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# Volatility: Refined Selection or Sector Index?

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In a Black-Scholes Option Pricing Model, one of the important variables to consider is volatility. But how do we calculate the volatility for a private company when applying the Option Pricing Model? Accounting Standards Codification Topic 718 dictates:

> "If it is not possible to reasonably estimate the fair value of equity share options and similar instruments because it is not practicable to estimate the expected volatility of the entity's share price, a nonpublic entity is required to measure its awards of equity share options and similar instruments based on a value calculated using the historical volatility of an appropriate industry sector index."*

Since it is not typically possible to reasonably estimate future volatility of a private company, we must look at historical volatility of the appropriate sector index. This allows us to view public market data and compare the degree of volatility of our subject company to its industry sector. We can then select a volatility value based on what has taken place in the market.

A common debate regarding this method is whether a full industry sector index should be analyzed for volatility or if a smaller set of comparable companies should be used. An argument can be made that a smaller, more specific set of comparables could yield results more relatable to the subject company. However this method does have its flaws.

Comparable companies are often selected based on specific factors such as business description, size, growth, risk, profitability and other relatable metrics. While the comparable companies selected should be similar to the subject company in most or all of these areas, sometimes a private company is so disruptive to the market that it cannot be fully represented by existing public companies. Another common problem is that companies may be comparable to our subject company in some key areas but may operate at a much different level in regards to volatility. The public company volatility that is being measured is based on the historical standard deviation of stock prices.  It is common that our subject company is high in volatility as it grows in the private market. However it is also common that public companies have varying levels of volatility depending on maturity and other economic factors.

So while it is reasonable to look at a refined set of comparables for financial metrics and performance comparisons, it is not always the best comparison for volatility unless the historical volatility of the comparables selected is closely correlated to the current and future volatility expectations of our subject company. This is often tough to analyze and justify.

As mentioned in the Accounting Standards Codification*, we may calculate volatility using an appropriate industry sector index. What this allows us to do is look at the sector from a higher level with specific company factors having less of a bearing on the overall result. We can look at the broader industry sector in which our company operates and base our volatility selection off of this data. While not every company in the sector is a direct comparison to our subject company, since the companies in the sector do operate in the same industry they are generally comparable, and by using the industry sector, we capture more industry related data that we may use for either qualitative or quantitative analysis in selecting our volatility. This becomes more justifiable as we have accounted for the industry at large and not a small sample of the sector.

So while there may be good arguments for using a refined comparables set as opposed to a sector index, using a sector index gives a better representation of the industry and more closely follows the Accounting Standards Codification.

*Summary of Topic 718 (formerly FASB 123R) Accounting for Stock Compensation. http://www.fasb.org

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