

How bad are your backtests?

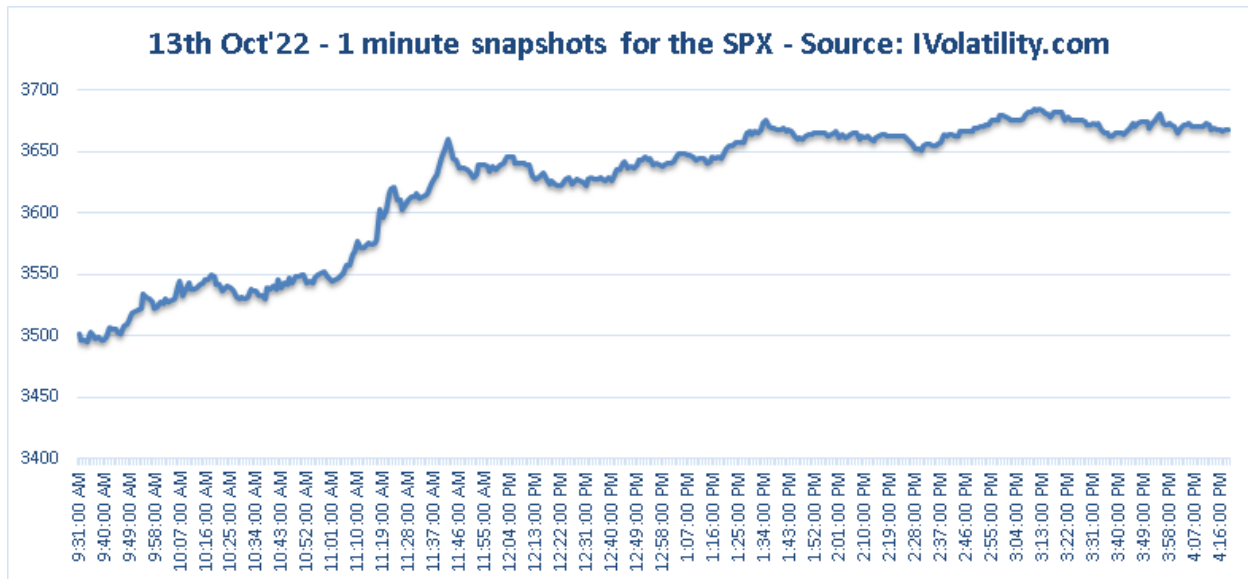
When it comes to accessing realtime market information, most institutional and professional traders are pretty well covered. Unfortunately, the same cannot be said about backtesting capabilities with most relying on low quality EOD data to test their options strategies.

Our internal tests lead us to think that, failing to consider the intraday effect and relying solely on end of the day data, carries the risk of a significant misrepresentation of the quality and risks of a strategy.

Furthermore, the subsequent implementation of the strategy can lead to complicated discussions with senior management and risk managers who have based their expectations on the historical end of the day backtest while the execution is tracked and managed on a continuous basis.

