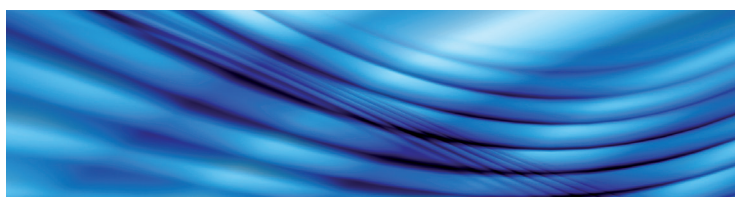




Market Quality Indicators

ASX Equity and Equity Index Derivatives



December Quarter 2010

Introduction

Welcome to this edition of *Market Quality Indicators*.

The Market Quality Indicators is a bi-annual publication prepared by ASX in conjunction with, Dr Andrew Lehone and Anthony Flint from the Discipline of Finance at the University of Sydney.

Market Quality Indicators has been developed to provide a quantitative overview of the trading activity and market dynamics of ASX equity index and interest rate futures, and highlights the extent of trading opportunities available on ASX.



ASX

AUSTRALIAN SECURITIES EXCHANGE

The Company

ASX is a multi-asset class, vertically integrated exchange group, and one of the world's top-10 listed exchange groups measured by market capitalisation.

ASX's activities span primary and secondary market services, central counterparty risk transfer, and securities settlement for both the equities and fixed income markets. It functions as a market operator, clearing house and payments system facilitator. It monitors and enforces compliance with its operating rules, promotes standards of corporate governance among Australia's listed companies and helps to educate retail investors.

ASX's diverse domestic and international customer base includes issuers of securities and financial products, investment and trading banks, fund managers, hedge funds, commodity trading advisers, brokers and proprietary traders, market data vendors and retail investors.

By providing its systems, processes and services reliably and fairly, ASX generates confidence in the markets that depend on its infrastructure. This is integral to ASX's long-term commercial success.

More information on ASX can be found on our website

www.asx.com.au

Executive Summary

The purpose of this booklet is to provide up-to-date semi-annual statistics that enable global institutions to evaluate trading opportunities in ASX equities and index derivatives.

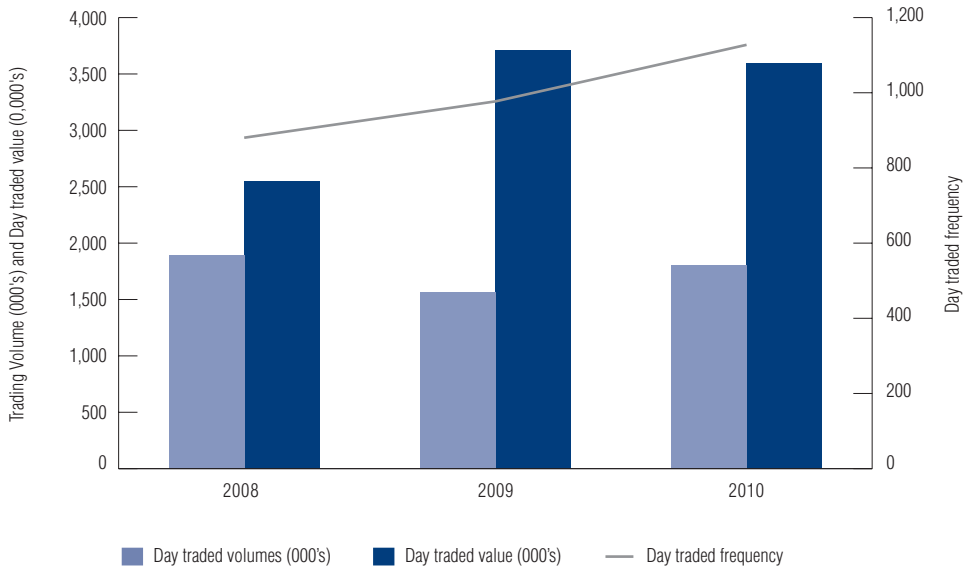
These statistics are provided for the

- (i) Underlying securities of the S&P/ASX 200 Index;
- (ii) S&P/ASX 200 Index Options;
- (iii) SPDR S&P/ASX 200 (STW) exchange traded fund; and
- (iv) ASX SPI 200® Index Futures;

The key findings for the calendar year ending December 31, 2010 are as follows:

