders and CXXT crossings relative to orders on the CLOB after accounting for the spread and explicit ASX trading fees.

Chart 1. Market Share of Centre Point Trades - by Value, Six Months to Dec 2010



1 CX orders can be entered as either Centre Point Market (CPM) or Centre Point Limit (CPL) orders

Chart 2. Market Share of Centre Point Crossings - by Value, Six Months to Dec 2010



Methodology

The sample for this study consisted of all executed CX orders and CXXT crossings during the six months to 31 December 2010. The sample size totaled approximately 250,000 trades across 390 securities. This study did not take into account unfilled CX orders.

Implicit execution costs for the CLOB were calculated as the percentage difference between the traded price and the midpoint price $[(ask\ price + bid\ price) / 2]$ for the corresponding order on either the bid side or ask side. Price impacts for each order were averaged across stocks and the time

period under examination.² As CX orders and CXXT crossings trade at the midpoint, price impact always equates to zero.

Thus price impacts were only calculated for trades executed in the CLOB. The limitation of this methodology is that market impact is *ex post i.e.*, implicit costs in the CLOB are computed after a CX or CXXT has been executed. There is an assumption made here that the mid point price at which the order was executed was the prevailing mid point price when the order was initiated. In practice this may not be the case as Centre Point orders adjust to movements of the best bid and offer in the CLOB thus the execution can occur at a different price relative to when the order was initiated.

2 Stocks included in the sample for estimating execution costs on the CLOB are stocks which were traded using Centre Point orders and/or Centre Point Crossing orders over the time period examined.

Results

Table 1 Execution Costs (basis points)

	July	August	September	October	November	December
Implicit Costs						
Central Limit Order Book	11.24	10.55	10.77	12.13	12.21	12.49
Explicit Costs						
Centre Point Order	0.5	0.5	0.5	0.5	0.5	0.5
Centre Point Crossing* ³	0.15	0.15	0.15	0.15	0.15	0.15
ASX Equities Trade Fee*	0.15	0.15	0.15	0.15	0.15	0.15
ASX On-Market Cross Trade Fee*	0.1	0.1	0.1	0.1	0.1	0.1
Price Improvement for CX orders net of ASX fee	10.74	10.05	10.27	11.63	11.71	11.99

The results of the study are shown in Table 1, which indicates that use of Centre Point orders can avoid market impact costs of 10.5 to 12.5 basis points that would otherwise be incurred in the CLOB. ASX charges participants a 0.5 basis point trading fee for executing Centre Point Orders and a 0.15 basis point fee for Centre Point Crossings. The trading fee for displayed limit and market orders in the CLOB is 0.15 basis points, while on-market crossings attract a trading fee of 0.10 basis points. The difference between the ASX fee applied to CX orders relative to standard CLOB orders is significantly less than the implicit cost of crossing the spread in the CLOB.

Transaction cost analysis consists of measuring the implicit and explicit costs of executing a trading strategy. Explicit costs, such as broker commissions and exchange fees, can be measured with a high degree of accuracy. Implicit costs are harder to identify and quantify. They are generally broken down into market impact, price trending, timing risk and opportunity costs.

Because this study uses post-trade data, it does not quantify implicit costs other than market impact. There is potential for participants to incur other forms of implicit costs by placing and/or routing their orders into the Centre Point book. Opportunity costs may arise if orders are queued in the Centre Point order book without being matched.

Latency sensitive traders may incur timing risk when routing orders to Centre Point, cancelling unfilled Centre Point Orders before executing that order in the CLOB. The opportunity and timing risk issues noted above will decrease as liquidity in Centre Point increases.

Table 2 Trading Activity

Month	July	August	September	October	November	December
Centre Point Orders						
Average Trade Volume (shares)	3,207	13,478	6,345	8,554	26,338	10,010
Average Trade Value (\$)	9,201	24,638	12,073	14,828	20,109	15,444
Average Daily Volume (shares)	3,274,249	3,629,395	7,039,834	8,160,362	26,267,052	9,023,141
Average Daily Value (\$)	9,393,761	6,634,270	13,697,149	14,146,276	20,054,602	13,920,890
Average Trading Frequency (trades)	1,020	269	1,158	954	997	901
Centre Point Crossings						
Average Trade Volume	37,773	7,801	10,768	6,949	9,403	11,199
Average Trade Value	113,634	11,250	16,928	10,908	13,991	9,927
Average Daily Volume	6,165,929	5,501,251	14,168,839	9,200,816	14,153,167	19,109,932
Average Daily Value	18,522,797	7,933,093	22,275,886	14,443,127	21,058,244	13,939,937
Average Trading Frequency	163	705	1,296	1,324	1,505	1,706
Central Limit Order Book						
Average Trade Volume	3,407	4,067	4,014	4,093	4,456	3,920
Average Trade Value	16,247	19,635	17,195	18,429	20,510	17,448
Average Daily Volume	922,376,562	1,079,679,623	1,210,385,307	1,262,395,561	1,352,685,299	1,194,796,666
Average Daily Value	4,398,503,851	5,211,588,089	5,348,225,873	5,683,833,976	6,226,354,950	5,318,274,333
Average Trading Frequency	270,711	265,413	298,589	308,413	303,574	304,811