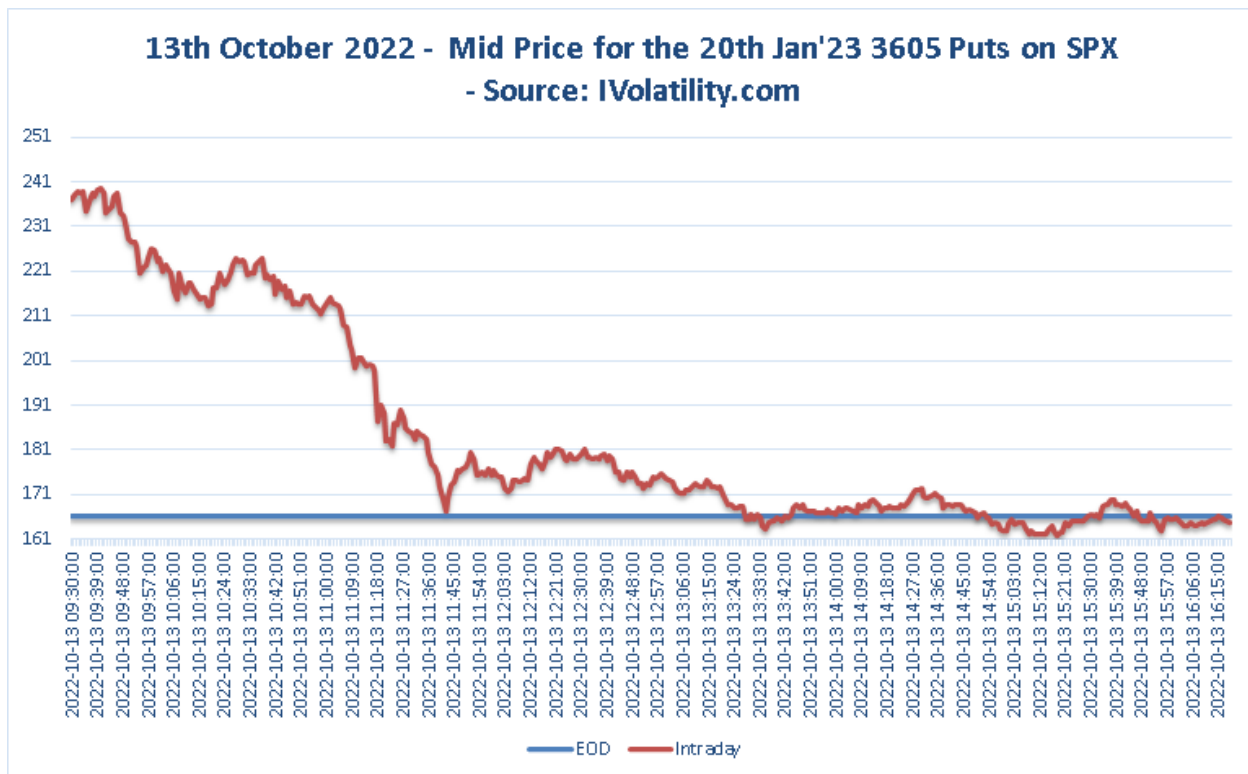
For that reason, using accurate intraday data can only lead to a significant improvement in the quality of the backtests being performed and reduce the overall implementation risks associated with the strategy.

To illustrate this point, let us consider the following example. We look at the SPX 1-minute snapshots on the 13th Oct'22. That day was quite interesting because, following a higher than anticipated CPI print, the market opened significantly lower before pushing higher throughout the intraday session.