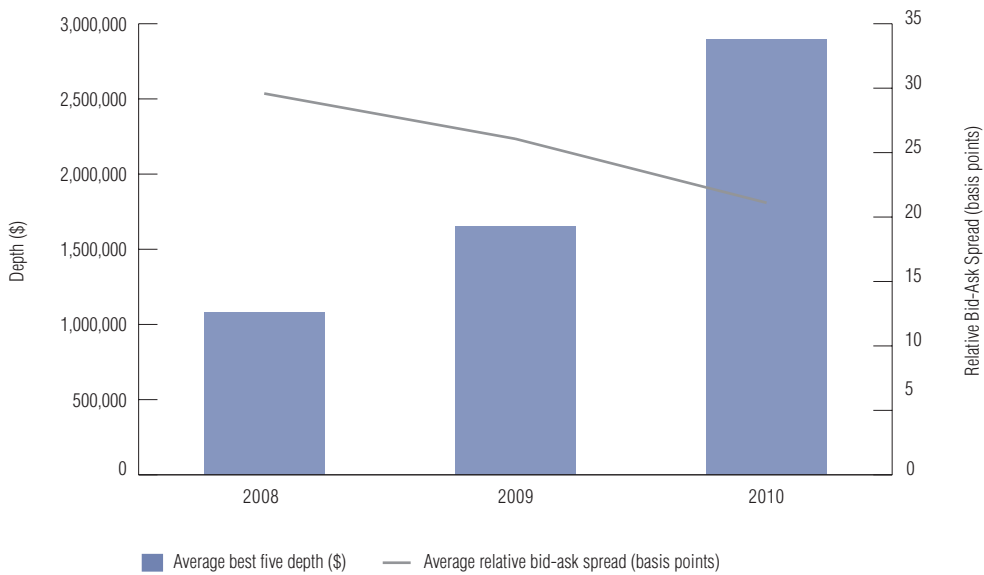
- (i) Improvement in the market quality from 2009 to 2010 of the S&P/ASX 200 Index underlying securities:
 - a. ADV and number of trades increased by 13% and 15% respectively,
 - b. 71% increase in the average market depth at the best five quotes,
 - c. Average bid-ask spread decreased from 26 basis points to 21 basis points. Also included in this booklet are spread figures for other S&P/ASX indices, showing that spreads tighten significantly for larger, more liquid securities.
 - d. The price impact for the underlying securities of the S&P/ASX 200 Index was reduced.
- (ii) Improvement in the XJO options contract in 2010:
 - a. The number of front month at-the-money contracts traded increased by 113% to 5,850 contracts per day.
 - b. Average bid-ask spreads fell from over 6.6 points to 3.8 points
 - c. Quoted depth increased more than fourfold to 184 contracts (approximately \$8.5 million in notional terms).
- (iii) Improvements in the S&P/ASX 200 (STW) Exchange Traded Fund in 2010:
 - a. ADV increased by 23%.
 - b. Bid-ask spread fell 32%, which averaged 4.7 basis points in 2010.
 - c. Quoted depth remained flat. As a result of narrowing spreads, price impact fell for all trade sizes by at least 25%. This reduction in implicit costs highlights that STW provides a cost effective way for investors to obtain exposure to the S&P/ASX 200 index.
- (iv) Improvements in the quality of the ASX SPI 200® Index Futures market:
 - a. The average market depth at the best bid and best ask in the nearest expiry month contract increased by 22%.
 - b. The average bid-ask spread narrowed to 1.1 index points in the December quarter 2010, representing AUD 28.13 or 2 one-hundredths of one percent of contract value.

Trading activity



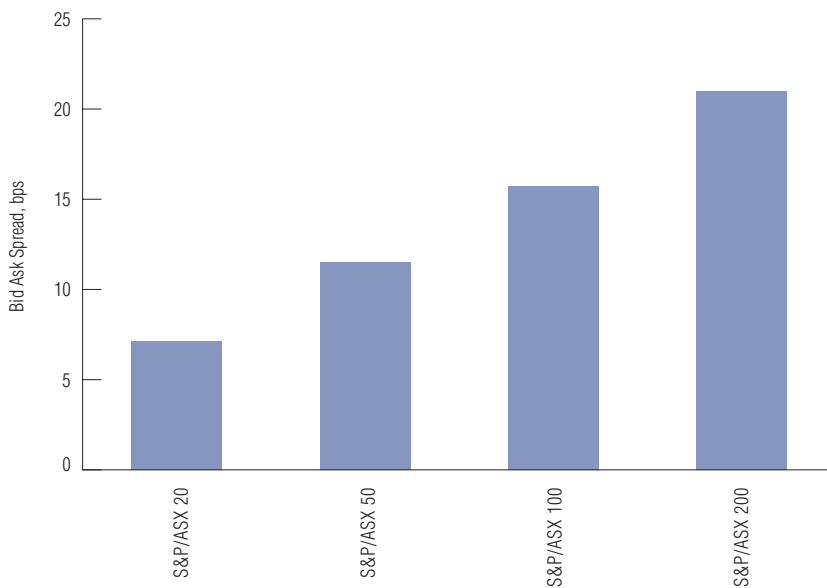
Market Depth and Bid-ask spreads

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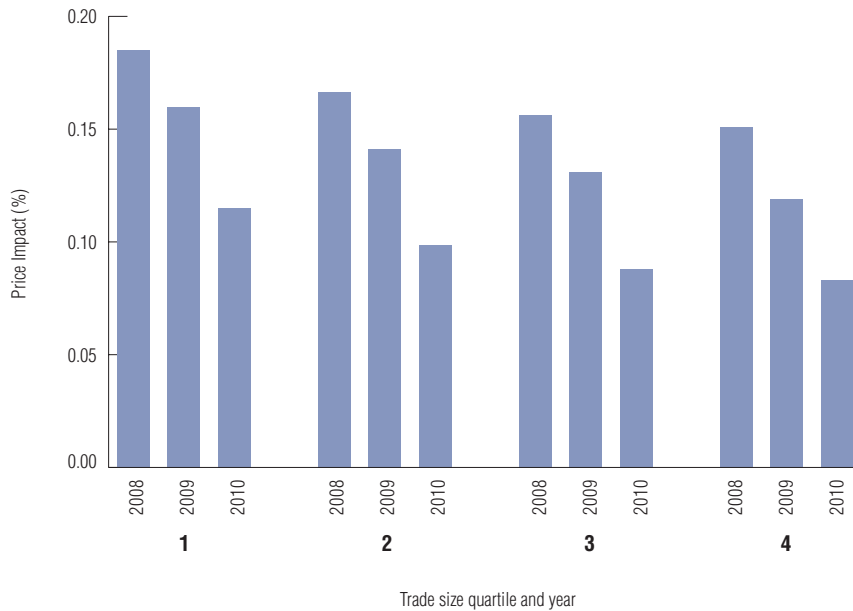


