



# Valuation Insights

## Revisiting Volatility Assumptions under ASC 718

Market volatility increased significantly in March 2020 due to the COVID-19 pandemic. The VIX, a measure of the volatility in the U.S. stock market, reached a high of 82.7 on March 16, 2020.<sup>1</sup> This represents a sharp increase to the levels observed in the preceding months and at most points during the last several years when the VIX consistently traded below 20. The volatility estimates observed in March were higher than at any other point since 2004, rivaled only by the 2008–2009 financial crisis when the VIX reached a high of 80.9 on November 20, 2008.<sup>2</sup>



This recent spike in volatility may lead to significant differences between historical and implied volatility measures. As a result, questions may arise regarding the treatment of the volatility assumption in valuation analyses, such as those performed under Accounting Standards Codification 718, Compensation – Stock Compensation (ASC 718). Over the following pages, we answer some of the more common questions.

### Can the recent period of increased volatility be excluded from historical volatility estimates?

ASC 718 indicates that historical volatility should be measured over a lookback period commensurate with the expected or contractual term of the award. An entity may find that there are periods when its stock price experiences much higher or lower volatility than other periods. Generally, an entity is not permitted to exclude those periods of volatility from its measure of historical volatility. ASC paragraph 718-10-S99-1 states that periods should be excluded from the measure of historical volatility only when there have been specific, discrete historical events that are not expected to recur. The SEC staff expects such situations to be rare.<sup>3</sup>

Events such as mergers or acquisitions, changes in capital or corporate structure, or adverse press reports are events that may recur and, generally, would not be a basis for excluding a period when calculating historical volatility. Likewise, it is generally inappropriate to exclude periods surrounding events such as an IPO, even when these events are not expected to recur.

We believe an entity should not exclude specific events or circumstances from its measure of historical volatility unless those events or circumstances are nonrecurring, specific to the entity, and are within the control of the entity. Events or circumstances affecting the overall market, including those that are considered unlikely to recur, should not be excluded. Any such exclusions are expected to be rare.<sup>4</sup>

<sup>1</sup> Source: cboe.com. The VIX Index is a calculation designed to produce a measure of constant, 30-day expected volatility of the U.S. stock market, derived from real-time, mid-quote prices of S&P 500® Index (SPXSM) call and put options. Although the VIX represents a short-term volatility indication, it can provide a relevant signal for potential changes in longer-term volatility levels.

<sup>2</sup> Starting on September 23, 2003, the CBOE began publishing the VIX index using a revised methodology. If the old methodology continued, the March 16, 2020 price would have been the highest observed since 1990.

<sup>3</sup> KPMG Share-Based Payment Handbook, January 2020. Section 2.036

<sup>4</sup> KPMG Share-Based Payment Handbook, January 2020. Section 2.037

## Can any adjustments be made for periods of increased volatility?

If it is determined that the historical volatility over the expected term of the subject awards is not indicative of a long-term normalized volatility, then it may be appropriate to use a longer lookback period. For example, when valuing an employee stock option with a six-year expected term, if it is determined that the historical volatility with a six-year lookback period is unreasonably high, use of a longer lookback period may be an alternative.<sup>5</sup> However, a period of time equal in length to the expected or contractual term of the option generally should serve as the starting point for the estimate.

While rarely applied, ASC 718 does allow for less weighting to be placed on a period during which an entity's stock price volatility was unusually high or low. This is based on the theory of mean reversion that assumes a volatility can be expected to return to its longer-term historical norms.<sup>6</sup> However, application of this approach is generally only appropriate if it is possible to objectively determine that the market expects future volatility to revert to a mean that will differ materially from the volatility observed during the period in question. Furthermore, historical share price volatility is only one of the factors that an entity should consider in estimating expected volatility.

Entities should not use historical information for the expected volatility without considering how future experience might reasonably be expected to differ from historical experience (e.g., because of a change in capital structure or announcement of a merger that would change future business ventures or risks).<sup>7</sup> Any significant adjustments to historical volatility to account for known current or future changes would need to be supported with objective market evidence. Forward-looking volatilities implied from traded options are one way to incorporate changes which are anticipated to significantly impact the entity's expected volatility.

For example, let's assume an entity believes that historical realized volatility is not indicative of expected volatility; however, it cannot justify excluding periods of historical volatility. It may be appropriate to place greater weight on implied volatility (and perhaps rely exclusively on implied volatility) if there is sufficient trading volume in its options and certain other criteria are met.<sup>8</sup>

## How should one weight historical and implied volatilities?

Selecting volatility estimates can be difficult in times of market turmoil. This can be even more challenging when historical and implied volatility estimates differ significantly.

The SEC staff has guidance on when it would not object to exclusive reliance on either historical or implied volatilities, as long as the appropriate methodology is consistently applied for any relevant measurement dates, as discussed below:<sup>9</sup>

### Exclusive reliance on historical volatility

- The entity has no reason to believe that its future volatility over the expected or contractual term, as applicable, is likely to differ from its past;
- The computation of historical volatility uses a simple average calculation method;
- A sequential period of historical data at least equal to the expected or contractual term of the share option, as applicable, is used; and
- A reasonably sufficient number of price observations are used, measured at a consistent point throughout the applicable historical period.