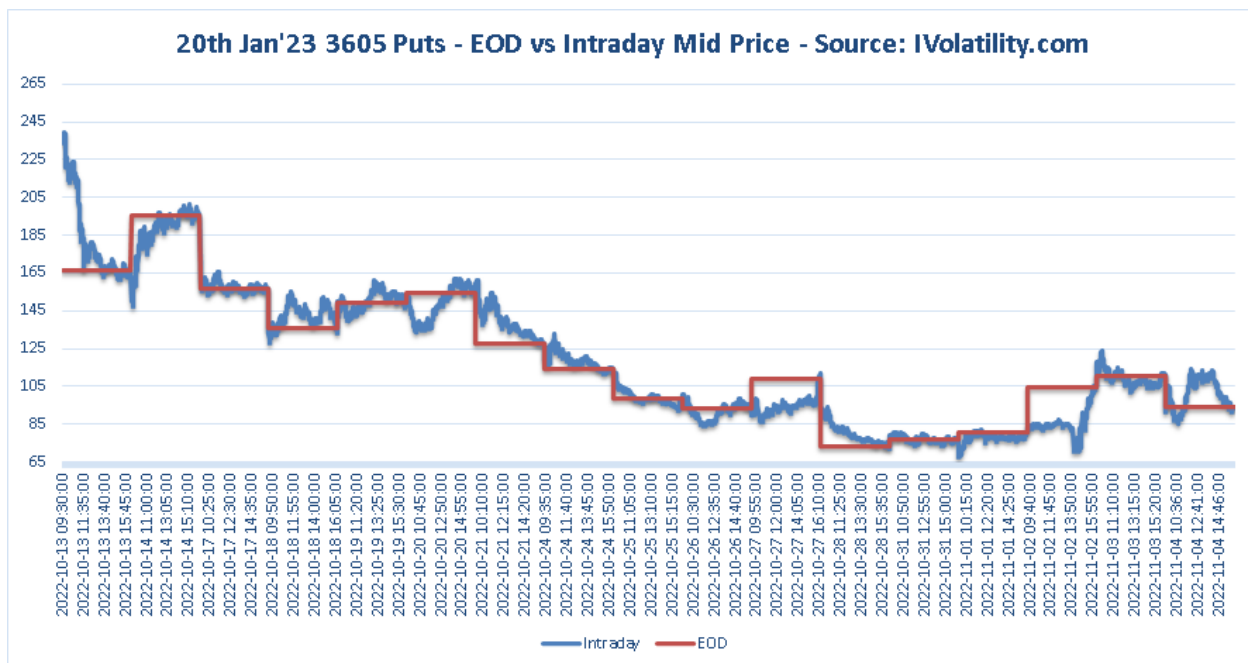


Below, we look at the mid-price of the 20th Jan'23 3605 puts on the SPX every minute. The first mid-price recorded at 9.30am was 237.15. The last recorded price for the day was 164.65 and the official settlement was set at 166.15.

Looking at an end of the day historical backtest would give a short seller a lot of comfort about the ability to run such a specific position but in reality, things might well have been different. As those options settled at a mid-price of 203.55 on the 12th Oct'22, a trader running an EOD historical backtest with 100 lots traded would only see a profit over the session on the 13th Oct'22 of \$389,000 ignoring a \$336,000 loss off the open.

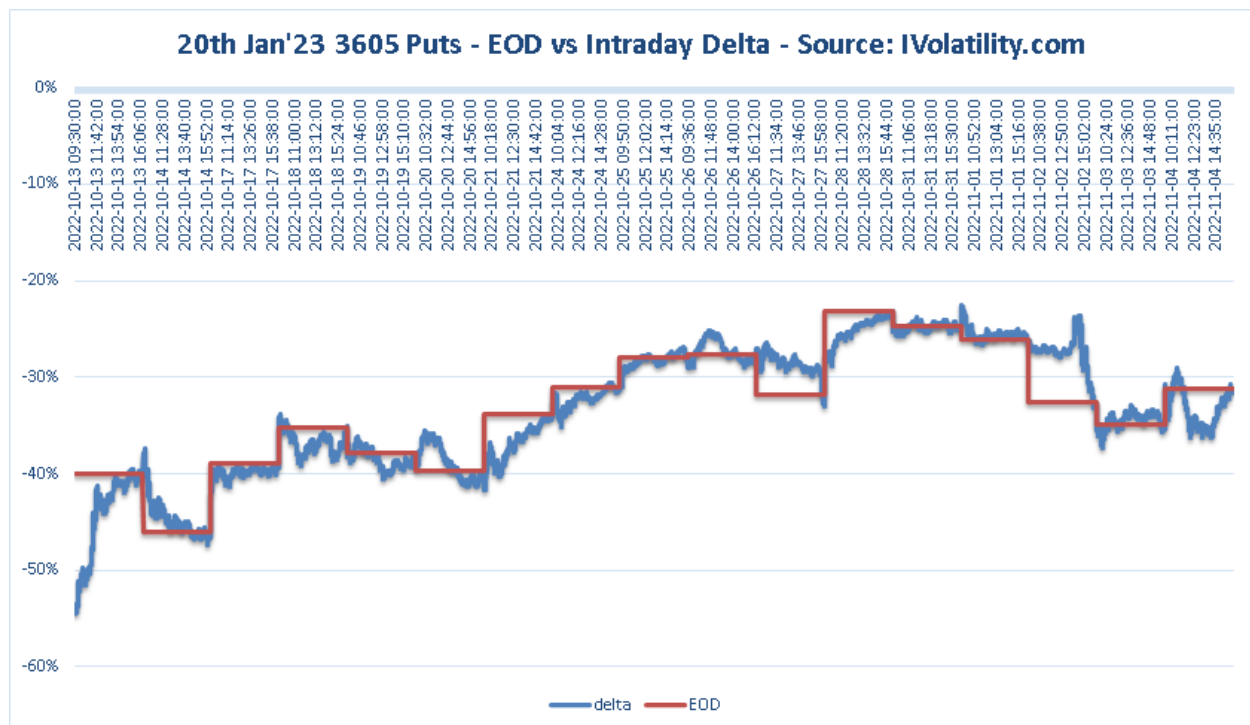


Looking at intraday data against their EOD settlement values shows the large approximation being made by performing an evaluation using simply one data point per day.

