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Common SBC Mistakes - Part-1

Interest Rates

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Introduction

Over the last 25 years, I have had the privilege of reviewing and implementing the Stock-Based Compensation (SBC) plans of over 2,000 companies. This experience has allowed me to observe common mistakes companies make when valuing and accounting for their stock-based compensation.

This article is the first in a series addressing these common mistakes. It focuses on errors related to the usage of interest rates in SBC valuation.

What is the common mistake?

Many companies use the government bond interest rate for a term that matches the nominal term of the grant in their valuation.

This approach involves two key mistakes, which we will address:

(1) Using the **nominal term** of the grant instead of the **expected term**

(2) Using the **government bond rate** instead of the **zero-coupon (strip-bond) rate**

What term should we use and why?

Ideally, a **staggered interest rate** should be used, where a different interest rate is used for each period (year or quarter) of the grant's term. However, this approach introduces a significant complexity, which is generally unnecessary given the relatively low impact of the interest rate on SBC valuations in a low-interest-rate environment. As a result, a **single interest rate** is typically used for valuation.

But which term should be applied?

Every grant has **two terms**: the **nominal term** and the **expected term**. The **nominal term** is determined by the grant's natural expiration date, while the **expected term** accounts for the possibility of early exercise or expiration. This distinction is outlined in both **IFRS 2** and **ASC 718**, as shown in the following excerpts:

ASC-718

> *718-10-30-10*
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> *To satisfy the measurement objective in paragraph 718-10-30-6, the restrictions and conditions inherent in equity instruments awarded are treated differently depending on whether they continue in effect after the requisite service period or the nonemployee's vesting period. A restriction that continues in effect after an entity has issued awards, such as the inability to transfer vested equity share options to*

third parties or the inability to sell vested shares for a period of time, is considered in estimating the fair value of the instruments at the grant date. For equity share options and similar instruments, the effect of non-transferability (and non-hedgeability, which has a similar effect) is taken into account by reflecting the effects of grantees' expected exercise and post-vesting termination behavior in estimating fair value (referred to as an option's expected term).

718-10-30-10A

On an award-by-award basis, an entity may elect to use the contractual term as the expected term when estimating the fair value of a nonemployee award to satisfy the measurement objective in paragraph 718-10-30-6. Otherwise, an entity shall apply the guidance in this Topic in estimating the expected term of a nonemployee award, which may result in a term less than the contractual term of the award.

718-10-30-10B

When a non-public entity chooses to measure a nonemployee share-based payment award by estimating its expected term and applies the practical expedient in paragraph 718-10-30-20A, it must apply the practical expedient to all nonemployee awards that meet the conditions in paragraph 718-10-30-20B. However, a nonpublic entity may still elect, on an award-by-award basis, to use the contractual term as the expected term as described in paragraph 718-10-30-10A.

IFRS-2

Expected early exercise

B16: Employees often exercise share options early, for a variety of reasons. For example, employee share options are typically non-transferable. This often causes employees to exercise their share options early, because that is the only way for the employees to liquidate their position. Also, employees who cease employment are usually required to exercise any vested options within a short period of time, otherwise the share options are forfeited. This factor also causes the early exercise of employee share options. Other factors causing early exercise are risk aversion and lack of wealth diversification.

B17: The means by which the effects of expected early exercise are taken into account depends upon the type of option pricing model applied. For example, expected early exercise could be taken into account by using an estimate of the option's expected life (which, for an employee share option, is the period of time from grant date to the date on which the option is expected to be exercised) as an input into an option pricing model (eg the Black-Scholes-Merton formula). Alternatively, expected early exercise could be modelled in a binomial or similar option pricing model that uses contractual life as an input.

> *B19: As noted in paragraph B17, the effects of early exercise could be taken into account by using an estimate of the option's expected life as an input into an option pricing model. When estimating the expected life of share options granted to a group of employees, the entity could base that estimate on an appropriately weighted average expected life for the entire employee group or on appropriately weighted average lives for subgroups of employees within the group, based on more detailed data about employees' exercise behaviour (discussed further below).*

To simplify, all valuation parameters for a grant should assume a term shorter than the nominal term to account for potential early exercises, forfeitures, and expirations of vested grants. This means that the interest rate term should be based on the **expected term**.