- Market activity improved as business, consumer and investor confidence levels trended more positively in an Australian economy rapidly returning to a strong growth trajectory, fuelled by demand from the Asian region. ADV for S&P/ASX 200 securities increased from \$15 million in 2009 to \$17 million in 2010 (average per security). Day traded frequency increased from 1,000 in 2009 to 1,150 trades per day per security. The top traded security, BHP, traded an average of 13,700 times per day with an ADV of \$600 million.
- Improving market conditions led to a significant increase in quoted depth in 2010. The dollar value quoted at the best five ticks improved to \$2.4 million on average for S&P/ASX 200 constituents after falling under \$1 million in 2008. Reduced volatility and improving macroeconomic conditions encouraged both investors and traders to place a greater number of limit orders into the CLOB rather than keeping their trading intentions undisplayed and sitting dormant in order management systems.
- During the year both implied and realised volatility moderated to normal levels. The S&P/ASX Volatility Index finished the year at 12.2 having reached a high of 34.2 in May 2010. Relative bid-ask spreads continued to improve in 2010. Spreads in the S&P/ASX 200 securities decreased to 21 bps in 2010, narrowing from 26 bps in 2009 and 30 bps in 2008. Share prices were relatively flat year-on-year so the narrowing spreads in the S&P/ASX 200 securities were most likely a result of tightening dollar spreads rather than an expanding denominator. The chart below shows the relative bid ask spreads in the large cap indices.

Bid Ask Spread by Index Inclusion



Price Impact

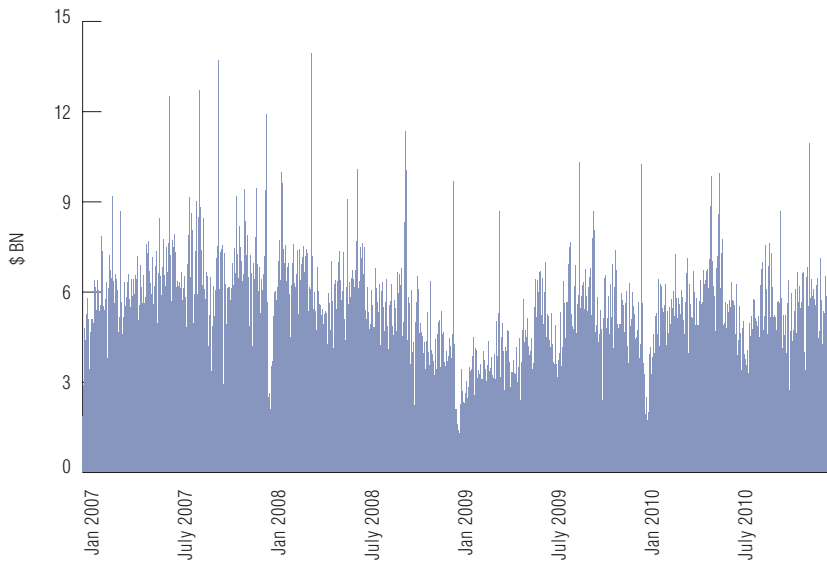


- Price impact¹ improved across all trade sizes in 2010. For the largest 25% of trades price impact decreased from 16 basis points (bps) in 2009 to 11.5 bps in 2010. quartile 2 price impact decreased from 14bps to 10bps, quartile 3 decreased from 12.5bps to 8.5bps and for the smallest 25% of trades price impact decreased from 11.5bps to 7.5bps.

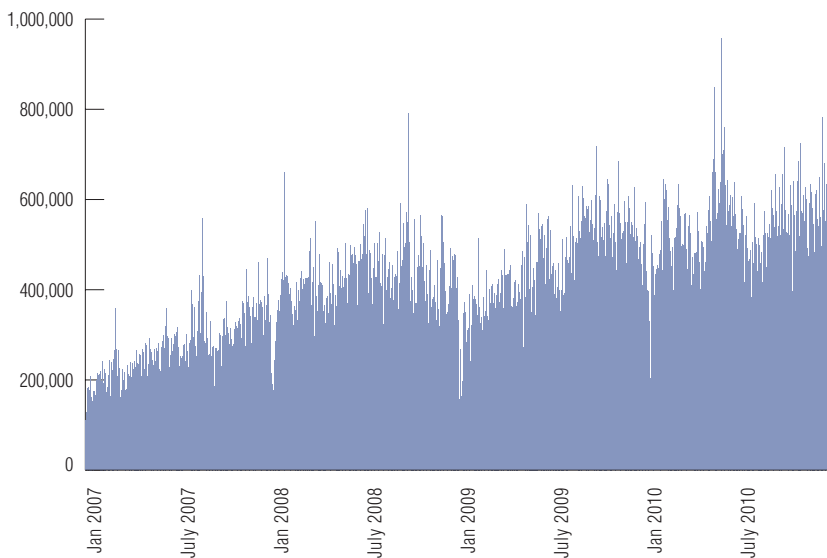
¹ Quartile 1 represents the largest trades, which are in the top 25% of all trades for that particular security. Quartile 4 represents the smallest trades, which are in the bottom 25% of all trades for that particular security. Price impact is a transaction cost measure that examines the impact that different sized trades have on market depth and provides an estimate of the transaction cost incurred by different trade sizes. This measure captures both the bid-ask spread and the amount of liquidity present in the limit-order book immediately before each trade.

