

VALUATION CONCEPTS APPLIED TO EQUITY INCENTIVE AWARDS BASED ON TOTAL SHAREHOLDER RETURN

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Share-based payment awards have been a subject of formal valuation for financial reporting and tax purposes since the adoption of FAS 123R in 2004 by the Financial Accounting Standards Board for US GAAP. This significant step immediately made the less familiar use of option-pricing theory a regular mainstay of audited financial statements. Thus, for the first time in a meaningful way, the use of numerical-based valuation models, including lattice and Monte Carlo simulation, became a necessary consideration. At the root of this valuation evolution are the companies choosing to adopt Equity Incentive Plans intent on aligning management and shareholders' interests. Stock option awards received the lion's share of initial attention because of their popularity and prevalence, while other forms of awards and their variants were starting to proliferate. Comfort with issuance of share-based payments has led to boardroom creativity around an award's design that has prompted development of new valuation approaches and methodologies, albeit around familiar theories.

VALUING RESTRICTED STOCK GRANTS

For this discussion, we turn our focus to *restricted stock* grants, which are a popular form of award and increasingly part of Equity Incentive Plans adopted by companies and their boards. Restricted stock and stock options share in their intent to benefit the recipient in the event the underlying common stock appreciates in price. Each form of award is available to and granted by both public and private companies. Public companies have the advantage of an observable stock price, which enables vesting requirements that are not applicable to a private company share with an unobservable stock

price. This article focuses on a specific form of market condition that is available only to a public company called Total Shareholder Return (TSR) or sometimes also referred to as relative Total Shareholder Return (rTSR).

Restricted stock grants come in a variety of forms, where the form refers to the conditions that make the stock restricted, i.e. vesting terms. This is not a lock-up or other non-vesting related restriction. Rather, restricted stock awards require some measure of vesting, be it service-based or performance-based, before the recipient (grantee) has ownership of an unrestricted stock. TSR is a specific type of vesting condition that has become popular among public companies issuing restricted stock awards. The basic premise is to compare the company's stock performance over a defined measurement period to that of a selected group of other public companies. This group is often referred to as a peer group since they will generally be companies in the same industry or sector. Thus, the vesting is based on a measure of *relative performance* with the idea being that an employee should benefit in a manner that is aligned with the company's performance versus its peers, instead of its own stock exclusively (like an option) or to a less descriptive diffuse comparison such as a broad-market index (e.g. S&P 500).

MEASURING TSR

TSR restricted stock vesting will award a percentage of the total grant to the recipient at the conclusion of a defined performance period based on the price performance of the stock. In the parlance of GAAP accounting, this is a *market condition*. Market

conditions must be considered in the fair value of the award as of the grant date. Thus, for a TSR award, a fair value analysis must incorporate the measurement or calculation of Total Shareholder Return (the underlying performance metric) in the context of the peer group such that rankings and associated vesting percentages are captured in the fair value. Each of these components would be explicitly defined in the Award Agreement.

The core of the analysis then is bringing these components together for valuation purposes. The most common framework for doing so is a Monte Carlo simulation process that works with observable stock prices at the Grant Date to simulate individual stock price performance for each peer company, as well as the subject company. Simulating the stock price allows the TSR calculation since the necessary ingredients will be in place, that being the starting (S_0) and ending stock price (S_T) over a defined period of time (T). Total shareholder return is most frequently defined as the percentage return on the stock in the form of:¹

$$\left[\frac{S_T}{S_0} \right]^{1/n} - 1$$

Thus, the relationship between the ending stock price and the beginning stock price translated into return measure over the performance period. While variations on this theme exist, this is the basic form. In addition, dividends and their inclusion or exclusion should be stipulated by the Award Agreement and considered in the measurement of TSR.

