Optiver

Insights

October | 2024
Market Structure

Improving settlement for Hong Kong's weekly index options

Settlement price methodologies are a crucial component in options markets because they affect the final valuation and proceeds of options contracts. The methodology currently used for weekly index products in Hong Kong limits their effectiveness as a hedge on expiry day. In this paper, we propose enhancements to increase their appeal to investors.

HKEX recently introduced Weekly Hang Seng TECH Index Options to meet the growing demand from investors for shorter-dated derivatives instruments. Across the globe, investors have embraced short-dated options as a way to manage short-term, event-driven risks more effectively.

While HKEX deserves credit for continuing to drive innovation in its derivatives offerings, the settlement price methodology used for these and other index products in Hong Kong limits their effectiveness as a hedge on expiry day. This in turn impedes their liquidity.

The proof is in the pudding: Optiver estimates that between January 2021 and September 2024, an average of 7,000-8,000 Hang Seng Weekly Index Options contracts traded electronically on expiry day — a drop of approximately 30% from the 11,000 contracts traded on the previous day. In many developed markets by contrast it's common to see an increase in volumes from one day to expiry (1DTE) to zero days to expiry (0DTE). (We elaborate on this point in an earlier paper.)

In this paper, we examine how the expiry settlement price methodology for Hong Kong's Weekly Index Options works and propose enhancements that could reverse this trend. In particular, we recommend that HKEX adopt a shorter final settlement window for the product as a way to increase its appeal to investors.

Current settlement price methodology

In Hong Kong, the current method for determining the final settlement price for cash-settled equity index options — such as Weekly Hang Seng Index Options — is to use a Full-Day Time-Weighted Average Price (TWAP) approach. This method involves taking snapshots at 5-minute intervals throughout the expiry day, with 66 observed prints in total.

A key consequence of using this methodology is that the delta of expiring options decays with each successive print. This makes the expected settlement value less representative of the underlying index value over the course of the expiry day, which in turn reduces the options' effectiveness as a hedging tool for investors.

Optiver

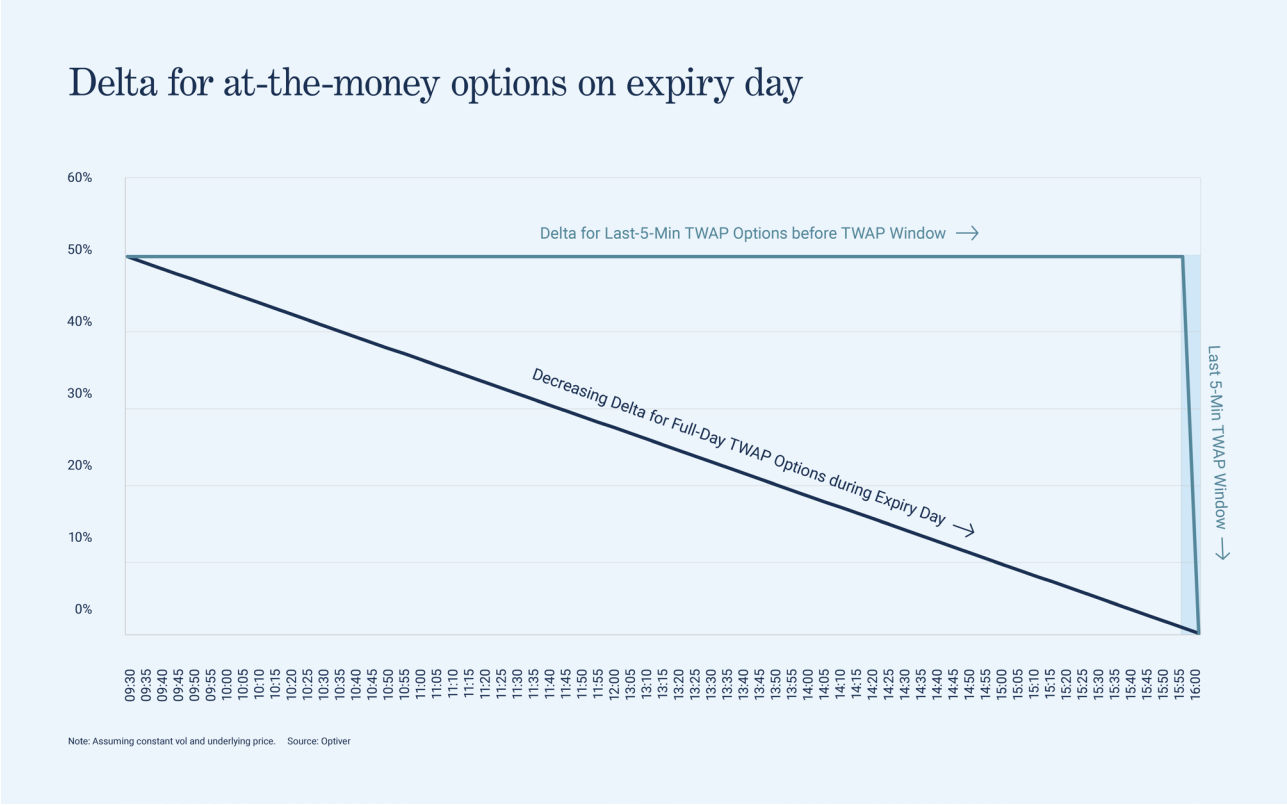
Consider an investor who enters the market at 3 p.m. HKT on expiry day to hedge against an intraday event-driven risk. The investor could consider using either of the following two instruments:

- An at-the-money Option on Index Futures ("OoF"), which settles based on the last 5-minute TWAP, or
- An at-the-money Index Option, which settles based on the full-day TWAP across the trading day.

In the case of the Index Option, 55 of the 66 price snapshots used to calculate the final settlement price have already been captured by the time the investor enters the market at 3 p.m. This means that any changes in the index price that occur later in the day will have a smaller impact on the Index Option's value.

By contrast, the OoF — which settles based on the last 5 minutes of trading — will be much more responsive to changes in the index price during the majority of the session before the settlement window, making it a more effective hedging tool on expiry day.

The chart below provides a simplified illustration of this dynamic. As the shorter TWAP settlement window reduces the delta decay period, the OoF product is far more effective for hedging on expiry day. The result of this discrepancy, as noted above, is a significant drop-off in trading volumes from 1DTE to 0DTE.



Optiver

Proposed enhancement

In our previous article on settlement methodologies, we proposed two overarching principles for settlement methodologies: that they should produce a Reliable Reference Price that minimises sensitivity to order imbalances, and that they should have Continuous Tradability to ensure a consistent and representative economic profile of the products.

Consistent with these principles, we recommend HKEX consider adopting an expiry settlement methodology based on a shorter final settlement window closer to the end of trading. One possibility is to replicate the current last 5-minute TWAP methodology used for OoFs and applying it to Weekly Index Options. By improving the short-term instrument's risk management properties on expiry day, HKEX can help attract more liquidity to Hong Kong's financial ecosystem.

About Optiver

Optiver is a global market maker with offices in Amsterdam, London, New York, Chicago, Austin, Sydney, Shanghai, Hong Kong, Singapore, Mumbai and Taipei. Founded in 1986, today we are a leading liquidity provider, with close to 2,000 employees in offices around the world, united in our commitment to improve the market by competitive pricing, execution and thorough risk management. By providing liquidity on multiple exchanges across the world in various financial instruments we participate in the safeguarding of healthy and efficient markets. We provide liquidity to financial markets using our own capital, at our own risk, trading a wide range of products: listed derivatives, cash equities, ETFs, bonds and foreign currencies.