Broader Market Indicators and Analysis

Daily Cash Market Value Traded

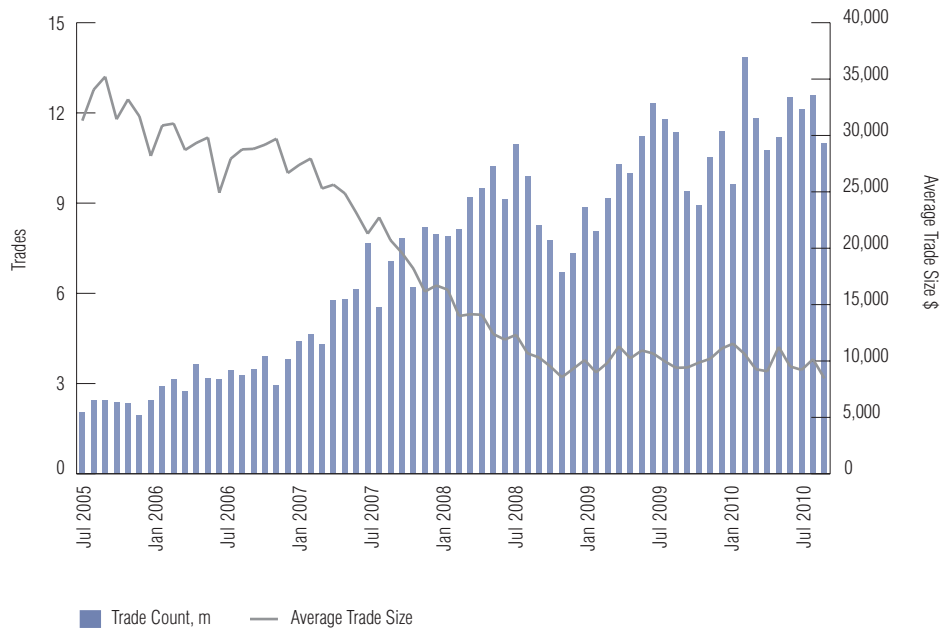


Cash Market Trades



- The growth trend in trade volumes from the lows of 2008/09 continued with 136 million trades executed on ASX Trade/ITS platforms in 2010. That equates to an average of 540,000 trades with a value of \$5.5 billion per day.
- On 29 November 2010 ASX launched its next generation trading system, ASX Trade, providing the fastest integrated equities and derivatives trading platform in the world. ASX Trade is powered by NASDAQ OMX's Genium INET platform. It has generated significant performance enhancements: latency today is 100 times faster than it was two years ago, having been improved from 30 milliseconds in 2008 to 300 microseconds today. The improved latency has been coupled with increased capacity, rising from 20,000 orders per second before the upgrade to 100,000 orders per second now.

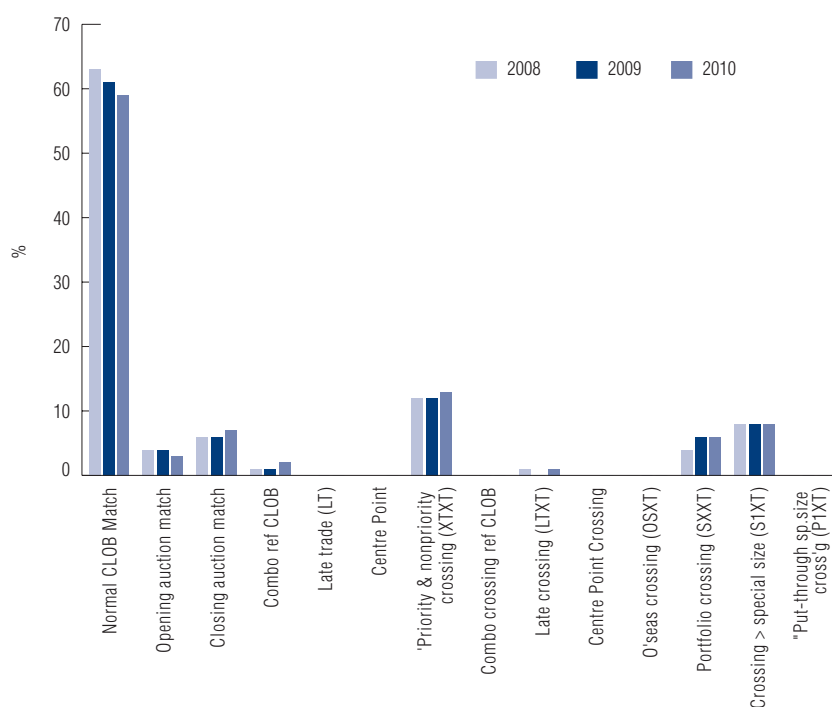
Number of trades and average trade size



- The downtrend in the average trade size has stabilised around the \$8,000 to \$10,000 level. This may be an equilibrium point where market depth is sufficient for algorithms to execute trading strategies with minimal market impact. The downward trend may resume once high frequency trading (HFT) strategies become more prevalent in the Australian market.

On-Market vs Off-Market Execution

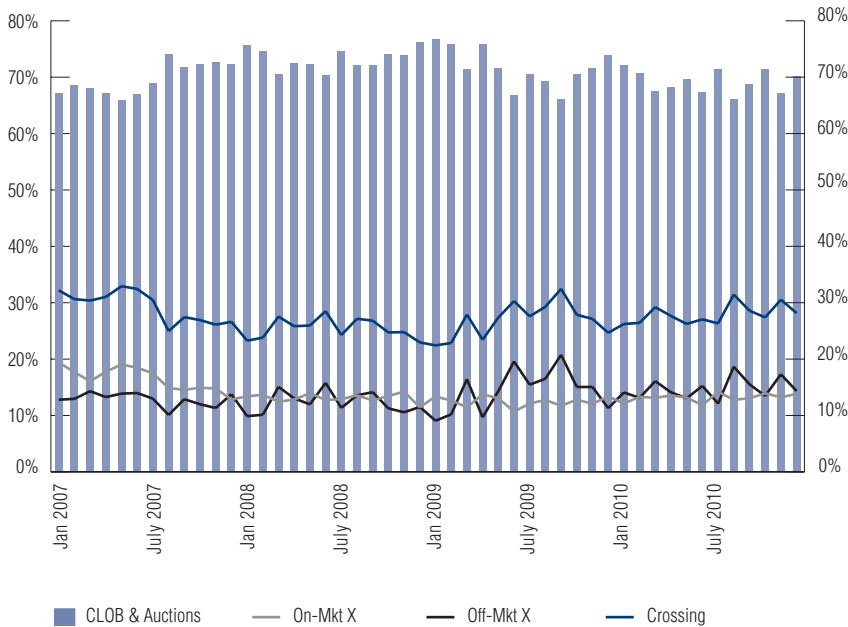
Trends in ASX Execution, Value Traded by Trade Type (called Condition Code)



