

Performance Stock Options

By J. Gregory Vermeychuk, Ph.D., CAIA

Performance Stock Options

Performance Stock Options (PSOs) are a specific variety of **Performance Price Target** award. Vesting of the award is contingent upon the achievement of a market-based performance condition, and optionally, a service condition. The distinguishing feature of PSOs is that the award settles in American-style options on the grantor's shares. These options, although not exchange-traded, have a strike price and expiration date associated with them. The time from the award date to the expiration date of the options is known as the **contractual period**.

In the White Paper dealing with Performance Price Target awards,¹ we discussed the procedures for valuation of PPTs both with and without service conditions. In the case of PSOs, the award comprises an option, whose value is dependent upon a number of factors, some of which may be known beforehand and some which are not. This additional layer of complexity, combined with the range of commonly accepted practices for estimation of the indeterminate components of value, renders the PSO worthy of discussion as a separate award category.

PSOs and Other Performance Based Equity Awards

A PSO program is based upon all the design assumptions which apply to a PPT program. The two are fundamentally different, however, in that once the award is earned, the share price must exceed the strike price of a PSO in order for a participant to receive value. The PSO award may be perceived as having less value than a similarly structured PPT, in that the share price could drop or remain below the strike price, even though the performance conditions have been met. On the other hand, PSO awards can be structured to return significant value to the participant if share prices continue to rise after the achievement of the performance condition. Since PSO programs may have contractual periods of ten years or more, there is sufficient time for the favorable achievements of participants to assert themselves upon the share price and ensure a positive outcome.

A Performance Stock Option award with a long contractual period provides a continuing source of motivation for participants after the achievement of the initial performance condition. The value eventually realized will continue to appreciate with increasing share price for as long as the award remains unexercised. Combined with this incentive, there is a potential for loss in value if the share price decreases between the date of vesting and the eventual exercise of the award. These features are considered by many compensation committees as providing an excellent alignment between the interests of the program participants and interests of shareholders. Since the strike price of the options awarded is independent of the share price which constitutes the performance condition, there is considerable design flexibility which may be employed by the compensation committee to provide the desired degree of incentive to the participants.

PSOs provide flexibility for the participants as well, since each participant may take his or her individual financial situation and tax circumstances into account when developing the decision of when best to exercise a PSO award.

A PSO award program provides a high degree of flexibility for both the grantor and the participant, along with a continuing long-term incentive.

PSO valuation requires a two-phase Monte Carlo simulation which incorporates assumptions about forfeiture and exercise behavior.

Valuation of the PSO

Valuation of PSOs proceeds in two phases. In the first phase, Monte Carlo simulation of the share price from the award date to the end of the performance (or service) period is conducted to develop a set of “successful” and “unsuccessful” share price paths. For those award programs without an explicitly stated or implicit service condition as defined in *FASB ASC 718*,² a **derived service period** is calculated from the set of “successful” paths as the median value of the elapsed time required to satisfy the performance condition. In order to produce this simulation, an estimate of the share price volatility over the period of simulation is required. As previously discussed in this series of White Papers,³ the estimated volatility may be a single value or a term structure. This value or term structure may be derived from either historical volatility or implied volatility of the share price under consideration. The process of estimation of implied volatilities from the prices of listed options has also been previously discussed. It is important to remember that an estimate of the risk-free interest rate or term structure thereof is necessary to produce the estimate of implied volatility, and assumptions regarding future dividend distributions from the grantor company’s stock must be made as well.

The second phase of the valuation of the award specifically addresses the American-style option which is created once the performance and service conditions (if any) of the award have been met. In addition to expanded estimates of volatility and interest rate behavior throughout the contractual period, the issues of **post-vest forfeiture** and **exercise behavior** are introduced.

Factors in the Valuation of Performance Stock Options

The value of a PSO depends upon a number of factors, some of which are shared with all equity options. These include:

- Path of the share price from vesting date to expiration date.
- Expected schedule of dividend payments from vesting date to expiration date.

The Monte Carlo simulation will yield the path of share prices. In the case of a dividend paying stock, specific dates and amounts of projected future dividend payments may be incorporated into the **binomial model**⁴ used to value the option. Further requirements include:

- The risk-free interest rate from vesting date to expiration date.
- The expected share price volatility from vesting date to expiration date.

