

Employee Stock Options for the Participant

Part II: Value of ESO's

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In **Part I** we discussed a fictional ESO from ABC Company and looked at what might happen if a participant had decided to exercise his option as soon as it vested, given that ABC shares had increased in value from \$40.00 to \$60.00 over the three year vesting period. Here in Part II, we consider the **theoretical value** of the fictional ESO, how the theoretical value is determined, and how the theoretical value of an option can inform a participant in his or her decision of when to exercise.

Since Employee Stock Options are not traded in public on an organized exchange, they do not have a **market value** or market price. We must depend on an **option pricing model** to price ESOs. When ABC Company awarded ESOs to employees, the Company was required to state a **fair value** for those options as of the award date. This value would be recorded as an expense on the income statement in the year in which the award was made. Companies which award ESOs have considerable latitude in selecting a valuation method under the applicable regulations. For our fictional case, we will assume that ABC Company selected the well-known **Black-Scholes model** to value its ESO award. Since the Black-Scholes model applies to European-style options (options which may be exercised only at their expiration date), ABC Company must make an assumption about when the options will be exercised. Although it is unrealistic to do so, the company may choose to assume that all the options will be exercised on the last day of the contractual term. Another assumption, equally unrealistic, is that all the options will be exercised immediately upon vesting. The company may elect to go with neither extreme and assume that all the options will be exercised when one-half the time between vesting and expiration has elapsed. In this particular case, the options described in Part I would have a fair value of \$17.99 per unit on the award date of 1/30/2013, assuming exercise on 7/30/2019.

It is useful for the participant to know the fair value of any ESOs he or she holds, and the assumptions used to develop that value. In the view of the Internal Revenue Service, the company has conveyed something of value to an employee in the form of compensation, even though no cash or stock has changed hands. The company may characterize the award as a compensation expense incurred upon the date of the award. At the time of the award, the employee has not received any tangible benefit, so no personal income tax is due. On 1/30/2016, when the award vests, the recipient has still not received any cash or stock, but has received a **right with potential value**. Recalling the example in Part I, with ABC shares are trading at 60.00 on the vesting date, and the assumed exercise still 3 years and 6 months away, the option has a theoretical (Black-Scholes) value of \$28.90. As we have discussed, \$20.00 represents the **intrinsic value**, or difference between the share price and the strike price. The additional \$8.90 is **extrinsic** or **time value**. This **time value** represents the expectation of potential gains from the share price moving above the current level of \$60.00 at some time before the assumed expiration date of the option. If the option is exercised at vesting when the shares are trading at \$60.00, the time value is considered as lost. We will return to this idea later in the paper.

What are the variables which affect the theoretical value of an option? No matter what model is used, the following variables determine the theoretical value:

1. Type of option (European or American style).
2. Price of the underlying stock.
3. Strike price of the option.
4. Time remaining until expiration.
5. Dividends expected from underlying stock.
6. The risk-free interest rate.
7. Expected volatility of the underlying stock.

We will not discuss the details of option pricing models in this paper. The reader seeking a thorough explanation of the Black-Scholes and other option pricing models should consult such references as Hull¹, McDonald² or Sundaram and Das³. Any theoretical model of a call option on an underlying whose market price is near the strike price of the option will predict an extrinsic or time value. This time value will

decrease as the time to expiration decreases, all other factors held constant. Although the recipient of an employee stock option may not regard time value as either “real” or important, time value plays a role in the decision of how to manage an employee stock option.

Let us consider a simple example. Our fictional employee receives an award of options with a strike price equal to the current share price. Three years later, the option is vested, and the price of the company shares declines by \$5.00. So, the recipient holds call options giving him the right to purchase company stock at \$40.00 per share, but the shares are trading for \$35.00. Such an option is said to be **out of the money** or **underwater**. Clearly, the recipient would not exercise such an option, but would he simply discard it as worthless? Of course not! Since the option has seven years left until expiration, the option has time value. This is because the share price could increase to \$40.00 or higher at some time in the next seven years, rendering exercise profitable. Since the option costs nothing to hold, the recipient should hold it.

Employee stock options are typically non-transferrable. If our fictional recipient could sell his option, he would receive a price dictated by the views of potential buyers in the market. The theoretical value of this fictional underwater option (according to the Black-Scholes model) is \$14.92 per unit, which is far from worthless. Note that the market value will not necessarily equal the theoretical value, since the latter is calculated from an idealized model based upon simplifying assumptions. Even so, the theoretical value of an option serves as a useful guideline when considering different approaches to managing a position.

We will now turn our attention to a specific decision which could be faced by the recipient of our fictional ESO. An option on 1,000 shares of ABC is awarded on January 30, 2013. The strike price is \$40.00, which is equal to the current share price. The option vests on January 30, 2016 and has seven years left to maturity. On the vesting date, the shares of ABC are trading at \$60.00. The option has an intrinsic value of \$20.00 per unit and is said to be **in the money**. The recipient has a decision to make. He can do one of three things:

1. Take no action and hold on to the option.
2. Exercise the option and immediately sell the stock.
3. Exercise the option and hold the stock. There is no reason to pursue this course because the exercise of a non-qualified option constitutes a taxable event in which the recipient is liable for taxes on the intrinsic value of the option. Simply holding the stock for one year and one day will not entitle the recipient to long-term capital gains treatment on the entire profit from the stock sale. If the recipient believes that the share price will continue to increase, then the long-term capital gains rate will apply to the difference between the stock value at sale and the value at exercise, while the intrinsic value of the option will be taxed as ordinary income, at a rate of up to 40%.