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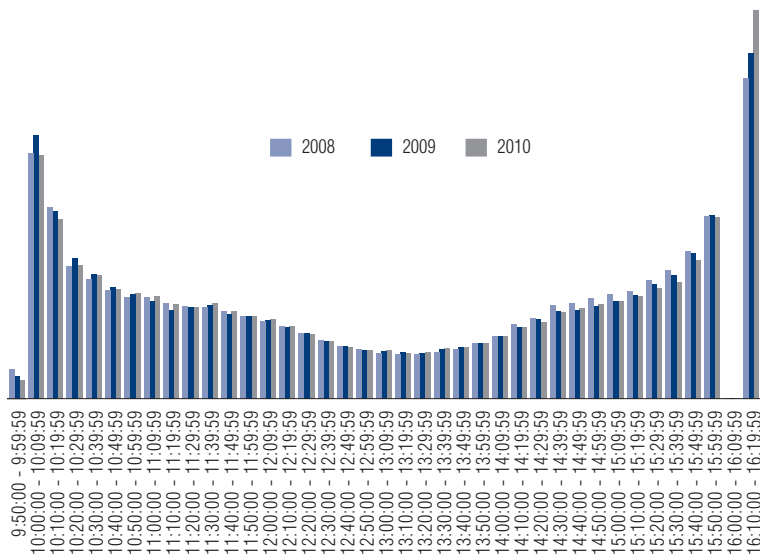
- The chart above shows the proportion of value executed by trade type i.e. the split of trading in the CLOB, Auctions, on-market-crossings, off-market block crossings and other execution mechanisms. There was some substitution from the central limit order book and the opening auction match into the closing auction and on-market crossings. The proportion of trade value executed with block special sized crossings was flat year on year. This was despite some high profile block trades executed on the back of Equity Capital Market transactions, the largest being a \$3.3BN special crossing in Woodside Petroleum as part of the Shell sell-down intermediated by UBS.
- There was also an increase in the relative use of tailor made combinations. This was due to a number of large statistical arbitrage strategies being executed by institutional investors in the first half of 2010.
- The other noteworthy point about execution trends has been the introduction of Centre Point and Centre Point Crossing orders, which accounted for approximately 1% of trade value in late 2010.

Auctions & CLOB vs Crossings



Central Limit Order Book Traded Value by Time Interval

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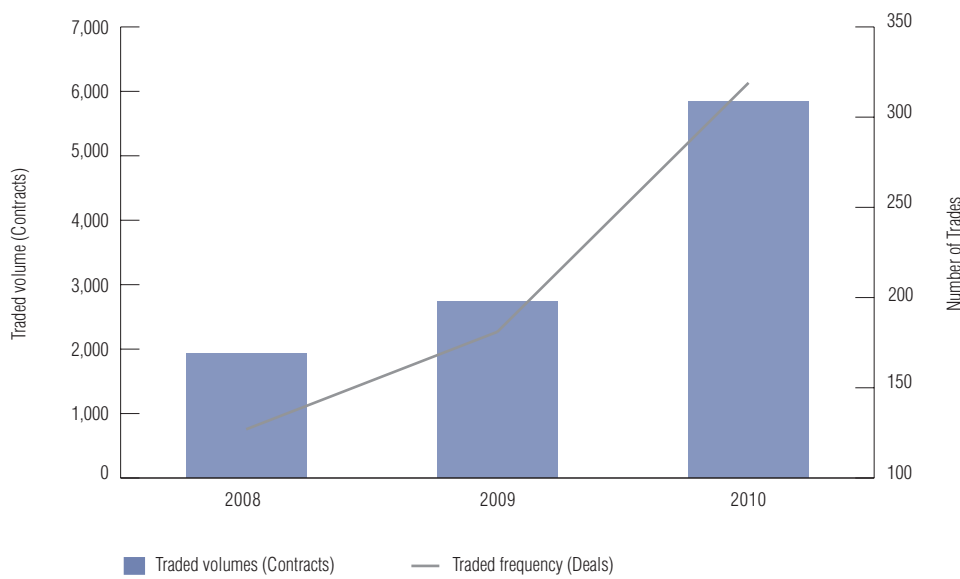
- The Chart above represents the value of Central Limit Order Book trading by time interval it is also known as the CLOB Smile. In the last few years there have been some gradual shifts in the shape of the smile. The most pronounced change has been a noticeable decline in execution in the final hour of trading and a subsequent increase in execution during the closing single price auction session. The trend towards larger volumes being matched during the close has also been seen in the US equity markets. This may be driven by institutions increasingly seeking large blocks of liquidity while minimising market impact. There has also been a minor increase in lunchtime trading, driven by algorithmic execution during the traditionally quiet trading hours between 1pm and 2pm.