### Exclusive reliance on implied volatility

- A valuation model that is based upon a constant volatility assumption is used to value the employee share options;
- The implied volatility is derived from options that are actively traded;
- The market prices (trades or quotes) of both the traded options and underlying shares are measured at a similar point in time to each other and on a date reasonably close to the grant date of the employee share options;
- The traded options have exercise prices that are both (a) near-the-money and (b) close to the exercise price of the employee share options; and
- The remaining maturities of the traded options on which the estimate is based are at least one year.<sup>10</sup>

If the historical or implied volatility indications do not meet all of the criteria the SEC staff outlined for exclusive reliance on either historical or implied volatility, a weighting between the two indications would be appropriate. We would expect this to be true in most

<sup>5</sup> Please note that this approach is infrequently used in practice. More often, increasing the weighting of implied volatility indications or other adjustments are made.

<sup>6</sup> ASC 718-10-55-37(a)

<sup>7</sup> ASC 718-10-55-24

<sup>8</sup> ASC 718-10-S99-1 SAB Topic 14.C Question 4

<sup>9</sup> ASC 718-10-S99-1 SAB Topic 14.D SAB Topic 14.D, Question 4

<sup>10</sup> While the SEC staff expects remaining terms of at least one year as one of the criteria for exclusive reliance on implied volatility, the staff believes that remaining terms of at least six months are needed for reliable implied volatility indications on which to provide some weighting. In general, the staff believes more reliance on the implied volatility derived from a traded option would be expected the closer the remaining term of the traded option is to the expected or contractual term of the relevant award (ASC 718-10-S99-1 SAB Topic 14.D Question 3).

cases. When selecting the weighting between historical and implied volatility measures, the criteria outlined previously regarding exclusive reliance should be considered, as well as some additional factors outlined in the following table:

|                       | Benefits  | Challenges   |
|-----------------------|---|--|
| Historical Volatility | Stable view of long-term volatility (mean-reversion will tend to offset above or below average periods) | Backward looking<br>May include less relevant times and may not properly incorporate recent movements<br>May not incorporate changes in capital structure (higher leverage generally equals higher volatility)   |
| Implied Volatility    | Forward looking   | Disparity between term of typical exchange-traded options (generally two years or less) and the longer expected term of typical share-based payment awards<br>May fluctuate significantly based on market factors on a particular trading day<br>There may be insufficient "near-the-money" option trades with maturities exceeding six months |

Finally, an entity should also consider the effect of financial leverage on expected volatility, particularly if there has been a recent drop in the entity's market capitalization. As noted in the table above, highly leveraged entities tend to have higher volatilities, so leverage and changes therein can affect the ability to apply historical data. Care should be taken to ensure that the expected volatility appropriately reflects expectations around an entity's capital structure over the expected term of the relevant awards.

If an analysis of the underlying data for an entity concludes that the implied volatility is meaningful and

reflects a shift in the market's expectations not yet fully manifested in the historical volatility measure, it might conclude to shift the weightings more heavily towards implied volatility than historical volatility.

### Summary

In times of market turmoil, such as the current market conditions driven by COVID-19, there are both benefits and drawbacks of using implied and historical volatility measures. In most cases, we recommend assigning weightings to both measures. It may seem counterintuitive in cases where each provides different indications; however, as neither will provide a perfect estimate for long-term expected volatility, a blend of both measures may provide the best estimate. While each situation is different, it is common to see equal weightings assigned to both historical and implied volatility measures as a starting point in the analysis. If, however, the company's long-term fundamentals have been impacted as a result of recent market events, it may be more appropriate to apply less weighting to the long-term historical volatility or apply appropriate adjustments to the longer-term data.

It is generally inappropriate to arbitrarily place little weight on different measures of volatility. One should document how the factors in the preceding sections were considered in developing the relative weights placed on different volatility indications in any given valuation. That documentation should support not only the current valuation but also the reasons for changes to the weightings from prior valuations, where applicable.

### Additional resources

KPMG guidance, updates and news covering financial reporting impacts of the COVID-19 outbreak can be found here:

<https://frv.kpmg.us/all-topics/coronavirus.html>

KPMG publications and guides relevant to share-based compensation can be found here:

<https://frv.kpmg.us/all-topics/expenses/compensation-stock-compensation.html>

### Have questions?

Please contact your local KPMG adviser if you have additional questions or would like to suggest a topic for inclusion in a future FAQ document.

## Contact



**Ron Elkounovitch**  
Principal  
Valuation & Business  
Modeling Services  
T: 404-222-7375  
E: ronelkounovitch@kpmg.com



**Alok Mahajan**  
Principal  
Valuation & Business  
Modeling Services  
T: 408-367-2841  
E: amahajan@kpmg.com

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