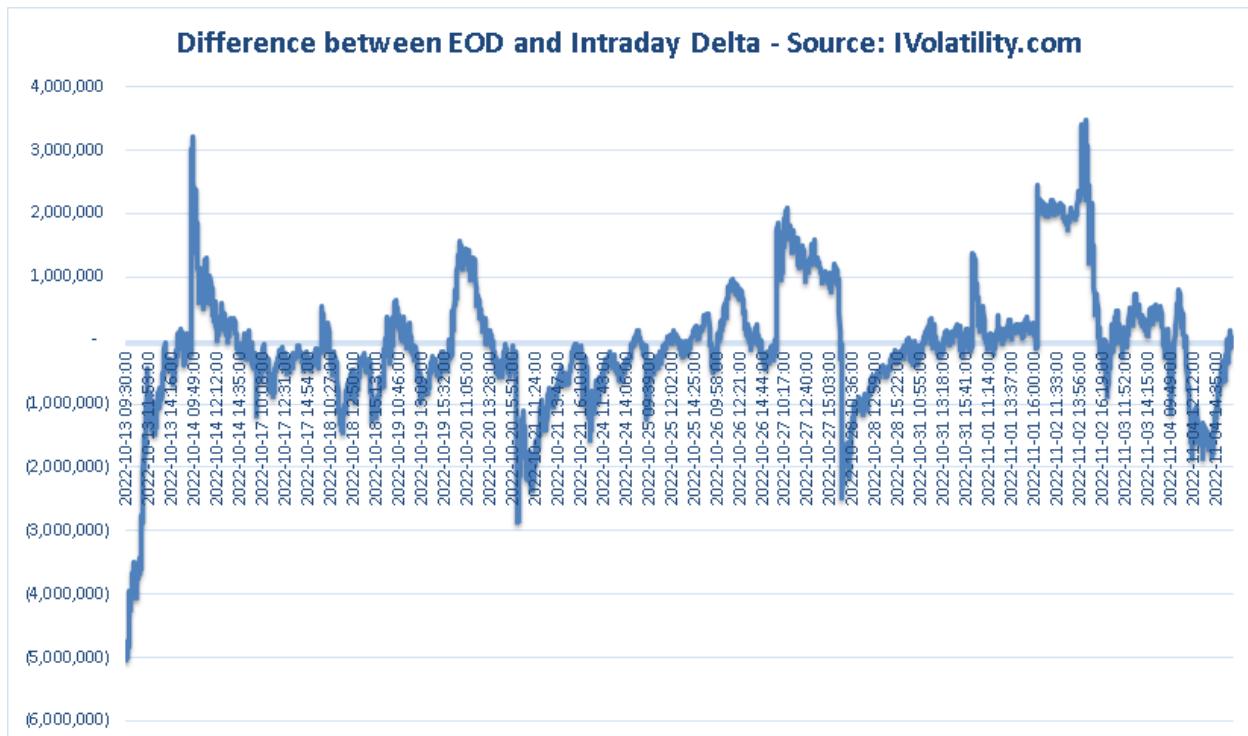


This significant misrepresentation of risk can have catastrophic consequences for the strategy being run, even leading to emotional reactions as the equity curve seen intraday deviates significantly from the prediction made using EOD data.

Looking at the Delta of the option using intraday data compared with a single EOD point shows that from a risk management perspective, the historical evaluation fails to accurately describe the magnitude of the risks embedded in the strategy.