Discussion

Table 2 shows the level of trading activity for both CX orders and CXXT crossings following their release in mid 2010. Results show that both CX trades and CXXT crossings represent a fraction of the trading volume on the CLOB. This is expected given that Centre Point is a new market feature and that optimal usage of these orders will require further automation and development of broker execution algorithms. The usage of CX orders and CXXT crossings can be expected to increase once the price improvement benefits are more widely known in the investment community.

Appendix I also shows that the distribution of trade size is highly skewed, with the median trade size significantly smaller than average trade size and daily volume. This also occurs on the CLOB but to a lesser degree. The small median trade size is indicative of two things:

1. Brokers initially system testing in the post launch period;
2. Traders searching for liquidity in Centre Point using small order sizes.

This could pose an execution risk for investors placing large orders (though this may be a short-term problem as Centre Point matures and liquidity improves). The results show that

liquidity in this market is increasing, with the median trade size and daily volume increasing from 3 and 3,207 shares, respectively in the month of July to 52 and 10,010 shares, respectively in December.

As Table 1 shows, implicit transaction costs on the CLOB are higher than ASX trading fees for both CX orders and CXXT crossings, being 0.5 basis points and 0.15 basis points respectively. As of December 2010, the average price impact on the CLOB was 12.49 basis points, illustrating that implicit costs of trading represent the largest proportion of execution costs. The assumption made here is that the participant trades at market and thus crosses the spread on the CLOB. Where a participant has found a counter-party for their order, either within their own order pad or in a dark pool, the participant can initiate a crossing. If the trade is less than \$1 million, the participant can either execute a priority crossing at the best bid or best ask price, or alternatively can choose to execute a CXXT at the mid point. It is more difficult to compute the price improvement of CXXT crossings relative to priority crossings⁴. Standard limit and market orders attract trading fees of 0.15 basis points, while on-market crossings attract a 0.10 basis point fee. Net of trading fees, CX orders and CXXT crossings offer price improvement of 10 to 12 basis points over orders executed in the CLOB.

Further Research

Market impact costs are one type of implicit trading costs. Research suggests that lower market impact costs of trading on anonymous exchanges may be offset by an increase in execution failure. An analysis of the execution probability of trades in Centre Point would show the total difference in the cost of trading on Centre Point and the CLOB. Another area for further research is an analysis of implementation shortfall using CX orders.