S&P/ASX 200 Index Options

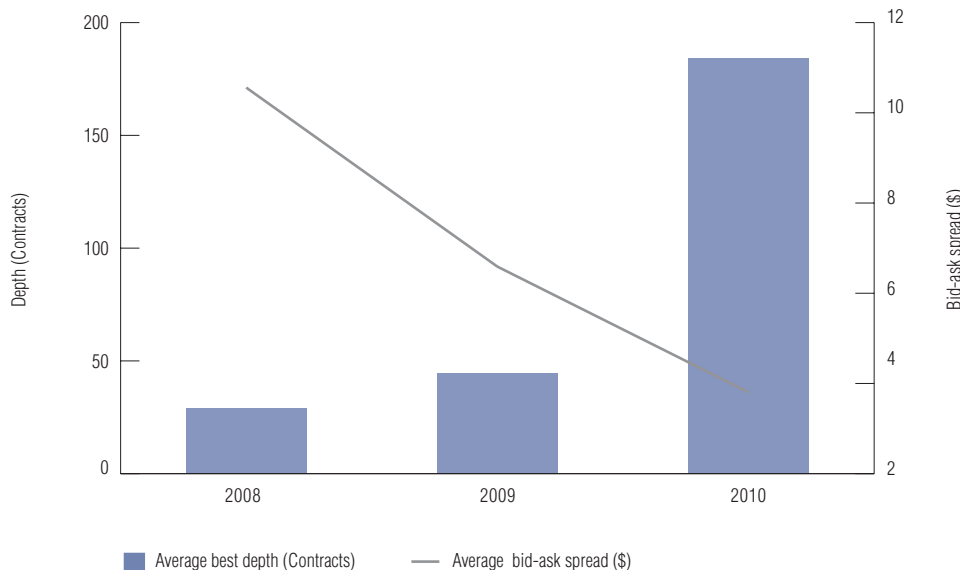
S&P/ASX 200 Index Options (commonly referred to as XJO Options) are exchange-traded options that offer exposure to the S&P/ASX 200 Index. There is a full range of put and call index options offering a wide selection of exercise prices and maturity. XJO options have a tick value of \$10 per point of the S&P/ASX 200 Index. This paper examined all contracts that are nearest to expiry (within one month) and closest to 'in-the-money' (index level plus/minus 2.5% of strike price).

Trading Activity

Front month contract around the money



Market Depth and Bid-ask spreads



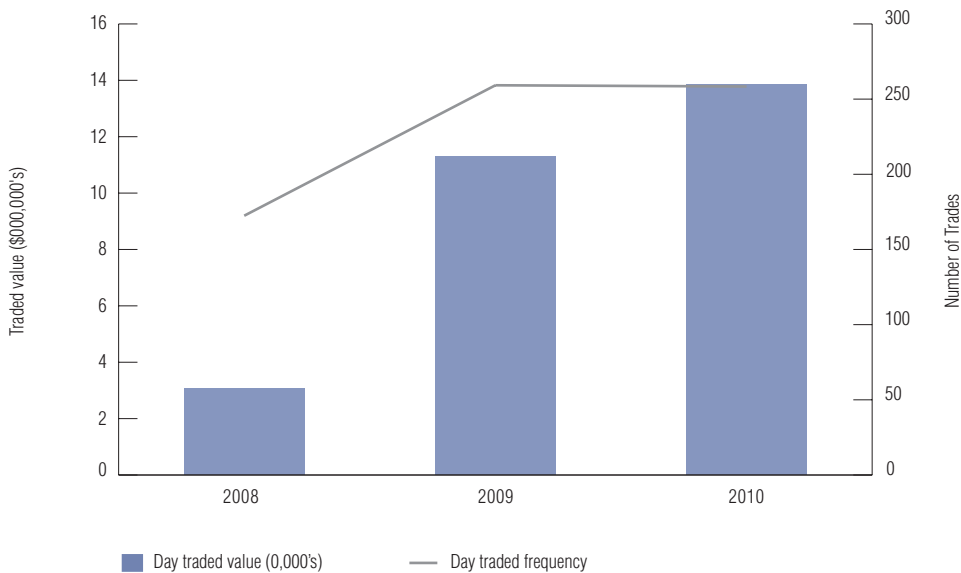
S&P/ASX 200 Index Options continued

- XJO options volumes were up 51% in 2010 with a daily average of 21,000 contracts traded. The number of front month at-the-money contracts traded increased from 2,742 contracts in 2009 to 5,850 contracts in 2010 – a 113% increase. The higher growth rate in front dated contracts implies there was more short-term and speculative trading activity occurring.
- Day traded frequency for front month at-the-money XJO Options increased from 181 trades per day in 2009 to 319 trades per day in 2010.
- Best depth for XJO Options increased from 45 contracts in 2009 to 184 contracts in 2010. Quoted depth for near month at-the-money contracts increased more than fourfold in 2010 and represents approximately \$8.5 million in notional terms.
- Relative bid-ask spreads for XJO Options decreased from 6.6 bps in 2009 to 3.8 bps in 2010. At-the-money options in the front expiry month are typically quoted at a 2-4 tick spread. This is equivalent to 6-8 basis points of notional value. There is, however, potential for price improvement as market makers will often deal within the quoted spread i.e. the effective spread can be narrower than the quoted BBO.
- The Put/Call ratio in XJO options increased to 129% in 2010 from 121% in 2009.

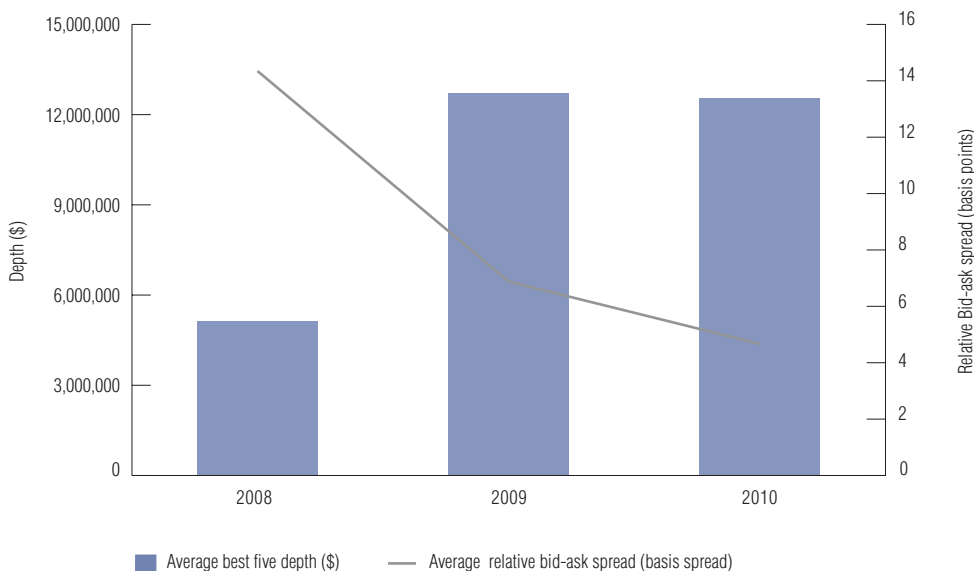
SPDR S&P/ASX 200 Fund (STW)

The SPDR S&P/ASX 200 (STW) is an ETF that offers exposure to the returns of the S&P/ASX 200 Index.

