What the ASX market price represents and how ASX Clear calculates settlement prices

Introduction

There are two closing price measures published and used by ASX:

- The ASX *market* closing price – published daily by ASX to reflect the last traded price executed on the ASX market; and
- The ASX *settlement* price – used by ASX Clear (the clearing house for equity securities) to determine daily margin calls and for derivative contracts (e.g. exchange traded options) is derived from the settlement price of the underlying security.

For cash equities, in all but a few exceptional circumstances the market and settlement closing prices will be identical.

However, there may be scenarios where ASX Clear uses settlement prices that diverge from the ASX market closing price to value positions in order to effectively manage clearing house risks. The settlement price for exchange traded options are derived from the underlying cash equity closing price, i.e. the settlement price for the underlying equity.

This document sets out ASX's determination, publication and use of closing prices and ASX Clear's approach to determining settlement prices. It aims to provide stakeholders with greater transparency and clarity into the process for calculating these prices to allow users to consider their own approaches to sourcing pricing information under different scenarios.

Calculation of ASX market closing prices

Closing prices for cash market and equity derivative securities quoted and traded on ASX's trading platform are calculated by ASX at the end of every trading day and represent the most recent valuation for a security on the ASX market. The ASX market is the primary and most liquid trading venue for price formation of Australian listed equity securities.

Under normal market conditions, ASX uses a Closing Single Price Auction (CSPA), to generate a consensus price reflecting the interaction between market supply and demand.

Where there are no trades completed in the daily CSPA, the closing price reflects the last trade executed on ASX during the continuous trading window or reported to ASX as an NBBO crossing. Where there were no trades in a security that day, the closing price will be the last traded price recorded on the ASX trading platform.

Closing prices for equity derivative securities are calculated from the published settlement price and an implied volatility level derived from observed market activity. Theoretical pricing uses the globally accepted Cox-Rubinstein binomial option pricing model. Theoretical pricing is required due to the fact the last traded price of a derivative may not reflect the most recent changes in the underlying cash market security, implied volatility, expected dividends or interest rates.

In the event that ASX's usual market operations are disrupted and a CSPA process is not completed the following methodologies are currently performed to determine the ASX market closing price for all quoted securities.

Product	Methodology
Cash Market Securities	The closing price is the last valid on-market transaction executed on the ASX trading platform or reported to ASX as a NBBO crossing. In the event that a security has not traded on ASX during the day, the last trading day's closing price is used.
Equity Derivatives (ETOs)	The closing price for equity derivative securities is calculated from the ASX cash equity closing price and an implied volatility level calculated from the most recent of the last traded price or midpoint of the bid and offer quotes in the derivative security, observed on ASX Trade. Where no market data is available to calculate an implied volatility level, a theoretical value is determined through volatility modelling, using the last traded price of the underlying security and market data observed across all derivatives of the same maturity for that security.

If a market outage precludes the holding of the daily CSPA, ASX would advise the market as soon as practicable and confirm the process under which the market closing prices will be determined.

ASX Clear pricing methodology for setting settlement prices for margin obligations

The settlement price used by ASX Clear to determine participant margin requirements will be the ASX market closing price generated from the ASX trading platform, except in very exceptional circumstances.

Where the daily CSPA does not occur because of technical difficulties on the ASX Trade platform, the settlement price may need to differ from the ASX closing price to ensure ASX Clear holds adequate margin in the event of a participant default or on days of high market activity or volatility.

The table below outlines ASX Clear's approach for the determination of settlement prices used for margining purposes where normal trading and the CSPA is disrupted.

Market Outage	ASX Approach
Partial Closure[1]	ASX Clear would use the ASX market closing price, in this case the last traded price for the day on ASX Trade prior to the disruption, as the settlement prices unless there was evidence that there had been a material market movement between the time of outage and the normal closing time. In event that the futures market remains open, ASX Clear may use the movement in the Share Price Index (SPI) Futures as a proxy for the absolute movement in the universe of S&P/ASX 200 Index stocks. If the absolute movement in the most active SPI Futures contract during the period of the outage (from the time of the outage until the normal market closing time of 4.12pm) is greater than 1 per cent, ASX Clear will apply an

[1] An event which causes ASX to cease market operations mid-way through a trading day. This may affect a section of or all securities available for trade.

Market Outage	ASX Approach
	equivalent price shift to all cash equities in the S&P/ASX 200 Index. This is in line with the current materiality threshold applied to determine if an ad hoc intraday margin run is required. Other cash equities securities outside of the S&P/ASX 200 universe will retain the last trade price as the settlement price given their lesser correlation to broader market movements and given that these securities do not have a material impact on the overall clearing house risks.
Market Closed (ASX)[2]	If no data is available from any ASX source (including futures) and there is evidence of a material market movement occurring during the period of the ASX outage, alternative sources will be considered. This may include observed price movements in other licensed markets trading ASX securities where there is sufficient liquidity to provide confidence in the quality of price formation. Where no domestic prices are available market movements in other global market indices averaging more than 2 percent will be considered. During the Asian time zone ASX Clear would monitor price movements in the major regional markets in Tokyo, Hong Kong and Singapore for this purpose. In the case of overnight movements, markets in the US, UK and Europe would be monitored.
Market Closed (All)[3]	ASX will determine settlement prices under its current methodologies using last traded price for cash equity securities, and theoretical option pricing based on last measured implied volatilities for equity derivatives.

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[2] An event which renders ASX unable to open the market for an entire session. Other markets, either domestic or international, are open.
[3] An event which renders ASX unable to open the market for an entire session. All other markets are closed.