To put this into context, we show below the difference between the delta estimated by using a single EOD data point and the intraday delta for a position size of 100 lots of those 20th Jan'23 3605 puts. On multiple occasions, the delta used in the backtest diverged from the intraday delta by more than \$3m either on the long or on the short side.

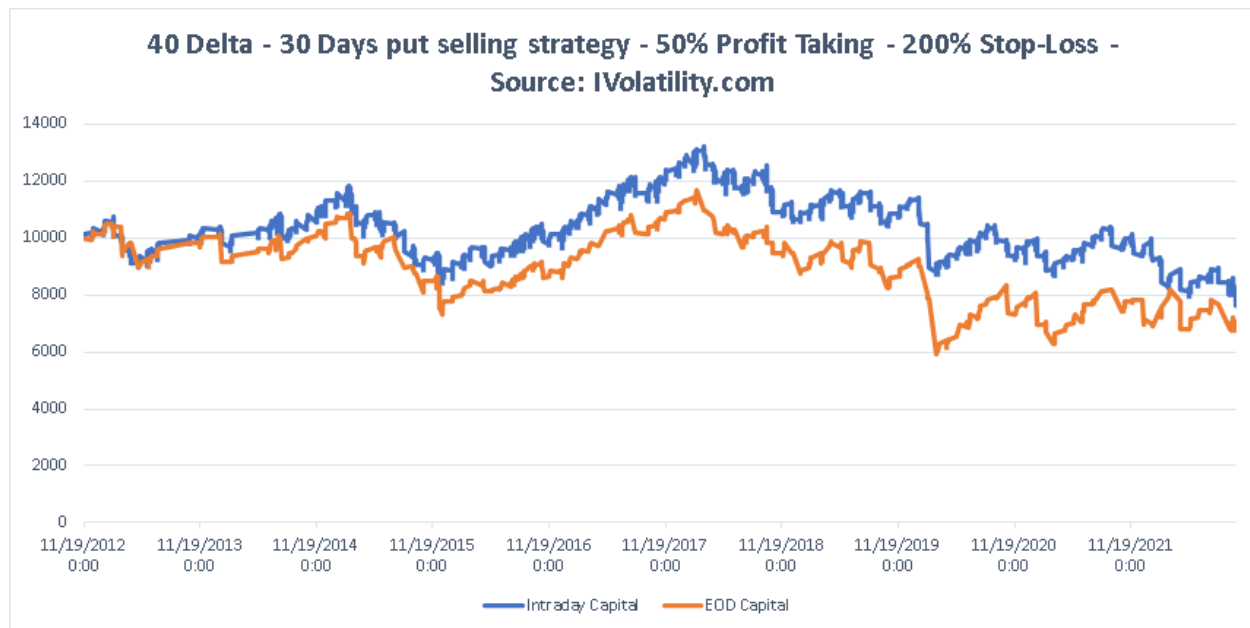


A risk manager might decide to set the maximum tolerated delta around the highest point observed during the backtest. Using the end of the day data would result in a risk limit set around \$17 million while in reality, the maximum reached over the same period was around \$19 million using intraday data.

This kind of issue is not limited to the delta of the option but could result in risk limit breaches for all other risk parameters depending on the conditions seen for the day.

Using the wrong type of data can also result in a complete misevaluation of the strategy. On the below, we show a back of the envelope backtest for a strategy consisting in selling the 30 days, 40 delta puts with the following unwind rules:

1. The position is closed if the premium left is less than 50% of the initial premium
2. The position is closed if the premium is more than 200% of the initial premium
3. The position is closed at expiration at intrinsic.



We see that the EOD and Intraday backtests offer substantially different equity curves best explained by the unwind rules described above.

One could easily imagine a situation where a good strategy turns out to be a losing one when evaluated using the wrong type of data.

At Ivolatality.com, we offer historical intraday data with Greeks and implied volatilities that can be sliced on the following timeframes:

- Hourly
- 30 minutes
- 15 minutes
- 5 minutes
- 1 minute

Reach out to our sales team, you might be surprised as those historical intraday options remain quite attractive considering the amount of information they offer. For more details about our products and delivery methods, feel free to reach out to sales@ivolatility.com