Trading Activity

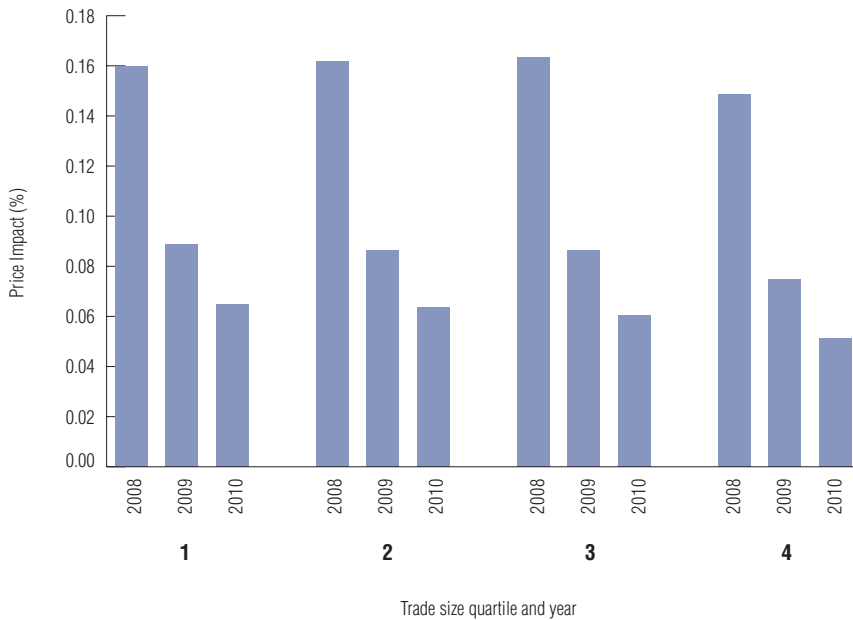


- Average daily value for the SPDR S&P/ASX 200 Fund increased from \$11.3 million in 2009 to \$13.9 million in 2010. Day traded frequency for the SPDR S&P/ASX 200 Fund was 258 trades per day, which was flat year-on-year.



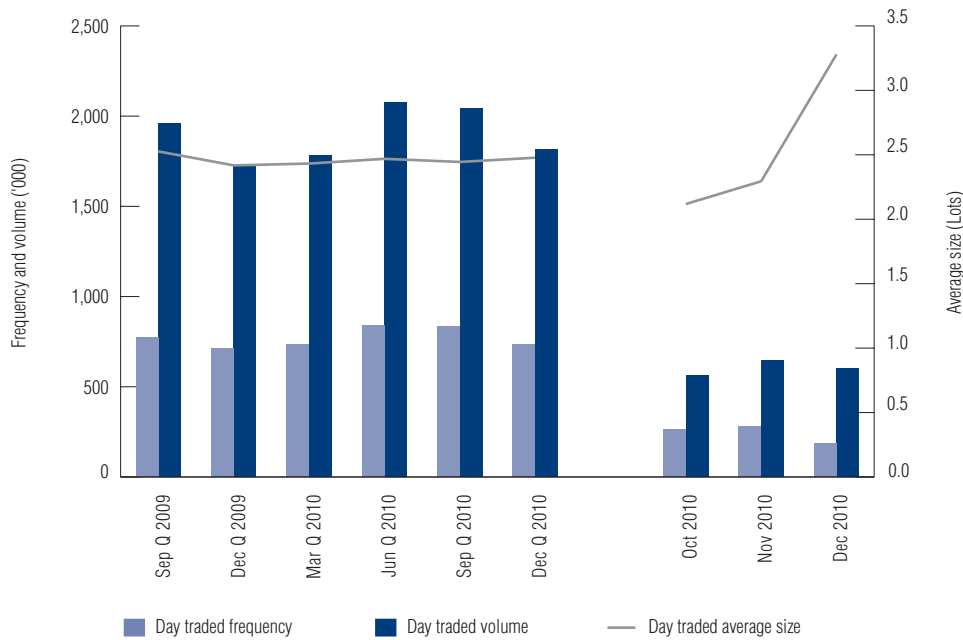
- The depth at the best five price levels for the SPDR S&P/ASX 200 Fund was \$12.6 million in 2010, which was flat year-on-year.
- Bid-ask spreads in STW continued to narrow in 2010. Relative bid-ask spreads for the SPDR S&P/ASX 200 Fund decreased from 6.9 bps in 2009 to 4.7 bps in 2010.