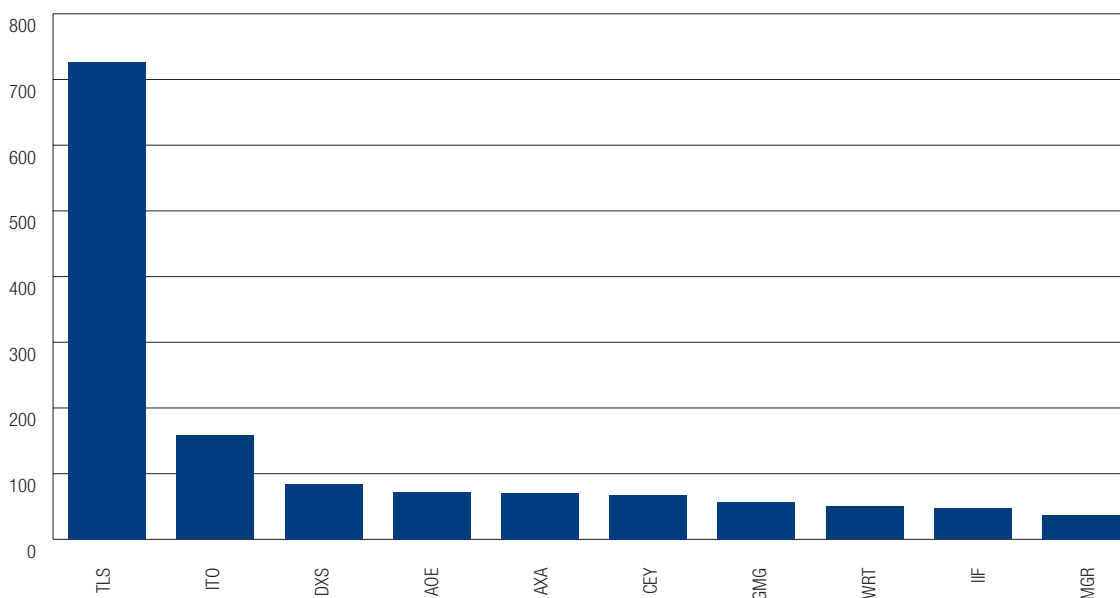
Appendix I

Trading Activity - Medians

Month	July	August	September	October	November	December
Centre Point Orders						
Median Trade Volume	3	378	77	114	86	52
Median Trade Value	12	672	233	249	215	159
Centre Point Crossings						
Median Trade Volume	215	283	296	274	198	155
Median Trade Value	247	360	345	330	269	375
Central Limit Order Book						
Median Trade Volume	195	230	200	202	218	160
Median Trade Value	1,488	1,960	1,527	1,503	1,690	1,139

Appendix II Top 10 Stocks

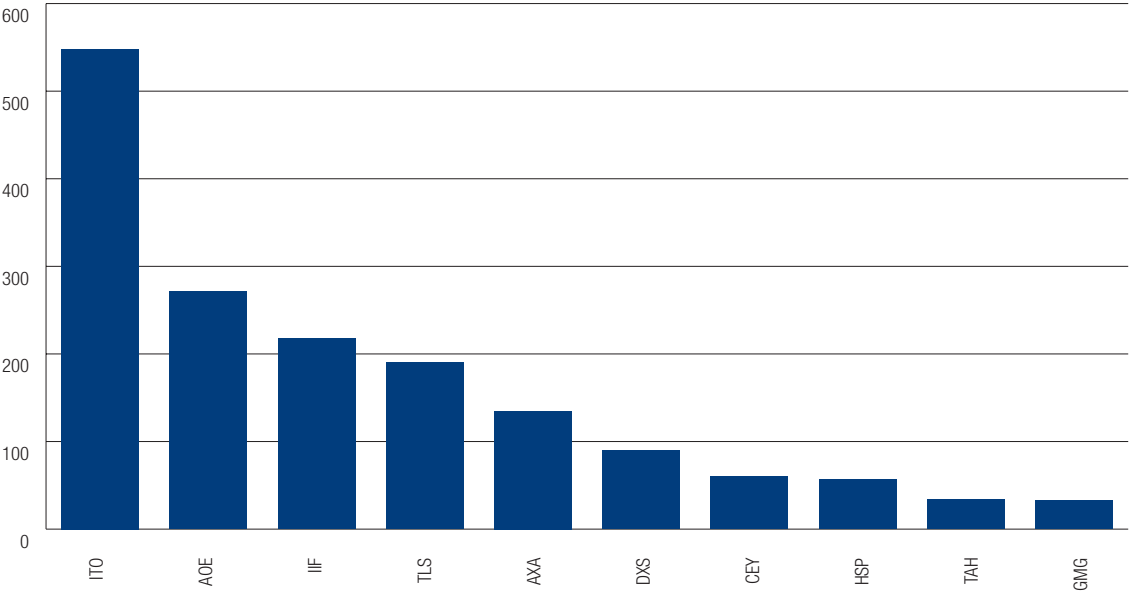
Centre Point Trades - by Value, \$m, Six Months to Dec 2010



4 Implicit execution costs for crossings may be lower than those reported in Table 1. For example, this can occur when brokers execute half their order at the bid price and half at the ask price, thus achieving an execution price for the order that is equivalent to the midpoint price. As trading fees are lower for priority crossings relative to CXXT (0.10bps vs. 0.15 bps) the execution costs of priority crossings may be lower. However if a priority crossing is executed at either the best bid or best ask then one side of the trade will incur implicit costs as outlined in Table 1.

Appendix III Top 10 Stocks

Centre Point Crossings - by Value, \$m, Six Months to Dec 2010



Contact details

Australia

David Stocken

Senior Manager, Institutional Sales

Telephone: +61 2 9227 0934

david.stocken@asx.com.au

Asia

Andrew Musgrave

Regional Manager, Asia

Telephone: +61 2 9227 0211

andrew.musgrave@asx.com.au

Europe

James Keeley

Regional Manager, Europe

Telephone: +44 203 009 3375

james.keeley@asx.com.au

North America

David Mitchell

Regional Manager, North America

Telephone: +1 312 788 3363

david.mitchell@asx.com.au

Head office ASX Limited

Exchange Centre

20 Bridge Street

Sydney NSW 2000

Telephone +61 2 9227 0000

www.asx.com.au



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