What should be the source of our interest rate and why?

A key driver for selecting the interest rates is the country in which the underlying security (the company's stock) is traded, as this provides the best estimate for the expected interest rate.

The second driver is determining which country's interest rate to use. Many companies make the mistake of using the government bond interest rate with a term equal to the expected term of the grant as a proxy for the expected interest rate; this is incorrect for several reasons:

(1) The term of the bond must align with the expected term of the grant. Government bonds typically pay interest semi-annually, so their actual term (duration) would be shorter than the nominal term of the bond. In other words, using a government bond with a term equal to the expected term of a grant would be equivalent to using an interest rate with a term shorter than the grant's expected term.
(2) **ASC 718** and **IFRS 2** clearly require the use of **zero-coupon (strip-bond)** interest rates for grant valuations, as demonstrated below:

ASC-718

> *718-10-55-28*
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> *Option-pricing models call for the risk-free interest rate as an assumption to take into account, among other things, the time value of money. A U.S. entity issuing an option on its own shares must use as the risk-free interest rates the implied yields currently available from the U.S. Treasury zero-coupon yield curve over the contractual term of the option if the entity is using a lattice model incorporating the option's contractual term. If the entity is using a closed-form model, the risk-free interest rate is the implied yield currently available on U.S. Treasury zero-coupon issues with a remaining term equal to the expected term used as the assumption in the model. For entities based in jurisdictions outside the United States, the risk-free interest rate is the implied yield currently available on zero-coupon government issues denominated in the currency of the market in which the share (or underlying*

share), which is the basis for the instrument awarded, primarily trades. It may be necessary to use an appropriate substitute if no such government issues exist or if circumstances indicate that the implied yield on zero-coupon government issues is not representative of a risk-free interest rate.

IFRS-2

Risk-free interest rate

B37: Typically, the risk-free interest rate is the implied yield currently available on zero-coupon government issues of the country in whose currency the exercise price is expressed, with a remaining term equal to the expected term of the option being valued (based on the option's remaining contractual life and taking into account the effects of expected early exercise). It may be necessary to use an appropriate substitute, if no such government issues exist or circumstances indicate that the implied yield on zero-coupon government issues is not representative of the risk-free interest rate (for example, in high inflation economies). Also, an appropriate substitute should be used if market participants would typically determine the risk-free interest rate by using that substitute, rather than the implied yield of zero-coupon government issues, when estimating the fair value of an option with a life equal to the expected term of the option being valued.

Conclusion

While determining the interest rate for the valuation of the stock-based compensation, please consider the following:

(1) Use the interest rates published by the central bank of the country in which the company is registered and the stock is traded.
(2) Use the zero-coupon (strip-bond) interest rate published by the central bank at the date closest to the grant date
(3) Consider a term corresponding to the expected term of the grant

Please note that out of the six parameters used for SBC valuation (stock price, strike price, term, expected volatility, expected interest rate and expected dividend), the interest rate has the least impact on the grant valuation; This is especially true in the low-interest rate environments. As a result, some approximations may be acceptable, such as:

- Using interest rates published at the beginning of every month
- Using terms that are not exactly equal to the expected term of the grant

About the Author

Ramy Taraboulsi is the CEO of VeritableSoft Innovations Inc., the parent of LoyaltyOptions (https://LoyaltyOptions.com), the software product that manages all aspects of administration and accounting of stock-based compensation and employee ownership plans, including Restricted Shares and other types of employee ownership instruments.

Prior to founding VeritableSoft, Ramy held different executive positions including Chairman and CEO at SyncBASE, CIO at Insurance Bureau of Canada, VP - Internet Strategy and Development at Fidelity Investments, VP - Internet Strategy at Merrill Lynch and Chief Systems Architect at Mercer Human Resources Consulting. Ramy has also held and is currently holding various directorship positions.

Ramy is a Professional Engineer who holds an M.Sc. in Computer Science, MBA and he is a Chartered Financial Analyst (CFA). Ramy has been practicing different forms of martial arts for 40 years and is currently actively practicing and teaching Karate. He also plays music and enjoys reading, writing, learning new languages and traveling around the world.