The stock price simulation process gives us the needed input to compute TSR and make a ranking comparison to determine the vesting percentage. The fundamental form is Geometric Brownian Motion (GBM) which is a stochastic (random, non-constant) diffusion process that results in a distribution of future stock prices consistent with a lognormal form and generally accepted as a reasonable proxy for the behavior of a random variable such as a stock price. The form of this equation is readily available and presented here:

$$S_i = S_0 * \exp\left(\left(r_f - \frac{\sigma^2}{2}\right)\Delta t + \sigma\sqrt{\Delta t} \epsilon_i\right)$$

Overall, the stock price evolves according to a constant underlying drift rate (r_f), a volatility estimate that speaks to the dispersion of prices around the drift rate, and a random variable (ϵ_i) selected from a standard normal distribution. The stock process could be adjusted for dividends as needed. The result is an ending stock process

consistent with the stock's own volatility and the time period.

A logical choice for drift rate would seem to be the required return on the stock, meaning the estimate of the company's cost of equity. After all, we are projecting the company's stock price to the end of the performance period to measure the return realized on the stock. But we would be wrong.

Rather than using a cost of equity drift rate for each company, we will instead use a single market-based risk-free rate whose term is consistent with the remaining time between the grant date (t_0) to the end of the performance period (T). Fortunately, identifying the appropriate risk-free rate is a much simpler and more objective task than a cost of equity.

APPLYING AN OPTION PRICING FRAMEWORK

But why? The key insight here is that the performance-based restricted stock award is a closet option – or at least close enough that we will value the TSR market condition award in an option pricing framework. This is a big idea that deserves to be considered carefully. Why option pricing? There isn't even a strike price for the underlying, and furthermore, the actual award when settled will be based on the ending stock prices for all of the peer companies, which grow in the real world at risk-adjusted rates. Instead, we're going to work with a risk-free rate that, when swallowed up by volatility, evolves a stock price distribution with a median ending stock price less than the current stock price.² Given the nature of the award, this seems to be a strange outcome.

The key in this conclusion is the payoff profile associated with holding a share of restricted stock subject to a market condition such as TSR. The payoff diagram has a "kink," meaning it is not linearly associated with all ending stock prices. Rather, there is a "zero value" for otherwise non-zero stock prices that do not satisfy the TSR condition. If the stock price does not attain a certain level of performance then the share will be forfeited at zero value to the holder, despite the stock itself having a value. This is the analog to principles associated with option pricing valuation.

With option pricing, the cost of equity turns out to be irrelevant given the notion that the current stock price fully reflects its expected return. In this context, the appropriate drift rate becomes the risk-free rate. This insight and outcome is a big advantage to the valuation process because it alleviates the need to estimate all the individual costs of equity. We can observe the risk-free rate and be done!

¹Generalized form that will be defined in the Award Agreement; n reflects the length of the performance period in years – some measurements may treat $n = 1$ to simply measure an absolute return rather than a periodic return.

²Note that the greater the volatility, the lower the ending median stock price; the mean ending stock price is not affected and reflects the constant drift rate.

CONSIDERATION OF CORRELATION

With the stock price process settled, we turn our attention to the consideration of correlation. Given that the market condition is designed to consider relative performance across a peer set of companies, it is likely that these stock prices will evolve in a generally connected way reflecting similar influences to movements in both industry-specific and broader economic conditions. Thus, we measure the TSR using correlated stock prices based on measures from historical stock prices. The correlation is captured within the simulation process itself.

ARRIVING AT A FAIR VALUE CONCLUSION

With all the pieces in place, the simulation is set to measure the dollar value of a single restricted share based on the ending stock price for each individual trial of the simulation. The ending stock price enables the calculation of the TSR and the rank of the company's stock in the peer set, which determines the percentage of a share received. The award agreement defines the desired vesting percentage, which will range from zero to 100 percent or more based on a range of TSR rank. The dollar value is then the vested percentage of a single share multiplied by the ending stock price and converted to a present value. The present value factor is consistent with the risk-free drift rate, again avoiding the potentially challenging question of applying the correct discount factor.

The restricted stock fair value is the mean of all the simulation results. The result should not be a complete mystery. The fair value must be less than the grant date stock price if the maximum vesting provides for 100 percent. If the award allows vesting in excess of 100 percent then the award could have a fair value in excess of the current stock price. Even with the possibility of excess vesting, the fair value is generally at a discount to the observable stock price on the grant date.

Incorporation of the TSR market condition into a fair value measurement introduces some interesting inputs that may not have been immediately intuitive, as well as a realization that the restricted share is more like an option than a share of stock.

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