Price Impact



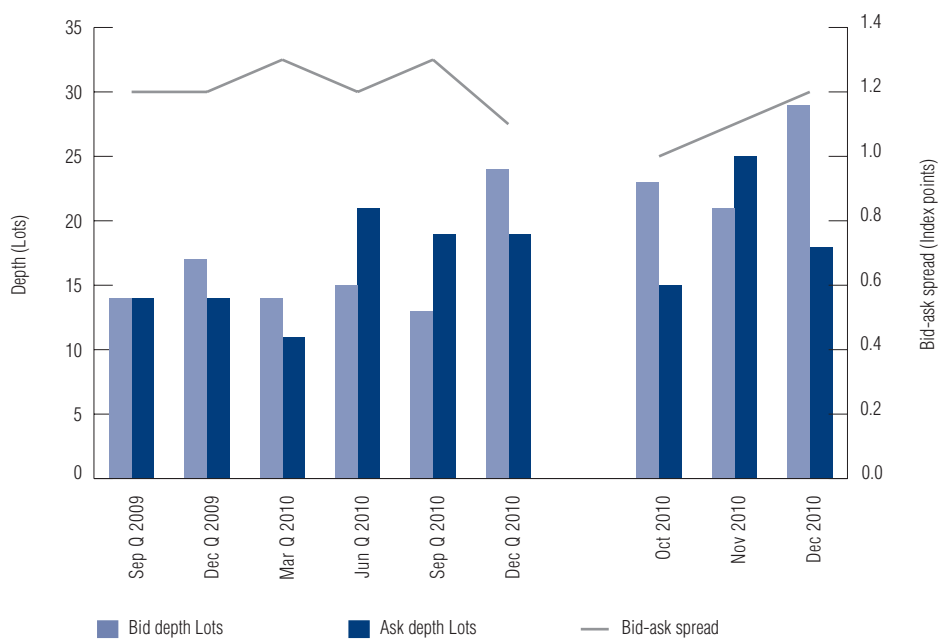
- Tighter spreads had a positive impact on implicit costs. Price impact improved across all trade sizes in 2010. For the largest 25% of trades price impact decreased from 9 basis points (bps) in 2009 to 6.5 bps in 2010. For quartile 2 price impact decreased from 8.5 bps to 6.4 bps, quartile 3 decreased from 8.5bps 6.3 bps and for the smallest 25% of trades decreased from 7bps to 5.1bps. The price impact and bid ask spread has converged to a point where it appears most trades are being executed within the BBO.

Trading activity



- The volume of SPI 200 Index Futures contracts was up 5% over 2010. 10 million contracts were traded in total in 2010, up from 9.5 million in 2009.
- 88% of volume was traded in the day session. The volume of contracts traded in the night session was up 57% year-on-year while day volumes remained relatively flat.

Transaction cost indicators



ASX SPI 200 Index Futures Market continued

- The average market depth at the best bid and ask in the nearest expiry month contract increased in the December quarter 2010, compared to the same quarter of the previous year. There were an average of 22 lots available at the bid and 16 lots available at the offer during the December quarter 2010. The average market depth increased from 14 lots in 2009 to 17 lots in 2010, a 22% increase. This level of liquidity is more than sufficient to accommodate the average trade size during day sessions (2 lots).
- The average bid-ask spread narrowed to 1.1 index points in the December quarter 2010, representing AUD28.13 or 2 one-hundredths of one percent of contract value. The cost of trading ASX SPI 200® Index Futures continues to be low.

Tracking error

	<i>Sep Q</i> <i>2009</i>	<i>Dec Q</i> <i>2009</i>	<i>Mar Q</i> <i>2010</i>	<i>Jun Q</i> <i>2010</i>	<i>Sep Q</i> <i>2010</i>	<i>Dec Q</i> <i>2010</i>	<i>Oct</i> <i>2010</i>	<i>Nov</i> <i>2010</i>	<i>Dec</i> <i>2010</i>
Mean of $R_{AP} - R_{cash}$									
Weekly (%)	0.15	0.16	0.20	0.13	0.11	0.13	0.10	0.12	0.17
Daily (%)	0.07	0.09	0.08	0.08	0.05	0.07	0.09	0.04	0.08
Standard deviation of $(R_{AP} - R_{cash})$									
Weekly (%)	0.17	0.25	0.19	0.11	0.07	0.13	0.06	0.10	0.24
Daily (%)	0.08	0.15	0.11	0.10	0.06	0.09	0.11	0.05	0.11

- The weekly average absolute tracking error of returns on the nearest expiry month contract against the S&P/ASX200 accumulation index was 11 and 13 one-hundredths of one percent over the September 2010 and December 2010 quarters, respectively. This is a minor reduction in tracking errors from the corresponding quarters in 2009.
- The week-to-week variability (standard deviation) of the difference in returns between the nearest expiry month contract and the S&P/ASX200 accumulation index was 7 and 13 one-hundredths of one percent over the September 2010 and December 2010 quarters, respectively. This again demonstrates a significant reduction in tracking errors relative to the corresponding quarters in 2009.
- These low and stable tracking errors demonstrate that ASX SPI 200® Index Futures provide an efficient way for investors to obtain Australian equities market index exposure synthetically.

Volatility

	<i>Sep Q</i> 2009	<i>Dec Q</i> 2009	<i>Mar Q</i> 2010	<i>Jun Q</i> 2010	<i>Sep Q</i> 2010	<i>Dec Q</i> 2010	<i>Oct</i> 2010	<i>Nov</i> 2010	<i>Dec</i> 2010
Standard deviation of return									
Weekly (%)	3.15	2.62	2.08	3.50	2.25	1.71	1.35	2.53	1.48
Daily (%)	1.18	1.11	0.93	1.35	1.05	0.79	0.90	0.73	0.76
Average range (Index points)									
Monthly	429	349	382	465	320	241	160	304	259
Weekly	191	202	157	233	167	130	134	153	108
Daily	77	83	73	95	74	61	72	61	52

- Monthly return volatility on the nearest expiry month contract decreased from 2.62% index points in the December quarter 2009 to 1.71% in the December 2010 quarter.
- Price volatility on the nearest expiry month contract decreased from 83 index points in the December quarter 2009 to 61 index points in the December 2010 quarter. The reduction in SPI volatility in the December 2010 quarter was inline with the underlying S&P/ASX 200 Index.
- ASX SPI 200 Index Futures can be used by institutional investors to synthetically replicate the performance of the S&P/ASX 200 Index. The tracking error is also a function of funding costs as a long futures/long bond is equivalent to a position in the underlying index constituents. The tracking error measured above therefore includes a component of basis cost.

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