Since the contractual period of a PSO may span several years, one approach is to use a single-value approximation for each item listed above. A more refined approach would be to use a term structure of interest rates derived from implied forward rates and some type of term structure for expected volatility. In all cases, sufficient justification for all assumptions should be provided. For those requiring a more detailed technical discussion, please refer to our additional resources^{5,6} on these topics.

Exercise behavior is subject to a number of assumptions, which must be clearly stated in the valuation of a PSO award.

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The **service date** may be explicitly stated in the terms of the award. In such cases, a **requisite service period** results. In those conditions where no service condition is present, an **implicit service date** as defined in ASC 718 may be used, or a **derived service period** may be used to calculate a **derived service date**. The appropriate choice depends upon the specific nature of each award.

Since there may be a significant span of time between the vesting date and the expiration date of the PSO, the **post-vest forfeiture rate** must be considered. Post-vest forfeiture occurs when a participant with a vested award terminates employment before the expiration date of the option. If the option has not been exercised, no payout occurs, and no costs are incurred. Post-vest forfeiture behavior may be estimated from historical employee turnover rates. In cases where such data are not available, the most conservative approach is to assume that no post-vest forfeiture will occur.

Finally, from the time the PSO award vests until the expiration date, the decision to exercise the options lies with the participant of the award program. Any a priori valuation of the award requires assumptions regarding exercise behavior. These assumptions may be developed by either of two basic approaches or by a combination of the two.

- Estimate of post-vest exercise behavior based upon time remaining until expiration.
- Estimate of a suboptimal exercise factor (SOEF) based upon a specified multiple of the exercise price.

In the first approach, exercise is assumed to take place between the vesting date and expiration date. This may be assumed to be 25%, 50%, 75%, or some other portion of the time interval. The SOEF is calculated using the amount of “moneyness” of the option, or a specific multiple of the exercise price, as an exercise price threshold. Various combinations of time and SOEF may be specified as exercise conditions as well.

Once all of the assumptions and conditions have been developed, they are incorporated into a Monte Carlo simulation of the share price spanning the period from grant date to expiration date. After the paths have been simulated and characterized the Fair Value is calculated in the like manner as explained in the previous White Paper⁷ in the series.

Design and Implementation of a Compensation Plan

The selection, design, and implementation of a successful equity compensation plan is a complex undertaking. The discussion of Performance Stock Options presented here serves to illustrate some of the issues which will be encountered. You may choose to complete the entire process internally, outsource the task, or follow an intermediate path. No matter what course you choose, **Montgomery Investment Technology** can provide you with proven resources which will maximize your likelihood of success.

For those who choose to develop and implement their program internally, MITI offers a series of **Working Papers** which are located on our website. We also can provide training seminars tailored to your specific needs, with subject matter spanning ASC Topic 718 accounting requirements, alternative awards, the characteristics of options, futures and other derivative instruments, the nature of volatility, hedging the cost of your equity compensation plan, and many other areas.

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We can also offer assistance in screening and selection of candidates for your peer group, preparation of modeling equations, preparation of justification for your underlying assumptions, and the valuation of exotic and complex instruments.

If you decide to outsource the process, MITI has the experience, expertise, and other resources to deliver a complete solution. We have designed and implemented equity compensation programs, including tools for the constant review of progress during the performance period and for the support of your accounting function. We will also develop the appropriate footnotes for your financial statements which will keep you compliant with all regulatory requirements. Furthermore, our highly skilled and credentialed team can answer all your questions regarding compliance, and will work with your independent auditors to explain your valuation methodology and support the underlying assumptions.

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Montgomery Investment Technology, Inc.

200 Federal Street, Suite 245
Camden, NJ 08103

Phone: 610-688-8111

Fax: 610-688-5084

Web: www.fintools.com

Email: miti@fintools.com

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¹ *Performance Price Target Awards: Basic Principles – Montgomery Investment Technology, Inc. – www.fintools.com/resources.*

² *Financial Accounting Standards Board, Topic 718, as updated January 2010, No. 2010-05*

³ *Introduction to TSRs – Montgomery Investment Technology, Inc. - www.fintools.com/resources*

⁴ *Cox, J.C., Ross, S.A., and Rubinstein, M., Journal of Financial Economics 7 (1979) 229-263*

⁵ http://fintools.com/SBP/Dow/SBP_BestPracticeSeries_ImpliedForwardRates.pdf

⁶ *Volatility Term Structure - <http://fintools.com/resources/working-papers>*

⁷ *Performance Price Target Awards: Basic Principles – op. cit.*