We can compare the two remaining choices to present the risks and rewards associated with each choice.

Choice #1: Hold the Option.

Holding the option provides no immediate reward. The risk which would be apparent to the participant would be a subsequent decline in the price of ABC shares which would not reverse itself for a period of seven years. In the absence of any company-specific factor which would drive the share price either higher or lower, the share price is more likely to advance instead of decline over the next interval of time, in a world in which a risk-free asset earns some return. If the option is held for a year, it will lose some time value, but this does not represent a loss of actual cash to the option owner. The option owner is rewarded by the expected increase in the share price over the time he holds the option.

If the option holder would like to diversify his portfolio, or needs cash immediately for some reason and cannot obtain it from other sources, holding the option may not be the optimal strategy. Even so, immediate exercise of an in-the-money option is not without cost. It should be noted that some employees, by virtue of their employment contracts, are required to hold the stock acquired by exercise of an ESO for a certain period of time. Also, some plans may impose “**blackout periods**” in which the options may not be exercised.

Choice #2: Exercise the Option and Sell the Stock Immediately.

In this choice, the consequences are more readily apparent. If a cashless exercise is possible, the recipient could exercise his option at a cost of \$40.00 per share then sell the stock immediately for \$60.00, obtaining a pre-tax profit of \$20,000. With a 40% tax rate on the profits of the stock sale, the after-tax profit becomes \$12,000. The recipient has foregone a theoretical time value of \$15,110, calculated on the basis of holding the option until just before expiration. At this stage, the lost time value is simply hypothetical, since our recipient does not know of any way to release this theoretical time value as real cash.

These two examples typify the alternatives available to a holder of vested non-qualified ESOs. The pros and cons of each alternative hinge on the concept of the time value of an option, which is recognized in exchange trading but which is not readily available to owners of ESOs. To expand upon this theme, we will now consider the important differences between non-qualified ESO's and exchange-traded options.

Availability:

Any corporation, whether publicly traded or privately held, may offer employee stock options. These options are created in a contract between a company and an employee. A firm with ESOs need not have options traded on an exchange, such as the CBOE. Conversely, the existence of exchange-traded options on the stock of a given company does not imply that the company provides ESOs as part of its employee compensation. Exchange traded options are created by an exchange in response to investor demand. They are not issued by a corporation, and have no impact upon the corporation's financial statements.

Transferability:

Employee Stock Options are typically non-transferable. They are issued to an employee who may not sell or assign them to a third party. Exchange traded options may be freely bought and sold by anyone with an options account with an SEC registered broker-dealer.

Term and Expiration:

Exchange-traded options typically expire no later than nine months from the present date. They are issued monthly or quarterly, and have standardized expiration dates, which fall on the third Friday of the expiration month. Some stocks have weekly options, which are issued on each Thursday and expire on the Friday of the next week. Some companies have active trading in **LEAPS®** (*Long Term Equity Anticipation Securities*) which have expiration dates longer than one year. Employee Stock Options are typically written with contractual terms of 10 years. Expiration dates are not standardized.

Style and Type:

Exchange-traded options are **American-style**, which means that they may be exercised at any time before the expiration date. ESOs are usually **Bermudan-style**, which means that they may be exercised only after a certain date. ESOs are written as **call options**, which give the holder the right but not the obligation to **purchase stock** at the strike price. Options traded on an exchange are both **calls and puts**. A put option gives the holder the right but not the obligation to **sell stock** at the strike price.

Contract Size:

A standard exchange-traded option represents a contract on 100 shares of the underlying stock. On some stocks, there are mini-options which represent a contract on 10 shares. Employee Stock Options are written to represent a certain number of units, or shares. One usually refers to one ESO as representing one unit or one share of stock.

Strike Price:

The strike price of an ESO is usually the closing price of the company shares on the award date. Strike prices of exchange-traded options are standardized to intervals of \$1.00, \$5.00 or \$10.00. Sometimes other intervals are specified if there is demand in the market.

In the next White Paper of this series, we will take a closer look at the "hold vs. exercise" decision and how it is influenced by the circumstances of the recipient and by his or her financial goals.

Disclaimer

The foregoing is intended for educational purposes only and is not to be regarded as investment advice. The examples are illustrative and do not represent actual employee stock options. The circumstances of every investor are unique. One should consult with licensed professionals before making any investment decision.

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¹ John C. Hull, *Options, Futures and Other Derivatives (6th Edition)*, c 2005, Prentice-Hall

² Robert L. McDonald, *Derivatives Markets (2nd Edition)*, c 2005, Addison-Wesley

³ R. Sundaram and S. Das, *Derivatives*, c 2010, McGraw-Hill/Irwin